Zootaxa 1983: 1–22 (2009)
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

Identification and host-plant associations of Australian Sericothripinae (Thysanoptera, Thripidae)

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Abstract

The Sericothripinae is a largely tropical group of about 140 species that are often strikingly bicoloured and have complex surface sculpture, but for which the biology is poorly known. Although 15 genera have been described in this subfamily, only three of these are currently recognised, with five new generic synonymies indicated here. In Australia, *Sericothrips* Haliday is introduced, with one European species deployed as a weed biological control agent. *Hydatothrips* Karny comprises 43 species worldwide, with six species found in Australia, of which two are shared with Southeast Asia, and four are associated with the native vine genus, *Parsonsia*. *Neohydatothrips* John comprises 96 species worldwide, with nine species in Australia, of which one is shared with Southeast Asia and two are presumably introduced from the Americas. Illustrated keys are provided to the three genera and 16 species from Australia, including six new species [*Hydatothrips aliceae*; *H. bhattii*; *H. williamsi*; *Neohydatothrips barrowi*, *N. bellissi*, *N. katherinae*]. One new specific synonym is recognised [*Hydatothrips haschemi* Girault (=*H. palawanensis* Kudo)], also four new generic synonyms [*Neohydatothrips* John (=*Faureana* Bhatti; *Onihothrips* Bhatti; *Sariathrips* Bhatti; *Papiliothrips* Bhatti); *Sericothrips* Haliday (=*Sussericothrips* Han)].

Key words: Thysanoptera, Thripidae, Sericothripinae, new species, new synonyms, *Sericothrips*, *Hydatothrips*, *Neohydatothrips*

Introduction

Sericothripines are remarkable amongst the Thripidae for their complex body sculpture and striking colour patterns. This paper establishes the identities of 16 of these species, at least 10 of which are Australian endemics, but with three known from Asia, and three northern hemisphere species of which one is a minor pest and one is involved in the biological control of a weed. Five of the 16 species were among 135 species of Thysanoptera described by A. A. Girault in a series of privately published notes between the years 1926 and 1932 (Gordh et al., 1979). These descriptions were excessively brief and uninformative, the slide-mounts of the type specimens were poorly prepared and often seriously damaged, and the species were usually based on single specimens. As a result, the Girault publications have posed a challenging problem to recognising and establishing the biological significance of many thrips species (Mound, 2008), and more than half of his names are now considered synonyms (Mound, 1996).

Host-plant associations

Host-plant associations have been established for 11 of the 16 species discussed here. Considering the Sericothripinae worldwide, host exploitation in this subfamily seems to have involved capture of various unrelated

Accepted by S. Winterton: 1 Dec. 2008; published: 19 Jan. 2009

plant species, but within Australia there is clear evidence of diversification in association with particular plant groups. Three closely related species in *Hydatothrips* are each associated with a different species of the vine genus *Parsonsia* (Apocynaceae) in eastern Australia, including an endemic species on Lord Howe Island. Moreover, a further new species of *Hydatothrips* is described for which the host plant remains unknown but is predicted to be a species of *Parsonsia*. Many Sericothripinae species seem to be associated with the leaves of Fabaceae. These include three closely related Australian species of *Neohydatothrips* that live on various low-growing native species in this family, one species of *Hydatothrips* that lives on *Centrosema* and is here considered a senior synonym of a species described from the Philippines, and one introduced European species, *Sericothrips staphylinus*, that lives on *Ulex*, an introduced European weed. In contrast, *N. gracilipes* seems to be associated primarily with *Sida* (Malvaceae), and *N. samayunkur* with *Tagetes* (Asteraceae). *N. plynopygus* was found near Darwin in large numbers on the aquatic vegetable *Ipomoea aquatica* (Convolvulaeae), but although this thrips is recorded widely across Asia there are no firm host records from other parts of its distribution.

Subfamily Sericothripinae

The Sericothripinae is one of four subfamilies recognised in the Thripidae, the others being the Dendrothripinae with 100 species (Mound, 1999), the Panchaetothripinae with 130 species (Wilson, 1975), and the Thripinae with more than 1600 species. The Sericothripinae is a group of about 140 flower and leaf-feeding, often bicoloured, species whose larvae (Figs 54, 60, 79) have fringed or trumpet-shaped major setae (Kudo, 1998). The adults are readily distinguished from other Thripidae by the following character states: 1. Abdominal tergites with closely spaced rows of microtrichia on the lateral thirds (Fig. 5); 2. Abdominal dorsoventral muscles arise from small but prominent sclerotised areas laterally on antecostal ridges of tergites and sternites (Figs 5, 53); 3. Forewing first vein with setal row complete, but second vein (Fig. 14) usually with no setae (sometimes with one or two setae near wing apex apparently displaced from first vein). 4. All femora and tibiae with closely spaced transverse rows of microtrichia (except *N. barrowi* sp.n.). 5. Antennal segment VI usually with base of sensorium long and slender. Among the bicoloured species the pronotum is distinctive in having a discrete discal area, the “blotch” (Fig. 1), the anatomical significance of which is unclear, although it appears to be internal; this structure is scarcely developed in species with a yellow body (Fig. 52).

A total of 15 generic names have been proposed in the Sericothripinae, but ten of these were each erected for a single species, and two were erected for a few species with 7-segmented instead of the normal 8-segmented antennae. Most of these genera were considered synonyms by Wang (2007), but four genera are here newly treated as synonyms of *Neohydatothrips*, and one monobasic genus from China is here synonymised with *Sericothrips*. Of the three recognised genera, *Sericothrips* comprises nine species, eight of these being Holarctic in distribution with the ninth from South Africa. The other two genera are widespread around the world in tropical and subtropical countries, *Hydatothrips* with 40 species, and *Neohydatothrips* with 95 species. The monotypic genera now placed in synonymy were each proposed because of the presence of a particular autapomorphy, but with no consideration of relationships between the taxa involved. If this phenetic logic were applied to the Australian species, then at least two further new genera would be recognised, one for a new *Hydatothrips* species that seems to be unique amongst Sericothripinae in having discal setae on the posterior sternites, and one for a new species of *Neohydatothrips* that appears to be unique in having the ocellar setae pair III arising between the posterior ocelli. Similarly, the sub-apical wing lobe that is reported here in four species is not reported for any sericothripine species from any other part of the world, although this may be due to lack of observation.

Even the classification of Sericothripinae into the three genera accepted here is based on character states that seem unlikely to have phylogenetic significance. The nine species placed in *Sericothrips* are characterised by extensive microtrichial fields on the metanotum and abdominal tergites. However, each of these nine species exhibits reduction in wing length, whereas all of the species in the other two genera are always fully winged. Among Thysanoptera, as well as other groups of insects, wingless individuals commonly have modifications to their dorsal surfaces. The use of such character states to define *Sericothrips* suggests that this genus might be a polyphyletic assemblage of species showing wing reduction, rather than a distinct phylogenetic lineage. The other two genera are distinguished solely by the shape of the metasternum. Species with the anterior margin of this sclerite deeply emarginate are placed in *Hydatothrips*; species with it only shallowly emarginate are placed in *Neohydatothrips*. But these differences are not always clear-cut, and the metasternum of *Neohydatothrips poeta* (Girault) (Fig. 71) approaches that of some species in *Hydatothrips* (Fig. 36). The validity of this distinction has been questioned previously because of the remarkable similarity between some pairs of Neotropical species currently placed one in each genus (Mound & Marullo, 1996). The structural difference is possibly related in some way to whether a species lives predominantly on leaves or in flowers. Reduction in the number of antennal segments occurs in both genera, and the presence of a sub-apical lobe overlapping the base of the forewing terminal seta is reported here for one species of *Hydatothrips* and three species of *Neohydatothrips*. Relationships among the Sericothripinae thus need extensive re-consideration, based on species from both the eastern and western hemispheres. Segregating individual species into monobasic genera, because of the presence of some unusual structural feature, does not facilitate the ultimate objective of a generic classification, the understanding of phylogenetic relationships.

Key to genera of Sericothripinae

1. Usually micropterous, females rarely macropterous; metanotum with transverse rows of coarse microtrichia on posterior third (Fig. 77); abdominal tergites fully covered medially and laterally with dense rows of microtrichia, major setae arising submarginally (Fig. 78); tergal posterior margins with complete microtrichial comb ..... *Sericothrips*
-. Always fully winged; metanotum without transverse rows of microtrichia, sculpture longitudinal (Fig. 3); rows of discal microtrichia present only on lateral thirds of abdominal tergites (Fig. 5); tergal marginal comb either present or absent medially (Figs 5, 10, 72) 2
2. Metasternal anterior border with deeply U-shaped emargination, usually more than half as deep as length of this sclerite (Figs 6, 18) ..... *Hydatothrips*
-. Metasternal anterior border transverse, or with shallow emargination (Figs 39, 43, 49, 71)..... *Neohydatothrips*

***Hydatothrips* Karny**

Hydatothrips Karny, 1913: 281. Type-species *Hydatothrips adolfifriderici* Karny.

As discussed above, the only character state used to distinguish this genus from *Neohydatothrips* is variable (Figs 6, 13, 36) and is possibly not a reflection of any phylogenetic relationship. Wang (2007) listed five genus-group names as synonyms of this genus. *Corcithrips* Bhatti had been erected for a single species in which the marginal setae arise submarginally on sternites II–VI as well as on sternite VII. *Pyrothrips* Bhatti was erected as a subgenus of *Hydatothrips* for a single species in which the tergal setae all arise on the discal area. *Zonothrips* Priesner was erected for a single species with 7-segmented antennae. In contrast to the decision by Wang (2007), two genera, *Faureana* Bhatti and *Sariathrips* Bhatti are here synonymised with *Neohydatothrips*.

Key to *Hydatothrips* from Australia

1. Sternites with long microtrichia across posterior margin arising from craspedate lobes between marginal setae (Fig. 4); tergites II–V medially with posteromarginal microtrichia (Fig. 5); ocellar setae III arise well outside lateral margins of ocellar triangle; male usually without sternal glandular areas; on leaves of *Parsonsia* species 2

-. Sternites medially without craspedate lobes bearing long microtrichia (Fig. 23); tergites II–V medially with no posteromarginal microtrichia (Fig. 22); ocellar setae III within or on lateral margins of ocellar triangle; male with glandular area on sternites V–VII (Figs 24, 29) 5

2. Anterior third of pronotum boldly reticulate with many markings within the reticles (Figs 1, 31) 3

-. Anterior third of pronotum transversely reticulate with no markings in reticles (Figs 9, 15) 4

3. Tergite I with complete microtrichiate craspedum medially, II–V medially with short microtrichia on prominent craspedum (Fig. 5); forewing swollen at sub-basal pale area, then uniformly shaded (Fig. 2); sternites VI–VII with no discal setae laterally; on *Parsonsia howeana* ..... *H. aliceae* sp.n.

-. Tergite I medially with no marginal microtrichia, II–V with long microtrichia but almost no craspedum (Fig. 34); forewing slender; sternites VI–VII with one or two discal setae laterally (Fig. 35); host unknown *H. williamsi* sp.n.

4. Metanotal sculpture equiangular, posterior reticles without internal markings (Fig. 16); tergites II–V with posteromarginal microtrichia sometimes reduced to minute pointed tubercles (Fig. 19); forewings pale on distal half; on *Parsonsia eucalyptophylla* ..... *H. bhattii* sp.n.

-. Metanotal sculpture mainly linear, with many markings between main sculpture lines (Fig. 12); tergites II–V with posteromarginal comb complete medially (Fig. 10); forewing fasciate, with median pale area before dark apex (Fig. 14); on *Parsonsia straminea* ..... *H. argenticinctus*

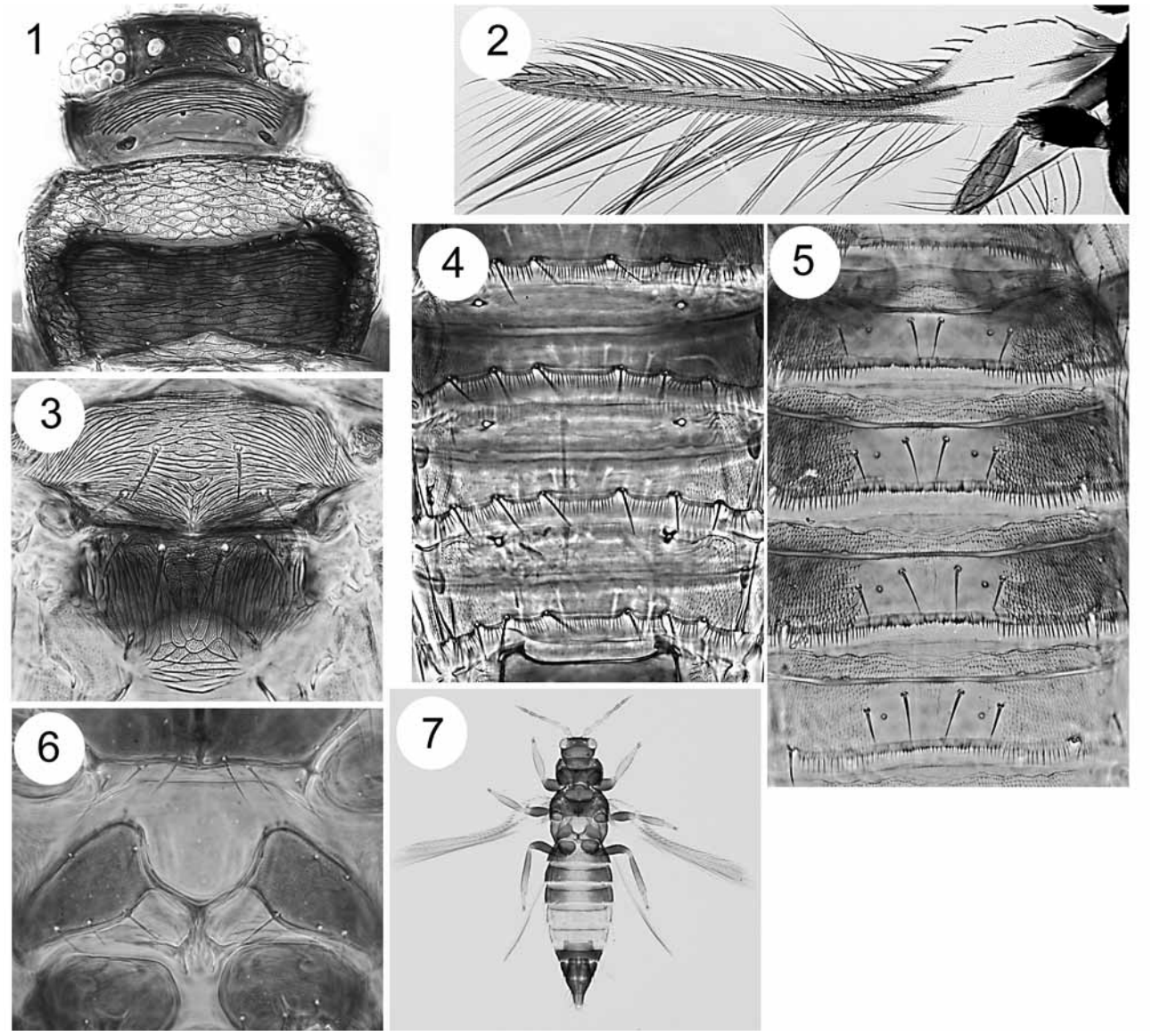
5. Antennae 7-segmented, sub-apical sensorium on VI broadly conical (Fig. 30); postoccipital carina not close to compound eye; ocellar setae III close together within ocellar triangle (Fig. 27); median postocellar setae well-developed; forewing distal half paler than median dark area; forewing apex without a sub-apical lobe; pronotum largely yellow with blotch weakly defined; male with large transversely oval glandular area on sternites III–VII (Fig. 29) .... *H. latisensibilis*

-. Antennae 8-segmented, sub-apical sensorium on VI slender (Fig. 25); postoccipital carina almost touching compound eye (Fig. 20); ocellar setae III arise on or just within lateral margins of ocellar triangle; median postocellar setae weak, shorter than length of nearest ocellus; forewing dark with sub-basal pale area; forewing terminal seta overlapped by ventral sub-apical lobe (Fig. 26); pronotum with well-defined light-brown blotch; male with slender transverse glandular area on sternites V–VII (Fig. 24); on *Centrosema* leaves..... *H. haschemi*

***Hydatothrips aliceae* sp.n.**
(Figs 1–7)

Female macroptera. Strongly bicoloured; body and legs mainly brown, abdominal segments V–VI largely yellow with dark tergal antecostal ridge; tarsi yellow, tibiae variably yellow at base and apex; antennal segments I–III yellow, IV pale near base, V–VIII light brown; forewing sub-basal pale area with stout costal setae, distal half of wing almost uniformly shaded, sometimes with one seta on second vein. Head with occipital carina close to eyes; ocellar triangle transversely striate; ocellar setae III arise outside ocellar triangle; three pairs of postocular setae, median pair long; postoccipital area transversely striate. Pronotum anterior third transversely reticulate with markings inside reticles; blotch with narrow transverse reticulation with markings between main striae. Metanotal reticulation almost equiangular medially, with many markings inside reticles. Forewing swollen at sub-basal area. Tergite I medially with prominent microtrichiate craspedum, II–VIII with complete microtrichiate craspedum. Sternites with no discal microtrichia mesad of marginal setae S2; posterior margins with lobed craspeda bearing long microtrichia between each pair of marginal setae; sternite VII medially with neither discal nor marginal microtrichia, three pairs of setae arise submarginally.

Measurements of holotype female in microns: Body length 1370. Head, length 250; width across eyes 195. Pronotum, length 145; width 240. Forewing length 830. Antennal segments III–VIII length 75, 70, 50, 53, 10, 12.



FIGURES 1–7. *Hydatothrips aliceae*. **(1)** Head & pronotum; **(2)** Forewing; **(3)** Meso & metanotum; **(4)** Sternites; **(5)** Tergites; **(6)** Metasternum; **(7)** Female.

Male. Similar to female, abdominal segment VII brownish yellow; sternites without glandular areas.

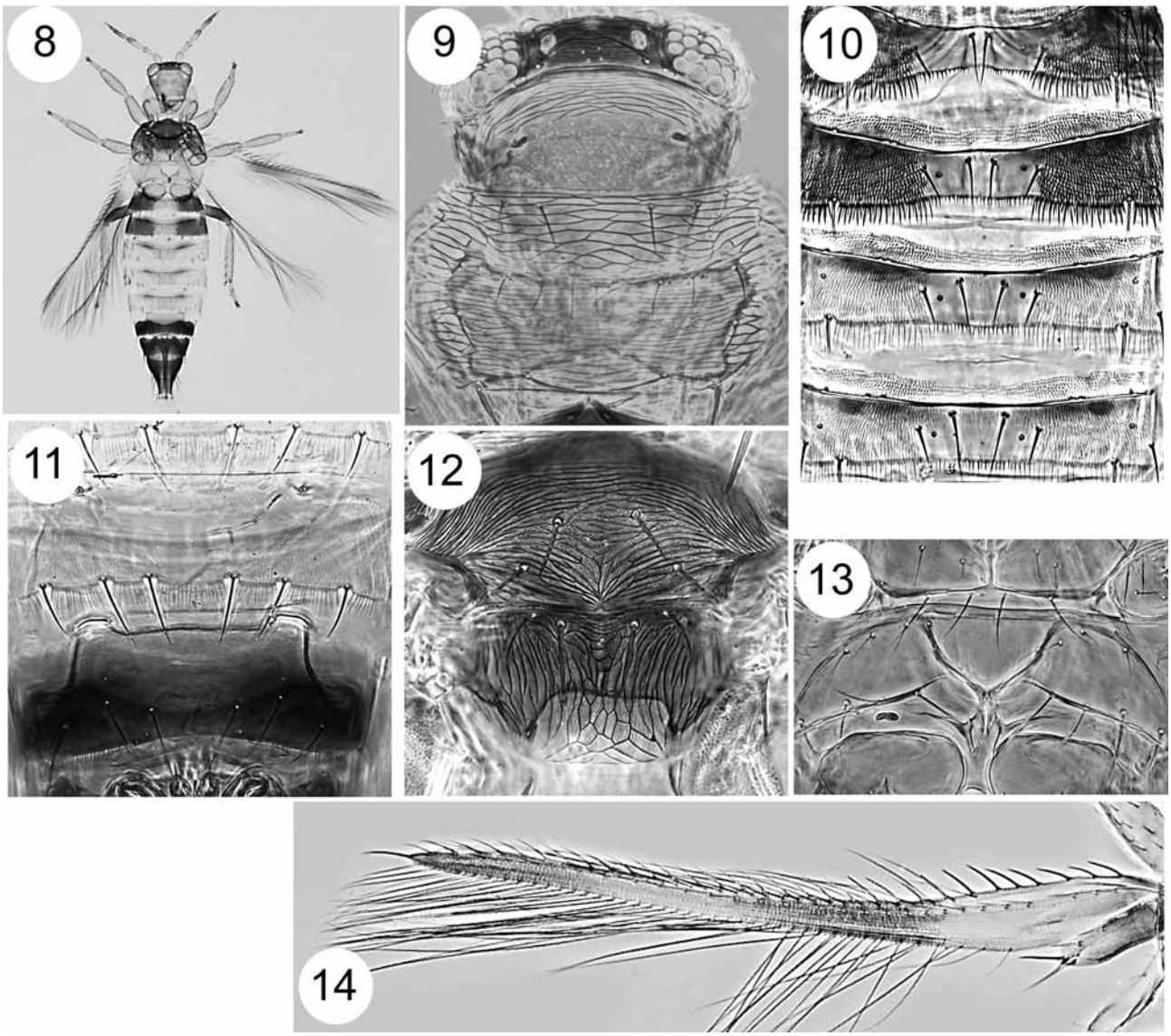
Material studied. Holotype female, **Lord Howe Island**, from leaves of *Parsonsia howeana*, 21.xii.2001 (LAM4070), in ANIC.

Paratypes: 3 females, 3 males collected with holotype; same host and locality, 2 females 1 male, 27.xii.2001; 3 females, 3 males, 21.xii.2007; same locality from grass, 1 female, 20.xi.1996.

***Comments*.** The host plant of this thrips is endemic to Lord Howe Island, and is considered to be closely related to *Parsonsia straminea* (Apocynaceae), although the two *Hydatothrips* that these plant species support are readily distinguished. This new species is remarkable for the expansion of the sub-basal area of the forewing, and it also differs from other members of the genus in the complete craspedum on the first abdominal tergite.

***Hydatothrips argenticinctus* Girault**
(Figs 8–14)

Hydatothrips argenticinctus Girault 1927: 1
This species is widespread in eastern Australia and has been taken at various sites between Batemans Bay and Brisbane. Two specimens have been studied from Weipa, Cape York Peninsula, that differ only in having the metanotal sculpture even more strongly linear. This thrips breeds on the leaves of *P. straminea*, a vine that is common in the eastern wet-sclerophyll forests.



FIGURES 8–14. *Hydatothrips argenticinctus*. **(8)** Female; **(9)** Head & pronotum; **(10)** Tergites; **(11)** Sternites; **(12)** Meso & metanotum; **(13)** Metasternum; **(14)** Forewing.

Female macroptera. Body and legs strongly bicoloured, mainly brown with pronotum largely yellow but fore coxae brown; metathorax posterior half and abdominal tergite I yellow; tergites IV–VI yellow, sometimes with antecostal line dark in association with two small sub-median light brown areas; hind tibiae yellow in contrast to brown femora; forewings banded with pale sub-basal area and extensive sub-apical area paler than dark apex. Head with occipital carina close to eyes; ocellar triangle transversely striate; ocellar setae III arise outside ocellar triangle; three pairs of postocular setae, median pair long; postoccipital area transversely striate/reticulate. Pronotum with anterior third transversely reticulate, blotch transversely striate with markings

between main striae. Metanotum with linear reticulation and linear markings within the reticles. Tergite I medially with no craspedum, II–IV with short microtrichiate craspedum medially, longer on V–VI. Sternites with no discal microtrichia medially, posterior margins with small lobed craspedum bearing long microtrichia between each pair of marginal setae; sternite VII medially with neither median discal nor marginal microtrichia.

Male. Sternites without glandular areas.

***Hydatothrips bhattii* sp.n.**

(Figs 15–19)

Female macroptera. Strongly bicoloured; head brown but postoccipital area yellow; pterothorax brown with metepisterna yellow; abdominal segment I yellow, II–III light brown with thickened dark antecostal ridge, IV–VI mainly yellow, VII–X dark brown; hind tibiae yellow in contrast to brown femora; antennal segments I–III yellow, IV pale near base, V–VIII light brown; forewing with pale sub-basal area, then weakly shaded but apex paler. Head with occipital carina close to eyes; ocellar triangle transversely striate/reticulate; ocellar setae III arise outside ocellar triangle; three pairs of postocular setae, median pair long; postoccipital area transversely striate. Pronotum anterior third with sculpture transverse, blotch transversely striate with markings between main striae. Metanotal reticulation mainly equiangular, only anterior reticles with internal markings, posterior half sharply paler. Tergite I medially with no craspedum, II–VI medially with marginal microtrichia scarcely extending beyond tergal margin. Sternites with no discal microtrichia mesad of marginal setae S2, posterior margins with small lobed craspeda bearing long microtrichia between each pair of marginal setae; sternite VII medially with neither discal nor marginal microtrichia.

Measurements of holotype female in microns: Body length 1380. Head, length 300; width across eyes 185. Pronotum, length 130; width 235. Forewing length 840. Antennal segments III–VIII length 80, 65, 45, 45, 8, 8.

Male. Similar to female, abdominal segment VII yellow; sternites without glandular areas.

Material studied . Holotype female, **New South Wales**, 10km south of Cobar, from leaves of *Parsonsia eucalyptophylla*, 9.xii.2001 (LAM4066), in ANIC.

Paratypes, all from *P. eucalyptophylla* leaves: 8 females, 1 male collected with holotype; Narrabri 32 miles north, 1 male, 16.vii.1968; Collarenabri 8 miles southwest, 9 females 2 males, 3.vi.1968; **Queensland**, Goondiwindi 30 miles north, 7 females with larvae, 16.vii.1968. The specimens collected in 1968 are in the collections of the Natural History Museum, London.

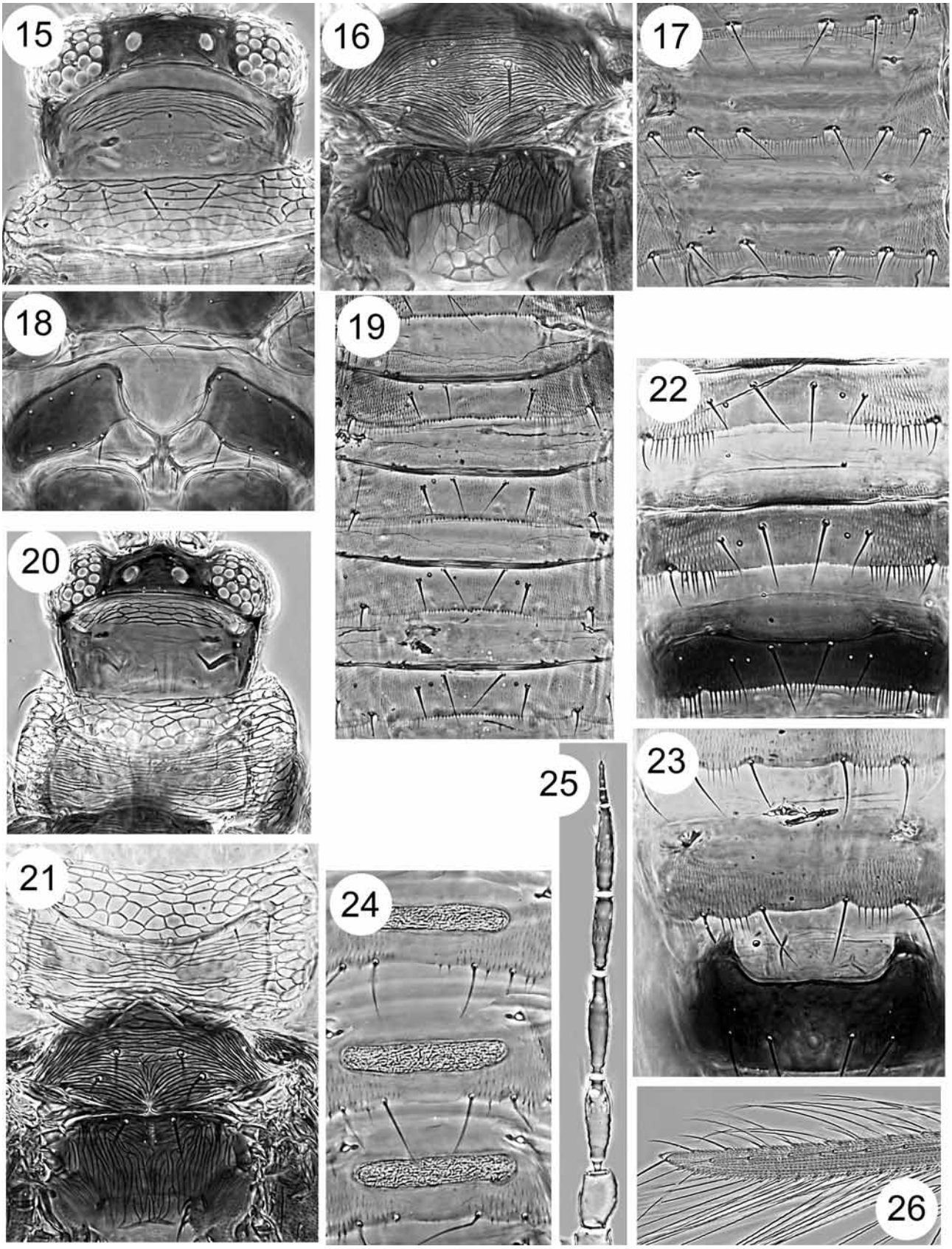
Comments. The host plant of this thrips is widespread in eastern Australia, in the lower rainfall areas of the western slopes of the Great Divide. In contrast to *H. argenticinctus* from the wet sclerophyll forests closer to the coast, this species has the forewings not banded, and the sculpture on the pronotum and metanotum is different.

***Hydatothrips haschemi* Girault**

(Figs 20–26)

Hydatothrips haschemi Girault, 1930: 2
Hydatothrips palawanensis Kudo, 1997: 336 **syn.n.**

Described from a single female, taken on a window at Indooroopilly, Brisbane, in December 1929, this species is common near Brisbane on the leaves of *Centrosema*, and has been found near Darwin on *Calopogonium*. One female of this species has also been studied from Thailand. Kudo (1997) has given an excellent description of the same species, under the synonym indicated above, based on six females and two males



FIGURES 15–26. *Hydatothrips bhattii* & *H. haschemi*. **(15–19)** *H. bhattii*, **(15)** Head; **(16)** Meso & metanota; **(17)** Sternites; **(18)** Metasternum; **(19)** Tergites. **(20–26)** *H. haschemi*, **(20)** Head & pronotum; **(21)** Pro, meso & metanota; **(22)** Tergites; **(23)** Sternites; **(24)** Male sternites; **(25)** Antenna; **(26)** Forewing apex.

taken on *Centrosema pubescens* on Palawan, Philippines. One female and one male paratype have been studied from that series, and the presence of a sub-apical lobe on the forewings of both sexes has been confirmed. This species differs from the four Australian endemic species discussed above in this presence of a forewing sub-apical lobe, and also in having extensive microtrichia on the sternites but no marginal craspedum medially on the tergites. It is particularly remarkable for the lack of the elongate median pair of postocular setae that are found in most species of Sericothripinae.

Female macroptera. Body and legs bicoloured, mainly brown with pronotum largely yellow, tergites IV–V (sometimes VI) brownish yellow with dark antecostal line; legs variable from yellow to brown; forewings light brown with pale sub-basal area. Head with occipital carina close to eyes; ocellar triangle weakly reticulate; ocellar setae III on anterior margins of triangle; only two pairs of postocular setae, median long pair absent. Pronotum with anterior third boldly reticulate, blotch transversely reticulate. Metanotum with irregular linear sculpture, with some markings between the main lines. Forewing with sub-apical lobe extending beyond base of terminal seta. Tergites II–VI with no marginal comb medially. Discal microtrichia extending fully across sternites V–VI, posterior margins medially with no long microtrichia; sternite VII medially with neither median discal nor marginal microtrichia.

Male. Sternites V–VII with large transversely oval glandular area.

Hydatothrips latisensibilis **Kudo**

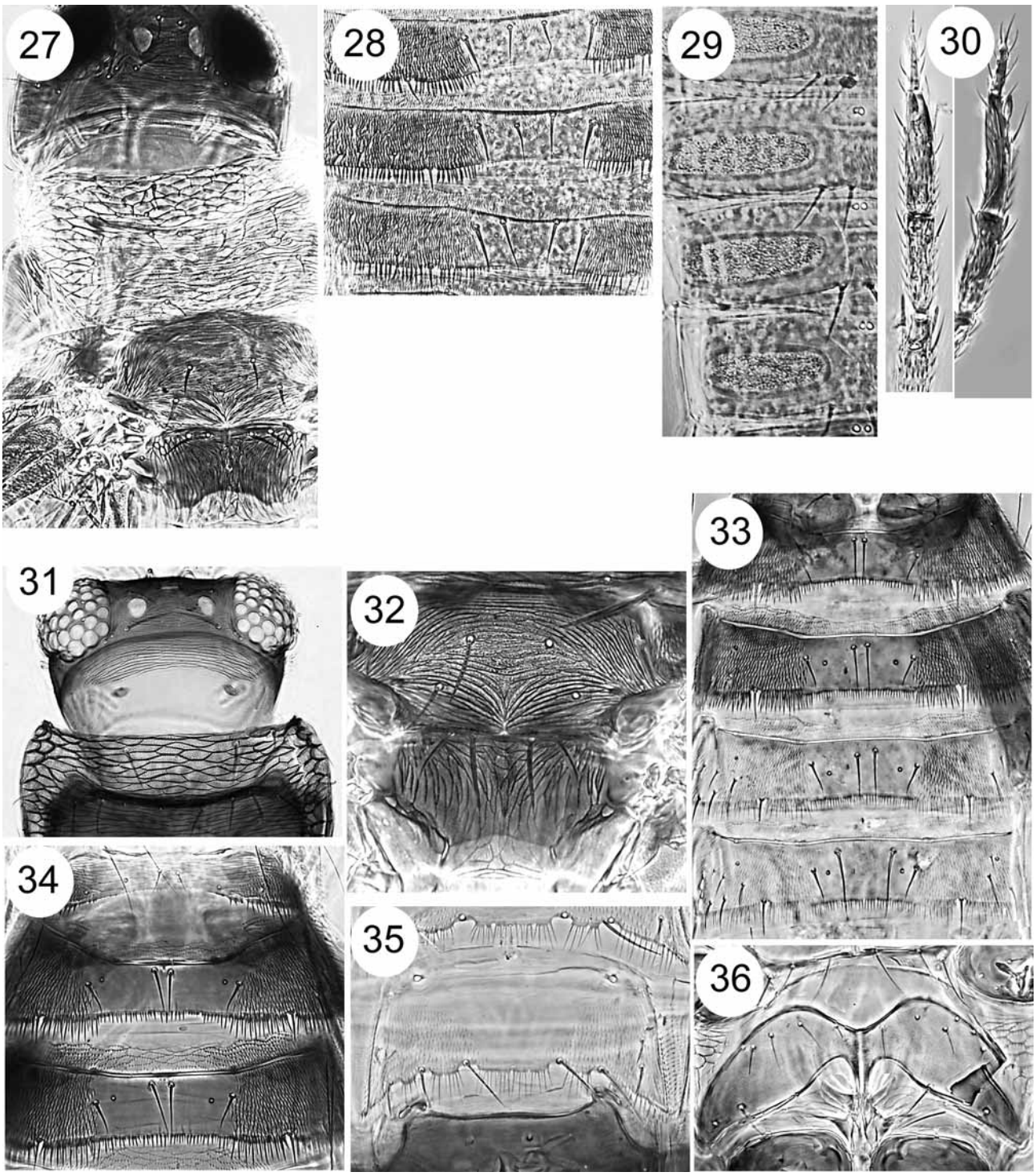
(Figs 27–30)

Hydatothrips(Zonothrips) latisensibilis Kudo, 1997: 353

This species was described from eight females and two males collected from *Desmodium* (Fabaceae) at Kuching, Sarawak, and of these, one female and one male paratypes have been studied. The female paratype has the sensorium at the apex of antennal segment VI greatly expanded, almost equal in length to antennal segment VII, although in the male it is scarcely half that length. The record here of this species from Australia is based on three females and two males taken from Fabaceae leaves at Darwin. These specimens are similar to the type specimens in many details, but the females have the sensorium on antennal segment VI equal in size only to that of the paratype male. The five specimens are all crushed under one coverslip, and the identification must remain tentative until such time as further specimens are collected. A female and male paratypes of *H. noro* Kudo, described from *Canavallia* (Fabaceae) on Okinawa, have also been studied. This closely related species has the sensorium on segment VI of the females about equal in size to that of the Australian females identified here as *H. latisensibilis*. However, the males of *H. noro* have a pair of stout curved setae on the ninth tergite, unlike the males of *H. latisensibilis*, including the Australian specimens. The differences among the available specimens could be interpreted as representing three different species, the Australian specimens differing from the other two in having curiously stout marginal microtrichia on the tergites. Alternatively, the three available samples may represent a single variable species that is associated widely with various legume cover crops.

Female macroptera. Bicoloured; brown on head, pteronota, abdominal tergites VII–VIII and lateral thirds of tergites II–IV; yellow on posterior half of metathorax, abdominal segments I, V–VI and IX–X, all legs; pronotum brownish yellow, particularly blotch; forewing clear sub-basally and on distal third, median area dark. Antennae 7-segmented, VI with enlarged sub-apical sensorium. Head with ocellar setae III inside ocellar triangle, ocellar region transversely striate; 3 pairs of postocular setae present. Pronotum anterior third reticulate with no internal markings, blotch transversely striate. Meso and metanota closely striate, with many lines between major sculpture lines. Abdominal tergites IV–V with two rows of discal setae laterally; tergite IX with only 4 pairs of submarginal setae. Sternites medially with neither discal nor marginal microtrichia.

Male. Sternites III–VII with broadly oval glandular area.



FIGURES 27–36. *Hydatothrips latisensibilis* & *H. williamsi*. **(27–30)** *H. latisensibilis*, **(27)** Head, pro, meso & metanota; **(28)** Tergites; **(29)** Male sternites; **(30)** Terminal antennal segments, ventral and lateral views. **(31–36)** *H. williamsi*, **(31)** Head; **(32)** Meso & metanota; **(33)** Tergites; **(34)** Tergites I–III; **(35)** Sternites; **(36)** Metasternum.

***Hydatothrips williamsi* sp.n.**
(Figs 31–36)

Female macroptera. Strongly bicoloured; body dark brown, abdominal segments IV–VI clear yellow with antecostal ridge lightly shaded; posterior half of metathorax yellow, also median part of tergite I; tarsi yellow,

also mid and hind tibiae; antennal segments I–III yellow, IV–V shaded at apex, VI–VIII pale brown; forewing sub-basal area pale before dark band, distal half variably paler. Head with occipital carina close to eyes; ocellar triangle transversely reticulate/striate with markings between the main lines; ocellar setae III arise outside ocellar triangle; three pairs of postocular setae, median pair long; postoccipital area with closely spaced reticulate striations. Antennal segments III–IV with long apical neck. Pronotum anterior third transversely reticulate with markings inside reticles; blotch almost rectangular, narrow transverse reticulation with markings between main striae. Metanotum with linear reticulation, many markings between main striae. Tergite I medially with no marginal microtrichia, II–VIII with complete microtrichiate posterior margin. Sternites with few or no discal microtrichia mesad of marginal setae S1; posterior margins with lobed craspeda bearing long microtrichia between each pair of marginal setae; sternite VII medially with neither discal nor marginal microtrichia, three pairs of setae arise sub-marginally; sternites VI–VII with 1 or 2 discal setae laterally.

Measurements. Holotype female in microns: Body length 1370. Head, length 230; width across eyes 190. Pronotum, length 130; width 225. Forewing length 885. Antennal segments III–VIII length 76, 74, 55, 58, 10, 14.

Male. Similar to female, abdominal segment VII yellowish medially; sternites VI–VII with broadly oval glandular area.

Material studied. Holotype female, **New South Wales**, 3km north of Lansdowne, near Taree, from *Morinda jasminoides*, 2.ii.2001 (G.Williams) (in ANIC).

Paratypes: 2 males beaten from foliage, Kiwarrak Forest south of Taree, 26.x.2001; **Queensland**, O'Reillys, Lamington, 1 female beating foliage, 14.iii.2007; same locality, 1 female in malaise trap, i. 2007; 8 miles north of Bell, 1 female from *Cassia nemophila*, 17.vii.1968.

Comments. This species has the metasternum less deeply eroded than in the three species described here from *Parsonsia* vines, and is apparently unique in this group in having one or two discal setae laterally on the sixth and seventh sternites. Despite these differences, the species is very similar to the three species from *Parsonsia* in the form of the tergal and sternal posterior margins, and is likely to be found to be associated with one of the species of this vine genus that occur widely in eastern Australia.

Neohydatothrips John

Neohydatothrips John, 1929: 33. Type-species *Neohydatothrips latereostriatus* John.
Faureana Bhatti, 1973: 411. Type-species *Zonothrips smutsi* Faure. **Syn.n**.
Neohydatothrips (*Onihothrips*) Bhatti, 1973: 435. Type-species *Neohydatothrips formosus* Faure. **Syn.n**.
Sariathrips Bhatti, 1990: 247. Type-species *Sericothrips masrensis* Priesner. **Syn.n**.
Papiliothrips Bhatti, 2006: 359. Type-species *Sericothrips gracilicornis* Williams. **Syn.n**.

This genus now includes almost 100 species, mainly from tropical countries. Separation of *Neohydatothrips* from *Hydatothrips* continues to be unsatisfactory, as indicated above, but is retained here because of the large number of names involved, including those of pest species, until such time as a comprehensive analysis of the Sericothripinae is attempted. Wang (2007) listed two further genera as synonyms under *Neohydatothrips*. *Elbuthrips* Bhatti was erected for a single species with the marginal setae arising submarginally on sternites II–VI as well as on sternite VII. *Kazinothrips* Bhatti was erected for two species with 7-segmented antennae. Moreover, the only species placed in *Sensothrips* Bhatti was treated in *Neohydatothrips* by Wang (2007). *Sensothrips* had been proposed for a species, described originally in *Kazinothrips*, in which the sensoria on antennal segments V–VI do not have elongate bases. However, the length of these sensoria is variable among Sericothripinae, and there is no phylogenetic purpose in separating this one species. To these three generic synonyms are here added a further four. *Papiliothrips* (mis-spelled initially as "Piliothrips") was proposed for three species in which the tergites have a continuous microtrichiate craspedum on the posterior margin; this is

here considered a synonym, as this tergal characteristic recurs in other apparently unrelated species. Similarly, *Onihothrips* Bhatti was erected as a subgenus of *Neohydatothrips* on the basis of character states that recur in different combinations amongst other species in this genus. *Faureana* Bhatti was erected for one species with a very long mouth cone extending almost to the metasternum, long ocellar setae III, no sculpture on the pale anterior half of the pronotum, and no sculpture on the strongly demarcated brown "blotch". It has the metasternum with the anterior margin shallowly concave, and the species seems best placed in *Neohydatothrips*. *Sariathrips* Bhatti was erected for a single species that has the anterior margin of the metasternum transverse, suggesting that the species is better placed within *Neohydatothrips*.

Key to *Neohydatothrips* from Australia

1. Body and wings largely pale, abdominal tergites II–VII with variably brown antecostal ridges and brown lateral areas, pronotal blotch light brown 2
-. Either the wings or the body sharply bicoloured or largely brown (Fig. 41, 73) 3
2. Sternites IV–VI with discal microtrichia complete across sternite, posterior margins with long microtrichia between each marginal seta (Fig. 53); mouth cone extending between fore coxae; male not known; on *Sida* leaves ..... *N. gracilipes*
-. Sternites IV–VI with no discal microtrichia mesad of marginal setae S2, and no marginal microtrichia except lateral to S3 (Fig. 40); mouth cone exceptionally long, extending to metasternum (Fig. 37); male not known ..... *N. barrowi* sp.n.
3. Forewing with strongly contrasting brown and white bands, extreme apex paler than sub-apical shaded area (Fig. 73) 4
-. Forewing not strongly banded, but sub-basal area pale before median darker area and sometimes with indistinctly paler area before dark apex 6
4. Antennae 7-segmented (Fig. 68); mesonotum with median and submedian pairs of setae almost in transverse straight line (Fig. 69); male with large transversely oval glandular area on sternites III–VII (Fig. 67); on *Ipomoea aquatica* leaves ..... *N. plynopygus*
-. Antennae 8-segmented; mesonotum with submedian pair of setae arising well posterolateral to median pair (Fig. 75); male without sternal glandular areas on III–VI 5
5. Body largely brown, pronotal anterior area yellow, median abdominal segments bicoloured (Fig. 73); tibiae and femora brown with apices yellow; abdominal sternites discal area covered with microtrichia, posterior margins with long fringe (Fig. 76); ocellar setae pair III on anterior margins of ocellar triangle (Fig. 74); three pairs of postocular setae, median pair elongate; occipital apodeme well separated from eyes; on *Tagetes* ..... *N. samayunkur*
-. Body largely whitish yellow (Fig. 41), but dark brown on anterior part of head, meso and metanota, metasternum, tergites VII–VIII and lateral areas of tergite III; legs pale; sternites without microtrichia on disc and posterior margins; ocellar setae pair III arise between hind margins of posterior ocelli; two or three pairs of postocular setae; occipital apodeme confluent with eyes ..... *N. bellisi* sp.n.
6. Ocellar setae III clearly anterolateral to ocellar triangle (Fig. 70); tergites II–VI posterior margin with fringe of microtrichia medially (Fig. 72); metasternum anterior margin forming a shallow broad V-shape (Fig. 71) .. *N. poeta*
-. Ocellar setae III within ocellar triangle (Fig. 46); tergites II–VI posterior margin without fringe of microtrichia medially (Fig. 48); metasternum anterior margin only weakly emarginate (Fig. 49); forewings with sub-apical lobe (Fig. 51); on leaves of various Fabaceae 7
7. Metanotal reticulation almost equiangular, with internal linear markings (Figs 47, 50); male with no sternal glandular areas ..... *N. diana*
-. Metanotal sculpture linear, with internal dot-like markings (Figs 61, 64); male with transverse glandular area on sternites V–VII (Fig. 65). 8
8. Mouth cone extending to mesosternum (Fig. 66); pronotal dark area with posterior margin deeply emarginate, posteromedian discal setae arise behind blotch (Fig. 63); metanotum sharply pale on posterior third (Fig. 64); tergites IV–V medially with few discal microtrichia; sternites V–VII with microtrichial fields not extending mesad of S2 ..... *N. katherinae* sp.n.
-. Mouth cone extending to fore coxae; pronotal dark area with posterior margin weakly concave, posteromedian discal setae arise on blotch (Fig. 59); metanotum brown on posterior third; tergites IV–V medially with many discal microtrichia; sternites V–VII with microtrichia fields extending to setae S1(Fig. 62)..... *N. haydni*

***Neohydatothrips barrowi* sp.n.**
(Figs 37–40)

Female macroptera. Mainly whitish yellow, with weak pale brown shading on fore coxae, metathoracic epimera, metanotum, and tergites II–VII anterolaterally; antennal segments IV–V weakly shaded at apex, VI–VIII pale brown; forewing pale. Head with occipital carina close to eyes; ocellar triangle transversely striate with no markings between the striae; ocellar setae III within ocellar triangle; three pairs of postocular setae, median pair long; postoccipital region transversely striate; mouth cone unusually long, extending to metasternum. Pronotum with closely spaced transverse lines, blotch not clearly defined. Mesonotum and metanotum with no markings between major sculpture lines, metanotal sculpture mainly linear. Metasternal anterior margin with shallow emargination. Forewing with no setae on second vein; wing apex with no sub-apical lobe. Tergites I–VI medially without marginal microtrichia; only VI with some discal microtrichia medially. Sternites II–VII medially without marginal microtrichia, discal microtrichia not extending mesad of setae S2.

Measurements. Holotype female in microns: Body length 970. Head, length 340; width across eyes 130. Pronotum, length 85; width 165. Forewing length 610. Antennal segments III–VIII length 50, 40, 40, 45, 10, 20.

Material studied. Holotype female, **Western Australia**, Barrow Island, 1.v.2007 (S. Callan), in ANIC.

Paratypes: 1 female with same data as holotype; 2 females from same locality, v.2005.

Comments. This species is remarkable for its pale colour, and the mouth cone extending beyond the mesothoracic coxae, longer than in any described species of Sericothripinae other than the South African *N. smutsi* (Faure). The specimens were extracted from litter and vegetation with no host plant association.

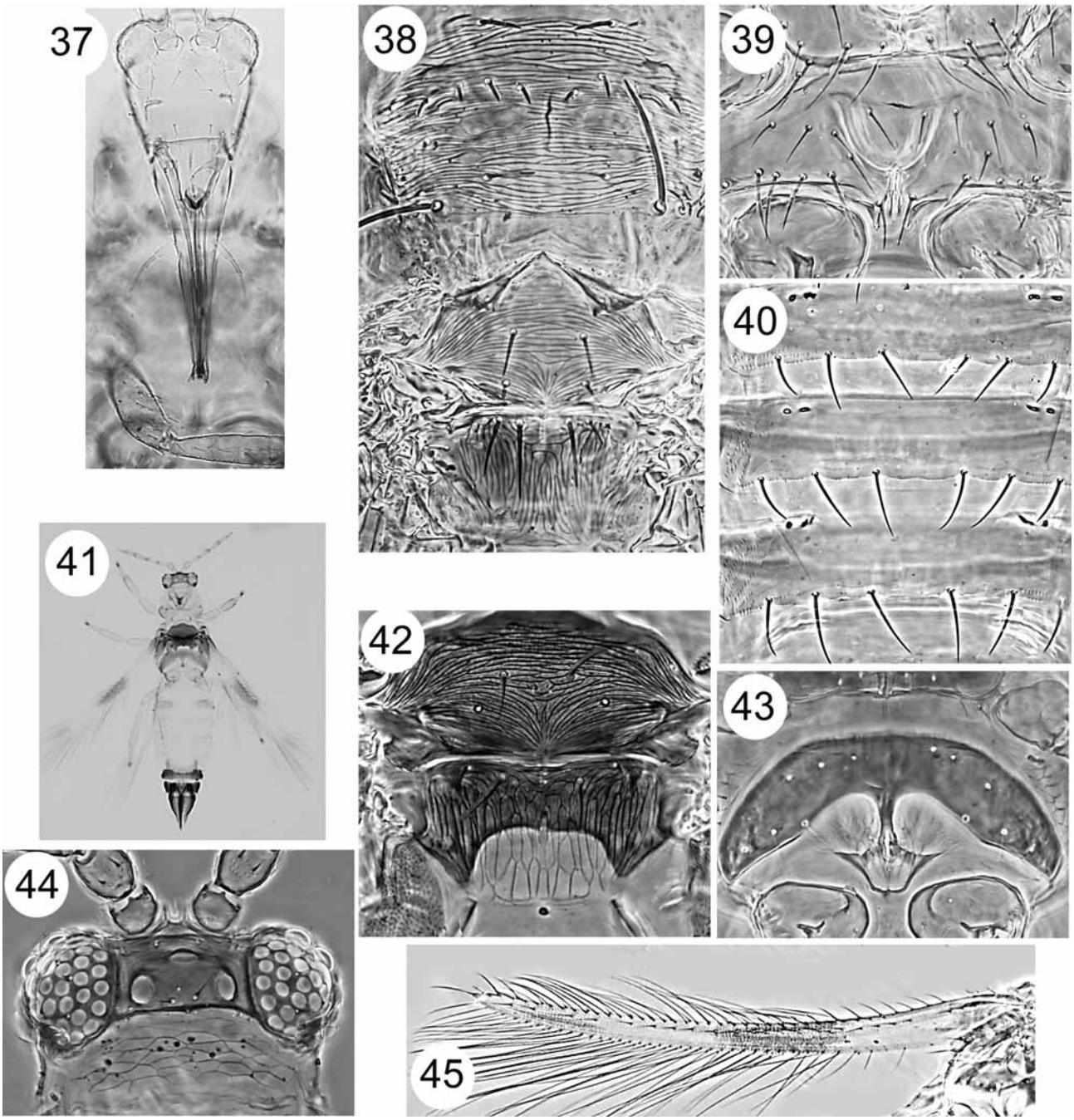
***Neohydatothrips bellisi* sp.n.**
(Figs 41–45)

Female macroptera. Strongly bicoloured; head brown but postoccipital region and pronotum yellow; meso and metanotum dark brown, meso and metasternum light brown; abdominal segment I yellow with antecostal ridge interrupted medially, II–VI yellow with III variably shaded anterolaterally, antecostal ridges weakly shaded but only laterally, VII–VIII dark brown, IX–X mainly yellow; legs yellow; forewings banded, dark at base including clavus, with pale sub-basal area before brown band, with second light brown band before pale apex. Antennal segments mainly yellow, with faint shadings at apex of IV–VI. Head with occipital carina close to eyes; ocellar triangle without sculpture lines; ocellar setae III close together between posterior margins of posterior ocelli; two or three pairs of postocular setae, median pair long; postoccipital region with transverse narrow reticulation. Pronotum transversely reticulate without internal markings, blotch weakly defined. Mesonotum with closely spaced striations, and small lines between the major striae. Metanotum with linear reticulation, many small linear markings between the major sculpture lines; posterior half sharply paler. Metasternal anterior margin straight. Forewing with distal setae widely spaced, no setae on second vein; wing apex with no sub-apical lobe. Tergites I–VI medially without marginal microtrichia; V–VI with few discal microtrichia medially. Sternites II–VII medially without marginal microtrichia, discal microtrichia not extending mesad of setae S2; VII with marginal setae arising on discal area.

Measurements. Holotype female in microns: Body length 1100. Head, length 140; width across eyes 160. Pronotum, length 95; width 185. Forewing length 730. Antennal segments III–VIII length 55, 40, 53, 40, 7, 12.

Male. Similar to female, abdominal segment VIII brown; sternites without glandular areas.

Material studied. Holotype female, **Queensland**, 30km north of Cloncurry, from unknown shrub, 1.viii.1993 (LAM2560), in ANIC.



FIGURES 37–45. *Neohydatothrips barrowi* & *N. bellisi*. **(37–40)** *N. barrowi*, **(37)** Head, ventral view; **(38)** Pro, meso & metanota; **(39)** Metasternum; **(40)** Sternites. **(41–45)** *N. bellisi*, **(41)** Female; **(42)** Meso & metanota; **(43)** Metasternum; **(44)** Head; **(45)** Forewing.

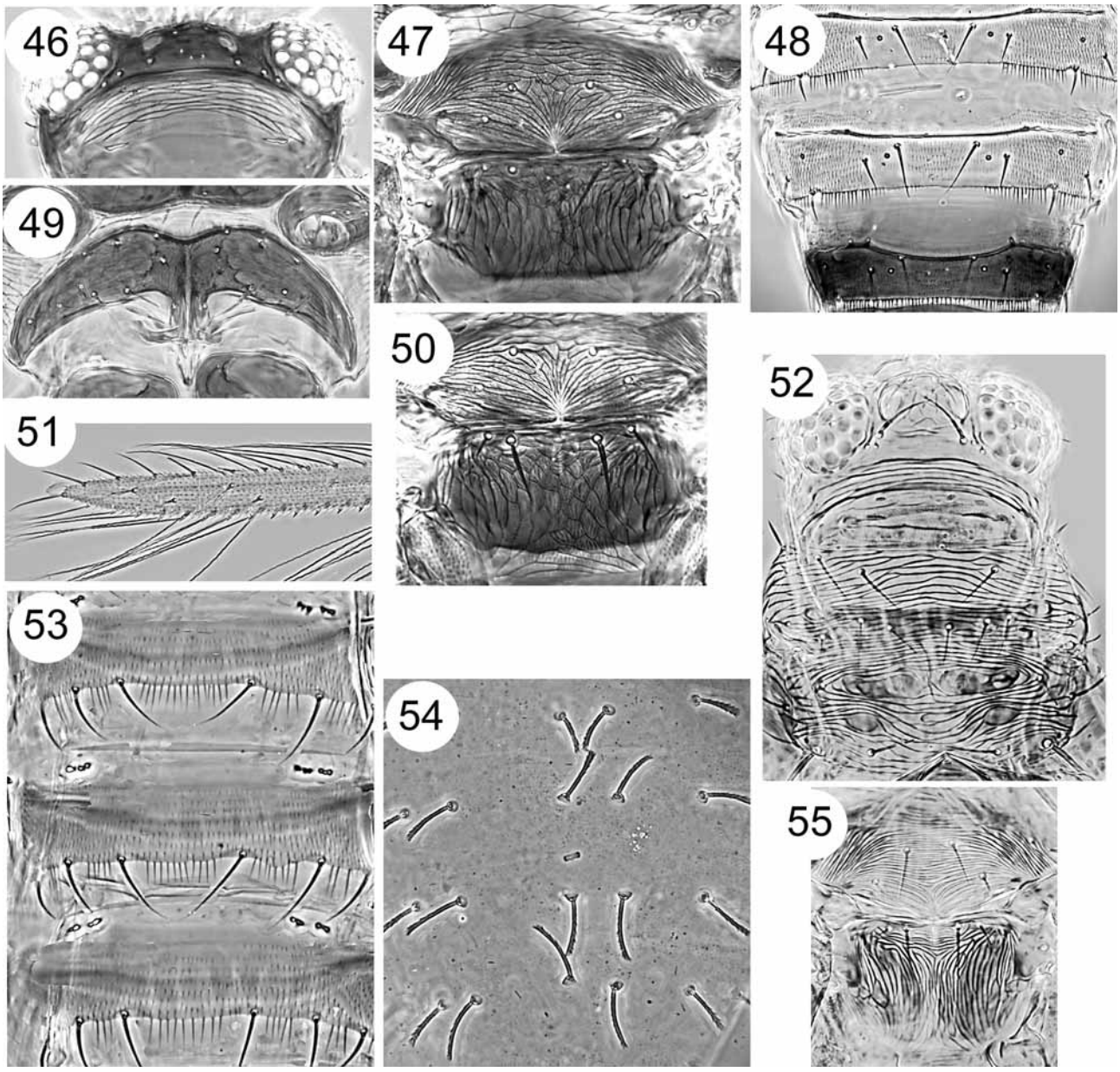
Paratypes: 3 females, 3 males taken with holotype; **Northern Territory**, Humpty Doo, I female from dead *Eucalyptus* leaves, 25.xii.1996; Bathurst Island, from *Ficus opposita*, 14.v.1999; **Western Australia**, Kununurra, 4 females from chillies, 7.ix.2005.

Comments. This species has been taken widely across northern Australia, but with no host association. The colour pattern is unique, predominantly whitish-yellow but with dark markings on the head and pterothorax, and two dark bands on the wings. Moreover, the position of the ocellar setae between the hind ocelli is unique within this genus.

Neohydatothrips diana (Girault)
(Figs 46–51)

Sericothrips diana Girault 1929: 3

This species is probably widespread in eastern Australia. It has been found commonly near Canberra on the leaves of two low-growing Fabaceae species, including *Dyllwynia seeberi* and *Pultenaea procumbens.*



FIGURES 46–55. *Neohydatothrips diana* & *N. gracilipes*. **(46–51)** *N. diana*, **(46)** Head; **(47)** Meso & metanota; **(48)** Tergites; **(49)** Metasternum; **(50)** Meso & metanota; **(51)** Forewing apex. **(52–55)** *N. gracilipes*, **(52)** Head & pronotum **(53)** Sternites; **(54)** Larva II tergal setae; **(55)** Meso & metanota.

Female macroptera. Body strongly bicoloured; head brown with postoccipital region and anterior half of pronotum yellow; pronotal blotch and pteronota, also meso and metasternum, dark brown; abdominal segments I–VI yellow, VII–X dark brown; legs mainly brown; forewings with pale sub-basal area then uniformly light brown. Head with occipital carina close to eyes; ocellar triangle irregularly sculptured; ocellar setae III

within anterior margins of triangle; three pairs of postocular setae, median pair long and arising near posterior ocelli; postoccipital region transversely striate. Pronotum anterior third transversely reticulate without internal markings; blotch transversely striate with many markings between the major lines. Mesonotum and metanotum with many linear markings between the major sculpture lines, metanotal reticulation equiangular to linear. Metasternal anterior margin with shallow emargination. Forewing with one or two setae distally on second vein, apparently displaced from first vein; wing apex with sub-apical lobe well developed. Tergites I–VI medially without marginal microtrichia; antecostal ridge interrupted medially on tergite I. Sternites II–VII medially without marginal microtrichia, but a few discal microtrichia extend mesad of setae S1 near posterior margin.

Male. Similar to female, abdominal segment VII yellow; sternites without glandular areas.

***Neohydatothrips gracilipes* (Hood)**
(Figs 52–55)

Sericothrips gracilipes Hood, 1924: 149

Described from Mexico, this species has been reported from several Caribbean countries as well as Texas, Hawaii and India (Bhatti, 1999; Mound & Marullo, 1996). Specimens have also been seen from Thailand and New Caledonia, as well as from several sites in northern Australia including Brisbane, Cape Tribulation, Mapoon and Darwin. It is associated with several common Malvaceous weeds, *Sida rhombifolia* and *Sida acuta*, as well as *Malvastrum* and *Abutilon*. Males have not been studied.

Female macroptera. Body and legs mainly yellow, tergites II–VII with dark antecostal line and brown shadings anterolaterally; ocellar triangle, pronotal median area and pteronota weakly shaded brown; forewings pale. Head with occipital carina not close to eyes; ocellar triangle weakly and irregularly reticulate; ocellar setae III close together behind fore ocellus; three pairs of postocular setae, median pair long and arising laterally. Pronotal sculpture mainly transverse, blotch weakly defined. Metanotum with irregular linear sculpture, without markings between the main lines. Tergites II–VI with no marginal comb medially. Discal microtrichia extending fully across sternites II–VI, posterior margins with long microtrichia; sternite VII medially with neither discal nor marginal microtrichia.

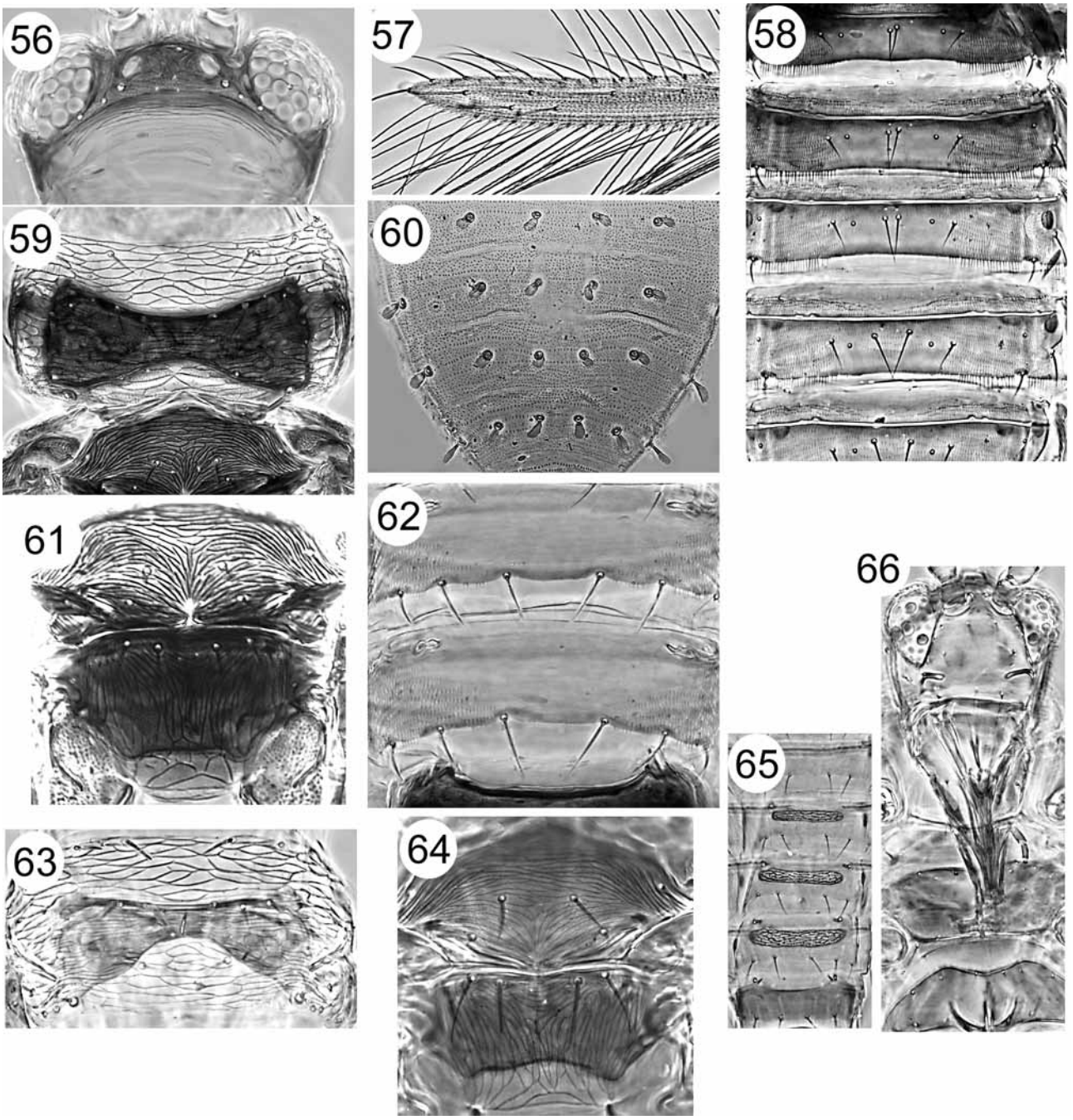
***Neohydatothrips haydni* (Girault)**
(Figs 56–62)

Sericicothrips haydni Girault 1932: 1

Described from a single female taken on *Psoralea tenax* at Brisbane, this species appears to be widespread in eastern Australia. Both sexes and larvae have been taken in considerable numbers on flowering *Swainsonia galegifolia*, *Jacksonia scoparia* and *Indigofera australis* (Fabaceae) at Brisbane (Qld), Coonabarabran (NSW) and Nelligen (NSW).

Female macroptera. Body strongly bicoloured; head brown with postoccipital region and anterior half of pronotum yellow; pronotal blotch and pteronota, also meso and metasternum, dark brown; abdominal segment I yellow with antecostal ridge interrupted medially, II–VI largely yellow with light brown shadings anterolaterally sometimes extending across tergite on II and III with antecostal ridge dark, VII–X dark brown; legs mainly brown, hind tibiae variably paler, all tarsi yellow; forewings with pale sub-basal area then uniformly light brown but paler toward apex. Head with occipital carina close to eyes; ocellar triangle transversely striate with markings in between the striae; ocellar setae III on or within anterior margins of triangle; three pairs

of postocular setae, median pair long; postoccipital region transversely striate/reticulate; mouth cone extending between fore coxae. Pronotum anterior third transversely reticulate without internal markings; blotch transversely striate with many markings between the major lines; blotch almost rectangular, anterior and posterior margins concave but posteromedian paired setae arising on dark area. Mesonotum and metanotum with many small linear markings between the major sculpture lines, metanotal reticulation irregular but mainly linear. Metasternal anterior margin with shallow emargination. Forewing with or without one or two setae displaced distally onto second vein from first vein; wing apex with long sub-apical lobe. Tergites I–VI medially without marginal microtrichia, IV–VI with many discal microtrichia medially. Sternites II–VII medially without marginal microtrichia, but a few discal microtrichia sometimes extend mesad of setae S1 near posterior margin.



FIGURES 56–66. *Neohydatothrips haydni* & *N. katherinae*. **(56–62)** *N. haydni*, **(56)** Head; **(57)** Forewing apex; **(58)** Tergites; **(59)** Pronotum; **(60)** Larva II tergal setae. **(61)** Meso & metanota; **(62)** Sternites. **(63–66)** *N. katherinae*, **(63)** Pronotum; **(64)** Meso & metanota; **(65)** Male sternites; **(66)** Head, ventral view.

Male. Similar to female, abdominal segment VII yellow; sternites V–VII with broadly transverse glandular area.

***Neohydatothrips katherinae* sp.n.**
(Figs 63–66)

Female macroptera. Strongly bicoloured; head brown with postoccipital region and anterior half of pronotum yellow; pronotal blotch and pteronota, also meso and metasternum, dark brown; abdominal segment I yellow with antecostal ridge interrupted medially, II–VI yellow scarcely shaded anterolaterally, antecostal ridge slightly darker, VII–X dark brown; legs mainly brown, hind tibiae variably yellow to brown, all tarsi yellow; forewings with pale sub-basal area before light brown band but uniformly pale in distal half. Head with occipital carina close to eyes; ocellar triangle transversely striate with markings in between the striae; ocellar setae III within anterior margins of triangle; three pairs of postocular setae, median pair long; postoccipital region transversely striate; mouth cone unusually long, extending to mesosternum. Pronotum anterior third transversely reticulate with few internal markings; blotch transversely striate with many markings between the major lines; posterior margin of blotch deeply concave, posteromedian discal setae arise behind the dark area. Mesonotum and metanotum with many small linear markings between the major sculpture lines, metanotal reticulation irregular but mainly linear. Metasternal anterior margin with shallow emargination. Forewing with no setae on second vein; wing apex with long sub-apical lobe. Tergites I–VI medially without marginal microtrichia; IV–V with few discal microtrichia medially. Sternites II–VII medially without marginal microtrichia, discal microtrichia not extending to setae S2.

Measurements. Holotype female in microns: Body length 1020. Head, length 290; width across eyes 150. Pronotum, length 85; width 175. Forewing length 660. Antennal segments III–VIII length 55, 48, 48, 45, 8, 15.

Male. Similar to female, abdominal segment VII yellow; sternites V–VII with broadly transverse glandular area.

Material studied. Holotype female, **Northern Territory**, Katherine, from Fabaceae shrub, 19.vii.1993 (LAM 2485), in ANIC.

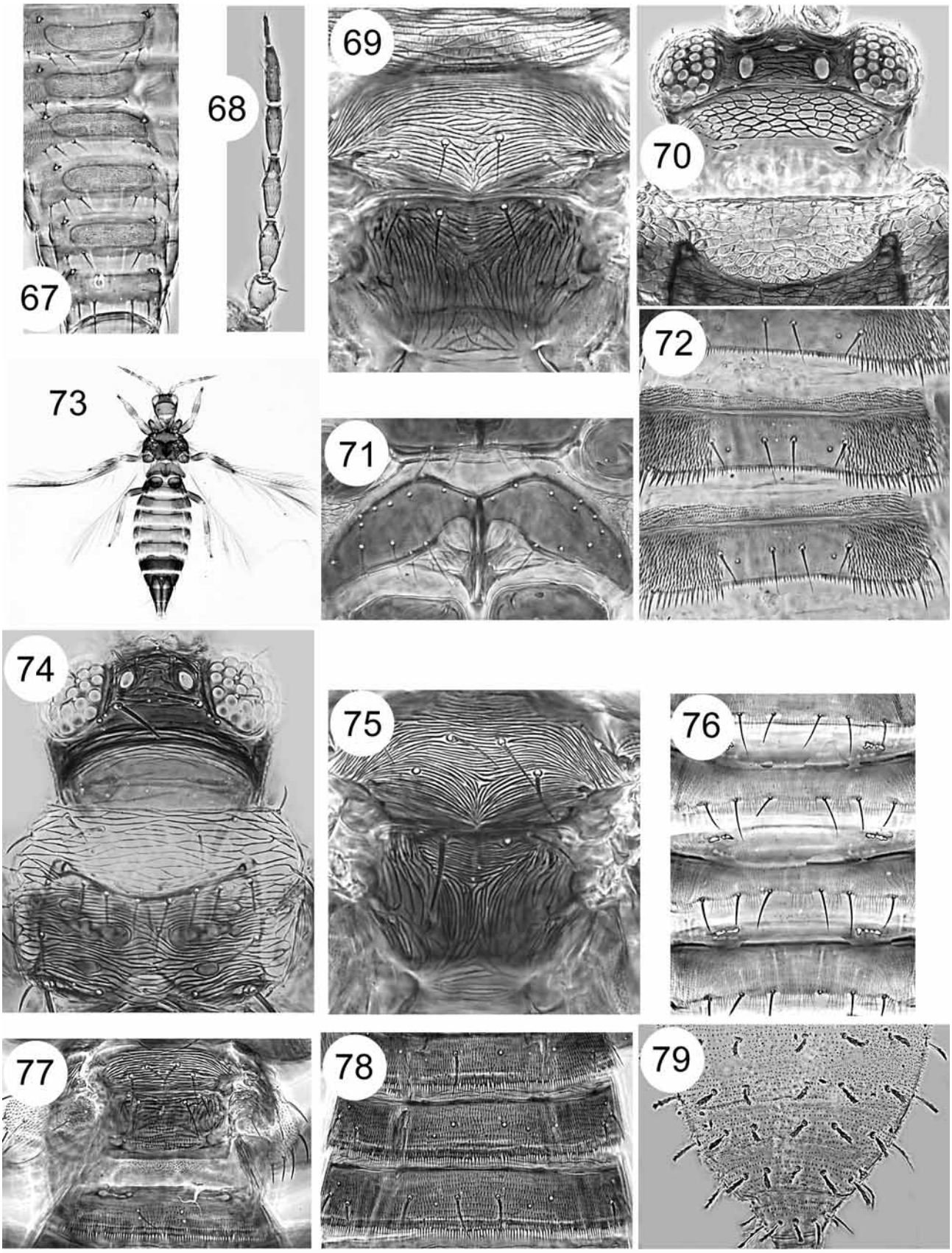
Paratypes: 6 females, 5 males collected with holotype; **Northern Territory**, Top Springs, 50km east, 1 female from grasses, 24.vii.1993. **Western Australia**, Kununurra, 2 female, 1 male from *Tephrosia coriacea* fls, 25.ii.2005; Mt Keith, 1 female swept, v.1995.

Comments. As indicated in the key above, this species is closely related to *N. haydni* but has the mouth cone unusually elongate. It apparently replaces that eastern Australian species in the north of this continent.

***Neohydatothrips plynopygus* (Karny)**
(Figs 67–69)

Anaphothrips plynopygus Karny, 1925: 29
Zonothrips luridus Ananthakrishnan, 1967: 115. Synonymised by Wang, 2007: 58

Described from Sumatra, and the synonym from India, this species has been recorded from Taiwan, as well as Bali, Singapore and Australia (Northern Territory). The record from Taiwan was based on about 40 specimens collected from grasses including *Imperata cylindrica*, but near Darwin this thrips was found living on the leaves of *Ipomoea aquatica* that was growing in shallow water. The genus *Kazinothrips* Bhatti was erected for this species together with one from North America, but was distinguished from *Neohydatothrips* solely by the 7-segmented antennae.



FIGURES 67–79. *Neohydatothrips plynopygus*, *N. poeta*, *N. samayunkur* & *Sericothrips staphylinus*. **(67–69)** *N. plynopygus*, **(67)** Male sternites; **(68)** Antenna; **(69)** Meso & metanota. **(70–72)** *N. poeta*, **(70)** Head; **(71)** Metasternum; **(72)** Tergites. **(73–76)** *N. samayunkur*, **(73)** Female; **(74)** Head & pronotum; **(75)** Meso & metanota; **(76)** Sternites. **(77–79)** *S. staphylinus*, **(77)** Meso & metanota; **(78)** Tergites; **(79)** Larva II tergal setae.

Recognition: Body dark brown, tergites II–IV paler medially, tergite I with dark antecostal ridge interrupted medially; all tarsi and tibiae yellow. Head with occipital carina close to eyes; ocellar triangle transversely striate; ocellar setae III lateral to triangle; three pairs of postocular setae, median pair not long and arising behind posterior ocelli. Pronotal sculpture mainly transverse with fine lines in between the main lines, blotch with posterior margin transverse. Metanotum with linear reticulation, many longitudinal lines between the main lines. Tergites II–V with no marginal comb medially, VI with comb weakly indicated. Sternites medially with neither discal microtrichia nor marginal microtrichia. Male sternites III–VII with large glandular area.

Neohydatothrips poeta (Girault)

(Figs 70–72)

Hydatothrips poeta Girault 1926: 1

Described from a single female specimen that is crushed and shattered into fragments, the identity of this species can be established from the reticulate sculpture of the metanotum, and the presence of a small microtrichiate craspedum on all but the first abdominal tergite. The generic placement of the species is more problematical, because the metasternum is more deeply emarginate than in any other *Neohydatothrips* species (Fig. 71). Apart from the holotype, the only other known specimen is a female taken near Taree (NSW) from *Eupomatia laurina* (Eupomatiaceae), a plant of the eastern rainforests.

Recognition: Body mainly dark brown, tergite V yellow laterally, pronotum with dark brown reticulation on anterior third; all tarsi yellow, mid and hind tibiae yellow at base and apex; forewings dark with pale subbasal area. Head with occipital carina close to eyes; ocellar triangle transversely reticulate; ocellar setae III lateral to triangle; two pairs of postocular setae, median pair not long and arising near posterior ocelli; postoccipital region reticulate. Pronotum anterior third boldly reticulate with faint dots internal to each reticle; blotch transversely reticulate with many dots internal to reticles, anterior angles of blotch acute. Metanotum with equiangular reticulation, with many internal dot-like markings; metasternal anterior margin with broadly V-shaped emargination. Forewing second vein with one seta; sub-apical lobe not developed. Tergite I medially without discal or marginal microtrichia, II–VI with short microtrichiate craspedum medially; antecostal ridge interrupted medially on tergite I, dark brown on II–VII. Sternites III–VII medially with neither discal microtrichia nor marginal microtrichia.

Neohydatothrips samayunkur Kudo

(Figs 73–76)

Hydatothrips (*Neohydatothrips*) *samayunkur* Kudo 1995: 169
Neohydatothrips pseudoannulipes; Mound & Marullo, 1996: 171 nec Johansen, 1983

A paratype of the Mexican *N. pseudoannulipes* that was borrowed from Dr Roberto Johansen was noted by Mound & Marullo (1996) to have the apex of the forewing pale not shaded as indicated in the original description. Assuming that the paratype was correct and that the description was incorrect, this species was later synonymised (Mound et al., 1996) with *N. samayunkur*, and the Mexican name thus introduced to the Australian fauna. However, although the label of this paratype indicated the same locality and collector as the holotype, it bore a collection date differing by one month from the published collection dates of the type series. Subsequently this "paratype" was recognised as having been misidentified by the original author, and the proposed synonymy is thus invalid (Nakahara, 1999). *N. samayunkur* is associated with garden plants of the genus *Tagetes* (Asteraceae), on which it can produce considerable damage to leaves and flowers, and it appears to have

been distributed widely around the world by the horticultural trade. The species has been recorded from Mexico, Costa Rica, El Salvador, California, Florida, Hawaii, Japan, Sri Lanka, Mauritius and Kenya. In Australia, considerable populations have been studied from Gosford (NSW) and Brisbane (Qld).

Recognition: Body bicoloured, mainly brown with anterior margin of pronotum yellow, also all tarsi yellow and tibiae extensively yellow; abdominal segments III–VI yellowish brown with dark antecostal ridge; forewing with three dark and three pale bands, apex pale. Head with occipital ridge not close to eyes; ocellar triangle with irregular reticulation; ocellar setae III on anterior margins of triangle; three pairs of postocular setae, median pair long and arising laterally. Pronotal sculpture mainly transverse, blotch deeply emarginate posteriorly. Metanotal sculpture linear on posterior half. Tergites II–VI with no marginal comb medially. Sternites fully covered with microtrichia, posterior margins with groups of long microtrichia between bases of marginal setae. Male with glandular area on sternite VII only.

Sericothrips Haliday

Sericothrips Haliday, 1836: 444. Type-species *Sericothrips staphylinus* by monotypy.
Sussericothrips Han, 1991: 208-211. Type-species *Sussericothrips melilotus* Han. **syn.n.**

The nine species in this genus all have the abdominal tergites completely covered with microtrichia medially, a character state that correlates with each of these species being known to produce micropterous adults. The structural similarities between the species seem likely to be related more to this short-winged condition than to any phylogenetic relationship. In two of these species, *S. kaszabi* Pelikan and *S. melilotus* Han, tergal discal setae pair III are described as arising at the margin (or on an indentation of the margin), rather than on the tergal surface. This character state was used to distinguish the genus *Sussericothrips* that is here placed as a synonym.

Sericothrips staphylinus Haliday
(Figs 77–79)

Sericothrips staphylinus Haliday, 1836: 444

Introduced in 2001 for the biological control of the noxius weed, *Ulex europaeus*, this Western European species is established in Tasmania and Victoria, and possibly also in South Australia (Ireson et al., 2008). One of the darkest members of the Sericothripinae in Australia, it is easily recognised from the structure of the metanotum and abdominal tergites (Figs 77, 78). Sternites IV–VII of males have a small circular (sometimes divided) glandular area medially.

Acknowledgements

Jitendravir Bhatti of New Delhi studied the Girault type specimens of this group some years ago, and kindly sent copies of his notes, in particular drawing our attention to the sub-apical wing lobe that is reported here in several species. Susan Wright and her colleagues at the Queensland Museum arranged loans to us of many Girault slides. We are particularly grateful to Iwao Kudo of Shizuoka, Japan, for loaning paratypes of species that he has described. John Ireson of Tasmania kindly sent thrips specimens, and also copies of his studies on the use of *Sericothrips* in the biological control of *Ulex*. We are also grateful for the advice and comments of several referees. Holotypes of the new species are in ANIC, CSIRO Entomology, Canberra.

References

Ananthakrishnan, T.N. (1967) Studies on new and little known Indian Thysanoptera. *Oriental Insects*, 1, 113–138.

Bhatti, J.S. (1973) A preliminary revision of *Sericothrips* Haliday, sensu lat., and related genera, with a revised concept of the tribe Sericothripini. *Oriental Insects* **7**: 403-449.

Bhatti, J.S. (1990) Catalogue of insects of the Order Terebrantia from the Indian Subregion. *Zoology (Journal of Pure and Applied Zoology)* **2**: 205-352.

Bhatti, J.S. (1999) The North American species *Kurtomathrips morrilli* Moulton and *Neohydatothrips gracilipes* (Hood) (Terebrantia: Thripidae) have now established large populations from North to South India. *Thrips* 1: 54-57.

Bhatti, J.S. (2006) The classification of Terebrantia (Insecta) into families. *Oriental Insects*, 40, 339–375.

Girault, A.A. (1926) *New pests from Australia III.* Privately published, Brisbane, 2pp.

Girault, A.A. (1927) *Thysanoptera Nova Australiensis from Queensland.* Privately published, Brisbane, 1pp.

Girault, A.A. (1929) *Description of a case of lunacy in Homo and of new six-legged articulates.* Published privately, Brisbane, 4pp.

Girault, A.A. (1930) *New pests from Australia VII.* Privately published, Brisbane, 3pp.

Girault, A.A. (1932) *Hymenoptera, Thysanoptera Nova Australiensis.* Privately published, Brisbane, 1pp.

Gordh, G., Menke, A.S., Dahms, E.C. & Hall, J.C. (1979) The privately printed papers of A.A.Girault. *Memoirs of the American Entomological Institute*, 28, 1–400.

Haliday, A.H. (1836) An epitome of the British genera, in the Order Thysanoptera, with indications of a few of the species. *Entomological Magazine*, 3, 439–451.

Han, Yun-fa. (1991) A new genus and species of Sericothripina from China (Thysanoptera: Thripidae). *Acta Entomologica Sinica*, 34, 208–211.

Hood, J.D. (1924) A new *Sericothrips* (Thysanoptera) injurious to cotton. *Canadian Entomologist*, 56, 149–150.

Ireson, J.E, Holloway, R.J. & Chatterton, W.S. (2008) Phenology and development of the gorse thrips, *Sericothrips staphylinus* Haliday (Thysanoptera: Thripidae), a biological control agent for gorse, *Ulex europeus* L. (Fabaceae), in Tasmania. *Biological Control*, 45, 65–71.

Johansen, R.M. (1983) Nuevas trips (Insecta: Thysanoptera; Terebrantia, Thripidae, Thripinae) de La Sierra Madre Oriental y del eje Volcanico Transversal de Mexico. *Anales del Instituto de Biologia. Universidad Nacional de Mexico*, 53, 91–132.

John, O. (1929) A new species of Thysanoptera from Brazil, representing a new genus. *Bulletin et Annales de la Société Entomologique de Belge*, 69, 33–36.

Karny, H. (1913) Thysanoptera. *Wissenschaftliche Ergebnisse der Deutschen Zentral-Afrika Expedition 1907–1908*, 4, 281–282.

Karny, H. (1925) Die an Tabak auf Java und Sumatra angetroffenen Blasenfüsser. *Bulletin van het deli Proefstation te Medan*, 23, 1–55.

Kudo, I. (1995) A new species of *Hydatothrips* (Thysanoptera: Terebrantia: Thripidae) on Marigold in Japan and the United States. *Applied Entomology and Zoology*, 30, 169–176.

Kudo, I. (1997) Malaysian *Hydatothrips* with some species from neighboring areas (Thysanoptera, Terebrantia, Thripidae). *Japanese Journal of Systematic Entomology*, 3, 325–365.

Kudo, I. (1998) The second instar larvae of some Japanese *Hydatothrips* species (Thysanoptera, Terebrantia, Thripidae). *Japanese Journal of Systematic Entomology*, 4, 243–261.

Mound, L.A. (1996) Thysanoptera, pp 249–336, 397–414 (Index), in Wells A, *Zoological Catalogue of Australia*. Volume 26. Psocoptera, Phthiraptera, Thysanoptera. Melbourne. CSIRO Australia.

Mound, L.A. (1999) Saltatorial leaf-feeding Thysanoptera (Thripidae, Dendrothripinae) in Australia and New Caledonia, with newly recorded pests of ferns, figs and mulberries. *Australian Journal of Entomology*, 38, 257–273.

Mound, L.A. (2008) Identification and host associations of some Thysanoptera Phlaeothripinae described from Australia pre-1930. *Zootaxa*, 1714, 41–60.

Mound, L.A., Goodwin, S. & Steiner, M.Y. (1996) *Neohydatothrips pseudoannulipes* Johansen (Thysanoptera: Thripidae), a pest thrips on African marigolds new to Australia. *Australian Journal of Entomology*, 35, 201–202.

Mound, L.A & Marullo, R. (1996) The Thrips of Central and South America: An Introduction. *Memoirs on Entomology, International*, 6, 1–488.

Nakahara, S. (1999) Validation of *Neohydatothrips samayunkur* (Kudo) (Thysanoptera: Thripidae) for a thrips damaging Marigolds (*Tagetes* spp.). *Proceeedings of the Entomological Society of Washington*, 101, 458–459.

Wang, C-L. (2007) *Hydatothrips* and *Neohydatothrips* (Thysanoptera, Thripidae) of East and South Asia with three new species from Taiwan. *Zootaxa*, 1575, 47–68.

Wilson, T.H. (1975) A monograph of the subfamily Panchaetothripinae (Thysanoptera: Thripidae). *Memoirs of the American Entomological Institute*, 23, 1–354.