



Species of the genus *Scirtothrips* from Africa (Thysanoptera, Thripidae)

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Abstract

A key is provided to 14 species of *Scirtothrips* recorded from Africa south of the Sahara, including Cape Verde Islands. *S. dodonaeae* sp. n. is described from *Dodonaea* in South Africa, and the possibility is discussed that South African populations here referred to as *S. aff. dorsalis* represent a new species. Type specimens of the six *Scirtothrips* species described by J.C.Faure have been re-examined, and brief diagnoses are provided for all 14 species.

Key words: *Scirtothrips*, Africa, *Dodonaea*, *S. dorsalis*, new species

Introduction

Species of the genus *Scirtothrips* are minute, usually yellow, insects of which several are major pests on the leaves of various crops around the world (Hoddle & Mound, 2003). The genus currently includes about 100 species from the tropics and subtropics (Mound, 2011), where these thrips feed and breed on newly emerged, young leaves. However, they also breed on other rapidly developing plant tissues, such as the very young fruits of several crops including *Citrus*, *Capsicum* and *Persea*, also, in Australia, in the flowering spikes of *Mangifera*. A few adults may sometimes be found in the flowers of various plants, but *Scirtothrips* species apparently do not need to feed on pollen to reproduce, and cannot usefully be considered as “flower thrips”. Many described species remain poorly defined, especially a suite of species from *Mangifera* in Mexico (Hoddle *et al.*, 2008a), and there is evidence of molecular diversity within species (Hoddle *et al.*, 2008b), as discussed below for *S. dorsalis*.

Among the earliest species described in this genus were six from South Africa (Faure, 1929). Unfortunately, the slides prepared and studied for the description of these species were all produced before Prof. J.C. Faure had perfected a technique for slide mounting cleared specimens. When uncleared specimens of *Scirtothrips* species are mounted onto microscope slides, the body contents are commonly iridescent. This iridescence can totally obscure all surface sculptural details, yet it is these details that are now recognised as important in distinguishing one species from another (Mound & Palmer, 1981). For detailed study, adults of *Scirtothrips* must be fully cleared prior to slide mounting (Hoddle *et al.*, 2008c). The identity and relationships of most of the six species described from South Africa have thus remained equivocal. The objective of the present work has been to examine the holotypes and best available paratypes of the species described by Faure, to determine where possible some of the surface details on these specimens, to present a new identification key to all of the *Scirtothrips* species known from Africa south of the Sahara including Cape Verde Islands, and to describe one new species that appears to be specific to *Dodonaea viscosa* in southern Africa. This new species is particularly interesting because it is only the third member of this genus known to have a comb of stout setae on the hind femora of males. The genus *Scirtothrips* is likely to include many more species, particularly in the semi-arid areas of Africa, and this paper is no more than an introduction to the subject.

The holotype of the new species is deposited, together with the holotypes of the six species of *Scirtothrips* described by Faure, in the ARC-Plant Protection Research Institute, Queenswood, South Africa. Nomenclatural

details and synonymies of all taxa discussed here are web-available (Mound, 2011). The authors are particularly grateful to Tim Grout and Mark Hoddle for much encouragement during these studies, and for many critical comments on an earlier draft of this text. We are also grateful to Alan Urban for collecting excellent samples of the new species.

***Scirtothrips* Shull**

Scirtothrips Shull, 1909. Type species *S. ruthveni* Shull.

A full definition of this genus, and discussion of its systematic relationships, is provided by Masumoto & Okajima (2007).

Diagnosis: Macropterous Thripinae with lateral thirds of terga covered with dense rows of microtrichia; antennae 8-segmented (rarely 7-segmented) with forked sensoria on III–IV; pronotum with transverse striae more or less closely spaced; meso and meta furca with spinula; fore wing first and second veins with setal row irregular, clavus with discal seta present in African species; tergum VIII with well-developed marginal comb; sterna without discal setae; male without sternal pore plates; African species (excluding *dorsalis*, *inermis* and *oligochaetus*) with paired drepanae laterally on tergum IX in males (male not known in *longipennis*).

Key to *Scirtothrips* species from Africa

*See note at end of key.

1. Abdominal sterna III–VI with several rows of prominent microtrichia present completely across median area, at least on posterior halves of these sterna (Figs 3, 6) 2
- Abdominal sterna with rows of prominent microtrichia restricted to lateral areas, rarely extending just mesad of marginal setal pair S1 (Fig. 14) 4
2. Fore wing posteromarginal cilia wavy; sterna IV–VI almost completely covered by microtrichia (Fig. 3); tergum IX with few or no microtrichia posteromedially (Fig. 2); ocellar setae III usually arising on tangent between anterior margins of hind ocelli (Fig. 1); male with comb of six stout setae on hind femora (cf. Fig. 13); male tergite IX with paired dark drepanae *aurantii*
- Fore wing posteromarginal cilia straight; sternal microtrichia restricted to posterior half of sterna IV–VI (Fig. 6); tergum IX with many microtrichia posteromedially (Fig. 5); ocellar setae III usually arising between hind ocelli (Fig. 4); male without a comb of stout setae on hind femora; male tergite IX without drepanae 3
3. Abdominal terga with median area and antecostal ridge dark, lateral microtrichial fields with 3 discal setae aff. *dorsalis*
- Abdominal terga with median area and antecostal ridge pale, lateral microtrichial fields with 4–5 discal setae (cf. Fig. 18). ... *oligochaetus*
4. Fore wing posteromarginal cilia all straight 5
- Posteromarginal cilia of fore wing either all wavy, or at least those at median part of wing wavy 7
5. Terga dark medially between lateral microtrichial fields; fore wings deeply shaded; pronotal posteromarginal setae S2 twice as long as S1 (Fig. 19); tergal microtrichial fields with 3 discal setae *kenyensis*
- Abdominal terga with no dark areas except antecostal ridge; fore wings pale; pronotal posteromarginal setae S2 less than 1.7 as long as S1; tergal microtrichial fields with 4–5 discal setae (Fig. 18) 6
6. Posteromarginal setae not longer than 0.3 as long as pronotum; ocellar setae III not longer than longitudinal width of an ocellus; male tergite IX with paired dark drepanae *fulleri*
- Posteromarginal setae S2 more than 0.5 as long as pronotum; ocellar setae III almost twice as long as longitudinal width of an ocellus; male tergite IX without drepanae. *inermis*
7. Pronotal posteromarginal setae pairs S2 and S3 more than 0.6 times as long as median length of pronotum (Fig. 21) *spinus*
- Pronotum with no setae more than 0.4 as long as median length of pronotum 8*
8. Fore wing second vein with 5–13 setae (rarely as few as 4); tergum VIII with no microtrichia medially near anterior margin (Fig. 7). 9
- Fore wing second vein with 2–3 setae (rarely as many as 4); tergum VIII usually with a few rows of microtrichia medially near anterior margin (Fig. 16). 10
9. Abdominal terga pale, antecostal ridge also pale; fore wing pale, second vein with 4–6 setae; metanotum with elongate reticulation (Figs 9, 10) *africanus*
- Abdominal terga light brown, antecostal ridge dark; fore wing shaded, second vein with 7–13 setae; metanotum almost striate medially (Fig. 23) *zuluensis*
10. Body mainly brown, fore wing uniformly deeply shaded *mugambii*
- Body largely yellow; fore wing pale or bicoloured 11

11. Ocellar setae III arise on anterior margins of ocellar triangle (Fig. 17); pronotal posteromarginal setae S2 about 0.4 as long as pronotum [body pale with anterior part of head brown, fore wings largely dark] *longipennis*
- Ocellar setae III arise within ocellar triangle (Fig. 11), just anterior to tangent between anterior margins of posterior ocelli; no pronotal posteromarginal setae more than 0.3 as long as pronotum (Fig. 11) 12
12. Terga with median dark area; fore wing pale at apex but median third shaded, clavus dark; sterna with microtrichia extending slightly mesad of marginal setae S1 *combreti*
- Terga pale with no median dark area; fore wing and clavus uniformly pale; sterna with microtrichia not extending mesad to setae S1 (Fig. 14) 13
13. Terga with antecostal ridge dark, lateral microtrichial fields with 3 discal setae (Fig. 15); tergum IX with no microtrichia present medially (Fig. 16); male hind femora with comb of about 6 stout setae (Fig. 13) *dodonaee* **sp. n.**
- Terga with antecostal ridge pale, lateral microtrichial fields with 4 discal setae (Fig. 20); tergum IX with microtrichia present medially; male hind femora without comb of stout setae *mangiferae*

*Four females collected in Zimbabwe, viii.1998, by Tim Grout have been studied that presumably represent a further undescribed species. These females have sternal sculpture similar to that of *africanus*, with which species they also share several other character states, but the tergal lateral microtrichial fields bear 4–5 discal setae.

***Scirtothrips africanus* Faure**

(Figs 7–10)

Scirtothrips africanus Faure, 1929: 12

Described from 63 females and 32 males, this species was collected in Transvaal and Cape Province from plants in several different genera but with no indication of any specificity. Some females have been taken on *Dodonaea viscosa* together with the new species described below from that plant. The problems of viewing surface details on specimens dating from the 1929 paper are indicated by comparing Figures 9 (old specimen) and 10 (recent specimen).

Diagnosis. Body mainly yellow with tergal antecostal ridge pale; antennal segments III–VIII usually weakly shaded; forewing pale. Ocellar setae III behind first ocellus, ocellar region transversely striate; pronotum closely striate, posteromarginal setae no more than 0.3 as long as pronotum, S2 scarcely longer than S1; fore wing second vein with 4–6 setae, cilia wavy; metanotum with variable elongate reticulation (Figs 9, 10); terga VI–VII microtrichial fields with two lateral discal setae; terga VIII–IX with no microtrichia medially; sterna with no prominent microtrichia medially but some sculpture lines bear minute microtrichial-like asperities.

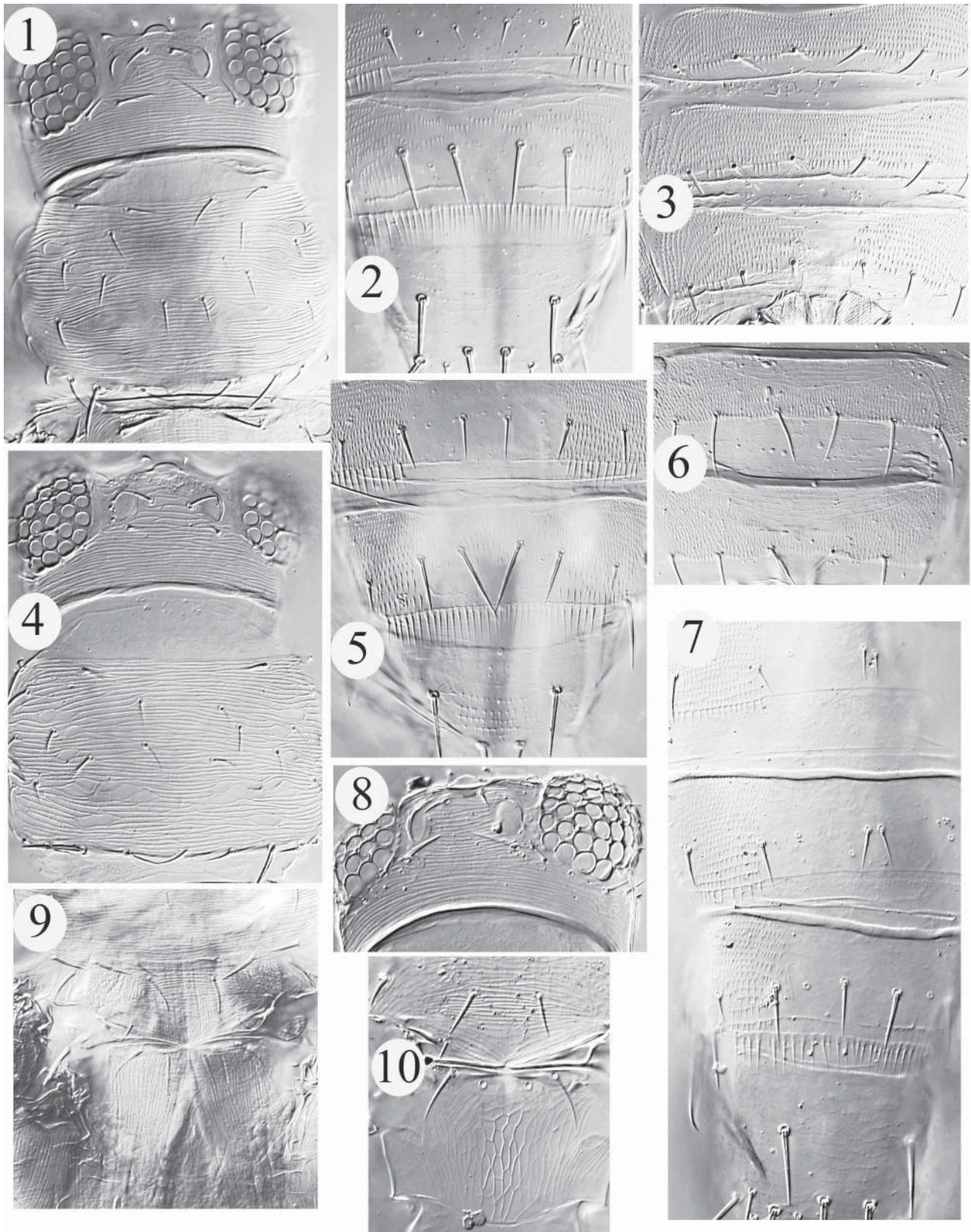
***Scirtothrips aurantii* Faure**

(Figs 1–3)

Scirtothrips aurantii Faure, 1929: 3

Described originally from more than 400 specimens taken from a very wide range of plants in Transvaal, Zululand and Cape Province, this species is widespread northward across Africa, through Kenya and Sudan, to Egypt and the Yemen (Mound & Palmer, 1981), and it feeds and breeds on many unrelated plants. Despite this, a population introduced to Australia has remained largely restricted to certain species of Crassulaceae, particularly *Bryophyllum*, although it readily transfers to, and breeds on, several other plants under experimental conditions (personal communication, Brian Garms, 2011). The males have a comb of stout setae on the hind femora, a character that is shared only with two other species in this genus, *dodonaee* and *mugambii*.

Diagnosis. Body mainly yellow, terga and sterna with dark median area, antecostal ridges dark; antennal segments III–IV paler than V–VIII; fore wings weakly shaded with apex paler. Ocellar setae III close together on tangent between anterior margins of posterior ocelli (Fig. 1); pronotum closely striate, posteromarginal setae no more than 0.3 as long as pronotum, S2 about 1.3 times as long as S1; fore wing second vein with 3–4 setae, cilia moderately wavy; metanotum with variable elongate reticulation; tergum VIII with one or two rows of microtrichia anteromedially (Fig. 2), IX with no microtrichia posteromedially; sterna IV–VI with microtrichia covering almost entire median area (Fig. 3), sternum VII with discal microtrichia scarcely extending mesad of setal pair S1.



FIGURES 1–10. *Scirtothrips* species. *S. aurantii* 1–3: (1) Head & pronotum; (2) Terga VII–IX; (3) Sterna V–VII. *S. dorsalis* 4–6: (4) Head & pronotum; (5) Terga VII–IX; (6) Sterna V–VII. *S. africanus* 7–10: (7) Terga VI–IX; (8) Head; (9) Metanotum (of paratype); (10) Metanotum.

Scirtothrips combreti Faure

Scirtothrips combreti Faure, 1929: 8

Described from 24 females and 11 males collected in Transvaal, this species remains known only from these original specimens taken from five species of *Combretum* as well as a few other plants. The species is unusual because the fore wings are weakly bicoloured, and in females the sternal microtrichial fields extend just mesad of the median marginal setal pair S1.

Diagnosis. Body mainly yellow, terga and sterna with diffuse median dark area and antecostal ridges dark; antennal segments III–VIII mainly dark; fore wings with distal half pale, median area weakly shaded but base paler and clavus uniformly dark. Ocellar setae III on line of tangent between anterior margins of posterior ocelli; pronotum closely striate, posteromarginal setae no more than 0.3 times as long as pronotum, S2 scarcely longer than S1; fore wing first vein with widely spaced setae, second vein with 3–4 setae, cilia wavy; metanotum with elongate reticulation; tergum VIII with microtrichia anteromedially, IX with no microtrichia posteromedially; sterna with microtrichia extending just mesad of marginal setal pair S1.

Scirtothrips dodonaeae sp. n.

(Figs 11–16)

Female macroptera. Body pale yellow, terga III–VII with antecostal ridge dark, sterna VI–VII with antecostal ridge faintly shaded; major setae on IX–X light brown; fore wings pale; compound eyes with no ommatidia pigmented; antennal segments I–III pale, IV–V light brown distally, VI–VIII light brown.

Antennal segments III–IV with short, stout forked sensoria. Vertex, including ocellar triangle, transversely striate (Fig. 11), ocellar setae III just anterior to tangent between anterior margins of posterior ocelli. Pronotum striate, posteromarginal setae no more than 0.3 times as long as pronotum (Fig. 11), setae S2 variable from sub-equal to more than 1.5 times as long as S1. Metanotum irregularly reticulate medially (Fig. 12), median setal pair behind anterior margin. Fore wing first vein with 3 setae near base, then about 5 setae, with 3 widely spaced setae on distal half; second vein with 3 setae; clavus with 4 veinal and one discal setae; cilia strongly wavy near their apices. Terga II–IV with median setae minute (Fig. 15); V–VI with 3 setae on lateral microtrichial field; VIII usually with one row of microtrichia anteromedially (Fig. 16), IX with no microtrichia medially. Sterna with discal microtrichia rarely extending mesad to marginal setae S1 (Fig. 14).

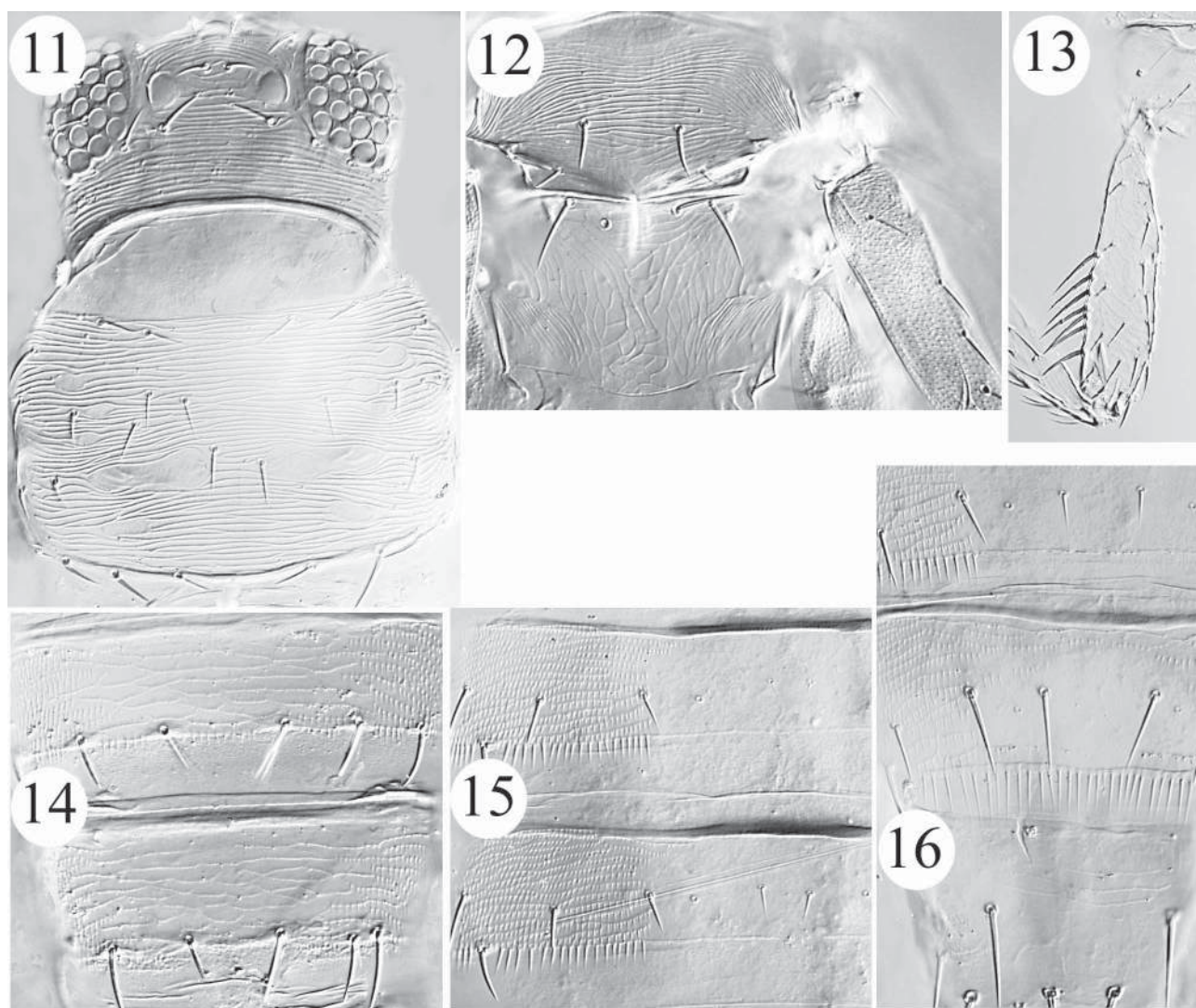
Measurements of holotype female in microns: Body length 1170. Head, length 75; width across eyes 140; postocular seta I 23. Pronotum, length 148; maximum width 170; posteromarginal setae S1 15, S2 25, S3 15. Forewing, length 640. Tergum IV median setae 5. Tergum VII median setae 12. Antennal segments III–VIII length 50, 45, 38, 40, 7, 12.

Male macroptera. Smaller and paler than female, tergal antecostal ridges scarcely shaded; tergum IX with pair of dark, upwardly curved, drepanae; hind femora with comb of 6–8 stout dark setae (Fig. 13).

Material studied. Holotype female, **SOUTH AFRICA**, Pretoria, beaten from flushing *Dodonaea viscosa*, 11.x.2010 (A.T.Urban).

Paratypes: 22 females, 10 males collected with holotype.

Comments. Judging from the large samples collected into ethanol by Alan Urban, this species was abundant on stands of *Dodonaea* in the vicinity of Pretoria in the second half of 2010. It was also collected from *D. viscosa* in Zimbabwe, near Muswewenhede in Mashonaland, by Dr Tim Grout in August 1998 and identified at that time by L.A.M. as a new species. Specimens in the Faure collection labelled as from *Dodonaea thunbergiana* have now been identified as *S. africanus*, a species that was also represented in the samples from which the type series of *S. dodonaeae* was prepared. These two are similarly pale bodied, but females of *S. dodonaeae* can be distinguished by the transverse dark antecostal ridge on each tergum, and the fewer setae on the fore wing second vein. The males of *S. dodonaeae* are very similar to those of *S. aurantii* particularly because of the comb of stout setae on the hind femora, but males of *S. aurantii* usually have darker markings on the body, particularly medially on the abdominal terga. The only other known species of *Scirtothrips* in which males have a hind femoral comb is *S. mugambii* from *Cedrus* in Kenya.



FIGURES 11–16. *Scirtothrips dodonaeae*. (11) Head; (12) Meso and metanota; (13) Male hind femur; (14) Female sterna VI–VII; (15) Terga IV–V; (16) Terga VII–IX.

***Scirtothrips* aff. *dorsalis* Hood**

(Figs 4–6)

The species *S. dorsalis* was described by Hood (1919: 90) from 34 females collected from “castor and chillies” at Coimbatore, India. It is currently considered to be a widespread polyphagous pest across Asia, that more recently has been introduced to Florida and other countries around the Caribbean area, as well as Israel. In contrast, the first official record of *dorsalis* from South Africa (Gilbert, 1986) is of a population that apparently remains restricted to the leaves of *Ricinus*, the castor oil plant. Molecular data suggest that this population is specifically different from some other populations around the world (Rugman-Jones *et al.*, 2006; Hoddle *et al.*, 2008b). Specimens from *Ricinus* at Nelspruit, South Africa, were kindly collected by Dr Tim Grout in November, 2010 and sent to Canberra for slide-mounting. Females from this population do not have the microtrichial field on sternite VII extending fully across the postero-median area between marginal setal pair S1; in this they resemble females of *S. aurantii* (Fig. 3). In contrast, sternite VII of females of *dorsalis* from all other available localities, including Australia, Asia, Israel, and the Caribbean, always bears several rows of microtrichia medially across the full width near the posterior margin (Fig. 6). No differences have yet been detected between males from different populations. No molecular studies have been carried out on Indian specimens from *Ricinus*, despite this being one of the host plants from which it was described by Hood, and *dorsalis* has been reported as numerous on *Ricinus* in Delhi (Mound & Palmer, 1981). The

small structural difference on sternite VII indicated above, together with the molecular data, suggest that the South African population on *Ricinus* may be a distinct species from the widespread pest. However, the original material used by Hood to describe *dorsalis* needs to be re-examined, to decide if his specimens from “castor and chillies” can be distinguished, and to determine from which of these plants was collected the holotype that he selected (indicated only as the specimen measured).

Diagnosis. Body mainly yellow, terga and sterna with median area variably shaded and antecostal ridges usually dark medially; antennal segments V–VIII deeply shaded, III–IV slightly paler; fore wings variously shaded with apex paler. Ocellar setae III situated between mid-points of posterior ocelli (Fig. 4); pronotum closely striate, posteromarginal setae 0.3–0.4 times as long as pronotum, S2 usually less than 2.0 times as long as S1; fore wing second vein with 2 setae, cilia straight; metanotum transversely striate on anterior half, irregular elongate reticulation on posterior half; tergum VIII with several rows of microtrichia anteromedially (Fig. 5), IX with numerous microtrichia posteromedially; sterna IV–VI with microtrichia covering median area except on anterior third or half (Fig. 6). Male tergite IX with no drepanae.

Scirtothrips fulleri Faure

Scirtothrips fulleri Faure, 1929: 10

Described from 84 females and 31 males collected in Transvaal and Cape Province, particularly from two species of *Acacia*, this species has also been collected in the Cape Verde Islands (zur Strassen, 1993), including a long series of females from *Dichrostachys cinerea* (as *glomerata*) (Mimosaceae). The thrips is unusual because, in common with *inermis*, *mangiferae* and *spinosus* the tergal microtrichial fields have four, rather than three, setae.

Diagnosis. Body mainly yellow, terga and sterna with dark antecostal ridges but without median dark area; antennal segments III–IV slightly paler than V–VIII; fore wing including clavus weakly shaded but wing apex pale. Ocellar setae III on or just within anterior margins of triangle; pronotum closely striate, posteromarginal setae no more than 0.3 as long as pronotum, S2 about 1.3 times as long as S1; fore wing second vein with 1–5 setae, cilia straight; metanotum transversely striate at anterior, apparently longitudinally striate medially; terga V–VII with 4 setae on each lateral microtrichial field, tergum VIII with microtrichia anteromedially, IX with microtrichia posteromedially; sterna without microtrichia medially. [zur Strassen (1993) states that females from Cape Verde Islands have 1–2 rows of microtrichia medially near the sternal posterior margins; these are not visible on the available paratypes].

Scirtothrips inermis Priesner (Fig. 18)

Scirtothrips inermis Priesner, 1933: 186

Described from the Canary Islands, and recorded from California, New Zealand and Australia (Hoddle & Mound 2003), the only record of this species from the African region is Cape Verde Islands (zur Strassen, 1993).

Diagnosis. Body yellow, tergal and sternal antecostal ridges dark; forewings shaded near base, pale distally; antennal segments II–VIII shaded. Ocellar setae III about twice as long as diameter of one posterior ocellus, close together between midpoints of posterior ocelli; pronotal striae not closely spaced, posteromarginal setae S2 50–65 microns long; fore wing second vein with 2–3 setae, posteromarginal fringe cilia straight; metanotum reticulate on posterior half; terga IV–VI with 4–6 discal setae on microtrichial fields (Fig. 18); VIII with discal microtrichia anteromedially, IX without discal microtrichia; sternal microtrichial fields extending just mesad of setae S2. Male tergite IX with no drepanae.

***Scirtothrips kenyensis* Mound**

(Fig. 19)

Scirtothrips kenyensis Mound, 1968b: 535

This species was described from 55 females and three males that were collected together with larvae on cultivated tea in Kenya and Uganda. Adults have also been seen from coffee plants in Kenya, but there is no recorded information on its native host plant. It is a dark species, with one pair of long pronotal setae, and straight cilia on the fore wing.

Diagnosis. Body yellow with extensive brown shading, terga and sterna with dark median areas and dark antecostal ridges, pronotum with brown markings, head brown in ocellar region; antennal segments II–VIII brown; fore wing including clavus brown. Ocellar setae III close together on tangent between anterior margins of posterior ocelli; pronotum striate, setae S2 about 0.5 times as long as pronotum (Fig. 19); forewing second vein with 3 setae, posterior cilia straight; metanotum reticulate (Fig. 19); terga VIII–IX with no microtrichia medially; sterna without microtrichia medially.

***Scirtothrips longipennis* (Bagnall)**

(Fig. 17)

Euthrips longipennis Bagnall, 1909: 173

Described originally from a greenhouse in Belgium, those specimens are apparently lost, and the identity of the species is based on two females labelled by Bagnall as “Type” but collected by him in England at about the same date (Mound, 1968a). Those specimens have been compared to a few females seen from Australia (Hoddle & Mound, 2003), and also the Cape Verde Islands (zur Strassen, 1993).

Diagnosis. Body yellow, head light brown at anterior; antecostal ridges dark on terga III–VIII and sterna V–VII; forewings strongly shaded in basal half, paler toward apex, clavus dark; antennal segments III–VIII dark. Ocellar setae III wide apart near margins of ocellar triangle (Fig. 17); pronotum with transverse striae wavy and widely separated (Fig. 17); posteromarginal setae S2 about 0.4 times as long as pronotum; forewing second vein with 2 setae; posteromarginal fringe cilia wavy except near apex of wing; metanotum longitudinally reticulate; terga V–VII with 3 discal setae on each microtrichial field; VIII with no discal microtrichia medially, IX with discal microtrichia on posterior half; sternites with microtrichial fields extending mesad almost to setae S2. Male not known.

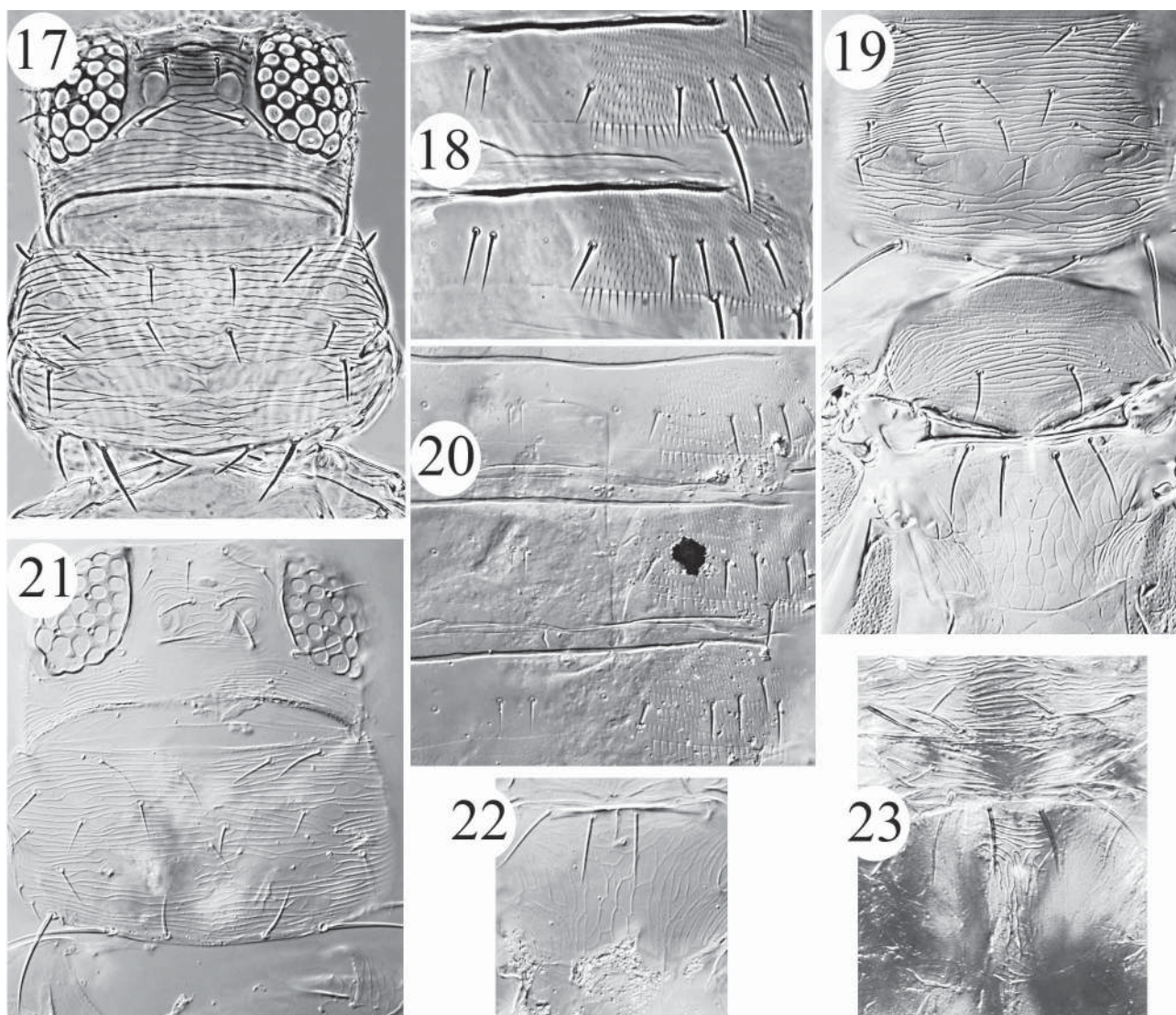
***Scirtothrips mangiferae* Priesner**

(Fig. 20)

Scirtothrips mangiferae Priesner, 1932: 143

Described originally from Egypt, and widespread from Israel and Iran to the Yemen and Sudan, this species is also recorded from Gabon (zur Strassen, 2003). Although adults have been found on various plant species, this thrips seems to be particularly associated with the freshly emerged young leaves of mango.

Diagnosis. Body yellow with no shading, terga and sterna with antecostal ridges pale; antennal segments III–V variably pale in basal half; fore wing pale. Ocellar setae III anterior to tangent between anterior margins of posterior ocelli; pronotum closely striate, setae S2 about 1.5 as long as S1; forewing second vein with 3 setae, posterior cilia strongly wavy; metanotum reticulate; terga V–VII with 4 setae on each lateral microtrichial field (Fig. 20), VIII–IX with many microtrichia medially; sterna without microtrichia medially.



FIGURES 17–23. *Scirtothrips* species. (17) *S. longipennis*, head and pronotum. (18) *S. inermis*, terga V–VI. (19) *S. kenyensis*, pro, meso and metanota. (20) *S. mangiferae*, terga IV–VI. (21) *S. spinosus*, head and pronotum. (22) *S. spinosus*, metanotum. (23) *S. zuluensis*, meso and metanota.

Scirtothrips mugambii Mound

Scirtothrips mugambii Mound, 2010: 66

Described from 11 females and two males collected in Kenya from *Cedrus*, this dark-bodied species shares with *aurantii* and *dodonaee* the character state of a comb of stout setae on the hind femora of males.

Diagnosis. Body mainly brown, terga and sterna with dark antecostal ridges; antennal segments II–VIII brown; fore wing including clavus brown. Ocellar setae III on or close to tangent between anterior margins of posterior ocelli; pronotum striate but striae less closely spaced than *aurantii*, posteromarginal setae scarcely 0.3 times as long as pronotum, setae S2 about 1.3 times as long as S1; forewing second vein with 3 setae, posterior cilia wavy; metanotum variably reticulate; terga V–VII with 3 setae on each lateral microtrichial field, VIII usually with one row of microtrichia anteromedially, IX with no microtrichia posteromedially; sterna without microtrichia medially.

Scirtothrips oligochaetus (Karny)

Anaphothrips oligochaetus Karny, 1927: 201

The lectotype of this species is from Coimbatore, India, the species being widespread in that country and also recorded from Tanzania, Nigeria and Ethiopia (Mound & Palmer, 1981), as well as Cape Verde Islands (zur Strassen, 1993). *S. oligochaetus* is particularly similar in structure to *dorsalis*, with the differences indicated in the key above.

Diagnosis. Body yellow, terga pale including antecostal ridge, sterna III–VI with antecostal ridge shaded; antennal segments I–II pale, V–VIII shaded; fore wings pale. Ocellar setae III situated between mid-points of posterior ocelli; pronotum closely striate, posteromarginal setae 0.3–0.4 times as long as pronotum, S2 less than 2.0 times as long as S1; fore wing second vein with 2 setae, cilia straight; metanotum transversely striate on anterior half, irregular elongate reticulation on posterior half; tergum VIII with several rows of microtrichia anteromedially, IX with numerous microtrichia posteromedially; sterna IV–VI with microtrichia covering median area except on anterior half. Male tergite IX with no drepanae.

Scirtothrips spinosus Faure

(Figs 21, 22)

Scirtothrips spinosus Faure, 1929: 16

Described from 11 females and four males, taken in Transvaal and Cape Province, this species is remarkable among *Scirtothrips* species for having two pairs of unusually long setae on the posterior margin of the pronotum.

Diagnosis. Body mainly yellow, terga and sterna without median dark area but antecostal ridges dark; antennal segments II–VIII light brown; fore wing including clavus weakly shaded but extreme apex of wing pale. Ocellar setae III anterior to tangent between anterior margins of posterior ocelli (Fig. 21); pronotum striate but striae less closely spaced than *aurantii*, posteromarginal setae S2 and S3 about 0.7 times as long as pronotum (Fig. 21); fore wing second vein with 3–4 setae, distal posterior cilia straight but those at middle of wing wavy; metanotum with large elongate reticles medially (Fig. 21); terga V–VII with 4 discal setae on each lateral microtrichial field, VIII–IX with no microtrichia medially; sterna without microtrichia medially.

Scirtothrips zuluensis Faure

(Fig. 23)

Scirtothrips zuluensis Faure, 1929: 14

Described from 13 females and two males taken from *Acacia* leaves in Zululand, this species is remarkable for the large and variable number of setae on the second vein of the fore wing. Moreover, the metanotum seems to be more closely striate (Fig. 23) than in the other species, and the abdominal terga are darker laterally than medially.

Diagnosis. Body mainly yellow, lateral thirds of terga also antennal segments II–VIII light brown; antecostal ridges of terga and sterna not dark; fore wing uniformly shaded. Ocellar setae III well developed, close together behind first ocellus; pronotum striate but striae less closely spaced than *aurantii*, posteromarginal setae no more than 0.3 times as long as pronotum, S2 about as long as S1; forewing second vein with 7–13 setae, cilia wavy; metanotum almost striate medially (Fig. 23); terga VIII–IX with no microtrichia medially; sterna without microtrichia medially.

References

- Bagnall, R.S. (1909) On the Thysanoptera of the Botanical Gardens, Brussels. *Annals de la Société entomologique de Belgique*, 53, 171–176.

- Faure, J.C. (1929) The South African citrus thrips and five other new species of *Scirtothrips* Shull. *Transvaal University College Bulletin*, 18, 1–18.
- Gilbert, M.J. (1986) First African record of *Scirtothrips dorsalis* Hood (Thysanoptera: Thripidae) a potential pest of citrus and other crops in southern Africa. *Journal of the Entomological Society of southern Africa*, 49, 159–161.
- Hoddle, M.S. & Mound, L.A. (2003) The genus *Scirtothrips* in Australia (Insecta, Thysanoptera, Thripidae). *Zootaxa*, 268, 1–40. <http://www.mapress.com/zootaxa/2003f/zt00268.pdf>
- Hoddle, M.S., Mound, L.A., Rugman-Jones, P.F. & Stouthamer, R. (2008a) Synonymy of five *Scirtothrips* species (Thysanoptera: Thripidae) described from Avocados (*Persea americana*) in Mexico. *Florida Entomologist*, 91, 16–21.
- Hoddle, M.S., Heraty, J.M., Rugman-Jones, P.F., Mound, L.A. & Stouthamer, R. (2008b) Relationships among species of *Scirtothrips* (Thysanoptera: Thripidae, Thripinae) using molecular and morphological data. *Annals of the Entomological Society of America*, 101, 491–500.
- Hoddle, M.S., Mound, L.A. & Paris, D. (2008c) *Thrips of California*. Cd-rom published by CBIT, Brisbane. http://www.lucidcentral.org/keys/v3/thrips_of_california/Thrips_of_California.html
- Hood, J.D. (1919) On some new Thysanoptera from southern India. *Insecutor Inscitiae menstruus*, 7, 90–103.
- Karny, H. (1927) Studies on Indian Thysanoptera. *Memoirs of the Department of Agriculture in India. Entomology Series*, 9, 187–239.
- Masumoto, M. & Okajima, S. (2007) The genus *Scirtothrips* Shull (Insecta, Thysanoptera, Thripidae) and three related genera in Japan. *Zootaxa*, 1552, 1–33.
- Mound, L.A. (1968a) A review of R.S. Bagnall's Thysanoptera collections. *Bulletin of the British Museum (Natural History). Entomology Supplement*, 11, 1–181.
- Mound, L.A. (1968b) A new species of *Scirtothrips* from Kenya attacking tea, with synonymic notes on two related pest species. *Bulletin of Entomological Research*, 57, 533–538.
- Mound, L.A. (2010) A second *Scirtothrips* species with a hind-femoral comb in males (Thysanoptera, Thripidae). *Zootaxa*, 2643, 66–68. <http://www.mapress.com/zootaxa/2010/f/zt02643p068.pdf>
- Mound, L.A. (2011) Thysanoptera (Thrips) of the World – a checklist. <http://www.ento.csiro.au/thysanoptera/worldthrips.html> [accessed 12.i.2011]
- Mound, L.A. & Palmer, J.M. (1981) Identification, distribution and host-plants of the pest species of *Scirtothrips* (Thysanoptera: Thripidae). *Bulletin of Entomological Research*, 71, 467–479.
- Priesner, H. (1932) Preliminary notes on *Scirtothrips* in Egypt, with key and catalogue of the *Scirtothrips* species of the world. *Bulletin de la Société Royal Entomologique d'Egypte*, 16, 141–155.
- Priesner, H. (1933) E. Titschack's Thysanopterenausbeute von den Canarischen Inseln. *Stettiner entomologischer Zeitung*, 94, 177–211.
- Rugman-Jones, P.F., Hoddle, M.S., Mound, L.A. & Stouthamer, R. (2006) A molecular identification key for pest species of *Scirtothrips* (Thysanoptera: Thripidae). *Journal of Economic Entomology*, 99, 1813–1819.
- Shull, A.F. (1909) Some apparently new Thysanoptera from Michigan. *Entomological News*, 20, 220–228.
- zur Strassen, R. (1993) Chorologische, phänologische und taxonomische Studien an Terebrantia der Kapverden (Insecta: Thysanoptera). *Courier Forschungsinstitut Senckenberg*, 159, 335–380.
- zur Strassen, R. (2003) Die terebranten Thysanopteren Europas und des Mittelmeer-Gebietes. *Die Tierwelt Deutschlands*, 74, 1–271.