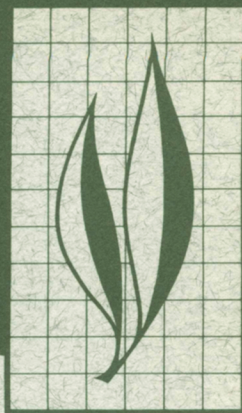


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A Revision of the
Genus *Scirtothrips* Shull
(Thysanoptera: Thripidae)

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The systematics of this group of insects is reviewed in its entirety. Keys to related genera and to the North American and world species are given, together with illustrations. Where necessary, all species are redescribed and three new members from California are added to bring the total number in the genus *Scirtothrips* to 35. The distribution and host plants are given for each; three species are of economic importance, particularly those attacking citrus in South Africa and southwestern United States. Species formerly included in the group are listed, and five additional species are removed. A complete bibliography is appended.



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A Revision of the Genus *Scirtothrips* Shull (Thysanoptera: Thripidae)¹

INTRODUCTION

THE RECENT COLLECTION of a thrips new to California, *Asprothrips antennatus* (Moulton), has prompted publication of notes collected on the genus *Scirtothrips* since about 1935. This relatively small genus (35 species) is apparently to be found worldwide. Five species are known in South and Central America, 12 in North America, and seven in Asia (and Australia). On the basis of information accumulated to date, the genus has reached its greatest development in Africa, where 12 known species exhibit the greatest variety of distinctive characters useful in differentiation. Apparently Africa offers more opportunity for allopatric speciation than do other areas.

Many problems remain to be resolved in *Scirtothrips*. Priesner prepared a key to the world species in 1932, but considerable synonymy is still to be settled, and no revised, highly satisfactory key to all the known species can be presented. I have been unable to see all the types, some of which are known from unique specimens, but have studied the majority, and a total of over 800 specimens.

Progress in the systematics of this group of insects is slow in comparison with that for mosquitoes, for example, because there are so few thysanopterists in the world. Furthermore, authors describing new species in recent years have not supplemented nor illustrated the older, imperfectly described ones.

In moments of frustration, the temptation is great to lump all the "species" together into three distinct groups—*Scirtothrips citri*, *S. longipennis*, *S. dorsalis*—and possibly a fourth, the *S. aurentii*-African group. But patient study of minor differences indicates that innumerable species are possible. Therefore, until the "normal variation" within the various populations can be assessed (for example, *one specimen only* is known from Australia), taxonomists must compromise, and prepare "progress reports" such as the one presented here.

In studying the relationships of the species, all related genera had to be examined, to determine affinities and the direction in which differentiation has likely proceeded.

RELATED GENERA

Scirtothrips apparently split off originally from *Anaphothrips*. Some species have retained the broad wings; the median pair of setae on the abdominal tergites is almost always present; the chaetotaxy of the pronotum is generally reduced; and the over-all appearance is

usually that of *Anaphothrips*. *Proscirtothrips*, evidence of a transitional group, retains the cleavage of antennal segment VI and the simple trichome on III. We do not consider the microsetulae on the abdominal tergites to be evidence of derivation from *Sericothrips*, but

¹ Submitted for publication July 10, 1963.

rather that *Scirtothrips* has developed in a parallel manner from the more primitive *Anaphothrips*. *Zonothrips* is more closely related to *Sericothrips*. *Scirtidothrips* has diverged further, to a small degree, in acquiring a heavily setose hind vein on the forewing (cf. *Scirtothrips zuluensis*) and in not having all terga with microsetulae. *Drepanothrips* and *Anascirtothrips* have lost one or both segments of the antennal style. Some species, such as *Scirto-*

thrips spinosus Faure, have taken on a pronotal setal pattern similar to that of *Taeniothrips*. However, the setal arrangement on the veins of the forewing have not acquired the stability (and usefulness) of the latter genus. *Oxythrips*, apparently also from *Anaphothrips*, has no microsetulae, has the hind vein more heavily set with setae than the forevein, and other differentiating characters. A key to these genera follows.

KEY TO GENERA AND SUBGENERA RELATED TO *SCIRTOTHRIPS*

Antennae six-segmented. Abdominal terga with microsetulae

Drepanothrips Uzel, 1895

Antennae seven-segmented 1

Antennae eight-segmented 2

Antennae nine-segmented 4

1. Forewings with one visible longitudinal vein. Pronotum with major setae.

Comb on posterior margin of abdominal tergites VI–VIII complete

Zonothrips Pr., 1926

Forewings with two longitudinal veins. Pronotum with setae on surface and posterior margin. Comb on tergite VIII complete

Anascirtothrips Bhatti, 1961

2. Forewings with one longitudinal vein. Microsetulae on abdomen present

Sericothrips Haliday, 1836

Forewings with two longitudinal veins. 3

3. Abdominal terga without microsetulae. Hind vein closely setose. Eyes strongly pilose *Scirtidothrips* Hood, 1954a

Abdominal terga with microsetulae. Comb complete on posterior margin of tergite VIII. Hind vein usually sparsely setose. Eyes not pilose

Scirtothrips Shull, 1909

(Note: Some *Anaphothrips* species have 8-segmented antennae, but lack the microsetulae and strong pronotal setae. *Oxythrips* Uzel lacks a comb on abdominal segment VIII.)

4. Sensory trichome on antennal segment III simple. Hairs on posterior fringe of forewing straight *Proscirtothrips* Karny, 1921

Sensory trichome on antennal segment III forked. Hairs on fringe wavy

Anaphothrips Uzel, 1895

THE GENUS *SCIRTOTHRIPS*

As increasing numbers of species have been described in the genus, such a diversity of characters has been added that the original concept of the group has become very clouded. The number of dominant setae on the posterior outer angles of the pronotum, as a diagnostic

character, has increased from one in *Scirtothrips citri* and two in *S. spinosus* to three in the case of *S. aceri*, *S. longipennis*, and *S. africanus*. Many species with transverse lines on the abdominal tergites (lacking in *S. citri*), such as *S. dorsalis*, *S. aurantii*, *S. manihoti*, and

S. multistriatus, are now included. The number of setae on the veins of the forewing exhibit much greater variation than formerly realized. For example, *S. fulleri* has 11–18 on the fore vein, and *S. longipennis*, in some specimens, only six; *S. zuluensis* has 18 on the hind vein. Species with seven or nine antennal segments must be removed from *Scirtothrips*. All the species presently known in North America have the posterior fringe of the forewing wavy. However, such generalized species as *S. dorsalis* and *S. fulleri* have a fringe of straight setae. The shape and proportions of the forewing are variable, and have not been utilized in separating species. All the known males of the African species, and only *S. aceri* in North America, have drepanae. Most species have the interocellar setae at the margin of or just within the ocellar triangle. Faure (1929) employed the position of the

lateral setae on the abdominal tergites as a supplementary character in species differentiation. I have found this character of little value in separating the North American species.

Hood (1954a) has established *Scirtidothrips* to take care of those species having the microsetulae absent (and the eyes heavily pilose). Those *Scirtidothrips*-like species having seven or nine antennal segments fit into *Anascirtothrips* Bhatti, *Proscirtothrips* Karny, or a new group shortly to be established by Priesner (in litt.). One of the species described below (*S. ewarti*), having a long mouth cone (cf. *Taeniothrips* and *Mycterothrips*), later may also need to be set apart. At present it seems wise to return to the concept of the genus in the strict sense and to redescribe it to include only a part of the admixture that has accumulated.

Scirtothrips Shull, s.s.

Scirtothrips Shull, 1909, p. 222.²

Scirtothrips, Hood, 1914b, p. 40.

Sericothripoides Bagnall, 1929, p. 69.

Scirtothrips, Priesner, 1932, p. 142.

Scirtothrips, Hood, 1935, p. 153.

Anaphothrips (*Scirtothrips*), Shumsher, 1944, p. 142.

Scirtothrips, Bailey, 1957, p. 192.

Antennae eight-segmented, style two-segmented; segment III with pedicel, III and IV with forked, sensory trichomes. Head wider than long. Three ocelli present. Interocellar setae placed on the margin or within the ocellar triangle. Mouth cone usually short. Prothorax wider than long, notum with transverse reticulations; one, two, or three major setae on posterior margin near outer angle, anterior angles without major setae, surface of pronotum irregularly set with minor setae. Forewings with two longitudinal veins with setae irregularly spaced, usually not entirely absent; posterior fringe wavy or straight. Tarsi unarmed. Abdomen

with rows of microsetulae on lateral surfaces of segments as in *Sericothrips*; comb nearly always complete on posterior margin of segment VIII only. Many species with dark transverse lines or bars on anterior margin of abdominal tergites. Male smaller than female; without glandular areas on sternites; some species with sickle-shaped bristles or drepanae on abdominal segment IX as in *Drepanothrips*. Type of genus: *Scirtothrips ruthveni* Shull.

In the future, when the males of more species of *Scirtothrips* are available for study, it might be desirable to establish a subgenus for those species having sickle bristles.

The exotic species of *Scirtothrips* fall into three principal groups: (1) those with drepanae and transverse lines or bars on the tergites; (2) those with either drepanae or bars; and (3) those having neither of these characters. Most of the African species fall in the first group. The Southern and Central

² See "Literature Cited" for citations referred to in the text by author and date.

American species lack drepanae. The Australasian members, with the exception of *S. dobroskyi*, also seem to lack drepanae.

The North American species all lack

drepanae except *S. aceri*, which also has very distinct bars. The new species described here have indistinct bars on the abdominal tergites as, apparently, does *S. brevipennis*.

Species Previously Included, but Transferred

The following species were included in the genus in the past, and have been previously transferred:

Scirtothrips batatae Bondar, 1931 = *Sericothrips portoriensis* Morgan. Moulton, 1933.

S. crawfordi Priesner, 1932 = *Anaphothrips zae* Moulton. O'Neill, 1955.

S. longipennis (D. L. Crawford, 1910) = *A. zae* Moulton. O'Neill, 1955.

S. owreyi Watson, 1924 = *Frankliniella fusca* Hinds. Priesner, 1932.

S. signipennis Bagnall, 1914 = *Chaetanaphothrips*. Priesner, 1932; Hood, 1954b; (see also Stannard, 1956).

S. tricolor (Moulton), 1911 = *Anaphothrips* (*Proscirtothrips*). Priesner, 1932; O'Neill, 1955.

S. ulmi Bagnall, 1913 = *Oxythrips ulmifoliorum* Haliday. Priesner, 1932.

S. zae (Moulton), 1911 = *Anaphothrips* (*Proscirtothrips*). O'Neill, 1955.

Species Now to be Removed

The following species, formerly included in *Scirtothrips*, now must be removed, for reasons discussed below: *S.*

antennatus Moulton, *S. antilope* Priesner, *S. bispinosus* (Bagnall), *S. clarus* Moulton, and *S. pomeroyi* Moulton.

Asprothrips antennatus (Moulton)

Scirtothrips antennatus Moulton, 1937, p. 409.

Asprothrips rauli J. C. Crawford, 1938, p. 109.

In 1946, K. Sakimura of Honolulu called my attention to the similarity of Moulton's *Scirtothrips antennatus* and the description of *Asprothrips rauli* by J. C. Crawford. Floyd Andre apparently had also observed this fact earlier. To my knowledge this synonymy has never been published. Some months ago, specimens submitted to me from the Bureau of Entomology, California State Department of Agriculture, were recognized as *A. rauli* by Miss Kellie O'Neill of the Agricultural Research Service, USDA. Topotypic material of

S. antennatus has been compared with the type of *A. rauli* by Miss O'Neill. I have in turn compared Crawford paratypes with the type of *S. antennatus* in the Moulton collection, and have definitely verified this new synonymy.

This species is very distinct from typical *Scirtothrips*, and, as Crawford pointed out, is related to *Dendrothrips*. It is known from Kauai and Oahu in Hawaii (both in the mountains and lowlands), the New York Botanical Gardens greenhouses, and now, out-of-doors in San Diego, California. The host plants recorded are *Nothopanax fructosum*, *Broussonetia papyrifera*, *Carludovica elegans*, *Pittosporum tobira*, *Plumeria* sp., and *Colubrina oppositifolia*.

Scirtothrips antilope (Priesner)

Anaphothrips antilope Priesner, 1923, p. 63.

Scirtothrips antilope, Priesner, 1932, p. 152.

Ascirtothrips antilope, Priesner, 1957, p. 165.

One male specimen, determined by Priesner, was loaned by J. C. Faure. Cleavage of antennal segment VI makes the appendage appear 9-segmented. The sensory trichome on segment III is forked and that on IV, while difficult to see, appears to be single or simple. Both segments have a dark ring at the tip. The forewings are broad, as in *Anaphothrips*, and the posterior fringe is wavy. Abdominal segments are without trans-

verse lines. Comb on posterior margin of tergite VIII absent. As in *Anaphothrips* species, a well-developed pair of setae is present in the center of the abdominal tergites. The legs are unarmed. Drepanae are present, not recurved, and appear to arise from the dorsal portion of the abdomen.

Priesner (private correspondence) indicates that he is establishing a new genus for this species. (See Priesner, 1957 reference, footnote 6, p. 165.) To our knowledge "*Ascirtothrips*" has not been described officially.

The only known collections are the original ones from Egypt and Cyprus, reported by Priesner (1939).

Dendrothrips (Monochaetella) bispinosus, Bagnall

Dendrothrips bispinosus Bagnall, 1924, p. 455.

Sericothripoides bispinosus, Bagnall, 1929, p. 69.

Scirtothrips bispinosus, Hood, 1935, p. 153.

Dendrothrips (Monochaetella) bispinosis, Shumsher, 1946, p. 158.

Sericothripoides bispinosus, Ananthakrishnan, 1962, p. 87.

From the Hood collection we have examined three co-types carrying the original Bagnall data.

Antennal segment VI without cleavage, segment I white, the remainder brown; sensory trichomes on segment III and IV forked. Four interocellar setae, two just forward of the posterior ocelli and two near the inner posterior margins. Surface of pronotum with

horizontal and loosely branched lines as in *Scirtothrips aceri*. One large dominant seta (B_2)³ is positioned at each outer posterior angle of the pronotum (see *Monochaetella* of Priesner, 1921). Forewing without cross bands and without a hind vein. Eight setae present on fore vein. Posterior fringe of forewing straight. Abdominal tergites II–VIII each with a basal transverse line, sternites V–VII also with transverse lines. Comb on posterior margin of tergite VIII complete. Microsetulae present on abdomen but reticulations, as seen in *Dendrothrips s.s.*, absent. Hind tibia with a long seta near tip.

All collections of the species have been made at Nilgiris, in south India, on Kotagiri pear and on tea. The type is in the Bagnall collection at Oxford University, England.

Chaetanaphothrips clarus (Moulton)

Scirtothrips clarus Moulton, 1942, p. 8.

Chaetanaphothrips clarus, Mitri and Stannard, 1962, p. 383.

The holotype is mounted in such a way that all characters cannot be properly seen and measured. Abdominal segments lack microsetulae, and tergite

³ We have followed Priesner's nomenclature in referring to the setae on each side of the posterior margin of the pronotum as B_1 , B_2 , and B_3 , counting from the center outward.

VIII has no comb on the posterior margin. Pronotum lacks horizontal striations. Antennae are relatively long and slender as in *Sericothrips*. Forewings are pale gray with a light-brown patch in center. Posterior marginal setae on the pronotum cannot be seen clearly. Setae on dorsum of abdominal segment IX are long and slightly curved distally. I have not seen the paratype. Additional collections must be made on

Guam before this thrips can be accurately placed. I did not find it on that island in 1944-1945.

Mitri and Stannard have studied additional specimens from the Marshall Islands and have transferred the species to *Chaetanaphothrips*.

The type is in the Moulton Collection, California Academy of Sciences, San Francisco.

Chilothrips pomeroyi (Moulton), new combination

Scirtothrips pomeroyi Moulton, 1930, p. 199.

Anaphothrips pomeroyi, Moulton, 1936, p. 266.

In his original description, Moulton noted the "unusually long prothorax," and compared it with *Stenothrips* Uzel but not with *Chilothrips* Hood. The holotype and one paratype examined in the Moulton collection have no microsetulae, nor a comb on abdominal tergite

VIII. Forewings are like those of *Anaphothrips*. Abdominal segment X is long and pointed as in *Chilothrips*. Legs are short and unarmed. Mouth cone is much longer than normal for *Scirtothrips*. For the time being we are assigning it to *Chilothrips*.

The species was collected from *Vitex* sp. and on an unknown host, at Yegi, Volta River, N. Ter., Gold Coast, Africa.

Nomina Dubia

The remaining exotic species, *Scirtothrips angusticornis* Karny, *S. bondari* Moulton, *S. dubius* Priesner, and *S. oligochaetus* (Karny), must be retained

in *Scirtothrips* in a doubtful status for the various reasons given below. *S. gracillipes* Watson (Knowlton and Thomas, 1933) is a *nomen nudum*.

Scirtothrips angusticornis Karny

Scirtothrips angusticornis Karny, 1923, p. 91.

Scirtothrips angusticornis, Priesner, 1932, p. 153.

Karny described this thrips from one female specimen and concluded that "perhaps it should form a new genus." Priesner (1932) emphasized that it did not belong in *Scirtothrips*. I have not seen the specimen and do not know where it is deposited. It was described from flowers of *Desmodium* sp. at Bang Saphan, South Siam. From the des-

cription, this species appears to be a transitional form between *Sericothrips* and possibly *Scirtidothrips*. It is difficult to place it more accurately since the presence of microsetulae, transverse lines on abdominal tergites, or a comb on abdominal tergite VIII is unknown. The dark body color and the heavily setose fore vein resemble those of *Taeniothrips*, and the long mouth cone is similar to that of *Mycterothrips*. The single B₂ seta on the posterior margin pronotum, however, excludes the species from those genera.

Scirtothrips bondari Moulton

Scirtothrips bondari Moulton, 1933, p. 104.

The holotype is mounted in such a manner that it is virtually impossible to see or measure the necessary specific diagnostic characters. Three paratypes in the Moulton collection were also examined, one of which has transverse lines on the sternites of abdominal segments IV–VIII. No lines can be seen on the tergites of any of the specimens. The forewings are uniformly light gray, and the posterior fringe is

straight although several ciliae near the base have a slight wavy appearance. The fore vein of the forewing of the holotype has 12 setae and the hind vein two. The setae on the posterior margin of the pronotum appear to be three of nearly equal length at the outer angles. The general appearance is that of *S. dorsalis*, and the species, if not synonymous, definitely is a part of the *S. dorsalis* complex.

The original collection was made at Bahia, Brazil, on *Ipomoea batatas*.

Scirtothrips dubius Priesner

Scirtothrips (Proscirtothrips) dubius Priesner, 1933, p. 184.

The types were undoubtedly destroyed during World War II. (See *inermis*, p. 352.) We must therefore depend solely on the published description. This species cannot be included in *Scirtothrips*, s.s. for the following reasons: the abdominal segments were

described as without microsetulae, the antennae as nine-segmented, and the male with glandular areas on sternites IV–VII. Neither can it be placed in *Anaphothrips (Proscirtothrips)* as defined by O'Neill (1955), because it has forked sense cones on the antennae. The nature of the posterior fringe on the forewing is unknown.

Scirtothrips oligochaetus (Karny)

Anaphothrips oligochaetus Karny, 1926, p. 201.

Anaphothrips oligochaetus, Ayyar, 1928, p. 268.

Anaphothrips (Scirtothrips) oligochaetus, Shumsher, 1946, p. 160.

Scirtothrips oligochaetus, Bhatti, 1962, p. 38.

Bhatti (1962) studied some of Karny's original specimens, and does not agree with Shumsher that *Scirtothrips oligochaetus* is a synonym of *S. dorsalis*. He restricts *S. dorsalis* to those specimens having transverse lines on the abdominal tergites and a clouded area in the center, as well as a body color of lemon yellow. In *S. oligochaetus* the transverse lines on the tergites are

absent, the body is orange, and antennal segment II is orange. Bhatti sent us the specimen that he had compared with Karny's types, and we noted also that the setae on the dorsum of abdominal segment IX are colorless (as in *S. mangiferae*). In some specimens of *S. dorsalis* these setae are yellow, and in some they are brown. On the whole, the Karny species is more robust. We have not seen type specimens.

In California we have a similar situation with *S. citri* in that considerable variability is seen in coloration, and a large "form" is found on native hosts. However, this species lacks the transverse lines. Interbreeding races may occur in these *S. dorsalis* and *S. citri* complexes and possibly in others.

World Distribution of *Scirtothrips* Species

To try to estimate the potential number of species yet to be described in *Scirtothrips* would be folly. I do not feel that North America, and latitudes greater than 40° and 45° are very rich in this group. However, only one species is as yet known from all of Australia, only two from India, none from China,

and only five from all of Central and South America. Therefore, any key to the species of *Scirtothrips*, or of almost any genus as widely distributed, must be very provisional because many new species of thrips are yet to be described. The following list shows the presently known world distribution.

AFRICA	AUSTRALASIA	NORTH AMERICA	CENTRAL AND SOUTH AMERICA
<i>acaciae</i>	<i>albomaculatus</i>	<i>aceri</i>	<i>bondari</i>
<i>africanus</i>	<i>angusticornis</i>	<i>albus</i>	<i>manihoti</i>
<i>aurantii</i>	<i>australiae</i>	<i>brevipennis</i>	<i>multistriatus</i>
<i>combreti</i>	<i>dobroskyi</i>	<i>citri</i>	<i>longipennis</i>
<i>dubius</i>	<i>dorsalis</i>	<i>ewarti</i>	<i>panamensis</i>
<i>fulleri</i>	<i>juniperinus</i>	<i>longipennis</i> *	
<i>fumipennis</i>	<i>oligochaetus</i>	<i>niveus</i>	
<i>inermis</i>		<i>prosopis</i>	
<i>mangiferae</i>		<i>ruthveni</i>	
<i>nubicus</i>		<i>solaris</i>	
<i>spinosus</i>		<i>taxodii</i>	
<i>zuluensis</i>		<i>tehachapi</i>	

* The only species that, to our knowledge, occurs in continental Europe. It has been found only in greenhouses in Belgium, Denmark, England, Finland, Germany, and Sweden (Morison, 1957). It was once intercepted in Honolulu (Swezey, 1945, p. 395).

NORTH AMERICAN SPECIES

From time to time thrips species are introduced to new areas through international commerce, and some of the more ubiquitous *Scirtothrips* may therefore be transported to North America or elsewhere and become established. Nevertheless, at present it seems better to separate the North American species from the exotic ones until more material accumulates and additional synonymy can be established.

At present, none of the species seems to be widespread in North America. The Moulton species, *Scirtothrips citri* and *S. aceri*, are distinctly Pacific Coast inhabitants. The Bagnall species, *S. longipennis*, appears to be a tropical form since it has been found in greenhouses only. Some forms are found on conifers and others on dogwood. The

desert species, *S. prosopis* Hood, so far is known only from mesquite. Collections of our eastern and southern species are insufficient to permit a complete picture of their range and variation. In general, the conclusion is that the members of the genus do not seem to be host specific. They are widespread on the continent, and sympatric speciation is apparently taking place at a slow rate.

In North America, *Scirtothrips* species are extremely difficult to distinguish, with a few exceptions. The light-colored "species" without drepanae or transverse lines or bars have practically no consistently good characters. An exasperating gradation exists between some populations, and confusing combinations of characters are to be seen on

some individual specimens. We have collected short-winged *S. citri*, *S. aceri* with wings similar to *S. citri*, and atypical *S. citri* on fir, grape, willow, cotton, mesquite, and oak. We conclude that in *Scirtothrips*, at least in the United States, there is more than meets the eye. It is a genus in transition, and some of the species are not stabilized. Bhatti (1962), in studying the genus in India, has encountered similar difficulties. Considering the variation in one

population studied (see discussion of *S. citri*, p. 340), it may be that in the future, *S. aceri*, *S. citri*, *S. ewarti*, and perhaps *S. prosopis* and *S. solaris*, will stand as distinct reference points among the native North American species. With the exception of *S. longipennis*, we have seen type material of all North American species. Types of all the Hood species are in his collection at Cornell University.

KEY TO SCIRTOTHRIPS SPECIES OF NORTH AMERICA

1. Mouth cone slender, sharply-pointed, and extending to posterior margin of pronotum 2
 Mouth cone bluntly rounded and not extending to posterior margin of pronotum 3
2. Abdominal tergites III–VIII each with a light-brown, transverse line on anterior margin extending across segment. Forewings 0.756 mm in length with very long setae (.051 mm) (Pl. III, fig. 10) *ewarti*, n. sp.
 Abdominal tergites without transverse lines. Forewings 0.648–0.688 mm in length with setae normal (.030 mm) *albus* Jones
3. Abdominal segments III–VIII each with a dark transverse line or bar on terga at anterior margin 4
 Abdominal segments without such markings 7
4. Head and body without gray pigmented areas. Males without drepanae.... 5
 Head and/or portions of body with pigmented areas..... 6
5. Forewings pale gray in basal third, fading to colorless at tip, moderately broad. Setae on wing veins of forewings brown, short and blunt in basal third, becoming lighter and more slender and sharply pointed toward tip *tehachapi* Bailey, n. sp.
 Forewings uniformly gray, broad and bluntly pointed. Setae on veins not as above (Pl. III, fig. 5) *solaris* Bailey, n. sp.
6. Head with gray-pigmented area between eyes. Forewings very dark gray, number of setae on fore vein reduced basally (Pl. III, fig. 8) *longipennis* (Bagnall)
 Head without gray coloration, but gray-pigmented areas on dorsum of abdominal segments II–VII, in the form of two spots laterally placed, one at each end of cross-line. Male with sickle bristle (Pl. I, fig. 4) *aceri* Moulton
7. Costal setae on forewings very short (.019 mm at center) (Pl. III, fig. 6).
 Central dorsal setae on abdominal terga II–VII
 closely spaced *prosopis* Hood
 Costal setae normal 8
8. Antennal segments I and II white to pale yellow. Posterior angular setae on pronotum short (Pl. II, fig. 6). Body and wings pale yellow to white *niveus* Hood
 Antennal segment II orange or brownish-gray. Posterior angular setae long, B₂ usually twice as long as B₁ or B₃ 9

9. Forewings broad, gray, veins usually indistinct. Antennal segment II brown 10
Forewings large, tapered, sharply pointed, veins usually prominent, often
with yellow pigment. Antennal segment II orange or orange-brown. 11
10. Eastern species. Forewings tapering from center to sharply pointed tip
(Pl. III, fig. 4). Body color brownish-orange. *brevipennis* Hood
Western species. Forewing broad, bluntly pointed. Body color yellow
solaris Bailey, n. sp.
11. Western species. Typical specimens from citrus have forewing length of
.607 mm (Pl. III, fig. 9), width at center, .032 mm, major pronotal seta
.041 mm long, pronotum, .147 mm wide (Pl. I, fig. 2) *citri* (Moulton)
Eastern and southern species. 12
12. Large species. Wing length, .661 mm, width at center, .048 mm. Pronotum
width, .156 *ruthveni* Shull
Smaller species. Wing length, .526 mm, width at center, .028 mm (Pl. III,
fig. 3). Pronotum width, .139 mm (Pl. II, fig. 10) *taxodii* Hood

Scirtothrips aceri Moulton

(Pl. I, fig. 4; Pl. II, figs. 7, 9;

Pl. III, fig. 7)

Scirtothrips aceri Moulton, 1926, p.
122.

Scirtothrips aceri, Bailey, 1957, p.
192.

The well developed setae on the surface of the pronotum, the smoky-gray, short wings, and the brownish-gray patch of color at each side of abdominal segments II–VII readily identify this distinct species. The striations on the pronotum are wavy and not closely spaced, similar to those of *Scirtothrips longipennis*. The transverse dark lines on the dorsum only, of abdominal segments III–VIII (anterior margin), are usually very prominent, those on the venter are very indistinct. The posterior fringe of the forewing is wavy. The male has sickle bristles (not mentioned by Moulton) similar to those of *S. spinosus* Faure from Africa. It is the only North American species yet described with this character. The holotype, which we have studied, is in the Moulton collection. The type locality is Redwood City, California.

While originally described from maple, *Scirtothrips aceri* is more easily

collected on young liveoak leaves and on *Chrysolepis* in the coastal region of northern California. It can be collected from March to October. A few scattered records are known from the interior foothills, but none south of Santa Barbara or north of Oroville, California. A new record is that of two females collected by Ewart at 11,000 feet, on *Senecio lugens*, August 15, 1959, at Big Pine Lakes, Inyo County, California.

It is most interesting that *Drepanothrips reuteri* Uzel, which keys out to *S. aceri* (with the exception of the six-segmented antenna), occurs together with *S. aceri* in the famous wine-producing Napa County. I consider *D. reuteri*, which is found as yet only on grapes in this state, an introduced European species (Bailey, 1938). Immediately adjacent to the vineyards, *S. aceri* is found on oaks. The two species do not cross over to my knowledge. No specimens of *S. aceri* exhibiting a reduction in the antennal style have been seen as yet. *Drepanothrips* is still monobasic.

Scirtothrips albus (Jones)

(Pl. I, fig. 3; Pl. II, fig. 8)

Anaphothrips albus Jones, 1912, p. 16.*Scirtothrips albus*, Karny, 1912, p. 334.*Scirtothrips albus*, Hood, 1914b, p. 40.*Scirtothrips albus*, Watson, 1923, p. 33.*Scirtothrips albus*, Priesner, 1932, p. 152.*Scirtothrips albus*, Bailey, 1937, p. 92.*Scirtothrips albus*, Bailey, 1957, p. 192.

On several occasions I have been inclined to synonymize this species with *Scirtothrips citri* but now, having seen the holotype and allotype, I do not think it advisable. After a comparison of the types, and disregarding color, discernible differences, although small, appear to justify the continuation of the Jones species. This necessitates refining the standards as to what constitutes a species in this genus solely on a morphological basis. Insufficient specimens exist on which to base a statistical study. In addition, who can say that *S. citri*, *S. ruthveni*, *S. albus*, and *S. niveus* are reproductively isolated?

As originally described by Jones, the mouth cone is long and pointed, but it is not so large as that of *Scirtothrips ewarti*. The interocellar setae are positioned within the triangle as in *S. citri*. The surface of the pronotum is finely cross-striated and the B₂ seta is longer and more delicate than in the average *S. citri*. The antennae are longer and

more slender than those of *S. citri*. The forewings are without pigment; the forevein of the holotype has 9 setae and the hind vein 3; the posterior fringe is wavy. In length and appearance the forewing is similar to that of *S. ewarti*. The abdominal tergites are without transverse lines. The comb on abdominal tergite VIII is complete.

The male is without drepanae, and the dorsal setae on abdominal segment IX are arranged in a semicircle and mounted on small tubercles as in *tehachapi*.

Critical measurements of the holotype are as follows (in mm): length of antennal segments: III, .041; IV, .041; V, .035; VI, .039; VII, .009; VIII, .011. B₂ seta on posterior margin of pronotum, .044. Length of forewing, .688, width at center, .038; length of costal seta at center of forewing, .038. Length of hind tibia, .156. Mid-dorsal setae on tergite of abdominal segment IX of male allotype, .028 in length.

The female holotype and the allotype were collected by P. R. Jones, June 6, 1910, on monkey-flower (*Mimulus*), at San Jose, California. These two slides are in the Hood collection. Additional specimens collected by Jones from laurel leaves, San Jose, California, June 20 and 29, 1911, are in my collection. I have collected the species once only, March 29, 1951, on willow twigs at Green Valley, Solano County, California. Its distribution, therefore, is presumably limited to a restricted area in northern California.

Scirtothrips brevipennis Hood

(Pl. II, fig. 5; Pl. III, fig. 4)

Scirtothrips brevipennis Hood, 1914a, p. 18.*Scirtothrips brevipennis*, Watson, 1923, p. 33.

The shorter wings and smaller size

appear to distinguish this species from *Scirtothrips ruthveni*. Antennal segment I is pale yellow, II–VIII are brown. The body coloration of the one paratype seen is identical with the type

series of *S. ruthveni*. One additional specimen from the Hood collection has light-brown, horizontal lines on abdominal segments III–VIII. The forewings are light, uniform gray. This species appears to be the eastern counterpart of the western *S. solaris* found on incense cedar. The principal differences between the two are the wing shape and degree of pigmentation. I have examined one paratype and the

one additional specimen from the Hood collection (from New York, on red cedar). The original collection was of eight females only. Crawford collected it again in New Jersey on the same host. Insufficient specimens are available to permit proper assessment of the variation in critical characters and possible placement in synonymy. The type locality is Plummer's Island, Maryland.

Scirtothrips citri (Moulton)

(Pl. I, fig. 2; Pl. III, fig. 9)

Euthrips citri Moulton, 1909, p. 121.

Euthrips citri Moulton, 1911, p. 26.

Euthrips citri, Jones, 1912, p. 10.

Physothrips citri, Karny, 1912, p. 339.

Scirtothrips citri, Hood, 1914b, p. 36.

Scirtothrips citri, Watson, 1923, p. 33.

Scirtothrips citri, Faure, 1929, p. 6.

Scirtothrips citri, Bailey, 1957, p. 192.

Scirtothrips clivicola Hood, 1957, p. 49. (New synonymy.)

I have collected this thrips in the type locality and have been adding specimens from the state over the years. An examination of the Moulton collection many years ago showed that no type was designated. This has been done (Lectotype Slide 156, Exeter, Calif., D.M., 10-5-08, Orange. Designated January 22, 1963). Since *S. citri* is the oldest species in the genus, it is an important reference point. I believe it to be a native species (Bailey, 1957) which has found the introduced citrus a very favorable host, and which increases on citrus to the point of economic importance. *S. aurantii* Faure, its counterpart in South Africa, seems to have followed a similar pattern.

The determining taxonomic characters for identification are not so constant and positive as one would wish. Pronotum with one long, slender, major seta at each outer posterior angle. An-

tennal segment II and veins of forewings usually bright orange. Forewings pointed; veins prominent. Abdominal segments without brown transverse lines. Number of setae on forewing vein varies: normal groups from base to tip are 3-4-3; variations are 2-5, 3-5, and 3 only distally. Three setae on hind vein. All other diagnostic characters also vary as follows: forewing length, .526-.688 mm; head length, .070-.092, width, .121-.150; pronotum length, .092-.105, width, .147-.182; major seta (B_2) on pronotum, .038-.048; antennal segment III, .038-.048, IV, .035-.038, V, .032-.038, VI, .035-.048; dorsal setae on abdominal segment X, .044-.057.

Male smaller; without sickle bristles or comb of setae on hind femora, as in *aurantii*.

Short-winged forms are known, as is a "monstrous form" which appears to be identical with *S. ruthveni*. I have also seen one specimen with two long pronotal setae as in *S. spinosus* Faure.

I have examined the specimens of the original 1908-1909 series of *Scirtothrips citri* from Exeter and Lindsey in the Moulton, Jones, and Watson collections. The specimens of *S. citri* from mesquite and liveoak (probably the native host) have longer antennae and wings, and approach what might be called a "form." These specimens are generally larger than the population that breeds continuously on citrus. This

is the only North American species yet available in large enough series to permit full appraisal of the anatomical variations. Within these variations, *S. taxodii* appears to fall in the lower range and *S. ruthveni* in the upper. Until a study of populations of this complex can be made in other areas of the United States, these species must be considered distinct.

However, I believe *S. clivicola* Hood, 1957, to be a synonym of *S. citri*. Like *S. taxodii*, it is smaller than the average *S. citri*, but otherwise it has no distinctive morphological character to separate it. The three specimens on which it was based were from grasses and herbs, and would therefore be lighter in color, as is *S. citri* when feeding on such plants. An examination of a series of the citrus thrips shows that the number of setae on the front margin of the anal lobe of the forewing varies from three to four, often differing on opposite wings of the same specimen. I have examined one paratype of *S. clivicola* from the single collection in the Chiricahua Mountains, Arizona.

When examined in alcohol shortly after collection, mature, fully pigmented specimens are orange, the pronotum and lateral margins of the abdomen are brownish, and all legs are smoky-brown, as are antennal segments III–VIII (cf. Hood's descriptions of *S. taxodii*, *S. brevipennis*). Antennal segment I is pale yellow, segment II, orange. The wing veins often are filled with yellow coloring. The brilliant coloring fades in the collecting solution, and may be entirely lost in xylol and in certain mounting media other than balsam. Specimens collected on willow and

laurel, such as *S. niveus*, for example, lack the orange pigment, are very pale, and are extremely difficult to separate from *S. albus*.

This is the only North American species in the genus for which biological details are known. Collection records show the adult citrus thrips to be active nearly all year. In the orange groves it passes the winter principally in the egg stage in the tender twigs. The first nymphs hatch in March. "Pupation" is in the topsoil and among litter beneath the trees. There are three to four generations a year. The nymphs and adults distort the young leaves and scar the fruit by feeding. Ebeling (1959) states: "The citrus thrips is probably third in importance among citrus pests in California as a whole, but is the most serious pest in the San Joaquin Valley, in the desert regions of California, and in Arizona." When the insect is feeding on citrus, the body coloration is much more a bright yellow, particularly in the wing veins and antennal segment II, than when it is feeding on most other trees and shrubs.

The hosts are much more diversified than usually believed; they include alfalfa, California laurel, chamise, citrus, cotton, date, *Prosopis* spp., fir, grape, grass, *Larrea tridentata*, liveoak, *Magnolia tripetala* (umbrella-tree), *Myrtus* spp., pecan, pepper tree, rose, sumac, tree dahlia, various deciduous trees, and willow.

The presently known distribution ranges from Tehama County in northern California, south through the Imperial Valley, and into northern Mexico. Typical *S. citri* is also known from Arizona.

Scirtothrips ewarti Bailey, n. sp.

(Pl. I, fig. 6; Pl. II, fig. 1;

Pl. III, figs. 1, 10)

Female (macropterous): Lemon yellow, thorax light orange. Antennal segment I pale yellow, II darker, re-

mainder of segments light brownish-gray. Wings pale yellow to white. Transverse line or bar on anterior mar-

gin of dorsum of abdominal tergites III–VIII extending entire width. Major setae brown.

Head wider than long, tapering sharply from behind eyes to posterior margin. Mouth cone long, sharply pointed, extending to posterior margin of pronotum. Maxillary palpi three-segmented, very long and slender. Eyes prominent. Ocelli present with a pair of setae within the triangle. Antennae long and slender; segments III and IV with long, slender forked trichomes. Forewings long, costal setae brown and long. Forevein with setae in groups of 4–3–3, hind vein with 4; costal setae long and brown in color. Posterior fringe wavy.

Pronotum wider than long. One major seta (B_2) at each posterior outer angle which is twice as long as the outer one (B_3). Surface with the usual horizontal striations. Legs long, slender, and unarmed.

Abdomen of normal shape, terminal segments longer than related species; comb on posterior dorsal margin of segment VIII present, irregular but complete.

Male (macropterous): Small and slender, pale yellowish-white. Horizontal markings on abdominal segments indistinct. Antennal segments I and II white, remainder pale gray. Forewing pale gray in basal third and becoming colorless in distal third; number of setae on wing veins reduced. Comb weak. Drepanae absent; six long dorsal setae on segment IX, not set on prominent tubercles. Legs unarmed.

Measurements of female holotype (in mm): Total body length, 1.20. Head, length .083; width behind eyes, .128, at

posterior, .120. Pronotum, length .099; width, .153. Major posterior angular seta on pronotum (B_2), .044; outer one (B_3), .022; central pair (B_1), .014. Forewing, length, .756; width at center, .041; costal setae, .051. Hind tibia, length, .198. Dorsal length of abdominal segment IX, .096; X, .064. Antennal segments: I, .019; II, .038; III, .054; IV, .048; V, .044; VI, .051; VII, .099; VIII, .016; total length, .288.

The general appearance is that of *Sericothrips*, particularly the head and antennae. The long mouth cone and antennae, as well as the long setae on the forewing, readily separate this species from all others except *Scirtothrips albus*. *S. angusticornis* Karny is similar in some respects but lacks other *Scirtothrips* characters.

Collection Data. The single male specimen was collected April 3, 1960, at Midway Well, Imperial County, California on *Simmondsia californica* by W. H. Ewart and O. L. Brawner. Nine paratypes were collected by the same persons in April at Cottonwood Springs, Riverside County, and 29 Palms, San Bernardino County, California, on creosote bush (*Larrea tridentata*) and spurge (*Tetradococcus halli*), from which the holotype came.

This desert-inhabiting species is named for Dr. Ewart who has added many new thrips records to the southeastern portion of the state by careful collecting. Several of the paratypes are deposited in the University of California Riverside collection, and one in the United States National Museum, Washington, D.C. Types are in the author's collection.

Scirtothrips longipennis (Bagnall)

(Pl. I, fig. 1; Pl. II, fig. 3; Pl. III, fig. 8)

Euthrips longipennis Bagnall, 1909, p. 173.

Euthrips parvus Moulton, 1911, p. 38.

Scirtothrips longipennis, Hood, 1914b, p. 37.

Scirtothrips longipennis, Priesner, 1932, p. 154.

Scirtothrips longipennis, O'Neill, 1955, p. 240.

Scirtothrips longipennis, Bailey, 1957, p. 193.

Scirtothrips longipennis, Melis, 1961, p. 336.

This species must be termed "exotic" because it is known chiefly from greenhouses. Gaud (1961) and others have reported it in nurseries "high in the mountains" of Puerto Rico. In the future, as apparently has been the case with *Anaphothrips orchidii*, it may become established outdoors elsewhere (Stannard, 1956). It is a very distinctive species in a genus wherein many species "blend" into one another. The following characters set it apart: Antennal segments I and II gray or yellowish, remainder gray. Head depressed in front and with irregular, gray-pigmented area between eyes. Mouth cone, forelegs, and ovipositor short. Pro-

notum with two major setae at each posterior outer angle, the longer one (B_2) being .028-.032 mm long. Pronotum sparsely striate horizontally, with wavy lines. Forewing very dark gray, narrow, sharply pointed, setae on forevein sparse, posterior fringe wavy. Abdominal segments II-VII with dark-brown, narrow cross-band at anterior margin of tergites and on III-VII of sternites.

The male has not been described, but very likely, when collected, it will be found to possess sickle bristles.

This species has been found on various greenhouse plants such as begonia, ferns, *Impomoea*, and *Pharbitis*, in Europe, Puerto Rico, Canada, New York, and California. Andison (1938) and Morison (1957) have reviewed its biology, damage caused by it, and control.

The type is in the British Museum; the type locality is Brussels, Belgium.

Scirtothrips niveus Hood

(Pl. II, fig. 6)

Scirtothrips niveus Hood, 1913, p. 161.

Scirtothrips niveus, Watson, 1923, p. 33.

In the original description of this species no comparison was made with *Scirtothrips ruthveni*. Its body color is almost white, antennal segments I and II are white, and the wings are colorless. The posterior pronotal setae are short in comparison with those of *S. citri* and *S. ruthveni*. This is the only distinctive morphological feature. The body size and wing length are greater than those of *S. brevipennis* and *S. taxodii* which also are pigmented like *S. citri*. The

general shape and body size are like *S. citri*. I have studied three paratypes (females) and a total of nine specimens, including one male. The male lacks drepanae, and the dorsal setae on abdominal segment IX are mounted on tubercles similar to those of *S. tehachapi*.

To my knowledge the collection made by J. C. Crawford (1939) in New Jersey has provided the only specimens other than the type series of 11 females and one male. The type locality is Plummer's Island, Maryland, and the only known host is leaves of flowering dogwood (*Cornus florida*).

Scirtothrips prosopis Hood

(Pl. III, fig. 6)

Scirtothrips prosopis Hood, 1939, p. 558.

This species appears to be known

only from the original two collections made in Texas in March, 1939. The seven grayish-yellow female specimens

were collected on the leaves of mesquite (*Prosopis* sp.). A specific character, namely, the somewhat short setae on the costa and the veins of the forewing, seems to distinguish this western form. It apparently represents a transitional form (with shorter antennae) between

S. ruthveni and *S. tehachapi*. A larger series from the arid southwest, including males, will more clearly define this species. I have examined two paratypes. The type locality which must be either Kingsville or Port Lavaca, Texas, was not designated in 1939.

Scirtothrips ruthveni Shull

Scirtothrips ruthveni Shull, 1909, p. 222.

Scirtothrips ruthveni, Watson, 1923, p. 33.

Shull's description of *Scirtothrips ruthveni* was published three months after that of *S. citri*. He was in correspondence with Moulton at the time, but neither author mentioned the other's species. Dogwood (*Cornus* spp.) was the original recorded host in Huron County, Michigan. An examination of the poorly mounted type material showed that it is almost impossible to separate *S. ruthveni* morphologically from *S. citri*. Also, an insufficient series is available to record the range of variation in the eastern population and verify the suspected synonymy. At present we must continue to consider *S.*

ruthveni and *S. citri* as distinct. In California, *S. citri* has not been collected as yet on dogwood, which may indicate a biological difference between the two. The co-types are deposited in the museum collection, University of Michigan, Ann Arbor. I have studied five paratype (co-types) females, none of which is a complete specimen.

Additional records of the species are those of the collection by J. C. Crawford, on *Kalmia* spp. in New Jersey and specimens taken by J. G. Watts in South Carolina on cypress, wild rose, and sparkleberry (*Vaccinium arboreum*). These records indicate that *S. ruthveni* is widespread and not limited to the range of dogwood (and *S. citri* in turn is not limited to citrus). At present I consider *S. ruthveni* the eastern and southern counterpart of *S. citri*.

Scirtothrips solaris Bailey, n. sp.

(Pl. II, fig. 4; Pl. III, fig. 5)

Female (macropterous): Color yellow. Antennal segment I white, remainder of segments gray, becoming darker toward the end. Legs gray. Forewings uniform smoky gray. Abdominal segments III–VIII with narrow, light-brown, dorsal horizontal lines extending three-fourths of their width at anterior margin, usually visible. Pigmentation on head, pronotum, or lateral portions of abdominal segments absent.

Head wider than long. Ocelli present with two setae inside triangle. Eyes swollen. Three postocular setae. Antennae normal for the genus. Mouth cone short, blunt; maxillary palpi three-segmented.

Pronotum wider than long with the usual horizontal lines and dorsal setae. One prominent seta (B_2) at each outer posterior angle; the smaller seta to the outside (B_3) about one-half as long, the central pair (B_1) about one-third as long. Forewing broad and bluntly pointed; forevein with setae in groups of 4–3–4, hind vein with 2 or 3; posterior fringe wavy. Legs normal, unarmed.

Abdomen of normal shape; comb on posterior margin of segment VIII. Horizontal markings on dorsum faint. Dorsal setae on segment IX sometimes variable in length.

Male (macropterous): Much smaller

than female. Color pale yellow. Antennal segment II large, wings short, comb weak, and horizontal markings indistinct. Drepanae absent. Dorsum of abdominal segment IX with six major setae not mounted on tubercles. Legs unarmed.

Measurements of holotype (in mm): total length, 1.09. Head, length .086; width behind eyes, .140. Pronotum, length .092; width, .163. Forewing, length, .607; width at tip of scale, .064; at center, .058. Major posterior angular seta on pronotum (B_2), .035; outer one (B_3), .016; inner (B_1), .012. Antennal segments: II, .035; III, .048; IV, .038; V, .038; VI, .044; VII, .009; VIII, .009; total length, .227. Dorsal setae on abdominal segment IX, .048.

This species is found in the same localities as *Scirtothrips aceri*, but is easily separated from it by the lack of gray patches of pigment on the sides of the abdomen, broader forewings, the single major seta (B_2) at the posterior outer angle of the pronotum, and the lack of drepanae in the male. In the long series studied, one specimen has

simple trichomes and one shows cleavage in antennal segment VI. Some variation also occurs in wing width and in the lengths of major setae. Such types of variability perhaps indicate that the species is not completely stabilized.

Collection Data. Described from a long series of specimens collected by the writer in 1938 and 1939 in Yosemite Valley and Nevada City, California, in April and May, on incense cedar (*Libocedrus decurrens*). Additional specimens were collected at Calistoga and Calaveras Big Trees, California. Recently W. H. Ewart has collected the same insect at Oasis, Mecca, and Cajon Pass in southern California. The hosts, other than incense cedar, are *Ceanothus*, *Adenostoma*, *Prosopis*, *Acer*, and *Prunus*. The holotype and allotype were collected April 27, 1939, at Nevada City, California, on incense cedar, and are retained in my collection. Paratypes are deposited in the University of California, Riverside, collection and the United States National Museum.

Scirtothrips taxodii Hood

(Pl. II, fig. 10; Pl. III, fig. 3)

Scirtothrips taxodii Hood, 1954c, p. 277.

This *Scirtothrips* is the smallest species of the *S. citri* group. Its wings are short, the abdominal terga lack visible cross-lines (at least in the only two specimens studied), and the coloration is the same as that of *S. citri*. I am impressed by the lack of good distinctive specific characters by which to

separate it from *S. ruthveni* and, especially, from smaller than normal specimens of *S. citri*. Here again, a study of the southeastern population will have to be made before the synonymy can be established.

The male is undescribed. It is known from 16 females taken on bald cypress (*Taxodium distichum*) and *Panicum agrostoides* in Georgia. I have seen two paratypes.

Scirtothrips tebachapi Bailey, n. sp.

(Pl. I, fig. 5; Pl. II, fig. 2; Pl. III, fig. 2)

Female (macropterous): Color pale yellowish-brown; antennal segment II, femora, and tibiae somewhat darker. Forewings pale gray in basal third,

fading to colorless at tip. Transverse, brownish-gray lines or bars on anterior margin of abdominal tergites III–VII, distinct, extending full width of seg-

ments. Major setae on abdominal segments yellowish-brown. Setae on basal third of forewing brown, and becoming nearly colorless at tip.

Head wider than long, eyes protruding, cheeks not swollen. Three ocelli present with one pair of interocellar setae within the triangle. Three postocular setae; central one, minute. Mouth cone broad and not reaching to posterior of pronotum. Maxillary palpi three-segmented. Antennae eight-segmented, normal for the genus; the forked trichomes on segments III and IV short and somewhat asymmetrical.

Pronotum wider than long, with the usual horizontal fine lines and irregularly spaced setae on the dorsum. The posterior angular seta (B_2) is dominant, the outer one (B_3) being about one-half as long and the inner (central, or B_1) about one-fourth as long. The forewings are broad as in *Scirtothrips solaris*, posterior fringe wavy, and the costal setae short but longer than in *S. prosopis*. The setae on the wing veins are short and somewhat blunt in the basal third of the wing, and become more slender and sharply pointed progressively toward the tip. The forevein has eight irregularly spaced setae in the basal half and three in the distal portion. The hind vein has three setae. Legs unarmed.

Abdomen of normal shape. Comb present on posterior margin of segment VIII, but irregular and sparse. Setae on dorsum of segments IX and X normal.

Measurements of female holotype (in mm): Total body length, 1.21; head, length, .099, width behind eyes, .147;

pronotum, length, .108, width, .179; forewing, length, .648, width at tip of scale, .070, at center, .048; posterior angular pronotal seta (B_2) length, .044, outer seta (B_3), .023, inner (B_1), .012. Length of antennal segments: I, .022; II, .041; III, .051; IV, .044; V, .041; VI, .048; VII, .009; VIII, .012; total length, .283.

Male (macropterous). Pale yellow, slender, much smaller than female. Drepanae absent. Six long dorsal setae on abdominal segment IX arising from large tubercles. Wings short with setae on veins reduced in number. Horizontal lines on abdominal segments faint.

This new species is related to *Scirtothrips solaris*, but is readily separated from it by the different setae on the forevein of the forewing, the darker legs, and the large tubercles on abdominal segment IX of the male.

Collection Data. The holotype female and allotype male were collected by W. H. Ewart and O. L. Brawner on March 25, 1960, at Whitewater, Riverside County, California, from Mexican tea (*Ephedra* sp.). They also collected 26 paratypes both at the above locality and at Monolith, Kern County, California, June 23, 1958, on *Lycium* sp. The latter locality is in the Tehachapi Mountains, which are considered the geographical boundary between northern and southern California. This species is apparently limited to the southern portion of the state. Several of the paratypes are deposited in the University of California, Riverside, collection, and one is in the United States National Museum. The types are in the author's collection.

Exotic Species

The following key to the species of *Scirtothrips* found outside North America is based on females only. The males of many species are unknown as yet. Since there is a lack of good constant morphological characters in the

group, color, unfortunately, has to be used extensively for identification. The setae on the wing veins also vary, but for the present they are useful in separating many forms.

KEY TO EXOTIC SPECIES OF *SCIRTOTHRIPS*

1. Abdominal tergites without transverse lines 2
 Abdominal tergites II or III to VII or VIII with basal (or anterior) transverse lines 5
2. Three posterior angular pronotal setae about equal in length. *bondari* Moulton
 One or two dominant posterior angular (B_2) pronotal setae 3
3. One dominant B_2 seta on pronotum. Hind vein of forewing with two setae
 oligochaetus (Karny) 4
 Two dominant B_2 setae on pronotum 4
4. Body uniform orange-yellow. Posterior vein of forewing with 3-4 setae
 mangiferae Priesner 4
 Body orange-yellow with gray blotches at sides of abdominal segments.
 Posterior vein of forewing with 5-6 setae *africanus* Faure
5. Forewings and scale very dark gray 6
 Forewings light gray, scale and basal area sometimes smoky gray or dark brown 11
6. Trichomes on antennal segments III and IV very stout and heavily shaded with brown *fumipennis* Jacot-Guillarmod
 Trichomes colorless 7
7. Pronotum with one dominant posterior angular seta 8
 Pronotum with three setae of nearly equal length at outer posterior angles. 10
8. Transverse lines on abdominal tergites occupying central third of segments
 manihoti (Bondar) 9
 Transverse lines on abdominal tergites extending across segments 9
9. Abdomen and head without gray blotches. Major posterior angular pronotal seta 48μ long *dobroskyi* Moulton
 Abdomen with gray blotches. Major posterior angular pronotal seta 27μ long *panamensis* Hood
10. Surface of pronotum with very fine, closely spaced horizontal lines
 acaciae Moulton 10
 Surface of pronotum with wavy, loosely spaced lines. . . *longipennis* (Bagnall)
11. Posterior outer angles of pronotum each with two long setae (54μ long).
 Head with brown band posterior to eyes *spinosus* Faure
 Posterior outer angles of pronotum each with one or two dominant setae.
 Head not so colored 12
12. Dominant posterior seta (B_2) on pronotum $70-76\mu$ long; B_3 , $36-39\mu$
 inermis Priesner 13
 Posterior outer setae (B_2 , B_3) on pronotum much shorter 13
13. Sides of abdominal segments II-VIII marked with irregular white areas
 albomaculatus Bianchi 14
 Sides of abdominal segments not so marked 14
14. Hind vein of forewing with 7-13 setae *zuluensis* Faure
 Hind vein of forewing with 1-4 setae 15
15. Transverse lines on abdominal tergites bisect a grayish-brown blotch, or arched in center 16
 Abdominal tergites without a distinct central blotch as above, usually with a lightly pigmented area posterior to transverse line and with or without lateral blotches 17
16. Sensory trichomes or antennal segments III and IV very long, extending to center of following segment. Transverse lines arched. Interocellar setae placed between posterior ocelli *multistriatus* Hood

Trichomes normal. Transverse lines straight. Interocellar setae placed behind anterior ocellus and on line between it and posterior pair

- aurantii* Faure
17. Forewings with dark grayish-brown bands or streaks at the base. Body mottled *combreti* Faure
Forewings at most with a streak of brown color over base of fore vein. Body not mottled 18
18. Transverse lines on abdominal tergites extending full width of segments.. 19
Transverse lines in central portion of tergites only..... 21
19. Hind vein of forewing with 4 setae..... *nubicus* Priesner
Hind vein of forewing with 1 or 2 setae..... 20
20. Transverse lines on abdominal sternites absent. Posterior fringe of forewing straight. B₂ seta inserted on a tubercle..... *australiae* Hood
Transverse lines on abdominal sternites IV–VII present and hooked at ends on VII. Posterior fringe of forewing wavy. B₂ seta not inserted on a tubercle *juniperinus* Pelikan
21. Tergites of abdominal segments III–VII with a group of 3–4 setae anterior to postero-angular seta. Forewings with dark area near base overlying base of fore vein *fulleri* Faure
Tergites of abdominal segments III–VII with a group of 2 setae anterior to postero-angular seta. Forewings uniformly light brown or pale gray
dorsalis Hood

Scirtothrips acaciae Moulton

Scirtothrips acaciae Moulton, 1930, p. 200.

Moulton based his description of this form on a unique female collected from *Acacia siberiana* at Yegi, Volta River, N. Ter., Gold Coast, Africa. I have examined this specimen and find it to be in the *Scirtothrips dorsalis* group. The horizontal lines on the abdominal tergites III–VIII are broad in the center, taper to a thin line at the ends, and extend across the median third. A pale gray patch of pigment covers the cen-

tral and basal portion of the tergites through which the line passes. The forewings are medium-gray but not so dark as those of *S. longipennis*. The posterior fringe of the forewing, however, is wavy as compared with that of *S. dorsalis*, which is straight. The three posterior angular setae on the pronotum are nearly equal in length, as in *S. fulleri*. The pronotal surface is etched with parallel, very closely spaced lines.

The type is in the Moulton collection, California Academy of Sciences, San Francisco.

Scirtothrips africanus Faure

Scirtothrips africanus Faure, 1929, p. 12.

This species is found on a wide variety of host plants in the Transvaal and Cape Province. I have studied two paratype females. *S. africanus* is one of the generalized types of *Scirtothrips* lacking any really distinctive characters. The abdominal tergites lack the cross-lines. Two major setae (B₂ and

B₃) on the posterior margin of the pronotum are short and of about equal length (21 and 17 μ). Body color is orange-yellow with grayish-brown patches on pterothorax and sides of legs and abdomen. The posterior fringe of forewing is wavy. Male with drepanae. The type is in the National Collection of Insects, University of Pretoria, Republic of South Africa.

Scirtothrips albomaculatus Bianchi

Scirtothrips albomaculatus Bianchi, 1945, p. 263.

This New Caledonia species might be expected to be related to *Scirtothrips australiae*, but the two appear to be distinct. Cross-bars are present on the median two-thirds of abdominal tergites III–VIII. Bianchi's very complete description, made from the unique female, determined the distinguishing characters: posterior fringe of the forewing is straight; sides of abdominal segments

II–VIII have a white instead of a smoky patch; setae on the wing veins are the same as in *S. africanus*; the single dominant posterior seta on the pronotum is 28μ long; the interocellar setae lie just outside the ocelli triangle; and the fore margin of the pronotum has a row of 6 to 8 small setae. I have not seen the unique female, which was collected on a rose flower at Nouméa, New Caledonia, and which is deposited in the Hawaiian Sugar Planters Association Collection, Honolulu.

Scirtothrips aurantii Faure

Scirtothrips aurantii Faure, 1929, p. 3.

The South African citrus thrips is one of the most clearly distinct species in the genus, particularly because of the comb of strong setae on the hind femora of the male. The female is typical of the group of species having horizontal lines and patches of color on the abdominal tergites. The pronotum and legs are more strongly setose than those of *Scirtothrips dorsalis*. The forewings are narrow and the posterior fringe wavy. The three major setae on the pos-

terior margin of the pronotum (B_1 , B_2 , B_3) are nearly equal in length (21, 29 and 25μ), and similar to but longer than those of *S. aceri*. In Africa the species occurs from Egypt to Cape Province on the eastern side of the continent. It is the counterpart of *S. citri* in that it is found on a large number of hosts, and is specifically injurious to citrus. I have seen both sexes, represented by six paratypes and many other specimens.

The type is in the National Collection of Insects, University of Pretoria, Republic of South Africa.

Scirtothrips australiae Hood

Scirtothrips australiae Hood, 1919b, p. 75.

The unique specimen, which I have examined, is very pale; it may be teneral. In contrast to *Scirtothrips albomaculatus* and *S. dorsalis*, the transverse lines extend entirely across abdominal tergites III–VII. No lines are evident on the sternites. The dominant seta (B_2) on the posterior margin of the pronotum is .032–.035 mm (twice as long as B_1), and arises from a small tubercle. The interocellar setae are within the triangle and about in line with the anterior margin of the posterior ocelli and the posterior of the forward ocellus. The pronotum is finely

cross-striate. The forked trichomes on antennal segments III and IV are normal, but the minute, single sensory cone of the outer surface of V and VI is broad and spear-like. The forewings are nearly colorless; the hind vein has only one setae and the posterior fringe is straight. The comb is present and complete on the posterior margin of abdominal tergite VIII. This species in general appearance is very similar to *S. dorsalis*. Here again, in contrast to many genera of Thysanoptera studied, we are impressed with the very minute differences separating geographically isolated populations of members of this genus.

A. A. Girault collected this female specimen by sweeping foliage and grass

at Pentland, Queensland (Cape River), Australia, January 6, 1913.

Scirtothrips combreti Faure

Scirtothrips combreti Faure, 1929, p. 8.

The more highly colored and mottled species in the group are found in South Africa. This is the case with *Scirtothrips combreti*, known only from that portion of the continent. It is restricted chiefly to species of *Combretum*. An examination of three paratypes shows a great similarity in general appearance to *S. aceri*. However, the forewings are banded in the basal third, and more

suddenly expanded in that area. The dominant two setae (B_2 and B_3) on the posterior margin of the pronotum are short, being nearly equal in length (21–22 μ). The central transverse lines on the abdominal tergites are heavy and broad with blotches of gray at each end and posterior to the bar. The male has drepanae.

The type is in the National Insect Collection, University of Pretoria, Republic of South Africa, with all of Faure's specimens.

Scirtothrips dobroskyi Moulton

Scirtothrips dobroskyi Moulton, 1936, p. 264.

As Moulton stated, this thrips is related to *Scirtothrips longipennis*. In comparing the holotype and allotype (the only specimens known) with others in the genus, I note the following: The dominant posterior angular seta (B_2) is 48 μ in length; the head is without a gray patch of pigment between the antennae; the transverse dark lines on the abdominal tergites extend nearly the entire width of the segments; the

posterior fringe of the forewing is nearly straight, and the wing setae are reduced. The male has drepanae. Obviously, the number of specimens available is too limited to permit drawing any conclusions. Also, for direct comparison, the male of *S. longipennis* is as yet unknown. The type specimen, collected from tomato in Manila, may have been adventitious.

The type is in the Moulton collection, California Academy of Sciences, San Francisco.

Scirtothrips dorsalis Hood

Scirtothrips dorsalis Hood, 1919a, p. 90.

Anaphothrips andreae Karny 1924, p. 24.

Scirtothrips dorsalis, Ayyar, 1928, p. 251.

Scirtothrips dorsalis, Ayyar and Margabandhu, 1931, p. 1032.

Scirtothrips andreae, Hood, 1935, p. 153.

Scirtothrips dorsalis, Shumsher, 1946, p. 160.

This *Scirtothrips* species is a generalized type and an important reference

point both taxonomically and chronologically, as are *S. citri* and *S. longipennis*. It represents a type of species having no drepanae in the male (described by Ayyar, 1928). It has horizontal lines on the dorsum of the abdominal tergites, which vary widely in their degree of pigmentation, lines also on the sternites, uniform light gray forewings with a straight posterior fringe, and no unique character, or combination of characters, to make it outstanding. Ayyar and Margabandhu (1931) wrote: "Examination of numerous forms from different localities has

shown that there are some variations in the coloring of the abdomen so much that some are likely to be taken for different species; the writers, however, think that these different forms in colour may at the most be considered as local varieties."

Hood (1935) reported that he had studied type material of *Scirtothrips andreae* (Karny) and considered it possibly a synonym of *S. dorsalis*. The Karny specimens were originally collected in Sumatra, where they were injuring field-grown tobacco. Hood did not mention the presence of a comb on the posterior margin of abdominal tergite VIII, microsetulae, or transverse lines on the tergites. The posterior-lateral setae on the pronotum were defined as very short and the surface was described as marked with fine cross-lines lacking a net-like connection. The fore

vein was described as having seven setae and the hind vein, two. The male was described as having two long, horn-shaped processes arising from the underside of the *tip* of the abdomen. I have not seen the male from the Karny collection. However, I have examined the female specimen of *S. andreae* from the Hood collection (labelled paratype), with Karny's original labels. It has all the characteristics of *S. dorsalis* and is definitely a synonym. Several paratypes of *S. dorsalis* have been seen. The type of *S. dorsalis* is in the Hood collection.

This thrips appears to be very common in South India, on many plants, and is a likely prospect for ready transport in world commerce. This undoubtedly has already occurred, particularly before the establishment of plant quarantines.

Scirtothrips fulleri Faure

Scirtothrips fulleri Faure, 1929, p. 10.

I have studied three paratypes of this South African form. It should be noted that Moulton's species *Scirtothrips acaciae* was also described at almost the same time and also from *Acacia* in western Africa (Gold Coast, now Ghana). The male of *S. acaciae* is unknown. The differences appear almost entirely in the coloration.

Specifically, in the paratypes, the fore vein of the forewing has 11–18 setae and the hind vein 2 (2–5 in

author's description); posterior fringe is straight. The forewing is darker in basal fourth. The pronotal striations are closely spaced and the major B₂ seta short (21 μ). The transverse lines on the abdominal tergites are indistinct. The male has drepanae. The type is in the National Collection of Insects, University of Pretoria, Republic of South Africa.

The species appears to be common in southern Africa on a number of plants. Bhatti (1962) reported this thrips from India but now informs me that it was misidentified.

Scirtothrips fumipennis Jacot-Guillarmod

Scirtothrips fumipennis Jacot-Guillarmod, 1937, p. 13.

This species, from *Acacia*, is a good example of the greater diversification of the African species. It is distinct from all others we have seen in that the forked sensory trichomes are very stout and "heavily shaded with pale brown."

The coloration is striking, and is darker than in *Scirtothrips aurantii*, and the comb of heavy spines on the hind femur of the male is composed of a smaller number of more robust spines than is the case with *S. aurantii*. The male has drepanae. Other characters of note are: three well-developed setae on the posterior margin of the pronotum; the two

interocellar setae placed in the center of the triangle; antennal segments III and IV long and vasiform; posterior fringe of forewing wavy. I have studied one paratype.

The only collection made is the original one by Faure in Portugese East Africa. The type is in the collection of Jacot-Guillarmod at Rhodes University, Grahamstown, South Africa.

Scirtothrips inermis Priesner

Scirtothrips inermis Priesner, 1933, p. 186.

According to Priesner (in litt.), the types deposited in the Hamburg Museum were destroyed by the bombardment in World War II. Therefore, the only two specimens formerly known, a type female and male, cannot be studied. Perhaps in the future additional collections from *Acacia* on Grand Canary Island will include this species again. Priesner placed this species in *Scirtothrips* s.s. The male had no drepanae. The abdominal tergites (and

sternites) had transverse lines; antennae were normal; and the one dominant posterior angular seta on the pronotum was very long (70–76 μ).

It should be mentioned that I have one female specimen of *Scirtothrips* collected at the Grand Canyon, Arizona, which has the dominant B_2 seta 73 μ in length. It appears to be a monstrous form of *S. citri*. These are the only cases known with such extremely long pronotal setae. After the males of *S. inermis* and *S. acaciae* are available for comparison, the relationship of the two can be evaluated more completely.

Scirtothrips juniperinus Pelikan

Scirtothrips juniperinus Pelikan, 1963, p. 106.

This species from Central Asia belongs to the *S. dorsalis* group but is much more distinctive than its relatives. I have a paratype female labeled as follows: "U.S.S.R., Samarkand, Zeravshan Mts., Aman-Kutan village. 2-VI-1959—in sparse forest. Lot No. 35. lgt. J. Pelikan." It can be distinguished from all other *Scirtothrips* I have seen by the following combination of characters: Both tergites and sternites with strongly pigmented horizontal lines, those on sternite VII hooked at the ends. These lines extend to the lateral margins of the segments. In addition, there are small brown blotches at the

sides of the segments posterior to the lines dorsally. Sides of the abdominal segments have only two setae anterior to the postero-angular seta. Forewings are broad, uniform light gray with a faintly darker area over base of forevein; the scale or anal lobe is dark brown. Posterior vein of forewing has one or two setae; posterior fringe is wavy. Interocellar setae lie within the triangle. The B_2 seta on outer posterior angle of pronotum is dominant, and is 42–46 μ in length.

Twenty-nine females only were collected on juniper. The holotype is in the describer's collection at the Czechoslovak Academy of Sciences, Brno, Drobného 28a, Czechoslovakia.

Scirtothrips mangiferae Priesner

Scirtothrips mangiferae Priesner, 1932, p. 143.

This is one of three species known to be directly injurious. In this case, *Scirtothrips mangiferae*, or the mango

thrips, stunts and deforms the buds and young leaves of mango in Egypt. It has also been found on citrus, *Parkinsonia*, and *Ficus* species in Egypt, and on cotton in the Sudan.

One specimen, determined by Pries-

ner, has been available for study. In general appearance it is remarkably similar to *S. niveus*. The males can be readily separated from those of *S. niveus* and *S. citri*, which it also resembles, by the absence of drepanae. Tergites have no transverse markings nor any distinctive color patterns to set this species apart from *S. africanus*. The dominant seta on the outer pos-

terior angle of the pronotum (B_2) is $28\ \mu$ long in contrast to $21\ \mu$ in *S. africanus* and $43\ \mu$ in *S. citri*. Priesner stated that the dorsal setae on abdominal segment IX were weak and colorless. In the specimen I examined, this character did not appear usable for separation.

I believe the type to be in the Priesner collection, Linz, Austria.

Scirtothrips manihoti (Bondar)

Euthrips manihoti Bondar, 1926, p. 70.

Scirtothrips manihoti, Moulton, 1933, p. 103.

Several slides of this species are in the Moulton collection. None are types, and none were determined by Bondar. These specimens are darker than two co-types and three topotypes in the Hood collection. I have examined eight specimens, and amend the description as follows: Forewings are dark gray, usually with 8 setae on the forevein, 2 on the hind vein, which is nearly indistinguishable, and the posterior fringe is wavy. The pronotum has gray blotches. There is one dominant posterior-angular seta (B_2) .028 mm in length; the surface is closely striated with slightly wavy lines. The dark transverse lines on abdominal tergites III–VIII are basal and in the median third. In some specimens the line passes through a longitudunal gray blotch, and

in others the tergites are nearly all light brown. No lines are evident on the sternites. The interocellar setae are well within the triangle and equidistant from the posterior pair and the anterior ocellus. In the two males examined, the forked trichomes on antennal segments III and IV are long, reaching well onto the following segment; in the female they are shorter. The outer, simple trichomes on V and VI are well-developed but not flattened as in *Scirtothrips australiae*. Comb on abdominal tergite VIII is complete. Male is without drepanae. The long setae on dorsum of segment IX are all equal in length and are in two rows similar to those of *S. ewarti*. The host at Bahia, Brazil, was given as *Mandioca utilissima*, which *S. manihoti* was injuring by transmitting a mosaic disease.

The types were originally deposited at the Pathology Laboratory, State of Bahia, Brazil. Moulton later collected two females in Minas Gerais, Brazil.

Scirtothrips multistriatus Hood

Scirtothrips multistriatus Hood, 1954a, p. 206.

The male is not known. Seven females only were taken "adventitious on dead branches of *Hevea*, and on grasses" at Belem, Para, Brazil. I have examined two paratypes and have noted a number of different characters which should be mentioned in order to distinguish the species more sharply. The forewing is very similar to that of *Scirtothrips pro-*

sopis; the basal fourth is expanded suddenly, and the distance between the short costal setae is about equal to their length. The posterior fringe is slightly wavy. The transverse lines on abdominal tergites III–VIII are arched forward in the center and extend nearly across the segments. Transverse lines or bars on sternites IV–VIII are indistinct. The setae on the pronotum are as in *S. dorsalis*, but the surface is covered

with very closely spaced, fine, horizontally etched lines. The two interocellar setae are within the triangle and are slightly forward of a line between the center of the posterior pair. The most outstanding character is the very

long, forked trichomes on antennal segments III and IV, which extend to the center of the following segment.

The type is in the Hood collection, Department of Entomology, Cornell University, Ithaca, New York.

Scirtothrips nubicus Priesner

Scirtothrips nubicus Priesner, 1936, p. 84.

In Africa, *Acacia* seems to be a favorite host of *Scirtothrips* as this species, too, is from *A. nubica* in the Sudan. On the basis of the original description (the number of specimens being unknown), it is almost impossible to separate this species from *S. fulleri*. The latter has, on the forevein of the forewing, 11–18 setae in the female and 9–15 in the male,

and on the hind vein, 2–5 in the female and 0–2 in the male. In contrast, *S. nubicus* has 13–15 setae on the forevein and 4–5 on the hind vein. According to Priesner, the dorsal setae on abdominal segment IX of the male “are arranged differently” from those in *S. fulleri* but no illustration was given. The type, which I have not seen, supposedly is in the Priesner collection, Linz, Austria.

Scirtothrips panamensis Hood

Scirtothrips panamensis Hood, 1935, p. 153.

This tropical species belongs in the *Scirtothrips dorsalis* complex and is close to *S. multistriatus*, from which it varies in the following ways: Trichomes on antennal segments III and IV are long, V-shaped (not U-shaped as in *S. multistriatus*), and do not extend to the center of the following segment. Major setae on the pronotum and abdomen are somewhat longer and darker. Forewings are light colored and shorter; the forevein has 8 setae and the hind vein 2. Interocellar setae are within the triangle, and placed to the rear of the anterior ocellus. Transverse lines on abdominal tergites II–VIII extend across the segments and are not arched. Other characters to be noted are the wavy

posterior fringe on the forewings, the complete and long comb on abdominal segment VIII, and the transverse lines on the abdominal sternites. The male is without drepanae. Hood remarked, in this description of *S. panamensis*: “Specimens in preservation quickly lose all of the orange cast and become pale straw-yellow.” I have noted this same condition with *S. dorsalis* and others. It can be distinguished from *S. manihoti*, another very close relative, by the greater length of the transverse lines on the abdomen.

Hood collected five females and one male of this species from miscellaneous plants on Barro Colorado Island, Canal Zone, Panama. I have seen two of the paratype females. The type is in the Hood collection, Cornell University, Ithaca, New York.

Scirtothrips spinosus Faure

Scirtothrips spinosus Faure, 1929, p. 16.

This South African species is well-named in that it is the most setose species I have seen. It is readily separated from all others known to date by the two

long setae (B_2 and B_3) at the posterior outer angles of the pronotum. In the paratype examined, these setae measured 54 μ . The general appearance reminds one of *Taeniothrips*. The forewings are dark gray, and the posterior

fringe is straight. In addition, it should be mentioned that the head has a brownish-gray blotch between the antennae and a similarly colored band posterior to the eyes. The male has drepanae.

The original collections were made from various trees. The types are in the National Collection of Insects, University of Pretoria, Republic of South Africa.

Scirtothrips zuluensis Faure

Scirtothrips zuluensis Faure, 1929, p. 14.

Faure found this species to be quite restricted in its distribution. Perhaps it is a local population of its very close relative, *Scirtothrips africanus*. The legs are more setose and stouter than those of *S. africanus*. Also, the posterior vein of the forewing has 7–13 setae, in

contrast to 3–8 in the case of its relative. The pronotal setae, B₁, B₂, and B₃, are all .021 mm in length. Only 15 specimens were taken originally on *Acacia* species. The type is with those of the many other species of thrips described by Faure, in the National Insect Collection, University of Pretoria, Republic of South Africa. I have not seen the species.

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PLATES I-III

All illustrations were made by the author, with the aid of a Zeiss drawing attachment.

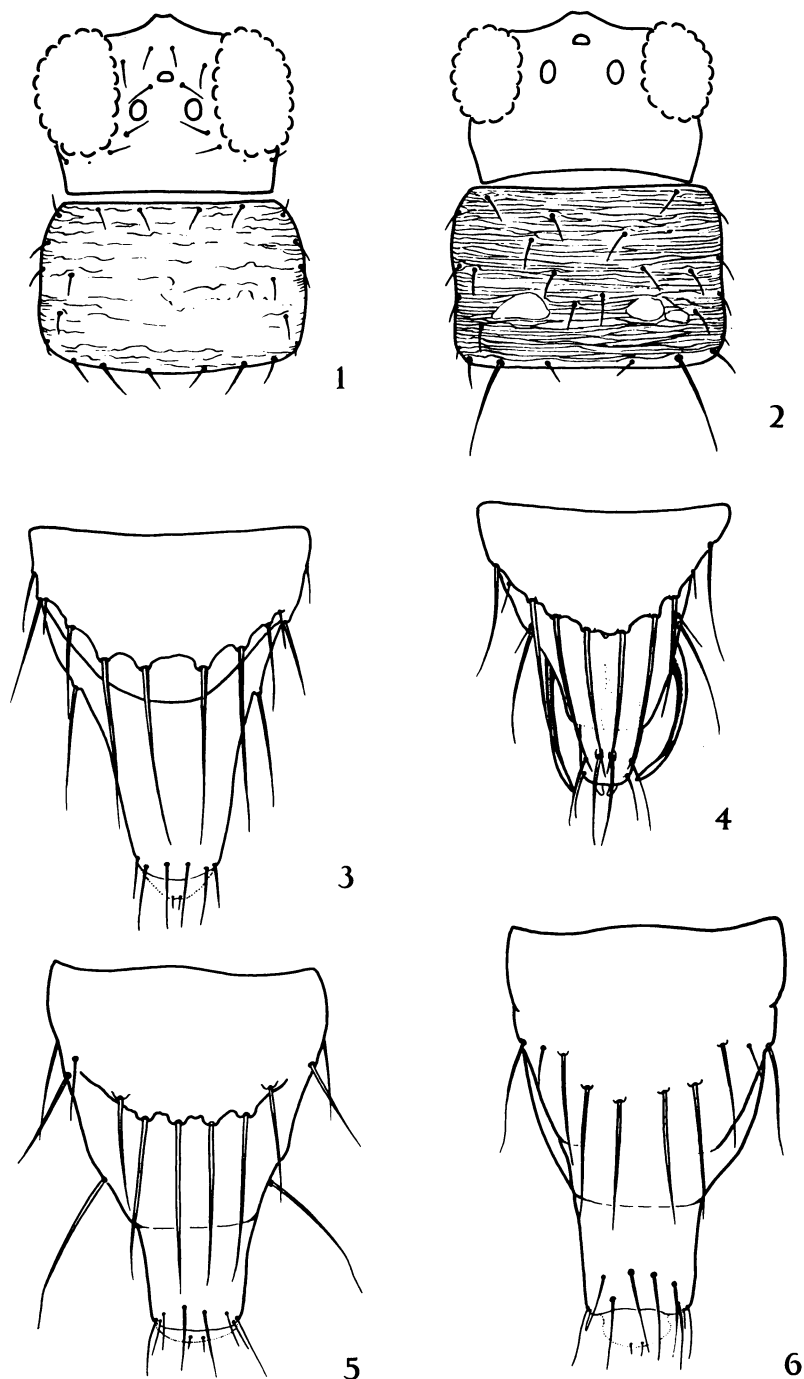


Plate I. **Fig. 1.** *Scirtothrips longipennis*, ♀, head and pronotum. **Fig. 2.** *S. citri*, ♀ topotype, head and pronotum. **Fig. 3.** *S. albus*, ♂ topotype, terminal abdominal segments, dorsal. **Fig. 4.** *S. aceri*, ♂, terminal abdominal segments, dorsal. **Fig. 5.** *S. tehachapi*, ♂ allotype, terminal abdominal segments, dorsal. **Fig. 6.** *S. ewarti*, ♂ allotype, terminal abdominal segments, dorsal.

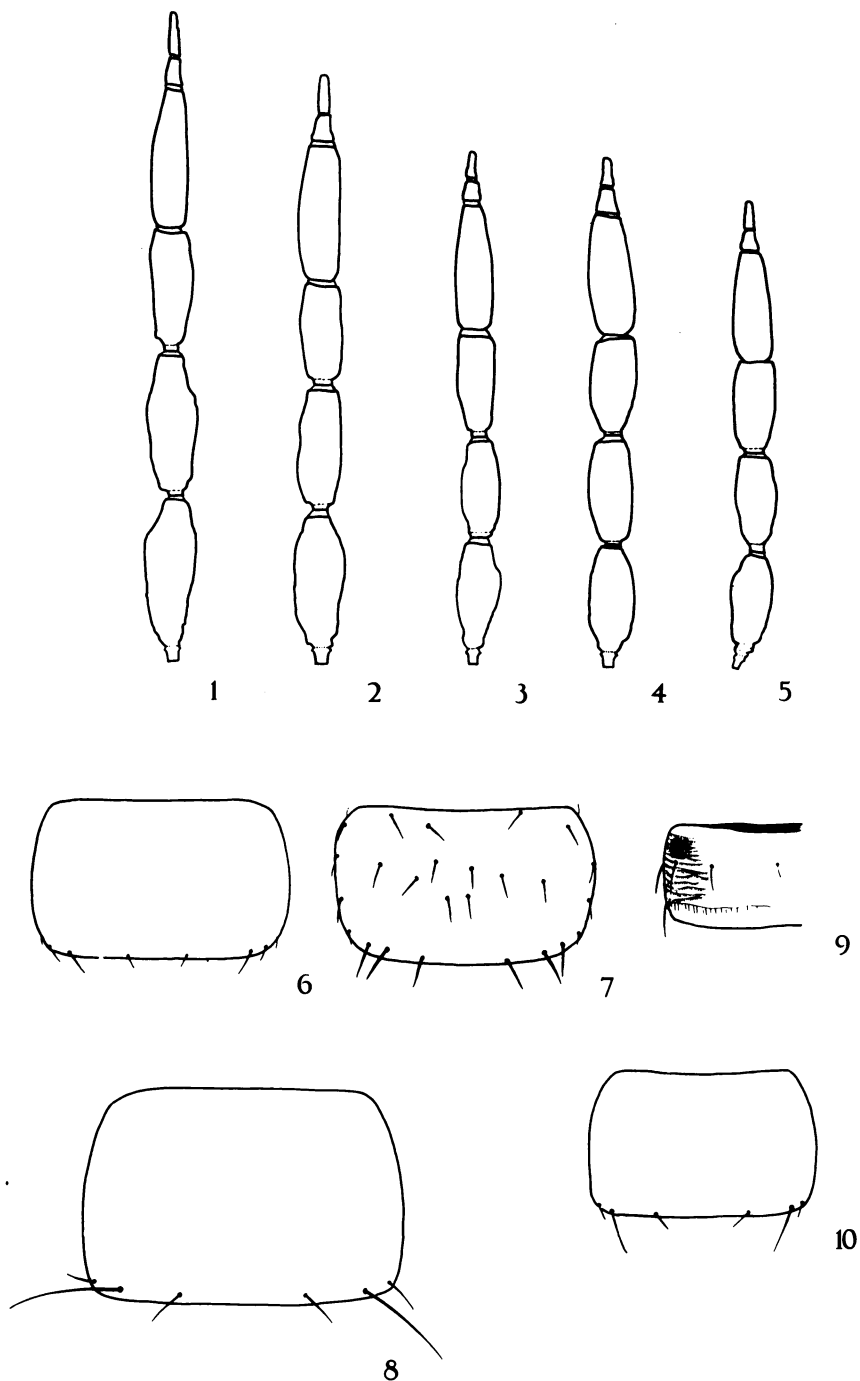
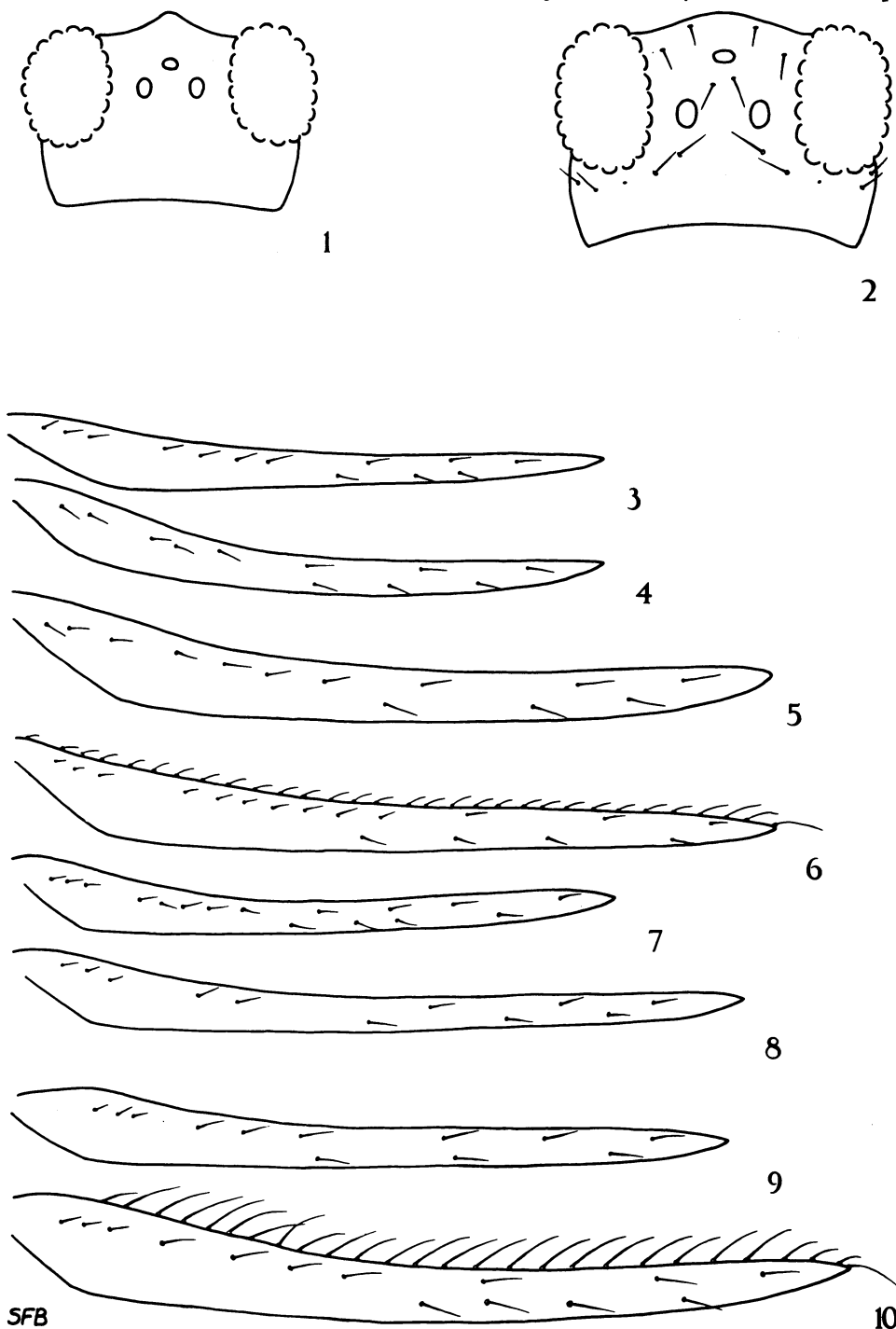


Plate II. **Fig. 1.** *Scirtothrips ewarti*, ♀ holotype, antennal segments III-VIII. **Fig. 2.** *S. tehachapi*, ♀ holotype, antennal segments III-VIII. **Fig. 3.** *S. longipennis*, ♀, antennal segments III-VIII. **Fig. 4.** *S. solaris*, ♀ holotype, antennal segments III-VIII. **Fig. 5.** *S. brevipennis*, ♀ paratype, antennal segments III-VIII. **Fig. 6.** *S. niveus*, ♀ paratype, pronotum. **Fig. 7.** *S. aceri*, ♀, pronotum. **Fig. 8.** *S. albus*, ♀ holotype, pronotum, somewhat reconstructed from tilted position of type specimen. **Fig. 9.** *S. aceri*, ♀, left half dorsum of sixth abdominal tergite. **Fig. 10.** *S. tazodii*, ♀ paratype, pronotum.



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Plate III. **Fig. 1.** *Scirtothrips ewarti*, ♀ holotype, head. **Fig. 2.** *S. tehachapi*, ♀ holotype, head. **Fig. 3.** *S. taxodii*, ♀ paratype, forewing. **Fig. 4.** *S. brevipennis*, ♀ paratype, forewing. **Fig. 5.** *S. solaris*, ♀ holotype, forewing. **Fig. 6.** *S. prosopis*, ♀ paratype, forewing. **Fig. 7.** *S. aceri*, ♀, forewing. **Fig. 8.** *S. longipennis*, forewing. **Fig. 9.** *S. citri*, ♀ topotype, forewing. **Fig. 10.** *S. ewarti*, ♀ holotype, forewing.

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