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Species-richness in Neotropical Sericothripinae (Thysanoptera: Thripidae)

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Abstract

Two of the three recognized genera of Sericothripinae are known from the Neotropics, and 14 **new species** from this area are here described in this subfamily. Illustrated keys are provided to females of seven species of *Hydatothrips*, and 41 species of *Neohydatothrips*, mainly from Brazil but including all recorded species south of the border between Mexico and USA. Plant species on which breeding has been recorded are indicated where possible, notes are provided on the few species of economic importance, and a key is appended to second instar larvae of seven species. *Neohydatothrips burungae* (Hood) **stat. rev.** and *N. aztecus* Johansen **stat. rev.** are recalled from synonymy with *Neohydatothrips signifer* (Priesner), and *N. denigratus* (De Santis) **syn. n.** is synonymized with *N. burungae*. *Hydatothrips williamsi* (Hood) **comb. n.** is relocated from *Neohydatothrips*, and as this produces a homonym in the genus, *Hydatothrips tareei* **nom. nov.** is proposed for *Hydatothrips williamsi* Mound & Tree from Australia.

Key words: Brazil, Neotropics, *Hydatothrips*, *Neohydatothrips*, new species, metasternal plate

Introduction

Sericothripinae is one of four subfamilies of Thripidae, comprising over 150 described species (ThripsWiki 2016) and including some of the most delicately ornamented and colourful members of Thysanoptera. Worldwide only three genera, out of 15 available genus-group names, are currently considered valid in this group (Lima & Mound 2016). These three genera differ greatly in species richness. *Sericothrips* Haliday includes only eight species, all from the Holarctic, whereas 41 species are listed in *Hydatothrips* Karny, mostly from Eastern Asia and Australia, and 103 in *Neohydatothrips* John, of which 63 are from the New World.

In the Neotropics, knowledge of the systematics of Sericothripinae is sparse. Out of 36 species previously recorded in this area, identification keys are available to only 18 species from between Mexico and Panama (Mound & Marullo 1996). In contrast, none of the 20 sericothripine species described from South America can be identified without access to the original specimens. Most of these are known only from their original descriptions, and older descriptions usually involved only "silhouette" characters, particularly colour. Improvements in slide preparation techniques in more recent years have facilitated studies on details of the surface sculpture that are now considered essential for distinguishing species in this group (Kudo 1991, 1997).

The biology of most sericothripines remains largely unknown. The host plants on which breeding occurs are known for six of the eight species in Europe (Mound *et al*. 1976; zur Strassen 2003), also for 10 North American species (Vance 1974), and 11 of the 16 described Australian species (Mound & Tree 2009). In Central and South America, host-associations have been suggested for only a restricted number of species, such as *N. burungae*, *N. signifer*, *N. portoricensis* and *H. gliricidiae*. Judging from the data on slide labels of museum specimens, one might conclude that polyphagy is common amongst these thrips. However, the plants from which adults are collected are not necessarily the plants on which a thrips species breeds (Mound 2013), and there is very little reliable information concerning the breeding-hosts for most species. Further information on second instar larvae of Sericothripinae is given below in Appendix A.

A few species of Sericothripinae are of interest in economic entomology. The marigold thrips, *N. samayunkur*, is a widespread pest of cultivated *Tagetes* species [Asteraceae] around the world (Moritz *et al*. 2004), and

Hydatothrips adolfifriderici is associated with cowpea and soybean crops (*Vigna unguiculata* & *Glycine max*) [Fabaceae] in several African countries (Moritz *et al*. 2004). In Europe, *N. gracilicornis* breeds on *Vicia cracca* [Fabaceae] in the north, but has been reported as damaging the needles of *Pinus* in Spain and southern Italy (Marullo 1990). In North America, *N. variabilis* is known to vector the *Soybean Vein Necrosis Virus,* which leads to death of soybean plants (Zhou & Tzanetakis 2013). *Neohydatothrips signifer* is a key pest of passion fruit (*Passiflora edulis*) [Passifloraceae] in Colombia, on which it can cause losses of up to 95% in vegetative terminals and 75% in flower buds by deforming leaves and sealing buds (Jaramillo *et al*. 2009; Santos *et al*. 2012). In South and Central America, *N. gracilipes* was described as damaging cotton in Mexico, but is associated with weedy species of *Sida* [Malvaceae] in the Caribbean region as well as in central India and northern Australia. More positively, the western European species, *Sericothrips staphylinus*, has been introduced to Hawaii, New Zealand and Australia (Ireson *et al*. 2008) for the biological control of the serious weed, *Ulex europaeus* [Fabaceae].

The objective of this work is to describe 14 new species mainly from Brazil, and thus emphasise the remarkable species richness of Sericothripinae in the Neotropics, and to provide an illustrated identification key to the 48 species of Sericothripinae currently recognised south of the border between Mexico and USA. Taxonomic knowledge of Thysanoptera across the vast and biologically diverse South American continent is weak. Mound and Palmer (1992) suggested that knowledge of the diverse thrips fauna of Panama was derived from less than 500 man-hours of field work. Studies on the thrips fauna of the rest of the Neotropics are similarly inadequately based.

Depositary abbreviations. Specimens of Sericothripinae, including primary types, have been examined either during visits to, or on loan from, the following collections: California Academy of Sciences, San Francisco, USA (CAS); U.S. National Museum of Natural History, Washington, USA (USNM); The Natural History Museum London, UK (BMNH); Museo de La Plata, Argentina (MLP); Universidad Nacional de Jujuy, Argentina (UNJA), Australian National Insect Collection, Canberra, Australia (ANIC); Instituto Biológico, São Paulo, Brazil (IBSP), Escola Superior de Agricultura "Luiz de Queiróz", Brazil (ESALQ), Universidade Federal do Piauí, Brazil (UFPI) and Universidade Federal do Rio Grande do Sul, Brazil (UFRGS).

Specimen preparation. For accurate studies on Sericothripinae taxonomy, good microscopic preparations are essential. The best slide mounts are those prepared as soon as possible after collection, because long periods of storage in alcohol cause colours to fade and thus be misleading and unavailable for comparisons. If slide preparation must be delayed, then thrips should be stored in ethanol in the dark at low temperatures, preferably around -15ºC. The body content of many thrips species is oily, and thus iridescent in slide mounted specimens from which the body contents have not been removed. This iridescence obscures surface details that are needed for accurate identification, but care is needed during chemical treatment of specimens that colour details are not seriously damaged. Technical details for preparing slide mounts are given by Okajima (2006) and Mound and Marullo (1996). Colour is important for species identification among Sericothripinae, but colour patterns sometimes vary between sexes; the keys below are therefore based on females, with important sexual differences noted in comments sections.

Sericothripinae Karny

This subfamily was erected by Karny (1921), and is generally considered a monophyletic group (Buckman *et al.* 2013). However, the classification into three genera probably does not reflect phylogenetic relationships (Lima & Mound 2016), and a total of 15 generic names are available for the 152 listed species (ThripsWiki 2016). These species share the following character states:

Head transverse with 3 pairs of ocellar setae; antennae usually 8-segmented, segments III & IV each with a forked sense cone, VI with an elongate narrow base to one external sense cone; occipital apodeme present; maxillary palps 3-segmented; fore femora and fore tibiae with numerous transverse rows of microtrichia; pronotum usually with a distinguishable darker blotch; mesosternum with spinula; first vein of fore wing with setal row continuous, second vein with no setae or with one or two near wing apex; posterior fringe cilia wavy (except *Neohydatothrips masrensis*); lateral thirds of abdominal tergites II–VII with dense rows of fine microtrichia; posteromarginal comb complete on tergite VIII; tergite IX with at least four pairs of robust posteromarginal setae, also at least two pairs of mid-dorsal setae. Males usually with a pore plate on one or more sternites; tergite IX without drepanae.

Metasternal plate. During the preparation both of this paper, and also of a recent publication on sericothripine systematics (Lima & Mound 2016), the authors recognized that the customary interpretation of the metasternum of these thrips was not entirely valid. For some years, the interpretation has been that the "anterior margin of the metasternum" is either weakly or strongly emarginate (Mound & Tree 2009), this difference being used in the generic classification. However, light microscopy indicates that in species of both *Hydatothrips* and *Neohydatothrips* there are setae on the metasternum anterior to the distinctive darkly sclerotised area (Figs 10, 13). Thus, the anterior margin of this area cannot represent the anterior margin of the metasternum. Based on these observations, the term "metasternal plate" was adopted in this paper, in the full realisation that its morphological significance remains unclear. Subsequent to these two papers being prepared, Gerald Moritz (Martin-Luther Universität Halle-Wittenberg, Germany) kindly prepared an SEM image (Fig. 2) of the metasternum of the Australian species, *Hydatothrips argenticinctus*. The metasternal plate of this species is distinctive when examined with transmitted light (Fig. 1), or even, due its pigmentation, when examined in ethanol by reflected light. But the SEM image indicates that this sclerite is not on the surface, but is an internal structure. Presumably it is a thickening of the inner surface of the metasternum, and possibly represents a muscle insertion area.

Key to genera of Sericothripinae

1. Metasternal plate with deep U- or V-shaped invagination at anterior margin; pantropical (Figs 10, 13). . . . . *Hydatothrips*
-. Metasternal plate with anterior margin transverse or with shallow invagination (Figs 53–59). 2
2. Metascutal sculpture with no microtrichia, sculpture lines usually longitudinal (Figs 47–51); tergites III–VI with few or no microtrichia on median discal area (Figs 76–79); worldwide. . . . . *Neohydatothrips*
-. Metascutal sculpture with many microtrichia, sculpture lines predominantly transverse; tergites III–VI fully covered medially with microtrichia; Holarctic only . . . . . *Sericothrips*

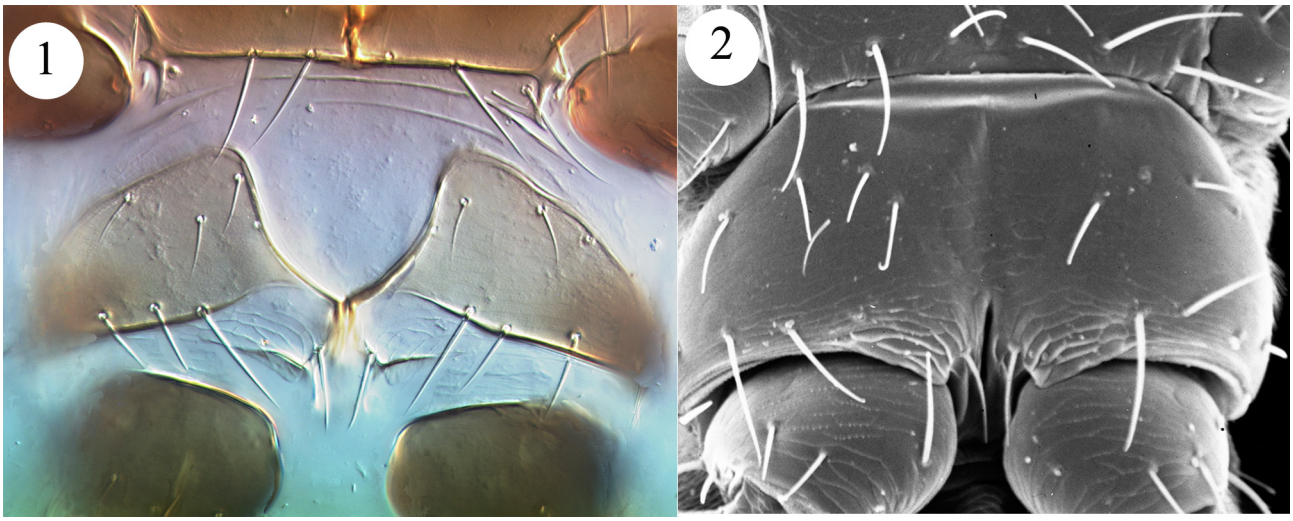
Hydatothrips Karny

Type species: *Hydatothrips adolfifriderici* Karny, 1913: 218.

The type species of this genus is a common African species. Remarkably, the 42 described members of the genus, including one new species described below, are found across the tropics as far South as Australia, but with none in North America or Europe (ThripsWiki 2016). Mound and Marullo (1996) provided a key to the five species then known from the Neotropics, but three of these (*H. gliricidiae*, *H. guanacastei* and *H. volcano*) are known only from Costa Rica. The apparent lack of species in South America is possibly an artifact related to the lack of collecting. The authors have seen at least one further member of this genus from South America, but represented only by one damaged specimen not suitable to describe satisfactorily.

Key to *Hydatothrips* species

1. Ocellar triangle without sculpture lines; tergite IX of female with 3 pairs of mid-dorsal setae; metasternal plate with broadly U-shaped invagination. . . . . *williamsi* **comb. n.**
-. Ocellar triangle with sculpture lines (Figs 3–8); tergite IX with either 2 or 4 pairs of mid-dorsal setae; metasternal plate invagination not broadly U-shaped 2
2. Fore wing with three distinct pale bands; meso and metanotum with many microtrichia (Fig. 12). . . . . *gliricidiae*
-. Fore wing with one or two pale bands; meso and metanotum with no microtrichia 3
3. Anterior third of pronotum broadly reticulate (Figs 3, 5); tergite IX with 4 pairs of mid-dorsal setae; fore wing second vein with no setae 4
-. Anterior third of pronotum transversely reticulate (Figs 4, 7, 8); tergite IX with 2 pairs of mid-dorsal setae; fore wing second vein with two setae 5
4. Pterothorax brown; mesonotum transversely striate (Fig. 5), metanotum longitudinally striate . . . . . *tricinctus*
-. Pterothorax yellow, meso and metanotum conspicuously reticulate (Fig. 9) . . . . . *canavaliae* **sp. n.**
5. Transverse reticles on pronotum without internal markings (Fig. 7) . . . . . *guanacastei*
-. Transverse reticles on pronotum with internal markings (Figs 4, 8). 6
6. Hind tibiae yellow; ocellar area without internal markings between striae; sternites with microtrichia medially . . . . . *sternalis*
-. Hind tibiae brown; ocellar area with internal markings between striae; sternites without microtrichia medially . . . . . *volcano*



FIGURES 1–2. Metasternum of the Australian species *Hydatothrips argenticinctus*. **(1)** transmitted light view; **(2)** SEM image (courtesy Gerald Moritz, Halle).

***Hydatothrips canavaliae* sp. n.**
(Figs 3, 9–11)

Female macroptera. Colour: body yellow, with brown on ocellar area, pronotal blotch, lateral thirds of metanotum, antecostal ridges, and anterolateral areas of abdominal tergites II–VII; fore wing yellowish brown, with paler subbasal area; legs yellow with femora shaded brown; antennal segments I–II yellow, III brownish yellow, IV with basal half yellowish brown and apical half brown; V with basal tip yellowish brown and the rest brown, VI–VIII brown.

Structure: Occipital apodeme not touching posterior margin of eyes, ocellar area reticulate, ocellar setae pair III on external margins of ocellar triangle, three pairs of postocular setae (Fig. 3). Pronotum broadly reticulate, blotch well-defined, blotch reticles with weak internal markings (Fig. 3); mesonotum reticulate with median setae far ahead of lateral setae; metanotum reticulate with two pairs of setae on anterior margin (Fig. 9). Metasternal plate with anterior margin deeply emarginated (Fig. 10). Fore wing second vein with no setae. Tergites I–VIII with closely spaced rows of fine microtrichia on lateral thirds, posterior margin of tergites II–V with comb of microtrichia incomplete medially, VI with minute microtrichia medially, comb complete on VII–VIII; tergite IX with 4 pairs of mid-dorsal setae. Sternites with discal microtrichia not extending mesad of setae S2, posteromarginal comb present lateral to setae S2.

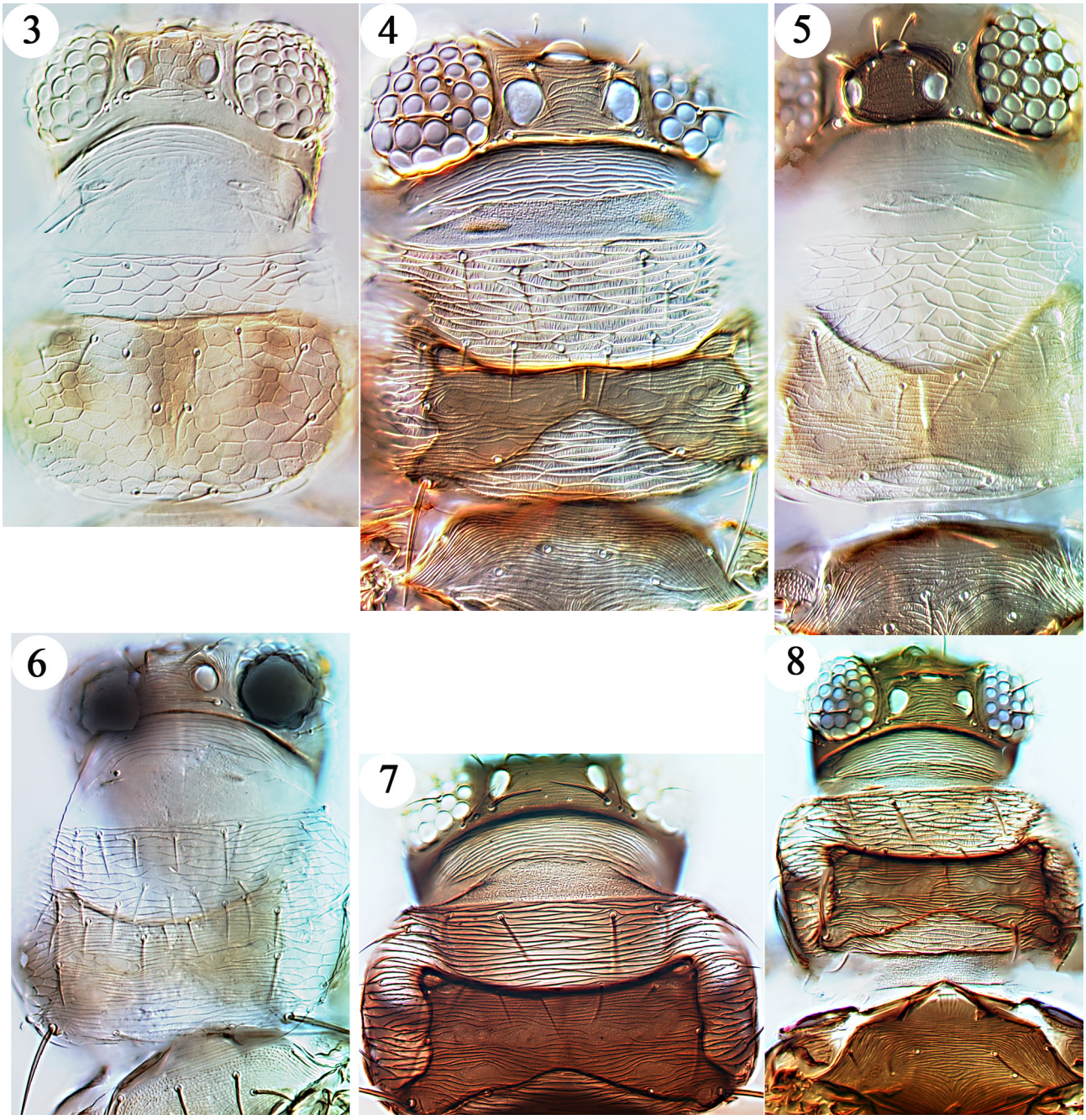
Larva II. Clear with dark markings all over the body; abdominal segments IX and X brown. Antennae 7-segmented, segment I yellow with brown shadings, II brown, III–IV yellow, V–VI brown. Thorax with brown sclerotized areas. Body with several brown setae (Fig. 11), with broadly expanded and fringed apices (apex about 4 times as long as base) arising from well-developed brown rings.

Measurements (holotype female in microns): Body length 980, Head, length 58, width 150; ocellar setae III length 10. Pronotum length 165, width 178. Fore wing length 650. Antennal segments I–VIII length 17, 30, 49, 46, 36, 36, 10, 9.

Material studied. Holotype female, **BRAZIL**, Piauí State, Teresina, on *Canavalia brasiliensis*, 7.vii.2010 (E.F.B.Lima) (ESALQ).

Paratypes: from same locality and host as holotype, 3 females, 9.vii.2010; 8 females and 4 larvae, 17.vii.2011 (E.F.B.Lima) (UFPI, UFRGS, USNM, CAS and ANIC).

Comments. Named after its host plant on which larvae and females have been collected commonly, this new species is unique in having pronotum, mesonotum and metanotum boldly reticulate. Males were not collected.



FIGURES 3–8. *Hydatothrips* species. Head and pronotum 1–6: **(3)** *canavaliae*; **(4)** *sternalis*; **(5)** *tricinctus*; **(6)** *gliricidiae;* **(7)** *guanacastei*; **(8)** *volcano*.

Hydatothrips gliricidiae **Mound & Marullo**
(Figs 6, 12)

Hydatothrips gliricidiae Mound & Marullo, 1996: 161.

Female macroptera. Colour: body mainly yellow, head, anterior two thirds of metanotum and tergites II–III and VII brown, tergites I and IV–V pale; antennal segments I–II pale, III yellow with apical third shaded brown, IV brown with apex and base yellow, V yellow basally and increasingly darker to brown apex, VI–VIII brown; legs yellow with shaded brown areas medially; fore wings with three pale and three brown bands, apex pale.

Structure: Occipital apodeme confluent with posterior margin of eyes, ocellar area transversely striate without internal markings; pronotum with anterior area transversely striate forming a few transverse reticles without

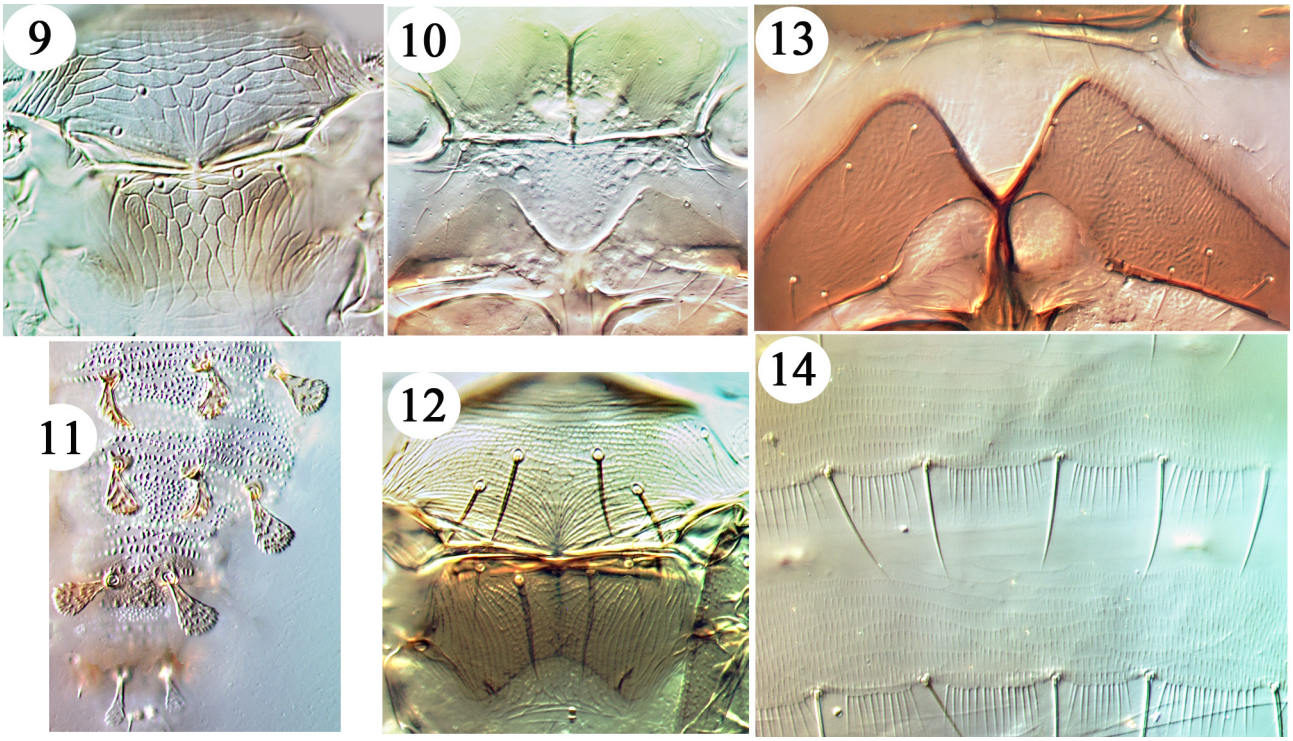
markings between the major lines, blotch distinct (Fig. 6); mesonotum transversely striate with several minute microtrichia-like lines, metanotum with transverse striae on anterior half, longitudinal striae on posterior half with internal lines (Fig. 12); fore wing second vein with two setae; posteromarginal comb on tergites II–VI incomplete medially, VII–VIII complete; tergite IX with with 4 pairs of mid-dorsal setae; sternites III–V and VII without microtrichia medially, VI with a few rows of microtrichia medially.

Male macroptera. Similar to female, but smaller and with darker abdominal tergites VII–VIII. Sternite VII with a small circular pore plate.

Larva II. Yellow without markings; antennae 7-segmented; thorax without brown sclerotized areas; body with setae short, with broadly expanded apices (Mound & Marullo 1996).

Material studied. Holotype female and two paratype males, **COSTA RICA**, Braulio Carrillo NP, Volcan Barba Station (2500 m), on Malaise trap, vi.1990 (BMNH).

Comments. Associated with *Gliricidia* leaves in Central America, this species is unique amongst Neotropical *Hydatothrips* in having the fore wing with three pale and brown bands. It is also the only species in this genus that has several microtrichia-like structures both on the mesonotum and metanotum. In the Holarctic area, *Sericothrips* species bear microtrichia on the metanotum, but differently from *H. gliricidiae*, and have the entire surface of the abdominal tergites covered with microtrichia and a more transverse metasternal plate.



FIGURES 9–14. *Hydatothrips* species. *canavaliae* 9–11: **(9)** meso and metanota; **(10)** metasternal plate; **(11)** larva II abdomen. **(12)** *gliricidiae* meso and metanotum. **(13)** *volcano* metasternal plate. **(14)** *sternalis* sternites V–VI.

***Hydatothrips guanacastei* Mound & Marullo**
(Fig. 7)

Hydatothrips guanacastei Mound & Marullo, 1996: 161.

Female macroptera. Colour: body mainly brown, tergite VI pale, tergite X yellowish brown also posterior area of metathorax; fore wing brown with pale sub-basal and subapical areas; antennal segments I–II pale, III yellow with apical half light brown, IV brown with basal third light brown, V–VIII brown; fore femora yellow with brown area mid-dorsally, mid femora with apex and basal third yellow, hind femora with base yellow, fore tibiae yellow with suffused brown area medially, mid and hind tibiae brown with base and apex light brown.

Structure: Occipital apodeme almost confluent with posterior margin of eyes (Fig. 7), ocellar area transversely striate with internal markings; pronotal striae forming a few long reticles without markings between the major lines, blotch distinct; mesonotum transversely striate, metanotum with transverse striae on anterior half and longitudinal striae on posterior half; fore wing second vein with two setae; posteromarginal comb on tergites II–V with minute teeth medially, VI with medium-sized teeth medially, comb on VII–VIII complete; tergite IX with 2 pairs of mid-dorsal setae; sternites III–VI with two or three rows of microtrichia medially, VII without microtrichia medially.

Material studied. Holotype female, **COSTA RICA**, Guanacaste National Park, Playa Naranja, on *Acacia* sp. leaves, 3.vi.1989 (BMNH).

Comments. This species remains known only by the holotype. It is similar to *volcano* and *sternalis*, from which can be distinguished by the character in the key.

***Hydatothrips sternalis* (Hood)**

(Figs 4, 14, 80, 81)

Sericothrips sternalis Hood, 1935: 148.

Female macroptera. Colour: body dark brown (Fig. 80), tergite VI pale; fore wing dark with white sub-basal area and an indistinct paler area medially; antennal segments I–III (or IV) largely pale; hind femora brown, hind tibiae yellow.

Structure: Occipital apodeme confluent with posterior margin of eyes, ocellar area transversely striate (Fig. 4); antennal segments III & IV with constricted apical neck; pronotum with anterior area transversely striate to narrowly reticulate with many markings between the major lines, blotch well-defined (Fig. 4); mesonotum and metanotum striate with markings between the striae; fore wing second vein with 2 setae; tergites II–VIII with comb of microtrichia complete on posterior margin but very short on II–VI; tergite IX with 2 pairs of mid-dorsal setae; sternites with microtrichia present medially, posterior margin with long fringe (Fig. 14).

Male macroptera. Similar to female, but smaller and with tergite VII mostly pale with suffused brown area medially (Fig. 81).

Material studied. **BRAZIL**, Minas Gerais State, 1 female from pea foliage, 14.vii.1933 (E.J.Hambleton) (USNM); Pará State, Itaituba, 1 female from dead twigs, 14.x.2013 (A. Cavalleri) (UFRGS). **ECUADOR**, Vinces, 11 females and 2 males from Cedar, 14.x.1944 (E.J.Hambleton) (USNM).

Comments. This species was described from 14 females and 4 males taken on Barrow Colorado Island, Panama, plus 1 male from Martinique. The holotype, collected from *Citrus* [Rutaceae] leaves, and paratypes from *Hamelia* [Rubiaceae] leaves, were examined during visits to the USNM. The species is recorded here for the first time from Brazil and Ecuador. Females have the posteromarginal fringe of microtrichia on the median abdominal tergites very short and sometimes difficult to discern.

***Hydatothrips tricinctus* (Hood)**

(Figs 5, 82, 83)

Sericothrips tricinctus Hood, 1928: 231.

Female macroptera. Colour: body bicoloured (Fig. 82), generally brown but yellow on pronotum, abdominal segments I, IV–VI and IX–X; fore wing dark with white sub-basal area and paler area at apex; antennal segments I–III largely pale but IV brown; hind femora pale brown, hind tibiae brownish yellow.

Structure: Occipital apodeme almost confluent with posterior margin of eyes, ocellar area with widely spaced transverse striae (Fig. 5); antennal segments III & IV with constricted apical neck; pronotum with anterior area broadly reticulate with no markings between the major lines, blotch weakly-defined (Fig. 5); mesonotum and metanotum with widely spaced striae; fore wing second vein with no setae; tergites II–VI without complete comb of microtrichia on posterior margin; tergite IX with 4 pairs of mid-dorsal setae.

Male macroptera. Similar to female, but smaller (Fig. 83); tergite VII mostly pale with suffused brown area medially; sternites III–VIII with transverse pore plates.

Material studied. **BRAZIL**, Santa Catarina State, Nova Teutônia [Seara], 11 females and 1 male from dead grasses, vi.1957 (F. Plaumann) (USNM); Rio Grande do Sul State, Porto Alegre, 1 male and 1 female on grass, 14.ii.2011 (F.S.Melo & A.Cavalleri) (UFRGS); Piaui State, Bom Jesus, 1 female from soybeans, 8.xi.2011, 1 female from same locality and host, 30.vii.2012 (E.F.B.Lima) (UFPI).

Comments. In addition to the material listed above, the holotype of this species from Martinique, also paratypes from Guadeloupe, Dominica and Trinidad, were examined during visits to the USNM collections. The specimens from Brazil differ from the Caribbean specimens in having the pronotal blotch yellow, in contrast to the white of the rest of the pronotum.

Hydatothrips volcano Mound & Marullo
(Fig. 8)

Hydatothrips volcano Mound & Marullo, 1996: 162.

Female macroptera. Colour: body mainly brown, tergite VI pale, tergite X yellowish brown also posterior area of metathorax; fore wing brown with pale sub-basal area and paler suffused brown area medially; antennal segment I yellow, II pale, III yellow with apical third light brown, IV yellow on basal half and increasingly darker towards apex, V–VIII brown; femora brown, except apex of fore femora, fore tibiae yellowish brown with brown suffused area medially, mid and hind tibiae brown with apex and base light brown.

Structure: Occipital apodeme confluent with posterior margin of eyes (Fig. 8), ocellar area transversely striate with internal markings; pronotum anterior area transversely reticulate with markings between the major lines, blotch distinct; mesonotum transversely striate (Fig. 8), metanotum with transverse striae on anterior half and longitudinal striae on posterior half; fore wing second vein with two setae; posteromarginal comb on tergites II–VI with minute teeth medially, VII with medium-sized teeth medially, VIII complete; tergite IX with 2 pairs of mid-dorsal setae. Sternites III–V and VII without microtrichia medially, VI with a few rows of microtrichia medially.

Material studied. Holotype female, **COSTA RICA**, Braulio Carrillo National Park, Volcan Barba Station (2500 m), on Malaise trap, vi.1990 (BMNH).

Comments. The only known specimen of this species was collected from a trap, and there is no further information about its biology. It is similar to *H. sternalis*, but larger, darker and without microtrichia medially on abdominal sternites.

Hydatothrips williamsi (Hood) comb. n.

Sericothrips williamsi Hood, 1928: 230.

Female macroptera. Colour: body yellow with light brown markings, head and metanotum brown with ocellar triangle darker, pronotal blotch light brown, tergites II–VI with antecostal ridge dark and brown markings anterolaterally, VII–X yellow; fore wing more or less uniformly brownish yellow with weak shadings around sub-basal paler area, clavus pale; antennal segments I–III pale, IV brown; hind tibiae yellow, femora light brown distally.

Structure: Occipital apodeme confluent with posterior margin of eyes, mouth cone extending beyond fore coxae; ocellar area apparently not striate; antennal segments III & IV elongate with apex constricted into slender neck; pronotum transversely striate-reticulate on anterior area, blotch striate with setae irregular, anterior margin distinct; mesonotal setae almost in transverse row; metanotum with poorly defined striations; metasternal plate with deeply U-shaped emargination. Fore wing second vein with no setae distally; tergites VII–VIII with complete comb of microtrichia on posterior margin, no comb medially on remaining tergites; tergite IX with 3 pairs of mid-dorsal setae.

Male macroptera. Similar to female, but smaller and with head slightly paler (ocellar area still darker); sternites V–VII with one circular pore plate.

Larva II. Clear with dark markings all over the body; abdominal segments IX and X brown. Antennae 7-segmented. Thorax with brown sclerotized lateral areas on pronotum, mesonotum and metanotum. Body with several brown setae with expanded and roundly fringed apices (apex about 3 times as long as base) arising from well-developed brown rings; setal pair II on tergites III–VI with flatly expanded apex.

Material Studied. Holotype female, **ST CROIX**, Virgin Islands, 9.iii.1915 (USNM). **ECUADOR**, Galápagos Is., Floreana Fucia Cruz, 1 female, 27.iii–16.iv.1996, 1 female, 3–16.iv.1996, 1 female 16–22.iv.1996 (ANIC). **BRAZIL**, Ceará State, Tianguá, 1 female, 1 male and 1 larva II on leaves of unidentified plant, 13.ii.2016 (E.F.B. Lima); Piauí State, Bom Jesus, 1 female on *Chamaesyce* sp., 30.vii.2012 (R. Querino), Floriano, 1 male on grasses, 23.ii.2016 (E.F.B.Lima) (UFPI); Rio Grande do Sul State, Eldorado do Sul, 1 female, 12.xi.2009 (L. Podgaiski) (UFRGS); São Paulo State, Juquiá Cedro, 1 female on *Allamanda polyantha*, 15.ii.2003 (E. Miyasato) (IBSP).

Comments. Hood described this species from a single female and compared it to *tricinctus*. This holotype is faded and rather opaque, and not possible to photograph clearly. The metasternal plate is not clearly visible, and most previous workers have assumed that this structure does not have an emarginate anterior margin. In contrast, freshly mounted specimens from Galapagos Islands and Brazil have a deeply U-shaped emargination, and the species is therefore here referred to *Hydatothrips*. It is now known to be widespread through the Neotropics from the Caribbean Islands to southern Brazil. The species has the four mesonotal setae almost in a transverse row (at most two lines of sculpture distant), the antennal segments slender and the presence of three pairs of mid-dorsal setae on tergite IX. The pronotal posteroangular setae are long, about twice as long as the median length of the pronotal blotch. Hoddle and Mound (2011) listed *Hydatothrips williamsi* from Galapagos Islands, but did not mention the homonym that this thus created in the Australian fauna. As a result of the new combination given above, *Hydatothrips tareei* **nom. nov.** is proposed as a replacement name for the Australian species, *H. williamsi* Mound & Tree (2009).

Neohydatothrips John

Type species: *Neohydatothrips latereostriatus* John, 1929: 34, synonym of *Sericothrips portoricensis* Morgan, 1925: 3.

As indicated in the Introduction, this genus currently includes species from most parts of the world, although with a large proportion from the New World. The biology of most species remains unknown, although some seem to live in flowers and others on leaves, but there is limited information available on the extent even of this specificity. In the Neotropical region, Mound and Marullo (1996) provided a key to the 13 species recorded between Mexico and Panama. Here we provide a key to the 41 species recorded from the Neotropics, including 14 new species.

Key to species of *Neohydatothrips* (based on females)

[* indicates five species included only from original descriptions]

1. Fore wing almost clear, very weakly shaded, or more or less uniformly brownish grey, sometimes with extreme apex slightly paler (Figs 67–69, 71) 2
-. Fore wing distinctly bicoloured, with one or more bands distinctly paler than dark areas (Figs 70, 72–74) 15
2. Mesonotal median pair of setae almost in line with lateral pair, not more than the width of two sculptured striae in advance of the lateral pair (Fig. 28) 3
-. Mesonotal median pair of setae arising anterior to the lateral pair, at least the width of 4 sculptured striae in advance of the lateral pair (Fig. 26) 5
3. Metanotum weakly reticulate medially; tergite IX with 3 pairs of mid-dorsal setae . . . . . *inversus*
-. Metanotum with irregular longitudinal striations medially (Fig. 25); tergite IX with 2 pairs of mid-dorsal setae 4
4. Antennal segments III–IV almost uniformly brown with extreme apex darkest but lacking an apically constricted neck (Fig. 66); abdominal segments VIII–X brownish yellow; ocellar area with weak, broadly spaced lines (Fig. 35) . . *plaumanni* **sp. n.**
-. Antennal segment III largely yellow, not darker at apex, IV with constricted apical neck; abdominal segments VIII–X pale; ocellar area with narrowly transverse reticulate lines (Fig. 25) . . . . . *goianus* **sp. n.**
5. Fore wing clavus with three stout setae (Fig. 75); metanotum reticulate (Fig. 49); abdominal tergites III–VI mostly brown, only posterior fourth yellow . . . . . *hadrosetae*
-. Fore wing clavus with slender setae; metanotum striate; abdominal tergites mostly yellow, only antecostal ridges and lateral thirds anteriorly brown 6
6. Ocellar area with closely spaced transverse lines (Fig. 27) 7

-. Ocellar area very weakly reticulate (Fig. 26), or without sculpture 8
7. Anterior area of pronotum with fine sculpture lines present between striae; pronotal posteromarginal setae S2 55–60 microns long . . . . . *flavens*
-. No sculpture lines between pronotal striae; pronotal setae S2 45 microns long. . . . . *ikelus* **sp. n.**
8. Ocellar region weakly and irregularly reticulate. 9
-. Ocellar region with no sculpture lines. 13
9. Pronotum pale with several brown spots, blotch indistinct, internal markings present between striae . . . . . *maculatus* **sp. n.**
-. Pronotum pale with a distinguishable dark blotch (Fig. 26), no internal markings between pronotal striae 10
10. Tergites VII–IX brown; fore wing second vein with two setae. . . . . **aztecus*
-. Tergites VII–IX yellow; fore wing second vein with one or no seta. 11
11. Ocellar setae III no further apart than width of first ocellus; fore wing second vein with no setae distally; mouthcone long, extending beyond fore coxae. . . . . *gracilipes*
-. Ocellar setae III further apart; fore wing second vein with one seta distally; mouthcone not extending beyond fore coxae. . . 12
12. Posteromarginal comb on tergite VII with minute teeth; dorsum of hind tibia shaded brown medially; antecostal ridge on tergite VIII yellow. . . . . *signifer*
-. Posteromarginal comb on tergite VII with developed teeth; dorsum of hind tibia yellow; antecostal ridge on tergite VIII medially usually brown. . . . . *burungae*
13. Antennal segment IV with sense cone scarcely extending to base of segment V; tergite VII with posteromarginal comb complete medially . . . . . *sulcus* **sp. n.**
-. Antennal segment IV with sense cone extending beyond basal third of segment V; tergite VII with posteromarginal comb absent medially 14
14. Pronotum with brown spots laterally and indistinguishable blotch; tergites VII–VIII with brown shadings medially . . . . . *zucchi* **sp. n.**
-. Pronotum pale with distinguishable blotch; tergites VII–VIII completely yellow. . . . . *luculentus*
15. Pronotum boldly reticulate in anterior third (Fig. 15), transverse width of some median reticles no more than 5 times their median length 16
-. Pronotum usually transversely striate, if with transversely elongate reticles then their transverse width is more than 5 times their median length (Figs 32, 34) 20
16. Some pronotal reticles with internal linear sculptured markings [some reticles fused transversely to produce elongate reticles]; median pair of mesonotal setae arise in line with lateral pair; fore wing uniformly dark distal to sub-basal pale band (Fig. 67) . . . . . *basilaris*
-. Pronotal reticles without internal markings; median pair of mesonotal setae arise anterior to lateral pair; fore wing with pale band either medially or at apex (Figs 87, 88) 17
17. Tergites II–VI with posteromarginal fringe of microtrichia medially [fore wing uniformly dark medially but sharply paler distal to last two setae on first vein; head dark brown, ocellar area with widely spaced striae; pronotum anterior third yellow, also abdominal segments V–VI; metanotal striae close and longitudinal medially] . . . . . *fimbriatus*
-. Tergites II–VI without a fringe of microtrichia medially on posterior margin 18
18. Fore wing with apex pale; occipital apodeme not touching posterior margin of compound eyes (Fig. 20). . . . . *daedalus*
-. Fore wing apex brown (Fig. 87); occipital apodeme touching posterior margin of compound eyes (Fig. 17). 19
19. Fore wing with a distinct median pale band; mid- and hind femora brown only medially . . . . . **pseudoannulipes*
-. Fore wing with a diffuse and indistinct median pale band (Fig. 89); mid- and hind femora completely brown . . *chelinus* **sp. n.**
20. Occipital apodeme close to or confluent with posterior margin of compound eyes (Fig. 36) 21
-. Occipital apodeme further apart from posterior margins of compound eyes (at least one facet of distance) (Figs 37, 38) 31
21. Anterior half of pronotum with internal markings between striae (sometimes very few) 22
-. Anterior half of pronotum without internal markings between striae. 27
22. Fore wing with three pale bands (but apical band sometimes weak) (Fig. 100). 23
-. Fore wing with one or two distinct pale bands (Fig. 103). 25
23. Pronotum with dense internal markings between the striae (Fig. 32); fore wing without subapical lobe . . . . . *notialis* **sp. n.**
-. Pronotum with few internal markings between the striae (Fig. 20); fore wing with subapical lobe (cf. Fig. 34 in Lima & Mound, 2016) 24
24. Fore wing with no setae on second vein; pronotal lines of sculpture forming transverse reticles . . . . . *dosulis* **sp. n.**
-. Fore wing with one seta on second vein; pronotal lines of sculpture not forming transverse reticles . . . . . *maculicollis*
25. Fore wing with one distinct pale band . . . . . *novateutoniae* **sp. n.**
-. Fore wing with two distinct pale bands. 26
26. Tergites III–VI medially with fringe of short microtrichia on posterior margin; metanotal sculpture longitudinally striate medially with lines between the main striae; abdominal segment X brown; fore wing median dark area long, usually more than 2.0 times as long as the median pale area . . . . . *portoricensis*
-. Tergites III–VI medially with no microtrichia on posterior margin; metanotal sculpture with anastomosing lines medially, and many fine sculptured markings between the striae; abdominal segment X yellow; fore wing median dark area shorter, usually less than 1.5 times as long as the median pale area (Fig. 105) . . . . . *ruginosus*
27. Fore wing with three distinct pale areas (Figs 90, 93) 28
-. Fore wing with one or two pale areas (Fig. 107) 30
28. Abdominal tergites III–IV and VII–IX completely brown . . . . . *varius*
-. Abdominal tergites III–IV yellow at least medially; tergites VII–IX yellow or brownish yellow 29

29. Antennal segments IV–V largely yellow with apices shaded brown; abdominal tergite II completely brown; abdominal tergite VII brown anterolaterally . . . . . *fasciatus*
-. Antennal segments IV–V largely or completely brown; tergite II brown only laterally; abdominal tergite VII completely brown . . . . . *flavicollis*
30. Fore wing clavus with setae exceptionally stout, black, and longer than clavus width; pronotal blotch dark brown; abdominal segment VI dark brown medially but with a small yellow area laterally . . . . . *clavisetis* **sp. n.**
-. Fore wing clavus setae not stout; pronotal blotch yellow (Fig. 39); abdominal segment VI uniformly suffused brown or brownish yellow . . . . . *sidae*
31. Anterior half of pronotum with internal markings between striae (sometimes very few) 32
-. Anterior half of pronotum without internal markings between striae 35
32. Fore wing with median and apical areas uniformly dark [sub-basal area pale] . . . . . *lassatus*
-. Fore wing with median and apical areas pale or suffused with brown [sub-basal area pale] 33
33. Fore wing with three distinct pale areas, second vein without setae; mesonotum and metanotum posteriorly yellow; tergites V–VI yellow in contrast to brown VII–VIII . . . . . **mirandai*
-. Fore wing with median and apical areas suffused brown to pale; second vein with one seta; mesonotum and metanotum completely brown; tergites V–VI brown 34
34. Ocellar area with weak lines of sculpture; pronotal transverse sculpture lines close together (Fig. 42) . . . . . *tibialis*
-. Ocellar area with distinct lines of sculpture forming ill-defined reticles (Fig. 22); pronotal transverse lines of sculpture further apart . . . . . *humberto*
35. Head bicoloured, mostly yellow (Fig. 38) 36
-. Head uniformly brown (Fig. 37) 38
36. Body bicoloured dark brown and pale; tergites VII–VIII brown . . . . . *renatae* **sp. n.**
-. Body colour yellowish brown; tergites never dark brown 37
37. Fore wing with three distinct pale bands . . . . . *gaucho* **sp. n.**
-. Fore wing mostly brown with sub-basal area pale . . . . . **rapoporti*
38. Pronotal blotch dark brown (Fig. 37) . . . . . *samayunkur*
-. Pronotal blotch yellow or indistinct 39
39. Postocellar setae in a longitudinal row (Fig. 22); occipital apodeme remarkably far from posterior margin of compound eyes (2 or more facets distant) . . . . . *hemileucus*
-. Postocellar setae in transverse row; occipital apodeme about one facet width from posterior margin of compound eye 40
40. Pronotal blotch yellow, but distinct; abdominal tergites IX–X brown . . . . . *paraensis*
-. Pronotal blotch indistinct; abdominal tergites IX–X yellow . . . . . **angelorum*

Neohydatothrips angelorum Valenzuela-García *et al.*

Neohydatothrips angelorum Valenzuela-García, Retana-Salazar, Johansen-Naime, García-Martínez, Gallegos-Morales & Carvajal-Cazola, 2012: 51.

Female macroptera. Colour: body bicoloured, head, pterothorax and tergites II–III and VII–VIII brown, tergites IV–VI yellow but apparently with suffused brown area medially, pronotum and tergites IX–X yellow, fore wing with three pale bands, antennal segments I–III yellow, IV–V brown with base yellow, VI–VIII brown; tibiae and fore and mid femora yellow, hind femora yellow with apex brown.

Structure: Occipital apodeme not confluent with posterior margin of eyes, ocellar area transversely striate; pronotum transversely striate with indistinct blotch; mesonotum and anterior part of metanotum closely striate; metasternal plate with shallow emargination; fore wing second vein with 2 setae; comb of microtrichia incomplete on tergites II–VI, complete on VII–VIII; tergite IX apparently with 2 pairs of mid-dorsal setae.

Material studied. None.

Comments. This species was based on a single female collected from beans in Nayarit, Mexico. Judging from the description, it is similar to *N. paraensis* and *Neohydatothrips hemileucus*, from which can be distinguished by the indistinct pronotal blotch and unusual yellow abdominal tergites IX–X. Although the authors state that the anterior third of the pronotum has transverse reticulation, the image they published seems to indicate broader reticles on the pronotum as in *N. hemileucus*.

Neohydatothrips aztecus Johansen stat. rev.

Neohydatothrips aztecus Johansen, 1983: 113.

Female macroptera. Colour: mainly yellowish brown, ocellar area brown, also pronotal blotch, anterior third and lateral areas of mesonotum and metanotum, antecostal ridges and anterolateral areas on tergites II–VI and VII–IX; fore wing grey; antennal segments I–II brown, III yellow with base brown and apical third light brown, IV brown with basal third yellow, V brown with small yellow ring at base, VI–VIII brown.

Structure: Occipital apodeme not confluent with posterior margin of eyes, ocellar area transversely striate; pronotum transversely striate with distinct blotch; mesonotum transversely striate; metanotum longitudinally reticulate; metasternal plate with shallow emargination; fore wing second vein with 2 setae; comb of microtrichia incomplete on tergites II–VI and complete on VII–VIII; tergite IX with 2 pairs of mid-dorsal setae.

Material studied. None.

Comments. This species was described from 4 females and 2 males collected in Pedregal de San Ángel, Mexico City, Mexico. Although placed in synonymy with *N. signifer* by Mound & Marullo (1996) based on the similarities on colouration and structure, it can be distinguished by the brown tergites VII–IX (Johansen 1983). Moreover, it was described as having two setae on the second vein of the fore wing in contrast to the single seta found in *N. burungae*.

Neohydatothrips basilaris (Hood)

(Figs 15, 45, 67, 84)

Sericothrips basilaris Hood, 1941: 139.

Female macroptera. Colour: body dark brown (Fig. 84), tergite X pale; fore wing uniformly dark with white subbasal area; antennal segments I–III (or IV) largely pale; hind femora and tibiae brownish yellow.

Structure: occipital apodeme confluent with posterior margin of eyes, ocellar area transversely striate (Fig. 15); antennal segments III & IV with constricted apical neck; pronotum with anterior area reticulate, blotch well-defined (Fig. 15); mesonotum and anterior part of metanotum closely striate (Fig. 45); metasternal plate with shallow emargination; fore wing second vein with 2 setae (Fig. 67); tergites II–VIII with comb of microtrichia complete on posterior margin but short on anterior tergites: tergite IX with 2 pairs of mid-dorsal setae.

Material studied. Holotype female, **CUBA**, San Vincente, 8–9 vii.1940 (USNM). **BRAZIL**, Santa Catarina State, Nova Teutônia [Seara], 14 females, 3 males, 1.i.1949 (F. Plaumann) (USNM).

Comments. This is a large dark brown species with much red internal pigment. Described from Cuba, but recorded from Panama and Costa Rica (Mound & Marullo 1996) and here from Brazil (Santa Catarina), the thoracic sculpture is almost unique in the genus (Fig. 15). As in *N. fimbriatus*, tergites II–VIII have a fringe of microtrichia medially on the posterior margin, although this fringe is short on the anterior tergites. Antennal segments III and IV both have a long slender apical neck.

Neohydatothrips burungae (Hood) stat. rev.

(Figs 16, 51, 53, 60, 68, 85, 86)

Sericothrips burungae Hood, 1935: 150.
Sericothrips mimosae Hood, 1955: 134. Synonymy in Mound & Marullo, 1996: 172.
Sericothrips denigratus De Santis, 1966: 11 **syn.n.**

Female macroptera. Colour: variable, body yellow or brownish yellow with light brown markings, ocellar region light brown, also pronotal blotch, anterior margin of mesonotum, and posterior of metanotum; tergal antecostal ridge dark, tergites II–VI shaded laterally, VII–VIII shaded medially, IX–X yellow; fore wing grey, darker subbasally (Fig. 85); antennal segment I pale, II usually shaded, III and base of IV pale; hind tibiae yellow, femora lightly shaded.

Structure: Occipital apodeme not confluent with posterior margin of eyes, ocellar area irregularly reticulate (Fig. 16); antennal segments III & IV with apex not constricted to neck; pronotum transversely striate, blotch well-defined (Fig. 16); mesonotum and anterior part of metanotum striate (Fig. 51); metasternal plate with shallow emargination (Fig. 53); fore wing second vein with one seta distally (Fig. 68); tergites VII–VIII with complete

comb of long microtrichia on posterior margin, no comb on remaining tergites; tergite IX with 2 pairs of mid-dorsal setae.

Male macroptera. Similar to female, but smaller (Fig. 86); sternites with one small circular pore plate on tergite VII (Fig. 60).

Larva II. Pale in colour, with microtrichia on dorsal surface. Antennae 7-segmented, segment I, apex of II and III yellow, IV–VII and bases of II–III yellowish brown. Thorax without brown sclerotized areas. Body with several short brown setae with apices fringed but not expanded, length up to about 20 microns on thorax and abdominal tergites I–IV, arising from normal setae insertions; sternal setae acute.

Material studied. Holotype female, **PANAMA**, Barro Colorado Is., 4.viii.1933 (USNM). Holotype female of *Sericothrips denigratus*, **ARGENTINA**, Tucuman Province, San Javier, 19.iii.1960 (MLP). **BRAZIL**, Santa Catarina State, Nova Teutônia [Seara], 9 females, 2 males from *Balfourodendron licanum*, xii.1949; same locality, 13 females, 1 male, various dates 1948–1951 (F. Plaumann) (USNM); Paraná State, Warta, 1 female from soybeans, 16.i.2001 (D.S. Gomes) (ESALQ); Rio Grande do Sul State, Viamão, Parque Estadual de Itapuã, 1 female from *Bidens* sp., 24.vi.2003, 1 female from flowers of Asteraceae, 13.iv.2004 (A. Cavalleri) (UFRGS).

Comments. *N. burungae* and *N. mimosae* were placed into synonymy with the Mexican species *N. signifer* by Mound and Marullo (1996), and *N. aztecus* was also included. However, Sueo Nakahara (in litt. 2004) indicated that *burungae* and *aztecus* should be considered valid, with *N. signifer* distinguished by an unusually short comb on tergite VII and hind tibiae that are shaded brown medially; this opinion is accepted here although we have not studied the *signifer* type specimen. *N. burungae* is unusual in having the interocellar area distinctly but weakly reticulate, much as in *N. gracilipes* and *N. samayunkur*. The apex of antennal segment IV is brown in colour, and not narrowed to a distinct neck. In the holotype of *N. denigratus*, the apical part of segment IV is more elongate, but despite this that species is treated here as a synonym. The metanotal striae are similar to those of *N. gracilipes* and not closely set, with no markings or shadow lines associated with the major striae. *N. burungae* was found in large numbers on avocado leaves in Mexico and Guatemala (Hoddle *et al*. 2002), and Contreras and Zamar (2010) indicated that the species breeds on *Medicago sativa*, *Phaseolus vulgaris* and *Solanum* e*sculentum* in Argentina (Table 1).

***Neohydatothrips chelinus* sp. n.**
(Figs 17, 46, 54, 87)

Female macroptera. Colour: body bicoloured (Fig. 87), head brown with postoccipital area paler, pronotal blotch dark brown with anterior area pale with dark reticulate lines; mesonotum and metanotum dark brown, tergites II–VII with antecostal ridge dark brown, II–IV brown laterally, V–VI mainly yellow but shaded brown medially, VII–IX dark brown, X light brown; fore wing brown with sub-basal pale band, an indistinct pale median area and apex sometimes a little paler, clavus dark at base with dark setae; antennal segments I–II weakly shaded, III–IV pale with apex light brown; hind tibiae yellow, femora brown.

Structure: Occipital apodeme confluent with posterior margin of eyes, ocellar area with widely spaced striae, setal pair III on margins of ocellar triangle (Fig. 17); antennal segments III & IV with short constricted apical neck; pronotum boldly reticulate on anterior and posteromedian areas, blotch striate with transverse row of setae on anterior margin (Fig. 17); mesonotum striate, median setal pair anterior to the lateral (Fig. 46); metanotum anterior half transversely striate, posterior half longitudinally striate, two pairs of setae on anterior margin; metasternal plate with distinctive anterior emargination (Fig. 54); fore wing second vein with 2 setae distally; tergites II–VI with comb of microtrichia incomplete medially, VII with minute teeth medially, VIII with complete comb; tergite IX with 2 pairs of mid-dorsal setae; sternites without microtrichia medially.

Measurements (holotype female in microns): Body length 1185, Head, length 63, width 1680; ocellar setae III length 24. Pronotum length 113, width 185. Fore wing length 685. Antennal segments I–VIII length 23, 34, 54, 51, 43, 48, 10, 13.

Male macroptera. Male similar to female, but tergites V and VII light brown; sternites without pore plates.

Measurements (paratype male in microns): Body length 940, Head length 63, width 140; ocellar setae III length 15. Pronotum length 100, width 165. Fore wing length 565. Antennal segments I–VIII length 23, 35, 49, 46, 36, 38, 8, 10.

Material studied. Holotype female, **BRAZIL**, Santa Catarina State, Nova Teutônia [Seara], on Myrtaceae, 5.xii.1949 (JDH 2077) (F. Plaumann) (USNM).

Paratypes: 31 females and 4 males collected with holotype (JDH 2077) (USNM); Rio Grande do Sul State, Cambará do Sul, Parque Nacional Aparados da Serra, 1 female on *Myrcia retorta*, 27.i.2013 (A. Cavalleri) (UFRGS).

Comments. Along with *N. basilaris*, *N. fimbriatus* and *N. daedalus*, this is one of four species with the anterior area of the pronotum boldly reticulate. Unlike the others, the pronotal blotch is dark brown in contrast to the pale anterior third of the pronotum. As indicated above, the colour of the fore wings is variable with the distal paler areas indefinite.

Neohydatothrips clavisetis sp. n.

(Figs 19, 48, 69, 78)

Female macroptera. Colour: body dark brown, yellowish only on tergite X, lateral areas of VI (cf. Fig. 78), and anterior margin of pronotum; fore wing dark with pale sub-basal band and diffusely paler median area, clavus with stout black setae; antennal segment I light brown, II pale, III pale medially but base and apex light brown, IV basal half pale apical half brown, V–VIII brown; femora dark brown, tibiae and tarsi yellowish; major setae on wings and pronotum stout and black.

Structure: Occipital apodeme confluent with posterior margin of eyes, ocellar area striate; antennal segments III & IV slender with apex not constricted to a neck; pronotum transversely striate, blotch well-defined with anteromarginal setae irregularly arranged, posteroangular paired setae long and dark (Fig. 19); mesonotum and anterior part of metanotum closely striate; metasternal plate with shallow anterior emargination; fore wing second vein with no setae (Fig. 48); clavus with 4 long veinal setae and one long discal seta (Fig. 69); tergites II–VI with comb of microtrichia absent medially, VI with minute teeth, VII–VIII with comb of long microtrichia; tergite IX with 2 pairs of mid-dorsal setae; sternites apparently with discal microtrichia medially.

Measurements (holotype female in microns): Body length 980, Head, length 58, width 150; ocellar setae III length 10. Pronotum length 165, width 178. Fore wing length 650; clavus setae 75. Antennal segments I–VIII length 17, 30, 49, 46, 36, 36, 10, 9.

Material studied. Holotype female, **BRAZIL**, Santa Catarina State, Nova Teutônia [Seara], on *Solanum*, 25.v.1949 (JDH 2044) (USNM).

Paratype female, **BRAZIL**, São Paulo State, São Carlos, on vine, 15.vi.1948 (JDH 1633) (USNM).

Comments. This is one of the darkest species of *Neohydatothrips* in South America and, although known only from 2 females collected by Fritz Plaumann in the 1940's, it is remarkable for the unusually stout black setae on the fore wing clavus and the slender antennae.

Neohydatothrips daedalus (Hood)

(Fig. 88)

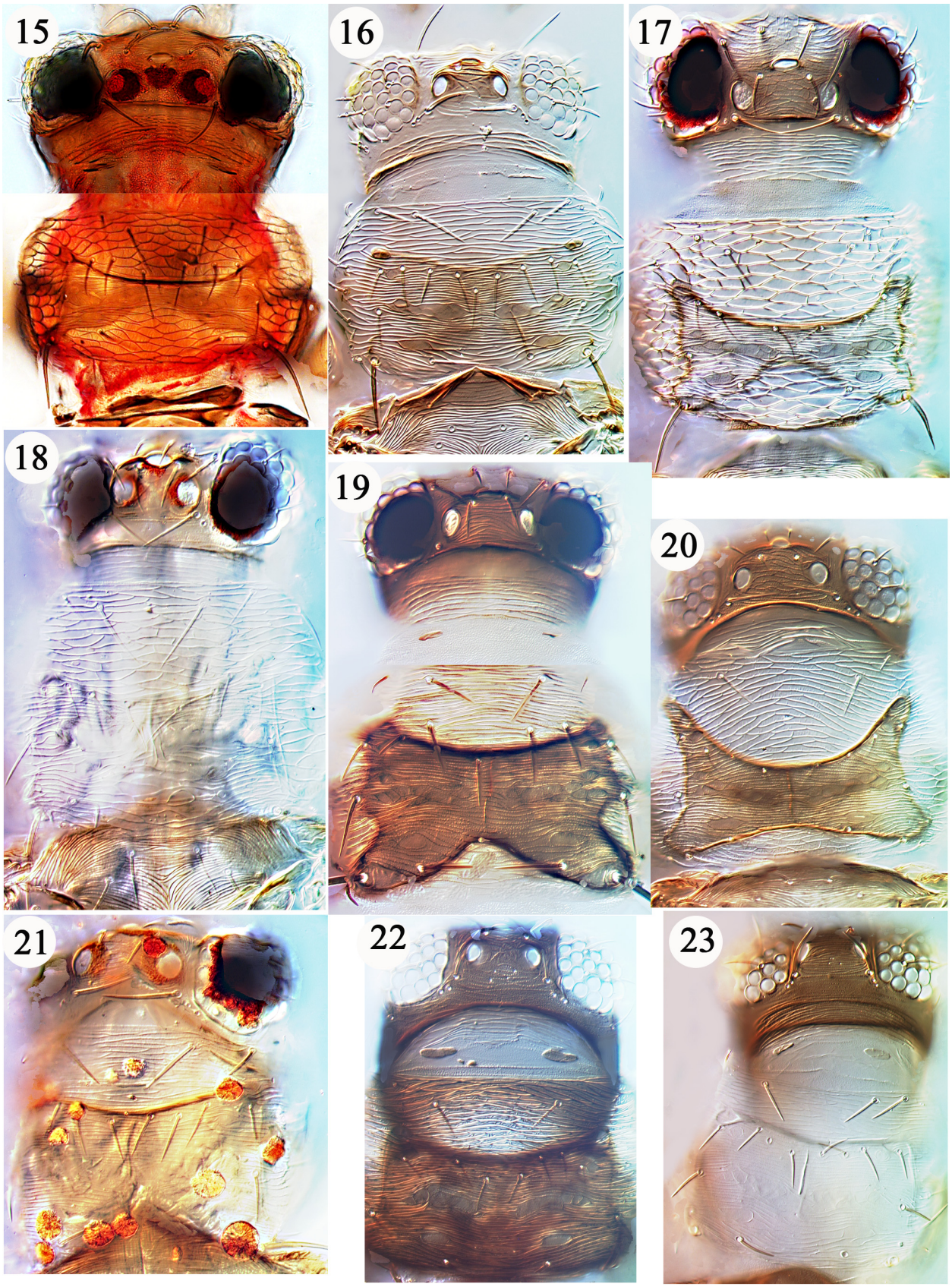
Sericothrips daedalus Hood, 1954: 201.

Female macroptera. Colour: body strongly bicoloured (Fig. 88), brown on head, mesonotum, metanotum, tergites II–IV laterally, tergites VII–IX; fore wing with 3 dark and 3 pale bands, apex pale, clavus dark with pale setae; antennal segments I–II light brown, III and base of IV pale; hind tibiae yellow with light shading medially.

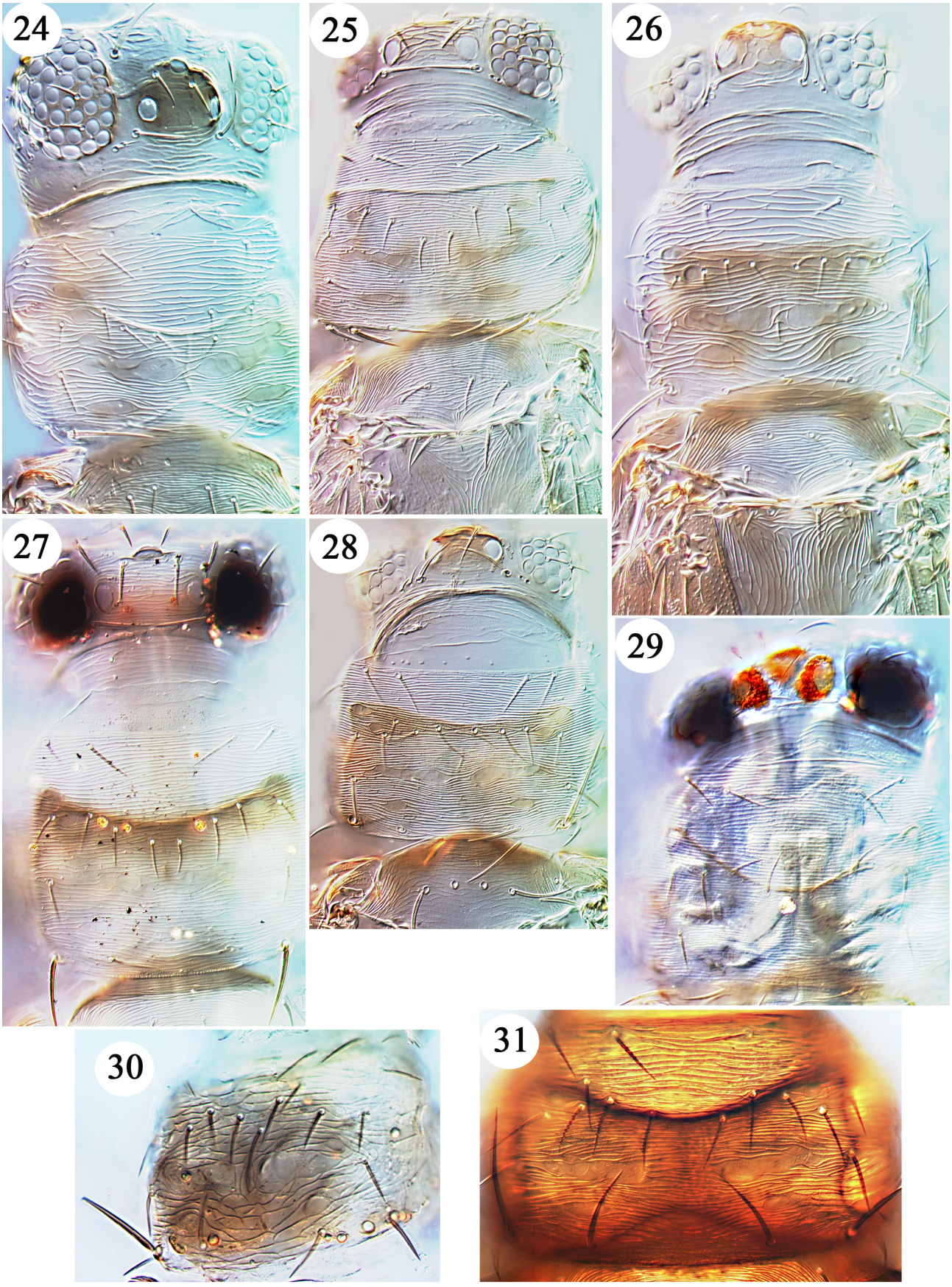
Structure: Occipital apodeme close to but not confluent with posterior margin of eyes, ocellar area irregularly reticulate; antennal segments III & IV constricted to short apical neck; pronotum transversely reticulate without internal markings, blotch well-defined and transversely striate; mesonotum and anterior part of metanotum striate; metasternal plate with shallow emargination; fore wing second vein with 1 or 2 setae; tergites VII–VIII with complete comb of long microtrichia on posterior margin, VI with comb shorter than diameter of campaniform sensilla, no comb on remaining tergites; tergite IX with 2 pairs of mid-dorsal setae.

Male macroptera. Similar to female, but smaller and with tergite VII pale.

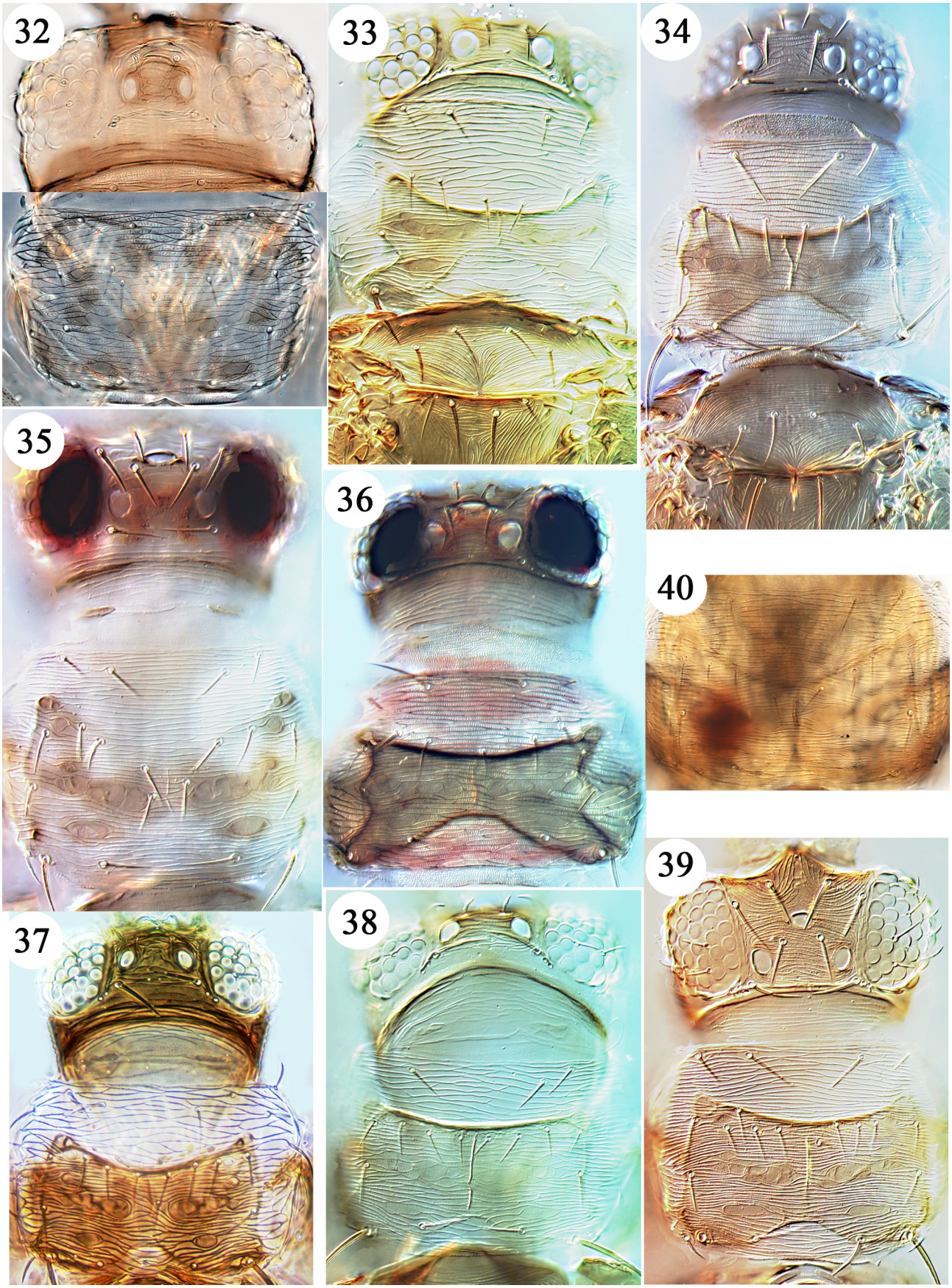
Material studied. Holotype female and paratype male, **BRAZIL**, Santa Catarina State, Nova Teutônia [Seara], on *Luehea,* 25.v.1949 (USNM).



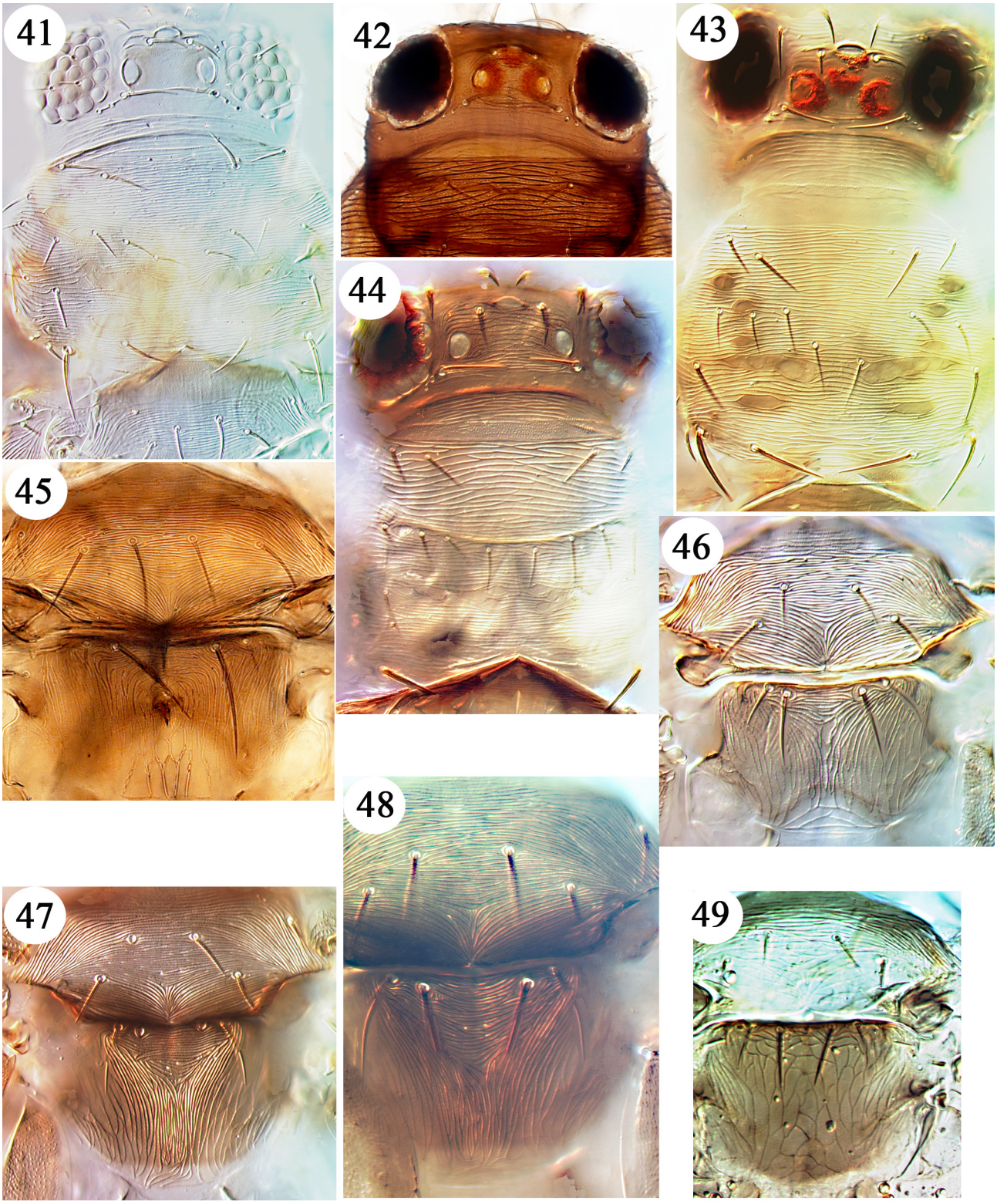
FIGURES 15–23. *Neohydatothrips* species, head and pronotum. **(15)** *basilaris*; **(16)** *burungae*; **(17)** *chelinus*; **(18)** *fasciatus*; **(19)** *clavisetis*; **(20)** *dosulis*; **(21)** *flavens*; **(22)** *humberto*; **(23)** *hemileucus*.



FIGURES 24–31. *Neohydatothrips* species. Head and pronotum 24–29: **(24)** *gaucho*; **(25)** *goianus*; **(26)** *gracilipes*; **(27)** *ikelus*; **(28)** *inversus*; **(29)** *luculentus*. Pronotum 30–31: **(30)** *hadrosetae*; **(31)** *lassatus*.



FIGURES 32–40. *Neohydatothrips* species. Head and pronotum 32–39: **(32)** *maculatus*; **(33)** *maculicollis*; **(34)** *notialis*; **(35)** *plaumanni*; **(36)** *novateutoniae*; **(37)** *samayunkur*; **(38)** *renatae*; **(39)** *sidae*. **(40)** *paraensis* pronotum.



FIGURES 41–49. *Neohydatothrips* species. Head and pronotum 41–44: **(41)** *sulcus*; **(42)** *tibialis*; **(43)** *zucchi*; **(44)** *varius*. Meso and metanotum 45–49: **(45)** *basilaris*; **(46)** *chelinus*; **(47)** *hemileucus*; **(48)** *clavisetis*; **(49)** *hadrosetae*.

Comments. This species remains known only from the type series of 3 females and 3 males collected from *Luehea* [Tiliaceae] in February, 1949 at Nova Teutônia. It is closely related to *N. fasciatus*, but is more boldly coloured and has the pronotal sculpture reticulate instead of transversely reticulate to striate.

***Neohydatothrips dosulis* sp. n.**
(Figs 20, 55, 70)

Female macroptera. Colour: body bicoloured, brown on head, pronotal blotch, metanotum, tergites VII–X and antecostal ridges of tergites II–VII; mesonotum anterior half brown but posterior half light brown; tergites I–IV laterally light brown, suffused with brown medially; femora brown with apex and base yellow, tibia brown with base yellow; anterior third of pronotum and tergites V–VI pale. Antennal segments I–II light brown, III yellowish brown, IV yellowish brown on basal half but brown on apical half, V–VIII brown. Fore wing bicoloured with basal, median and sub-apical brown bands contrasting with three pale areas, median pale area suffused with brown.

Structure: Occipital apodeme close to, but not confluent with posterior margin of compound eyes (Fig. 20); ocellar setae pair III within ocellar triangle, ocellar triangle transversely striate with internal markings between the striae; pronotum striate with a few markings between the striae, pronotal blotch distinctively dark brown; mesonotum striate, median setal pair anterior to the lateral; metanotum anterior half transversely striate, posterior half longitudinally striate, with markings between the striae, two pairs of setae at anterior margin; metasternal plate with distinct anterior emargination (Fig. 55); fore wing with sub-apical lobe; second vein with no setae (Fig.70); tergites II–VI posterior margin with comb of microtrichia incomplete medially, VII–VIII with comb complete; tergite IX with 2 pairs of mid-dorsal setae; sternites III–VI with discal microtrichia medially, absent medially on VII.

Measurements (holotype female in microns): Body length 1140, Head length 55, width 168; ocellar setae III length 20. Pronotum length 128, width 205. Fore wing length 820. Antennal segments I–VIII length 20, 38, 58, 58, 48, 53, 8, 13.

Male macroptera. Similar to female, but smaller. Sternites without pore plates.

Measurements (paratype male in microns): Body length 785, Head length 38, width 142; ocellar setae III length 15. Pronotum length 100, width 173; pa setae 30. Fore wing length 590. Antennal segments I–VIII length 23, 34, 48, 54, 30, 45, 10, 10.

Material studied. Holotype female. **BRAZIL**, Rio Grande do Sul State, Cachoeirinha, sweeping net near rice crop, 3.xi.2004 (E.N. Rodrigues) (UFRGS).

Paratypes. **BRAZIL**, Rio Grande do Sul State, Cachoeirinha, 1 female and 1 male collected with the holotype (E.N.Rodrigues), Cachoeira do Sul, 2 females from rice, 11.x.2004 (E.N.Rodrigues), Eldorado do Sul, 1 female from Pitfall trap, 17.ix.2009 (L. Pogdaiski) (UFRGS).

Comments. This species is remarkable for the distinctive dark pronotal blotch in contrast to the pale anterior third of pronotum. Along with *N. maculicolis*, it is one of two species considered here that has a sub-apical lobe subtending the apical seta on the fore wing.

***Neohydatothrips fasciatus* (Moulton)**
(Figs 18, 89, 90)

Sericothrips fasciatus Moulton, 1938: 375.

Female macroptera. Colour: body bicoloured (Fig. 89), brown on head, mesonotum, metanotum, tergite II laterally, tergites III–VII with brown mark anterolaterally but antecostal ridge pale medially except on VII; VIII–IX yellow; fore wing with 3 dark and 3 pale bands, apex pale, clavus dark with pale setae; antennal segments I–III pale, basal half of IV–VI pale; hind tibiae yellow.

Structure: Occipital apodeme close to but not quite confluent with posterior margin of eyes, ocellar area irregularly reticulate-striate; antennal segments III & IV without an apical neck; pronotal anterior area with narrow transverse reticulations without internal markings, blotch pale and transversely striate (Fig. 18); mesonotum and metanotum striate; metasternal plate with shallow emargination; fore wing second vein with 1 or 2 setae; tergites VII–VIII with complete comb of long microtrichia on posterior margin, VI with comb short but longer than diameter of one campaniform sensillum, no comb on remaining tergites; tergite IX with 2 pairs of mid-dorsal setae.

Male macroptera. Similar to female (Fig. 90), but smaller and with colour of antennae and tergites slightly different. Antennal segments I–II pale, III pale with apical third light brown, IV pale with apical third brown, V–VI

pale on basal half and brown on apical half, VII–VII brown. Brown marking on tergites smaller than on female, usually only very near antecostal ridges, especially on tergites IV–VI.

Material studied. Holotype female, **BRAZIL**, Minas Gerais, Viçosa, 8.iv.1933 (CAS); Santa Catarina State, Nova Teutônia [Seara], 23 females and 2 males from young leaves, x.1949; 8 females 2 males from *Morus nigra*, xi.1949; 7 females 1 male from *Sapium*, xii.1949 (F. Plaumann) (USNM).

Comments. Described from a single female, three series of this species have been identified from Nova Teutônia. Antennal segments I–IV, most of V and the base of VI are unusually pale. As noted above, *N. daedalus* is particularly closely related to this species.

Neohydatothrips fimbriatus (Hood)

(Figs 91, 92)

Sericothrips fimbriatus Hood, 1954: 200.

Female macroptera. Colour: body strongly bicoloured (Fig. 91), brown on head, mesonotum, metanotum, tergites II–IV and VII–VIII, tergite IX light brown, X yellow, pronotum pale with blotch yellowish; fore wing dark with pale band sub-basally and at apex, clavus dark with pale setae; antennal segments I–II pale, III–IV pale at base; hind tibiae yellow in contrast to dark brown femora.

Structure: Occipital apodeme confluent with posterior margin of eyes, ocellar area with widely spaced striations; antennal segments III & IV with an apical neck; pronotal anterior area with broad transverse reticulations without internal markings, blotch in part transversely striate; mesonotum and metanotum striate; metasternal plate with shallow emargination; fore wing second vein with no setae; tergites II–VIII with complete comb of microtrichia on posterior margin, comb short on anterior tergites; tergite IX with 2 pairs of mid-dorsal setae.

Male macroptera. Similar to female, but smaller and with tergite VII pale (Fig. 92).

Material studied. Holotype female, **BRAZIL**, Santa Catarina State, Nova Teutônia [Seara], ii. 1950; 1 female from *Sapium* sp., 1.xii.1949; 12 females, 1 male from Capoeira, 18–20.x.1949 (F. Plaumann) (USNM).

Comments. Described from 5 females, a further 13 females and 1 male have now been identified from the same locality. This species is similar to *N. basilaris* in having a complete fringe of microtrichia on the posterior margin of tergites II–VIII.

Neohydatothrips flavens (Moulton)

(Fig. 21)

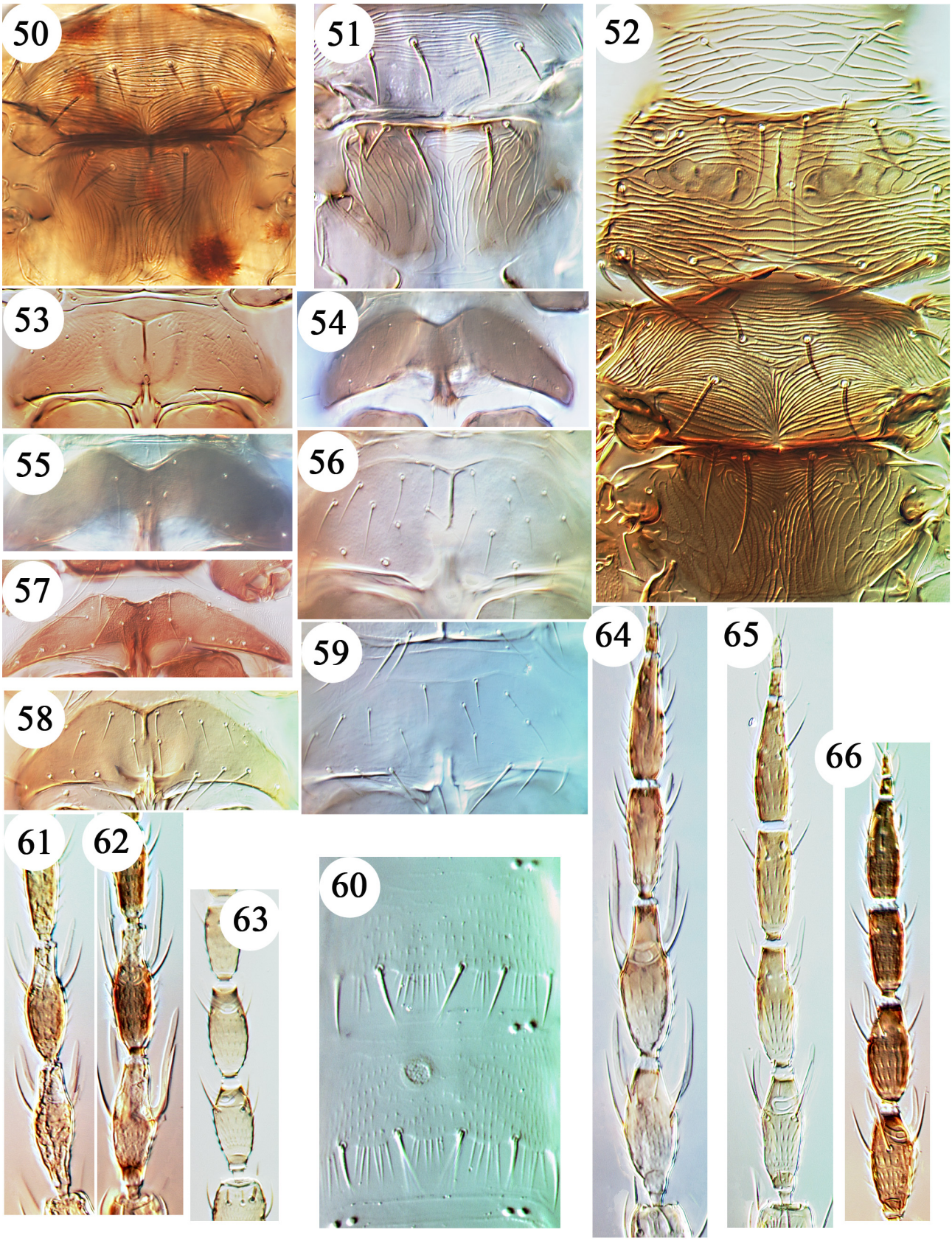
Sericothrips flavens Moulton, 1941: 316.

Female macroptera. Colour: yellow with light brown markings as follows: anterior area of head, slender transverse pronotal blotch, mesonotal anterior margin; tergites II–VII with antecostal ridge dark and brown markings anterolaterally, VII–VIII with faint shading medially, IX–X yellow; fore wing grey, darkest sub-basally, apex pale; antennal segments I–II pale, III pale medially, also base of IV; hind tibiae yellow, femora lightly shaded.

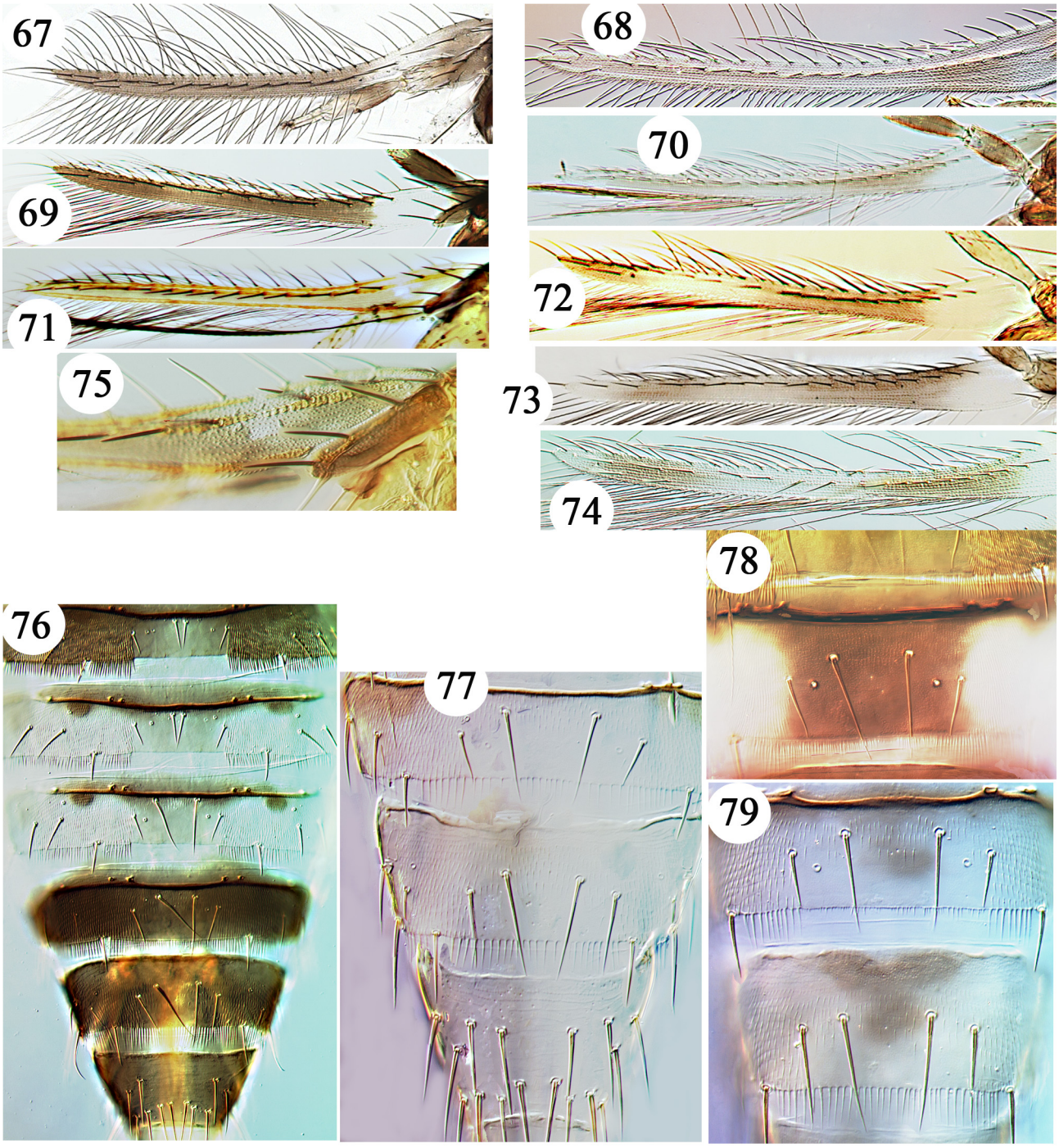
Structure: Occipital apodeme close to but not confluent with posterior margin of eyes, ocellar area striate (Fig. 21); antennal segments III & IV with apex constricted into short neck; pronotum transversely striate including blotch with markings between the striae, transverse row of setae along anterior margin of blotch (Fig. 21); mesonotum and metanotum striate; metasternal plate with shallow emargination; fore wing second vein with one or two setae distally; tergites VII–VIII with complete comb of microtrichia on posterior margin but comb short medially on VII, no comb on remaining tergites; tergite IX with 2 pairs of mid-dorsal setae.

Material studied. Holotype female, **BRAZIL**, Minas Gerais, 22.vi.1933 (CAS).

Comments. This species is known from a single female. Specimens in USNM bearing this name are now considered to be the new species described below, *N. ikelus* **sp. n**. The holotype is not in good condition, but the striate ocellar area is characteristic, and there are fine lines between the pronotal striae in contrast to *N. ikelus*. The fore wing is extensively but weakly shaded, with an indistinct paler area medially and the extreme apex pale, and antennal segment III is distinctly shaded at base and apex.



FIGURES 50–66. *Neohydatothrips* species. Head and pronotum 50–51: **(50)** *paraensis*; **(51)** *burungae*. **(52)** *samayunkur*, pro, meso and metanotum. Metasternal plate 53–59: **(53)** *burungae*; **(54)** *chelinus*; **(55)** *dosulis*; **(56)** *gracilipes*; **(57)** *humberto*; **(58)** *sidae*; **(59)** *inversus*. **(60)** *burungae* male sternite VII. Antennal segments III–V: **(61)** *inversus* paratype; **(62)** *geminus* paratype; **(63)** *sulcus*. Antennal segments III–VIII: **(64)** *novateutoniae*; **(65)** *renatae*; **(66)** *plaumanni*.



FIGURES 67–79. *Neohydatothrips* species. Fore wing 67–74: **(67)** *basilaris*; **(68)** *burungae*; **(69)** *clavisetis*; **(70)** *dosulis*; **(71)** *hadrosetae*; **(72)** *notialis*; **(73)** *paraensis*; **(74)** *renatae*. **(75)** *hadrosetae* fore wing clavus. Tergites 76–79: **(76)** *varius* IV–IX; **(77)** *inversus* VII–IX; **(78)** *clavisetis* IV; **(79)** *zucchi* VII–VIII.

***Neohydatothrips flavicollis* (Hood)**

(Fig. 93)

Sericothrips flavicollis Hood, 1954: 204.

Female macroptera. Colour: body bicoloured (Fig. 93), head light brown, metanotum brown but mesonotum yellowish-brown, tergites II–III brown on lateral two thirds, IV–VI yellow with small brown areas anterolaterally and antecostal ridge dark, VII–IX brown; pronotum pale with blotch weakly defined; fore wing with 3 dark and 3

pale bands, apex pale, clavus dark with pale setae; antennal segments I, II and most of III pale, IV brown with base paler; V–VIII brown, hind tibiae yellow with brown markings.

Structure: Occipital apodeme almost confluent with posterior margin of eyes, ocellar area with closely spaced striations; antennal segments III & IV with an apical neck; pronotum transversely striate; mesonotum and metanotum closely striate; metasternal plate weakly developed, and with anterior margin almost transverse. Fore wing second vein with no setae; tergites VII–VIII with complete comb of microtrichia on posterior margin, comb absent medially on remaining tergites; tergite IX with 2 pairs of mid-dorsal setae.

Material studied. Holotype female, **BRAZIL**, Rio de Janeiro State, Ilha da Gipoia, 25.v.1948 (USNM).

Comments. This species is known only from the original 3 females. It is closely related to *N. fasciatus*, but is less shaded brown on abdominal tergites II–VI, and bears a shorter mouth cone that does not extend to the fore coxae.

***Neohydatothrips gaucho* sp. n.**
(Fig. 24)

Female macroptera. Colour: body yellow, but brown on ocellar area, mesonotum, metanotum, antecostal ridges of tergites II–VII, lateral thirds of tergite II and anterolateral areas of III. Antennal segments I–II yellow, III yellow with apex brown, IV–V yellow with apical third brown, VI–VIII brown. Pronotal blotch light brown. Fore wing bicoloured with basal, median and subapical brown bands in contrast to pale areas.

Structure: occipital apodeme distant from posterior margin of compound eyes, ocellar setae pair III near margins of ocellar triangle, ocellar triangle smooth with very week striae (Fig. 24); pronotum striate with blotch pale (Fig. 24); mesonotum striate, median setal pair anterior to the lateral; metanotum anterior half transversely striate, posterior half longitudinally striate, two pairs of setae on anterior margin; metasternal plate with very shallow anterior emargination; fore wing second vein with no setae; tergites II–V with posteromarginal comb of microtrichia incomplete medially, VI with irregularly spaced small teeth medially and VII–VIII with comb complete; tergite IX with 2 pairs of mid-dorsal setae; sternites III–VII with no microtrichia medially, few laterally.

Measurements (holotype female in microns): Body length 1020, Head length 93, width 150; ocellar setae III length 18. Pronotum length 105, width 163, pa setae 37. Fore wing length 650. Antennal segments I–VIII length 23, 35, 46, 45, 38, 53, 8, 10.

Material studied. Holotype female, **BRAZIL**, Rio Grande do Sul State, Cambará do Sul, Parna Aparados da Serra, on *Baccharis* cf. *trimera* 27.i.2013 (A. Cavalleri) (UFRGS).

Paratype. **BRAZIL**, Rio Grande do Sul State, Eldorado do Sul, 1 female from net sweeping, 15.xii.2010 (L. Podgaiski) (UFRGS).

Comments. This bicoloured species has a colour pattern that resembles *N. flavicollis*, from which it can be distinguished easily by its yellow head with the ocellar area brown and weak sculpture lines, and the greater distance of the occipital apodeme from the compound eyes.

***Neohydatothrips goianus* sp. n.**
(Fig. 25)

Female macroptera. Colour: body mainly yellow with ocellar area, anterior third of mesonotum and lateral thirds of metanotum shaded brown, and antecostal ridges on tergites II–VII brown. Antennal segments I–III yellow, IV brown with basal fourth yellow and apex light brown, V brown with base light brown, VI–VIII brown. Fore wing uniformly pale brownish grey.

Structure: Occipital apodeme not confluent with posterior margin of compound eyes; ocellar area with irregularly reticulate transverse striae (Fig. 25), setal pair III outside the ocellar triangle; pronotum closely striate with anterior margin of blotch distinct; mesonotum striate, two pairs of setae almost in transverse straight line; metanotum anterior half transversely striate, posterior half longitudinally striate, two pairs of setae on anterior margin; metasternal plate with very shallow anterior emargination; fore wing second vein with two setae; tergites II–VI with comb of microtrichia incomplete medially, comb complete on VII–VIII; tergite IX with 2 pairs of mid-dorsal setae; sternites III–VII with microtrichia medially.

Measurements (holotype female in microns): Body length 820, Head length 53, width 130; ocellar setae III length 23. Pronotum length 103, width 153. Fore wing length 565. Antennal segments I–VIII length 23, 33, 43, 45, 35, 38, 8, 8.

Material studied. Holotype female, **BRAZIL**, Goiás State, Goiânia, on *Ocotea* sp. flowers, 20.ix.2014 (A. Cavalleri) (UFRGS).

Comments. This species is based on a single female. Although this is not a recommended taxonomic procedure, the specimen is readily distinguished from the similar species *N. similis* and *N. flavens* and has an unusual sculpture on the ocellar area.

Neohydatothrips gracilipes (Hood)

(Figs 26, 56, 94)

Sericothrips gracilipes Hood, 1924: 149.

Female macroptera. Colour: body yellow with light brown markings (Fig. 94), ocellar region faintly shaded; pronotal blotch light brown, with margins poorly defined; anterior margin of mesonotum, and lateral margins of metanotum light brown; tergites II–VII with antecostal ridge dark and brown markings anterolaterally, VIII–X yellow; fore wing pale with faintly shaded area in basal third, clavus shaded; antennal segments I–II pale, III pale medially but shaded at base and apex, base of IV pale; hind tibiae yellow, femora lightly shaded.

Structure: Occipital apodeme not confluent with posterior margin of eyes; ocellar area irregularly reticulate (Fig. 26); mouth cone long, extending between fore coxae; antennal segments III & IV with apex weakly constricted into neck; pronotum transversely striate, blotch with transverse row of setae on anterior margin (Fig. 26); mesonotum and anterior part of metanotum striate; metasternal plate moderately emarginate (Fig. 56); fore wing second vein with no setae; tergites VII–VIII with complete comb of long microtrichia on posterior margin, no comb medially on remaining tergites; tergite IX with two pairs of mid-dorsal setae; sternites III–VI with discal microtrichia medially, but not VII.

Larva II. Pale, with few microtrichia on dorsal surface. Antennae 7-segmented, segment I yellow, II–VII yellowish brown. Thorax without brown sclerotized areas. Body with several long brown setae with fringed but not expanded apices, up to about 32 microns long on thorax and abdominal tergites I–IV, arising from normal setae insertions; sternal setae acute.

Material studied. Holotype female, **MEXICO**. Laguna District, 25.x.1917 (USNM). Several females from **INDIA**, **THAILAND**, **NEW CALEDONIA** and **NORTHERN AUSTRALIA** (ANIC).

Comments. Described originally from Mexico in association with extensive damage to a crop of cotton, and subsequently recorded from various places around the Caribbean (Mound & Marullo, 1996), this species is probably widespread on its major host plants, various weedy species of *Sida*. It has been recorded on these plants both from central India (Bhatti *et al*., 1999), from across northern Australia (Mound 2002), and Galapagos Is. (Ecuador) (Hoddle & Mound 2011). It is closely related to *N. burungae* and *N. signifer*, but has the mouth cone unusually long and is further distinguished by the characters indicated in the key above. It is not yet recorded from Brazil, but is likely to be present.

Neohydatothrips hadrosetae Mound & Marullo

(Figs 30, 49, 71, 75)

Neohydatothrips hadrosetae Mound & Marullo, 1996: 168.

Female macroptera. Colour: mainly yellowish brown with brown head, median area of pronotum, anterior third of mesonotum, metanotum and fore wing clavus; tergites II– VII extensively light brown except for posterior fourth yellow; fore wing uniformly brown except for small pale spot medially on basal fifth; antennal segments I–II yellow, III light brown, IV–VIII brown.

Structure: Occipital apodeme not confluent with posterior margin of eyes, ocellar area apparently transversely striate; pronotum transversely reticulate with some broader reticles medially and indistinct blotch (Fig. 30); mesonotum transversely reticulate; metanotum reticulate (Fig. 49); metasternal plate with shallow emargination; fore wing first vein with long setae (about 50 microns) and second vein with no setae (Fig. 71), clavus with three unusually stout setae (Fig. 75); comb of microtrichia incomplete on tergites II–VI and complete on VII–VIII; tergite IX with 2 pairs of mid-dorsal setae.

Material studied. Holotype female, **COSTA RICA**, University of Costa Rica, on *Brickellia argyrolepsis*, 25.i.1992 (BMNH).

Comments. This species from Costa Rica remains known only from the holotype. It is very distinctive by its brown pronotum without a distinct blotch and the long fore wing setae.

Neohydatothrips hemileucus (Hood)

(Figs 23, 47, 95, 96)

Sericothrips hemileucus Hood, 1952: 144.

Female macroptera. Colour: body bicoloured (Fig. 95), head brown, pronotum yellow with posteroangular setae dark brown, mesonotum and metanotum brown, tergites II–IV light brown, V–VI yellow, VII dark brown, VIII–X yellow; fore wing with 3 dark and 3 pale bands, apex pale, clavus dark with stout dark setae; antennal segments I–II pale, III–IV yellow with light brown apices; hind tibiae yellow, femora shaded with light brown.

Structure: Occipital apodeme distant from eyes; ocellar area closely striate, postocular setae in longitudinal row close to eye (Fig. 23); antennal segments III & IV slender with an apical neck; pronotum transversely striate with no internal markings, blotch not defined except for anterior apodeme (Fig. 23); mesonotum and metanotum closely striate (Fig. 47); metasternal plate with shallow emargination; fore wing second vein with no setae; tergites VII–VIII with complete comb of long microtrichia on posterior margin, no comb medially on remaining tergites; tergite IX with 2 pairs of mid-dorsal setae.

Male macroptera. Similar to but smaller than female and tergite VIII brown (Fig. 96).

Material studied. Holotype female, **BRAZIL**, São Paulo State, Salesópolis, 8.vi.1948 (USNM); Santa Catarina State, Nova Teutônia [Seara], 16 females 2 males, v & x–xii.1949, xi.1955, and vii.1957, mainly from *Solanum* sp. and *Balfourodendron licanum* (USNM); São Paulo State, Piracicaba, 1 female from *Dracena marginata colourama*, 16.viii.1993 (E. Bergmann) (ESALQ).

Comments. Described from 2 females from São Paulo (vi.1948), and one from Nova Teutônia (i.1949), the structure of the head with the transverse apodeme far behind the eyes is unusual, as are the slender antennae.

Neohydatothrips humberto Mound & Marullo

(Figs 22, 57)

Neohydatothrips humberto Mound & Marullo, 1996: 169.

Female macroptera. Colour: brown, except for tibiae and fore wing sub-basal pale band and apex; antennal segments I–II yellow, III light brown, IV–VIII brown.

Structure: Occipital apodeme not confluent with posterior margin of eyes, ocellar area weakly reticulate with faint markings between the striae (Fig. 22); pronotum transversely reticulate with internal markings, pronotal blotch distinct; mesonotum transversely striate; metanotum with striae transverse on anterior half and longitudinal on posterior half; metasternal plate with shallow emargination (Fig. 57); fore wing second vein with one seta; comb of microtrichia with sparse minute teeth on tergites II–VI, medium-sized teeth on VII and complete on VIII; tergite IX with 2 pairs of mid-dorsal setae; sternites II–VI with microtrichia medially, VII with microtrichia medially.

Material studied. Paratype female, **COSTA RICA**, Poas Volcano, on grasses by road, 30.vi.1983 (BMNH). **GUATEMALA**, Solola, 3 females on *Phaseolus vulgaris*, 21.iii.1997 (ANIC).

Comments. This species was described based on 5 females from Costa Rica. It is very similar to other dark brown species such as *N. mirandai* and *N. lassatus*. It is particularly similar to *N. tibialis*, from which it is

tentatively distinguished based on the characters in the key. These two possibly represent the same species, but the poorly mounted type specimens of *N. tibialis* do not permit firm conclusions on their identities. Previously known only from Costa Rica, 3 females have been identified from Guatemala.

Neohydatothrips ikelus sp. n.

(Figs 27, 97)

Female macroptera. Colour: body mainly yellow (Fig. 97) with pronotal blotch, antecostal ridges and adjacent anterolateral areas brown, also anterior third of mesonotum and lateral thirds of metanotum shaded brown. Antennal segments I–II yellow, III shaded brown on median third, IV brown with basal fourth yellow and apex light brown, V brown with base light brown, VI–VIII brown. Fore wing uniformly pale brownish grey.

Structure: Occipital apodeme close to, but not confluent with, posterior margin of compound eyes; ocellar setae pair III on external margins of ocellar triangle, ocellar triangle with parallel transverse sculpture lines; pronotum striate with distinctive blotch (Fig. 27); mesonotum striate, median setal pair anterior to the lateral; metanotum anterior half transversely striate, posterior half longitudinally striate, with two pairs of setae on anterior margin; metasternal plate with very shallow anterior emargination; fore wing second vein with two setae; tergites II–VI with comb of microtrichia incomplete medially, VII with minute teeth medially, VIII with complete comb; tergite IX with 2 pairs of mid-dorsal setae; sternites VI–VII with microtrichia medially.

Measurements (holotype female in microns). Body length 1160, Head length 63, width 154; ocellar setae III length 20. Pronotum length 125, width 178. Fore wing length 740. Antennal segments I–VIII length 23, 38, 60, 50, 45, 48, 10, 13.

Material studied. Holotype female, **BRAZIL**, Santa Catarina State, Nova Teutônia [Seara], v.1952. (F. Plaumann) (USNM).

Paratypes. **BRAZIL**, Rio Grande do Sul State, Viamão, 1 female on *Leandra australis* flowers, 21.xi.2003, Porto Alegre, 1 female on *Borreria verticilata* flowers, 11.ii.2011, 2 females on Fabaceae, 11.ii.2011 (F.S.Melo) (UFRGS); Piauí State, Bom Jesus, 1 female on soybeans *Glycine max*, 12.xi.2012 (E.F.B.Lima) (UFPI).

Comments. *N. ikelus* is very similar to *N. flavens*, but can be distinguished using the characters in the key above. Part of the type material used for this description was collected by Fritz Plaumann from 1949 to 1952 (in USNM), but other specimens were also recently collected in southern and northeastern Brazil. The species seems to be widespread in Brazil.

Neohydatothrips inversus (Hood)

(Figs 28, 59, 61, 62, 77, 98, 99)

Sericothrips inversus Hood, 1928: 232.
Sericothrips geminus Hood, 1935: 146.

Female macroptera. Colour: body yellow with light brown markings (Fig. 98), pronotum with three pairs of light brown areas laterally that are not fused medially; mesonotum yellow, metanotum light brown; tergites II–VII with antecostal ridge brown and paired brown markings anterolaterally, VIII–X yellow; fore wing pale with faintly shaded area in basal third, clavus weakly shaded; antennal segment I pale, II with light brown markings, III pale at base, IV brown medially with apex sharply pale; hind tibiae yellow, femora lightly shaded.

Structure: Occipital apodeme not confluent with posterior margin of eyes; mouth cone long, extending between fore coxae; antennal segments III & IV with apex constricted into neck; pronotum transversely striate (Fig. 28); mesonotum with four setae in transverse row, metanotum weakly reticulate; metasternal plate weakly developed, anterior margin almost transverse (Fig. 59); fore wing second vein with no setae; tergites VII–VIII with complete comb of long microtrichia on posterior margin, no comb medially on remaining tergites; tergite IX with 4 pairs of mid-dorsal setae (Fig. 77); sternites III–VII without discal microtrichia medially.

Male macroptera. Similar to female but smaller (Fig. 99), sternites IV–VII with oval pore plate 25 microns wide (Mound & Marullo 1996).

Material Studied. Holotype female of *inversus*, **DOMINICA**, 13.iii.1915 (USNM). Holotype female of

geminus, **PANAMA**, Barro Colorado Is., 9.viii.1933 (USNM). **BRAZIL**, Piauí State, Bom Jesus, 3 females from weeds, 30.vii.2012 (E.F.B.Lima) (UFPI). **TRINIDAD**, Curepe, 1 female from *Coursetia arborea* leaves, 9.xi.1970 (L.A.Mound). **MEXICO**, Oaxaca State, La Ventosa, 1 female from ?*Citrus*, 29.iii.2014 (F. Infante) (ANIC).

Comments. Described originally from Dominica and Trinidad, this species was recorded subsequently from Panama. Mound and Marullo (1996) synonymised *geminus* with *N. inversus*, these two having a very similar mesonotum and metanotum. We examined the type material of both species, and the types of *geminus* differ from those of *inversus* in having the sense cones on segment IV distinctly longer (Figs 61, 62), also the anterior margin of the pronotal blotch completely coloured, with the pronotal discal setae in a transverse row. Nevertheless, in material from Brazil and Central America these character states are not constant, with specimens variably bearing morphological traits of both nominal species. Therefore, *geminus* remains treated here as synonym of *N. inversus*.

Neohydatothrips lassatus (De Santis)

(Fig. 31)

Sericothrips lassatus De Santis, 1966: 8.

Female macroptera. Colour: body dark brown including femora and tibiae, fore wing dark with white sub-basal area, antennal segment I brown, II yellow, III basal half pale but apical half brown, IV with basal third light brown, remainder brown.

Structure: Occipital apodeme distant from posterior margin of eyes, ocellar area apparently without sculpture; antennal segments III & IV with short apical neck; pronotum with two pairs of prominent setae on posterior margin, anterior area transversely striate, blotch well-defined (Fig. 31); mesonotum and anterior part of metanotum closely striate. Fore wing second vein with one (or two widely separated) setae distally; tergite VII with posteromarginal comb of microtrichia complete but short and irregular medially, on III–VI incomplete medially; tergite IX with 2 pairs of mid-dorsal setae.

Material Studied. **ARGENTINA**, Neuquén Province, Hua Hum, 5 females, 21.ii.1955 (Torres - De Santis) (MLP).

Comments. This species is known only from 5 females from Argentina, probably near the border with Chile, given on the original slide labeled "holotype". It is similar to *N. clavisetis* and *N. novateutoniae*, but darker.

Neohydatothrips luculentus (Moulton)

(Fig. 29)

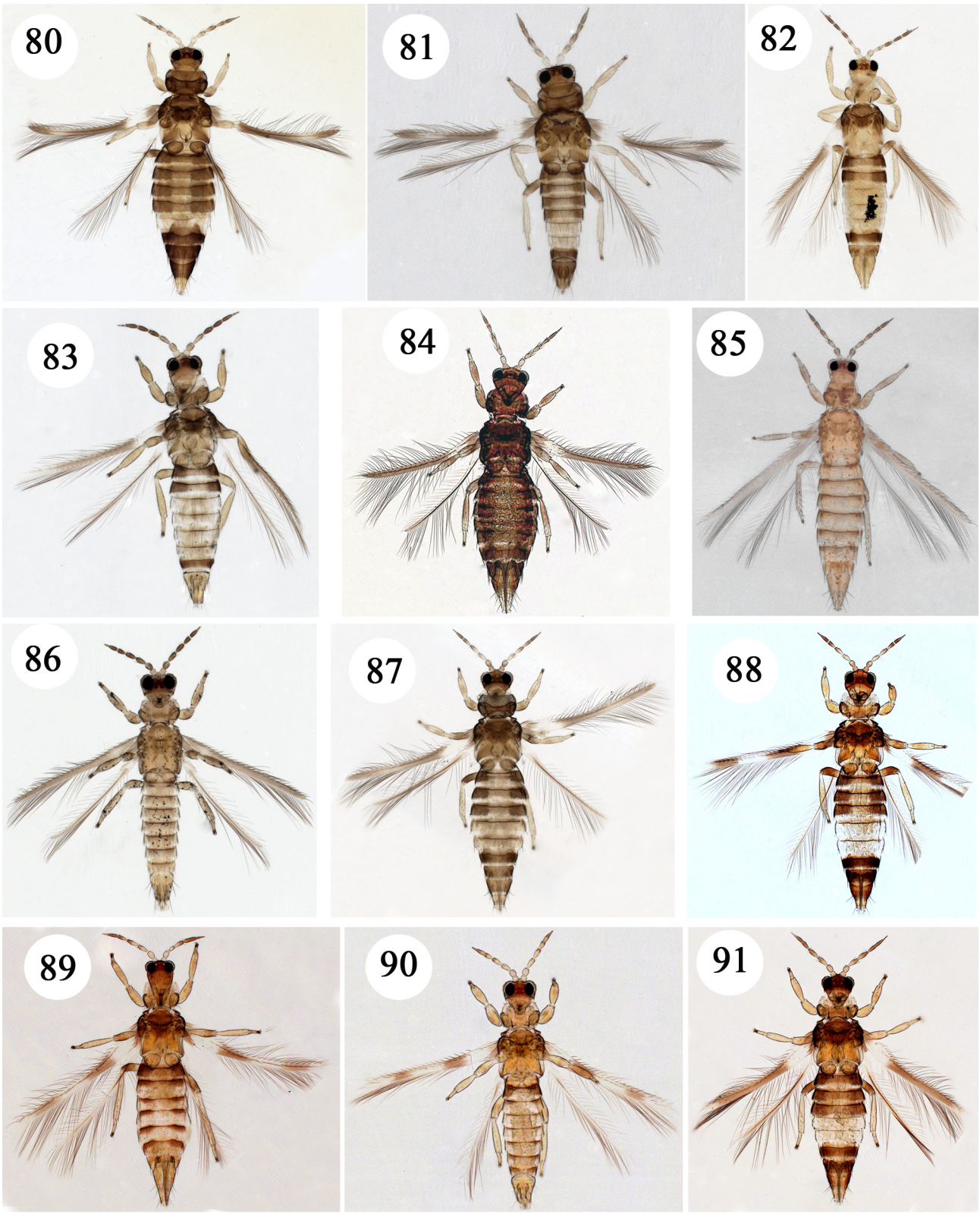
Sericothrips luculentus Moulton, 1938: 376.

Female macroptera. Colour: body yellow with light brown markings, pronotum with four pairs of small light brown areas laterally that are not fused medially; tergites II–VII with antecostal ridge light brown and small paired brown markings anterolaterally, VIII–X yellow. Fore wing uniformly grey; antennal segment I pale, II light brown, III pale at base, IV mainly light brown; hind tibiae and femora yellow.

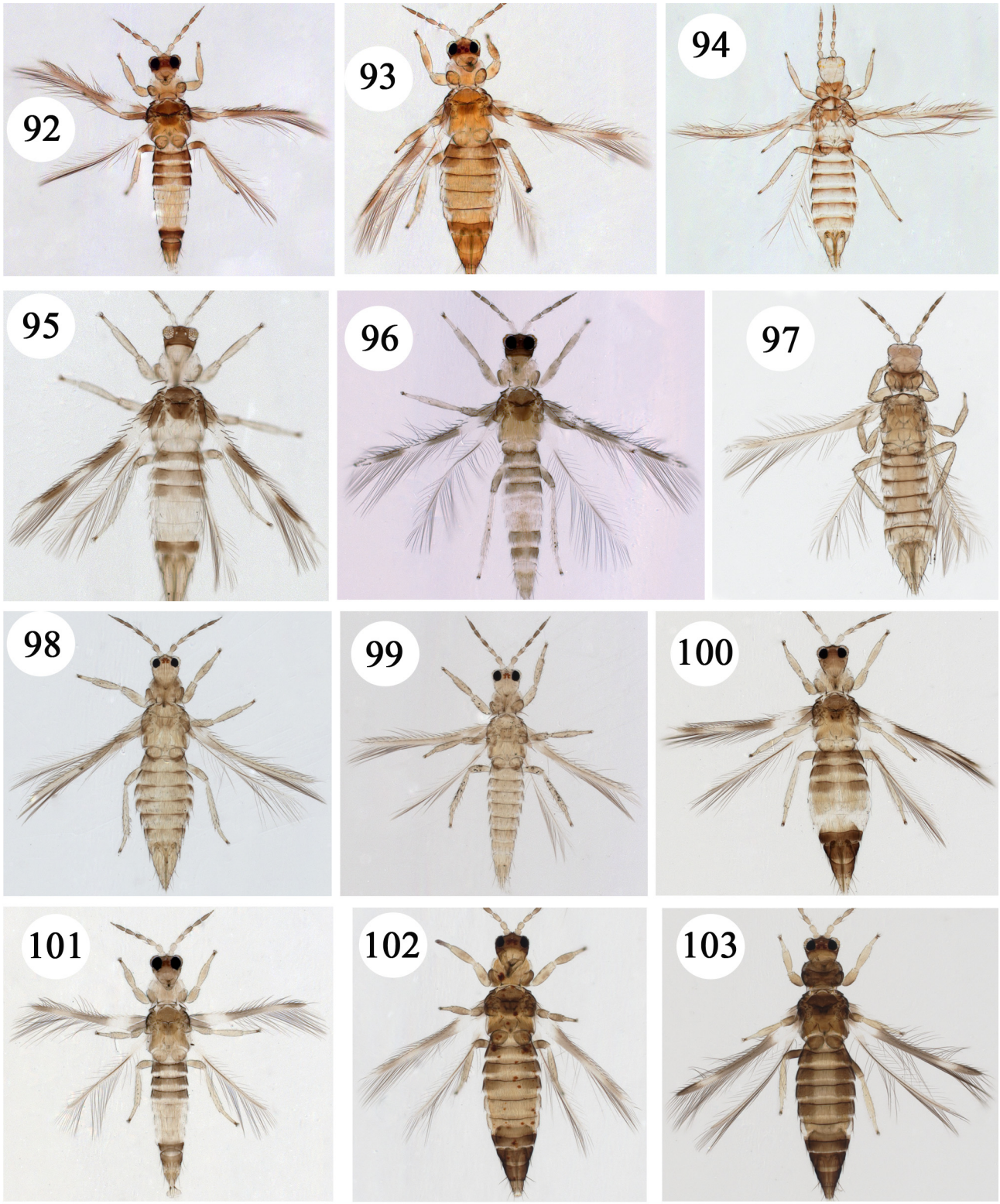
Structure: Occipital apodeme close to but not confluent with posterior margin of eyes, ocellar area not sculptured; mouth cone not long; antennal segments III & IV with apex not constricted into neck; pronotum closely transversely striate (Fig. 29); mesonotum with median pair of setae slightly anterior to lateral pair, metanotum striate; metasternal plate with shallow emargination; fore wing second vein with two setae distally; tergite III–VII with posteromarginal comb absent medially, VIII with complete comb; tergite IX with 2 pairs of mid-dorsal setae; sternites apparently with microtrichia medially.

Material Studied. Holotype female, **BRAZIL**, Minas Gerais, 22.vi.1933 (CAS).

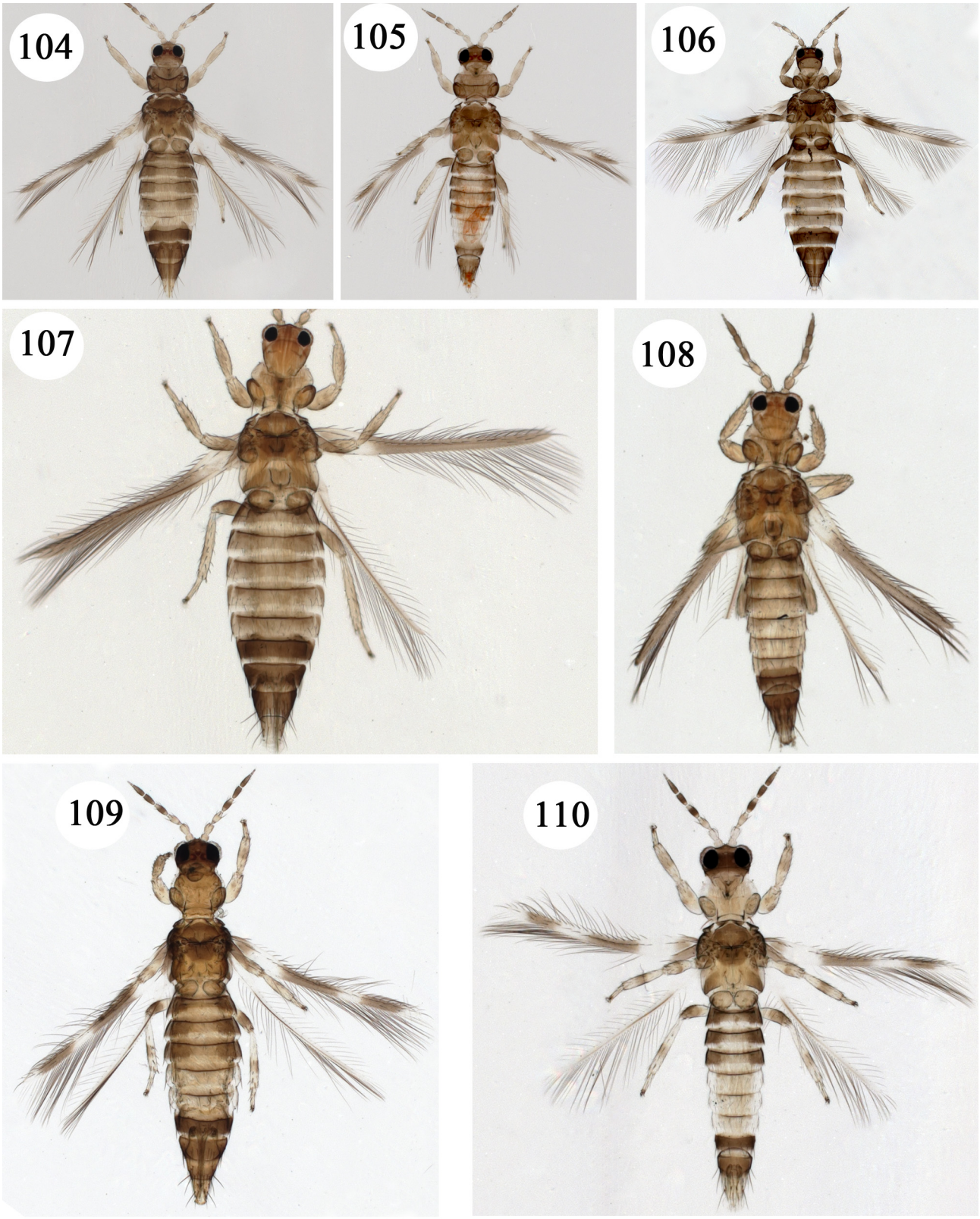
Comments. Although described from 1 female and 1 male, the male was probably a different species from the holotype (Mound & Marullo 1996). This female is badly mounted, but is similar to *N. burungae* with the pronotal striae closer, much as in typical *Scirtothrips* species, and the interocellar area lacks sculpture. It is also particularly similar to *N. zucchi* in having long sense cones, but can be distinguished by the characters in the key.



FIGURES 80–91. *Hydatothrips* and *Neohydatothrips* species. **(80)** *H. sternalis* (female), **(81)** *H. sternalis* (male), **(82)** *H. tricinctus* (female), **(83)** *H. tricinctus* (male), **(84)** *N. basilaris* (female), **(85)** *N. burungae* (female), **(86)** *N. burungae* (male), **(87)** *N. chelinus* (female), **(88)** *N. daedalus* (female), **(89)** *N. fasciatus* (female), **(90)** *N. fasciatus* (male), **(91)** *N. fimbriatus* (female).



FIGURES 92–103. *Neohydatothrips* species. **(92)** *fimbriatus* (male), **(93)** *flavicollis* (female), **(94)** *gracilipes* (female), **(95)** *hemileucus* (female), **(96)** hemileucus (male), **(97)** *ikelus* (female), **(98)** *inversus* (female), **(99)** *inversus* (male), **(100)** *maculicollis* (female), **(101)** *maculicollis* (male), **(102)** *paraensis* (female), **(103)** *portoricensis* (female).



FIGURES 104–110. *Neohydatothrips* species. **(104)** *ruginosus* (female), **(105)** *ruginosus* (male), **(106)** *samayunkur* (female), **(107)** *sidae* (female), **(108)** *sidae* (male), **(109)** *varius* (female), **(110)** *varius* (male).

***Neohydatothrips maculatus* sp. n.**
(Fig. 32)

Female macroptera. Colour: body mainly yellow, brown on ocellar area, area around occipital apodeme, spots on pronotum, anterior third of mesonotum, antecostal ridges and abdominal tergites II–VII with brown spots anterolaterally; fore wing uniformly pale brownish grey with apex paler and a small pale circular area sub-basally; antennal segment I brown, II brown with apex and base light brown, III light brown on median third but brown on basal and apical thirds, IV–V light brown with base and apical third brown, VI–VIII brown; all femora and tibiae yellow with median brown area.

Structure: Occipital apodeme not close to posterior margin of eyes (Fig. 32), ocellar area reticulate, setal pair III on external margins of ocellar triangle; pronotum transversely reticulate with internal markings between the striae (Fig. 32), blotch not defined; mesonotum striate, median setal pair anterior to the lateral; metanotal striae transverse on anterior half, longitudinal on posterior half but forming ill-defined reticles, two pairs of setae on anterior margin; metasternal plate with shallow anterior emargination. Fore wing second vein with 2 setae distally; tergites II–VI with comb of microtrichia incomplete medially, VII–VIII with complete comb; tergite IX with 2 pairs of mid-dorsal setae; sternites III–VI with microtrichia medially, VII withouth microtrichia medially.

Measurements (holotype female in microns): Body length 945, Head, length 78, width 150; ocellar setae III length 19. Pronotum length 102, width 163; posteroangular setae 19. Fore wing length 640. Antennal segments I–VIII length 22, 38, 39, 39, 36, 39, 9, 11.

Male macroptera. Male similar to female; but smaller.

Measurements (paratype male in microns): Body length 875, Head length 70, width 140. Pronotum length 95, width 145. Fore wing length 530. Antennal segments I–VIII length 22, 34, 38, 38, 34, 34, 6, 8.

Material studied. Holotype female, **MEXICO**, Intercepted from *Opuntia* sp. in El Paso Port of Entry, Texas State, USA, 9.v.1992 (H. Grieb) (USNM).

Paratypes. **MEXICO**, From same host and locality [all specimens intercepted], 1 female and 3 males collected with holotype, 2 females, 9.vi.1991, 1 male, 23.iv.1992, 1 male, 5.v.1992, 2 females, 5.iii.1993, 5 females and 3 larvae, 7.iii.1993 (H. Grieb) (USNM).

Comments. This species is remarkable for being one of only two yellowish *Neohydatothrips* with internal markings between the pronotal striae. The other species, *N. flavens*, has rather fewer internal markings, a distinct pronotal blotch, the ocellar area pale and transversely striate, and no brown spots on the pronotum nor laterally on the abdominal tergites. Apart from this, *N. maculatus* can be distinguished from other species with a reticulate ocellar area by the characters in the key.

***Neohydatothrips maculicollis* (Hood)**
(Figs 33, 100, 101)

Sericothrips maculicollis Hood, 1954: 203.

Female macroptera. Colour: body bicoloured (Fig. 100), head light brown, mesonotal anterior margin and metanotum brown, tergites II–IV brown to light brown, VII–VIII dark brown, IX light brown, X yellow; fore wing with clearly defined sub-basal pale band, but median pale band weakly defined from surrounding brown areas, and small apical pale area weakly defined, clavus dark with brown setae; antennal segment I pale, II–III and base of IV mainly pale but with weak shadings; hind tibiae and femora yellow.

Structure: Occipital apodeme confluent with posterior margin of eyes (Fig. 33), ocellar area transversely striate with internal markings; antennal segments III & IV constricted to short apical neck; pronotum transversely reticulate to striate with a few weak internal markings, blotch with anterior striae more closely spaced, setae placed irregularly (Fig. 33); mesonotum and anterior part of metanotum striate (Fig. 33); metasternal plate with shallow V-shaped emargination; fore wing second vein with one seta distally; wing apex with small subapical lobe; tergites III–V with posteromarginal comb incomplete medially, VI sometimes with minute teeth medially, VII with small teeth medially, VIII with complete comb; tergite IX with 2 pairs of mid-dorsal setae; sternites with one or two rows of discal microtrichia medially.

Male macroptera. Similar to but smaller than female, with light brown tergite V and pale tergite VII (Fig. 101); sternite VII with very small circular pore plate.

Material studied. **BRAZIL**, Holotype female, São Paulo State, Franco da Rocha, 11.vi.1948 (USNM); Santa Catarina State, Nova Teutônia [Seara], 6 females, 3 males from *Alchornea* (or *Trichilia*), 14.xii.1949; 2 females, 1 male from *Trichilia* sp., xii.1949; 1 female, 2 males from *Balfourodendron licanum*, 20.xii.1949; 1 female, 1 male from *Terminalia*, 26.xi.1949; 1 male from *Sapium*, 1.xii.1949; 4 females, 2 males from dry branches, 1.i.1949 (F. Plaumann) (USNM); Rio Grande do Sul State, Jaquirana, 1 female from *Myrcia lajeana*, 1 male from *Discorea* cf. *sublastatum*, 1 female from *Erythroxylum deciduum*, 28.i.2013, São Francisco de Paula, 1 female from *Lamanonia ternata,* 26.i.2013 (A. Cavalleri) (UFRGS). **TRINIDAD**, St. Joseph, 1 female, 26.vi.1951 (USNM).

Comments. Described from 6 females collected near the city of São Paulo, further specimens examined are listed above, including 1 male recorded for the first time. The striae on the anterior area of the pronotum are more widely spaced in the type series than in any of the other specimens listed, but this is here interpreted as intraspecific variation. The wing colour is variable, with the two pale areas, medially and at apex, being poorly defined, as discussed below under *N. paraensis*.

Neohydatothrips mirandai (Johansen)

Sericothrips mirandai Johansen, 1981 [1979]: 169.

Female macroptera. Colour: body bicoloured, yellowish brown with head, pronotum, anterior areas of mesonotum and metanotum and abdominal tergites II–IV and VII–VIII brown, antennal segment I yellow, II pale, III pale with apex light brown, IV light brown with base and apical fourth brown, V light brown with base and apical third brown, VI–VIII brown, legs yellow except for median area of femora. Fore wings bicoloured with three pale bands, including apex.

Structure: Occipital apodeme not confluent with posterior margin of eyes, ocellar area apparently weakly striate; pronotum transversely reticulate with internal markings, pronotal blotch distinct; mesonotum transversely striate; metanotal striae transverse on anterior half, longitudinal on posterior half; metasternal plate with shallow emargination; comb of microtrichia incomplete on tergites II–V, with minute teeth on VI, with medium-sized teeth on VII and complete on VIII; tergite IX with 2 pairs of mid-dorsal setae.

Material studied. None.

Comments. This species was described from 2 females collected in Chiapas, Mexico. It has internal markings between the striae on the pronotum, similar to several Neotropical species of both *Neohydatothrips* and *Hydatothrips*. However, *N. mirandai* seems to be more closely related to *N. tibialis*, also described from Mexico and from which it is tentatively distinguished in the key above. The type specimens of *N. tibialis* are not well mounted, and the colour pattern might be the same as in *N. mirandai*, although in the original description the latter species is regarded to have abdominal tergites IX–X yellow, in contrast to the definitely brown tergites in *N. tibialis*. In the absence of further details on the type specimens of *N. mirandai*, this species is treated here as valid.

Neohydatothrips notialis sp. n.

(Figs 34, 72)

Female macroptera. Colour: body bicoloured, brown on head, mesonotum, metanotum, tergites II–IV and VII–IX, also antecostal ridges on II–VIII, tergite X light brown; legs yellow, anterior third of pronotum, also tergites V–VI pale. Antennal segments I–II yellow, III yellow with apex brown, IV yellow with apical third brown, V basal half yellow but apical half brown, VI–VIII brown. Pronotal blotch light brown. Fore wing bicoloured with basal, median and subapical brown bands in contrast with three pale areas of which the apical area is very small (Fig. 72).

Structure: occipital apodeme confluent with posterior margin of compound eyes, ocellar setae pair III on external margins of ocellar triangle, ocellar triangle with transverse striae with markings in between the striae; pronotum striate with internal markings (Fig. 34), blotch distinctive; mesonotum striate, median setal pair anterior to the lateral; metanotum anterior half transversely striate, posterior half longitudinally striate, two pairs of setae on

anterior margin; metasternal plate with distinct anterior emargination; fore wing second vein with one seta. Tergites II–VI with comb of microtrichia incomplete medially, VII with irregularly spaced small teeth medially with minute fringe of microtrichia between these, VIII with comb complete; tergite IX with 2 pairs of mid-dorsal setae. Sternites III–VI with microtrichia medially, VII with none medially.

Measurements (holotype female in microns): Body length 995, Head length 58, width 140; ocellar setae III length 21. Pronotum length 113, width 165; pa setae 55. Fore wing length 670. Antennal segments I–VIII length 23, 33, 53, 50, 45, 38, 8, 10.

Material studied. Holotype female, **BRAZIL**, São Paulo State, Mogi-Guaçu, from dead twigs, 31.ix.2011 (A. Cavalleri) (UFRGS).

Paratypes. **BRAZIL**, Rio Grande do Sul State, Porto Alegre, 1 female on *Eryngium* sp. flowers, 16.xi.2010 (F.S. Melo), 1 female with same collection data (A. Cavalleri), 1 female from *Trema micrantha*, 27.i.2011 (A. Cavalleri) (UFRGS).

Comments. This species has transverse markings between the striae on the anterior third of the pronotum and interocellar area, as in *N. ruginosus* and *N. portoricensis*. It is closely related to *N. ruginosus*, but tergite V is totally pale.

Neohydatothrips novateutoniae sp. n.

(Figs 36, 64)

Female macroptera. Colour: body mainly brown, tergites VI and X yellow, fore wing dark with sub-basal area pale, antennal segments I–III and base of IV largely pale, fore and mid legs largely pale, hind femora brown but tibiae yellow.

Structure: Occipital apodeme confluent with posterior margin of eyes, ocellar area with irregular transverse striae, setal pair III on anterior margins of ocellar triangle; antennal segment IV with constricted apical neck and elongate sensorium extending to mid point of V; pronotum striate-reticulate, with many short longitudinal lines between the striae, blotch well-defined; mesonotum and metanotum striate with markings between the striae; metasternal plate with shallow anterior emargination; fore wing second vein with no setae. Tergites II–VI with comb of microtrichia absent medially, VII with minute teeth, VIII with comb of long microtrichia; tergite IX with 2 pairs of mid-dorsal setae; sternites apparently with discal microtrichia medially.

Measurements (holotype female in microns): Body length 1120, Head, length 58, width 160; ocellar setae III length 23. Pronotum length 110, width 185. Fore wing length 700. Antennal segments I–VIII length 25, 38, 60, 69, 50, 55, 10, 13.

Material studied. Holotype female, **BRAZIL**, Santa Catarina State, Nova Teutônia [Seara], vii.1957, on dead branches (F. Plaumann) (USNM).

Comments. Known only from a single female, this species is similar to *N. ruginosus* in colour and sculpture, but has the fore wings uniformly dark medially, and the sense cone on antennal segment IV exceptionally elongate.

Neohydatothrips paraensis (Hood)

(Figs 40, 50, 73, 102)

Sericothrips paraensis Hood, 1954: 205.

Female macroptera. Colour: body bicoloured (Fig. 102), head brown, mesonotum and metanotum light brown to brown, tergites II–VII with antecostal ridge brown, II–IV brown laterally, VII–IX dark brown, X light brown; fore wing with clearly defined sub-basal pale band, but median pale band and apical pale area weakly defined from surrounding brown areas, clavus dark with pale setae; antennal segment I pale, II–III and base of IV mainly pale but with weak shadings; hind tibiae yellow with external margin shaded, femora light brown.

Structure: Occipital apodeme well separated from posterior margin of eyes, ocellar area transversely striate; antennal segments III & IV constricted to short apical neck; pronotum transversely striate without internal markings, blotch with anterior striae more closely spaced and bearing transverse row of setae (Fig. 40); mesonotum

and anterior part of metanotum striate (Fig. 50); metasternal plate with shallow emargination; fore wing second vein with no setae distally (Fig. 73); tergites VII–VIII with complete comb of microtrichia on posterior margin but sometimes irregular on VII, no comb medially on remaining tergites; tergite IX with 2 pairs of mid-dorsal setae.

Material studied. Holotype female, **BRAZIL**, Pará State, Belém, 23.vii.1951, taken with 4 other females on sweeping grass (USNM); Maranhão State, São Luís, 1 female on *Aeschynomene* sp. flowers, 22.vii.2010 (E.F.B.Lima); Minas Gerais State, Uberlândia, 1 female on *Phaseolus vulgaris*, v.2001 (ESALQ).

Comments. Described from eight females collected in Pará State this species has also been taken in Maranhão State, close to Pará, and Minas Gerais. In sculpture and in colour pattern, this species is very similar to *N. maculicollis*, differing primarily in having the postoccipital apodeme more distant from the posterior margin of the compound eyes, and also in having the brown areas darker and the pale bands of the fore wing rather more clearly defined.

Neohydatothrips plaumanni sp. n.

(Figs 35, 66)

Female macroptera. Colour: body brownish yellow, postoccipital region of head light brown, pronotum with three light brown areas laterally that fuse medially in some specimens; tergites II–VI with antecostal ridge dark brown and associated light brown areas anterolaterally, VIII–IX with shaded area medially; fore wing uniformly pale brownish grey; antennal segment I pale, II–IV light brown; hind femora and tibiae yellow with light brown markings.

Structure: Occipital apodeme distant from posterior margin of eyes (Fig. 35); ocellar area with sculpture lines weak or apparently absent, setal pair III on or near anterior margins of ocellar triangle; antennal segments III & IV with short constricted neck apically (Fig. 66); pronotum striate, blotch indistinct with irregular transverse row of setae (Fig. 35); mesonotum striate with median setae almost in a transverse row; metanotum with irregular longitudinal striae; metasternal plate with anterior margin almost straight; fore wing second vein with 2 setae distally; tergites II–VI with comb of microtrichia incomplete medially, VII–VIII with comb of long microtrichia; tergite IX with 2 pairs of mid-dorsal setae; sternites without discal microtrichia medially.

Measurements (holotype female in microns): Body length 1139, Head, length 85, width 130; ocellar setae III length 28. Pronotum length 116, width 170. Fore wing length 700. Antennal segments I–VIII length 20, 33, 53, 45, 38, 45, 8, 10.

Male macroptera. Male similar to female; sternites without pore plates.

Measurements (paratype male in microns): Body length 920, Head length 78, width 143; ocellar setae III length 28. Pronotum length 100, width 145. Fore wing length 580. Antennal segments I–VIII length 20, 30, 48, 38, 33, 40, 8, 10.

Material studied. Holotype female, **BRAZIL**, Santa Catarina State, Nova Teutônia [Seara], 20.xii.1949, on *Balfourodendron licanum*, (JDH 2082) (F. Plaumann) (USNM).

Paratypes: 9 females and 9 males collected with holotype; 1 female from same locality as holotype and without host data, 15.xi.1949 (JDH 2017A); 1 female from same locality as holotype and without host data, 20.v.1949 (JDH 2041); 1 female from same locality as holotype and without host data, 17.xi.1949 (F. Plaumann) (USNM).

Comments. This species is one of the few members of this genus with the median pair of setae on the mesonotum almost in line transversely with the lateral pair.

Neohydatothrips portoricensis (Morgan)

(Fig. 103)

Sericothrips portoricensis Morgan, 1925: 3.
Sericothrips latereostriatus John, 1929: 34.
Sericothrips portoricensis extremus Moulton, 1941: 315.
Scirtothrips batatae Bondar, 1930: 19.

Female macroptera. Colour: body bicoloured (Fig. 103), head brown, pronotum brown with blotch dark,

mesonotum and metanotum brown, tergites II–VII with antecostal ridge dark brown, II–V brown laterally, VI yellow with weak shading medially, VII–X brown; fore wing with clearly defined sub-basal pale band, but median pale band more diffuse, clavus shaded; antennal segments I–II pale, III–IV yellow with brown apex, V yellow at base; hind tibiae yellow, femora brown.

Structure: Occipital apodeme not quite confluent with posterior margin of eyes, ocellar area transversely striate; antennal segments III & IV with constricted apical neck; pronotum with transversely narrow reticulations or striations, with many internal markings, blotch more closely striate and bearing transverse row of setae on anterior margin; mesonotum and metanotum very closely striate; metasternal plate with shallow emargination; fore wing second vein with 2 setae distally; tergites VI–VIII with complete comb of microtrichia on posterior margin, III–V with minute teeth; tergite IX with 2 pairs of mid-dorsal setae; sternites without discal microtrichia medially.

Material Studied. Holotype female, **PUERTO RICO**, Rio Pedras, 25.iii.1920 (USNM). Holotype female of *latereostriatus*, **BRAZIL**, Espirito Santo State, Alfonso Claudio, ix.1928 (BMNH). Syntype female of *batatae*, **BRAZIL**, Bahia, from *Ipomoea* leaves (IBSP). **COSTA RICA**, San Pedro, 1 female, 24.ii.1991, La Selva, 1 female, 26.iv.1992, both from *Ipomoea* leaves (ANIC). **BRAZIL**, 30 females from various localities in Pará, Rio de Janeiro, São Paulo, and Santa Catarina States (USNM).

Comments. Described originally from Puerto Rico, the synonyms indicated above were established by Mound and Marullo (1996) for three species described from southern Brazil. This species is widespread in South America between Bermuda and Santa Catarina (Brazil). Despite the frequency with which it has been collected, the range of host plants is not clear, although the species is commonly associated with *Ipomoea* leaves in Central America (Mound & Marullo, 1996). It is a large dark species, with red internal pigment and, like *N. fimbriatus*, it has a fringe of small microtrichia medially on the posterior margins of tergites II–VI. The metanotal sculpture is linear and longitudinal, but has duplicate striae alongside the main sculptured striae. The pronotal sculpture is formed of narrow transverse reticulations, with many longitudinal markings in between the main striae.

Neohydatothrips pseudoannulipes Johansen

Neohydatothrips pseudoannulipes Johansen, 1983: 108.

Female macroptera. Colour: body bicoloured, head, mesonotum, metanotum and abdominal tergites II–IV and VII–IX brown; pronotum and abdominal tergites I, V–VI and X yellow, antennal segments I–III pale, IV yellow with apical third brown, V brown with basal third yellow, light brown with base and apical fourth brown, V light brown with base and apical third brown, VI–VIII brown; legs yellow except for median shaded brown area on mid and hind femora also fore and mid tibiae; fore wing with three brown (including base and apex) and two pale bands.

Structure: Occipital apodeme not confluent with posterior margin of eyes, ocellar area apparently weakly striated; pronotum transversely reticulate with no internal markings and some broader reticles medially, pronotal blotch distinct; mesonotum transversely striate; metanotal striae transverse on anterior half, longitudinal on posterior half; metasternal plate with shallow emargination; fore wing with two setae on second vein, comb of microtrichia incomplete on tergites III–VI, complete on VII–VIII; tergite IX with 2 pairs of mid-dorsal setae.

Material studied. None.

Comments. This species was described from several specimens collected in a montane area in Hidalgo, Mexico, although at least one of them is not conspecific (Nakahara 1999) (see *N. samayunkur* comments section). Although compared to *N. annulipes* in the original description, it seems to be more related to *N. chelinus* and *N. daedalus*, although the pattern of colouration is different and the pronotal reticles of these Brazilian species are broader.

Neohydatothrips rapoporti Johansen

Neohydatothrips rapoporti Johansen, 1983: 110.

Female macroptera. Colour: mainly yellowish brown, ocellar area striate, anterior margin of mesonotum and

metanotum, pronotal blotch and antecostal ridges also anterolateral areas on tergites III–VII brown; abdominal tergites II–IV and VII–IX brown; antennal segment I light brown to brown, II brown, III light brown with darker apex, IV light brown with base and apex brown, V light brown with brown base and apical half, VI–VIII brown; legs yellow with femora and tibiae shaded brown medially; fore wing brown with one sub-apical pale area.

Structure: Occipital apodeme not confluent with posterior margin of eyes; pronotum transversely striate with no internal markings, pronotal blotch distinct; mesonotum transversely striate; metanotal striae transverse on anterior half, longitudinal on posterior half; metasternal plate with shallow emargination; comb of microtrichia incomplete on tergites III–VI, complete on VII–VIII; tergite IX with 2 pairs of mid-dorsal setae.

Material studied. None.

Comments. This species was based on several specimens collected in Hidalgo, Mexico. It is described as having the occipital apodeme close to the posterior margins of the compound eyes, and one small pale spot sub-basally on the fore wing. However, Johansen's original illustrations, and a photograph presumably of a specimen from the type series published subsequently (Johansen-Naime & Mojica-Guzmán 2009), show the occipital apodeme far from the compound eyes and one defined pale band subapically on the fore wing. It is these character states that are used here to distinguish *N. rapoporti* from its congeners. Apart from the type specimens, several other individuals have been collected on *Buddleja* leaves, which is probably its host plant (Johansen-Naime & Mojica-Guzmán 2009). The species is unique in being mostly yellowish brown but with bicoloured fore wings.

***Neohydatothrips renatae* sp. n.**
(Figs 38, 65, 74)

Female macroptera. Colour: body bicoloured, brown on mesonotum, metanotum, tergites II–IV and VII–IX also antecostal ridges on II–VIII, tergite X light brown; head pale with median area brown; fore femora yellow with suffused brown, mid and hind femora with basal half yellow but apical half brown; pronotum anterior third also tergites V–VI pale; antennal segment I light brown, II light brown at base but progressively yellow toward apex, III yellow on basal half but light brown on apical half, IV light brown on basal half and brown on apical half, V brown but slightly paler near base, VI–VIII brown (Fig. 65); pronotal blotch light brown; fore wing bicoloured with basal, median and sub-apical brown bands in contrast to three pale areas.

Structure: occipital apodeme not touching posterior margin of compound eyes (Fig. 38), ocellar setae pair III near external margins of ocellar triangle, ocellar triangle transversely striate with internal markings between the striae; pronotum striate, blotch weakly defined apart from anterior margin (Fig. 38); mesonotum striate, median setal pair anterior to the lateral; metanotum anterior half transversely striate, posterior half longitudinally striate, two pairs of setae at anterior margin; metasternal plate with very shallow anterior emargination; fore wing second vein with two setae (Fig. 74). Tergites II–VI posterior margin with comb of microtrichia incomplete medially, VII with minute teeth medially, VIII with comb complete; tergite IX with 2 pairs of mid-dorsal setae; sternites III–VI with discal microtrichia medially, absent medially on VII.

Measurements (holotype female in microns): Body length 1130, Head length 40, width 163; ocellar setae III length 13. Pronotum length 119, width 195; pa setae 60. Fore wing length 730. Antennal segments I–VIII length 25, 38, 60, 53, 50, 53, 13, 15.

Male macroptera. Similar to female, but smaller and with tergite VII pale, sternites without pore plates.

Measurements (paratype male in microns): Body length 940, Head length 33, width 145; ocellar setae III length 10. Pronotum length 103, width 175. Fore wing length 590. Antennal segments I–VIII length 23, 33, 53, 48, 45, 50, 10, 13.

Material studied. Holotype female, **BRAZIL**, São Paulo State, Piracicaba, from unidentified plant, 1.iv.1995 (F.L. Cônsoli) (ESALQ).

Paratypes. 5 females and 5 males collected with the holotype (UFPI, UFRGS, USNM, CAS and ANIC).

Comments. *N. renatae* is similar to *N. paraensis* in colour, but can be distinguished by the unusually bicoloured head (pale laterally and brown medially), the more distinct median pale band on fore wing, and the longer distance between the compound eyes and occipital apodeme.

***Neohydatothrips ruginosus* (Hood)**
(Figs 104, 105)

Sericothrips ruginosus Hood, 1954: 202.

Female macroptera. Colour: body bicoloured (Fig. 104), head light brown medially but paler at anterior and posterior, pronotum, mesonotum and metanotum brown, tergites II–V brown at least laterally, VI yellow, VII–IX dark brown, X yellow; fore wing with 2 pale bands, apex dark, clavus dark with pale setae; antennal segments I–III pale, apex of IV –V light brown; hind tibiae yellow, femora shaded with light brown.

Structure: Occipital apodeme confluent with posterior margin of eyes, ocellar area striate with markings between the striae; antennal segments III & IV with apex not forming an elongate neck; pronotum transversely striate with many markings between the striae; mesonotum and metanotum striate with markings between the striae; metasternal plate with shallow emargination; fore wing second vein with one seta distally; tergites VII–VIII with complete comb of microtrichia on posterior margin but this is shorter on VII, also VI sometimes with very short comb medially, no comb on remaining tergites; tergite IX with 2 pairs of mid-dorsal setae; sternites without microtrichia medially, or with one row.

Male macroptera. Similar to female, but smaller, with tergite VII pale (Fig. 105); sternite VII with one small circular pore plate scarcely 5 microns in diameter.

Material Studied. Holotype female, **BRAZIL**, Rio de Janeiro, Itaguai, 22.vi.1948 (USNM); Santa Catarina State, Nova Teutônia [Seara], 30 females and 4 males, between 1948 and 1957. (F. Plaumann) (USNM); Rio Grande do Sul State, Porto Alegre, 1 male from *Passiflora elegans*, 17.i.2011 (A. Cavalleri) (UFRGS).

Comments. Described from eight females collected in Rio de Janeiro State, further specimens been studied from Santa Catarina and Rio Grande do Sul States, including the previously unknown male. The pronotal sculpture is more delicate than that of the more widespread *N. portoricensis*, and the metanotal sculpture more complex, but these two species are otherwise similar to each other. The specimens from Santa Catarina State are paler than the type series, with abdominal segment VI almost clear yellow and segment V yellow with light brown shading medially. However, the sculpture of the head and metanotum is essentially similar in all available specimens.

***Neohydatothrips samayunkur* (Kudo)**
(Figs 37, 52, 106)

Hydatothrips (*Neohydatothrips*) *samayunkur* Kudo, 1995: 169.

Female macroptera. Colour: body bicoloured (Fig. 106), head brown, pronotum with anterior area yellow but blotch brown, mesonotum and metanotum brown, tergites I–II light brown, III–VI brown laterally but increasingly yellow medially with antecostal ridge dark brown, VII–IX dark brown, X brown; fore wing with 3 dark and 3 pale bands, apex pale, clavus dark with brown setae; antennal segment I pale, II with brown shadings, III pale with brown base and apex, IV–V pale with apex brown; hind tibiae yellow with external margin shaded, femora brown.
Structure: Occipital apodeme well separated from posterior margin of eyes, ocellar area with reticulate markings (Fig. 37); antennal segments III & IV constricted to short apical neck; pronotum anterior area with transverse reticulation but no internal markings, blotch striate and bearing transverse row of setae (Fig. 52); mesonotum and metanotum striate (Fig. 52); metasternal plate with shallow emargination; fore wing second vein with no setae distally; tergite VIII with complete comb of microtrichia on posterior margin, VII with comb interrupted medially, no comb on remaining tergites; tergite IX with 2 pairs of mid-dorsal setae; sternites III–VI with microtrichia, VII without microtrichia medially.

Male macroptera. Similar to female but smaller, tergites II–VII and X yellow; sternite VII with small circular pore plate.

Larva II. Pale with microtrichia on dorsal surface. Antennae 7-segmented, segment I yellow, II–VII yellowish brown. Thorax with brown sclerotized areas on mesonotum and metanotum. Body with several brown setae with fringed, expanded apices, about 10 microns long medially and 20 microns laterally on thorax and abdominal tergites I–IV; sternal setae acute.

Material Studied. **BRAZIL**, Paraná State, Curitiba, 18 females flowers of *Tagetes patula*, 30.i.2015 (A.S.

Poltronieri & E.F.B. Lima) (UFPI). Several specimens from **MEXICO**, **SOUTH AFRICA**, **KENYA**, **MAURITIUS** and **EASTERN AUSTRALIA** (ANIC).

Comments. This species has been recorded from several countries around the world as a pest of garden *Tagetes* plants. It was misidentified by Mound and Marullo (1996) and Mound *et al*. (1996) under the name *N. pseudoannulipes* Johansen, based on a specimen purporting to be a paratype of this species on loan from Roberto Johansen. Nakahara (1999) subsequently recognized this specimen as *N. samayunkur*, and this pest of marigold plants (*Tagetes* spp.) has also been found in southern Brazil (Monteiro *et al*. 1999).

Neohydatothrips sidae (Crawford)

(Figs 39, 58, 107, 108)

Sericothrips sidae Crawford, 1944: 200.

Female macroptera. Colour: body bicoloured (Fig. 107), head light brown, pronotum brownish yellow with posteroangular setae dark brown, mesonotum and metanotum brown, tergites II–VIII with antecostal ridge dark brown, II–VI light brown, VII–X brown, X light brown; fore wing brown with pale sub-basal band, clavus shaded in basal half; antennal segment I pale, II weakly shaded, III brown near base but pale medially, IV brown with yellow base; hind tibiae yellow, femora shaded with light brown.

Structure: Occipital apodeme not confluent with eyes, ocellar area striate with markings between the striae (Fig. 39); antennal segments III & IV without a strongly constricted apical neck; pronotum transversely striate with no internal markings, striae of blotch more closely spaced than those of anterior area (Fig. 39); mesonotum and metanotum closely striate; metasternal plate with shallow emargination (Fig. 58); fore wing second vein with one or two setae distally; tergites VII–VIII with complete comb of microtrichia on posterior margin but this is short medially on VII, no comb medially on remaining tergites; tergite IX with 2 pairs of mid-dorsal setae; sternites III–VI with microtrichia medially, VII with few microtrichia medially.

Male macroptera. Similar to female, but smaller and with tergite VII paler than VIII (Fig.108).

Larva II. Clear yellow with microtrichia on dorsal surface. Antennae 7-segmented, segment I and III-VII light brown, II brown. Thorax with brown sclerotized areas on mesonotum and metanotum. Body with several brown setae with fringed, expanded apices, about 8 microns long medially on thorax and 14 microns laterally on thorax and abdominal tergites I–IV; sternal setae acute.

Material studied. Holotype female, **BRAZIL**, São Paulo, *Sida rhombifolia* (USNM); Santa Catarina State, Nova Teutônia [Seara], 12 females, 1 male from *Sida* sp., 6.i.1949 (JDH 2024); 8 females, 2 males from *Cedrella*, 9.xi.1949 (JDH 2042A); 7 female, 2 male from *Balfourodendron licanum*, 20.xii.1949 (JDH 2082); 2 female, 1 male from *Fagara* [Rutaceae], 24.x.1949 (JDH 2069); 5 females, 29.xii.1948 (JDH 2016); 1 female from *Dalbergia*, 15.x.1949 (JDH 2066); 1 female from *Morus nigra*, 5.xi.1949 (JDH 1784); 1 female, 20.v.1949 (JDH 2041); 1 female from Myrtaceae, 10.x.1949 (JDH 2064); 1 female, 15.xi.1949 (JDH 2017A); 3 females from grasses, i.1954 (JDH 2113/4) (USNM). **ARGENTINA**, Tucuman Province, 2 females, 2 larvae II, 19.ii.2015 (B. Carrizo) (UNJA).

Comments. This species is difficult to define clearly, because abdominal tergites V and VI appear to be variable in the intensity and extent of brown colour. The species was described from specimens collected at São Paulo, but further specimens have been studied from Santa Catarina and Rio Grande do Sul States as well as Argentina (first record for that country). The body is not as strongly bicoloured as in some species, but abdominal segments III–VI are mainly light brown with the antecostal ridge dark and anterolateral brown shadings, and tergites VII–IX are dark brown with X almost yellow. Tergites V–VI are sometimes pale to variably light brown.

Neohydatothrips signifer (Priesner)

Sericothrips signifer Priesner, 1932: 172.

Described from Mexico, this species was considered a senior synonym of *burungae* by Mound and Marullo (1996). The name *signifer* has been used for specimens from other South American areas, such as Colombia (Santos *et al*.

2012), presumably based on the available identification key (Mound & Marullo 1996), although Hoddle *et al*. (2002) used the name *burungae* for specimens collected from avocado leaves in Mexico and Guatemala. At present it is not possible to decide whether the names *signifer* and *burungae* refer to one or to two species.

***Neohydatothrips sulcus* sp. n.**
(Figs 41, 63)

Female macroptera. Colour: body mainly yellow with ocellar area shaded light brown, antecostal ridges on tergites II–VI brown with yellowish brown areas posterolaterally; antennal segment I yellow, II yellowish brown, III light brown with base and apex brown, IV light brown on basal half but brown on apical half (Fig. 63), V brown with base light brown, VI–VIII brown; fore wing uniformly pale brownish grey.

Structure: Occipital apodeme not touching posterior margin of compound eyes; ocellar setae pair III on external margins of ocellar triangle, ocellar triangle smooth (Fig. 41); pronotum closely striate with indistinct blotch (Fig. 41); mesonotum striate, median setal pair anterior to the lateral; metanotum anterior half transversely striate, posterior half longitudinally striate, two pairs of setae on anterior margin. Metasternal plate with very shallow anterior emargination; fore wing second vein with two setae; tergites II–VI with comb of microtrichia incomplete medially, comb complete on VII–VIII; tergite IX with 2 pairs of mid-dorsal setae; sternites III–VII with no microtrichia medially.

Measurements (holotype female in microns): Body length 985, Head length 65, width 148; ocellar setae III length 20. Pronotum length 110, width 175. Fore wing length 600. Antennal segments I–VIII length 20, 33, 43, 38, 35, 38, 5, 8.

Male macroptera. Similar to female, but smaller; sternites without pore plates.

Measurements (paratype male in micros): Body length 720, Head length 53, width 130; ocellar setae III length 13. Pronotum length 98, width 135. Fore wing length 470. Antennal segments I–VIII length 15, 30, 40, 29, 24, 26, 3, 5.

Material studied. Holotype female. **BRAZIL**, Rio Grande do Sul State, Santo Antônio das Missões, 1 female from *Vachellia caven* (labelled as *Acacia caven*) 3.ii.2013 (A. Cavalleri) (UFRGS).

Paratypes. **BRAZIL**, Rio Grande do Sul State, Santo Antônio das Missões, 2 males and 2 females collected with the holotype, 3.ii.2013 (A. Cavalleri), Barra do Quaraí, 1 female and 1 male from same host as holotype, 18–19.ix.2003 (S.M.J.Pinent) (UFRGS); Piauí State, Teresina, 1 female from *Caesalpinia pulcherrima*, 6.i.2012 (E.F.B.Lima) (UFPI).

Comments. This new species is similar to *N. luculentus* and *N. zucchi*, but has shorter sense cones in antennal segments III and IV. It seems to be associated to *Vachellia caven* flowers [Fabaceae] in southern Brazil, although one specimen was collected from another Fabaceae in the northeast.

***Neohydatothrips tibialis* (Priesner)**
(Fig. 42)

Sericothrips tibialis Priesner, 1924: 528.

Female macroptera. Colour: mainly dark brown, tibiae and apex of femora yellow; antennal segments I–II yellow, III light brown, IV light brown with brown apical third, V–VIII brown; fore wing brown with one sub-apical pale area and apparently median and apical bands suffused brown to pale.

Structure: Occipital apodeme not confluent with posterior margin of eyes (Fig. 42), ocellar area irregularly sculptured with internal markings; pronotal transverse striae forming some transverse reticles with internal markings, pronotal blotch distinct; mesonotum transversely striate; metanotal striae transverse on anterior half, longitudinal on posterior half; metasternal plate with shallow emargination; comb of microtrichia incomplete on tergites III–VI, complete on VII–VIII; tergite IX with 2 pairs of mid-dorsal setae.

Material studied. Cotype female, **MEXICO**, Chapingo, on alfafa field, 13.iii.1924 (USNM).

Comments. Based on three poorly cleared females, this species was regarded as having only one pale area

(sub-basal) on the fore wing, although the key by Mound and Marullo (1996) suggests that the fore wing has three pale bands. The cotype examined here is not fully cleared with the fore wing laying over the body, but the apex of the fore wing is light brown. In the original description, Priesner (1924) indicated that the species has one pale sub-basal band also other more or less diffused brown bands.

Neohydatothrips varius (Moulton)

(Figs 44, 76, 109, 110)

Sericothrips varius Moulton, 1941: 317.

Female macroptera. Colour: body strongly bicoloured (Fig. 109), brown on head, mesonotum, metanotum, tergites II–IV and VII–VIII; tergites V–VI shaded brown medially, with antecostal ridge dark and small brown spot anterolaterally (Fig. 76); tergite IX posterior half light brown, X yellow, pronotum yellow, blotch almost indistinguishable apart from anterior margin; fore wing with 3 dark and 3 pale bands, apex pale, clavus dark with pale setae; antennal segments I–II pale, III pale with weak shading medially, IV brown with apex pale; hind tibiae yellow with brown marking on external distal margin, femora brown distally.

Structure: Occipital apodeme close to, but not touching posterior margin of eyes, ocellar area with closely spaced striations and markings between the striae (Fig. 44); antennal segments III & IV with a short constricted apical neck; pronotum transversely striate, blotch with striae more closely spaced and transverse row of setae on anterior margin (Fig. 44); mesonotum and metanotum closely striate; metasternal plate with shallow emargination; fore wing second vein with 2 setae distally; tergites VII–VIII with complete comb of microtrichia on posterior margin but short on VII, comb absent medially on remaining tergites; tergite IX with 2 pairs of mid-dorsal setae; sternites III–VI with microtrichia medially but VII with none medially.

Male. Similar to female, but smaller, with tergite VII pale (Fig. 110).

Material studied. Holotype female, **BRAZIL**, Minas Gerais, October 1933 (CAS); Santa Catarina State, Nova Teutônia [Seara], 7 females 1 male, various dates in 1949 (F. Plaumann) (USNM).

Comments. Described originally from a single female, further specimens have been studied from Brazil. The colour of *N. varius* is similar to that of *N. maculicollis*, but these species can be distinguished by the characters in the key.

Neohydatothrips zucchi sp. n.

(Figs 43, 79)

Female macroptera. Colour: body mainly yellow, posterior half of head light brown, pronotum with small light brown areas laterally; tergites II–VII with antecostal ridge dark brown and associated small light brown areas anterolaterally (Fig. 79); tergites VIII–X brownish yellow; fore wing uniformly pale brownish grey with apex paler; antennal segment I pale, II–IV light brown; legs yellow.

Structure: Occipital apodeme not close to posterior margin of eyes, ocellar area apparently lacking sculpture lines, setal pair III just outside ocellar triangle (Fig. 43); antennal segments III & IV with short constricted neck apically, sense cones elongate; pronotum striate, posterior margin with 2 pairs of prominent setae, blotch not defined, transverse row of setae irregular (Fig. 43); mesonotum striate, median setal pair anterior to the lateral; metanotum anterior half transversely striate, posterior half longitudinally striate, two pairs of setae on anterior margin; metasternal plate with shallow anterior emargination; fore wing second vein with 2 setae distally; tergites II–VI with comb of microtrichia incomplete medially, VII with minute teeth medially, VIII with complete comb; tergite IX with 2 pairs of mid-dorsal setae; sternites without microtrichia medially.

Measurements (holotype female in microns): Body length 1230, Head, length 88, width 165; ocellar setae III length 23. Pronotum length 135, width 180; posteroangular setae 43. Fore wing length 710. Antennal segments I–VIII length 25, 34, 53, 48, 40, 45, 8, 10.

Male macroptera. Male similar to female; sternites without pore plates.

Measurements (paratype male in microns): Body length 950, Head length 84, width 150; ocellar setae III

length 25. Pronotum length 111, width 153. Fore wing length 590. Antennal segments I–VIII length 15, 30, 50, 50, 38, 44, 8, 11.

Material studied. Holotype female, **BRAZIL**, Santa Catarina State, Nova Teutônia [Seara], on *Balfourodendron licanum,* 20.xii.1949 (JDH 2082) (F. Plaumann) (USNM).

Paratypes: 2 females collected with holotype, 10 females from same locality as holotype and without host data, 20.v.1949 (JDH 2041), 1 female from same locality as holotype and without host data, 9.xi.1949 (JDH 2042A), 2 female 1 male same locality as holotype on dead branches, xii.1951 (JDH 2084A) (F. Plaumann) (USNM); Ceará State, Tianguá, 3 females on leaves of unidentified Fabaceae, 1 female on leaves of unidentified herb, 14.ii.2016; Piauí State, Bom Jesus, 2 females on soybeans, 19.x.2011, 1 female from same locality and host, 1.xi.2011, 1 male from same locality and host, 30.vii.2012 (E.F.B Lima) (UFPI).

Comments. This species is unusual in having the comb of microtrichia on the posterior margin of tergite VII either interrupted or absent medially, as well as two pairs of prominent setae on the posterior margin of the pronotum and the antennal sense cones elongate. It is closely related to *N. luculentus*, and the differences between these two species are discussed under that species.

TABLE 1. Known host-associations for Neotropical Sericothripinae.

Species	Hosts*
Hydatothrips canavaliae **sp. n.**	*Canavalia brasiliensis*
Hydatothrips gliricidiae	*Gliricidia sepium*
Hydatothrips sternalis	*Acalypha diversifolia*
Neohydatothrips basilaris	*Eupatorium odoratum*
Neohydatothrips burungae	*Medicago sativa, Phaseolus vulgaris, Solanum esculentum*; *Persea americana*
Neohydatothrips gracilipes	*Sida rhombifolia*
Neohydatothrips hadrosetae	*Gouania lupuloides*
Neohydatothrips inversus	*Coursetia arborea*
Neohydatothrips maculatus **sp. n.**	*Opuntia* sp.
Neohydatothrips portoricensis	*Ipomoea batatas*
Neohydatothrips rapoporti	*Buddleja cordata cordata*
Neohydatothrips samayunkur	*Tagetes patula*
Neohydatothrips sidae	*Sida* spp.
Neohydatothrips signifer	*Brickellia argyrolepis*; *Passiflora edulis*

* Based on Bondar (1930), Mound & Marullo (1996), González & Castillo (2009), Johansen-Naime & Mojica-Guzmán (2009), González *et al.* (2011) and authors' data.

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APPENDIX A. Identification of second instar larvae.

Most Sericothripinae larvae II have the dorsal setae fimbriate or, if the setae are simple, the cuticle is densely covered with microtrichia (Vance 1974). The only identification key to larval Sericothripinae, based on larvae II, refers to 10 North American species (Vance 1974), although several workers have demonstrated that satisfactory identifications can be based on immatures (Speyer & Parr 1941; Priesner 1964; Heming 1991; Vierbergen *et al*. 2010). In the Neotropics, identification systems for larval stages are non-existent, and host-associations are known for only 14 of the Sericothripinae species considered in this paper (Table 1). Of these 14, we have been able to study the second instar larvae of only seven species.

We recognise the limitations of presenting a formal key to such a small sample of species. However, we hope that this first attempt will foster the study of larval thrips in the Neotropics. The chaetotaxy used here follows Heming (1991). However, it should be noted that we were not able to recognise character states that might distinguish Sericothripinae larvae at genus level. Detailed comments on larvae II are given above under each species for which larvae are available.

1. Body without brown markings . . . . . *Hydatothrips gliricidiae*
-. Body with brown markings 2
2. Mesonotum and metanotum with brown lateral sclerotized areas mid-laterally 3
-. Mesonotum and metanotum without with brown lateral sclerotized areas 6
3. Pronotum without brown sclerotized areas 4
-. Pronotum with brown sclerotized areas 5
4. Thoracic setae with broadly expanded apex (about 4 times as wide as base); body setae small, pronotal setae 7 and metanotal setae 5 about 14 microns . . . . . *Neohydatothrips sidae*
-. Thoracic setae less broadly expanded (apex about twice as wide as base); body setae long, pronotal setae 7 and metanotal setae 5 about 21 microns . . . . . *N. samayunkur*
5. Thoracic setae with broadly expanded apex (about 4 times as wide as base); tergites III–VI with setal pair 2 with apex roundly expanded . . . . . *H. canavaliae*
-. Thoracic setae with apex less fringed and less expanded (about 3 times as wide as base); tergites III–VI with setal pair 2 with apex flatly expanded . . . . . *H. williamsi*
6. Body setae long; pronotal setae 1 and 2 and tergal setae 1 about 32 µm . . . . . *N. gracilipes*
-. Body setae smaller; pronotal setae 1 and 2 about 14 µm and tergal setae 1 about 20 µm . . . . . *N. burungae*