Problems in Costa Rican Thrips Taxonomy and Systematics (Insecta: Thysanoptera)

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Problems in Costa Rican thrips taxonomy and systematics (Insecta: Thysanoptera)

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Abstract

The following nomenclatural actions are in response to a series of published reports, emanating from the University of Costa Rica, that were based on faulty microscopy and inaccurate scholarship. Among Thysanoptera Phlaeothripidae, the recently described genera Kolia and Arthrips are considered new synonyms of Holothrips, and reasons are provided for continuing to regard Abiaothrips as a synonym of Holothrips; also Camlothrips and Marinaella are considered new synonyms of Eurythrips. Among Thripidae, Frankiiniella caribae is considered a new synonym of Frankiiniella insularis and the synonymy of Frankiiniella fortissima with insularis is re-established; Jessicathrips is considered a new synonym of Thrips genus. In addition, two misinterpretations of the Code of Zoological Nomenclature are discussed.

Key Words: Generic synonyms; Code of Zoological Nomenclature; microscopy; thrips

Resumen

Las siguientes acciones de nomenclatura son en respuesta a una serie de informes publicados, que proceden de la Universidad de Costa Rica, los cuales se basaron en una microscopía pobre usado y un conocimiento inexacto. Entre los Thysanoptera, Phlaeothripidae, se consideran los géneros recientemente descritos Kolia y Arthrips nuevos sinónimos de Holothrips, y se aportan las razones para continuar considerando Abiaothrips como sinónimo de Holothrips; también se consideran Camlothrips y Marinaella nuevos sinónimos de Eurythrips. Entre los Thripidae, se considera Frankiiniella caribae un nuevo sinónimo de Frankiiniella insularis y se restablece la sinonimia de Frankiiniella fortissima con Frankiiniella insularis; Jessicathrips se considera un nuevo sinónimo del género Thrips. Además, se discuten dos errores interpretaciones del Código de Nomenclatura Zoológica.

Palabras Clave: sinónimos genéricos; Código de Nomenclatura Zoológica; microscopía; thrips

Taxonomy, the process of naming organisms, is a science to which anyone can contribute, regardless of expertise. However, every new name for a species or genus that is published in accordance with the basic requirements of the International Code of Zoological Nomenclature (ICZN 2014) becomes technically available, and must be considered as a valid scientific hypothesis. The supporting evidence for such hypotheses must also be available for critical assessment by other workers. This situation was discussed by Goldarazena et al. (2008) with respect to a series of taxonomic problems emanating from Costa Rica, and these authors emphasized that taxonomy requires a combination of good technical methods and critical scholarship. Despite this, misinformation about Thysanoptera continues to emerge from the University of Costa Rica. Unfortunately, as pointed out by Goldarazena et al. (2008), also Mound (2013), correction of such published errors is often laborious and costly. This paper considers a few of the recently published factual errors for which it has been possible to develop refutations.

INADEQUATE LABORATORY TECHNIQUES

Two new genera, Kolia and Arthrips, were described by Soto-Rodríguez, Retana-Salazar & Rodríguez-Arrieta (2013) for which the most important diagnostic character state was the position of the maxillary stylets very low in the head (Fig. 1). The first of these genera was erected for 4 new species, of which three were based on single specimens and the fourth on 3 specimens, and the second genus was erected for 2 species, of which one was based on a single specimen and the other on 2 specimens. Six of these specimens were taken in Malaise traps, and no biological information was available for any of the 9 specimens. The combination of character states given by the authors for these 2 genera was intriguing, because apart from the remarkable position of the stylets the species were not clearly distinguished from members of the common and species-rich genus Holothrips. Species in that genus feed on fungal hyphae, and are common in Costa Rica on recently dead woody plants. Indeed, a colony of 1 species was found in 1992 living in an abandoned scolytid gallery within a stem of Cecropia next to the Museo de Insectos of the University of Costa Rica, and Mound & Marullo (1996) pointed out that individuals of Holothrips were unusually common in Malaise traps. Requests to borrow one or more of the original specimens of Kolia and Arthrips were rejected, but through the courtesy of the Director of the Centro de Investigación en Estructuras Mircoscópicas at UCR where the specimens are deposited (the publication actually named the depositary as Colección Institucional de Thysanoptera de la Universidad de Costa Rica), a large series of photographic images was made available. These images indicate that the specimens have been poorly slide-mounted, such that they are seriously distorted with the fore legs retracted under the head (Figs. 3–5). However, ventral images of the heads (Figs. 6–7) clearly demonstrate that the maxillary stylets are fully protruding from the mouth cone. This is the normal feeding position that can be observed in any species...
of Phlaeothripidae with long stylets. The stylet position as described for both Arthrrips and Kolia is thus an artifact, and cannot be considered as diagnostic of these taxa. Because of this, and the other character states indicated in the original descriptions, the generic names, Arthrrips and Kolia, are here recognized as new synonyms of Holothrips Karny. This genus is discussed and extensively illustrated by Okajima (1987), also Mound & Tree (2014), and in the normal retracted position the stylets of species in this genus lie close together medially for the full length of the head. Unfortunately, the species-level identities of the 9 Costa Rican specimens are likely to remain in doubt, because the damaged condition of the specimens will make critical comparisons particularly difficult.

INACCURATE MICROSCOPY

According to Retana-Salazar (2013b) the holotype of Trichothrips schaubergeri Priesner, the type species of the genus Abiastothrips Priesner, has only 2 sensoria on each of antennal segments III and IV, he therefore redefined Abiastothrips as a valid genus distinct from Holothrips Karny with which it had previously been considered a synonym (Mound & Marullo 1996). The statement concerning the number of antennal sensoria is curious, because not only does Priesner (1928) state, when re-describing schaubergeri, that there are 3 sensoria on segment III and four on IV, but Schliephake & Klimt (1979) clearly illustrate this species with this sensorial arrangement, and lativerticis Post (1961), a north American species that is considered a synonym of schaubergeri, was also described as having this sensorial arrangement. Moreover, in synonymising Cratothrips priesneri Bagnall with schaubergeri, Priesner (1964) states that there are 3 sensoria on the third antennal segment. In July 2014 the original specimen of schaubergeri was re-examined, and there are clearly 3 sensoria on III and four on IV, and this is true also of the holotype and paratype of priesneri, as well as of all of the available specimens of schaubergeri in the collections of the Senckenberg Museum, Frankfurt, and the Natural History Museum, London. Examination of these specimens indicates that the notopleural sutures are slightly variable in schaubergeri, normally being fully complete but sometimes weakly incomplete on one side. The rejection of Abiastothrips as a synonym of Holothrips (see ThripsWiki 2014) is thus not supported by the available evidence.

In Frankliniella insularis (Franklin), a common and widespread Neotropical species of Thripidae, the posterior margin of abdominal tergite VIII bears a comb of dentate microtrichia but with 1 to 3 of these microtrichia absent medially. Priesner (1925) described Frankliniella for-
Figs. 3–9. [3–7 provided by Olman Alvarado Rodríguez of CIEMIC, University of Costa Rica]. 3–5. Holotype females of Arthrips madresalvensis, Kolia lilianae and Kolia zaidae. 6–7. Mouth cone of Kolia guanacastenis and Kolia zaidae, with protruding maxillary stylets indicated. 8. Tergite VIII posterior margin of Frankiniella fortissima female labelled “type” with microtrichial comb interrupted medially. 9. Head of Frankiniella caribae holotype (Fig. 2 from Retana-Salazar 2010a).
“tubo fuertemente elongado y ornamentado”. However, both of these character states are not developed in many of the species of *Eurythrips* and *Terthrothrips*, the 2 most species-rich genera of this group (see illustrations in Mound 1976 & 1977). In view of the lack of any diagnostic characters, the genus *Marinaella* is here considered a new synonym of *Eurythrips* Hinds.

A second new Glyptothripine genus and species described by Retana-Salazar & Soto-Rodriguez (2013c), *Camiliothrips saidamhedi*, was based on 5 wingless females from Costa Rica of which 1 paratype was studied in July 2014 at the Senckenberg Museum, Frankfurt. The description states that the prosternal basantra are absent in this species, whereas these sclerites are actually present but due to contraction of the prosternal surface are in an oblique position. The new genus was further justified by the lack of tergal wing-retaining setae. As with lack of ocelli and reduction in compound eye size, this condition is correlated with wing loss in many taxa throughout the Order Thysanoptera. It certainly occurs among the litter-living, fungus-feeding, species of *Eurythrips* and *Terthrothrips* (Mound 1976 & 1977). One diagnostic character stated for *Camiliothrips* was the presence of only 2 sense cones on the third antennal segment, with the claim that species of *Eurythrips* have 3 sense cones on this segment. However, both Stannard (1968) and Mound (1976) have pointed out that the number of sense cones on this segment is variable among and within *Eurythrips* species. In *ampilliventris* Hinds, the type species of *Eurythrips*, the number varies from 1 to 3, and this variation can occur between the left and right antennae as well as among individuals from the same locality. In the absence of any further evidence, the genus *Camiliothrips* is therefore considered a new synonym of *Eurythrips* Hinds.

A new genus and species of Thripidae, *Jessicathrips cubensis*, was described by Gonzalez, Retana-Salazar & Castillo (2010) from Cuba based on a single female. The generic definition provided includes all of the characteristics of the genus *Thrips*, except for the presence of only 6 antennal segments. The new genus was differentiated solely on this character. However, the illustration that accompanied the description indicates a specimen with grossly deformed antennal segments (Fig. 2), with the left and right antennae asymmetric. Antennal abnormalities are common among Thripidae, and based on such an artefact the putative genus *Jessicathrips* cannot be considered as distinct from *Thrips*. The species involved is probably the widespread pest, *Thrips tabaci*. The new species name fails to meet the requirements of Article 16.4.2 of the International Code for Zoological Nomenclature (ICZN 2014), in that no indication was given of the institutional collection in which the holotype was deposited. The name *Jessicathrips cubensis* is thus unavailable and must be considered a nomen nudum, although for reference purposes it can be placed within the long synonymy of genus *Thrips* Linnaeus.

**Discussion**

Taxonomy is certainly a difficult biological discipline, involving the satisfactory delineation of one species from another, whether by morphology or molecules, and the assessment of observed differences to infer phylogenetic relationships. However, a large proportion of the difficulties faced by professional taxonomists arise from poor quality work. Most of the Thysanoptera names for the Neotropical fauna are derived from 2 North American workers. Taxon descriptions by J. D. Hood (Hoebeke 1994) are detailed and supported by excellent slide preparations and highly skilled line drawings. In contrast, those by D. Moulton (Arnaud & Lee 1973) are often superficial, based on distorted slide preparations, and with illustrations that are sketchy and inaccurate. As a result, many of the thrips taxa described by Moulton from Brazil are likely to remain unrecognizable. Similarly, the number and diversity of errors indicated in the paragraphs above can only increase the problems of understanding Neotropical biological diversity.

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