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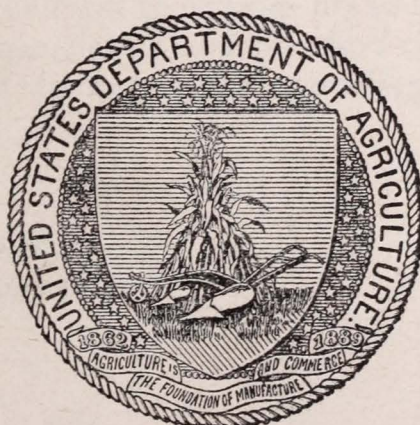
L. O. HOWARD, Entomologist and Chief of Bureau.

SYNOPSIS, CATALOGUE, AND
BIBLIOGRAPHY OF
NORTH AMERICAN THYSANOPTERA,
WITH DESCRIPTIONS OF NEW SPECIES.

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DUDLEY MOULTON,
Deputy State Commissioner of Horticulture for California.

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ENTOMOLOGY,
Washington, D. C., December 13, 1910.

SIR: I have the honor to transmit herewith the manuscript of a bulletin to be entitled "Synopsis, Catalogue, and Bibliography of North American Thysanoptera, with Descriptions of New Species."

During the past few years the order Thysanoptera in America has been the subject of increased study by entomologists, not only on account of the extreme interest attaching to the insects themselves, but also by reason of the considerable importance which several of the species have attained as pests of horticultural and other crops. Mr. Moulton, while in the employ of this bureau, was a part of the time engaged in a study of two very destructive species in California, namely, the pear thrips (*Euthrips pyri* Daniel) and the orange thrips (*Euthrips citri* Moulton), and the present paper is an outgrowth of data and specimens collected during his investigation of these insects for the bureau.

An up-to-date synopsis and catalogue of the Thysanoptera is greatly to be desired and will be of much use to students of this order. I would therefore recommend the publication of this paper as Technical Series No. 21 of the Bureau of Entomology.

Respectfully,

L. O. HOWARD,
Chief of Bureau.

Hon. JAMES WILSON,
Secretary of Agriculture.

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SYNOPSIS, CATALOGUE, AND BIBLIOGRAPHY OF NORTH AMERICAN THYSANOPTERA, WITH DESCRIPTION OF NEW SPECIES.

INTRODUCTION.

The many recent publications on American thrips, and especially the descriptions of new species with their added notes, have constantly impressed the writer with the need of a catalogue of these already known species, with references to their habitat and food plants and to notes on their life history. The writer is also impressed with the need, for future workers, of a uniform method in describing new species.

Several English and European entomologists have published extensively on European thrips, but it is only within the last decade that American writers have given more than passing notice to these insects. Several species of injurious thrips, in both the East and West, have been carefully studied, and these economic problems, it seems, have been largely the incentive for the other, the systematic work. The grass thrips (*Anaphothrips striatus* Osborn), the strawberry thrips (*Euthrips tritici* Fitch), the onion thrips (*Thrips tabaci* Lindeman), the tobacco thrips (*Euthrips fuscus* Hinds), the greenhouse thrips (*Heliothrips hæmorrhoidalis* Bouché), the bean thrips (*Heliothrips fasciatus* Pergande), the orange thrips (*Euthrips citri* Moulton), and lastly the pear thrips (*Euthrips pyri* Daniel) are all examples of what serious pests this group includes. Already many agents of the Bureau of Entomology of the United States Department of Agriculture and various State and county workers have spent much time and money in learning the habits of these several injurious forms. California, unfortunately, harbors all of the above-mentioned species except, so far as we know, the tobacco thrips.

Messrs. Hood, Shull, Franklin, and D. L. Crawford have published extensively on these insects since the monograph by Dr. W. E. Hinds appeared. The writer also knows of others who are collecting thrips and preparing manuscript on description of new species. It seems opportune, therefore, for the sake of future workers, that a uniform method of describing species be adopted. The writer, therefore,

includes an outline,¹ which has been found most satisfactory in his own work.

Thrips are such minute insects that it is necessary for accurate study that they be mounted on slides. The writer has been able to get the best results by treating them in the following way: The thrips should be collected and killed by dropping them directly into 75 or 80 per cent alcohol; they should be dehydrated by passing them successively through 90 per cent, 95 per cent, and absolute alcohol, and then cleared in xylol or cedar oil, and mounted in balsam. One specimen only should be placed under a cover glass; but by using small cover glasses, two can be placed side by side on a single slide. Glycerin jelly mounts are not to be desired.

The present paper includes 118 species of known American thrips, which are variously divided among 40 genera. Descriptions of 2 genera, 10 species, and 1 variety are herewith presented. The bibliography includes only references to recent publications.

CLASSIFICATION OF NORTH AMERICAN THYSANOPTERA.

KEY TO THE SUBORDERS AND FAMILIES.

I. SUBORDER TEREBRANTIA.

Female with a sawlike ovipositor. Terminal abdominal segment of female conical and of male broadly rounded. Wings usually present; fore pair strongest, with more or less well-developed veins; membrane of wings with microscopic hairs.

a. Antennæ with nine segments. Fore wings broad and rounded and with prominent ring veins and cross veins. Ovipositor upcurved.

(*A.*) Family *ÆOLOTHRIPIDÆ*.

a'. Antennæ with seven, eight, nine, or ten segments. Wings present or wanting; when present usually narrow and pointed at tips. Ovipositor downcurved (*B.*) Family *THRIPIDÆ*.

¹ ORDER FOLLOWED IN DESCRIBING THYSANOPTERA.

Name.

Measurements: Head length, width; prothorax length, width; mesothorax width; abdomen width; length of tube in the *Phlæothripidæ*; total body length; antennæ, length of segments in microns, total length. Note any variations.

General color, with variations.

Head: Comparative size, shape (frons, cheeks), markings, spines.

Eyes: Size, shape, position on head, color; shape and size of facets; presence or absence of pilosity.

Ocelli: Present or wanting, size, position, color.

Mouth-cone: Comparative size, shape; maxillary palpus, shape, segments; labial palpus, shape, segments.

Antennæ: Number of segments, total length compared with head, color, markings including spines, sense cones and areas.

Prothorax: General shape, size, angles, number and position of spines, color.

Mesothorax: Shape, comparative size, color.

Metathorax or pterthorax: Ditto.

Legs: Shape, markings of claws or spines, color.

Wings: Fore wings, size, shape, veins, spines or hairs, fringe, color; hind wings, ditto.

Abdomen: Shape, markings, spines; shape of tube in *Phlæothripidæ*.

Number of specimens from which described.

Habitat.

Food plants.

Notes: Including time of year when adults are taken.

Descriptions of males should follow the same outline as for females.

Notes on larval stages.

II. SUBORDER TUBULIFERA.

Female without sawlike ovipositor. Terminal abdominal segment tubular in both sexes. Wings usually present; fore pair only with a rudimentary median longitudinal vein; membrane of wings without microscopic hairs. Antennæ with eight segments, or sometimes only seven.

(C.) Family PHLÆOTHIRIPIDÆ.

KEY TO THE GENERA.

A. Family ÆOLOTHIRIPIDÆ.

1. All segments of antennæ freely movable and diminishing in size gradually toward the tip.
 - a. Maxillary palpi with seven or eight segments; wings with bands.
 - b. Wings with dark cross-bands; maxillary palpi with seven segments.
 - (1) *Orothrips* Moulton.
 - b'. Wings with dark longitudinal bands along posterior margin; maxillary palpi with eight segments..... (2) *Erythrothrips* new genus.
 - a'. Maxillary palpi three-segmented, labial palpi two-segmented; wings without dark cross-bands..... (3) *Ankothrips* Crawford.
2. Last four segments of antennæ closely united and together shorter or a little longer than the fifth; maxillary palpi three-segmented, labial palpi four-segmented (4) *Æolothrips* Haliday.

B. Family THIRIPIDÆ.

1. Antennæ with seven segments.
 - a. Body with deeply reticulated structure; wings broad, reticulated, and without front fringe..... (5) *Parthenothrips* Uzel.
 - a'. Body without reticulated structure; wings pointed, front fringe present.
 - b. Maxillary palpus with two segments..... (6) *Baliothrips* Haliday.
 - b'. Maxillary palpus clearly with three segments..... (7) *Thrips* Linnæus.
2. Antennæ with eight segments (with six segments in *Aptinothrips rufus* var. *con-natticornis*).
 - a. Body with reticulated structure, wings present.
 - b. Last segment of antenna long and slender and very much longer than segment 7.
 - c. style longer than segment 6; prothorax much shorter than head; spines on veins pointed..... (8) *Heliothrips* Haliday.
 - c'. style shorter than segment 6; prothorax about as long as head; spines on wings long, strong, and with dilated tips.
 - (9) *Echinothrips* new genus.
 - b'. Last segment of antenna not noticeably long and slender and only a little longer than segment 7; style shorter than segment 6.
 - (10) *Dictothrips* Uzel.
 - a'. Body without reticulated structure (except in *Sericothrips reticulatus*).
 - b. Abdomen having a silky luster (when living or in dried condition), because of covering of extremely small hairs.
 - (11) *Sericothrips* Haliday.
 - b'. Abdomen without small hairs giving it a silky luster.
 - c. Last two antennal segments longer than the sixth.... (12) *Raphidothrips* Uzel.
 - c'. Last two antennal segments shorter than the sixth.
 - d. Terminal segment of abdomen with a pair of extremely stout, short spines near the tip above..... (13) *Limothrips* Haliday.
 - d'. Terminal abdominal segments without stout spines.

- e.* Antennæ with second segment drawn out into an acute process on outer angle; fore femora usually broad and with small tooth at end on outside.....(14) *Chirothrips* Haliday.
- e'.* Antennæ with second segment normally symmetrical fore femora smaller and without tooth.
- f.* Ocelli and wings wanting; hairs upon the end of the abdomen short and as a rule very weak.....(15) *Aptinothrips* Haliday.
- f'.* Ocelli and wings present; hairs upon the end of the abdomen moderately long and proportionately stout.
- g.* With a long spine at the middle of each side of prothorax; spines on body and wings very strong.....(16) *Scolothrips* Hinds.
- g'.* Without a spine at the middle of each side of prothorax.
- h.* Ovipositor long and extending considerably beyond tip of abdomen.....(17) *Scirtothrips* Shull.
- h'.* Ovipositor not unusually long and not extending beyond tip of abdomen.....(18) *Euthrips* Targioni-Tozzetti.
- 3. Antennæ with apparently nine segments.
 - a.* Head only slightly wider than long; wings not regularly set with spines; spines weak and not conspicuous.(19) *Anaphothrips* Uzel.
 - a'.* Head fully one and one-half times as wide as long; wings set regularly with spines.....(20) *Pseudothrips* Hinds.
- 4. Antennæ with clearly nine segments, sometimes apparently ten.
 - (21) *Heterothrips* Hood.

C. Family PHLÆOTHIRIPIDÆ.

- 1. Head about as long as wide and either shorter or only a little longer than the prothorax.
 - a.* Antennæ with seven segments.
 - b.* Antennæ one and one-half times as long as head; head rounded in front and about as wide as long; basal segments of antennæ subap. proximate(22) *Allothrips* Hood.
 - b'.* Antennæ two and one-half times as long as head; head rectangular; basal segments of antennæ widely separated and placed on the prominent anterior angles of the head.
 - (23) *Rhaphothrips* Crawford.
 - a'.* Antennæ with eight segments and one and one-half to twice as long as head.
 - b.* Width of abdomen of females not nearly equal to one-half its length; wings constricted in the middle.
 - c.* Mouth-cone not longer than its breadth at base; labrum narrowed toward the tip but not sharply pointed; fore femora but slightly thickened; fore femora of males without large curved tooth on inner side.....(24) *Anthothrips* Uzel.
 - c'.* Mouth-cone reaching nearly to hind edge of prosternum; labrum blunt; fore femora of females thickened, of males greatly enlarged and with a large curved tooth on inner side.
 - (25) *Aleurodothrips* Franklin.
 - b'.* Width of abdomen of females equal to about one-half its length.
 - c.* Head narrowed in front.....(26) *Eurythrips* Hinds.
 - c'.* Head not narrowed in front.
 - d.* Third antennal segment very short and narrow.....(27) *Lissothrips* Hood.
 - d'.* Third antennal segment normal.
 - e.* Segment 8 of antenna shorter than segment 7....(28) *Trichothrips* Uzel.
 - e'.* Segment 8 of antenna very slender and noticeably longer than segment 7.
 - (29) *Plectothrips* Hood.

2. Head considerably longer than wide and longer than the prothorax.

a. Head less than twice as long as wide.

b. Fore femora each with a tooth on the inner side near the end.

(30) *Acanthothrips* Uzel.

b'. Fore femora unarmed.

c. Wings wanting or reduced to pads (or very short and weak if fully developed).

d. Mouth-cone shorter than its width at base, labrum not narrowed in the middle and with a blunt tip.....(31) *Cephalothrips* Uzel.

d'. Mouth-cone as long as its width at base, labrum sharply pointed.

e. Cheeks with spine-bearing warts.....(32) *Malacothrips* Hinds.

e'. Cheeks without spine-bearing warts.....(33) *Neothrips* Hood.

c'. Wings fully developed.

d. Wings constricted in the middle.

e. Mouth-cone broadly rounded at the end; wings only slightly narrowed in the middle.....(34) *Cryptothrips* Uzel.

e'. Mouth-cone constricted at the end; wings considerably narrowed in the middle and having somewhat the shape of a sole.

f. Head nearly twice as long as wide; mouth-cone reaching nearly across prosternum.....(35) *Leptothrips* Hood.

f'. Head only a little longer than broad; mouth-cone reaching only to middle of prosternum.....(36) *Zygothrips* Uzel.

d'. Wings of equal width throughout.

e. Cheeks with a few very small warts, each of which bears a small spine. (37) *Phlaothrips* Haliday.

e'. Cheeks without such warts.....(38) *Liothrips* Uzel.

a'. Head more than twice as long as wide; individuals very large.

b. Antennæ one and one-sixth to one and one-half times as long as head; fore tarsi of females unarmed, of males each armed with a tooth; without prominent spines along fore margin of prothorax.

(39) *Idolothrips* Haliday.

b'. Antennæ twice as long as head; color brown to dark brown; fore tarsi not armed; four prominent spines along fore margin of prothorax, two of which stand on the outer angles.

(40) *Megalothrips* Heeger.

KEY TO THE SPECIES.

(1) Genus OROTHRIPS Moulton.

1. Segment 2 of antenna quite uniform brown; segment 3 not constricted in the middle; sense areas on segments 3 and 4 elongate.

(1) *Orothrips kelloggii* Moulton.

2. Segment 2 of antenna brown at base, yellow at tip; segment 3 constricted in the middle; sense areas on segments 3 and 4 ovoid.

(2) *Orothrips kelloggii yosemitii*, new variety.

(4) Genus ÆOLOTHRIPS Haliday.

1. Fore wings with dark cross-bands.

a. White band around abdominal segments 1 and 2; last four segments of antennæ much longer than fifth.

b. Segments 2 and 3 of abdomen white; wings with cross-veins.

(5) *Æolothrips bicolor* Hinds.

b'. Segments 1, 2, and posterior half of 3 white; wings without cross-veins.

(6) *Æolothrips vespiformis* Crawford.

- a. Without white band around first two abdominal segments; last four segments of antennæ approximately as long as the fifth alone.
(7) *Æolothrips fasciatus* Linnæus.
- 2. Each fore wing with dark longitudinal band along posterior margin.
 - a. With veins in anterior wings normal as in most species of this genus.
(8) *Æolothrips kuwanaii* Moulton.
 - a'. Without veins in anterior wings.....(9) *Æolothrips longiceps* Crawford.

(7) Genus *THRIPS* Linnæus.

- 1. Head considerably wider than long.
 - a. Body color dark brown, thorax and other parts orange-tinted, inner crescents bordering ocelli orange-red; individuals large, about 1.25 mm. in length.
 - b. Wings light brown, with lighter colored area near base.
(12) *Thrips madronii* Moulton.
 - b'. Wings uniform dark brown to brown.....(13) *Thrips magnus*, new species.
 - a'. Body color light yellow to light brown or brown; inner crescents bordering ocelli light brown; body length about 1 mm.
 - b. Ocelli subapproximate; posterior longitudinal vein of fore wing with about fourteen to seventeen regularly placed spines.
(14) *Thrips tabaci* Lindeman.
 - b'. Ocelli widely separated, anterior one on frons and directed forward; posterior longitudinal vein bearing about seven spines.
(15) *Thrips abdominalis* Crawford.
- 2. Head about as long as wide.
 - a. Color uniform light lemon-yellow.....(16) *Thrips bremnerii* Moulton.
 - a'. Color of head brown, of thorax reddish orange-brown, of abdomen pale yellow to gray-brown.....(17) *Thrips perplexus* Beach.

(8) Genus *HELIOTHRIPS* Haliday.

- 1. All tibiæ yellow.
 - a. Antennæ nearly three times as long as head; wings shaded brown, with two more or less distinct whitish cross-bands and whitish at tip.
(18) *Heliothrips femoralis* Reuter.
 - a'. Antennæ about twice as long as head; wings almost white, shaded light brown along veins.....(19) *Heliothrips hæmorrhoidalis* Bouché.
- 2. Middle and hind tibiæ brown.
 - a. Antennæ two and one-half times as long as head, segments 3 and 4 modioliform, maxillary palpi three-segmented... (20) *Heliothrips fasciatus* Pergande.
 - a'. Antennæ twice as long as head, segments 3 and 4 fusiform; maxillary palpi two-segmented.....(21) *Heliothrips fasciapennis* Hinds.

(11) Genus *SERICOTHRIPS* Haliday.

- 1. Wings fully developed or rudimentary.
 - a. Wings fully developed.
 - b. Fore wings dusky or gray-brown and more or less distinctly marked with whitish cross-bands; general color yellowish to dusky gray.
(24) *Sericothrips variabilis* Beach.
 - b'. Fore wings black, with two broad white cross-bands, and white at tip; general color blackish.....(25) *Sericothrips pulchellus* Hood.
 - a'. Wings reduced or fully developed; body dark brown to nearly black, except segments 4, 5, and 6 of abdomen, which are almost white.
(26) *Sericothrips cingulatus* Hinds.

2. Wings wanting.

- a.* Body very dark brown, nearly black; prothorax yellow to yellow-brown; legs brown.....(27) *Sericothrips apteris* Daniel.
- a'.* Body uniform brown; surface of body strongly reticulated; legs yellow.
(28) *Sericothrips reticulatus* Moulton.
- a''.* Body and legs uniform brown; four stout spines on dorsal side of segment 9.
(29) *Sericothrips stanfordii* Moulton.

(14) Genus CHIROTHRIPS Haliday.

1. With two moderately long spines at each hind angle of prothorax; two longitudinal veins in each fore wing; fore wings gray-brown.
(31) *Chirothrips manicatus* Haliday.
2. With one moderately long spine at each hind angle of prothorax; one median longitudinal vein in each fore wing, five spines on apical part of wing where second vein should be.....(33) *Chirothrips mexicanus* Crawford.
3. Without spines at hind angle of prothorax.
- a.* Abdomen light yellow.....(34) *Chirothrips obesus* Hinds.
- a'.* Abdomen light brown.....(35) *Chirothrips crassus* Hinds.

(18) Genus EUTHRIPS Targioni-Tozzetti.

1. Without prominent spines on fore angles of prothorax, longitudinal veins not regularly set with spines.
- a.* Head noticeably wider than long; general color white to light yellow or orange.
- b.* Last two segments of antennæ rather long and slender, and together about two-thirds as long as segment 6; wings shaded brown, with transparent whitish areas near base and at tip; ring vein and longitudinal veins not conspicuous.....(39) *Euthrips orchidii* Moulton.
- b'.* Last two segments of antennæ not noticeably elongate and slender and together about one-half as long as segment 6.
- c.* Ring vein and at least a part of fore vein conspicuous; color of body orange-yellow.
- d.* Wings shaded brown; fore part of longitudinal vein alone conspicuous.
(40) *Euthrips parvus*, new species.
- d'.* Wings not shaded brown; both longitudinal veins present, with three or four scattered spines on each, one of which stands at the abrupt ending of each vein.....(41) *Euthrips citri* Moulton.
- c'.* Ring vein and longitudinal veins not conspicuous; group of six spines on basal part of wing where anterior vein should be and nine on outer half where posterior vein should be; color of body and wings clear white, outer half of antennæ dark brown... (42) *Euthrips albus*, new species.
- a'.* Head about as long as wide; general color brown, thorax sometimes orange-brown.
- b.* Basal segment of antennæ concolorous with head and with segment 2; wings brown, with an irregular, somewhat triangular transparent area near base; two long prominent spines between posterior ocelli; without prominent spines along posterior margin of prothorax; legs brown, concolorous with body, except tarsi, which are lighter.
(43) *Euthrips pyri* Daniel.
- b'.* Basal segment of antennæ lighter colored than head and segment 2; wings uniform light brownish-gray, without whitish area near base.
(44) *Euthrips ehrhornii* Moulton.
2. With spines on fore angle of prothorax; longitudinal veins set regularly with spines.

- a. Fore tibiae armed at end with tooth. Females dark brown; wings brown, with whitened area near base; antennae concolorous with head, except segment 3, which is light yellow.

(45) *Euthrips ulicis californicus* Moulton.

- a'. Fore tibiae not armed with tooth.

- b. Postocular spines wanting; row of spines along anterior margin of prothorax either wanting or at least not conspicuous, except often the third from the outer margin.

- c. Antennae uniformly brown to dark brown, concolorous with body; wings light brown, veins prominent; spines brown, twenty-three on fore vein, sixteen on hind vein, short and comparatively stout; white longitudinal area near base of wing. . . (46) *Euthrips minutus* Moulton.

- c'. Antennae with segment 3 yellowish, 4 and 5 light gray-brown, yellowish at base; wings gray-brown, veins not prominent, spines on wings normally long and stout, fourteen on fore vein, ten on hind vein. (Wings may be reduced to pads). (47) *Euthrips fuscus* Hinds.

- b'. Postocular spines conspicuous.

- c. General color uniformly brown to dark brown, no shading of orange; antennae with segments 3, 4, and 5 light brown to yellow and shaded.

- d. Uniformly dark brown; fore wings shaded dark brown, with a large whitened area extending across wing near base; spines on wings all dark brown. (48) *Euthrips insularis* Franklin.

- d'. Color yellowish brown; fore wings uniformly shaded with gray.

(49) *Euthrips nervosus* Uzel.

- c'. General color whitish to yellow or yellowish to brown, no shading or orange.

- d. Second segment of antennae with a double spine-bearing tubercle; vertex of head depressed; anterior ocellus directed forward.

- e. Color uniformly yellow; surface of body without reticulation.

(50) *Euthrips cephalicus* Crawford.

- e'. Color uniformly brown; surface of body reticulated.

(51) *Euthrips cephalicus reticulatus* Crawford.

- d'. Second segment of antennae without double spine-bearing tubercle; vertex of head not depressed; anterior ocellus directed upward; color yellowish, shaded with dusky brown.

(52) *Euthrips helianthi* new species.

- c''. General color light yellow to yellowish brown; thorax or other parts decidedly tinted with orange.

- d. Head pale lemon-yellow to light yellowish brown; thorax orange-yellow; abdomen brownish yellow to brown; segment 1 of antenna whitish to light brown; segment 2 dark brown.

(53) *Euthrips occidentalis* Pergande.

- d'. General color brownish yellow, not uniform; thorax orange-yellow; segment 1 of antenna pale yellow, 2 light brown, base sometimes yellowish. (54) *Euthrips tritici* Fitch.

- d''. General color brown to dark brown; thorax orange-brown.

(55) *Euthrips tritici californicus*, new variety.

(19) Genus ANAPHOTHRIPS Uzel.

1. Without spines on posterior angles of prothorax; cheeks straight; surface of abdomen not faintly cross-striated; crescents of ocelli bright orange-yellow. (56) *Anaphothrips striatus* Osborn.

2. With one stout spine on posterior angle of prothorax; cheeks arched; surface of abdomen distinctly cross-striated; crescents of ocelli light brown.

a. Head about as long as wide; wings shaded gray-brown; segments 5, 6, 7, and 8 of abdomen without comblike arrangement of spines along posterior margin; color uniformly yellow to gray-brown.

(57) *Anaphothrips hesperus* new species.

a'. Head noticeably wider than long; wings transparent; segments 5, 6, 7, and 8 of abdomen with conspicuous comblike arrangement of spines; color of head and prothorax yellowish or orange-yellow, abdomen brown.

(58) *Anaphothrips tricolor* new species.

(21) Genus *HETEROTHRIPS* Hood.

1. Prothorax twice as long as head; antennæ with apparently nine segments.

a. Antennæ without circles of distal sensoria on segment 4; segment 3 light yellow, palest at base; segment 4 brownish, palest toward base; articulation of segments brown, not clear. Wings brown, paler at base. Anterior femora shading to yellow at apex, fore tibiæ yellow, shaded with brown laterally; tarsi yellow.....(60) *Heterothrips salicis* Shull.

a'. Antennæ without distal circles on segment 4; segments 1 and 2 slightly lighter than body, shaded laterally with black; segment 3 light yellow, with a narrow subbasal white band; distal one-third clouded with brown; segments 4 to 9 uniform light blackish-brown except band of sensoria on segment 4. Wings blackish brown, with a broad white band near base. Legs concolorous with body, except tarsi and distal part of fore tibiæ, which are yellow.

(61) *Heterothrips orisæmæ* Hood.

2. Prothorax less than twice as long as head; antennæ with apparently 10 segments; circles of sense areas on segments 4 and 5 (corresponding to segments 3 and 4 of other species of *Heterothrips*); segments 3 and 4 (corresponding to segment 3 of other species) light yellow; all others dark brown. Wings light brown, basal one-sixth clear.

(62) *Heterothrips decacornis* Crawford.

(24) Genus *ANTHOTHRIPS* Uzel.

1. Postocular spines wanting; antennæ almost uniformly brown, except segment 3 and base of 4, which are light brown....(65) *Anthothrips niger* Osborn.

2. Postocular spines well developed.

a. Segments 3 and 6 of antennæ, eyes, fore tibiæ, all tarsi, and other lighter parts of body shaded with orange-yellow... (66) *Anthothrips verbasci* Osborn.

a'. Intermediate segments of antennæ and other light parts of body light brown.

(67) *Anthothrips variabilis* Crawford.

(26) Genus *EURYTHRIPS* Hinds.

1. Width of abdomen about one and two-thirds times that of prothorax; antennæ twice as long as head.....(69) *Eurythrips ampliventralis* Hinds.

2. Width of abdomen about one and one-fourth times that of prothorax; antennæ two and one-half times as long as head.(70) *Eurythrips osborni* Hinds.

(28) Genus *TRICHOTHRIPS* Uzel.

1. Prominent spines on body with blunt or dilated tips; most forms very dark brown or nearly black (except *T. angusticeps*), usually with short wings (except *T. longitubus*).

a. Each fore tarsus armed with a tooth; antennæ about one and two-thirds times as long as head; total body length about 1.4 to 1.7 mm.

b. Postocular spines very short and not conspicuous.

c. Color brown, with conspicuous red pigment blotches; mouth cone pointed and reaching beyond posterior margin of prosternum; segments 1 and 2 of antennæ brown, unicolorous with body.

(72) *Trichothrips dens* Moulton.

b'. Postocular spines prominent.

c. Postocular spines acute; color of body black; mouth cone blunt, short, reaching but slightly past middle of prosternum; segments 1 and 2 of antennæ black, segment 2 shading to lighter.

(73) *Trichothrips brevicuralis* Shull.

c'. Postocular spines prominent and knobbed at ends.

d. Color of body brownish yellow, shaded with brownish black, with maroon-colored hypodermal pigmentation; mouth cone considerably surpassing base of prosternum; segments 1 and 2 of antennæ paler than body color.....(74) *Trichothrips angusticeps* Hood.

d'. Color of body brown to deep brown, with maroon-colored pigmentation; mouth cone not surpassing base of prosternum; segments 1 and 2 unicolorous with body.....(75) *Trichothrips ruber* new species.

a'. Fore tarsi not armed; body length about 1.8 mm.; antennæ about twice as long as head.

b. Wings fully developed; tibiæ, tarsi, and intermediate segments of antennæ bright lemon-yellow; prothorax two-thirds as long as head; tube fully as long as head.....(76) *Trichothrips longitubus* Hood.

b'. Wings short; antennal segments 1 to 3 yellowish-brown, segments 4 to 8 black; prothorax about as long as head; tube slightly shorter than head.....(77) *Trichothrips buffæ* Hood.

2. Prominent spines on body acute; most forms yellow-brown (except *T. ilex* which may be almost black); antennæ about twice as long as head; all rather large individuals, about 1.7 mm. or more in length, and with wings usually fully developed (except *T. smithii*, which is without wings and very small, about 1 mm. in length).

a. Individuals small and without ocelli or wings....(78) *Trichothrips smithi* Hood.

a'. Individuals large; wings usually fully developed (they may be rudimentary in *T. americanus*.)

b. Each fore tarsus armed with a small tooth.

c. Small stout spines on head borne upon small warts; tube fully as long as head.

(79) *Trichothrips beachi* Hinds.

c'. Spines on head not borne on small warts; tube shorter than head.

d. Antennæ one and three-fourths times as long as head; tube two-thirds as long as head; total length about 2 mm.; fore tarsus with a short, stout tooth; wings clear white, except a slightly clouded band at one-third the wing's length.....(80) *Trichothrips ambitus* Hinds.

d'. Antennæ twice as long as head; tube three-fourths as long as head; total body length about 1.7 mm.; fore tarsi with a very small tooth; wings clear white.....(81) *Trichothrips femoralis* Moulton.

d''. Antennæ slightly more than twice as long as head; tube slightly shorter than head; total body length about 1.7 mm.; fore tarsi with a small acute tooth; wings light gray-brown, spotted with darker.

(82) *Trichothrips americanus* Hood.

b'. All tarsi armed each with a small tooth.

c. Color very dark brown, almost black; all tarsi, tips of fore tibiæ, and segments 3 and 4 of antennæ shading to yellow; sides of head slightly arched.....(83) *Trichothrips ilex* Moulton.

c'. General color similar to that of *T. ilex*; all tarsi gray-brown to brown; antennæ brown, with base of segment 3 yellow.

(84) *Trichothrips ilex dumosa* Moulton.

c''. Color brown to light brown; tarsi light brown; antennæ concolorous with body, except segment 2 and base and top of 3, which are yellowish; sides of head nearly parallel.....(85) *Trichothrips tridentatus* Shull.

(30) Genus ACANTHOTHRIPI Uzel.

1. Postocular spines wanting; back of head with spine-bearing tubercles; antennæ hardly twice as long as head; body without latero-dorsal white stripes.

a. General color yellowish brown; antennæ, legs, and segments 8 and 9 of abdomen banded with nearly transparent or yellowish white; tube bearing a circlet of eight very long hairs.

(87) *Acanthothrips magnafemoralis* Hinds.

a'. General color dark brown, without white bands and without long hairs at end of tube.

b. A distinct white fleck, by reflected light, on dorsal anterior corners of all abdominal segments except the two basal and the two apical.

(88) *Acanthothrips nodicornis* Reuter.

b'. Without whitish markings(89) *Acanthothrips doanei* Moulton.

2. Postocular spines long and pointed; back of head without spine-bearing tubercles; antennæ about one and one-fourth times as long as head; body with latero-dorsal white stripes extending from posterior margin of eyes to base of eighth abdominal segment.

(90) *Acanthothrips albivittatus* Hood.

(31) Genus CEPHALOTHRIPI Uzel.

1. General color yellowish brown; antennæ yellow, shaded with brown; all femora and middle and hind tibiæ brown; all tarsi and fore tibiæ (except at base outside) pale yellow; body length 1.48 mm. (1.40 mm. to 1.56 mm.).....(91) *Cephalothrips yuccæ* Hinds.

2. General color dark brown; antennæ dark brown, except segment 3, which is yellowish brown at tip; all femora and bases of all tibiæ brown; tips of all tibiæ and all tarsi yellow; body length 1.16 mm. (1.86 mm. in winged forms when bodies are distended).

(92) *Cephalothrips errans* new species.

(34) Genus CRYPTOTHRIPI Uzel.

1. Color brown to blackish brown, with conspicuous purplish pigmentation; segments 1 and 2 of antennæ concolorous with head, 3 and base of 4 yellow, others shading to brown toward tip; postocular spines not long and prominent.....(93) *Cryptothrips californicus* Daniel.

2. Color uniformly coal-black, except tarsi, which are blackish brown.

a. Antennæ uniformly black; body length about 2.22 mm.; two pairs of prominent postocular spines.....(96) *Cryptothrips carbonarius* Hood.

a'. General color of antennæ black, segment 2 paler at apex, segment 3 with two transverse brownish-yellow bands, one at base and the other in the middle; body length about 2.7 mm.; without prominent postocular spines.....(97) *Cryptothrips rectangularis* Hood.

(37) *PHLÆOTHRIPS* Haliday.

1. Postocular spines long and conspicuous.

- a.* General color dark brown, with tibiae and tarsi bright yellow; cheeks nearly straight; antennae one and three-fourths times as long as head.

(100) *Phlæothrips uzeli* Hinds.

- a'.* General color yellowish brown, with considerable irregular red hypodermal pigmentation; legs grayish brown; cheeks slightly arched; antennae twice as long as head.....(101) *Phlæothrips pergandei* Hinds.

- a''.* General color brown; fore tibiae and all tarsi light brown; cheeks strongly arched; antennae one and one-half times as long as head.

(102) *Phlæothrips raptor* Crawford.

2. Postocular spines wanting; general color dark mahogany brown, with many smaller white pigment markings along head, thorax, and abdomen, and on legs.....(103) *Phlæothrips maculatus* Hood.(38) Genus *LIOTHRIPS* Uzel.

1. Head about one and three-tenths or less times as long as wide.

- a.* Fore wings brownish at extreme base; head about one and fifteen one-hundredths times as long as wide; marginal abdominal bristles yellowish; tube eight-tenths as long as head.....(104) *Liothrips ocellatus* Hood.

- a'.* Fore wings nearly black in basal half; head about one and three-tenths times as long as wide; marginal abdominal spines nearly black; tube six-tenths as long as head.....(105) *Liothrips umbripennis* Hood.

- a''.* Fore wings brownish in basal half.

(106) *Liothrips umbripennis mexicanus* Crawford.

2. Head about one and five-tenths times as long as wide.

- a.* Antennae lemon-yellow; spines on prothorax large and prominent; mid laterals present, fully as long as anterior marginals; tube two-thirds as long as head.....(107) *Liothrips citricornis* Hood.

- a'.* Antennal segments 1 and 2 concolorous with head; spines on prothorax not prominent; mid laterals wanting.

- b.* Antennae with segments 1 and 2 almost black, 3 light yellow to light brown, others brown; tube one-half as long as head.

- c.* Head converging anteriorly.....(108) *Liothrips fasciculatus* Crawford.

- c'.* Head distinctly converging posteriorly.

(109) *Liothrips fasciculata stenoceps* Crawford.

- b'.* Antennae one and two-thirds times as long as head; segments 1 and 2 dark brown, concolorous with body, others yellow.

(110) *Liothrips bakeri* Crawford.

- b''.* Antennae one and one-fourth times as long as head; segment 1 and base of 2 concolorous with body, apical half of 2 and of 5 and 6 to 8 light brown; 3, 4, and basal half of 5 yellow; tube one-half as long as head.....(111) *Liothrips mcconnelli* Crawford.

(39) Genus *IDOLOTHRIPS* Haliday.1. Wings wanting or reduced to pads; all tibiae and tarsi bright yellow; tibiae often clouded with brown at base.....(112) *Idolothrips flavipes* Hood.

2. Wings fully developed but short.

- a.* Average length 5.28 mm.; color deep black; entire body surface, including femora and tibiae, finely reticulated; tarsi yellow.

(113) *Idolothrips angusticeps* Crawford.

- a'.* Average length about 4 mm.; color coal-black, without markings; tarsi dark brown.....(114) *Idolothrips coniferarum* Pergande.

- a''*. Average length about 3.3 mm.; color black, antennal segments 3 to 5 yellow at bases; tarsi blackish brown.....(115) *Idolothrips armatus* Hood.
3. Wings large, powerful, brown at base; median vein brown, prominent, and extending to middle of wing; fore wings double fringed behind for about 40 hairs.....(116) *Idolothrips tuberculatus* Hood.

(40) Genus MEGALOTHRIPS Heeger.

1. Color dark brown, with orange or red pigment; all tibiae and tarsi shaded with yellowish; bases of antennal segments 3-6 lemon-yellow.
(117) *Megalothrips hesperus* Moulton.
2. Color nearly uniformly black, excepting tarsi, which are blackish brown.
(118) *Megalothrips spinosus* Hood.

CATALOGUE OF NORTH AMERICAN THYSANOPTERA.

1. Genus OROTHRIPS Moulton, 1907.

- (1) *Orothrips kelloggii* Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 45, figs., 1907.
Habitat: Santa Cruz Mountains, central California.
Taken in blossoms of manzanita (*Manzanita manzanita*) and madroña (*Arbutus menziesii*) in March and April.
- (2) *Orothrips kelloggii yosemitii* new variety. (For description see p. 34.)
Habitat: Yosemite Valley, Cal.
Taken in blossoms of wild lilac (*Ceanothus* sp.?) at an altitude of 6,000 feet, in June and July.

2. Genus ERYTHROTHRIPS new genus.

(Described on page 34.)

- (3) *Erythrothrips arizonæ* new species. (For description see p. 35.)
Habitat: Phoenix, Ariz.; Oroville, Cal.
Taken in orange and olive blossoms in Arizona, by Mr. J. Eliot Coit, and on *Rhamnus purshiana* at Oroville, Cal., by Mr. B. B. Whitney.

3. Genus ANKOTHRIPS Crawford.

- (4) *Ankothrips robustus* Crawford, Pomona College, Journ. Ent., vol. 1, no. 4, p. 100, figs., 1909.
Habitat: Claremont and Los Gatos, Cal.
Taken on California laurel (*Umbellularia californica*) and California lilac (*Ceanothus* sp.?) at an altitude of 5,000 feet.

4. Genus ÆOLOTHRIPS Haliday.

- (5) *Æolothrips bicolor* Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 130, figs., 1902.
Habitat: Amherst, Mass.
Food plants: *Brunella vulgaris*, *Panicum sanguinale*, bindweed, and various grasses in mowings.
- (6) *Æolothrips vespiformis* Crawford, Pomona College, Journ. Ent., vol. 1, no. 4, p. 109, figs., 1909.
Habitat: Managua, Nicaragua.
Food plant not known.

- (7) *Æolothrips fasciatus* Linnaeus, 1758. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 127, figs., 1902.

Habitat: England; Vienna, Austria; Finland; Germany. In the United States—Connecticut; Massachusetts; New York; Indiana; Iowa; Michigan; New Mexico; San Jose and Chico, Cal.; Corvallis, Oreg.

Food plants: As listed by Hinds—alfalfa, buckwheat, celery, clover, Compositæ, oats, onion, tansy, wheat, various grasses and weeds. In California in blossoms of California buckeye (*Æsculus californica*) and monkey flower (*Diplacus glutinosus*), and on sugar beet foliage. In Oregon on *Chrysanthemum leucanthemum*, specimens collected by J. C. Bridwell. Taken in California from April to July.

- (8) *Æolothrips kuwanaii* Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 47, figs., 1907.

Habitat: Santa Cruz Mountains, California.

Food plants: California lilac (*Ceanothus thyrsiflorus*), elderberry (*Sambucus glauca*), chamisal (*Adenostoma fasciculatum*), purple lupine (*Lupinus* sp.?), April to July.

NOTE.—Specimens of *Æolothrips kuwanaii* collected from the blossoms of *Ceanothus thyrsiflorus*, at La Honda, Cal., have a variation in the shape of the dark longitudinal band on the wing. This band is widened at its anterior end and often extends across the entire wing. Segment 3 of the antenna is also often brown instead of lemon-yellow, shading to light brown at the tip.

Æolothrips kuwanaii, variety *robustus* Moulton (Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 48) is withdrawn and included in the species.

- (9) *Æolothrips longiceps* Crawford, Pomona College, Journ. Ent., vol. 1, no. 4, p. 101, figs., 1909.

Habitat: Claremont, Cal.

Food plant: *Artemisia*.

NOTE.—Described from one male.

5. Genus PARTHENOTHRIPS Uzel.

- (10) *Parthenothrips dracænæ* Heeger, 1854. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 176, figs., 1902.

Habitat: Vienna; Finland; St. Petersburg; Germany; Bohemia. United States—Washington, D. C.; Amherst, Mass.; San Francisco and Sacramento, Cal.

Food plants: After Hinds—*Dracæna*, *Ficus elastica*, *Kentia belmoreana*. In California on *Aralia* (?) and sago palm (*Cycas revoluta*).

6. Genus BALIOTHRIPS Haliday.

- (11) *Baliothrips basalis* Shull, Ent. News, vol. 20, p. 224, figs., May, 1909.

Habitat: Huron County, Mich.

On leaves of millet grass (*Milium effusum*) in August.

7. Genus THRIPS Linnæus.

- (12) *Thrips madronii* Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 57, figs., 1907.

Habitat: California; Oregon.

Food plants: California lilac (*Ceanothus thyrsiflorus*), mountain laurel (*Umbellularia californica*), *Solanum umbelliferum*, *Arbutus menziesii*, western azalea (*Rhododendron occidentale*), lemon blossoms; taken from April to July.

- (13) **Thrips magnus** new species. (For description see p. 36, Pl. II, figs. 10, 11.)
Habitat: Visalia, Cal.
 On monkey-flower (*Mimulus* sp.). Specimens collected by Mr. P. R. Jones.
- (14) **Thrips tabaci** Lindeman, 1888. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 179, figs., 1902. (The onion thrips.)
Habitat: After Hinds—Russia; England; Italy; Bohemia; Heligoland; Bermuda. In United States, generally distributed from Maine to California.
Food plants: Almost all wild and cultivated flowers, grasses, fruit blossoms, and truck crops.
- (15) **Thrips abdominalis** Crawford, Pomona College, Journ. Ent., vol. 2, no. 1, page 157, March, 1910.
Habitat: Guadalajara, Mexico.
 Taken in various Compositæ, *Solanum*, *Daucus* sp., and others.
- (16) **Thrips bremnerii** Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 59, figs., 1907.
Habitat: San Jose, Cal.
 From inside of ripe figs, July.
- (17) **Thrips perplexus** Beach, 1895. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 184, figs., 1902.
Habitat: Ames, Iowa; Amherst, Mass.
Food plants: After Hinds—*Cyperus* sp., corn, various grasses.

8. Genus **HELIOTHRIPS** Haliday.

- (18) **Heliothrips femoralis** Reuter, 1891. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 172, figs., 1902.
Habitat: Helsingfors, Finland. United States—District of Columbia; Amherst, Mass.
Food plants: As listed by Hinds—*Amarillis* sp., *Aralia*, *Arum*, *Cestrum nocturnum*, *Chrysanthemum*, *Crinum*, cucumber, *Dracæna* sp., *Eucharis grandiflora*, *Ficus elastica*, *F. grandiflora*, *Gardenia*, *Gossypium*, *Hydrangea*, *Mina lobata*, moonflower, *Pandanus*, *Phoenix*, *Richardia æthiopica*, tomato, *Vitis*.
- (19) **Heliothrips hæmorrhoidalis** Bouché, 1833. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 168, figs., 1902. Ref.: Russell, Bul. 64, Pt. VI, Bur. Ent., U. S. Dept. Agr.; Proc. U. S. Nat. Mus., vol. 33, p. 719, 1908. (The greenhouse thrips.)
Habitat: England; Germany; Vienna; Finland. United States—District of Columbia; Iowa; Massachusetts; Michigan; California. Mexico; St. Vincent and Barbados Islands; Hongkong, China.
Food plants: *Aspidium*, azaleas, croton, dahlias, ferns, liliaceous plants, *Pellea hastata*, phlox, pinks, verbenas, vines, laurestinas.
 NOTE.—This insect is usually a hothouse pest, but lives out of doors on such plants as laurestinas and azaleas in the milder California climate. Mr. Franklin records it from the Barbados and St. Vincent Islands, in the West Indies group, where it feeds on cacao, kola, and date palms; and numerous shipments of mangoes from Mazatlan, Mexico, which arrive in the port of San Francisco, indicate that this insect is a serious pest on these fruits.
- (20) **Heliothrips fasciatus** Pergande, 1895. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 174, 1902.
Caliothrips woodworthi, Ent. News, vol. 15, p. 297, November, 1904.
Habitat: Widespread throughout California.

Food plants: Oranges, wild vetch, burr clover; foliage of beets, radishes, pea vines, and lettuce; pear blossoms and foliage.

NOTE.—This insect is a serious pest on oranges, alfalfa, pear trees, and various garden crops.

- (21) *Heliothrips fasciapennis* Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 171, figs., 1902.

Habitat: Amherst, Mass.

Food plants: Grasses.

9. Genus *ECHINOTHRIPS* new genus.

(Described on page 37.)

- (22) *Echinotrips mexicanus* new species. (For description see p. 37.)

Habitat: Acapulco, Mexico.

Specimens taken from a small potted plant on shipboard in San Francisco, Cal.

10. Genus *DICTOTHRIPS* Uzel.

- (23) *Dictotrips reticulatus* Crawford, Pomona College, Journ. Ent., vol. 2, no. 1, p. 155, figs., 1910.

Habitat: Guadalajara, Mexico.

"Taken on blossoms of native acacia-like tree" (Crawford).

11. Genus *SERICOTHRIPS* Haliday, 1836.

- (24) *Sericotrips variabilis* Beach, 1895. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 143, figs., 1902.

Habitat: Iowa; Massachusetts; Yosemite Valley and San Jose, Cal.

Food plants: Cucumber, grass, smartweed; in blossoms of buckthorn and mountain lilac (*Ceanothus* sp.?) in Yosemite Valley in California at an altitude of 5,000 ft. The California specimens should probably rank as a distinct new variety of this species.

- (25) *Sericotrips pulchellus* Hood, Bul. Ill. State Lab. Nat. Hist., vol. 8, art. 2, p. 363, 1908.

Habitat: Muncie, Ill.

Food plants: Hop-tree (*Ptelea trifoliata*).

NOTE.—Mr. Hood notes that "this species is very close to *Sericotrips variabilis* Beach, but the coloration is distinctive. In living specimens examined under a hand lens, the head and prothorax are velvety black and without luster, due no doubt to the microscopic reticulation."

- (26) *Sericotrips cingulatus* Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 141, figs., 1902.

Habitat: Amherst, Mass.; Nebraska City, Nebr.

Food plants: Various grasses. The writer has collected specimens of this insect from grass at Nebraska City, Nebr., which have fully developed wings. These are broader and clear white in the basal fourth and slender and uniform gray-brown in the outer three-fourths.

- (27) *Sericotrips apteris* Daniel, Ent. News, vol. 15, p. 295, November, 1904. Redescribed by Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 49, 1907.

Habitat: Counties about San Francisco Bay, California.

Food plants: Various grasses and weeds.

NOTE.—Many specimens of this thrips collected recently indicate a close relationship to *S. stanfordii* Moulton. Some specimens are almost uniformly brown.

- (28) **Sericothrips reticulatus** Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 50, figs., 1907.
Habitat: Santa Clara Valley, Cal.
Food plant: Grass and weeds.
- (29) **Sericothrips stanfordii** Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 51, figs., 1907.
Habitat: Stanford University, California.
Food plants: Grasses and various weeds.

12. Genus **RAPHIDOTHRIPS** Uzel.

- (30) **Raphidothrips fuscipennis** Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 159, figs., 1902.
Habitat: Massachusetts.
Food plants: Grasses.

13. Genus **LIMOTHRIPS** Haliday.

- (31) **Limothrips cerealium** Haliday, 1852, Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 139, figs., 1902. (*Limothrips avenæ* Hinds.)
Habitat: England; Germany. United States—Pennsylvania; Massachusetts.
Food plants: Oats, *Festuca pratensis*.

14. Genus **CHIOTHRIPS** Haliday.

- (32) **Chirothrips manicatus** Haliday, 1836. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 134, figs., 1902.
Habitat: England; Germany; Finland; Russia; Bohemia. United States—Manchester, Iowa; Amherst, Mass.; Nebraska City, Nebr.; Corvallis, Oreg.
Food plants: Flowers of various grasses and cereals, clover, wild carrots.
- (33) **Chirothrips mexicanus** Crawford, Pomona College, Journ. Ent., vol. 1, no. 4, p. 114, figs., 1909.
Habitat: Guadalajara, Mexico.
Food plants: Tobacco flowers (*Nicotiana tabacum*).
- (34) **Chirothrips obesus** Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 137, figs., 1902.
Habitat: Amherst, Mass.
Food plants: *Festuca ovina*, *Poa pratensis*.
- (35) **Chirothrips crassus** Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 136, figs., 1902.
Habitat: Amherst, Mass.
Food plants: "Old witch grass," *Panicum capillare*.

15. Genus **APTINOTHRIPS** Haliday.

- (36) **Aptinothrips rufus** Gmelin, 1788, and variety *connatticornis* Uzel, 1895. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 166, figs., 1902.
Habitat: England; Russia; Sweden; Bohemia; Germany; Heligoland; Finland. United States—Amherst, Mass.; Nebraska City, Nebr.; San Jose and Oakland, Cal.
Food plants: Various grasses and in turf.

16. Genus **SCOLOTHRIPS** Hinds.

- (37) **Scolothrips sexmaculatus** Pergande. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 157, figs., 1902.

Habitat: Missouri; Ames, Iowa; Lincoln, Nebr.; Baraboo, Wis.; Honolulu, Oahu, Hawaiian Islands.

Taken on beans, blackberry, elm, and hop (Beach).

NOTE.—“Found on many plants infested with red spiders, on which it has repeatedly been observed to feed” (Pergande). “Feeding on mites in fold of cottonwood leaf” (Bruner). Specimens of thrips sent by Mr. David Fullaway from the Hawaiian Islands are larger and darker in color than as given in Hinds’s description and all of the dark spots on the wings are enlarged to bands.

17. Genus **SCIRTOTHRIPS** Shull.

- (38) **Scirtothrips ruthveni** Shull, Ent. News., vol. 20, p. 222, figs., May, 1909.

Habitat: Huron County, Mich.

Food plants: Terminal clusters of dogwood (*Cornus stolonifera*).

18. Genus **EUTHRIPS** Targioni-Tozzetti.

- (39) **Euthrips orchidii** Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., figs., 1907.

Habitat: Fruitvale, Alameda County, Cal.; Brussels, Belgium (Bagnall).

Taken in flowers of orchids in greenhouse in California and on *Chamaedorea fragrans*, *Ficaria*, and palms in Belgium, by Mr. Bagnall.

- (40) **Euthrips parvus** new species. (For description see p. 38, Pl. IV, figs. 23–25.)

Habitat: San Francisco, Cal.

Food plants: Various hothouse plants.

- (41) **Euthrips citri** Moulton, Tech. Ser. 12, Pt. VII, Bur. Ent., U. S. Dept. Agr., ill., 1909. (The orange thrips.)

Habitat: Orange districts on eastern foothills of San Joaquin Valley, southern California; Phoenix, Ariz.

Taken from citrus trees and thistle (?) in San Joaquin district; from orange in southern California; from nightshade (by Mr. P. R. Jones) in Phoenix, Ariz.

NOTE.—This is a very destructive pest in some of the orange districts of California, the injury being done in the retarding and deforming of the new growth of foliage and in the marking (scabbing) of the oranges.

- (42) **Euthrips albus** new species. (For description see p. 39, Pl. III, figs. 20–22.)

Habitat: Red Bluff, Cal.

Taken on peach-tree foliage.

- (43) **Euthrips pyri** Daniel, Ent. News, vol. 15, p. 294, November, 1904. Redescribed by Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 53, figs., 1907; Bul. 68, Pt. I, Bur. Ent., U. S. Dept. Agr., figs., ill., 1907; Bul. 80, Pt. IV, Bur. Ent., U. S. Dept. Agr., figs., ill., 1909. (The pear thrips.)

Habitat: Counties around San Francisco Bay, central California, north to Sacramento, south to Hollister; Berkhamsted, Hertford County, England.

Food plants: Deciduous fruits, including almond, apple, apricot, cherry, fig, grape, peach, pear, plum, prune, English walnut. Blossoms of wild plum in England.

- (44) **Euthrips ehrhornii** Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 54, figs., 1907.

Habitat: San Jose and Saratoga, Cal.

Taken on grass and on foliage of prune trees.

- (45) **Euthrips ulicis californicus** Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 55, figs., 1907.
Habitat: Wrights Station, Santa Cruz Mountains, Cal.
 Taken from wild vetch sweepings.
- (46) **Euthrips minutus** Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 56, figs., 1907; Pomona College, Journ. Ent., vol. 1, no. 4, figs., 1909.
Euthrips minutus setosus Crawford.
Habitat: Santa Clara Valley, Yosemite Valley (altitude 5,000 ft.), Suisun, Newcastle, Loomis, Lindsay, East Highlands, La Honda, Cal.
Food plants: Prune and cherry foliage, pear and cherry blossoms, grass, yarrow, chamisal, buttercups, sunflowers.
 NOTE.—This insect is also found to be usually much larger than in the original description. A new typical specimen has: Head, length 0.105 mm., width 0.135 mm.; prothorax, length 0.12 mm., width 0.18 mm.; mesothorax, width 0.240 mm.; abdomen, width 0.270 mm., and total body length 1.30 mm.
 Antennæ: 1, 15 μ ; 2, 33 μ ; 3, 37 μ ; 4, 39 μ ; 5, 36 μ ; 6, 45 μ ; 7, 9 μ ; 8, 15 μ ; total 0.23 mm.
 The back of the head is cross-striate, the ocelli have orange-brown crescents, and the fore and middle tibiae are light brown. The costa has twenty-six to twenty-eight spines, the fore vein twenty to twenty-one spines, and the hind vein fifteen to sixteen spines.
- (47) **Euthrips fuscus** Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 154, figs., 1902. *Euthrips nicotianæ* Hinds, Proc. Biol. Soc. Wash., vol. 18, p. 197, 1905; Cir. 68, Bur. Ent., U. S. Dept. Agr., figs., 1906; Bul. 65, Bur. Ent., U. S. Dept. Agr., figs., ills., 1907. (The tobacco thrips.)
Habitat: Massachusetts; Florida; Georgia; Texas.
Food plants: Grass (?), tobacco.
- (48) **Euthrips insularis** Franklin, Proc. U. S. Nat. Mus., vol. 33, p. 715, figs., 1908.
Euthrips insularis reticulata Crawford, Pomona College, Journ. Ent., vol. 1, no. 4, p. 116, 1909.
Habitat: Guadalajara, Mexico; Barbadoes and West Indies Islands.
Food plants: *Lupinus*, *Convolvulus*, Compositæ, *Rhamnus* in Mexico at an elevation of from 1,000 to 2,500 ft.; black willow, legumes, yams, beans, roses, grass, potato, papaw, pepper, tobacco, white wood, woolly pyrol, *Convolvulus*, ground nut, arrowroot, flamboyant in the Barbados and West Indies Islands.
- (49) **Euthrips nervosus** Uzel, 1895. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 155, figs., 1902.
Habitat: Bohemia; Ames, Iowa; Amherst, Mass.
 Taken on corn, various grasses, and spring flowers.
- (50) **Euthrips cephalicus** Crawford, Pomona College, Journ. Ent., vol. 2, no. 1, p. 153, March, 1910.
Habitat: Guadalajara, Mexico.
Food plants: "Several compositæ, a small native acacia-like tree, a *Solanum*, and several other plants" (Crawford).
- (51) **Euthrips cephalicus reticulatus** Crawford, Pomona College, Journ. Ent., vol. 2, no. 1, p. 155, March, 1910.
Habitat: Guadalajara, Mexico.
 Taken on certain Rosaceæ and Labiatae.
- (52) **Euthrips helianthi** new species. (For description see p. 40, Pl. IV, figs. 26–29.)
Habitat: Visalia, Cal.
 Taken in wild sunflower blossoms.
- (53) **Euthrips occidentalis** Pergande, 1895. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 152, 1902.
Habitat: California.
Food plants: Blossoms and foliage of numerous trees and weeds.

- (54) *Euthrips tritici* Fitch, 1855. (For description, life-history notes, and references, see Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 149, 1902.)

Habitat: Generally distributed throughout the United States.

Taken in flowers of almost all wild and cultivated plants.

NOTE.—This is undoubtedly the commonest and the most widely distributed of all American species of thrips. The variation within the species will probably lead some later writer to divide the group into several distinct varieties. The insect varies from very light colored, almost white individuals (which for the most part are collected in white or light colored flowers) to very dark brown, and from individuals with no shading of orange to those colored to a deep red-orange. The writer is here erecting one new variety, to include the very dark brown specimens in this group. These can not possibly be included within the species as Mr. Hinds's description now stands. The variety is called *Euthrips tritici californicus*.

- (55) *Euthrips tritici californicus* new variety.

Habitat: California, Oregon, and Washington.

Taken in company with *Euthrips tritici*, in the blossoms of almost all wild and cultivated plants. The variety is distinguished from the species by the following characters: General color uniformly dark brown, thorax orange-brown; segment 1 of antennæ brown, unicolorous with head, segment 2 uniformly darker brown.

19. Genus ANAPHOTHRIPS Uzel.

- (56) *Anaphothrips striatus* Osborn, 1883. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 160, figs., 1902. Ref.: Ent. News, vol. 20, p. 224, May, 1909 (males found).

Habitat: Illinois; Iowa; Maine; Massachusetts.; New York; Ohio; Ontario; Nebraska; California.

Food plants: *Poa pratensis*, *Phleum pratense*, and other grasses; in California on leaves and ears of corn, and on alfalfa.

- (57) *Anaphothrips zeæ* new species. (For description see p. 41, Pl. IV, figs. 31–34.)

Habitat: Visalia, San Jose, and Red Bluff, Cal.

Taken on leaves and ears of corn, on grasses, and on foliage of orange.

- (58) *Anaphothrips tricolor* new species. (For description see p. 41.)

Habitat: Tulare County, Cal.

Taken on goldenrod and on orange nursery stock by Mr. P. R. Jones.

20. Genus PSEUDOTHRIPS Hinds.

- (59) *Pseudothrips inequalis* Beach, 1896. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 146, figs., 1902.

Habitat: Ames, Iowa.

Food plant: Aster.

21. Genus HETEROTHRIPS Hood.

- (60) *Heterothrips salicis* Shull, Ent. News, vol. 20, p. 220, figs., May, 1909.

Habitat: Huron County, Mich.

Taken on the outside of catkins of a willow (*Salix fluviatilis*).

- (61) *Heterothrips arisæmæ* Hood, Bul. Ill. State Lab. Nat. Hist., vol. 8, art. 2, p. 362, August, 1900.

Habitat: Urbana, Ill.

Taken in flowers of jack-in-the-pulpit (*Arisæma triphyllum*).

- (62) *Heterothrips decacornis* Crawford, Pomona College, Journ. Ent., vol. 1, no. 4, p. 110, 1909.

Habitat: Guadalajara, Mexico.

Taken on a low native tree with small yellow flowers, common in the barrancas near Guadalajara; also on a shrub belonging to the family Malpigiaceæ.

22. Genus *ALLOTHRIPS* Hood, 1908.

- (63) *Allothrips megacephalus* Hood, Bul. Ill. State Lab. Nat. Hist., vol. 8, art. 2, p. 372, figs. 1908. Ref.: Ent. News, vol. 20, p. 228, May, 1909 (males found).

Habitat: Urbana and Springfield, Ill.

Taken from under bark of various trees in winter.

23. Genus *RHAPTOTHRIPS* Crawford.

- (64) *Rhaptothrips peculiaris* Crawford, Pomona College, Journ. Ent., vol. 1, no. 4, p. 116, figs., 1909.

Habitat: Guadalajara, Mexico.

Food plant: "A certain spiny solanaceous plant" (Crawford).

24. Genus *ANTHOTHRIPS* Uzel.

- (65) *Anthothrips niger* Osborn. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 188, figs., 1902.

Habitat: Iowa; Michigan; Massachusetts; Oregon; California.

Food plants: *Achillea millefolium*, oxeye daisy, red and white clover, various grasses.

- (66) *Anthothrips verbasci* Osborn. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 189, figs., 1902.

Habitat: Ames, Iowa; Amherst, Mass.

Food plant: Mullein.

- (67) *Anthothrips variabilis* Crawford, Pomona College, Journ. Ent., vol. 2, no. 1, p. 166, fig., March, 1910.

Habitat: Santiago de las Vegas, Cuba; Managua, Nicaragua; Guadalajara, Mexico.

Food plants: "Celosa, Dodder and native creeping vine" (Crawford).

25. Genus *ALEURODOTHrips* Franklin.

- (68) *Aleurodothrips fasciapennis* Franklin (described as *Cryptothrips fasciapennis*), Proc. U. S. Nat. Mus., vol. 33, p. 727, figs., 1908; as *Aleurodothrips fasciapennis* in Ent. News, vol. 20, p. 228, figs., May, 1909.

Habitat: Newstead, St. Peters, Barbados Islands; Florida.

Taken on flower of La France rose and commonly in Florida feeding on the eggs, larvæ, and pupæ of the citrus white fly (*Aleyrodes citi* R. & H.).

26. Genus *EURYTHRIPS* Hinds, 1902.

- (69) *Eurythrips ampliventralis* Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 202, figs., 1902.

Habitat: Amherst, Mass.

"Taken in turf in fall" (Hinds).

- (70) *Eurythrips osborni* Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 203, figs., 1902.

Habitat: Amherst, Mass.

Food plants: Grasses.

27. Genus **LISSOTHRIPS** Hood, 1908.

- (71) *Lissothrips muscorum* Hood, Bul. Ill. State Lab. Nat. Hist., vol. 8, art. 2, p. 265, 1908.
Habitat: Illinois.
Taken in moss.

28. Genus **TRICHOTHRIPS** Uzel, 1895.

- (72) *Trichothrips dens* Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 60, figs., 1907.
Habitat: Santa Clara Valley, Cal.
Taken on apricot foliage.
- (73) *Trichothrips brevicuralis* Shull, Ent. News, vol. 20, p. 227, figs., May, 1909.
Habitat: Huron County, Mich.
Taken among leaves of pine-cone gall on willow (*Salix fluviatilis*).
- (74) *Trichothrips angusticeps* Hood, Bul. Ill. State Lab. Nat. Hist., vol. 8, art. 2, p. 367, figs., 1908.
Habitat: St. Joseph and Urbana, Ill.
Taken under bark of rotten stumps.
- (75) *Trichothrips ruber* new species. (For description see p. 42.)
Habitat: San Jose, Cal.
Taken in azalea blossoms.
- (76) *Trichothrips longitubus* Hood, Bul. Ill. State Lab. Nat. Hist., vol. 8, art. 2, p. 368, 1908.
Habitat: Carbondale, Ill.
Taken in sweepings.
- (77) *Trichothrips buffæ* Hood, Bul. Ill. State Lab. Nat. Hist., vol. 8, art. 2, p. 369, figs., 1908.
Habitat: Decatur, Homer, and Urbana, Ill.
Taken under bark of soft-maple trees.
- (78) *Trichothrips smithi* Hood, Ent. News, vol. 20, p. 29, figs., January, 1909,
Habitat: Boskydell, Ill.
Taken on hard maple (*Acer saccharum*).
- (79) *Trichothrips beachi* Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 192, figs., 1902.
Habitat: Amherst, Mass.
Taken under quince bark.
- (80) *Trichothrips ambitus* Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 191, figs., 1902.
Habitat: Amherst, Mass.
Food plant: Grass.
- (81) *Trichothrips femoralis* Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 61, figs., 1907.
Habitat: Newcastle, Cal.
Food plant: Wild mullein.
- (82) *Trichothrips americanus* Hood, Bul. Ill. State Lab. Nat. Hist., vol. 8, art. 2, p. 366, figs., 1908.
Habitat: Carbondale, Homer, and Urbana, Ill.
Taken under bark on rotten stumps.
- (83) *Trichothrips ilex* Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 62, figs., 1907.
Habitat: Coast region of California.
Food plant: Christmas berry (*Heteromeles arbutifolia*).

- (84) **Trichothrips illex dumosa** Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 63, 1907.
Habitat: Saratoga, Cal.
Taken on scrub oak (*Quercus dumosa*).
- (85) **Trichothrips tridentatus** Shull, Ent. News, vol. 20, p. 226, figs., May, 1909.
Habitat: Huron County, Mich.
Taken under the scales of the bark of white oak (*Quercus alba*).

29. Genus **PLECTOTHRIPS** Hood, 1908.

- (86) **Plectothrips antennatus** Hood, Bul. Ill. State Lab. Nat. Hist., vol. 8, art. 2, p. 370, 1908.
Habitat: Urbana, Ill.
Taken on a window of a woodshed, in June.

30. Genus **ACANTHOTHRIPS** Uzel, 1895.

- (87) **Acanthothrips magnafemoralis** Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 199, figs., 1902. Ref.: Psyche, vol. 10, p. 221, October-December, 1903.
Habitat: Miami, Fla.; Amherst, Mass.
Food plant: Under loose bark on a sycamore tree.
- (88) **Acanthothrips nodicornis** Reuter, Uzel's Monograph, p. 260, figs., 1895.
Ref.: Psyche, vol. 10, p. 222, October-December, 1903.
Habitat: Germany; Finland; Bohemia; Amherst, Mass.
Taken under the bark of a sycamore tree in Massachusetts.
- (89) **Acanthothrips doanei** Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 64, figs., 1907.
Habitat: Alum Rock Canyon, San Jose, Cal.
Food plant: Grass.
- (90) **Acanthothrips albivittatus** Hood, Bul. Ill. State Lab. Nat. Hist., vol. 8, art. 2, p. 374, 1908.
Habitat: Bloomington, Ill.
Taken on the trunk of a Carolina poplar.

31. Genus **CEPHALOTHRIPS** Uzel, 1895.

- (91) **Cephalothrips yuccæ** Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 194, figs., 1902.
Habitat: Amherst, Mass.; Washington, D. C.
Food plants: *Yucca filamentosa*, goldenrod.
- (92) **Cephalothrips errans** new species. (For description see p. 43, Pl. VI, figs. 42-44.)
Habitat: San Jose, Cal.
Food plants: Wild mustard, apricot, and pine foliage. Taken during June and July.

32. Genus **MALACOTHRIPS** Hinds, 1902.

- (93) **Malacothrips zonatus** Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 200, figs., 1902.
Habitat: Amherst, Mass.
Taken in turf.

33. Genus **NEOTHRIPS** Hood, 1908.

- (94) *Neothrips corticis* Hood, Bul. Ill. State Lab. Nat. Hist., vol. 8, art. 2, p. 372, figs., 1908.

Habitat: Urbana and Hillery, Ill.

Taken under bark in winter.

34. Genus **CRYPTOTHRIPS**¹ Uzel, 1895.

- (95) *Cryptothrips californicus* Daniel, Ent. News, vol. 15, p. 293, November, 1904. Redescribed by Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 66, figs., 1907.

Habitat: California, Oregon, and Washington.

Often taken under the old shells of the brown apricot scale (*Lecanium corni* Bouché (*armeniaceum* Craw)) and black scale (*Saissetia oleæ* Bern.).

Taken on foliage of peach, French prune, and Bartlett pear, also on leaves of chamisal (*Adenostoma fasciculatum*) and tanbark oak (*Quercus densiflora*) and other plants.

- (96) *Cryptothrips carbonarius* Hood, Bul. Ill. State Lab. Nat. Hist., vol. 8, art. 2, p. 376, figs., 1908.

Habitat: Pulaski, Ill.

Taken in sweepings from grass and weeds.

- (97) *Cryptothrips rectangularis* Hood, Can. Ent., vol. 40, no. 9, p. 307, figs., 1908.

Habitat: Urbana, Ill., and Harrisburg, Pa.

Taken under dead bark in peach tree in Illinois and "In burrow of lepidopterous or coleopterous larva in dead willow stem."

35. Genus **LEPTOTHRIPS** Hood, 1909.

- (98) *Leptothrips asperus* Hinds, Ent. News, vol. 20, p. 249, June, 1909.

Cryptothrips asperus Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 205, figs., 1902.

Phyllothrips asperus Hood, Can. Ent., vol. 40, no. 9, p. 305, 1908.

Habitat: Amherst, Mass.

Taken on grape.

36. Genus **ZYGOTHRIPS** Uzel, 1895.

- (99) *Zygothrips longiceps* Hood, Bul. Ill. State Lab. Nat. Hist., vol. 8, art. 2, p. 364, figs., 1908.

Habitat: Carbondale, Ill.

Taken in a gall on *Solidago*.

37. Genus **PHLÆOTHRIPS** Haliday, 1836.

- (100) *Phlæothrips uzeli* Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 196, figs., 1902.

Habitat: Amherst, Mass.

Taken on various grasses and clover and on *Ulmus montana* var. *pendula*.

- (101) *Phlæothrips pergandei* Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 197, figs., 1902.

Habitat: Amherst, Mass.

Taken on grass.

¹ For *Cryptothrips asperus* Hinds, see *Leptothrips asperus*, No. 98.

- (102) *Phloeothrips raptor* Crawford, Pomona College, Journ. Ent., vol. 2, no. 1, p. 159, March, 1910.
Habitat: Guadalajara, Mex.
 Taken in sweeping shrubbery.
- (103) *Phloeothrips maculatus* Hood, Ent. News, vol. 20, p. 250, figs., June, 1909.
Habitat: Baldwin, Mich.
 Taken under rotting poplar bark.

38. Genus *LIOTHRIPS* Uzel, 1895.

- (104) *Liothrips ocellatus* Hood, Bul. Ill. State Lab. Nat. Hist., vol. 8, art. 2, p. 375, 1908. Ref.: Ent. News, vol. 20, p. 249, June, 1909.
Habitat: Hillery, Ill.
 Taken in moss.
- (105) *Liothrips umbripennis* Hood, Ent. News, vol. 20, p. 30, figs., January, 1909.
 (Described as *Phyllothrips umbripennis*.)
Habitat: Illinois and Michigan.
 Taken on various species of oak.
- (106) *Liothrips umbripennis mexicanus* Crawford, Pomona College, Journ. Ent., vol. 2, no. 1, p. 161, March, 1910.
Habitat: Guadalajara, Mex.
 Taken in oak galls, at an elevation of 10,000 feet.
- (107) *Liothrips citricornis* Hood, Can. Ent., vol. 40, no. 9, p. 305, fig., 1908.
 (Described as *Phyllothrips citricornis*.)
Habitat: Dubois, Duquoin, Odin, and Pulaski, Ill.; Harrisburg and Rockville, Pa.
Food plants: "On hickory leaves," in Illinois and "on wild grape" in Pennsylvania, April 28 to July 16.
- (108) *Liothrips fasciculatus* Crawford, Pomona College, Journ. Ent., vol. 1, no. 4, p. 105, figs., 1909. (Described as *Phyllothrips fasciculata*.)
Habitat: Claremont and Suisun, Cal.
Food plant: Wild buckwheat (*Eriogonum fasciculatum*).
- (109) *Liothrips fasciculatus stenoceps* Crawford, Pomona College, Journ. Ent., vol. 1, no. 4, p. 108, 1909.
Habitat: Claremont, Cal.
 Specimens taken with *Liothrips fasciculatus* on wild buckwheat.
- (110) *Liothrips bakeri* Crawford, Pomona College, Journ. Ent., vol. 2, no. 1, p. 161, March, 1910.
Habitat: Havana, Cuba.
 Taken on "galls on leaves of *Ficus nitida* and flowers of *Ficus religiosa*" (Crawford).
- (111) *Liothrips mcconnelli* Crawford, Pomona College, Journ. Ent., vol. 2, no. 1, p. 163, March, 1910.
Habitat: Guadalajara, Mex.; Chico and Suisun, Cal.
 Taken from "stems and leaves of a certain bignoniaceous shrub, and also from sweepings on other shrubs" (Crawford); prune foliage and apple blossoms in California.

39. Genus *IDOLOTHRIPS* Haliday, 1852.

- (112) *Idolothrips flavipes* Hood, Bul. Ill. State Lab. Nat. Hist., vol. 8, art. 2, p. 377, fig., 1908.
Habitat: Illinois.
 Specimens taken among fallen oak leaves.

- (113) *Idolothrips angusticeps* Crawford, Pomona College, Journ. Ent., vol. 2, no. 1, p. 168, figs., March, 1910.
Habitat: "Belize; Havana, Cuba; San Marcos and Chivandega, Nicaragua; Guadalajara, Mex." (Crawford).
- (114) *Idolothrips coniferarum* Pergande, 1896. Redescribed by Hinds, Mon. Thys. N. Amer., Proc. U. S. Nat. Mus., vol. 26, p. 206, figs., 1902.
Habitat: Washington, D. C.; Amherst, Mass.
 Taken on *Pinus inops*, *Juniperus virginiana*, and *Abies* sp.
- (115) *Idolothrips armatus* Hood, Ann. Ent. Soc. Amer., vol. 1, no. 4, p. 285, figs., December, 1908.
Habitat: Carbondale, Havana, Pulaski, and Urbana, Ill.
 Taken in galls of *Gnorimoschema gallæsolidaginis* on *Solidago canadensis* in miscellaneous and woodland sweepings; on *Plantago rugelii*.
- (116) *Idolothrips tuberculatus* Hood, Ann. Ent. Soc. Amer., vol. 1, no. 4, p. 287, figs., December, 1908.
Habitat: White Heath and Boskydell, Ill.
 Taken on white oak.

40. Genus MEGALOTHRIPS Heeger.

- (117) *Megalothrips hesperus* Moulton, Tech. Ser. 12, Pt. III, Bur. Ent., U. S. Dept. Agr., p. 65, figs., 1907.
Habitat: Stanford University, California.
Food plant: Not known.
- (118) *Megalothrips* (?) *spinosus* Hood, Can. Ent., vol. 40, p. 306, figs., 1908. Ref.: Ent. News, vol. 20, p. 231, May, 1909.
Habitat: Harrisburg, Pa.; St. Anthony Park and St. Paul, Minn.
 Taken "in burrows of lepidopterous or coleopterous larvæ in dead willow stem," and "under the bark of dead limb of white birch."

DESCRIPTIONS OF NEW GENERA AND NEW SPECIES.

[The numbers correspond to the list numbers in the catalogue.]

(2) *Orothrips kelloggii yosemitii* new variety. (Pl. II, fig. 9.)

Measurements: Head, length 0.16 mm., width 0.20 mm.; prothorax, length 0.16 mm., width 0.25 mm.; mesothorax, width 0.35 mm.; abdomen, width 0.45 mm.; total body, length 1.75 mm. Antennæ: 1, 30 μ ; 2, 54 μ ; 3, 99 μ ; 4, 96 μ ; 5, 63 μ ; 6, 48 μ ; 7, 45 μ ; 8, 33 μ ; 9, 33 μ ; total, 0.50 mm.

Color dark brown to blackish-brown; cheeks not strongly arched. Segment 2 of antennæ yellow, dark brown at base; segment 3 yellow, but dark brown in outer half; segment 3 noticeably constricted in the middle; sense areas on segments 3 and 4 ovoid (in *O. kelloggii* elongate). Spines on hind margin of prothorax short but quite stout; those on mesonotum likewise small. Trochanters not noticeably yellow. Darkened bands in center and at tip of wings smaller and lighter colored and more irregular than in *Orothrips kelloggii*.

2. Genus ERYTHROTHRIPS new genus.

Head almost one-third longer than wide. Ocelli present in both sexes. Antennæ nine-segmented, the last two segments closely joined and together somewhat shorter than segment 7. Maxillary

palpi geniculated and with eight segments. Labial palpi with three segments. Prothorax about as long as head and only a little wider, without large bristles. Legs long and slender; fore femora somewhat thickened in both sexes. Wings present in both sexes; fore wings very slightly narrowed before the middle; fore part of ring vein and fore longitudinal vein furnished with a few sparse, inconspicuous hairs; fore wings white, with dark-brown longitudinal band along posterior margin.

(3) *Erythrothrips arizonæ* new species. (Pl. I, figs. 1-7.)

Measurements: Head, length 0.24 mm., width 0.19 mm.; prothorax, length 0.24 mm., width 0.23 mm.; mesothorax, width 0.38 mm.; abdomen, width 0.49 mm.; total body, length 2.66 mm. *Antennæ*: 1, 45 μ ; 2, 63 μ ; 3, 126 μ ; 4, 111 μ ; 5, 6, 72 μ ; 7, 69 μ ; 8, 30 μ ; 9, 18 μ ; total length, 0.64 mm.

Color dark brown, with red pigmentation; connecting tissue of abdominal segments light brown to brown.

Head about one-fourth longer than wide, rounded in front and elevated only a little between basal segments of antennæ; cheeks slightly arched, converging but very slightly posteriorly; back of head cross-striated; without prominent spines. *Eyes* prominent, not protruding, black; eyes with large facets, pilose. *Ocelli* present. *Mouth-cone* short, pointed; maxillary palpi geniculate, eight-segmented; labial palpi four-segmented; basal segment small. *Antennæ* nine-segmented, two and one-half times as long as head; brown, unicolorous with body except basal part of segment 3, which is light brown. All segments thickly clothed with short spines. A long slender sense area on each of segments 3 and 4.

Prothorax about as wide as long and only a little larger than the head; with several inconspicuous spines; all angles broadly rounded. *Legs* uniformly dark brown in females, but fore tibiæ and tarsi shading to light brown in males. Fore femora slightly enlarged; tibiæ each with a stout spine at tip; all legs thickly set with short, dark spines. *Fore wings* of about even width for entire length, very slightly narrowed before the middle, broadly rounded at tip; with ring vein and two longitudinal veins that unite with ring vein near tip; with five cross veins; fore part of ring vein and fore longitudinal vein with small, white, inconspicuous spines; second longitudinal vein with about twenty-seven dark spines. Posterior margin of wing only with fringe. Wings clear white, with dark-brown longitudinal band extending from base, including scale, to tip, this band broadest at middle of wing and somewhat narrowed before the middle. Hind wings clear white, margined with fringe only along posterior side.

Abdomen large, fourth and fifth segments widest and from them tapering gradually to the bluntly pointed tenth segment. Without

long spines except on last three segments. Eighth abdominal segment of males covered with many long hairs.

Described from four females and ten males.

Habitat: Phoenix, Ariz., type specimens collected and forwarded by Mr. J. Eliot Coit; California, specimens collected by Mr. B. B. Whitney at Oroville.

Food plants: Orange and olive blossoms in Arizona; *Rhamnus purshiana* in California.

The larva of this species is uniformly light brownish-yellow and has conspicuous red pigment bands across the dorsal plates of mesothoracic and metathoracic segments and all segments of abdomen.

(13) *Thrips magnus* new species. (Pl. II, figs. 10, 11.)

Measurements: Head, length 0.13 mm., width 0.18 mm.; prothorax, length 0.16 mm., width 0.23 mm.; mesothorax, width 0.35 mm.; abdomen, width 0.40 mm.; total body, length 1.70 mm. Antennæ: 1, 24 μ ; 2, 36 μ ; 3, 56 μ ; 4, 51 μ ; 5, 42 μ ; 6, 54 μ ; 7, 24 μ ; total length 0.30 mm.

General color very dark brown, head blackish brown.

Head considerably wider than long, broadest near back; cheeks very slightly arched, roughened; front of head broadly rounded; back of head transversely striate. A small spine on front of each posterior ocellus and a row of several smaller spines back of each eye. *Eyes* large, occupying about two-thirds the width of the head, not unusually protruding, pilose. *Ocelli* subapproximate, with dark-brown crescents. *Mouth-cone* short, reaching hardly past middle of prothorax, pointed; maxillary palpi three-segmented; labial palpi two-segmented. *Antennæ* seven-segmented, slightly more than twice as long as head, uniform dark brown, with segments 1 and 2 often blackish-brown; forked sense cones on dorsal side of segment 3 and ventral side of segment 4.

Prothorax somewhat larger than head, all angles rounded; two long prominent spines on each posterior angle, several smaller ones along posterior margin, the inner one being the longest; other spines present but not conspicuous. *Mesothorax* largest, sides of *ptertorax* broadly and evenly rounded. *Legs* dark brown, tips of tibiæ and tarsi shading to lighter or yellowish brown; hind tibiæ alone armed with spines. *Wings* present; fore wing large, uniform brown, with spines arranged as follows: Costa, thirty-one; fore longitudinal vein with eight at base and three scattered on outer half; hind vein with thirteen.

Abdomen subovate, third and fourth segments largest; longest spines on last two segments.

Described from numerous females. Males much larger.

Habitat: Visalia, Coyote, and San Francisco, Cal.

Food plant: *Mimulus* sp.

9. Genus **ECHINOTHRIPS** new genus.

Head and thorax with a deeply reticulated structure (sides of abdomen may also be reticulated). Head about as long as wide and not longer than the prothorax. Eyes large, oval, prominent. Ocelli present. Antennæ with eight segments, long, slender, last four segments united evenly and diminishing in size gradually. Prothorax angular at sides. Legs slender, unarmed. Wings present, strong, broadest at base and tapering gradually to a pointed tip, without prominent veins except fore part of ring vein. Spines on fore margin and where fore longitudinal vein should be, long, strong, and with blunt tips.

This genus has many of the characters of both *Heliothrips* and *Dictothrips*. It is readily determined from the former by the shape of the antennæ, inasmuch as the segments are all rather slender and quite evenly united; segment 6 is longest; the style not longer than segment 6. It is readily separated from *Dictothrips* by the character of the wings, which have two rows of long, strong, blunt spines along the anterior margin.

(22) **Echinothrips mexicanus** new species. (Pl. III, figs. 16-19.)

Measurements: Head, length 0.10 mm., width 0.15 mm.; prothorax, length 0.10 mm., width 0.18 mm.; mesothorax, width 0.23 mm.; abdomen, width 0.23 mm.; total body, length 0.92 mm. Antennæ: 1, 9 μ ; 2, 30 μ ; 3, 45 μ ; 4, 39 μ ; 5, 45 μ ; 6, 60 μ ; 7, 15 μ ; 8, 27 μ ; total, 0.27 mm.

General color uniform dark brown, with red pigmentation. Bases of femora, tips of tibiæ, all tarsi, outer half of segments 3 and 4, and base of segment 5 of antennæ yellow.

Head noticeably wider than long, retracted into the prothorax, angular in front, with basal joints of antennæ subapproximate; vertex depressed and bearing the anterior ocellus on its anterior surface; strongly reticulate; cheeks roughened and with spines. *Eyes* large, oval, prominent, slightly protruding, reddish black with yellowish inner and outer margins; facets large, protruding, strongly pilose. *Ocelli* present, subapproximate, placed near center of head, anterior ocellus directed forward, posterior ones distinctly separated from inner margins of eyes; yellow-orange, with deep orange-red crescents. *Mouth-cone* pointed, reaching past base of prosternum. *Antennæ* with eight segments, two and one-half times as long as head, slender; segment 6 longest; segments 1 and 2 deep brown, unicolorous with head, terminal segments brown, intermediate segments yellow. (Segments 5 to 8 united evenly, antennæ tapering gradually from base of segment 6 to tip.)

Prothorax about as long as head, widest at middle; sides angular, roughened and with curved spines; strongly reticulate. *Mesothorax*

largest, with notch on either side near posterior margin, uniting evenly with metathorax. *Legs* slender, with numerous hairs but without claws. *Fore wings* strong, broadest at base, tapering gradually from base to point at tip; anterior part of ring-vein prominent, posterior part and other longitudinal veins wanting. With a row of thirteen long, brown, blunt spines along anterior margin, and ten other similar spines close to anterior margin where fore longitudinal vein should be; fore fringe long and wavy, especially on outer half of wing; posterior fringe also well developed. Wings uniform dark brown, with elongate whitened area near base. Posterior pair of wings each with single, median, dark brown, longitudinal vein extending from base to near tip; wing membrane brown, fringe well developed.

Abdomen widest across third and fourth segments and from them tapering gradually to a blunt tip; with numerous spines along sides and on dorsum; a single pair near anterior margin on each segment most conspicuous.

Described from a single female.

Habitat: Acapulco, Mexico.

Specimens taken from a small potted plant on shipboard in San Francisco from Acapulco, Mexico. One adult with numerous larvæ and pupæ.

(40) *Euthrips parvus* new species. (Pl. IV, figs. 23-25.)

Measurements: Head, length 0.09 mm., width 0.126 mm.; prothorax, length 0.096 mm., width 0.144 mm.; mesothorax, width 0.16 mm.; abdomen, width 0.21 mm.; total body, length 0.95 mm.

Antennæ: 1, 15 μ ; 2, 30 μ ; 3, 45 μ ; 4, 39 μ ; 5, 36 μ ; 6, 45 μ ; 7, 9 μ ; 8, 12 μ ; total length 0.225 mm.

General color orange-yellow; forewings, as also segments 3 to 8 of antennæ, light brown.

Head angular in front, with depression to receive basal segments of antennæ; frons depressed, broadest across eyes; sides of head constricted posteriorly, not retracted into prothorax; back of head faintly cross-striated; two small spines in front of anterior ocellus and one in front of each posterior ocellus; a pair bordering the posterior inner side of each eye. *Eyes* large, ovoid, prominent and protruding; facets large, pilose. *Ocelli* located in central part of head, closely placed but not contiguous, yellow, with orange-red crescents; anterior ocellus in depression on fore part of head and directed forward. *Mouth-cone* short, blunt, tipped with black; maxillary palpi with three segments, labial palpi with two. *Antennæ* with eight segments, two and one-half times as long as head; segment 1 pale yellow, 2 orange-brown, others uniformly brown; spines and sense cones present but not conspicuous.

Prothorax only a little wider than head, sides arched, all angles rounded; with scattering spines, three on either side along posterior margin, brown and conspicuous, the central one of each group largest; sides of prothorax constricted in middle. *Legs*, especially posterior pair, rather long and slender, covered with numerous hairs, unicolorous with body. *Fore wings* broadest in basal one-third, pointed at ends; ring vein prominent, fore longitudinal vein conspicuous only at base; with about twenty spines along anterior margin; five or six spines on basal part of fore longitudinal vein, the outer two separated from the others; three spines on outer half of wing where fore vein should be and three spines near posterior margin where posterior longitudinal vein should be. Fringe on wing on both anterior and posterior margins long only on outer half of wing. Wings brown, with inconspicuous, light, longitudinal area extending from base to tip. *Abdomen* rather long and slender, spines conspicuous only on last two segments; a comblike structure on posterior margin of segment 8.

Described from numerous specimens.

Habitat: San Francisco, Cal.

Food plants: Taken on various hothouse plants, especially on *Cathartica* sp?

Adults and larvæ collected during June and July.

(42) *Euthrips albus* new species. (Pl. III, figs. 20-22; Pl. IV, fig. 30.)

Measurements: Head, length 0.12 mm., width 0.12 mm.; prothorax, length 0.12 mm., width 0.16 mm.; mesothorax, width 0.23 mm.; abdomen, width 0.25 mm.; total body, length 1 mm.

Antennæ: 1, 15 μ ; 2, 30 μ ; 3, 48 μ ; 4, 45 μ ; 5, 33 μ ; 6, 54 μ ; 7, 9 μ ; 8, 12 μ ; total length 0.25 mm.

Color translucent whitish, segments 4 to 8 of antennæ brown.

Head about as wide as long, noticeably square, cheeks straight and very slightly arched; front angular; spines, except a pair between eyes, weak. *Eyes* prominent, black, with light outer borders, coarsely faceted. *Ocelli* wanting. *Mouth-cone* long, pointed, tipped with black; maxillary palpi three-segmented. *Antennæ* eight-segmented, about twice as long as head, segments 1 to 3 inclusive whitish, 4 brown, whitish at base, others brown. Forked sense cone on dorsal side of segment 3, and a similar one on ventral side of segment 4.

Prothorax somewhat wider than long. A very weak spine at each anterior angle. A pair of prominent ones on each posterior angle. *Mesothorax* largest; front angles rounded. *Legs* unicolorous with body. Spines prominent only on hind tibiæ, each tarsus with a black spot at end. *Wings* present, rather broad, and tapering gradually from base to distal end; not sharply pointed at tip; costa of fore wings set rather sparsely with about twenty spines; fore vein with six spines near base of wing and two near tip. Hind vein with nine

regularly placed spines, these beginning immediately below where the group of six spines on fore vein ends. Spines brown.

Abdomen elongate-ovate, tapering rather gradually from third segment to near tip; with prominent spines on outer posterior angles of all abdominal segments except first.

Described from one female taken on peach foliage, Red Bluff, Cal.

(52) ***Euthrips helianthi*** new species. (Pl. IV, figs. 26-29.)

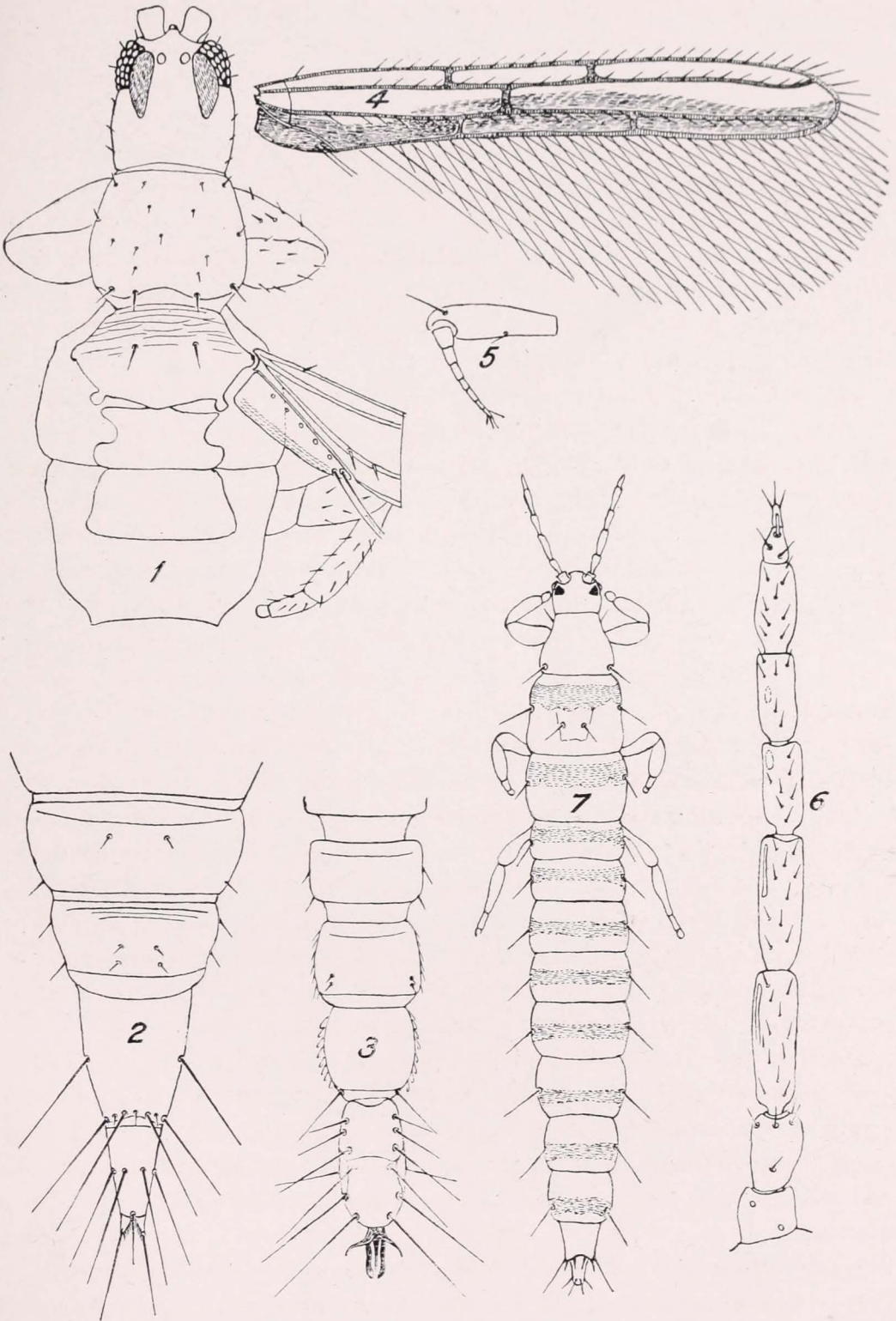
Measurements: Head, length 0.135 mm., width 0.16 mm.; prothorax, length 0.150 mm., width 0.20 mm.; mesothorax, width 0.28 mm.; abdomen, width 0.28 mm.; total body, length 1.25 mm.

Antennæ: 1, 21 μ ; 2, 39 μ ; 3, 60 μ ; 4, 51 μ ; 5, 42 μ ; 6, 54 μ ; 7, 9 μ ; 8, 15 μ ; total length 0.300 mm.

General color transparent yellowish-gray, shaded with brown.

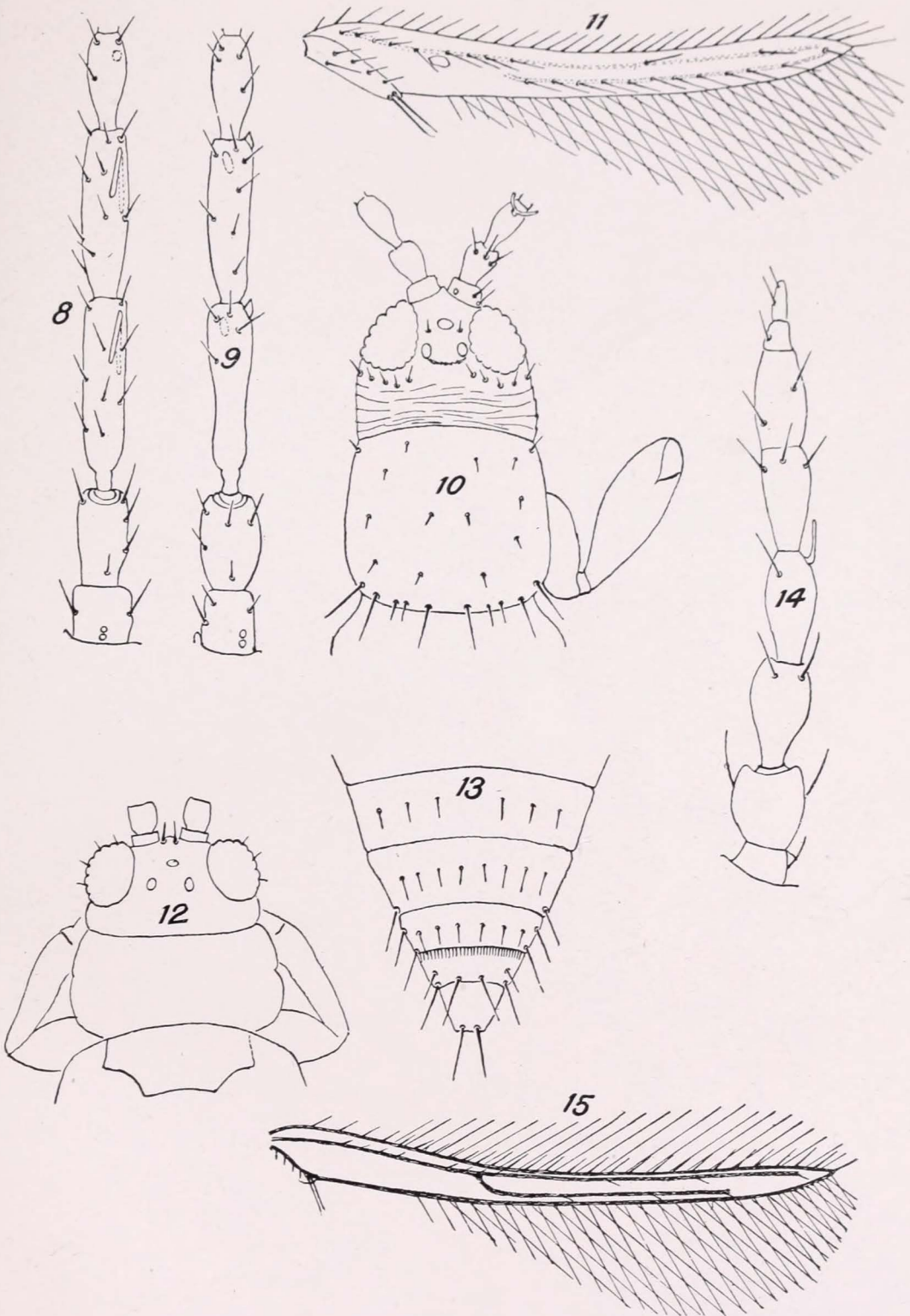
Head only a little wider than long, cheeks straight and parallel; anterior margin only slightly elevated and rounded in front, back of head very faintly cross-striated. Head retracted into prothorax. Large, brown, conspicuous spines in front of posterior ocelli and back of eyes; other smaller spines present, also dark brown and conspicuous. *Eyes* rather small, occupying about one-half the width of the head, not prominent, with purple-black pigment, pilose. *Ocelli* present, translucent whitish, separated, and posterior ones not contiguous to eyes, with light orange-yellow pigment blotches which are only irregularly crescent-shaped. *Mouth-cone* pointed, dark brown, nearly black at tip. Maxillary palpi three-segmented, labial palpi two-segmented, basal segment very short. *Antennæ* eight-segmented, only slightly more than twice as long as head, segment 1 light yellowish gray, unicolorous with head; 2 dark brown; 3, 4, and 5 brown, yellowish at base; 3 also sometimes yellowish at tip; 6 and style uniform dark brown. A forked sense cone on dorsal side of segment 3 near tip, and a similar one near tip on ventral side of segment 4. All spines dark brown and conspicuous.

Prothorax about one-fourth wider than long, with a long, conspicuous, dark-brown spine at each anterior angle, two at each posterior angle, one on either side of anterior margin about halfway between center and side, a medium-sized dark spine on posterior margin on either side near center, and many other smaller spines, also brown and conspicuous. *Mesothorax* with angles broadly rounded in front, uniting almost evenly with metathorax, the sides of which converge posteriorly. *Legs* with fore femora somewhat thickened, light brownish gray; all tibiae armed; all tarsi with a dark-brown spot near tip. *Wings* uniform translucent whitish. Veins set regularly with spines; costa with about twenty-seven, fore vein with twenty-one, hind vein with fifteen, scale with six, inner side of scale with one; all spines brown. Microscopic hairs transparent; costal fringe short; posterior fringe long and wavy.



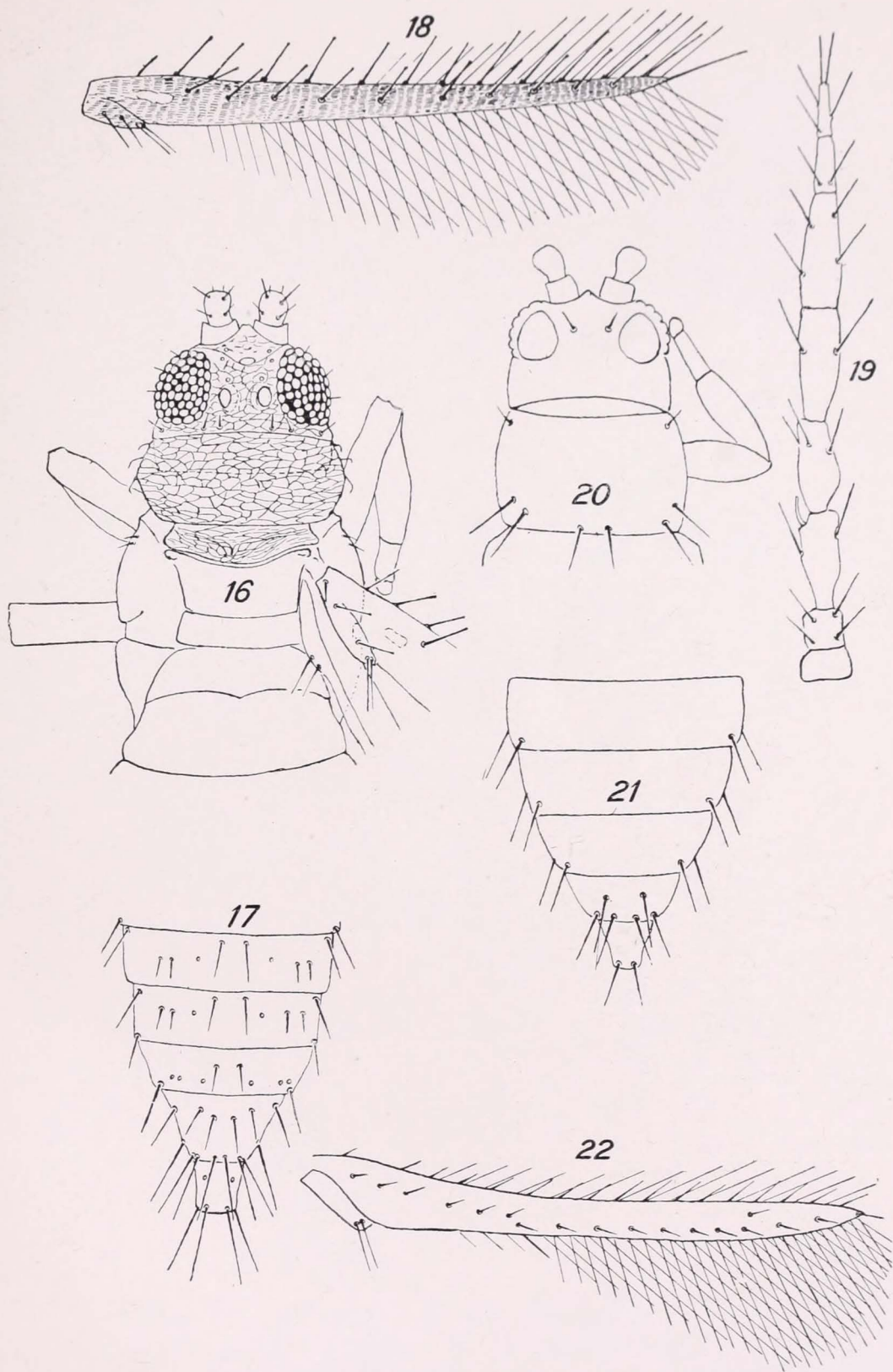
NORTH AMERICAN THYSANOPTERA.

Fig. 1.—*Erythrothrips arizonæ*: Head and thorax of female, dorsal view. Fig. 2.—*Erythrothrips arizonæ*: Tip of abdomen of female, dorsal view. Fig. 3.—*Erythrothrips arizonæ*: Tip of abdomen of male, dorsal view. Fig. 4.—*Erythrothrips arizonæ*: Right fore wing. Fig. 5.—*Erythrothrips arizonæ*: Maxillary palpus. Fig. 6.—*Erythrothrips arizonæ*: Left antenna. Fig. 7.—*Erythrothrips arizonæ*: Larva. (Original.)



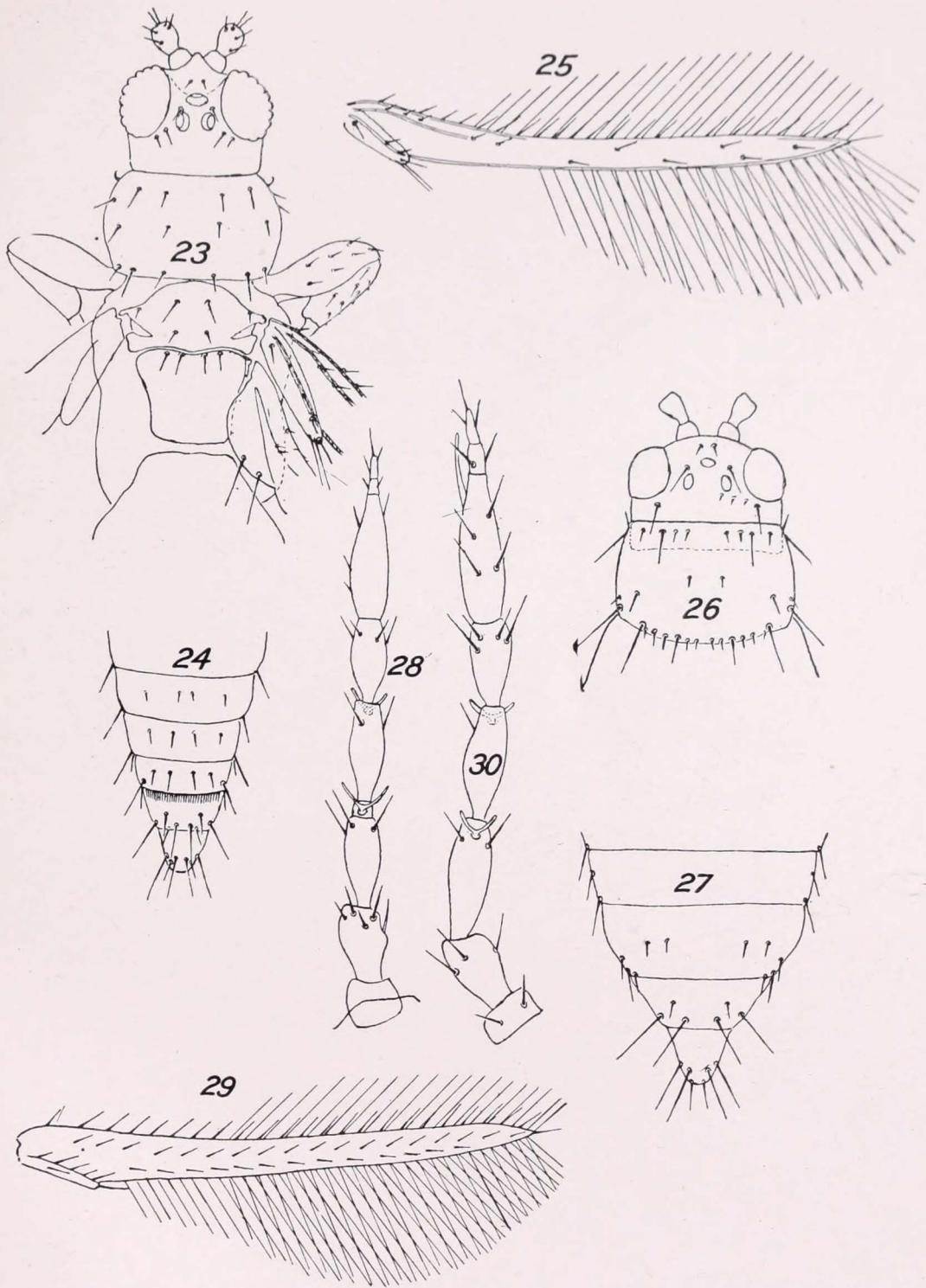
NORTH AMERICAN THYSANOPTERA.

Fig. 8.—*Orothrips kellogii*: Right antenna. Fig. 9.—*Orothrips kellogii yosemitii*: Right antenna. Fig. 10.—*Thrips magnus*: Head and prothorax of female. Fig. 11.—*Thrips magnus*: Right fore wing. Fig. 12.—*Euthrips citri*: Head and prothorax of female. Fig. 13.—*Euthrips citri*: Tip of abdomen of female. Fig. 14.—*Euthrips citri*: Right antenna of female. Fig. 15.—*Euthrips citri*: Right fore wing. (Original.)



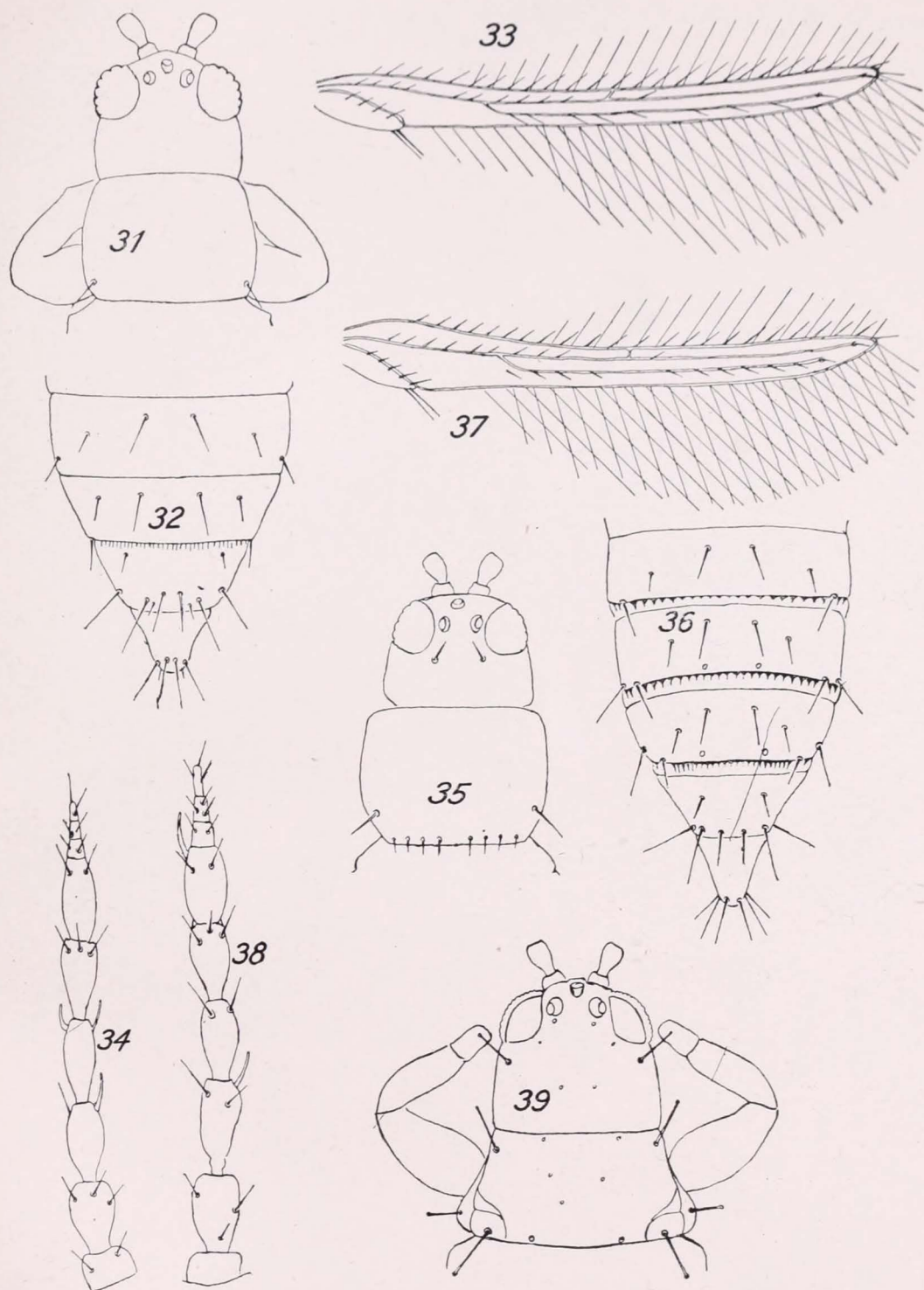
NORTH AMERICAN THYSANOPTERA.

Fig. 16.—*Echinothrips mexicanus*: Head and thorax of female, dorsal view. Fig. 17.—*Echinothrips mexicanus*: Tip of abdomen of female, dorsal view. Fig. 18.—*Echinothrips mexicanus*: Right fore wing of female. Fig. 19.—*Echinothrips mexicanus*: Right antenna. Fig. 20.—*Euthrips albus*: Head and prothorax of female, dorsal view. Fig. 21.—*Euthrips albus*: Tip of abdomen of female, dorsal view. Fig. 22.—*Euthrips albus*: Right fore wing. (Original.)



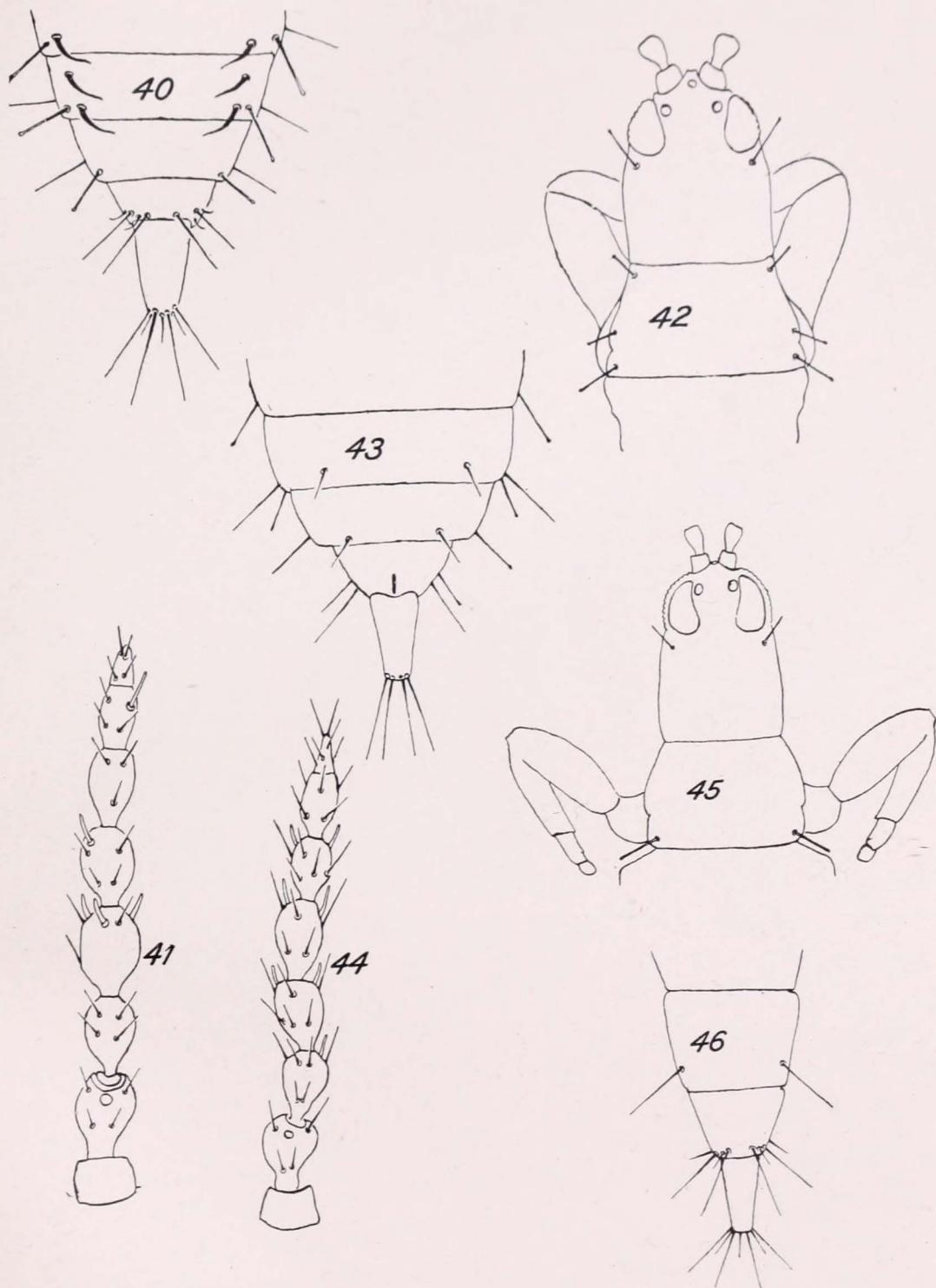
NORTH AMERICAN THYSANOPTERA.

Fig. 23.—*Euthrips parvus*: Head and thorax of female, dorsal view. Fig. 24.—*Euthrips parvus*: Tip of abdomen of female, dorsal view. Fig. 25.—*Euthrips parvus*: Right fore wing of female. Fig. 26.—*Euthrips helianthi*: Head and prothorax of female, dorsal view. Fig. 27.—*Euthrips helianthi*: Tip of abdomen of female, dorsal view. Fig. 28.—*Euthrips helianthi*: Right antenna of female. Fig. 29.—*Euthrips helianthi*: Right fore wing. Fig. 30.—*Euthrips albus*: Right antenna of female. (Original.)



NORTH AMERICAN THYSANOPTERA.

Fig. 31.—*Anaphothrips zæ*: Head and prothorax of female, dorsal view. Fig. 32.—*Anaphothrips zæ*: Tip of abdomen of female, dorsal view. Fig. 33.—*Anaphothrips zæ*: Right fore wing. Fig. 34.—*Anaphothrips zæ*: Right antenna of female. Fig. 35.—*Anaphothrips tricolor*: Head and prothorax of female, dorsal view. Fig. 36.—*Anaphothrips tricolor*: Tip of abdomen of female, dorsal view. Fig. 37.—*Anaphothrips tricolor*: Right fore wing of female. Fig. 38.—*Anaphothrips tricolor*: Right antenna of female. Fig. 39.—*Trichothrips ruber*: Head and prothorax of female, dorsal view. (Original.)



NORTH AMERICAN THYSANOPTERA.

Fig. 40.—*Trichothrips ruber*: Tip of abdomen, dorsal view. Fig. 41.—*Trichothrips ruber*: Right antenna of female. Fig. 42.—*Cephalothrips errans*: Head and prothorax of female, dorsal view. Fig. 43.—*Cephalothrips errans*: Tip of abdomen of female, dorsal view. Fig. 44.—*Cephalothrips errans*: Right antenna of female. Fig. 45.—*Cryptothrips californicus*: Head and prothorax of female, dorsal view. Fig. 46.—*Cryptothrips californicus*: Tip of abdomen of female, dorsal view. (Original.)

Abdomen cylindrical ovate, with conspicuous brown spines on outer margin of each segment, six along the posterior ventral margin of each ventral plate, and longer, stronger ones at tip on segments 9 and 10.

Habitat: Visalia, Tulare County, Cal.

Food plant: Wild sunflower.

(57) *Anaphothrips zeæ* new species. (Pl. V, figs. 31-34.)

Measurements: Head, length 0.12 mm., width 0.13 mm.; prothorax, length 0.12 mm., width 0.16 mm.; mesothorax, width 0.23 mm.; abdomen, width 0.26 mm.; total length 1.10 mm.

Antennæ: 1, 18 μ ; 2, 30 μ ; 3, 42 μ ; 4, 39 μ ; 5, 33 μ ; 6, 30 μ ; 7, 8, 9, 33 μ ; total length 0.225 mm.

Color yellow to grayish brown, wings gray.

Head about as long as wide, broadly rounded in front, cheeks arched. *Eyes* prominent, slightly protruding, with coarse facets. *Ocelli* present, widely separated, with light-brown crescents. Head with prominent spines. *Mouth-cone* broad at base, pointed at tip. Maxillary palpi large, three-segmented, labial palpi very small, with two segments, mouth-cone dark brown at tip. *Antennæ* about as long as head, segment 1 yellowish gray, segment 2 light brown, segment 3 light brown, transparent yellowish at basal half, segment 4 and others light brown, shading to darker toward the tip, without conspicuous spines or sense cones. *Antennæ* sometimes almost uniformly light brown, with segment 2 darker.

Prothorax about as long as head and only slightly wider, with one transparent but rather prominent spine on each posterior angle. *Mesothorax* largest, sides rounded; *metathorax* with sides almost parallel but constricted abruptly at the posterior margin. *Pterothorax* somewhat darker than rest of body. *Legs* uniformly grayish brown, only hind tibia armed. *Wings* uniformly brownish gray, with small, semitransparent, elongate area near base with veins and spines prominent, although all veins are transparent. *Costa* with twenty-seven spines, fore vein with nine regularly placed spines near base and other scattered spines along outer part. Hind vein arising from fore vein at about one-fourth the wing's length from the base and ending abruptly near tip of wing with ten more or less regularly placed spines. Fringe on fore vein weak.

Abdomen cylindrical ovate, uniformly brownish gray, without prominent spines except on terminal segments; all spines transparent.

Habitat: San Jose, Fresno, Lindsay, Tulare County, Cal. Taken on grasses, leaves, and ears of corn.

(58) *Anaphothrips tricolor* new species. (Pl. V, figs. 35-38.)

Measurements: Head, length 0.10 mm., width 0.15 mm.; prothorax, length 0.13 mm., width 0.18 mm.; mesothorax, width 0.23 mm.;

abdomen, width 0.25 mm.; total length 1.16 mm. Antennæ: 1, 12 μ ; 2, 30 μ ; 3, 39 μ ; 4, 30 μ ; 5, 30 μ ; 6, 30 μ ; 7, 8, 9, 33 μ ; total length 0.21 mm.

Color: Head and prothorax grayish yellow; pterthorax orange; abdomen brown, shading to darker toward tip.

Head considerably wider than long, cheeks almost straight and diverging behind. Front of head broadly rounded; back of head very faintly cross-striated, without prominent spines. *Eyes* prominent, black, occupying almost two-thirds of width of head. *Ocelli* present, with light-brown inner crescents. *Mouth-cone* long and slender, reaching almost to posterior margin of prothorax, tipped with black. Maxillary palpi three-segmented, labial palpi two-segmented, basal segment very short, second segment very long. *Antennæ* apparently with nine segments, only slightly more than twice as long as head, segments 1, 2, 3, and base of 4 unicolorous with head, segment 2 shaded with brown, tip of 4 and others shading quite uniformly to dark brown, all spines transparent.

Prothorax with angles broadly rounded, unicolorous with head, with one prominent spine on each posterior angle; other smaller spines are present but all are transparent. *Mesothorax* and *metathorax* united evenly at sides and conspicuously orange-colored. *Legs* slender, grayish yellow, unicolorous with head, all tibiæ armed. *Wings*, including veins and spines, transparent. Veins prominent. Costa with twenty-five regularly placed spines, fore vein with a group of about eight spines on basal half and two or three scattered spines near tip. Posterior longitudinal veins arising from fore veins at about one-third the wing's length from the base and ending abruptly near tip of wing with about ten regularly placed spines; fringe on anterior pair of wings slight.

Abdomen with segments 2 to 6, inclusive, almost equal and with sides parallel. Segments 8, 9, and 10 with sides abruptly converging to meet the smaller pointed tenth segment. Surface of abdomen cross-striated. Posterior margins of dorsal plates of segments 5 to 8, inclusive, with arrangement of short, sharp spines; these are most conspicuous on segments 7 and 8. Abdomen dark brown, shading to darker toward tip, all spines of abdomen dark brown.

Habitat: Tulare County, Cal. Taken on goldenrod and orange foliage. Specimens collected by Mr. P. R. Jones.

(75) *Trichothrips ruber* new species. (Pl. V, fig. 39; Pl. VI, fig. 40.)

Measurements: Head, length 0.18 mm., width 0.19 mm.; prothorax, length 0.14 mm., width 0.28 mm.; mesothorax, width 0.33 mm.; abdomen, width 0.33 mm.; tube length 0.12 mm.; total body, length 1.42 mm. Antennæ: 1, 18 μ ; 2, 42 μ ; 3, 36 μ ; 4, 48 μ ; 5, 42 μ ; 6, 39 μ ; 7, 33 μ ; 8, 21 μ ; total 0.28 mm.

General color uniform dark brownish-red. Antennæ dark brown, legs brown, tips of fore tibiae and fore tarsi yellow.

Head about as long as wide, broadly rounded in front, cheeks slightly arched, back of head cross-striated; postocular spines long and with blunt tips. *Eyes* large, semitriangular in shape, slightly protruding, black, with bright-yellow outer borders, pilose. *Ocelli* present, situated far forward, anterior one on vertex; posterior ocelli contiguous with inner anterior margins of eyes, red, with reddish-black crescents.

Mouth-cone short, pointed, not reaching across prosternum, maxillary palpus with two segments. *Antennæ* with eight segments, one and five-tenths times as long as head, dark brown, except segment 3, which is lighter; segments increasing in size gradually until the fourth, which is largest, and then gradually diminishing toward the tip; all spines and sense cones transparent, three sense cones on segment 4, two smaller ones on segment 5.

Prothorax with sides diverging posteriorly, widest near the back. The fore coxæ are broadly rounded and prominent and form what appear to be the posterior angles of the prothorax; long blunt spines on anterior and posterior angles, on sides and on prominent coxæ; other spines not conspicuous. *Pterthorax* largest. *Legs* rather slender, without conspicuous spines or markings; only a very small claw on each fore tarsus. *Wings* long, slender, transparent except where light brown at extreme base above.

Abdomen with segments 2 to 6, inclusive, about equal, after which they decrease gradually until the tube. Segments 2 to 8 each with two long, blunt hairs on posterior angles. Segments 2 to 7 each with a pair of strong, brown, inwardly curved spines on either side half way from center to margin; other spines smaller and not conspicuous. Hairs on terminal segments long and slender.

Described from a single female.

Habitat: San Jose, Cal.

Taken in blossoms of azalea, in May.

(92) *Cephalothrips errans* new species. (Pl. VI, figs. 42-44.)

Measurements of two wingless females: Head, length 0.18 mm., width 0.13 mm.; prothorax, length 0.12 mm., width (including prominent fore coxa) 0.22 mm.; mesothorax, width 0.20 mm.; abdomen, width 0.28 mm.; tube length 0.10 mm.; total body, length 1.16 mm. Antennæ: 1, 18 μ ; 2, 39 μ ; 3, 39 μ ; 4, 45 μ ; 5, 45 μ ; 6, 39 μ ; 7, 39 μ ; 8, 24 μ ; total length 0.28 mm.

Three specimens of the winged male of this species show the following variations: Prothorax, length 0.14 mm., width 0.26 mm.; mesothorax, width 0.25 mm.; total length 1.86 mm. when the body is distended. Antennæ: 1, 21 μ ; 2, 45 μ ; 3, 45 μ ; 4, 48 μ ; 5, 42 μ ; 6, 39 μ ; 7, 45 μ ; 8, 30 μ .

General color uniform dark brown except tips of all tibiæ and all tarsi, which are yellowish. Wings (in the forms which have wings) transparent.

Head about four-tenths longer than wide, broadly rounded in front except at vertex, which projects forward between basal segments of antennæ; cheeks almost straight, without markings and without spines other than the long, transparent, blunt, postocular ones. *Eyes* somewhat triangular in shape, prominent but not protruding, black, with lemon-yellow outer margins, not pilose. *Ocelli* present, situated far forward on head, each posterior one contiguous with inner anterior margin of eye, slightly reddish-brown, with darker crescents; anterior ocellus smaller and with pigment, elongate and not crescent shaped. *Mouth-cone* a little shorter than its width at base; maxillary palpus two-segmented, basal segment very small, second segment long; labium broadly rounded. *Antennæ* with eight segments, one and one-half times as long as head, uniform dark brown except segment 3, which is light brown and somewhat yellowish at base; spines and sense cones present but not conspicuous; segments 7 and 8 closely joined.

Prothorax about seven-tenths as long as head; sides (including prominent coxa) diverging rapidly from the anterior margin to about three-fourths the length and then abruptly constricted, the outer angles thus formed broadly rounded. With three pairs of long, blunt spines on fore and hind angles and one midway along sides; also similar spine on each prominent fore coxa. *Pterthorax* with sides almost even and parallel, a little narrower than prothorax but much wider than head; almost as wide as prothorax in winged forms. *Legs* short, stout, each fore tibia with a small tooth. *Wings* (in winged forms) very weak, hardly attaining half the length of the abdomen, transparent, and hardly to be seen except for very light brownish area at extreme base.

Spines on sides of *abdomen* long and transparent, those on tip of tube brown.

Described from two wingless and three winged females.

Habitat: San Jose, Cal.

Food plants: Wild mustard, apricot, and prune foliage.

Adults taken from April to July.

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