SCIRTOTHRIPS COCCOLOBAE SP. NOV. (THYSANOPTERA: THRIPIDAE), A LEAF-FEEDING THRIPS ON SEA GRAPE KNOWN FROM FLORIDA AND THE CAYMAN ISLANDS

DOMINIQUE W. COLLINS[1,*] AND G. B. EDWARDS[2]
[1]The Food and Environment Research Agency, Sand Hutton, York, YO41 1LZ, UK

[2]Florida State Collection of Arthropods, Florida Department of Agriculture and Consumer Services, Division of Plant Industry, P.O. Box 147100, Gainesville, FL 32614-7100, USA

*Corresponding author; E-mail: dom.collins@fera.gsi.gov.uk

ABSTRACT

A new species of *Scirtothrips*, *S. coccolobae* **sp. nov.** (Thysanoptera: Thripidae), is described from the state of Florida in the United States of America, and from the Cayman Islands. This species appears to be native to the Caribbean region. Present evidence indicates it to be specific to a single host plant, *Coccoloba uvifera* L. (Caryophyllales: Polygonaceae).

Key Words: Caribbean, *Coccoloba uvifera*, new species, Greater Antilles

RESUMEN

El presente trabajo describe una nueva especie de *Scirtothrips*, *S. coccolobae* **sp. nov.** (Thysanoptera: Thripidae), originaria del estado de Florida en Estados Unidos y de las Islas Caimán. Esta especie parece ser nativa de la región Caribeña. Las pruebas disponibles indican que es específica de una única planta hospedera, *Coccoloba uvifera* L. (Caryophyllales: Polygonaceae).

Palabras Clave: Caribe, *Coccoloba uvifera*, neuva especie, Antillas Mayores

The existence of an undescribed species of *Scirtothrips* Shull (Thysanoptera: Thripidae), associated with *Coccoloba uvifera* (L.) L. (Caryophyllales: Polygonaceae) (sea grape) in Florida and on the Cayman Islands has been known for a while. Sueo Nakahara, formerly of the United States Department of Agriculture - Systematic Entomology Laboratory, included the species in a draft key to *Scirtothrips* species that he produced privately and circulated to several specialists. However, the key was never published and the new *Scirtothrips* species was never formally described.

The collections of the Florida State Collection of Arthropods (FSCA) in Gainesville, Florida, contain 13 adult specimens of the undescribed species, including 3 males. Records from across southern Florida, and from one location on the east coast of the upper Florida peninsula, are represented, the earliest dating to May 1983; there are also a couple of records from the Cayman Islands, from 2009.

In Mar 2010, specimens of thrips that had been collected whilst causing damage (leaf curling) to sea grape at South Side, Cayman Brac, Cayman Islands, in Sep 2009, were sent for identification to the Food and Environment Research Agency (FERA) in York, United Kingdom (UK), as part of a UK government-funded project to provide plant health diagnostic support for ongoing work against non-native plant pests in the UK Overseas Territories. These thrips were identified as an undescribed species of *Scirtothrips*, and were subsequently matched to the FSCA material.

The genus *Scirtothrips* currently comprises 102 named species (ThripsWiki 2013). Mound & Marullo (1996) recorded 12 species from Central America and the Caribbean basin. These included 7 species newly described from Costa Rica and the authors speculated that there were probably many undescribed species in the region.

Subsequently, 27 new species of *Scirtothrips* were described from Mexico in a single paper (Johansen & Mojica-Guzman 1998), but the taxonomic decisions made therein were later subjected to criticism by other researchers. In particular, doubt was expressed about the biological validity of the 18 species recorded from *Mangifera indica* L. (Anacardiaceae), a plant not native to the Americas (Mound & zur Strassen 2001). Furthermore, 5 of Johansen & Mojica-Guzman's newly described species, all from avocado (*Persea americana* Miller (Lauraceae)) were later synonymised

with *S. perseae* Nakahara, a major pest of avocado in California (Hoddle et al. 2008).

In contrast to the Central American mainland, the genus *Scirtothrips* is poorly represented in faunistic literature from the Caribbean islands. Mound & Marullo (1996) listed only 3 such species including *S. oligochaetus* (Karny), a species from the Indian sub-continent that has clearly been introduced into Barbados, and, from Trinidad, the Central and South American species *S. manihoti* (Bondar).

The native *Scirtothrips* fauna of the area associated with this new species collected from sea grape, from the most south eastern states of the USA in the north to the Greater Antilles in the south, is sparse to non-existent. Medina Gaud (1961) recorded only 1 species from Puerto Rico, *S. longipennis* (Bagnall) causing injury to *Cinchona* species (Gentianales: Rubiaceae) in 1 glasshouse at low altitude and at 2 nurseries at higher altitude. However, *S. longipennis* is known from several parts of the world without its region of origin having been established. Alayo (1980) reported no *Scirtothrips* species as present in Cuba.

Likewise, only 2 species have previously been recorded from Florida, one or both of which represent man-mediated introductions: *S. citri* (Moulton) and *S. dorsalis* Hood (Diffie et al. 2008). *Scirtothrips citri*, a pest of *Citrus* species (Rutaceae) known as the Californian citrus thrips, originated in western USA; *S. dorsalis* is a polyphagous Asian species that has been spread around the world in recent years by the global trade in plants and plant products.

An additional 3 species are recorded from Georgia, *S. niveus* Hood, *S. rutheni* Shull and *S. taxodii* Hood (Diffie et al. 2008). All are rarely collected species, primarily from the eastern seaboard of the United States, and appear to have a much closer relationship with *S. citri* than with the new species (Bailey 1964).

The species newly described here, *Scirtothrips coccolobae*, therefore apparently represents the first discovered species of *Scirtothrips* that is truly native to Florida and the Greater Antilles.

Methods

Material of the new species was compared with specimens from all species of *Scirtothrips* present in the combined collections of the Natural History Museum, London, (NHM), FSCA and FERA. This included specimens, examining types where available, of 22 of 27 extant species listed as present in Central America, the Caribbean, or the United States of America by Bailey (1964), Mound & Marullo (1996), Diffie et al. (2008), and Hoddle et al. (2012); specimens of species described in the literature as having 3 pairs of postocular setae were present in the collections of the NHM, and examined. All remaining species could be clearly eliminated using information provided in published descriptions.

Photographs were taken by a Zeiss Axio Imager M1 microscope connected to a computer using Axiovision image analysis software. The same equipment was used to take all the measurements.

Description

Scirtothrips coccolobae **sp. nov.**

Female Macroptera (Fig. 1, a-e; Fig. 2, a-b).

Body mainly pale yellow, tergites III-VIII with dark median areas, tergites III-VIII with antecostal ridge dark, sternites III-VII with antecostal ridge shaded; major setae on IX-X light brown; forewings only lightly shaded; compound eyes with no ommatidia pigmented; antennal segment I pale, II-III lightly shaded, IV-VIII light brown.

Antennal segments III-IV with long, stout forked sensoria. Head sculpture transversely striate, more widely spaced within the ocellar triangle; ocellar setae III on, or fractionally anterior to, the tangent between the anterior margins of the posterior ocelli (very occasionally between the posterior ocelli); 3 pairs of median postocular setae, S1 positioned behind the posterior ocellus, S3 behind the inner margin of the eye. Pronotum transversely striate, posteromarginal setae with S2 between 1.5 and 2.0 times as long as either S1 or S3. Metanotum with anterior sculpture transverse basally and then curving distally and medially; posterior sculpture irregularly or longitudinally reticulate medially; median setal pair behind anterior margin. Forewing first vein with 3 setae near base, then 4-6 setae, and then 3 widely spaced setae in the distal half; second vein with 3 setae; clavus with 3 veinal setae, the distal seta longer than the other two, with a gap between the basal seta and the two distal setae; cilia moderately and irregularly wavy. Median pair of setae on tergites IV-V longer than the distance between their bases. Tergites IV-VI with 3 setae on lateral microtrichial field; tergite VIII without any microtrichia anteromedially; tergite IX with microtrichia broadly covering the posterior half. Sternites with discal microtrichia rarely extending mesad to marginal seta S1.

Measurements of holotype female (on microscope slide) in microns: Body length 978. Head, length 72; width across eyes 143; postocular seta I 19 (left), 16 (right). Pronotum, length 96; maximum width 163; posteromarginal setae S1 18, S2 34, S3 13 (left), 18 (right). Forewing, length 561 (right, left twisted). Tergite IV median seta 16 (left), 17 (right). Tergite VII median setae 27. Antennal segments III-VIII length (left antenna) 46, 46, 49, 41, 8, 14.

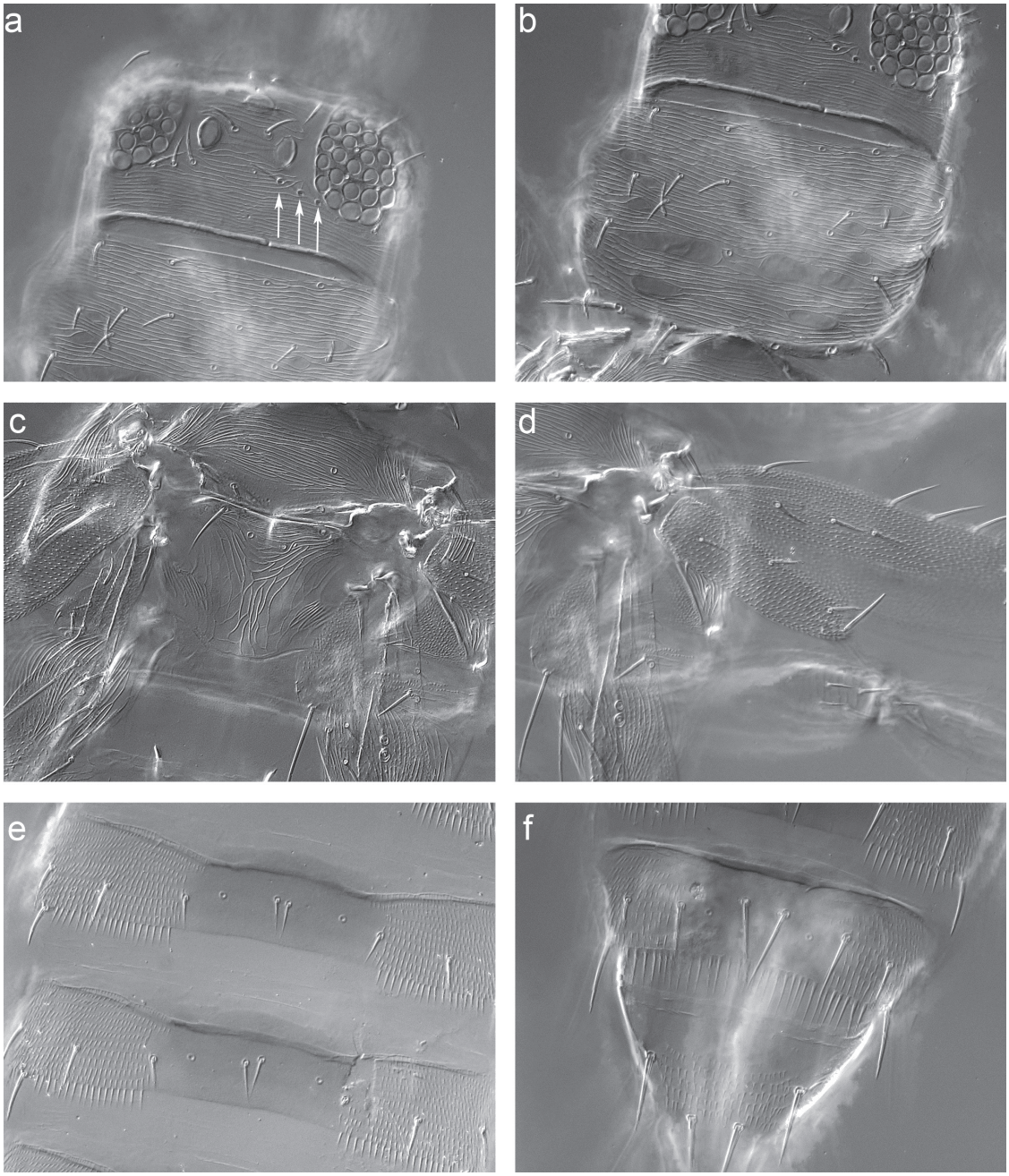


Fig. 1. *Scirtothrips coccolobae* **sp. nov.**. Holotype female: a- head (median postocular setae - from left to right - S1, S2 and S3 arrowed), b-pronotum, c-metascutum, d-right clavus, e-tergites iv-v, f-tergites viii-ix.

Male Macroptera (Fig. 2, c).

Smaller and paler than the female, tergites barely shaded; tergite IX with a pair of pale curved drepanae; hind femora lacking a comb of stout setae.

Specimens Studied

All on *Coccoloba uvifera* unless otherwise stated.

HOLOTYPE female*:* U.S.A., Florida, Miami-Dade County, Miami, 20950 SW 177th Avenue, 20-VI-2001, *Coccoloba uvifera*, leg. D. Hanna

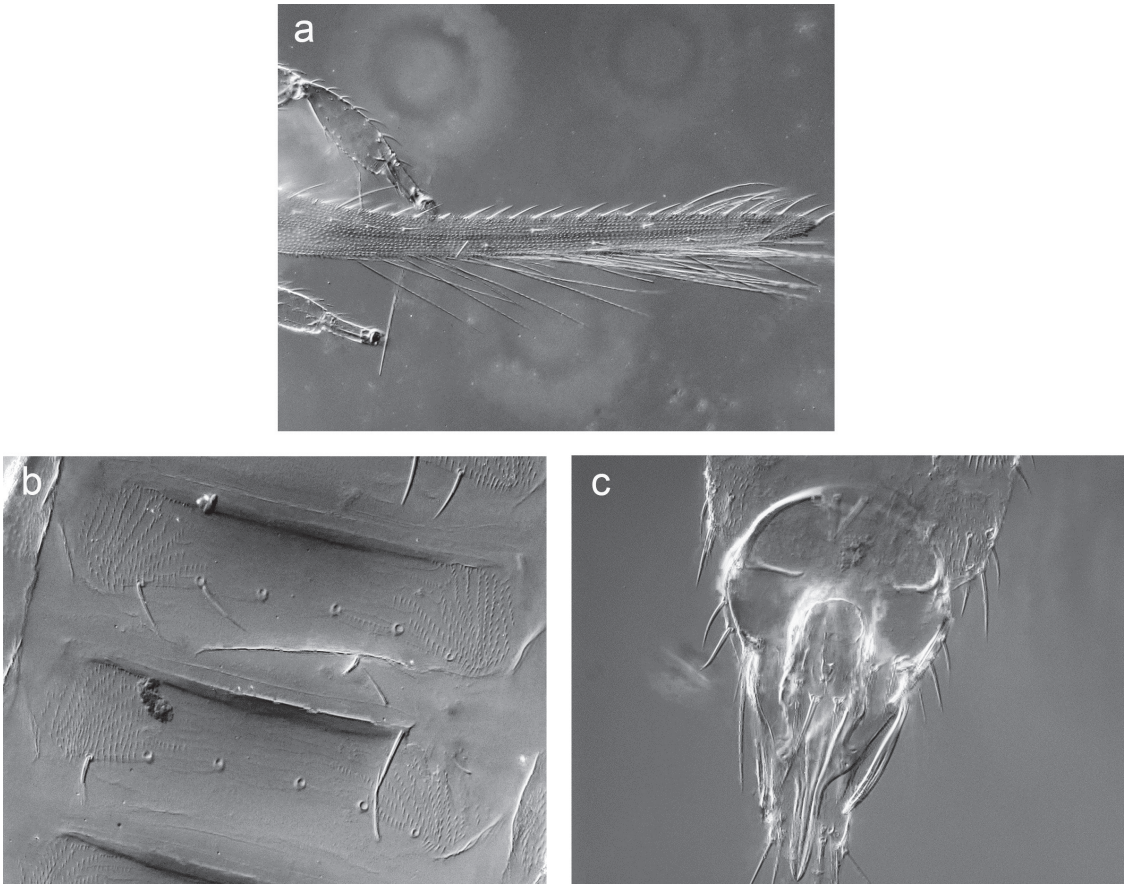


Fig. 2. *Scirtothrips coccolobae* **sp. nov.**. Holotype female: a-right forewing; b-sternites iv-v; Male: c-tergites IX-X.

[E2001-1626]. Specimen has been deposited in the Florida State Collection of Arthropods, Gainesville.

Other Material Examined

U.S.A., Florida, Lee County, Fort Myers, 05-V-1983, *Coccoloba* sp. (leg. A. Gambill, W. T. Walsh), 2 ♀. Glades County, Moore Haven, 22-IV-2011, E2011-2395-1 FSCA (M. Terrell), ♀. Miami-Dade County, Miami, 20-IV-2001, E2001-1626 (D. Hanna), ♀, ♂; Homestead, 15-VI-2002, E2002-2129 (C. Barbare), 2 ♀, 2 ♂. Volusia County, Orange City, 09-VI-1995, E95-2559 (J. Beckwith), ♀.

CAYMAN ISLANDS. Locality not specified, 14-VII-2009, E2009-6582-1 FSCA (N. Hansraj), ♀. Grand Cayman, Royal Palms, 16-VII-2009, E2009-6577-1 FSCA (N. Hansraj), ♀. Cayman Brac, South Side, 03-IX-2009, 21004450 FERA, (K. Palmer), 6 ♀, 2 ♂.

Specimens have been deposited in the collections of the FSCA, FERA, and the NHM.

Etymology

The species is named after the generic name of plant from which it has been exclusively collected, *Coccoloba*. This concurs with the name originally proposed by Sueo Nakahara in his unpublished key to *Scirtothrips* of Florida (see above).

Diagnosis

Scirtothrips coccolobae may be identified by a combination of the following characters: ocellar setae III on, or fractionally anterior to, the tangent between the anterior margins of the posterior ocelli; 3 pairs of median postocular setae; forewing second vein with 3 setae; clavus with 3 veinal setae, the distal seta longer than the other two, with a gap between the basal seta and the 2 distal setae; cilia moderately and irregularly wavy; tergites IV-VI with 3 setae on lateral microtrichial field; tergite VIII without any microtrichia anteromedially, IX with microtrichia broadly covering the posterior half; tergites III-VIII with dark median areas, tergites III-VIII with antecos-

tal ridge dark, sternites III-VII with antecostal ridge shaded; sternites with discal microtrichia rarely extending mesad to marginal seta S1; male with a pair of pale curved drepanae on tergite IX.

Discussion

Scirtothrips coccolobae may be immediately distinguished from all other *Scirtothrips* species in the region by the presence of 3 pairs of medially-positioned major postocular setae (subequal in length with each other and with ocellar setae III). However, although this is not a commonly expressed character state within the genus *Scirtothrips*, 3 pairs of median postocular setae are found in a small number of congeners. These include: *S. albomaculatus* Bianchi, *S. astibos* Hoddle & Mound, *S. erimicus* Hoddle & Mound, and *S. pilbara* Hoddle & Mound, all from Australia and representing a group of related species, largely or wholly associated with *Acacia* species (Fabales: Fabaceae), whose taxonomy may not yet be fully resolved (Hoddle & Mound 2003); *S. helenae* Palmer & Mound, also from Australia, recorded only from *Brachychiton populneus* (Schott & Endl.) R. Br. (Malvales: Sterculiaceae) and unique in the genus in having transverse metanotal sculpture (Palmer & Mound 1983); and *S. pendulae* Han, from China (Han 1986) originally collected on *Sophora japonica* L. (Fabaceae) (pagoda tree), in which the median postocular setae are very small. In all these species the males lack drepanae on tergite IX (male unknown in *S. astibos*). There is no biogeographical relationship between *S. coccolobae* and these species, and it is clear that none of these species share a close affinity with the new species.

The general appearance of the new species under a low power microscope, in particular the dark abdominal antecostal ridges and the dark medial areas on the tergites, means that, without examination under higher magnification, it could easily be mistaken for the invasive, polyphagous, pest species *S. dorsalis*. It should be noted that the FSCA collection includes a female specimen of *S. dorsalis* taken from *Coccoloba tenuifolia* L. (Florida, Dade County, Homestead, 11-V-2008, leg. A. Derksen).

Although the new species has yet to be confirmed as breeding on *Coccoloba uvifera*, it seems reasonable to assume the host relationship to be a true one, as it is consistently and uniquely found only on this plant species. It remains to be seen whether the current known distribution for the species is fully comprehensive, and as such represents the area of origin. In addition to Florida and the Cayman Islands, *S. coccolobae* may also be present in Jamaica, approximately 150 miles south east of Cayman Brac. Six adult females and a single male of an unidentified *Scirtothrips* species were taken on *Coccobola uvifera* at Woodstock, Buff Bay, Jamaica, during a thrips survey in and around the coconut plantations on the island during Oct and Nov 1964. The brief published description of the *Scirtothrips* (Sakimura 1986) stated that it "differs from *S. manihoti* and *multistriatus* by wider frontal costa, hind vein of fore wing with 3 to 4 setae, and male with a prominent pair of drepana"; allowing for the lack of clarity as to what Sakimura meant by the first part of the quoted statement, this is consistent with *S. coccolobae*. Further afield, sea grape is native to the Bahamas, southern Florida, the Caribbean region, and tropical and subtropical Central and South America. It has also been introduced elsewhere; for example, having become naturalised in the Hawaiian Islands.

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