The generic and tribal classification of spore-feeding Thysanoptera (Phlaeothripidae: Idolothripinae)

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Synopsis

In this paper 154 genus-group names are recognised as available in the subfamily Idolothripinae, including six new genera. However, 75 of these names are here placed in synonymy, including 36 new generic synonyms, and one genus was unavailable for study. Keys are provided to the 78 remaining genera, based on a study of more than 480 of the 600 species listed here in this group. In addition, a further 200 species-group names are listed in synonymy, including eight new synonyms, and 17 new species and 110 new combinations are established. These taxa are arranged into two tribes and nine sub-tribes, with eight family-group names being placed in synonymy. Moreover, 26 generic names are transferred from the Idolothripinae to the subfamily Phlaeothripinae and placed in two newly recognised tribes, the Apelaunothripini with two genera and 12 species, and the Docessissophothripini with nine genera and 99 species. Decisions on the Docessissophothripini are based on the study of 44 species, and include 13 new generic synonyms, two new specific synonyms and 69 new combinations. Various aspects of the biology, distribution and structure of spore-feeding thrips are discussed, where these seem relevant to problems of constructing a phylogenetic classification.

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Introduction

The family Phlaeothripidae, the sole family in the Thysanoptera sub-order Tubulifera, comprises about 2700 described species (Mound *et al.*, 1980). Members of this family are structurally uniform, although diverse in superficial appearance and with a wide range of biologies. Probably about half of them feed on leaves of green plants, in tropical countries often inducing galls (Ananthakrishnan, 1978), although in temperate regions phlaeothripids are most commonly observed in the flowers of Compositae and Gramineae (Mound *et al.*, 1976). A number of often unrelated species are predatory on other small arthropods. However, almost half of the phlaeothripid species are associated with fungi – under bark, on dead twigs and branches, or in leaf litter – some feeding on spores but the majority feeding on hyphae or possibly the external digestion products of fungal decay. This paper concerns the classification of those species which feed on fungal spores, most of which comprise the holophyletic, worldwide, sub-family Idolothripinae.

Existing classifications of Phlaeothripidae derive largely from two publications by Priesner (1949: 1961) and these in turn are derived in part from earlier studies by Karny (1921*a*; 1925). Unfortunately, the tradition of work throughout this period often involved acceptance of previously published taxa without further re-examination of the specimens involved. Thus, the key to genera of the world by Priesner (1949) does not indicate which genera he was unable to study personally, although it is evident that parts of the key are based solely on published descriptions. This is also true of Priesner's 1961 classification, which is reproduced almost unmodified by Ananthakrishnan (1969*d*) and Jacot-Guillarmod (1978). This approach could only produce a typological classification, that is a classfication emphasising the importance of single characters. Moreover, characters found to be of use in classification by later workers are not available in the descriptions of earlier taxa, with the result that spurious comparisons are often made.

Stannard (1957) broke with this tradition by personally examining a wide range of phlaeothripid taxa. His outstanding analysis of the North American genera set entirely new standards, by demonstrating a range of previously unobserved characters and by clearly introducing the concept of evolutionary relationships into the systematics of the family. Following this lead, Mound (1974*b*) re-examined almost all of the 100 species comprising the *Nesothrips* genus-group, thus producing a revised generic classification, and Palmer & Mound (1978) redefined a further eight genera from the Oriental region having examined the 60 species concerned. Few other workers have ever examined more than a small percentage of described taxa, and because descriptions often have a low information content (comprising colour and silhouette characters mainly) the systematic confusion is considerable. The objectives of the present study were therefore:

1, to examine the type-species of all genera of Idolothripinae (sensu lato);

2, to examine as many species as possible described in or referred to this group (together with any relevant species described in the Phlaeothripinae), and also to examine more recently collected unidentified material;

3, to try to recognise clusters of related species and, from these presumably holophyletic groupings, to construct a new classification at genus level and above based on phylogenetic rather than typological principles;

4, to communicate this revised classification in the form of an illustrated key to genera.

The first of these objectives was achieved almost completely; only one genus remained unstudied. The second objective was also achieved in that 75 per cent of the known species were studied; those not examined are indicated in the lists of species under each genus by an asterisk (*). The third objective has been achieved only partially; as discussed below, the authors have frequently sacrificed phylogenetic principles to traditional classificatory expediency at both tribal and generic levels. Formal diagnoses are not given for most genera, although brief comparative notes are given for each genus to supplement the key, and at least one species of each genus is illustrated.

Acknowledgements and depositories

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AMG	Albany Museum, Grahamstown, South Africa
ANIC	Australian National Insect Collection, C.S.I.R.O., Canberra, Australia
BCIQ	Bureau of Commodity Inspection and Quarantine, Taipei, Taiwan
BCM	Prof. A. Bournier collection, Ecole Nationale Supérieure Agronomique, Montpellier, France
BMNH	British Museum (Natural History), London, U.K.
BPBM	Bernice P. Bishop Museum, Honolulu, Hawaii
CAS	California Academy of Sciences, San Francisco, U.S.A.
DART	Department of Agricultural Research, Taipei, Taiwan
DEI	Deutsches Entomologisches Institut, Eberswalde, East Germany
FSAC	Florida State Arthropod Collection, Dept. of Agriculture, Gainesville, U.S.A.
INHS	Illinois Natural History Survey, Urbana, U.S.A.
MACN	Museo Argentino de Ciencias Naturales Bernardino Rivadavia de Buenos Aires, Argentina
MDA	Museu do Dundo, Angola
MLPA	Museo de la Plata, Argentina
MNHN	Muséum National d'Histoire Naturelle, Paris, France
MNHO	Osaka Museum of Natural History, Japan
MRAC	Musée Royal de l'Afrique Centrale, Tervuren, Belgium
NCIP	South African National Insect Collection, Pretoria, South Africa
NIAT	National Institute of Agricultural Science, Tokyo, Japan
NMB	Naturhistorisches Museum, Basel, Switzerland
NMG	Naturhistoriska Museum, Göteburg, Sweden
NMV	Naturhistorisches Museum, Vienna, Austria
NRS	Naturhistoriska Riksmuseet, Stockholm, Sweden
NZAC	New Zealand Arthropod Collection, D.S.I.R., Entomology Division, Auckland, New Zealand
OCT	Dr Shûji Okajima Collection, Tokyo Agricultural University, Japan
QMB	Queensland Museum, Brisbane, Australia
RPAESIC	Río Piedras Agricultural Experimental Station Insect Collection, Argentina
SMF	Senckenberg Museum, Frankfurt, West Germany
TM	Természettudományi Múzeum (Hungarian Natural History Museum), Budapest, Hungary
TNA	Prof. T. N. Ananthakrishnan, Loyola College, Madras, India
UNAM	Universidad Nacional Autonoma de Mexico, Mexico, D.F., Mexico
USNM	United States National Museum of Natural History, Washington, D.C., U.S.A.
ZMB	Zoologisches Museum an der Humboldt-Universität zu Berlin, East Germany

Problems in constructing classifications

Biologists construct classifications for two major purposes: firstly to provide an identification and data storage and retrieval system, secondly to reflect wherever possible those evolutionary relationships presumed to exist between different taxa. These two purposes, although apparently independent, are often closely inter-related, because a classification derived from evolutionary relationships has the potential for yielding further biological information whereas a typological classification based solely on superficial resemblances has no such potential. Some Thysanoptera specialists have claimed that it is not possible to ascertain evolutionary pathways, and therefore a phenetic classification is the proper practical solution. However, none of them follows such an extreme attitude to its logical conclusion, e.g. by placing all wingless forms in one group and all winged forms in another, and most classifications are an uneasy and unexplained mixture of phenetics and phylogenetics. The present authors have considered many of the problems involved in the production of phylogenetic classifications of Thysanoptera (Mound *et al.*, 1980; Mound & Palmer, 1981), and have attempted to point out areas where our assumptions have least justification. We accept that a completely phylogenetic classification of this group is not yet possible, but our objective has been to emphasise the presumed underlying evolutionary relationships between taxa, in contrast to most of our predecessors who have emphasised the often startling, but frequently superficial, differences which are readily observed.

Character inheritance

A phylogenetic classification is based on the recognition of two or more taxa jointly exhibiting one or more derived characters – apomorphies – not found in other taxa. Two such taxa sharing an apomorphy not exhibited by related taxa (and each itself characterised by a further unique apomorphy), may be regarded as holophyletic sister-groups. That is, they are derived from a single common ancestor, and moreover include all extant taxa which have evolved from that ancestor. Shared primitive characters – plesiomorphies – although indicating relationship cannot be used to define a natural evolutionary group (Hennig, 1966).

Unfortunately, this strictly logical approach is subject to practical difficulties when applied to some groups of organisms (Gauld & Mound, 1982). It is often possible to characterise one particular group through the presence of one or more apomorphies, but the sister-group may remain unclear (Greenwood, 1980). In such instances the true sister-group appears to lie within some residual group that is itself imperfectly characterised. Moreover, the strictly logical approach assumes that an apomorphy will find expression in *all* species in a holophyletic group, although this would not be expected from current genetical theory (Maynard Smith, 1975) and is contrary to observation in some groups of insects (Gauld & Mound, 1982).

Within any particular evolutionary lineage it is not unusual to observe a *tendency* for a particular character to be developed (Stys, 1967), although not all species will exhibit the character and its development is not a direct measure of evolutionary relationship. Such a character, although inherited by all members of the lineage, fails to be expressed in some species (even in some individuals of a species) probably because its ontogenetic development is inhibited by some other aspect of the genotype. Similarly, reversal of a character state during evolution is apparently common in Thysanoptera, e.g. antennal segment number (Mound & Palmer, 1981). Unfortunately, many apomorphies in this group of insects involve losses (e.g. loss of metathoracic sternopleural sutures or praepectus) or reductions (e.g. number of antennal sense cones or sternal discal setae), and such characters are more likely to have evolved more than once than a new complex structure. This irregular pattern of character inheritance, involving reversal and recurrent reductions in structures, may be a reflection of the ecology of the group as discussed below under patterns of speciation.

Further complications of character inheritance in Phlaeothripidae result from sex-linkage and allometry. In fungus-feeding phlaeothripids, including spore-feeding idolothripines, males are often oedymerous (large) and develop a range of structures not found in females. For example, *Mecynothrips* and *Elaphrothrips* males have tubercles or setae on the forelegs not found in females, *Bactrothrips* males usually have abdominal tubercles which do not occur in females, and *Gastrothrips, Diceratothrips* and *Macrothrips* all include species in which males may be oedymerous or gynaecoid (female-like). This relationship is reversed in *Machatothrips*, however, in which females exhibit the secondary sexual characters. Moreover, in gall-forming phlaeothripines, males are usually small and constant in size but females are variable; large females may look quite different from small females due to enlargement of the forelegs and pronotum. Similar phenomena can be associated with wing reduction, the wingless morph again usually being female.

The difficulty for classification arises particularly when related evolutionary lineages involve emphasis on different morphs; that is one lineage may emphasise male-ness whereas another emphasises female-ness. For example, *bicornis*, the most common species of *Diceratothrips*, is also the largest member of the genus with the greatest sexual dimorphism. The other members of *Diceratothrips* tend to have both sexes similar in structure to female *bicornis*, moreover, these females are structurally similar to females of *Sporothrips*. The ontogenetic threshold at which various characters associated with wing length or sexuality may be expressed will itself be liable to variation during evolution, and could well be independent of close phylogenetic relationships. Emphasis by taxonomists on striking differences between males of different species will tend to increase the number of 'genera' without producing any increased understanding of the underlying evolutionary relationships.

Zoogeography

The observed geographic distribution of natural groups of organisms can provide additional evidence in support of a classification. For example, in the classification adopted here the Hystricothripina is predominantly New World and the Idolothripina predominantly Old World. Moreover, the Macrothripina is largely Oriental and the Pygothripina predominantly Austro–Oriental. Such distribution patterns reassure the systematist that he is probably recognising real evolutionary groups. However, natural distribution patterns have been disrupted in many instances by human trading. For example, *Nesothrips propinquus* is now found at most points along the old shipping route between Britain and New Zealand and was probably distributed in hay and straw; *Nesothrips lativentris*, which is frequent on dead palm leaves and coconuts, is now widespread in the tropics; other species appear to have been transported across the Atlantic by the slave trade, or across the Indian Ocean by even earlier shipping (Mound, 1974*b*). Moreover, since many species are known only from single individuals or single samples it is probable that recognition of further synonymy will increase the number of species known to have been distributed by man (Mound & Walker, 1982).

Patterns of speciation

There is little evidence that most spore-feeding thrips exhibit any particular host specificity, although there tends to be some correlation between stylet diameter and the size of spores found in the gut, and a few species are found in association with particular plants, e.g. *Sporothrips* on dead leaves of Palmetto palms in Florida. Not only are two or more congeneric species found together quite frequently, but such species are sometimes widespread, e.g. *Elaphrothrips* species (Palmer & Mound, 1978). The extensive distributions of such species are probably facilitated by the availability of suitable fungal spores widespread on dead branches and in leaf littler. Palmer & Mound (1978) interpreted the Oriental *Elaphrothrips* species as structurally variable and behaviourally vagile with extensive and broadly overlapping geographical ranges. In contrast, Dr R. Johansen is currently describing numerous species of *Elaphrothrips* from Mexico, thus implying that the biology of these insects is different in the Neotropics. Spore-feeding species of low vagility (low dispersive ability) may develop clines, such as that of *Allothrips megacephalus* across North America (Mound, 1972*a*). Unfortunately, although at times it may be possible to relate different biologies to different patterns of speciation, most species are based on few specimens (e.g. *Bactrothrips*) and so the concept of species is itself often poorly defined.

Commenting on the large number of co-existing congeneric species of fungus-feeding thrips in leaf litter in southern Brazil, Mound (1977) suggested a possible relationship to a seasonal excess of available food, and subsequent reduction in competition between species. Such a reduction in competition, and consequent reduction in selection pressures on incipient species, may be related to the frequency of homoplasy (reversal and parallelism) in character inheritance within these thrips (Gauld & Mound, 1982). Host specific phytophagous thrips will almost certainly be subject to greater selection pressures in dividing up available resources, because they must develop the necessary behaviour patterns to find and respond to their particular niches. Unfortunately, the ecology, and hence speciation patterns, associated with this type of evolutionary strategy, involving competition and resource partitioning, is more fully investigated than the ecological and evolutionary strategies of non-specific leaf litter insects. If it should prove correct that the available resources in leaf litter are periodically in excess of the demands of the total arthropod fauna, then the classical evolutionary model involving niche separation and competition may be inappropriate for these small organisms with a short life cycle.

Characters studied

Head

Head shape is often useful in recognising relationships between taxa, e.g. relative length/breadth, constriction behind eyes or basally, prolongation in front of eyes, elevation in mid-line. However, shape is readily distorted by cover-glass pressure on specimens mounted onto microscope slides, the degree of distortion being particularly remarkable when the posterior half of the head is deep dorso-ventrally.

Maxillary stylets are broader (5–10 μm) in Idolothripinae than in most Phlaeothripinae (2–3 μm), but are intermediate in width (3–6 μm) in members of the phlaeothripine tribes Apelaunothripini and Docessissophothripini. The plesiomorphic position of the stylets in Idolothripinae is probably deeply retracted and parallel medially (Figs 2–11), the derived condition being wide apart and low in the head (Figs 134–144). However, polarity of this character is confused by homoplasy, both reversal (*Zeuglothrips*, Fig. 342) and parallelism (cf. *Ozothrips* and *Nesothrips*, Figs 13, 142). The stylets of Docessissophothripini are sometimes exceptionally long and convoluted (Figs 385–390).

Maxillary guides are thickened internal structures associated with the stylets of Phlaeothripinae. In Docessissophothripini they are large bowed structures (Figs 385–390), and in *Haplothrips* species they form a characteristic bridge (Mound *et al.*, 1976). However, in Idolothripinae these structures are developed only in some Pygothripina.

Mouth cone shape is frequently stressed in older descriptions, but is of limited systematic value. The apparent shape depends largely on whether the mouth cone is directed posteriorly (pointed) or ventrally (rounded).

Maxillary palps are two-segmented and generally rather large in idolothripines, but in Allothripina the terminal sensorium is often enlarged giving the appearance of a third segment (Fig. 77).

Compound eyes, although rounded and multifaceted in most species, are sometimes reduced to a few facets (*Anaglyptothrips*, Fig. 103) or prolonged ventrally (*Bolothrips*, Fig. 94). Reduction in facet number is usually associated with aptery, and ventral prolongation of the eyes seems to be correlated with the grass-living habit.

Ocelli are almost always present in macropterae, usually absent in apterae, and frequently reduced in micropterae. Thus, although there is a positive correlation between presence of wings and presence of ocelli, the development of these two structures is controlled independently. When the head is prolonged in front of the eyes, the fore ocellus may be unusually distant from the hind ocelli.

Setae are developed on the head surface in a fairly restricted pattern. There are usually about three pairs of setae associated with the ocelli, and either the post-ocellars or preocellars are frequently enlarged. Most species have a pair of major post-ocular setae; a few have two pairs, the second arising on the cheeks, or medially, or on the vertex. Many Idolothripinae have a series of stout setae on the cheeks.

Antennal structure is important in deducing relationships between taxa. The plesiomorphic number of antennal segments in Phlaeothripidae is eight (Mound *et al.*, 1980). However, Idolothripinae may have evolved from species with only seven segments, because the subgroups which are here regarded as least advanced (Pygothripina and Allothripina) tend to have that number. If this is so, then the number of antennal segments has undergone reversal to eight and reduction to seven (or less) several times. Similarly the plesiomorphic sense cone formula in idolothripines is considered to be two on III and two on IV, but in most species the number of sense cones on IV is doubled. The condition of three sense cones on IV has probably evolved more than once, being found in *Cryptothrips* (Pygothripina), *Bolothrips* (Compsothripina) and *Gastrothrips* (Gastrothripina). The relative lengths of antennal segments have been used frequently for defining species, but caution is required in using such ratios because segment lengths are sometimes affected by allometric growth.

Prothorax

Pronotal shape is often affected by sex and morph correlated allometry, and is not usually significant at genus-level (see *Diceratothrips*), although some groups exhibit a tendency for the anterior margin or median line of the pronotum to be thickened.

Epimeral sutures are usually present posterolaterally on the pronotum, but these are incomplete or fused in some taxa.

Setae are borne in a very regular pattern on the pronotum, there being five pairs of major setae in most species – antero-marginals (am), antero-angulars (aa), mid-laterals (ml), epimerals (epim) and postero-angulars (pa). The two anterior pairs are often shorter than the other three; only rarely are these setae undeveloped (*Anaglyptothrips*).

Praepectal plates (or praepectus) are a pair of small sclerites on the prosternum, arising in front of the major probasisternal plates (Figs 140, 143), but they are often reduced (Fig. 372) or absent (Fig. 371).

Pterothorax

The *mesonotum* in macropterae often bears a pair of major setae laterally. In apterae this sclerite is reduced and in extreme instances fused to the metanotum. The mesothoracic spiracle is situated on the anterior angles of the segment and is sometimes surrounded by an area of specialised sculpture (e.g. *Dinothrips*). Ventrally, the mesopraesternum is usually a boat-shaped sclerite but is often reduced and occasionally absent.

The *metanotum* often bears a pair of stout setae medially, but the sclerite is reduced and transverse in apterae. The metathoracic sternopleural sutures, which curve posteriorly from the mid-coxal cavities (Fig. 100), are regarded as a plesiomorphic character which has been lost in the more advanced subgroups of Idolothripinae (Fig. 99). This derived condition may have developed more than once, because the suture is variable in position, sometimes reduced in length, or so slender as to be almost obliterated (*Carientothrips*). Although generally constant within groups, the sternopleural suture is variable within a few species (e.g. *Nesothrips propinquus*).

The *katepisternum* and *anepisternum* of the metathorax are swollen in some groups (Hystricothripina) and the anepisternal suture is short (Figs 353–355). However, the plesiomorphic condition seems to be represented by a complete suture (Fig. 127), although these sclerites are often eroded in reduced or apterous forms (Figs 21–22).

The *forewings* bear a fringe of cilia although, unlike Terebrantia, these cilia do not arise from sockets; there are no true longitudinal veins and the surface of the wing does not bear microtrichia (Mound *et al.*, 1980). On the distal hind margin the forewings often bear duplicated cilia, ranging in number from one to almost one hundred. Idolothripines show less variation in wing length than phlaeothripines; micropterae are rare and hemimacropterae unrecorded, most species being macropterous and/or apterous.

The *forelegs* often bear a small or large tarsal tooth in one or both sexes. Similarly the foretibiae, forefemora and even the forecoxae may bear one or more tubercles in different genera. These tubercles, and particularly the swelling of the forefemora, are subject to allometric growth patterns, and they are also usually sex-linked. Moreover, the production of tubercles may recur in particular groups of related genera, e.g. many species of Macrothripina have a small tubercle at the inner apex of the foretibiae in both sexes (Figs 220–221).

Abdomen

Pelta is the term applied to the first abdominal tergite. In most species this tergite is reduced to a small median tergite, only in *Allidothrips* is it completely transverse (Fig. 64). In some

Hystricothripina the setae on the pleurites of the first segment have migrated onto the pelta (Figs 375–384), and in some Pygothripina the pelta is eroded posteromedially (Figs 36–37).

Wing-retaining setae are developed sub-medially on tergites II–VII of most macropterae. These setae are usually sigmoid in shape (Fig. 294), but are sometimes almost straight (Fig. 326) or even flattened (Fig. 369). The plesiomorphic condition for the subfamily Idolothripinae is here interpreted as involving only one pair of wing-retaining setae on each tergite as in Pygothripini (Fig. 43). The condition with two pairs of such setae as in most Idolothripini is considered apomorphic, and the three or more pairs found in *Mecynothrips* species (Fig. 297) is particularly advanced. Micropterae and apterae have the wing-retaining setae reduced or absent.

Tergite IX setae are important in the recognition of the two subfamilies of Phlaeothripidae. The males of almost all phlaeothripine species have the submedian pair of setae (B_2) on tergite IX short and stout, whereas males and females of all Idolothripinae have these setae as long as the dorsal (B_1) and lateral (B_3) pairs.

The *tube* is the most characteristic structure of Phlaeothripidae, abdominal segment X being entirely tubular with the anus emerging terminally and the genital ducts between segments IX and X. The tube is greatly swollen in several genera of Pygothripina and Diceratothripina. In many Idolothripini, as well as in *Cleistothrips* (Pygothripina) and *Campulothrips* (Diceratothripina), the tube bears prominent lateral setae. The base of the tube is emarginate ventrally in males, but completely cylindrical in females.

Sternal glandular areas are rarely developed in Idolothripinae, the only known species being in the Macrothripine genera *Dichaetothrips, Peltariothrips* and *Tarassothrips*. Glandular areas are frequently developed in the Phlaeothripinae, however – on the median sternites in both sexes of many Plectrothripini (Okajima, 1981), on the median sternites in the males of most species of Docessissophothripini (p. 90), and on the eighth sternite in the males of many other Phlaeothripinae.

Sternal discal setae are usually developed as a single transverse row medially on each sternite, but they are duplicated in some species (*Actinothrips*) or reduced in others (*Priesneriella*).

Family-group classification of Idolothripinae

Two sub-families are recognised in the family Phlaeothripidae, the Phlaeothripinae and the Idolothripinae. This latter group, the spore-feeding thrips, was defined in its modern sense (under the name Megathripinae) by Stannard (1957), who characterised it by the *presence* of broad maxillary stylets and the *absence* in males both of sternal glandular areas and of short stout B_2 setae on tergite IX. The latter characteristic is constant throughout the Idolothripinae as defined in the present paper; however, three species of Macrothripina are now known which appear to have sternal glandular areas in males and/or females (see *Dichaetothrips, Peltariothrips* and *Tarassothrips*).

Broad maxillary stylets are a functional adaptation to feeding on fungal spores, but although the sub-family Idolothripinae appears to be a holophyletic group the characteristic of broadened stylets has also evolved in several groups of Phlaeothripinae. Two such groups, the tribes Apelaunothripini and Docessissophothripini, are discussed in this paper (p. 88) because they were treated as idolothripines by Priesner (1961). In addition, species of the quite unrelated genus *Lissothrips*, associated with lichens and possibly mosses, also have rather broad stylets. Moreover, a Neotropical species-group of *Liothrips* is known in which the males may be mistaken for idolothripines in that they lack sternal glandular areas and have three pairs of elongate setae on the ninth tergite (Mound, 1974*b*: 182).

A further negative characteristic of idolothripine species is the apparent absence of maxillary guides, with the exception of a few species of Pygothripina, particularly from New Zealand.

Table 1 indicates the family-group names in the Idolothripinae, and it must be emphasised that according to the *Code of Zoological Nomenclature* (1961) all categories of family-group names are co-ordinate. The various names listed in this table must therefore be employed for groups containing their appropriate nominal taxon in order of date priority. Thus Mound

Table 1 Family-group names in Idolothripinae

Families
- Idolothripidae Bagnall, 1908
- Hystricothripidae Karny, 1913*a*
- Megathripidae Karny, 1913*a*
- Pygothripidae Hood, 1915

Subfamilies
- Bactrothripinae Karny, 1919
- Compsothripinae Karny, 1921*a*
- Cryptothripinae Karny, 1921*a*
- Macrothripinae Karny, 1921*a*
- Diceratothripinae Karny, 1925*c*

Tribes
- Emprosthiothripini Priesner, 1961
- Pygidiothripini Priesner, 1961

Subtribes
- Allothripina Priesner, 1961
- Atractothripina Priesner, 1961
- Gastrothripina Priesner, 1961
- Zeugmatothripina Priesner, 1961
- Hartwigia Stannard, 1976

Table 2 Current family-group classification of Idolothripinae (Jacot-Guillarmod, 1978)

IDOLOTHRIPINI
- Idolothripina [32 genera]
- Atractothripina [1 genus]
- Hystricothripina [3 genera]
- Megathripina [2 genera]
- Apelaunothripina [2 genera]

CRYPTOTHRIPINI
- Cryptothripina [22 genera]
- Allothripina [6 genera]
- Gastrothripina [13 genera]
- Diceratothripina [18 genera]

COMPSOTHRIPINI
- Compsothripina [3 genera]
- Hartwigia [1 genus]

EMPROSTHIOTHRIPINI [1 genus]

PYGIDIOTHRIPINI [1 genus]

PYGOTHRIPINI [1 genus]

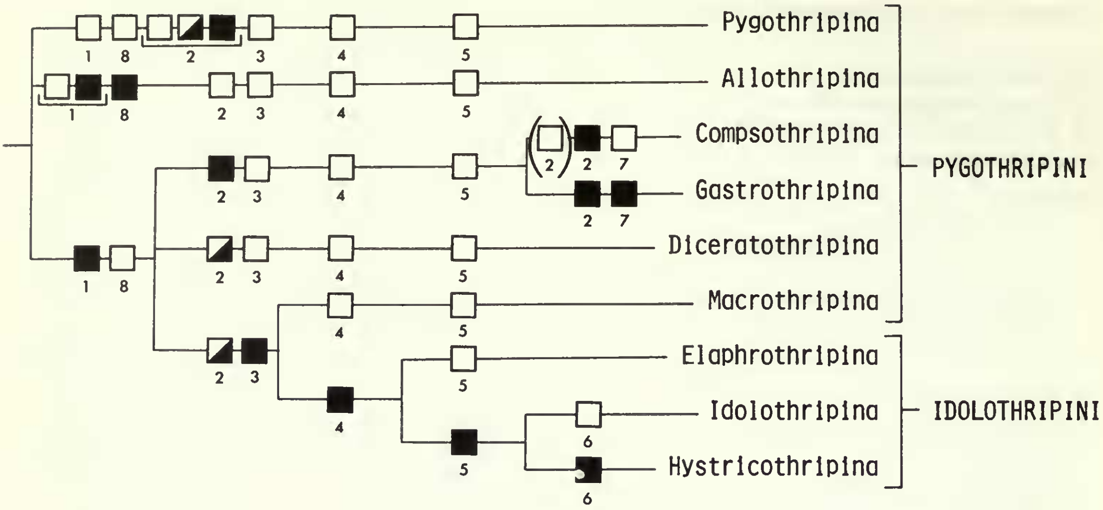
Table 3 Revised family-group classification of Idolothripinae

PYGOTHRIPINI Hood, 1915
- **PYGOTHRIPINA** Hood, 1915
    - Cryptothripinae Karny, 1921*a*
    - Emprosthiothripini Priesner, 1961
- **ALLOTHRIPINA** Priesner, 1961
    - Pygidiothripini Priesner, 1961
- **COMPSOTHRIPINA** Karny, 1921*a*
- **GASTROTHRIPINA** Priesner, 1961
- **DICERATOTHRIPINA** Karny, 1925*c*
- **MACROTHRIPINA** Karny, 1921*a*

IDOLOTHRIPINI Bagnall, 1908
- **ELAPHROTHRIPINA** subtrib. n.
    - Hartwigia Stannard, 1976
- **IDOLOTHRIPINA** Bagnall, 1908
    - Bactrothripinae Karny, 1919
    - Megathripidae Karny, 1913*a*
- **HYSTRICOTHRIPINA** Karny, 1913*a*
    - Atractothripina Priesner, 1961
    - Zeugmatothripina Priesner, 1961

(1974*a*) pointed out that the earliest available name for the spore-feeding thrips is Idolothripidae not Megathripidae which previously had been widely used. Table 2 summarises the family-group classification of Idolothripinae in current use as given by Jacot-Guillarmod (1978), and Table 3 gives the family-group classification (with synonymies) adopted in the present paper.

Only two tribes are recognised by the present authors: Idolothripini in which species never have metathoracic sternopleural sutures, and (with the exception of many Hystricothripina, as well as *Elaphrothrips antennalis*) have two pairs of tergal wing-retaining setae; and Pygothripini which have only one pair of wing-retaining setae on each tergite (except for two species of *Phaulothrips*) and which usually have well-developed metathoracic sternopleural sutures (except Macrothripina, some Compsothripina and a few Diceratothripina). However, these two tribes are probably not sister-groups. Idolothripini may be holophyletic, but its only possible sister-group on present evidence is the sub-tribe Macrothripina in the Pygothripini (Fig. 1). Despite this, the two tribes are retained here for traditional classificatory convenience.



1. Maxillary stylets long □ ; short ■

2. Antennal segment IV with 2 sense cones □ ; 4 sense cones ◪ ; 3 sense cones ■

3. Metathoracic sternopleural sutures present □ ; absent ■

4. Tergites with 1 pair □ ; 2 pairs ■ wing retaining setae

5. Tube glabrous □ ; hairy ■

6. Praepectal plates present □ ; absent ■

7. Antennal sense cones slender □ ; stout ■

8. Maxillary palp sensoria small □ ; large ■

Fig. 1 Summary diagram of classification and character-state distribution in suprageneric taxa of Idolothripinae.

Within the Idolothripini three sub-tribes are recognised. Idolothripina and Hystricothripina, the species of which bear pronounced setae on the margins of the tube, are regarded as sister-groups, and these two together possibly represent the sister-group of the third sub-tribe, Elaphrothripina. Priesner's group Atractothripina is synonymised with Hystricothripina, and Megathripina with Idolothripina. Moreover, Apelaunothripina is recognised as a tribe in the Phlaeothripinae (p. 89).

The second tribe, Pygothripini, corresponds largely with the group previously known as Cryptothripini (together with the four other smaller tribes listed in Table 2), with the major exception of a long series of genera removed from Cryptothripina to the Phlaeothripinae – Docessissophothripini (q.v., p. 89 & Table 5).

Within the Pygothripini six sub-tribes are recognised in the present re-classification (Table 3). The Pygothripina, which is characterised primarily by plesiomorphies, probably represents the closest living approximation to the 'proto-idolothripine' condition: stylets long and close together medially; antennae often 7-segmented, usually with two sense cones on segments III and IV; metathoracic sternopleural and anapleural sutures present; pelta with slender, wide lateral wings. However, within this group there are species with one or other apomorphic characters found otherwise only in comparatively unrelated, more advanced groups, e.g. *Cleistothrips* has the tube hairy as in Idolothripina and Hystricothripina; *Cryptothrips* has three sense cones on antennal segment IV as in Gastrothripina and *Bolothrips* (Compsothripina). Thus certain of the most advanced characteristics seem to have made their first appearance in certain of the least advanced genera. The alternative explanation, involving placing *Cleistothrips* in Idolothripini on the basis of this one character, the hairy tube, is contrary to the information provided by other structural characters and makes no sense zoogeographically.

The sub-tribe Allothripina comprises a small group of closely related species, derived from Pygothripina but with a remarkable terminal sensorium on the maxillary palps. Gastrothripina includes most idolothripine species with three short, stout sense cones on the fourth antennal segment. *Bolothrips* species, here placed in Compsothripina, also have three sense cones on this segment, but in this genus the sense cones are slender. The Compsothripina, as interpreted here, comprises a series of grass-living species in *Bolothrips* and related genera, together with the ant-mimicking *Compsothrips*-group. As discussed below (p. 34), intermediates between these two genera are found in the Mediterranean region. Although both the Gastrothripina and Compsothripina are each interpreted here as holophyletic groups, their out-group relationships are unclear.

The Diceratothripina is a large group, comprising those Pygothripini with metathoracic sternopleural sutures but with the maxillary stylets wide apart and four (rarely two) sense cones on the fourth antennal segment. This sub-tribe includes a large number of Austro-Oriental and Pacific species in the *Nesothrips*-group, a few Neotropical species in the *Diceratothrips*-group, together with an ill-defined pan-tropical genus *Neosmerinthothrips*.

Finally the Macrothripina comprises most of the Pygothripini species which lack metathoracic sternopleural sutures. This group is almost entirely Oriental with a few species in Africa, although the two species of *Diplacothrips* are known only from South America. This is a very clearly defined group; its relationship to the other Pygothripini is unclear, but Macrothripina may be the sister-group of the Idolothripini on the basis of the apomorphy – loss of sternopleural sutures.

Key to subtribes of Idolothripinae

N.B. This key is intended only to summarise the relationships discussed above based on the morphological characters indicated; because of individual variation it is not intended to be a practical key for routine identifications.

1 Metathoracic sternopleural sutures absent (cf Fig. 99); tergites usually with two or more pairs of wing-retaining setae (except *Anactinothrips* and *Elaphrothrips antennalis*) (Figs 294–299) and/or tube bearing long lateral setae (Fig. 374) (**IDOLOTHRIPINI** (p. 62)) 2

– Metathoracic sternopleural sutures present or absent (Figs 97–100); tergites each with only one pair of wing-retaining setae (except two species with well-developed sternopleural sutures); tube never with long lateral setae (except two species with well-developed sternopleural sutures) (**PYGOTHRIPINI** (p. 20)) 4

2 Tube without conspicuous lateral setae; metathoracic anapleural sutures complete (Figs 280–283) .... **ELAPHROTHRIPINA** (p. 62)

– Tube with conspicuous lateral setae; metathoracic anapleural sutures short (Figs 353–355) 3

3 Forewing duplicated cilia well developed; praepectal plates present; tergites each with two pairs of wing-retaining setae: ♂ frequently with one or more pairs of lateral abdominal tubercles (Figs 324–325) .... **IDOLOTHRIPINA** (p. 71)

– Forewing usually lacking duplicated cilia; praepectal plates usually absent; tergites usually each with one pair of wing-retaining setae; ♂ without lateral abdominal tubercles **HYSTRICOTHRIPINA** (p. 80)

4 Metathoracic sternopleural sutures absent; antennal segment IV with four sense cones, these sometimes unusually long; foretibia often with a tubercle near inner apex; head sometimes with an isolated ommatidium-like structure on each cheek (Figs 194–196) **MACROTHRIPINA** (p. 50)

– Metathoracic sternopleural sutures usually present, when absent antennal sense cones short or segment IV with three sense cones 5

5 Terminal sensorium on maxillary palps stout (Fig. 77).......... **ALLOTHRIPINA** (p. 30)

– Terminal sensorium on maxillary palps not unusually stout 6

6 Maxillary stylets wide apart in head but antennal segment IV with three stout sense cones (Fig. 93) .... **GASTROTHRIPINA** (p. 38)

– Not this combination of characters, if three sense cones on IV then these are slender or stylets are close together in the head 7

7 Maxillary stylets wide apart in head, V-shaped; antennal segment IV with four (rarely two) sense cones.......... **DICERATOTHRIPINA** (p. 40)

– Maxillary stylets rarely more than one-third of head width apart; antennal segment IV with 2, 3 or 4 sense cones 8

8 Eyes frequently prolonged ventrally on head, if eyes not prolonged then antennal segment IV with three slender sense cones; maxillary stylets not touching medially in head.......... **COMPSOTHRIPINA** (p. 34)

– Eyes never prolonged ventrally; antennal segment IV with two (rarely three or four) sense cones; stylets usually close together .... **PYGOTHRIPINA** (p. 21)

Genus-group classification of Idolothripinae

The present authors consider a genus, ideally, to comprise a group of species which share a unique apomorphy and which together represent a holophyletic lineage. Within this phylogenetic ideal there seems to us to be no room for the subordinate category of subgenus. We recognise the value of species-groups in defining evolutionary relationships, but do not accord these any status in nomenclature.

Unfortunately, for reasons discussed above in the section concerning problems in constructing classifications, the phylogenetic ideal is difficult to achieve. Only half of the described genera are accepted here (Table 4), mainly because so many monobasic genera have been placed into larger holophyletic groupings. A more strictly phylogenetic classification would probably recognise even fewer genera, particularly in the Hystricothripina. But there is a tradition amongst thysanopterists of considering any unusual character, or character combination, as meriting recognition at generic level, and we are aware that some of our colleagues would prefer to maintain this tradition.

This paper is therefore only a preliminary step toward a phylogenetic classification. We hope that other workers will recognise the value of such an approach, and examine the confused systematics of the rest of the Phlaeothripidae.

The key below includes all 78 idolothripine genera recognised in this revision (Table 4), and is based on a study of all those species indicated under each generic name in the main text. Only one generic name is excluded; the monobasic *Pinaceothrips* Yakhontov (1956) was not available for study and is unrecognisable from its description. The key is by no means easy to use, because of the diversity of species within some genera and the variation found within many species. The present authors themselves regularly experience difficulty in placing an unknown species to genus, and under such circumstances frequently have to reinspect the range of variation exhibited within one or more genera.

Table 4 Generic classification of Idolothripinae

(*Pinaceothrips* Yakhontov, 1956 is unplaced)

- Tribe **PYGOTHRIPINI**
  - Subtribe **PYGOTHRIPINA**
    - ***CLEISTOTHRIPS*** Bagnall
    - ***CRYPTOTHRIPS*** Uzel
    - ***EMPROSTHIOTHRIPS*** Moulton
    - ***HEPTATHRIPS*** Moulton
      - *Ascania* Faure **syn. n.**
      - *Capnothrips* Zur Strassen **syn. n.**
    - ***OZOTHRIPS*** **gen. n.**
    - ***PELINOTHRIPS*** Mound
    - ***PHAULOTHRIPS*** Hood
      - *Kaleidothrips* Kelly **syn. n.**
      - *Tetraceratothrips* Bagnall
      - *Titanothrips* Karny
    - ***PRIESNERIANA*** Ananthakrishnan
    - ***PYGOTHRIPS*** Hood
      - *Barythrips* Hood & Williams **syn. n.**
      - *Diplochelaeothrips* Moulton **syn. n.**
  - Subtribe **ALLOTHRIPINA**
    - ***ALLIDOTHRIPS*** Zur Strassen
    - ***ALLOPISOTHRIPS*** Sakimura & Bianchi
    - ***ALLOTHRIPS*** Hood
      - *Bryothrips* Priesner
    - ***FAUREOTHRIPS*** Priesner
    - ***PRIESNERIELLA*** Hood
      - *Embothrips* Dyadechko
      - *Parallothrips* Hood **syn. n.**
      - *Pygidiothrips* Hood **syn. n.**
    - ***PSEUDOCRYPTOTHRIPS*** Priesner
  - Subtribe **COMPSOTHRIPINA**
    - ***ANAGLYPTOTHRIPS*** **gen. n.**
    - ***BOLOTHRIPS*** Priesner
      - *Bolothrips (Botanothrips)* Hood
      - *Boloadelothrips* Moulton **syn. n.**
    - ***COMPSOTHRIPS*** Reuter
      - *Macrothrips* Buffa
      - *Leurothrips* Bagnall
      - *Leptogastrothrips* Trybom
      - *Oedaleothrips* Hood
      - *Myrmecothrips* Watson
      - *Formicothrips* Priesner
    - ***ILLINOTHRIPS*** Stannard
    - ***LOYOLAIA*** Ananthakrishnan
  - Subtribe **GASTROTHRIPINA**
    - ***GASTROTHRIPS*** Hood
      - *Goetothrips* Priesner
      - *Isopterothrips* Bagnall **syn. n.**
      - *Paragastrothrips* Zur Strassen **syn. n.**
      - *Percnothrips* Ananthakrishnan **syn. n.**
      - *Pharetrothrips* Priesner **syn. n.**
      - *Probolothrips* Moulton
      - *Syncerothrips* Hood **syn. n.**
  - Subtribe **DICERATOTHRIPINA**
    - ***ACALLUROTHRIPS*** Bagnall
      - *Diopsothrips* Hood **syn. n.**
    - ***CAMPULOTHRIPS*** Moulton
    - ***CARIENTOTHRIPS*** Moulton
    - ***DICERATOTHRIPS*** Bagnall
      - *Diceratothrips (Endacnothrips)* Priesner
      - *Eulophothrips* Schmutz
      - *Megalomerothrips* Watson
    - ***ELGONIMA*** Zur Strassen
    - ***NEOSMERINTHOTHRIPS*** Schmutz
      - *Coenurothrips* Bagnall
      - *Galactothrips* Moulton
    - ***NESIDIOTHRIPS*** Mound
    - ***NESOTHRIPS*** Kirkaldy
      - *Oedemothrips* Bagnall
      - *Rhaebothrips* Karny **syn. n.**
    - ***PHACOTHRIPS*** Mound
    - ***PSEUDOEURHYNCHOTHRIPS*** Moulton
    - ***SPOROTHRIPS*** Hood
  - Subtribe **MACROTHRIPINA**
    - ***AESTHESIOTHRIPS*** Ananthakrishnan
    - ***CELIDOTHRIPS*** Priesner
      - *Ommatidothrips* Mound
    - ***DIAPHOROTHRIPS*** Karny
      - *Diaphorothrips (Cnemidothrips)* Priesner
    - ***DICHAETOTHRIPS*** Hood
    - ***DIPLACOTHRIPS*** Hood **gen. rev.**
    - ***ETHIROTHRIPS*** Karny
      - *Decothrips* Ananthakrishnan **syn. n.**
      - *Elaphridia* Ananthakrishnan **syn. n.**
      - *Eurynotothrips* Moulton **syn. n.**
      - *Paracryptothrips* Moulton **syn. n.**
      - *Percipiothrips* Ananthakrishnan **syn. n.**
      - *Scotothrips* Priesner **syn. n.**
      - *Uredothrips* Ananthakrishnan **syn. n.**
    - ***HERATHRIPS*** Mound
    - ***ISCHYROTHRIPS*** Schmutz
    - ***MACHATOTHRIPS*** Bagnall
      - *Adiaphorothrips* Bagnall
      - *Cnestrothrips* Priesner
    - ***MACROTHRIPS*** Bagnall
    - ***PELTARIOTHRIPS*** **gen. n.**
    - ***POLYTRICHOTHRIPS*** Priesner
    - ***TARASSOTHRIPS*** **gen. n.**
- Tribe **IDOLOTHRIPINI**
  - Subtribe **ELAPHROTHRIPINA subtrib. n.**
    - ***ANACTINOTHRIPS*** Bagnall
      - *Lophothrips* Karny
      - *Ophidothrips* Schmutz
    - ***DERMOTHRIPS*** Bagnall
    - ***DINOTHRIPS*** Bagnall
      - *Paxillothrips* Ananthakrishnan
    - ***ELAPHROTHRIPS*** Buffa
      - *Dicaiothrips* Buffa
      - *Elaphridothrips* Priesner

Table 4 cont.

        - *Elaphrothrips (Cradothrips)* Ananthakrishnan
        - *Elaphrothrips (Elaphoxothrips)* Bagnall
        - *Elaphrothrips (Paraclinothrips)* Priesner
        - *Klinothrips* Bagnall
        - *Palinothrips* Hood **syn. n.**
    - ***HARTWIGIA*** Faure
    - ***LAMILLOTHRIPS*** Bagnall
        - *Hylothrips* Priesner **syn. n.**
    - ***MALESIATHRIPS*** Palmer & Mound
    - ***MECYNOTHRIPS*** Bagnall
        - *Acrothrips* Karny
        - *Dracothrips* Bagnall
        - *Kleothrips* Schmutz
        - *Kleothrips (Akleothrips)* Priesner
        - *Kleothrips (Synkleothrips)* Priesner
        - *Phoxothrips* Karny
- ***OPHTHALMOTHRIPS*** Hood
    - *Derothrips* Jacot-Guillarmod **syn. n.**
    - *Fulgorothrips* Faure **syn. n.**
    - *Pyrgothrips* Karny **syn. n.**
- ***TIAROTHRIPS*** Priesner

Subtribe **IDOLOTHRIPINA**

- ***BACILLOTHRIPS*** Buffa
- ***BACTROTHRIPS*** Karny
    - *Bactrianothrips* Bagnall
    - *Bactridothrips* Karny **syn. n.**
    - *Caudothrips* Karny **syn. n.**
    - *Cervothrips* Bagnall **syn. n.**
    - *Eidothrips* Bagnall **syn. n.**
    - *Krinothrips* Bagnall
- ***CEUTHOTHRIPS*** Hood
- ***CYLINDROTHRIPS*** Moulton
- ***EGCHOCEPHALOTHRIPS*** Bagnall
- ***IDOLOTHRIPS*** Haliday
    - *Acanthinothrips* Bagnall
- ***LASIOTHRIPS*** Moulton
- ***MEGALOTHRIPS*** Uzel
- ***MEGATHRIPS*** Targioni-Tozzetti
    - *Siphonothrips* Buffa **syn. n.**
- ***MEIOTHRIPS*** Priesner
    - *Meiothrips (Aculeathrips)* Kudo

Subtribe **HYSTRICOTHRIPINA**

- ***ACTINOTHRIPS*** Bagnall
    - *Dasythrips* Hood **syn. n.**
- ***ATRACTOTHRIPS*** Hood
- ***AZEUGMATOTHRIPS*** **gen. n.**
- ***CYPHOTHRIPS*** Hood
- ***HOLUROTHRIPS*** Bagnall
- ***HYBRIDOTHRIPS*** Stannard
- ***HYSTRICOTHRIPS*** Karny
    - *Zeugmatothripoides* Bagnall
- ***NEATRACTOTHRIPS*** **gen. n.**
- ***PARACTINOTHRIPS*** **gen. n.**
- ***SAUROTHRIPS*** Hood
- ***ZACTINOTHRIPS*** Hood
- ***ZEUGLOTHRIPS*** Hood
- ***ZEUGMATOTHRIPS*** Priesner

Key to genera of Idolothripinae

1 Abdominal tergite I complete, transversely rectangular, bearing spiracles laterally and 4 pairs of setae sublaterally (Fig. 64) .... ***ALLIDOTHRIPS*** (p. 30)

– Abdominal tergite I reduced to a median pelta which is varied in shape but rarely transverse (cf. Fig. 63), rarely bearing setae (Figs 375–384); spiracles never associated with pelta 2

2 Tube long with numerous lateral setae (Fig. 24), also metathoracic sternopleural sutures present and anapleural sutures complete 3

– Not this combination of characters, if tube hairy then metathoracic sternopleural sutures absent and anapleural sutures short and incomplete 4

3 Head with stylets close together medially and 2 pairs of postocular setae (Fig. 5) [New Zealand] .... ***CLEISTOTHRIPS*** (p. 22)

– Head with stylets wide apart and V-shaped, dorsal surface with one pair of postocular setae and one pair of very stout ocellar setae (Fig. 133) [Fiji] .... ***CAMPULOTHRIPS*** (p. 42)

4 Tube usually long with numerous long lateral setae (these setae short in *Atractothrips*) (Fig. 374); anapleural sutures short and incomplete (Fig. 353); metathoracic sternopleural sutures absent 5

– Tube usually short, apparently glabrous or with lateral setae sparse and minute; anapleural sutures usually complete (Fig. 282); metathoracic sternopleural sutures present or absent 28

5 Praepectus absent [Neotropics; western Africa] 6

– Praepectus present, at least laterally, but often weakly sclerotised [eastern Oriental Region] 16

6 Median metanotal setae less than 25 μm long 7

– Median metanotal setae more than 40 μm long, usually very long [Central and South America] 8

7 Tube convex laterally, with numerous long (70 μm) setae [Africa] ***HYSTRICOTHRIPS*** (p. 84)
– Tube sides parallel to weakly concave, setae weak and scarcely 20 μm long [Florida] ***ATRACTOTHRIPS*** (part) (p. 82)

8 Abdominal segment I with lateral setae in normal position, arising on anterolateral sclerites, not associated with pelta 9
– Abdominal segment I with setae arising on lateral extremities of broad pelta (Figs. 376), or on small sclerites distinct from the anterolateral sclerites (Fig. 375) 12

9 Head with all dorsal setae shorter than distance between two ocelli; compound eyes small and angular (Fig. 346) ***ATRACTOTHRIPS*** (part) (p. 82)
– Head with at least one pair of elongate dorsal setae, compound eyes well developed and round (Fig. 340) 10

10 Head with 3 pairs of stout setae dorsally (Fig. 340); pronotal *am* setae more than 0·5 times as long as *aa* setae, *pa* setae reduced but *pm* setae large [Mexico] ***HYBRIDOTHRIPS*** (p. 84)
– Head with one pair of stout setae dorsally (Fig. 345); pronotal *am* setae reduced, *pm* setae never enlarged 11

11 Antennal segments III–IV with numerous small sense cones near apex ventrally; foretarsal tooth present in ♂ [Peru] ***ZACTINOTHRIPS*** (p. 87)
– Antennal segments III–IV without supernumerary ventral sense cones; foretarsal tooth present or absent in ♂ ***ACTINOTHRIPS*** (p. 81)

12 Head with maxillary stylets close together medially and retracted to postocular setae (Fig. 342) [Peru] ***ZEUGLOTHRIPS*** (p. 87)
– Maxillary stylets wide apart medially, not retracted so deeply into head 13

13 Abdominal tergites each with 2 pairs of wing-retaining setae (Fig. 368); tube more than 2·5 times as long as head [Brazil] ***SAUROTHRIPS*** (p. 86)
– Tergites each with only one pair of wing-retaining setae; tube at most 2·0 times as long as head 14

14 Micropterous, *or* forewing with no duplicated cilia. ♂ without a foretarsal tooth ***ZEUGMATOTHRIPS*** (p. 88)
– Macropterous, forewing with at least two duplicated cilia 15

15 Head with 2 pairs of stout setae dorsally (Fig. 339); antennal segments III–IV without stout dorsal setae [Brazil] ***CYPHOTHRIPS*** (p. 83)
– Head with 3 pairs of stout setae dorsally (Fig. 349); antennal segments III–IV with 2 stout dorsal setae (Fig. 357) [Trinidad] ***AZEUGMATOTHRIPS*** (p. 82)

16 Ventral length of eyes at least twice dorsal length, ventral prolongation of eyes broad (Fig. 341); head prolongation longer than eyes and bearing 2 pairs of setae [Malaya, Japan, Queensland] ***HOLUROTHRIPS*** (p. 83)
– Eyes not prolonged ventrally, or ventral prolongation shorter and narrower; head frequently little extended in front of eyes 17

17 Tergal wing-retaining setae leaf-like (Fig. 369); antennal segment III 0·9 times as long as IV [Malaya, Philippines] ***PARACTINOTHRIPS*** (p. 85)
– Tergal wing-retaining setae acute, usually sigmoid, antennal segment III longer than IV 18

18 Mesopraesternum transverse, apparently fused to lateral sclerites (Fig. 372); abdominal segment I with lateral setae arising anterior to lateral lobes of pelta (Fig. 377); forewing without duplicated cilia ***NEATRACTOTHRIPS*** (p. 85)
– Mesopraesternum boat-shaped, clearly defined from lateral sclerites; pelta different; forewings, when present, with duplicated cilia 19

19 Epimeral sutures complete; ♂ (where known) without drepanae laterally on abdomen 20
– Epimeral sutures incomplete; ♂ often with lateral drepanae on abdomen 22

20 Pronotum 2·0 times as broad as long; lateral lobes of pelta broad (Fig. 335) [South Africa] ***CYLINDROTHRIPS*** (p. 75)
– Pronotum more than 2·8 times as broad as long; lateral lobes of pelta slender 21

21 Head with 2 pairs of postocular setae arising in a transverse row; dorsal surface of head grossly swollen [New Caledonia] ***EGCHOCEPHALOTHRIPS*** (p. 76)

– Head with 2 pairs of postocular setae arising one behind the other (Fig. 322); dorsal surface of head less elevated [Australia] .... ***LASIOTHRIPS*** (p. 77)

22 Stylets well retracted and lying close together in middle of head (Figs 315, 318); ♂ with drepanae on tergite VI 23
– Stylets not well retracted, or if well retracted then not close together in middle of head (Figs 314, 321); ♂ with or without drepanae 24

23 Pronotum short (cf. *Lasiothrips*); pelta with slender lateral lobes; eyes sometimes slightly prolonged ventrally .... ***MEGALOTHRIPS*** (p. 77)
– Pronotum longer, only 1·5 times as broad as long; pelta with broad lateral lobes set close to centre (Fig. 330); eyes usually small, not prolonged ventrally [Europe]... ***BACILLOTHRIPS*** (p. 72)

24 Stylets retracted far into head (Figs 319, 321); tibiae pale or dark, not bicoloured; wings when fully developed, pale 25
– Stylets not retracted far into head (Figs 313–314); tibiae usually bicoloured; wings when fully developed with a darker median basal line 26

25 Tibiae completely dark; head and pronotal setae short except ocellars and epimerals; pelta with slender lateral lobes; abdominal tergites with 1 pair of sigmoid wing-retaining setae; ♂ without drepanae on abdomen [Florida] .... ***CEUTHOTHRIPS*** (p. 75)
– Tibiae completely pale; pelta with broad lateral lobes set close to centre; abdominal tergites with 1 to 2 pairs of sigmoid wing-retaining setae; ♂ without or with drepanae only on tergite VI [Holarctic] .... ***MEGATHRIPS*** (p. 78)

26 Lateral lobes of pelta narrowly joined to centre, broadest distal part of lobe sometimes 1·3, usually more than 2·0 times as long as the narrowest proximal part (Figs 332–333); metanotal setae 0·6 to 1·6 times as long as the distance between their bases; head 1·4 to 2·2 times as long as broad; ♂ drepanae, when present, not bearing a stout terminal seta [Old World Tropics, southern Europe and California] .... ***BACTROTHRIPS*** (p. 72)
– Lateral lobes of pelta broadly joined to centre, broadest distal part of lobe 1·1 to 1·4 times as long as the narrowest proximal part (Figs 334, 336); metanotal setae shorter or longer; ♂ drepanae, when present, bearing a stout terminal seta 27

27 Metanotal seta short, 0·3 times as long as the distance between their bases, abdominal tergites without accessory setae anterior to antecostal line; ♂ with posterior angles of at least abdominal tergite VIII produced outwards bearing a spine-like seta; head 1·4 to 2·2 times as long as broad [Australia] .... ***IDOLOTHRIPS*** (p. 76)
– Metanotal setae usually long, twice as long as the distance between their bases; abdominal tergites with accessory setae anterior to antecostal line; posterior angles of abdominal tergites of ♂ sometimes bearing a spine but not produced outwards; head 1·7 to 3·0 times as long as broad [Indomalaysia] .... ***MEIOTHRIPS*** (p. 79)

28 Abdominal tergites each with 2 (or 3) pairs of wing-retaining setae; usually macropterous, anterior pair of wing-retaining setae sometimes reduced in apterae but rarely absent (eg. *Elaphrothrips antennalis)* 29
– Abdominal tergites each with only one pair of wing-retaining setae; frequently apterous 37

29 Head grossly swollen and bearing numerous small setae, constricted to basal neck (Fig. 268); body ant-like [South Africa] .... ***HARTWIGIA*** (p. 68)
– Head and body different 30

30 Eyes prolonged posteriorly on ventral surface of head (Figs 264–267) ***OPHTHALMOTHRIPS*** (p. 70)
– Eyes scarcely longer ventrally than dorsally 31

31 Small dark brown species with complex sculpture on head (Figs 273, 274, 276) 32
– Large to very large, brown to black species, without complex sculpture on head 33

32 Antennal segment II with 1 or 2 large dorsal setae (Figs 291–292) [Java to Micronesia] ***MALESIATHRIPS*** (part) (p. 69)
– Antennal segment II without enlarged setae [Hawaii] .... ***DERMOTHRIPS*** (part) (p. 63)

33 Abdominal tergites with three or more pairs of major wing-retaining setae, anterior pair close to antecostal ridge (Fig. 297); ♂ usually with one or more tubercles on inner margin of forefemora .... ***MECYNOTHRIPS*** (p. 69)

– Abdominal tergites with two pairs of major wing-retaining setae (one pair only in *Elaphrothrips antennalis*), although large individuals may have several pairs of supplementary sigmoid setae anterolateral to the major pairs (Fig. 299); ♂ never with a tubercle on inner margin of forefemora 34

34 Foreocellus arising just posterior to major ocellar setae 35
– Foreocellus arising anterior to major ocellar setae 36

35 Head prolonged to front of eyes, prolongation about four times as long as wide (Fig. 269); pelta not divided into three separate parts .... ***TIAROTHRIPS*** (p. 71)
– Head scarcely prolonged in front of eyes; pelta divided into three distinct sclerites (Fig. 310) ***DINOTHRIPS*** (p. 64)

36 Pronotum of ♂ with anterior angles produced into flattened plates, forefemora without a sickle-shaped seta apically .... ***LAMILLOTHRIPS*** (p. 68)
– Pronotum of ♂ variable but never produced at anterior angles; ♂ forefemora often with a stout sickle-shaped seta .... ***ELAPHROTHRIPS*** (p. 64)

37 Anapleural sutures long but incomplete; metathoracic sternopleural sutures absent; head with 3 pairs of stout setae dorsally; metanotum and femora with long, stout setae; ♂ with a foretarsal tooth, also a stridulating mechanism between posterior angle of forefemora and ridged surface of forecoxae .... ***ANACTINOTHRIPS*** (p. 63)
– Not this combination of characters 38

38 Antennal segment IV with 3 sense cones 39
– Antennal segment IV with 2 or 4 to 5 sense cones 45

39 Maxillary stylets deeply retracted and close together medially in head (Fig. 2) [Holarctic] ***CRYPTOTHRIPS*** (p. 22)
– Maxillary stylets at least one-third of head width apart 40

40 Metathoracic sternopleural sutures absent .... ***BOLOTHRIPS*** (part) (p. 35)
– Metathoracic sternopleural sutures present 41

41 Yellow species; dorsal surface of head reticulate (Fig. 103) [New Zealand] ***ANAGLYPTOTHRIPS*** (p. 34)
– Usually brown species; head not reticulate 42

42 Pelta trilobed (Fig. 109) [India] .... ***LOYOLAIA*** (p. 38)
– Pelta triangular to broadly rounded 43

43 Compound eyes longer ventrally than dorsally (Fig. 94) .... ***BOLOTHRIPS*** (part) (p. 35)
– Compound eyes not prolonged ventrally 44

44 Eyes small, cheeks incut behind eyes; pelta broadly rounded (Fig. 104); tube with margins straight [North America] .... ***ILLINOTHRIPS*** (p. 38)
Eyes larger (Figs 120, 125); pelta usually triangular (Figs. 122–124, 129); tube frequently constricted at apex .... ***GASTROTHRIPS*** (p. 38)

45 Metathoracic sternopleural sutures not developed 46
– Metathoracic sternopleural sutures present but variable in length, width and position (Figs 20–22) 64

46 Antennal segment IV with 2 sense cones 47
– Antennal segment IV with 4 sense cones 48

47 Eyes prolonged ventrally on head; dorsal surface of head weakly sculptured ***BOLOTHRIPS*** (part) (p. 35)
– Eyes not longer ventrally than dorsally; dorsal surface of head strongly sculptured (Fig. 276) [Hawaii] .... ***DERMOTHRIPS*** (part) (p. 63)

48 Small species, dorsal surface of head with complex sculpture (Figs 67, 273) 49
– Small to very large species, head different 50

49 Yellow species with head reticulate (Fig. 67); antennal segment II without large setae [South Africa] .... ***FAUREOTHRIPS*** (p. 32)

– Brown species, head with complex sculpture (Figs 273–274); antennal segment II with 1 or 2 large setae .... ***MALESIATHRIPS*** (part) (p. 69)

50 Maxillary stylets retracted to compound eyes and close together medially in head (Figs 195–196); compound eyes large and round; antennal segment III shorter than IV *52*
– Maxillary stylets often wide apart and retracted only half-way into head, sometimes about one-third of head width apart and deeply retracted; a few species with stylets closer together have the eyes reduced and antennal segment III longer than IV 53

51 Antennal sense cones not exceptionally long (Fig. 243); pelta without any sculpture (Fig. 211) [Borneo] .... ***POLYTRICHOTHRIPS*** (p. 60)
– Sense cones on antennal segments III–IV long and slender, about half as long as each segment (Figs 251–253); pelta sculptured 52

52 Head elongate with one pair of long ocellar setae (Fig. 200) [India; Malaya] ***AESTHESIOTHRIPS*** (p. 51)
– Head not elongate, without long ocellar setae (Fig. 196) [Malaya] .... ***TARASSOTHRIPS*** (p. 61)

53 Pelta triangular with posterior margin concave, anterior margin of tergite II protruding into pelta (Fig. 212); antennal sense cones long (Fig. 242) [Malaya; Philippines] ***PELTARIOTHRIPS*** (p. 59)
– Not this combination of characters 54

54 Pelta D-shaped (Figs 225–227) 55
– Pelta broader (Fig. 215) 56

55 Antennal sense cones short (Fig. 245); preocellar setae long (Fig. 197) [South America] ***DIPLACOTHRIPS*** (p. 54)
– Antennal sense cones long (Figs 254–256); preocellar setae not elongate (Fig. 199) [Guyana; South East Asia] .... ***DICHAETOTHRIPS*** (p. 52)

56 Head about twice as long as wide; cheeks with several stout setae and an isolated ommatidium-like structure behind eyes; maxillary stylets retracted to postocular setae, one-third of head width apart (Fig. 201) [Malaya to Australia and Solomon Is.] .... ***CELIDOTHRIPS*** (p. 51)
– Head different, stylets further apart and usually lower in head, or with cheeks different 57

57 Small, usually apterous species with eyes usually prolonged ventrally; one pair of ocellar setae long (Figs 142–144); ♀ without fore tarsal tooth [Hawaii, Australia, New Zealand] ***NESOTHRIPS*** (part) (p. 47)
– Not above combination 58

58 Small, usually apterous species with eyes reduced to about 30 facets (50 in macropterae); cheeks narrowed behind eyes without stout setae; pelta broadly oval; ♀ without foretarsal tooth [Australia, New Zealand] .... ***CARIENTOTHRIPS*** (part) (p. 42)
– Not this combination, usually large dark species 59

59 Pronotum with a hook ventrally at each anterior angle (Fig. 206); forecoxae of ♂ with large recurved tubercle, forefemora of ♂ and ♀ with stout pale spines on inner surface [New Guinea] .... ***MACROTHRIPS*** (p. 59)
– Not as above 60

60 Fore tibiae with tubercle arising subapically in ♂ and ♀ (Fig. 220); foretarsal tooth well developed [India to Pacific] .... ***DIAPHOROTHRIPS*** (p. 52)
– Tubercle on foretibiae, if present, arising at inner apex, not subapically; ♂ sometimes without foretarsal tooth 61

61 Maxillary stylets scarcely retracted into head capsule (Fig. 188) [Australia] .... ***HERATHRIPS*** (p. 58)
– Maxillary stylets retracted at least halfway into head 62

62 Preocellar setae well developed (Fig. 203); fore femora of ♀ (sometimes ♂) with row of stout dark tubercles (Figs. 217–219) [India to Micronesia] .... ***MACHATOTHRIPS*** (p. 58)
– Preocellar setae not elongate 63

63 Forefemora of ♀ with 7 to 10 tubercles on inner margin [India] .... ***ISCHYROTHRIPS*** (p. 58)
– Forefemora of ♀ without tubercles [Old World Tropics] .... ***ETHIROTHRIPS*** (p. 54)

64 Black apterous species with head strongly sculptured, broadly produced in front of compound eyes and constricted basally into a neck (Fig. 18); head and pronotum without long setae; mesopraesternum absent (Fig. 20) [Australia; New Zealand] .... ***EMPROSTHIOTHRIPS*** (p. 23)
– Not this combination of characters, if black and apterous then pronotal setae long and mesopraesternum developed 65

65 Maxillary palps with a large terminal sensorium which looks like a third segment (Fig. 77); small, yellow usually apterous species with 5 to 10 eye facets dorsally; antennae with 7 segments or less (8 segments in *Pseudocryptothrips*) 66
– Maxillary palps without a single large sensorium terminally; mostly dark species, with eyes larger and antennae usually 8-segmented 69

66 Antennae 8-segmented, segment IV with 4 sense cones (Fig. 73) ... ***PSEUDOCRYPTOTHRIPS*** (p. 33)
– Antennae with 6 or 7 segments; IV with 2 sense cones 67

67 Antennal segment VII broadly joined or fused to VI (Figs 79–83) .... ***PRIESNERIELLA*** (p. 32)
– Antennal segment VII narrower at base than VI at apex 68

68 Antennal segment VII strongly constricted to basal neck (Fig. 78); mesonotum well developed with 1 to 3 pairs of major setae .... ***ALLOTHRIPS*** (p. 31)
– Antennal segment VII scarcely narrower at base than VI at apex; mesonotum fused to metanotum and with no setae [Hawaii] .... ***ALLOPISOTHRIPS*** (p. 31)

69 Maxillary stylets close together medially in head (Figs 2–11) 70
– Maxillary stylets at least one-third of head width apart 76

70 Antennal segment VIII clearly distinct from VII 71
– Antennae 7-segmented, or VII–VIII broadly joined 74

71 Dorsal surface of head strongly sculptured, bearing rows of short broad setae (Fig. 17) [Australia] .... ***PELINOTHRIPS*** (p. 27)
– Head without numerous short broad setae 72

72 Head elongate, dorsal surface elevated in midline, anterior margin bearing at least one pair of stout preocellar setae (Figs 7–11) [Australia] .... ***PHAULOTHRIPS*** (p. 27)
– Head different 73

73 Maxillary stylets almost touching and closely parallel medially in head (Figs 3–4); antennal segment IV with 2 sense cones (Fig. 53) [New Zealand] .... ***HEPTATHRIPS*** (part) (p. 23)
– Maxillary stylets close but not parallel and touching medially (Fig. 16); antennal segment IV with 4 sense cones [India; Australia] .... ***PRIESNERIANA*** (part) (p. 28)

74 Tube broad, basal or medial width more than 3 times apical width (Fig. 23) ...... ***PYGOTHRIPS*** (p. 28)
– Tube more slender and parallel-sided, sometimes constricted at apex 75

75 Maxillary stylets not parallel and touching medially in head (Fig. 16) .. ***PRIESNERIANA*** (part) (p. 28)
– Maxillary stylets close together and parallel in head (Figs 3–4) [New Zealand, South Africa, Saudi Arabia] .... ***HEPTATHRIPS*** (part) (p. 23)

76 Apterous species; colour black, brown or yellow, usually constricted at metathorax with a pair of chalky white markings producing an ant-like appearance; metathoracic sternopleural sutures exceptionally long and extending to hind coxae (Fig. 100); antennal segment IV with 2 sense cones; eyes usually prolonged on ventral surface of head (Figs 84–86) .... ***COMPSOTHRIPS*** (p. 36)
– Wings present or absent; metathoracic sternopleural sutures shorter; antennal segment IV usually with 4 (or 5) sense cones; eyes rarely prolonged ventrally 77

77 Head with one pair of stout ocellar setae arising within ocellar triangle and anterior to posterior ocelli (Fig. 134) [India, Seychelles, Solomon Is.] .... ***NESIDIOTHRIPS*** (p. 47)
– Ocellar setae not arising in this position within ocellar triangle 78

78 Metanotum reticulate with several pairs of scattered minor setae; all major setae including postocellars, median metanotals and those on tergite IX with abruptly expanded apices; epimeral sutures not complete [Africa] .... ***ELGONIMA*** (p. 45)
– Not this combination of characters 79

79 Head with one pair of preocellar setae more or less conspicuous (Figs 130, 140); species often large but pronotum usually broad and flat, scarcely thickened medially with am, aa and ml setae much shorter than epim and pa setae; ♂ with forefemora enlarged, posterior angle flattened and extending to a stridulatory file on forecoxae (Fig. 149) 80

– Preocellar setae not larger than ocellars or postocellars; pronotum usually thickened medially in large species; pronotal anterior setae usually not much shorter than posterior pairs; male forefemora and forecoxae not developed into a plectrum and stridulatory file 81

80 Foretibiae of male produced into long tubercle which underlies the long, slender foretarsal tooth (Fig. 147); forefemora not bearing stout spines on inner margin; pterothoracic anapleural ridge sinuate and ending in a small lateral tubercle; metathorac sternopleural sutures short (Fig. 150) [south-eastern U.S.A.] .... ***SPOROTHRIPS*** (p. 50)

– Foretibiae of ♂ without apical tubercle; forefemora usually swollen and inner margin bearing several stout spines; anapleural ridge not extending to a lateral tubercle; metathoracic sternopleural sutures long [Florida and Texas to Brazil] .... ***DICERATOTHRIPS*** (p. 43)

81 Antennae 7-segmented or with segments VII–VIII broadly joined 82

– Antennae 8-segmented 83

82 Tube greatly expanded, lateral margins convex (Fig. 161) [widespread in tropics] ***ACALLUROTHRIPS*** (p. 40)

– Tube normal and tapering with margins straight [New Zealand] .... ***OZOTHRIPS*** (p. 24)

83 Head with one ommatidium-like structure on each cheek, situated midway between hind margin of eye and posterior of head (Fig. 141); tube exceptionally broad with convex margins, maximum width 5·0 times apical width (Fig. 158); forewing without duplicated cilia [Brazil] .... ***PHACOTHRIPS*** (p. 49)

– Cheeks without ommatidium-like structure; tube not so broad; forewing usually with duplicated cilia 84

84 Tube heavy with margins convex and sometimes bearing one or more lateral setal bases (Figs 153–156) [widespread in tropics] .... ***NEOSMERINTHOTHRIPS*** (p. 45)

– Tube with margins straight and tapering 85

85 Foretarsus of ♀ with well-developed tooth; tube long and slender [Afrotropical Region] ***PSEUDOEURHYNCHOTHRIPS*** (p. 50)

– Foretarsus of ♀ without a tooth (very small tooth present in *N. doulli*; moderate tooth present in *N. leveri* but this has tube short) [Pacific & Oriental Regions] 86

86 Maxillary stylets usually deeply retracted, extending to postocular setae, usually subparallel medially and about one-third of head width apart (Figs 135–137), if V-shaped then head more than 1–3 times as long as wide.................................. ***CARIENTOTHRIPS*** (part) (p. 42)

– Maxillary stylets wide apart and V-shaped in head, head less than 1·2 times as long as wide (Figs 142–144) .... ***NESOTHRIPS*** (part) (p. 47)

Tribe **PYGOTHRIPINI**

As discussed above this tribe corresponds largely to the Cryptothripini of previous authors, with some minor additions (Tables 2 & 3). The name change is due to recognition of the close relationship between *Cryptothrips* and *Pygothrips* species, and the priority of the family-group name Pygothripidae (Hood, 1915) over Cryptothripinae (Karny, 1921*a*) (Table 1). The most important character defining the group is the presence of only a single pair of wing-retaining setae on each tergite (except for two species of *Phaulothrips*). The metathoracic anapleural sutures are always complete, but the sternopleural sutures may be well developed or absent. The tube is variable in structure between genera, but in only two species does it bear prominent lateral setae.

Six sub-tribes are here recognised within the Pygothripini (Table 3) and this group at present includes 45 genera and 331 species. The sub-tribe Pygothripina includes species with the largest number of presumably plesiomorphic characters. Sister-group relationships between the sub-tribes are unclear, but the Macrothripina may be the sister-group of the Idolothripini, and the

Allothripina the sister-group of the Pygothripina. The Gastrothripina and Compsothripina may be sister-groups on the basis of the frequent presence of three sense cones on antennal segment IV; on this assumption they would presumably have been derived from *Cryptothrips*-like ancestors (Fig. 1). The Diceratothripina differ from the Pygothripina primarily in having the maxillary stylets farther apart and lower in the head.

Genera of Pygothripina

This group name was proposed by Hood (1915) as Pygothripidae to include one monobasic genus from Australia characterised by its greatly swollen tube. Hood and subsequent authors have emphasised for systematic purposes the importance of a swollen tube, but this characteristic has developed in at least two distinct phyletic lines of Idolothripinae (*Acallurothrips, Diceratothrips, Neosmerinthothrips* and *Phacothrips* in Diceratothripina; *Phaulothrips* and *Pygothrips* in Pygothripina) as well as in the phlaeothripine tribe Docessissophothripini (*Holothrips* and *Symphyothrips*) (p. 96).

The species of *Pygothrips* have many characters in common with the species of *Cryptothrips*, and as they are here both placed in the same subtribe the name Pygothripidae must take priority over Cryptothripinae (see Table 1). Most of the genera placed in this group (as Cryptothripina) by Priesner (1961) are now referred to the Phlaeothripinae tribe Docessissophothripini (p. 90).

The Pygothripina is used here for a group of 9 genera. Most of these come from New Zealand and Australia, although *Pygothrips* has several Neotropical species and *Cryptothrips* is Holarctic in distribution. The members of these genera all have two undoubtedly plesiomorphic characters, the presence of metathoracic sternopleural sutures and complete anapleural sutures. Moreover, many members of the group, alone amongst idolothripines, have well-developed maxillary guides. Finally the pelta is broad basally in many species. These characteristics, together with the zoogeographic distribution, suggest that Pygothripina species are the closest living representatives to the proto-Idolothripinae.

The New Zealand idolothripine fauna might be expected to be particularly significant when considering the origins of the Idolothripinae, because ancestral groups of Thripidae have recently been described from that area (Mound & Palmer, 1981; Mound & Walker, 1982). In New Zealand there are two groups of idolothripines; a few species of Diceratothripina evidently derived from Pacific and Australian faunas, and the *Heptathrips* genus-group (*Cleistothrips, Heptathrips* and *Ozothrips*). This latter genus-group is particularly interesting because, not only do the members retain the plesiomorphic characters of other Pygothripina but the species show a wide range of structural diversity. This suggests that the group is relatively ancient.

The diversity within the *Heptathrips*-group is remarkable. Most of the species have the antennae 7-segmented (Figs 52–53), but one (?two) species of *Ozothrips* and two species of *Heptathrips* from New Zealand (also two South African species transferred to *Heptathrips* from *Ascania*, and one Saudi Arabian species transferred to *Heptathrips* from *Capnothrips*) have the eighth segment more or less developed (Figs 50–51). Most of the species have only two sense cones on segments III and IV, but two species of *Ozothrips* have four sense cones on IV. Again, most of the species have long maxillary stylets deeply retracted and touching medially (Figs 2–5), but the stylets are further apart in *Ozothrips* species (Figs 12–14). Finally, most of the species lack praepectal plates although these are weakly developed in two species of *Ozothrips*. It thus seems logical (although very surprising) to deduce that the 'proto-idolothripine' condition involved 7-segmented antennae with two sense cones on III and IV, elongate stylets with stout maxillary guides and absence of praepectal plates.

A further unusual feature of the *Heptathrips* group is the diversity in form of the tube. In *Cleistothrips* the tube is long and hairy (Fig. 24), a condition found otherwise only in the two most advanced idolothripine groups – Idolothripina and Hystricothripina. The tube is variable in *Heptathrips* species from long to very short. One (undescribed) species of *Heptathrips* is remarkable for its reticulate sculpture similar to *Faureothrips*, and *Ozothrips janus* is equally unusual because of the ventral prolongation of the compound eyes (Fig. 12). One species of *Ozothrips*, described below as *eurytis*, would probably be placed in the Diceratothripina near

Neosmerinthothrips if it were not for the fact that it is known only from native forest habitats in New Zealand and fits logically into the pattern of diversity of the *Heptathrips*-group.

Of the remaining six pygothripine genera *Phaulothrips* species have elongate stylets as in *Pygothrips,* also the head bears a pair of stout ocellar setae as in some species of *Pygothrips* and *Cryptothrips*. The Australian genus *Pelinothrips* probably shared a common ancestor with *Phaulothrips*, and the remarkable Australian genus *Emprosthiothrips* is here interpreted as an extreme form on this phyletic line. Finally *Priesneriana* appears to be related to *Cryptothrips* but has the stylets further apart and the compound eyes reduced (Fig. 16). *Cryptothrips* species are the only members of Pygothripina with three sense cones on the fourth antennal segment (except possibly *Priesneriana amneius* in which this is possibly variable).

CLEISTOTHRIPS Bagnall

(Figs 5, 24, 32, 46)

Cleistothrips Bagnall, 1932: 511. Type-species: *Cleistothrips idolothripoides* Bagnall, by monotypy.

This genus comprises a single large species from New Zealand which bears a long, hairy tube similar to that found in members of the distantly related group Idolothripini (Fig. 24). Despite this tube, and the presence of two pairs of postocular setae (Fig. 5), *idolothripoides* is very similar to species of *Heptathrips*. The median area of the pelta is smaller than in *Heptathrips* or *Ozothrips*, and the lateral wings of the pelta more elongate (Fig. 32). *Cleistothrips* forms with these two genera the *Heptathrips* genus-group which is the essential idolothripine element of the New Zealand fauna. Contrary to Mound (1968), it is not related to the Docessissophothripini, because the tergites bear a single pair of wing-retaining setae, the pelta is wide basally, the maxillary stylets are broad, and antennal segments III and IV each bear only two sense cones (Fig. 46).

SPECIES INCLUDED

idolothripoides Bagnall, 1932: 512–3. Holotype ♀, NEW ZEALAND (BMNH).

CRYPTOTHRIPS Uzel

(Figs 2, 34, 47)

Cryptothrips Uzel, 1895: 228–9. Type-species: *Cryptothrips lata* Uzel (a synonym of *nigripes* Reuter), by subsequent designation, Hood, 1916: 64.

Jacot-Guillarmod (1978) lists 24 species under *Cryptothrips*. However, *breviventris* Hood (1927*a*) is a phlaeothripine and should be placed provisionally in *Hoplothrips* (teste Steve Nakahara *in litt*.); *okamatoi* Karny (1913*c*) is a *Phlaeothrips* species with long postocular setae; *daedalus* Karny (1912*b*) apparently represents a *Psalidothrips* species with postocular setae arising far behind the eyes. (Type-material of the latter two species has been studied on loan from the Humboldt University Museum, Berlin.) Moreover, the following seven species also belong in the Phlaeothripinae but in undetermined genera: *additamentus* Karny, *bursarius* Karny, *longicaput* Girault, *nigronympha* Girault, *pusillus* Karny, *rufiprothorax* Girault, *schilleri* Girault.

Two species described in *Cryptothrips* from Australia, *pygus* and *shavianus*, are here transferred to *Pygothrips*; three further Australian species, *amneius, laticeps* and *uptoni*, are transferred to *Priesneriana*; *constans* is now regarded as a synonym of *Nesothrips niger,* and *latus* var. *fijiensis* is a synonym of *Ethirothrips hibisci.* Judging from the original description, *sauteri* may belong in *Pygothrips*, but the description of *flavus* is too inadequate for recognition. Finally, *maritimus* was described as a predator of Scolytid beetle larvae, and judging from the original illustration may well belong in *Liothrips*.

Cryptothrips thus appears to be Holarctic in distribution, and it may be the sister-group of the Indo-Australian genus *Priesneriana*. The latter has reduced eyes which are directed forwards (Fig. 16), and four sense cones on the fourth antennal segment (Fig. 48). In contrast *Cryp-*

tothrips species have three sense cones on the fourth segment (Fig. 47). Both genera are similar to *Pygothrips* in having broad maxillary stylets deeply retracted and close together in the middle of the head (Figs 2, 6), and the metathoracic sternopleural sutures are well developed.

SPECIES INCLUDED
***angustus** Uzel, 1895: 231–2. Holotype ♀, CZECHOSLOVAKIA: Bohemia (? lost).
carbonarius Hood, 1908*a*: 376–7. Holotype ♂, U.S.A.: Illinois (USNM).
    longiceps Hood, 1912*c*: 153–4. Holotype ♀, U.S.A.: Illinois (USNM).
***flavus** Solowiow, 1924: 24. Types not indicated, U.S.S.R. (? lost).
***maritimus** Djadetschko, 1962: 764–5. Holotype ♀, U.S.S.R.: Ukraine (not known).
nigripes (Reuter, 1880: 11) (*Phloeothrips*). Holotype ? ♀, FINLAND (? lost).
    lata Uzel, 1895: 230–1. Syntypes ♂♀, CZECHOSLOVAKIA: Bohemia (? lost).
    major Bagnall, 1911: 60–1. Holotype ♀, NORWAY (BMNH).
    latus f. *breviceps* Maltbaek, 1929: 372. Types not designated, DENMARK (? lost).
    williamsi Bagnall, 1933*a*: 120–1. Holotype ♂, GREAT BRITAIN: England (BMNH).
    nigripes phariacus Titschack, 1965: 147, replacement name for *insularis* Titschack, 1964: 51. Syntypes ♂♀, YUGOSLAVIA (SMF).
rectangularis Hood, 1908*b*: 307–9. Lectotype ♀, U.S.A.: Illinois (USNM).
    salicis (Watson, 1921: 80–1) (*Trichothrips*). Syntypes ♂♀, U.S.A.: New York (FSAC).
***sauteri** Karny, 1913*c*: 1278. Holotype? ♀, TAIWAN (unknown).
***sordidatus** Hood, 1927*b*: 199. Lectotype ♀, U.S.A.: California (USNM).

EMPROSTHIOTHRIPS Moulton

(Figs 18, 19, 20, 31, 55)

Emprosthiothrips Moulton, 1942*a*: 12. Type-species: *Emprosthiothrips niger* Moulton, by monotypy.

This genus comprises six dark, apterous species from Australia which are remarkable for the shape of their antennae (Fig. 55), and for their reduced setae and fused sclerites. As a result of these peculiarities the systematic position of the genus has been in doubt. Priesner (1961) placed it in a monobasic tribe, but Mound (1974*a*) suggested a relationship to *Dermothrips* and *Pelinothrips* 'in the Cryptothripini'. *Dermothrips* is here referred to the Elaphrothripina, but *Pelinothrips* and *Emprosthiothrips* probably represent together an Australian derivative from early Pygothripina ancestors. The stylets are further apart than in other Pygothripina species (in *brimblecombei* they are very short and wide apart), but the praepectal plates and metathoracic sternopleural sutures are well developed, antennal segment IV bears two sense cones, and segments VII–VIII are broadly joined. The species of this genus are found at the bases of grass tussocks; four of them have the eyes prolonged ventrally as in some species of *Bolothrips* and *Carientothrips* in the same habitat.

SPECIES INCLUDED
bogong Mound, 1969: 185. Holotype ♀, AUSTRALIA (ANIC).
brimblecombei Mound, 1974*a*: 51–2. Holotype ♀, AUSTRALIA (ANIC).
brittoni Mound, 1969: 186. Holotype ♂, AUSTRALIA (ANIC).
csiro Mound, 1969: 185–6. Holotype ♀, AUSTRALIA (ANIC).
epallelus Mound, 1974*a*: 52–3. Holotype ♂, AUSTRALIA (ANIC).
niger Moulton, 1942*a*: 12–3. Holotype ♀, AUSTRALIA (CAS).

HEPTATHRIPS Moulton

(Figs 3, 4, 33, 53)

Heptathrips Moulton, 1942*a*: 3. Type-species: *Heptathrips tonnoiri* Moulton, by monotypy.
Ascania Faure, 1954*a*: 17–20. Type-species: *Ascania magnifica* Faure, by original designation. **Syn. n.**
Capnothrips Zur Strassen, 1979: 99. Type-species: *Capnothrips ruficaudis* Zur Strassen, by monotypy. **Syn. n.**

Only one species was originally described in this genus, but a further four undescribed species from New Zealand have been studied; these will be treated in detail in an account of the

Phlaeothripidae of New Zealand currently in preparation. One species is similar to *tonnoiri* but with a longer tube. The other three are apterous; one is pale and strongly reticulate, one has a short tube and antennal segment VIII defined by a suture, the third has a stout tube and segment VIII clearly separated from VII. As discussed above, this remarkable structural radiation suggests the group has been long established in New Zealand. The species all have the stylets close together in the head with well-developed maxillary guides (Figs 3, 4), a broadly based pelta (Fig. 33) and well-developed metathoracic sternopleural sutures.

The two species from South Africa described in *Ascania* cannot at present be distinguished from *Heptathrips*. The heavy tube with constricted apex found in *magnifica* is longer but otherwise similar to that of one of the undescribed New Zealand species referred to above. These African species have the preocellar setae stouter, the metathoracic sternopleural sutures weaker, and the tergal wing-retaining setae straighter than the New Zealand species. The single species described in *Capnothrips* is very similar to *africana* but has the inner sense cone on antennal segment III much shorter, scarcely one-third as long as the outer sense cone.

SPECIES INCLUDED

africana (Moulton, 1949: 491–2) (*Adelothrips*). Holotype ♀, SOUTH Africa (BMNH). **Comb. n.**
magnifica (Faure, 1954*a*: 20–3) (*Ascania*). Holotype ♀, SOUTH AFRICA (NCIP). **Comb. n.**
ruficaudis (Zur Strassen, 1979: 99–101) (*Capnothrips*). Holotype ♀, SAUDI ARABIA (NMB). **Comb. n.**
tonnoiri Moulton, 1942*a*: 3–4. Holotype ♀, NEW ZEALAND (CAS).

OZOTHRIPS gen. n.

Type-species: *Ozothrips priscus* sp. n.

Small to large, brown species of Pygothripini. Antennae 7-segmented or with VII-VIII closely joined; III with two sense cones, IV with two or four sense cones. Head usually slightly longer than wide, eyes large; maxillary stylets broad, retracted almost to postocular setae and about one-third of head width apart, maxillary guides stout; mouth cone broadly rounded, maxillary palps stout. Pronotum transverse, relatively longer in large ♂ with median thickening, epimeral sutures complete; praepectus present or absent; probasisternum large, mesopraesternum broadly boat-shaped, *or* both sclerites eroded. Foretarsi with a large tooth in ♂, with or without a small tooth in ♀. Forewing broad, almost parallel-sided, with duplicated cilia. Metathoracic sternopleural sutures well developed, anapleural sutures complete. Pelta with broad lateral wings; tergite II eroded laterally; tergites II–VII each with one pair of weakly sigmoid wing-retaining setae; tergite IX with three pairs of slender setae in both sexes; sternites with one row of small discal setae, reticulate sculpture more evident in ♂ than in ♀.

The type-species of this new genus is abundant and widespread on dead leafy twigs of *Nothofagus* in New Zealand. The fact that it is found only in native forest areas is good evidence that it is itself endemic to that country. Most of the characters listed above are shared with *Heptathrips* and *Cleistothrips*, although the widely separated stylets of *Ozothrips* are regarded as an apomorphy achieved independently of the similar stylet arrangement found in many other less closely related idolothripines. Two of the species described below have four sense cones on antennal segment IV, they lack a foretarsal tooth in the female, and praepectal plates are developed. These species are thus convergent in structure on members of the widespread tropical genus *Neosmerinthothrips*, but with the tube slender and antennal segments VII–VIII broadly joined or fused. In the absence of evidence to the contrary, it seems sensible to regard them as endemic but aberrant members of the New Zealand fauna.

Key to *Ozothrips* species

1 Antennal segment IV with 2 sense cones (Fig. 51); praepectus absent; ♀ with well-developed foretarsal tooth; macropterous .... ***priscus*** sp. n. (p. 26)
– Antennal segment IV with 4 sense cones (Figs 50, 52); praepectus present; ♀ with no foretarsal tooth; usually apterous 2

2 Antennal segments VII–VIII forming one unit but with suture complete (Fig. 50); eyes narrowed but not elongate ventrally (Fig. 13); tergite IX setae B_1 about half as long as tube .... ***eurytis*** sp. n. (p. 25)

– Antennal segments VII–VIII without a suture (Fig. 52); eyes narrowed and prolonged ventrally (Fig. 12); tergite IX setae longer than tube .... ***janus*** sp. n. (p. 26)

Ozothrips eurytis sp. n.

(Figs 13, 42, 50)

Macropterous ♀. Colour mainly brown, inner apex of femora yellowish, also base and external margin of antennal III; forewings uniformly shaded; setae dark.

Head with postocular setae arising close to eyes, ocelli far apart, postocellar setae small, eyes not large (Fig. 13). Distal antennal segments with clearly defined pedicels, VII–VIII broadly fused but with suture usually complete, III with 2 sense cones, IV with 4 sense cones (Fig. 50). Pronotum transverse, epimeral sutures complete; praepectal and probasisternal plates weakly sclerotised, mesopraesternum and mesoeusternum broadly eroded medially. Mesonotal midlateral setae minute; metanotal median setae close together, sternopleural sutures short and broad. Forewing parallel-sided, 5 to 8 duplicated cilia. Pelta broad basally but weakly and irregularly sclerotised (Fig. 42). Tergite IX setae acute. Tube very slightly constricted apically and in basal third. Sternites with 3 to 9 discal setae.

Measurements (holotype ♀ in μm). Body length 1850. Head, length 200; width 190; postocular setae 70; postocellar setae 20. Pronotum, length 120; width 240; major setae – am 20, aa ?, ml 30, epim 75, pa 60. Forewing, length 650; median width 65; sub-basal setae 25. Tergite IX setae 70, 75, 120. Tube, length 150; terminal setae 130. Antennal segments III–VII+VIII length 65, 62, 58, 55, 55.

Micropterous ♀. Body brown, head and tube darkest; leg colour similar to macropterae but distal half of femora sometimes yellow; antennal segments I–III sometimes paler but more or less shaded particularly at apices.

Head with ocelli reduced or absent, postocellar setae slightly longer than in macropterae. Mesonotum with small round lobes laterally but axillary sclerites absent. Praepectus small; pterothoracic sternites eroded; pelta variable but broad basally; tergal wing-retaining setae absent.

Measurements (paratype ♀ collected with holotype in μm). Body length 2200. Head length 230; width 205; postocular setae 80; postocellar setae 30. Pronotum, length 160; width 270; major setae – am 27, aa ?, ml 45, epim 90, pa 50. Tergite IX setae 90, 85, 120. Tube length 170. Antennal segments III–VII+VIII length 75, 70, 63, 57, 73.

Apterous ♂. Similar to ♀ but pronotum and forefemora enlarged; foretarsal tooth as long as tarsal width in large individuals; tube slightly constricted medially; sternites IV–VI reticulate anterior to discal setae (except gynaecoid ♂). Measurements (paratype ♂ collected with holotype in μm). Body length 1700. Head, length 195; width 170; postocular setae 90; postocellar setae 35. Pronotum, length 170; width 240; major setae – am 30, aa 55, ml 90, epim 120, pa 90. Tergite IX setae 75, 65, 80. Tube length 130. Antennal segments III–VII+VIII 60, 60, 57, 50, 60.

SPECIMENS STUDIED

Holotype ♀ macroptera, **New Zealand**: North Island, Wattle Bay near Auckland, on dead twigs and branches, 23.ii.1979 (*L. A. Mound* 1349) (NZAC).

Paratypes (2 ♀ mac., 19 ♀ mic., 7 ♂ apt.). **New Zealand.** North island: 5 ♀, 2 ♂ collected with holotype; Auckland, Mt Albert, 1 ♀, 18.xi.1978, 1 ♀ mac., 16.xii.1978 (*A. K. Walker*); Te Aroha, 1 ♀ mac. 6 ♀, 2 ♂ on dead twigs and branches, 14.ii.1979 (*L. A. Mound* 1447, 1452); Coromandel Peninsula, Coroglen Saddle, 2 ♀, 1 ♂ on dead branch, 13.ii.1979 (*L. A. Mound* 1443). South Island: Nelson, 1 ♀ from Thrush nest, 6.xii.1967 (*B. S. Gourley*); 2 ml north of Reefton, 1 ♂, 6.ii.1979 (*L. A. Mound* 1411); Glenorchy State Forest, Dart River, 1 ♀, 1 ♂, 21.i.1981 (*Valentine & Noyes*); Invercargill, 1 ♀ on Rhododendron, 18.iv.1977 (*A. K. Walker*). Chatham Islands: South East Island, 1 ♀, 9.xi.1970 (*J. Townsend*); Chatham, Waitangi, 1 ♀, 10.ii.1967 (*G. W. Ramsey*) (NZAC & BMNH).

Material excluded from paratype series. **New Zealand.** South Island: Kaihoka Lake, 10 ml west of Collingwood, 1 ♀ mac., 5 ♀ mic., 5 ♂ apt. on dead frond of *Rhopalostylis sapidia*, 1.ii.1979 (*L. A. Mound* 1392).

COMMENTS. The series of specimens collected on a dead palm frond at Kaihoka Lake is remarkable in that the micropterae and apterae, but not the macropterae, have antennal segments II–III almost clear yellow, and the legs more extensively pale than typical specimens of *eurytis*. In addition, six specimens have been studied from three widely separated areas of the North Island of New Zealand (Auckland, Rotorua, Levin) with the tube clear yellow medially. These six specimens probably represent a further new species. *O. eurytis* is widespread in New Zealand, but has only been taken in native forest areas. This reinforces the impression that the species is related to the larger and more common species, *priscus*, described below, and that they, together with *janus*, constitute an endemic New Zealand genus. Both *eurytis* and *janus* (together with the species with the tube yellow referred to above) have praepectal plates unlike *priscus*, the type-species of this genus. One apterous female of *eurytis* collected with the holotype bore about 10 specimens of a mite species belonging to the genus *Adactylidium* (Pyemotidae).

Ozothrips janus sp. n.

(Figs 12, 40, 52)

Apterous ♀. Colour brown, foretarsi yellow, extreme apex of forefemora and median area of foretibiae yellowish, also extreme base of antennal segment III and apex of II; tube golden yellow with dark brown apex; major setae weakly shaded with long fine apices.

Head about as wide as long, ocelli absent, ocellar setae elongate; eyes greatly prolonged ventrally with two rows of large ommatidia (Fig. 12); maxillary stylets apparently wide apart, V- or U-shaped (Disorganised in available specimens). Antennae with segments pedicillate; 2 sense cones on III, 4 on IV, VIII completely fused to VII (Fig. 52). Foretarsus with inner margin slightly thickened. Praepectus weak; pterothoracic sternites heavily eroded; meso- and metanota small and transverse. Pelta broad and flattened (Fig. 40); lateral abdominal setae elongate; wing-retaining setae short and straight; tube short and constricted apically. Sternites with few discal setae, holotype with no discal setae on II–III.

Measurements (holotype ♀ in μm). Body length 1500. Head, length 150; width 170; postocular setae 120; postocellar setae 60. Pronotum, length 120; width 240; major setae – am 20, aa 55, ml 105, epim 150, pa 120. Tergite IX setae 135, 135, 120. Tube, length 110; terminal setae 120. Antennal segments III–VII length 40, 45, 43, 43, 55.

SPECIMENS STUDIED

Holotype ♀, **New Zealand**: North Island, Hauraki Gulf, Noises Islands, Otata I., in seed heads of *Ghania*, 1.xii.1979 (*A. K. Walker*) (NZAC).

Paratype. 1 ♀ collected with holotype (BMNH).

COMMENTS. The remarkable ventral prolongation of the eyes in this species suggests that its normal habitat is at the base of grasses. Despite this character, *janus* is very similar to *eurytis*, although more apteriform.

Ozothrips priscus sp. n.

(Figs 14, 41, 51)

Macropterous ♀. Dark brown, tarsi slightly paler; pedicels of antennal segments III–V yellow to light brown; major setae brown, terminal setae of tube darkest; forewings strongly shaded.

Head with eyes slightly smaller ventrally than dorsally, postocular setae finely acute (Fig. 14); maxillary stylets broad (10–12 μm). Antennae with 7 segments, VI broadly truncate at apex, pedicels of VI–VII narrow, III–IV each with 2 long sense cones (Fig. 51). Praepectus absent, probasisternum large, mesopraesternum broadly boat-shaped. Forefemora slender; foretarsal tooth small and curved at inner apical margin. Mesonotal midlateral and metanotal median setae moderately developed (50 mm). Forewing with 4 sub-basal setae. Pelta broadly rounded medially (Fig. 41). Tergite II posteroangular setae not developed (Fig. 41).

Measurements (holotype ♀ with smallest paratype ♀ in μm). Body length 3700 (3100). Head, length 390 (345); median width 300 (280); postocular setae 120 (96). Pronotum, length 210 (160); median width 420 (370); major setae – am 40 (40), aa 43 (40), ml 75 (60). epim 120 (120), pa 75 (66). Forewing, length 1500 (1300); distal width 150 (120); sub-basal setae 22, 65, 105, 210 (?, 60, 105, 200); number of duplicated cilia 35 (28). Tergite IX setae 240, 330, 300 (210, 300, 300). Tube, length 400 (320); longest terminal setae 210 (200). Antennal segments III–VII length 130, 110, 100, 85, 105 (110, 90, 90, 75, 85).

Macropterous ♂. Colour and structure very similar to ♀; large males with a small tubercle ventrally on frons (approximately underlying posterior ocelli), also with pronotal midlateral setae elongate, forefemora enlarged, foretarsal tooth broad and about as long as tarsal width, and antennal segment III relatively long. Measurements (large and small paratype ♂ – LAM 1372; LAM 1407 – in μm). Body length 3400 (2800). Head, length 390 (345); median width 260 (240); postocular setae 165 (120). Pronotum, length 315 (180); median width 440 (345); major setae – am 40 (25), aa 75 (30), ml 170 (60), epim 120 (130), pa 110 (60).

Forewing, length 1550 (1300). Tergite IX setae 270, 320, 300 (200, 270, 255). Tube length 380 (300). Antennal segments III–VII lengths 145, 120, 105, 85, 90 (115, 90, 90, 80, 90).

SPECIMENS STUDIED

Holotype ♀, **New Zealand**: South Island, Whangamoa Saddle near Nelson, on dead leaves and branches of *Nothofagus*, 27.i.1979 (*L. A. Mound* 1359) (NZAC).

Paratypes (93 ♀ 40 ♂): **New Zealand**. South Island: 10 ♀, 5 ♂ data as for holotype, 7 ♀ similar data except LAM 1357; Nelson, 17 ♀, 6 ♂ on dead twigs and leaves, 28.i.1979 (LAM 1367); Nelson, Dun Mt., 4 ♀, 4 ♂, 29.i.1979 (LAM 1372); Nelson, Cobb Reservoir, 4 ♀, 1 ♂, 31.i.1979 (LAM 1381); Nelson, Lake Rotoiti, 24 ♀, 14 ♂, 4–8.ii.1979 (*L. A. Mound & A. K. Walker*); Marlborough Sounds, Tennyson Inlet & Opouri Saddle, 16 ♀, 8♂ on dead leafy branches, 28.i.1979 (*A. K. Walker* 3, 6); 20 ml NE. of Reefton, 2 ♀ on dead *Nothofagus* branches, 6.ii.1979 (LAM 1716). North Island: 20 ml S. of Turangi, 7 ♀, 2 ♂ on dead *Nothofagus* branches, 19.ii.1979 (LAM 1478) (NZAC & BMNH).

COMMENTS. Both *priscus* and *eurytis* are variable in body size with several characters subject to allometric growth particularly in males. *O. priscus* has been collected only on dead *Nothofagus* branches and twigs which presumably support a particular fungus to which the thrips is specific.

PELINOTHRIPS Mound

(Figs 17, 38, 39, 54)

Pelinothrips Mound, 1974*a*: 75–6. Type-species: *Rhopalothrips ornatus* Girault, by original designation.

Two species, both Australian, are placed in this genus. These resemble *Cryptothrips* species in having long maxillary stylets deeply retracted into the head with maxillary guides weakly indicated medially. The metathoracic sternopleural sutures are short, the tergites each bear a single pair of wing-retaining setae, and praepectal plates are present. However, antennal segment IV only bears two sense cones (Fig. 54), and both sexes have a foretarsal tooth. This genus is probably related to the Australian genus *Emprosthiothrips* in which the species have the maxillary stylets slightly further apart.

SPECIES INCLUDED

brochotus Mound, 1974*a*: 76–7. Holotype ♀, AUSTRALIA (ANIC).
ornatus (Girault, 1930: 1) (*Rhopalothrips*). Holotype ♀, AUSTRALIA (QMB).

PHAULOTHRIPS Hood

(Figs 7–11, 25–30, 43–45)

Phaulothrips Hood, 1918*b*: 146–7. Type-species: *Phaulothrips vuilleti* Hood, by monotypy.

Titanothrips Karny, 1920*c*: 44. Type-species: *Titanothrips portentosus* Karny, by monotypy. [Synonymised by Mound, 1974*a*: 78.]

Tetraceratothrips Bagnall, 1924: 628. Type-species: *Tetraceratothrips agrestis* Bagnall, by monotypy. [Synonymised by Mound, 1974*a*: 78.]

Kaleidothrips Kelly, *in* Kelly & Maine, 1934: 73. Type-species: *Kaleidothrips inquilinus* Kelly, by monotypy. **Syn. n.**

A revision of this genus by Mound (1974*a*) included nine species, all of which are Australian although specimens of *vuilleti* have now been studied from Tanzania. In addition, the single species in *Kaleidothrips* is here interpreted as an aberrant member of *Phaulothrips*, undescribed species from New Guinea and Fiji are referred to by Mound (1974*a*: 81) and *Docessissophothrips magnificus* Bianchi from Samoa is also here placed in *Phaulothrips*. This latter species has the pelta typical of the genus (Fig. 28), a pair of slender preocellar setae, and only one pair of wing-retaining setae on each tergite. However, the pair of postocular setae found on the cheeks of the other *Phaulothrips* species arise dorsally behind the dorsal postocular setae in *magnificus* (Fig. 10), and the head is very strongly elevated medially as figured by Bianchi (1953). All *Phaulothrips* species have long curved metathoracic sternopleural sutures which arise close to the mesothoracic border. Antennal segments III and IV each bear two sense cones (Fig. 45), but due to the dark colour of the head long, curved maxillary guides have been observed in only a few specimens. *P. agrestis* and *uptoni* are unusual in having two or more pairs of sigmoid wing-retaining setae (Fig. 44).

SPECIES INCLUDED

agrestis (Bagnall, 1924: 628–9) (*Tetraceratothrips*). Holotype ♂, AUSTRALIA (BMNH).
anici Mound, 1974*a*: 82–3. Holotype ♀, AUSTRALIA (ANIC).
barretti Mound, 1974*a*: 83. Holotype ♂, AUSTRALIA (ANIC).
caudatus Bagnall, 1932: 510–1. Holotype ♀, AUSTRALIA (BMNH).
fuscus Moulton, 1935: 100. Holotype ♀, AUSTRALIA (CAS).
    punctatus Rayment, 1948: 257–8 (*Cladothrips*). Syntypes ♂ ♀, AUSTRALIA (ANIC).
inquilinus (Kelly, 1934: 73) (*Kaleidothrips*). Holotype ♀, AUSTRALIA (ANIC). **Comb. n.**
longitubus Girault, 1928: 2. Holotype ?♀, AUSTRALIA (QMB).
magnificus (Bianchi, 1953: 106–7) (*Docessissophothrips*). Holotype ♀, SAMOA (BPBM). **Comb. n.**
sibylla Mound, 1974*a*: 84–5. Holotype ♀, AUSTRALIA (ANIC).
uptoni Mound, 1974*a*: 85–6. Holotype ♀, AUSTRALIA (ANIC).
vuilleti Hood, 1918*b*: 147–8. Holotype ♂, AUSTRALIA (USNM).
    portentosus Karny, 1920*c*: 40–4 (*Titanothrips*). Holotype ♂, AUSTRALIA (NRS).

PRIESNERIANA Ananthakrishnan

(Figs 16, 48)

Priesneriana Ananthakrishnan, 1956*b*: 138. Type-species: *Gnophothrips kabandha* Ramakrishna, by monotypy.

This genus was erected for a single species, from southern India, which has the general appearance of an *Ethirothrips* species (particularly to those species previously placed in *Uredothrips*), but which possesses well-developed metathoracic sternopleural sutures. The maxillary stylets of *kabandha* are retracted to the compound eyes, but although arched towards each other medially they are about one-fifth of the head width apart (Fig. 16). The two Australian species here transferred to this genus have stylets rather similar to *kabandha*, but *amneius* (from New Guinea, Australia and New Zealand) has the stylets meeting medially. These three species resemble *kabandha* in having the eyes reduced and directed forwards, although *uptoni* is unusual in that antennal segments VII–VIII are partially fused. *Priesneriana* is closely related to *Cryptothrips* but has four sense cones on antennal segment IV (Fig. 48), and the eyes are reduced in size.

SPECIES INCLUDED

amneius (Mound, 1974*a*: 42) (*Cryptothrips*). Holotype ♀, NEW GUINEA (ANIC). **Comb. n.**
kabandha (Ramakrishna, 1928: 293–4) (*Gnophothrips*). Holotype ♂, INDIA (TNA).
laticeps (Hood, 1918*b*: 142–3) (*Cryptothrips*). Holotype ♀, AUSTRALIA (USNM). **Comb. n.**
uptoni (Mound, 1974*a*: 44–5) (*Cryptothrips*). Holotype ♀, NORFOLK IS. (ANIC). **Comb. n.**

PYGOTHRIPS Hood

(Figs 6, 21–23, 36–37, 49)

Pygothrips Hood, 1915: 49–50. Type-species: *Pygothrips rugicauda* Hood, by monotypy.
Barythrips Hood & Williams, 1915: 134–5. Type-species: *Barythrips sculpticauda* Hood & Williams, by monotypy. **Syn. n.**
Diplochelaeothrips Moulton, 1944: 284. Type-species: *Diplochelaeothrips mikrommatos* Moulton, by monotypy. **Syn. n.**

This genus was based originally on a single apterous female collected in Queensland, Australia. Hood (1915) figured the terminal segments of the antenna and abdomen, and Mound (1974*a*) gave outline drawings of the head, stylets and pelta. This species has never been collected again, although a damaged apterous female which may be conspecific has been taken recently near Adelaide, South Australia. Subsequently, 19 species have been described in *Pygothrips*, but re-examination of all but five of these has indicated that more than one phylogenetic group is involved. Moreover, many of the species are known only from single samples or even single individuals, and so no concept of intraspecific variation has been applied within the group.

The type-species of *Pygothrips* has the maxillary stylets elongate and close together in the middle of the head (cf Fig. 6). In contrast, most species described in the genus have the stylets low and wide apart in the head, and all such species are here referred to the genus *Acallurothrips*. The two genera exhibit a series of characters in common in addition to the swollen tube, but several characters are probably functionally related to the shared habit of raising the tube over the head, thus producing an almost spherical mite-like body outline. For example, the sternites are longer than the tergites, and the pelta, metathorax and antennae are reduced. The functional significance of this behaviour is not obvious, but appears to be defensive.

The species here referred to *Pygothrips* share the following characters. Head longer than wide, stylets long and close together medially (Fig. 6). Antennal segments VII–VIII broadly joined; sense cones often lateral in position, 2 on III, 4 (rarely 2) on IV (Fig. 49). Pronotal epimeral sutures complete or incomplete, praepectus present or absent; mesopraesternum eroded; metathoracic sternopleural sutures present but often broadly eroded (Figs 21–22), also anapleural sutures. Foretarsal tooth usually present in both sexes. Forewing with or without duplicated cilia. Pelta eroded at posterior margin (Figs 36–37); median sternites longer than tergites. Wing-retaining setae often weak; tube expanded to greatly expanded with convex margins, often ridged and constricted apically (Fig. 23).

In addition to *rugicauda* three species have been studied (*albiceps, fortis* and *satanas*) which were described in *Pygothrips* and which agree with the above definition of the genus. Moreover, five further species which have not been studied are retained in the genus on the basis of their original descriptions together with information kindly provided by Steve Nakahara that the types all have stylets deeply retracted and close together medially. Two species described recently in *Cryptothrips* are here transferred to *Pygothrips* because of the swollen tube and presence of four sense cones on the fourth antennal segment. Finally, the type-species of both *Barythrips* and *Diplochelaeothrips* are also referred to *Pygothrips* (N.B. – *B. grandicauda* belongs in *Neosmerinthothrips* q.v.; *B. mathuri* Ananthakrishnan, 1961*a* belongs in the phlaeothripine genus *Hoplothrips*, teste Prof. T. N. Ananthakrishnan *in litt.*).

Barythrips sculpticauda was based on one oedymerous male which has been studied and compared with macropterous females and four, small apterous males from Florida. These all have the same remarkable antennal colour with segments I–II yellow and III–V yellow except for a median dark area on the pedicel. The head and stylets are similar to *rugicauda* although the pelta of the males is almost divided into two parts (Fig. 37). Moreover, the epimeral sutures are usually just complete, the forewings bear 7 to 10 duplicated cilia, and the female lacks a foretarsal tooth.

D. mikrommatos has the epimeral sutures complete, and the forewings bear duplicated cilia. Moreover, this species is sexually dimorphic, the male being unlike other males in *Pygothrips*. The antennal sense cones of *albiceps* arise laterally (as in *Acallurothrips spinicauda*) whereas in *fortis* they arise ventrally, although the head of these two species is similar with a pair of elongate postocellar setae (Fig. 6). The sense cones of *rugicauda* are short and weak, but those of *mikrommatos, satanas* and *sculpticauda* are short and stout. Two macropterous females from Java (in BMNH) have been studied which appear to belong in *Pygothrips*, but these have well-developed foretarsal teeth, about 14 forewing duplicated cilia and the tube, although large, is not rugose; a similar species from Obi Island lacks the foretarsal teeth. Finally, a male has been studied from Singapore which is similar to *rugicauda* females, but has the tube much less enlarged.

Pygothrips as defined here is closely related to *Cryptothrips*. However, these tropical species have four, instead of three, sense cones on the fourth antennal segment, and the tube is enlarged. The head and stylets are similar in the two genera, and both have well-developed metathoracic sternopleural sutures.

Species included
albiceps Hood, 1938*c*: 401–2. Lectotype ♀, U.S.A.: Florida (USNM).
***callipygus** Hood, 1952*c*: 164–5. Holotype ♀, Brazil (USNM).
fortis Hood, 1938*c*: 402. Holotype ♀, U.S.A.: Florida (USNM).
***longiceps** Hood, 1952*c*: 164. Holotype ♀, Brazil (USNM).
***magnicauda** Hood, 1954*a*: 45. Holotype ♀, Brazil (USNM).
mikrommatos (Moulton, 1944: 284–5) (*Diplochelaeothrips*). Holotype ♀, Fiji (BPBM). **Comb. n.**
***needhami** Hood, 1938*c*: 397–401. Holotype ♀, U.S.A.: Florida (USNM).
pygus (Mound, 1974*a*: 43) (*Cryptothrips*). Holotype ♀, Australia (ANIC). **Comb. n.**
rugicauda Hood, 1915: 50–1. Holotype ♀, Australia (USNM).
satanas De Santis, 1957: 3–4. Holotype ♂, Argentina (MLPA).
sculpticauda (Hood & Williams, 1915: 135–6) (*Barythrips*). Holotype ♂, U.S.A.: Florida (USNM). **comb. n.**
shavianus (Bagnall, 1918: 216–7) (*Cryptothrips*). Lectotype ♀, Australia (BMNH). **Comb. n.**
***zeteki** Hood, 1934: 420. Holotype ♂, Panama (USNM).

Genera of *Allothripina*

This subtribe was erected by Priesner (1961) for six genera, each of which includes species with reduced eyes, although *Illinothrips* is here transferred to the Compsothripina where it appears to be closely related to *Bolothrips*. Sakimura & Bianchi (1977) also referred *Diopsothrips* to the Allothripina, but this genus is here placed in the Diceratothripina as a synonym of *Acallurothrips*. Moreover, both *Allidothrips* and *Allopisothrips* have subsequently been described as allothripines.

Four genera recognised here in this subtribe share a unique apomorphy in the form of the terminal sensorium on the maxillary palps. These genera are: *Allopisothrips, Allothrips, Priesneriella* (=*Pygidiothrips* and *Parallothrips*), and *Pseudocryptothrips*. All the species in these genera have the terminal sensorium on the maxillary palps exceptionally large, looking like an extra segment (Fig. 77), whereas in normal Idolothripinae the palps bear a terminal and sub-terminal sensorium which do not differ greatly in size and arise almost at right angles.

Faureothrips is retained in the Allothripina although the only species does not have enlarged maxillary palp sensoria, the metathoracic sternopleural sutures are not developed (they are weak in *Pseudocryptothrips*), and the eighth antennal segment is pedicillate and distinct from the seventh segment. Assuming that the Allothripina have developed from Pygothripina, with which they share the presumably plesiomorphic characteristics involved in the tendency for fusion of antennal segments VII–VIII and the close approximation of the maxillary stylets, then *Faureothrips* must be interpreted as a reversion from the trend toward sclerite reduction. Resemblance of *F. reticulatus* to some *Bolothrips* species is probably due to convergence associated with adaptation to the leaf litter habitat. *Allidothrips* is also retained in this subtribe and is discussed below.

ALLIDOTHRIPS Zur Strassen

(Fig. 64)

Allidothrips Zur Strassen, 1968: 86–7. Type-species: *Allidothrips tricolor* Zur Strassen, by monotypy

Mound (1972*a*) transferred *Allothrips cinctus* Faure to *Allidothrips* as a second species in the genus. These species do not have the terminal sensorium on the maxillary palps exceptionally large, although they share with the other Allothripina a series of characters involving reduction of sclerites. Antennal segment III bears only one sense cone, although segments VII–VIII are fused. The pelta is quite unique in that it appears to be a complete transverse tergite (Fig. 64). This structure might be considered to be part of the same transformation series which includes *Priesneriella gnomus* and *P. seminole* in which the pelta is reduced but transverse (Figs 62–63). Alternatively, *Allidothrips* might be quite unrelated to this group, its larviform appearance being interpreted as indicating development by neotony from some entirely different ancestry.

SPECIES INCLUDED

cinctus (Faure, 1945: 150–2) (*Allothrips*). Holotype ♀, SOUTH AFRICA (NCIP).
tricolor Zur Strassen, 1968: 87–90. Holotype ♀, MOROCCO (SMF).

ALLOPISOTHRIPS Sakimura & Bianchi

Allopisothrips Sakimura & Bianchi, 1977: 498–9. Type-species: *Allopisothrips alakaiensis* Sakimura & Bianchi, by monotypy.

This monobasic genus, based on a single male specimen, is intermediate in structure between *Allothrips* and *Priesneriella*. The fused antennal segments VII–VIII are broadly based (unlike *Allothrips*) but distinct from VI (unlike *Priesneriella*). The meso- and metanota are fused and the pelta reduced, but the major setae are longer than in *Priesneriella* species.

SPECIES INCLUDED

alakaiensis Sakimura & Bianchi, 1977: 489. Holotype ♂, KAUAI Is (BPBM).

ALLOTHRIPS Hood

(Figs 57, 58, 78)

Allothrips Hood, 1908*a*: 372–3. Type-species: *Allothrips megacephalus* Hood, by monotypy.
Bryothrips Priesner, 1925*a*: 6. Type-species: *Bryothrips pillichelus* Priesner, by monotypy. [Synonymised by Stannard, 1957: 92.]

In this genus Mound (1972*a*) recognised only four species, but with two of these divided into a total of 16 subspecies. One reason for this interpretation was the recognition by Stannard (1955) of a cline across North America. Mound (1972*a*) described three forms from Australia as subspecies of *megacephalus*, and suggested that these had been transported artificially by ships trading across the Pacific from the American West Coast. This hypothesis requires testing by collecting further populations of *Allothrips* in western America and Panama, but further evidence for artificial transportation is provided by the record of *brasilianus* in large numbers on the Hawaiian Islands (Sakimura & Bianchi, 1977). *Allothrips* species frequently produce quite large populations in leaf litter but macropterae are rare. This probably leads to reduced gene flow between natural populations resulting in increased structural diversity between populations.

SPECIES INCLUDED

brasilianus Hood, 1955: 101–3. Holotype ♀, BRAZIL (USNM).
megacephalus Hood
  m. acutus Stannard, 1955: 154–5 (*watsoni acuta*). Holotype ♀, MEXICO (INHS).
  m. greensladei Mound, 1972*a*: 30. Holotype ♀, AUSTRALIA (ANIC).
  m. megacephalus Hood, 1908*a*: 373. Lectotype ♀, U.S.A.: Illinois (USNM).
  m. mexicanus Stannard, 1955: 154 (*watsoni mexicana*). Holotype ♀, MEXICO (INHS).
  m. prolixus Mound, 1972*a*: 30–1. Holotype ♀, AUSTRALIA (ANIC).
  m. stannardi Mound, 1972*a*: 31–2. Holotype ♀, AUSTRALIA (ANIC).
  m. watsoni Hood, 1939*b*: 600–2. Holotype ♀, U.S.A.: Florida (USNM).
nubillicauda Watson, 1935: 60–1. Syntypes ♂ ♀, U.S.A.: Florida, Alabama (FSAC).
pillichellus (Priesner)
  p. acaciae Faure, 1945: 152–4. Holotype ♀, SOUTH AFRICA (NCIP).
  p. africanus Faure, 1933: 57–9. Holotype ♀, SOUTH AFRICA (NCIP).
  p. aureus Stannard, 1955: 155. Holotype ♂, U.S.A.: California (INHS).
  p. bicolor Ananthakrishnan, 1964*a*: 83–4. Holotype ♀, INDIA (TNA).
  p. biminianus Stannard, 1955: 155 (*watsoni biminiana*). Holotype ♀, BAHAMAS (INHS).
  p. bournieri Mound, 1972*a*: 35–6. Holotype ♀, FRANCE (MNHN).
  ***p. indicus** Ananthakrishnan, 1958: 277–8. Holotype ♀, INDIA (TNA).
  p. montanus Ananthakrishnan, 1968*b*: 53. Holotype ♀, INDIA (TNA).
  p. pillichellus (Priesner, 1925*a*: 6–7) (*Bryothrips*). Holotype ♀, HUNGARY (SMF).

FAUREOTHRIPS Priesner

(Figs 66, 67)

Faureothrips Priesner, 1949: 116–7. Type-species: *Cryptothrips reticulatus* Trybom, by monotypy.

This monobasic genus from southern Africa is difficult to place phylogenetically. The antennae are similar to *Pseudocryptothrips*, with two sense cones on segment III and four on IV; however, segment VIII is slender and pedicillate. Moreover, as in *Pseudocryptothrips*, the stylets are fairly wide apart, there is a pair of stout interocellar setae with expanded apices, and the eyes are somewhat reduced (Fig. 67). However, unlike the other Allothripina, *Faureothrips* does not have the terminal sensorium on the maxillary palps exceptionally large, and the metathoracic sternopleural sutures are not developed (N.B. they are only weakly developed in *Pseudocryptothrips*). The pronotal epimeral sutures are incomplete, the praepectus is present, the pelta broad (Fig. 66), but the metanotum bears more than 10 minor setae in addition to a pair of widely spaced major setae.

SPECIES INCLUDED
reticulatus (Trybom, 1912: 9–13) (*Cryptothrips*). Syntypes ♂ ♀, SOUTH AFRICA (NMG).

PRIESNERIELLA Hood

(Figs 59–63, 68–72, 74–77, 79–83)

Priesneriella Hood, 1927*b*: 198–9. Type-species: *Priesneriella citricauda* Hood, by monotypy.
Pygidiothrips Hood, 1938*c*: 389–90. Type-species: *Pygidiothrips seminole* Hood, by monotypy. **Syn. n.**
Parallothrips Hood, 1939*b*: 602. Type-species: *Parallothrips thomasi* Hood, by monotypy. **Syn. n.**
Embothrips Dyadechko, 1961: 688–9. Type-species: *Embothrips tubversicolor* Dyadechko, by monotypy. [Synonymised with *Parallothrips* by Dyadechko, 1964: 307.]

Seven species are listed under the above four generic names, and a further new species is described below from New Zealand. Several characters in these eight species exhibit transformation series involving reduction or fusion. Traditional interpretations of this variation would require five genera although the present authors regard these species as constituting a single holophyletic group. That is, the group was derived once from *Allothrips*-like ancestors. *Allopisothrips* appears to be the sister-group. The apomorphy on which this conclusion is based is the broad and close union of antennal segment VI with segments VII & VIII (Figs 79–83). The seven species examined have the following characteristics.

P. thomasi. Maxillary stylets close together; ocellar setae stout; antennal III with 2 sense cones, VI subequal in length to VII+VIII; meso- and metanota fused; pelta with median lobe, and wide but slender base; sternite IV with 4 discal setae; tube width 0·9 times length (Figs 60, 68, 82).

P. mavromoustakisi. As *thomasi* but pelta larger; tube width 0·8 times length.

P. luctator. As *thomasi*; tube width 0·76 times length.

P. clavicornis. Maxillary stylets wide apart; ocellar setae stout; antennal III with 0(?1) sense cones, VI slightly larger than VII+VIII but these have a partial suture; meso- and metanota not quite fused; pelta with median lobe and wide base; sternite IV with 2 discal setae; tube width 0·7 times length (Figs 59, 70, 81).

P. gnomus. Maxillary stylets wide apart; ocellar setae small; antennal III with 0(or 1) sense cones, VI shorter than VII+VIII; meso- and metanota separate; pelta slender and transverse; sternite IV with 0 discal setae; tube width 0·68 times length (Figs 62, 71, 74, 79).

P. citricauda. Stylets wide apart; ocellar setae small; antennal III with 0 sense cones, VI fused to VII+VIII; meso- and metanota separate; pelta as in *thomasi*; sternite IV with 0 discal setae; tube width 0·8 times length (Figs 61, 80).

P. seminole. Stylets wide apart; ocellar setae small; antennal III with 1 sense cone, VI fused to VII+VIII; meso- and metanota separate; pelta slender and transverse; sternite IV with 0 discal setae; tube width 1·1 times length (Figs 63, 69, 72, 75, 76, 83).

The following characters are plesiomorphic in this group, in that they also occur in *Allothrips* and *Pseudocryptothrips*: stylets close together; ocellar setae long and stout; antennal III with 2 sense cones, terminal segments separate; meso and metanota separate; pelta large and rounded; sternites with numerous discal setae; tube width 0·5 times length. Most of these characters (apart from the fusion of the meso- and metanota) are in their most derived state in the smallest species.

SPECIES INCLUDED
citricauda Hood, 1927*b*: 199. Lectotype ♀, U.S.A.: California (USNM).
clavicornis (Knetchtel, 1936: 159–60) (*Hoplothrips*). Syntypes ♂, RUMANIA (unknown). **Comb. n.**
  tuzetae Bournier, 1956: 160–3 (*Parallothrips*). Holotype ♀, FRANCE (BCM).
gnomus sp. n. Holotype ♀, NEW ZEALAND (NZAC).
luctator (zur Strassen, 1966: 3–6) (*Parallothrips*). Holotype ♀, TENERIFFE (SMF). **Comb. n.**
mavromoustakisi (Crawford, 1948: 213–5) (*Parallothrips*). Holotype ♀, CYPRUS (USNM). **Comb. n.**
  f. *flaviceps* Bournier, 1962: 43. Types not specified, FRANCE (BCM).
seminole (Hood, 1938*c*: 390–2) (*Pygidiothrips*). Holotype ♀, U.S.A.: Florida (USNM). **Comb. n.**
thomasi (Hood, 1939*b*: 603–5) (*Parallothrips*). Holotype ♀, U.S.A.: Texas (USNM). **Comb. n.**
***tubversicolor** (Dyadechko, 1961: 688–9) (*Embothrips*). Syntypes ♂ ♀, U.S.S.R.: Kiev (Acad. Sci., U.S.S.R.). **Comb. n.**

Priesneriella gnomus sp. n.

(Figs 62, 71, 74, 79)

Apterous ♀. Colour brown, inner margin of forefemora and apex of antennal II paler; basal two-thirds of tube yellow. Head scarcely longer than wide; eyes small with only about 5 ommatidia ventrally; ocellar-setae small, postocular setae long and acute (Fig. 71); stylets wide apart, maxillary palps with large terminal sensorium (Fig. 77). Antennae with 7 segments, VI separate from VII+VIII; IV with 2 sense cones, III without sense cones or with one small one (6 μm) (Fig. 79). Pronotum transverse, epimeral sutures incomplete, anterior setae reduced. Praepectus and probasisternum absent; metathoracic sternopleural sutures broad. Meso- and metanota separate. Pelta very short but wide and close to anterior margin of tergite II (Fig. 62); tergites without sculpture, major setae long and slender (Fig. 74); tube with sides almost straight, scarcely constricted at apex; sternites II–IV without discal setae.

Measurements (holotype ♀ in μm). Body length 1500 (extended). Head, length 150; median width 150; postocular setae 80. Pronotum, length 110; width 220; major setae – am 25, aa 20, ml 25, epim 120, pa 120. Tergite IX median dorsal setae 150. Tube, length 110; basal width 75; terminal setae 140. Antennal segments II–VII length 45, 36, 40, 42, 45, 50.

SPECIMEN STUDIED

Holotype ♀, **New Zealand**: South Island, 25 ml west of Christchurch, Kowai Bush, on dead branch of *Griselinia littoralis*, 13.x.1972 (*V. F. Eastop*) (NZAC).

COMMENTS. This new species has the distal antennal segments similar to *thomasi* (type-species of *Parallothrips*), but the third segment similar to *citricauda* and *seminole*. The left antenna of the holotype has a small (6 μm) sense cone externally, but this is not visible on the right antenna (similar variation occurs in *clavicornis* from southern France). The meso- and metanota are separate as in *citricauda*, and the pterothoracic endofurca is stout as in that species and *mavromoustakisi*. *P. gnomus* is probably not native to New Zealand.

PSEUDOCRYPTOTHRIPS Priesner

(Figs 56, 65, 73)

Pseudocryptothrips Priesner, 1919: 105. Type-species: *Pseudocryptothrips meridionalis* Priesner, by monotypy.

The type-species of this genus is very similar to *Allothrips* species in the structure and chaetotaxy of the head, and in the form of the pelta and maxillary palp sensoria. However, antennal segments VII–VIII are separated by a complete suture, and IV bears four sense cones (Fig. 73). Moreover, the meso- and metanota are rather more fused than in *Allothrips* species, although the meso- and metasterna are less eroded, and the mesonotum bears a short wing lobe (60 μm) laterally with one or two setae. Specimens of this genus have been studied from the following countries: Mexico (3 ♀, 2 ♂), Barbados (1♀), Trinidad (2 ♀), Transvaal (2 ♂), Kenya (1 ♀), France (1 ♀). However, the present authors are not convinced that this material represents more than one species, although three species have been described in the genus. *P. remotus* Bianchi (1947) from Hawaii was transferred to *Apterygothrips* in the Phlaeothripinae by Sakimura & Bianchi (1977).

SPECIES INCLUDED

fuscicauda (Trybom, 1912: 13–5) (*Cryptothrips*). Holotype ♀, SOUTH AFRICA (NMG).
    proximus Faure, 1933: 55–7. Holotype ♂, SOUTH AFRICA (NCIP).
****gradatus*** (Hood, 1925*b*: 64) (*Cryptothrips*). Holotype ♀, TOBAGO (USNM).
meridionalis Priesner, 1919: 105–6. Syntypes ♀ ♂, ALBANIA (SMF).

Genera of Compsothripina

This group was erected by Karny (1921*a*) as a subfamily to include four generic names. Two of these are now placed in Elaphrothripina as synonyms of *Anactinothrips*, the other two are here treated as a single genus. The subtribe is here reinterpreted to include an ill-defined series of Pygothripini mainly found at soil level in association with grasses and litter. The species share a combination of the following characters: usually apterous; antennal segment VIII distinct from VII; antennal segment IV with 3 (or 2) sense cones, III with 2 or 1 sense cones; eyes frequently reduced laterally, but often extended ventrally; praepectus present; mesopraesternum entire; metathoracic sternopleural sutures well developed or absent; tube short with sides straight.

Bolothrips species, together with the related monobasic genera *Illinothrips*, *Loyolaia* and *Anaglyptothrips*, are here brought into the same subtribe as the ant-mimicking species of *Compsothrips* (together with *Leptogastrothrips* and *Oedaleothrips*). This decision is based on a comparison of *Bolothrips cingulatus*, which has long metathoracic sternopleural sutures (Fig. 98), with species of *Compsothrips* from the Mediterranean region. In this region several species are known which are intermediate in structure between *Bolothrips* and *Compsothrips* (*B. cingulatus, B. insularis, C. albosignatus, C. maroccanus* and *C. uzeli*). These two genera probably constitute sister-groups, of which one has radiated mainly in the Holarctic Region, and the other mainly in the tropics where it has produced remarkable ant-mimics.

In Compsothripina the plesiomorphic condition of the antennal sensoria is regarded as: III with 2 sense cones, IV with 3 sense cones. However, there are four species of *Bolothrips* with the ventral sense cone missing on segment IV (two species Mediterranean, two species South African) (Fig. 118), and this derived condition is maintained in *Compsothrips* (Figs 113, 114). The ventral prolongation of the eyes may be plesiomorphic in this group, but is possibly functionally correlated with the habit of living at the base of grasses. The eyes are not prolonged ventrally in *B. pratensis* (Fig. 96) and *I. rossi* (N. America) (Fig. 104), *L. indica* (India) (Fig. 105), *A. dugdalei* (New Zealand) (Fig. 103), and only weakly so in *C. albosignatus* (Fig. 84), *C. maroccanus* and *B. insularis*. As a result the subtribe is not easy to define, but on the basis of the antennal sense cone formula it may be the sister-group of the Gastrothripina.

In contrast to Stannard (1976) *Hartwigia* is here transferred to the Elaphrothripina in the Idolothripini because of the presence of two pairs of wing-retaining setae on each tergite, and also the absence of metathoracic sternopleural sutures.

ANAGLYPTOTHRIPS gen. n.

(Figs 97, 103, 106, 115)

Type-species: *Anaglyptothrips dugdalei* sp. n.

Medium sized, apterous, yellowish Pygothripini with body surface, including legs and antennae, reticulate. Antennae 8-segmented, VIII not constricted at base, 2 sense cones on III, 3 on IV (Fig. 115). Head longer than wide, protruding in front of small rounded eyes (Fig. 103); postocular setae of ♀ scarcely longer than minor setae, but half as long as eye in ♂; maxillary stylets V-shaped and low in head; mouth cone short and rounded. Pronotum with no long setae, epimeral sutures complete (Fig. 103). Foretarsal tooth absent in ♀, present in ♂. Mesonotum transversely rectangular; metanotum transverse with explanate lateral margins. Praepectus small (Fig. 103); probasisternum large; mesopraesternal posterior margin short; metathoracic sternopleural sutures long and curved (Fig. 97). Pelta broadly oval (Fig. 106); tergal discal setae numerous, posteromarginal setae short and blunt on anterior segments but longer on posterior segments; tube moderately long, margins straight; sternal discal setae in one transverse row.

This new genus is considered to be related to *Bolothrips* because of the presence of three sense cones on antennal segment IV, and because of the long curved metathoracic sternopleural sutures as in *B. varius* and *B. cingulatus* (Fig. 98). It is distinguished from all other Idolothripinae by the sculpture, pale body colour, rounded eyes and short postocular setae. *Faureothrips reticulatus* is the only species of similar appearance, but that has four sense cones on antennal segment IV and lacks the sternopleural sutures. The new species for which this new genus is erected has been collected only in New Zealand, but as discussed below it is probably introduced to that country.

Anaglyptothrips dugdalei sp. n.

Apterous ♀. Colour brownish yellow, posterior segments darkest; eyes and antennal segments VI–VIII dark brown, V light brown; major setae on posterior abdominal segments pale. Sculpture of head evenly reticulate in posterior third but irregular medially (Fig. 103); compound eyes with about 10 ommatidia. Pronotal sculpture weaker, major setae not distinguishable from minor setae (Fig. 103). Metanotum with one pair of major setae medially and 10 pairs of minor setae. Pelta with strong sub-basal line of sculpture (Fig. 106). Tergites strongly reticulate.

Measurements (holotype ♀ in μm). Body length (extended) 2450. Head, length 300; width across cheeks 200; postocular setae 15. Pronotum, length 195; width 270; epimeral setae 10. Metanotal median setae 20. Tergite IX setae B_1–B_3 60, 70, 100. Tube, length 195; maximum width 95; terminal setae 100. Antennal segments III–VIII length 70, 60, 55, 55, 45, 30.

Apterous ♂. Similar to ♀ except postocular setae longer (45 μm), foretarsus with stout curved tooth, metanotal median setae short (15 μm).

SPECIMENS STUDIED

Holotype ♀, **New Zealand**: North Island, Waiwera, at base of grasses, 21.viii.1968 (*L. A. Mound* 802) (NZAC).

Paratypes. **New Zealand**. North Island: 5 ♀ collected with holotype; Huia, near Auckland, 1 ♂ at base of grass tussock, 24.i.1979 (*L. A. Mound* 1353); Auckland, Lynfield, 3 ♀ under dead sheep in field, 6.iii.1977 (*G. Kuschel*) (NZAC; BMNH).

COMMENTS. The sites at which this species has been collected all had a ground cover of European grasses. In New Zealand it is relatively unusual for native species to be found in association with non-native habitats (Mound & Walker, 1982). Moreover, despite extensive sampling of leaf litter in New Zealand, *A. dugdalei* has not been found in areas of native flora. Therefore it seems likely that *Anaglyptothrips* is itself introduced to New Zealand from some other continent.

BOLOTHRIPS Priesner

(Figs 94–96, 98, 99, 101, 102, 118, 119)

Bolothrips Priesner, 1926*a*: 90. Type-species: *Phloeothrips bicolor* Heeger, by original designation.

Bolothrips (Botanothrips) Hood, 1939*b*: 605–6. Type-species: *Bolothrips pratensis* Hood, by original designation.

Boloadelothrips Moulton, 1949: 489. Type-species: *Boloadelothrips africanus* Moulton, by monotypy. **Syn. n.**

A revision of this genus, including a key to 14 species, was given by Mound (1974*b*). Although widespread in the Holarctic, it is also represented in Africa by several species. *Illinothrips* from North America, *Loyolaia* from India, and *Anaglyptothrips* are here regarded as derivatives from *Bolothrips* because of the presence of three sense cones on the fourth antennal segment (Fig. 119).

Botanothrips was proposed for species with the eyes not prolonged ventrally (Fig. 96), but this varies within species (e.g. *varius*) and does not define a real phylogenetic group. *Boloadelothrips* is also placed in synonymy here, the only species having antennae similar to *Bolothrips dentis*

(1 sense cone on III, 2 on IV; VII–VIII broadly joined). Both *dentis* and *africanus* have metathoracic sternopleural sutures, but the former has long interocellar setae and the female bears a foretarsal tooth. Most *Bolothrips* species have lost the metathoracic sternopleural sutures, but these are present in *insularis* and the closely related *varius* (N.B. not *icarus*, Fig. 99), and are exceptionally long in *cingulatus* (Fig. 98). *Bolothrips* is here interpreted as the sister-group of *Compsothrips* which appears to replace it ecologically in much of the tropics.

SPECIES INCLUDED

africanus (Moulton, 1949: 489–92) (*Boloadelothrips*). Holotype ♀, SOUTH AFRICA (BMNH). **Comb. n.**
bicolor (Heeger, 1852*b*: 477–8) (*Phlaeothrips*). Syntypes ?sex, AUSTRIA (?lost).
  f. *brevicornis* Priesner, 1928*a*: 687. Holotype ♀, HUNGARY (SMF).
  andrei Watson, 1933: 49–50 (*Oedaleothrips*). Syntypes ♀ ♂, U.S.A.: Iowa (FSAC).
cinctus Faure, 1943: 86–7. Syntypes ♀, SOUTH AFRICA (NCIP).
cingulatus (Karny, 1916: 92) (*Cryptothrips*). Syntypes? sex, AUSTRIA (SMF).
dentipes (Reuter, 1880: 12–4) (*Phloeothrips*). Syntypes ?sex, FINLAND (?lost).
  bagnalli Karny, 1916: 94 (*Cryptothrips*). Syntypes ?sex, SARDINIA (?lost).
dentis Faure, 1954*b*: 155–9. Holotype ♂, SOUTH AFRICA (NCIP).
***embotyi** Faure, 1943: 87–9. Syntypes ♀ ♂, SOUTH AFRICA (NCIP).
gilvipes (Hood, 1914: 169–70) (*Cryptothrips*). Holotype ♀, U.S.A.: Maryland (USNM).
  litoreus Hood, 1939*b*: 609–12. Holotype ♀, U.S.A.: Texas (USNM).
icarus (Uzel, 1895: 323–3) (*Cryptothrips*). Syntypes ♂ ♀, CZECHOSLOVAKIA (?lost).
  var. *pallipes* Uzel, 1895: 233. Syntypes ♀♂, CZECHOSLOVAKIA (?lost).
insularis (Bagnall, 1914*b*: 295) (*Cryptothrips*). Holotype ♀, CANARY ISLAND (BMNH).
  icarus tuberculatus Priesner, 1922: 105 (*Cryptothrips*). Holotype ♀, YUGOSLAVIA (SMF).
  brachyurus Bagnall, 1927: 573–4 (*Cryptothrips*). Lectotype ♂, FRANCE (BMNH).
  arenarius Priesner, 1950: 36–7. Syntypes ♀ ♂, EGYPT & SYRIA (SMF).
italicus Mound, 1974*b*: 122. Holotype ♀, ITALY (USNM).
pratensis Hood, 1939*b*: 606–9. Holotype ♀, U.S.A.: Texas (USNM).
***rachiphilus** Cott, 1956: 181–2. Holotype ♀, U.S.A.: California (?lost).
schaferi (Thomasson & Post, 1966: 31–2) (*Nesothrips*). Holotype ♀, U.S.A.: North Dakota (INHS).
varius Hartwig, 1948: 110–2. Holotype ♀, SOUTH AFRICA (NCIP).

COMPSOTHRIPS Reuter

(Figs 84–86, 100, 107, 108, 111–114)

Compsothrips Reuter, 1901: 214. Type-species: *Phloeothrips albosignata* Reuter, by monotypy.
Macrothrips Buffa, 1908: 4. Type-species: *Phloeothrips albosignatus* Reuter, by monotypy.
Leurothrips Bagnall, 1908: 196. Type-species: *Leurothrips albomaculata* Bagnall, by original designation. [Synonymised by Priesner, 1928.]
Leptogastrothrips Trybom, 1912: 28. Type-species: *Leptogastrothrips reuteri* Trybom, by monotypy. [Synonymised by Priesner, 1964.]
Oedaleothrips Hood, 1916: 64. Type-species: *Oedaleothrips hookeri* Hood, by original designation. [Synonymised by Priesner, 1964.]
Myrmecothrips Watson, 1920: 20. Type-species: *Myrmecothrips querci* Watson, by original designation. [Synonymised with *Oedaleothrips* by Watson, 1924.]
Myrmecothrips Priesner, 1926*b*: 485–8. Type-species: *Myrmecothrips dampfi* Priesner, by original designation. [Junior homonym of *Myrmecothrips* Watson, 1920] [Synonymised with *Oedaleothrips* by Hood, 1936.]
Formicothrips Priesner, 1927: 479. [Replacement name for *Myrmecothrips* Priesner.] [Synonymised with *Oedaleothrips* by Hood, 1936.]

Stannard (1976) recognised three genera in this group, although apparently accepting that they constituted together a holophyletic assemblage. *Compsothrips* was used for one species, *albosignatus*, with the head produced into a cone over the antennal bases (Fig. 84), the mesonotum short and transversely rectangular, and the metanotum rectangular without a median raised area. *Oedaleothrips* was reserved by Stannard for the North American species of the group on the argument that in these the head is greatly swollen behind the eyes (Fig. 86) and the metanotum produced medially into a cone or node. *Leptogastrothrips* was used for the rest of the species in the group from the Old World as well as the Neotropics. This division into three genera is not accepted here for the following reasons. One particularly small male of *C. albosignatus* from Greece has been studied which lacks a head cone; this structure probably varies in size allometrically. Moreover, although the mesonotum of most species placed in *Leptogastrothrips* and *Oedaleothrips* is relatively long (Fig. 111) and quite unlike the transverse mesonotum of *albosignatus* (Fig. 112), this is not true of *uzeli* which has a typical '*Leptogastrothrips*' head but a mesonotum and metanotum similar to *albosignatus*. The species *maroccanus* is also intermediate between the two groups. Similarly, although the head and metanotum of certain North American species are remarkable in structure, the head of *yosemitae* is intermediate between *Leptogastrothrips* and *Oedalothrips*, and the metanota of *reuteri* and *hookeri* (the two type-species) are essentially similar. *Hartwigia,* another ant-mimic which is superfically similar, is here transferred to the Elaphrothripina (p. 68).

Compsothrips is here interpreted as the sister-group of *Bolothrips* which it largely replaces in the tropics. The genus is circumtropical, but with most species in Africa and South America, one species-group in North America, and a few species in the North African/Mediterranean region. The species of continental areas appear to exist as a series of intergrading populations which are difficult to classify, as has been reported for other groups of apterous thrips living at soil level (Mound, 1972*b*). The metathoracic sternopleural sutures are more strongly developed in this genus than in any other idolothripines (Fig. 100), possibly correlating with the narrowed ant-like body form.

SPECIES INCLUDED

aeneus* (Hood, 1937*a*: 280–5) (*Oedaleothrips*). Holotype ♀, PERU (USNM). **Comb. n.
albosignatus (Reuter, 1884: 290–1) (*Phloeothrips*). Syntypes ♀ ♂, ALGERIA (?lost).
  albomaculata Bagnall, 1908: 196–8 (*Leurothrips*). Holotype ♀, no data (BMNH).
baileyi (Hood, 1941: 193–5) (*Oedaleothrips*). Holotype ♀, U.S.A.: Kansas (USNM). **Comb. n.**
****bicolor*** Priesner, 1921: 213–5. Syntypes ♀ ♂, PARAGUAY (SMF).
brasiliensis (Hood, 1952*c*: 166–7) (*Oedaleothrips*). Lectotype ♀, BRAZIL (USNM). **Comb. n.**
brunneus (Hood, 1941: 187–90) (*Oedaleothrips*). Holotype ♀, U.S.A.: Florida (USNM). **Comb. n.**
congoensis (Hood, 1952*b*: 204–9) (*Oedaleothrips*). Lectotype ♀, CONGO (USNM). **Comb. n.**
****dampfi*** (Priesner, 1926*b*: 488–9) (*Myrmecothrips*). Holotype ♂, MEXICO (?lost). **Comb. n.**
graminis (Hood, 1936*c*: 265–9) (*Oedaleothrips*). Holotype ♀, TRINIDAD (USNM). **Comb. n.**
****hoodi*** (De Santis, 1958: 98–9) (*Leptogastrothrips*). Holotype ♀, ARGENTINA (MLPA). **Comb. n.**
hookeri (Hood, 1916: 64–5) (*Oedaleothrips*). Holotype ♀, U.S.A.: Texas (USNM). **Comb. n.**
  bradleyi Hood, 1937*b*: 111–3 (*Oedaleothrips*). Holotype ♀, U.S.A.: Florida (USNM).
  campestris Hood, 1941: 190–3 (*Oedaleothrips*). Holotype ♀, U.S.A.: Florida (USNM).
jacksoni (Hood, 1925*c*: 137–8) (*Oedaleothrips*). Holotype ♀, U.S.A.: Colorado (USNM). **Comb. n.**
  hubbeli Watson, 1931: 341–2. Holotype ♀, U.S.A.: Oklahoma (FSAC).
maroccanus Priesner, 1964: 146. Holotype ♀, MOROCCO (?SMF).
****oneillae*** Bournier, 1974: 153–6. Holotype ♀, ANGOLA (MDA).
****pampicolla*** (De Santis, 1958: 100–2). (*Leptogastrothrips*). Holotype ♀, ARGENTINA (MLPA). **Comb. n.**
****querci*** (Watson, 1920: 20–1) (*Myrmecothrips*). Syntypes ♀ ♂, U.S.A.: Florida (FSAC). **Comb. n.**
ramamurthiii (Ananthakrishnan, 1964*b*: 111–3) (*Oedaleothrips*). Syntypes ♀ ♂, INDIA (TNA). **Comb. n.**
  ramamurthii indicus Ananthakrishnan, 1973*b*: 120. [Replacement name for *ramamurthii bicolor* Ananthakrishnan, 1966: 11, nec *bicolor* Priesner.]
reuteri (Trybom, 1912: 29–31) (*Leptogastrothrips*). Holotype ♀, SOUTH AFRICA (NMG).
  recticeps Hood, 1925*a*: 293–5. Holotype ♀, SOUTH AFRICA (USNM).
  amabilis Jacot-Guillarmod, 1942: 67–71 (*Oedaleothrips*). Holotype ♀, SOUTH AFRICA (AMG).
  aemulus Jacot-Guillarmod, 1942: 71–4 (*Oedaleothrips*). Holotype ♀, SOUTH AFRICA (AMG).
****sinensis*** (Pelikan, 1961: 306–8) (*Oedaleothrips*). Holotype ♀, CHINA (Pelikan Coll.).
****sumatranus*** Priesner, 1928*c*: 54–5. Holotype ♀, SUMATRA (?lost).
****timur*** (Pelikan, 1961: 302–6) (*Oedaleothrips*). Holotype ♀, U.S.S.R. (Pelikan Coll.).
****tristis*** (Cott, 1956: 186–8) (*Oedaleothrips*). Holotype ♀, U.S.A.: California (?lost). **Comb. n.**
uzeli (Hood, 1952*a*: 134–40) (*Oedaleothrips*). Holotype ♀, ITALY (USNM).

*__walteri__ (Watson, 1933: 48–9) (*Oedaleothrips*). Holotype ♀, ARGENTINA (FSAC). **Comb. n.**
yosemitae (Moulton, 1929*a*: 135–6) (*Formicothrips*). Holotype ♀, U.S.A.: California (CAS). **Comb. n.**

ILLINOTHRIPS Stannard

(Figs 104, 110, 116)

Illinothrips Stannard, 1954: 193–5. Type-species: *Illinothrips rossi* Stannard, by monotypy.

This monobasic genus was compared originally to *Pseudocryptothrips* and to *Gastrothrips acuticornis*. However, the pelta (Fig. 110) and abdomen are typical of *Bolothrips*, and the antennae essentially similar to members of that genus (3 sense cones on IV, but only 1 on III) (Fig. 116). The head, with the eyes small and cheeks incut behind the eyes (Fig. 104), is unlike most species of *Bolothrips*, although *B. pratensis* from North America is intermediate. Only one female of *rossi* has been examined; according to Stannard the male bears a tooth-like projection in front of the mesothoracic spiracle. The metathoracic sternopleural sutures are retained in *rossi,* which implies that the species is not derived from the present North American *Bolothrips* fauna.

SPECIES INCLUDED
rossi Stannard, 1954: 195–6. Holotype ♀, U.S.A.: Illinois (INHS).

LOYOLAIA Ananthakrishnan

(Figs 105, 109, 117)

Loyolaia Ananthakrishnan, 1964*b*: 106–7. Type-species: *Loyolaia indica* Ananthakrishnan, by monotypy.

As indicated in the original description, this monobasic genus from India is similar in appearance to *Illinothrips*, and the antennae have a similar sense cone arrangement (1 on III, 3 on IV) (Fig. 117). The metathoracic sternopleural sutures are present, and the prothoracic epimeral sutures complete, but unlike *Illinothrips* the pelta of *indica* is trilobed (Fig. 109). This species is probably derived from the holarctic genus *Bolothrips*.

SPECIES INCLUDED
indica Ananthakrishnan, 1964*b*: 107–8. Syntypes ♀ ♂, INDIA (TNA).

Genera of Gastrothripina

This subtribe was erected by Priesner (1961) for a series of 13 generic names, most of which through subsequent reinterpretation are now placed elsewhere. As a result only *Gastrothrips*, with seven generic synonyms, remains in the subtribe, the species of which (in common with most *Bolothrips* species) are unusual amongst Idolothripinae in having three sense cones on the fourth antennal segment (Fig. 93). In *Gastrothrips* species, however, these sense cones are relatively short and stout. The metathoracic sternopleural sutures are present (Fig. 128), but unlike *Bolothrips* in the Compsothripina, the eyes are usually rounded and not prolonged ventrally (Fig. 120), and the pelta, although variable, is basically triangular with lateral wings rather than rounded (Figs 121–124). Gastrothripina is possibly the sister-group of Compsothripina, the two groups having adopted different habitats; the former is common on dead twigs and branches in the tropics, the latter is found in grass tussocks and leaf litter in both tropical and temperate regions.

GASTROTHRIPS Hood

(Figs 87–93, 120–129)

Gastrothrips Hood, 1912*c*: 156. Type-species: *Gastrothrips ruficauda* Hood, by original designation.
Goetothrips Priesner, 1925*c*: 316. Type-species: *Goetothrips terrestris* Priesner, by monotypy. [Synonymised by Johansen, 1978*c*: 277.]
Isopterothrips Bagnall, 1926: 553. Type-species: *Isopterothrips tenuipennis* Bagnall, by monotypy. **Syn. n.**

Syncerothrips Hood, 1935*b*: 191–2. Type-species: *Syncerothrips harti* Hood, by monotypy. **Syn. n.**
Probolothrips Moulton, 1941: 319. Type-species: *Probolothrips hambletoni* Moulton (now regarded as a synonym of *abditus*), by monotypy. [Synonymised by Hood, 1952: 163.]
Pharetrothrips Priesner, 1952*a*: 195. Type-species: *Agnostochthona curvidens* Karny, by monotypy. **Syn. n.**
Percnothrips Ananthakrishnan, 1967: 233. Type-species: *Percnothrips turbinatus* Ananthakrishnan, by monotypy. **Syn. n.**
Paragastrothrips Zur Strassen, 1977: 59–60. Type-species: *Paragastrothrips mauli* Zur Strassen, by monotypy. **Syn. n.**

A definition of this genus, with a key to 16 species, was given by Mound (1974*b*). The Neotropical species referred to in couplets 5 to 15 of that key, together with *gurdus, harti* and *terrestris*, form a closely related and presumably holophyletic group. One species, *terrestris*, was placed in a separate genus *Goetothrips* because the interantennal projection is relatively long. However, *Gastrothrips fulviceps* has a similar but shorter projection. Similarly, *harti* was placed separately in *Syncerothrips* because of the partial fusion of antennal segments VII–VIII (cf. Fig. 93), whereas most of the South American species have the eighth segment long and slender (Fig. 91).

A smaller group of Old World species, in which the tube is not constricted apically (Mound, 1974*b*: 136 – key couplet 2 plus *acutulus*) (Fig. 88), may also constitute a holophyletic group, although no generic name has ever been proposed for it. However, the six remaining species (*curvidens, fuscatus, mauli, tenuipennis, turbinatus* and *xosa*) seem to be less closely related, but although four generic names are available they are here placed in synonymy until such time as the Old World fauna is more fully investigated. *Pharetrothrips* was erected for a species with long preocellar setae, and a long curved apical tubercle on the foretibiae; antennal segment VIII of this species is narrowed basally, whereas in *fuscatus* (which also has a foretibial tubercle) segments VII–VIII are broadly joined. *Percnothrips*, like *Syncerothrips*, was erected for a species with antennal segments VII–VIII almost completely fused (Fig. 93) but with a pair of long preocellar setae (Fig. 126). *Paragastrothrips* includes a single species which is similar to several *Gastrothrips* species but with a long head, broad pelta and short antennal segment VIII. Finally, *Isopterothrips* includes a single large species with long postocellar setae, a fan of stout spines on the forecoxae in males, and a slender eighth antennal segment. The species *xosa,* known from a single female, is very similar to *tenuipennis* but smaller.

All of the species listed below as examined have well-developed metathoracic sternopleural sutures (Fig. 128), three sense cones on antennal segment IV and two (or one) on segment III (Figs 92, 93), and only the three species noted above have long ocellar setae. In most New World species antennal segment VIII is long and slender, but it is broadly joined to VII in most Old World species.

SPECIES INCLUDED

abditus Hood, 1935*b*: 177–82. Holotype ♀, PANAMA (USNM).
  brasiliensis Moulton, 1938: 378–9 (*Hoplothrips*). Holotype ♀, BRAZIL (CAS).
  hambletoni Moulton, 1941: 320–1 (*Probolothrips*). Holotype ♀, BRAZIL (CAS).
acuticornis (Hood, 1925*b*: 65) (*Cryptothrips*). Holotype ♀, WEST INDIES: St. Croix (USNM).
  cybele Girault, 1927*d*: 1 (*Cryptothrips*). Holotype ♂, AUSTRALIA: Queensland (QMB).
  noumeae Bianchi, 1945: 251–4. Holotype ♀, NEW CALEDONIA (BPBM).
acutulus Okajima, 1979*c*: 511–3. Holotype ♀, JAPAN (OCT).
alticola Hood, 1942: 570–3. Holotype ♀, PERU (USNM).
anolis Morgan, 1925: 7–8. Holotype ♀, PUERTO RICO (USNM).
  proteus Hood, 1933: 417–9. Holotype ♀, PANAMA (USNM).
callipus Hood, 1935*b*: 182–6. Holotype ♀, U.S.A.: Texas (USNM).
****citriceps*** (Priesner, 1921: 208–9) (*Cryptothrips*). Holotype ♀, PARAGUAY (ZMB).
corvus Priesner, 1933: 55–7. Holotype ♀, MEXICO (SMF).
  capitalis Hood, 1935*b*: 174–7. Holotype ♀, U.S.A.: Texas (USNM).
curvidens (Karny, 1921*c*: 38–41) (*Agnostochthona*). Holotype ♀, JAVA (SMF). **Comb. n.**
falcatus (Ananthakrishnan, 1968*c*: 969–71) (*Nesothrips*). Syntypes ♀ ♂, INDIA (TNA).
fulvicauda Hood, 1937*a*: 277–80. Holotype ♀, PERU (USNM).

fulviceps Hood, 1937*a*: 274–7. Holotype ♀, PERU (USNM).
fumipennis Hood, 1952*c*: 163. Holotype ♀, BRAZIL (USNM).
fuscatus Okajima, 1979*c*: 513–5. Holotype ♀, TAIWAN (OCT).
harti (Hood, 1935*b*: 192–4) (*Syncerothrips*). Holotype ♀, U.S.A.: Texas (USNM). **Comb. n.**
****heterocerus*** (Hood, 1925*b*: 66) (*Barythrips*). Syntypes ♀ ♂, WEST INDIES: St. Thomas (USNM). [Jacot-Guillarmod, 1978: 1427 states 'Should be placed in *Neosmerinthothrips*'.]
intonsus Hood, 1941: 180–3. Holotype ♀, PERU (USNM).
mandiocae (Moulton, 1941: 321–2) (*Dichaetothrips*). Holotype ♀, BRAZIL (CAS).
  **oeceticola* De Santis, 1943: 92–6. Holotype ♀, ARGENTINA (MLPA).
mauli (Zur Strassen, 1977: 60–63) (*Paragastrothrips*). Holotype ♀, MADEIRA (SMF). **Comb. n.**
mongolicus (Pelikan, 1965: 231–3) (*Nesothrips*). Holotype ♀, MONGOLIA (TM).
monticola Hood, 1942: 573–6. Holotype ♀, PERU (USNM).
procerus Hood, 1956: 99–100. Holotype ♀, BRAZIL (USNM).
proturus (Bagnall, 1921*a*: 269–70) (*Acallurothrips*). Holotype ♀, SEYCHELLES (BMNH). **Comb. n.**
****pueblae*** Johansen, 1979: 179–80. Holotype ♀, MEXICO (UNAM).
ruficauda Hood, 1912*c*: 156–7. Syntypes ♀, U.S.A.: Illinois (USNM).
stygicus Hood, 1935*b*: 186–91. Holotype ♀, PANAMA (USNM).
subulatus (Hartwig, 1948: 113–5) (*Bolothrips*). Holotype ♀, SOUTH AFRICA (NCIP).
tenuipennis (Bagnall, 1926: 554) (*Isopterothrips*). Holotype ♀, GHANA (BMNH). **Comb. n.**
  penicillatus Priesner, 1937*b*: 626–9 (*Dichaetothrips*). Holotype ♀, SIERRA LEONE (BMNH).
terrestris (Priesner, 1925*c*: 316–7) (*Goetothrips*). Syntypes ♀ ♂, MEXICO (SMF). **Comb. n.**
  **gurdus* Johansen, 1974: 266 (*Nesothrips*). Holotype ♀, MEXICO (UNAM).
texanus Hood, 1912: 157–9. Holotype ♀, U.S.A.: Texas (USNM).
turbinatus (Ananthakrishnan, 1967: 233–4) (*Percnothrips*). Holotype ♀, INDIA (TNA). **Comb. n.**
xosa (Jacot-Guillarmod, 1939*b*: 43–6) (*Dichaetothrips*). Holotype ♀, SOUTH AFRICA (AMG). **Comb. n.**

Genera of Diceratothripina

Karny (1925*c*) erected this group as a subfamily for 11 genera, including some now placed in the Phlaeothripinae. Priesner (1961) used it as a subtribe of his Cryptothripini, but included a wide range of genera whose main common characteristic was the large body size of most species. The present reclassification derives largely from recognition of the phylogenetic significance of the presence of metathoracic sternopleural sutures. The Diceratothripina is thus defined as those Pygothripini which possess these sutures (with a few exceptions) as well as four sense cones on antennal segment IV and widely spaced (usually V-shaped) maxillary stylets. The group is large and diverse, and represented in all parts of the tropics and subtropics. However, the *Nesothrips*-group (*Campulothrips, Carientothrips, Nesidiothrips* and *Nesothrips* + *Rhaebothrips*) is found mainly in the Australian and Pacific regions. This genus-group probably shared an ancestor with *Acallurothrips* and *Neosmerinthothrips,* but species of these two pantropical genera exhibit a tendency for the tube to be swollen or at least to have convex margins. This is also found in *Phacothrips* and the new species of *Diceratothrips* described below; these two genera, together with *Sporothrips*, constitute the New World element in the Diceratothripina. Two genera described from Africa, *Elgonima* and *Pseudoeurhynchothrips*, are each based on a single damaged individual on which a full range of characters is not visible. *Pseudoeurhynchothrips* has a large foretarsal tooth in the female, as in *Neosmerinthothrips*-group but unlike *Nesothrips*-group, and the straight-sided tube of the only known specimen probably represents a reversion from the convex form found in *Neosmerinthothrips* species.

ACALLUROTHRIPS Bagnall

(Figs 145, 146, 161, 168, 179, 180)

Acallurothrips Bagnall, 1921*a*: 269. Type-species: *Acallurothrips macrurus* Bagnall, by original designation.
Diopsothrips Hood, 1934: 422–3. Type-species: *Diopsothrips flavus* Hood, by original designation. **Syn. n.**

This genus was erected for two species from the Seychelles, each of which was known only from a single damaged specimen (Mound, 1968). Moulton described a third species, *latus* from Fiji, but the genus has never been redefined. However, one of Bagnall's species, *proturus*, is here transferred to *Gastrothrips*, and *macrurus* and *latus* are recognised as being closely related to *spinicauda* Priesner together with several other species originally described in *Pygothrips*. *Acallurothrips*, which differs from *Pygothrips* in head shape and stylet position, may be defined as follows.

Head broad, maxillary stylets wide apart (Figs 145, 146). Antennae with segments VII–VIII broadly joined (rarely fused); sense cones usually arising laterally, 2 on III, 4 on IV, sometimes long and curved in large species (Fig. 168). Epimeral sutures usually complete. Praepectus present (Fig. 145); mesopraesternum often eroded; metathoracic sternopleural sutures present, but area posterior to mesocoxae as well as anapleural suture and anterior border of anepisternum often eroded into chitinous islets. Foretarsal tooth present in both sexes. Forewing without duplicated cilia (except *breviceps*); sub-basal seta B_3 long. Metanotum weakly reticulate, median setae long and widely spaced. Pelta broadly reticulate, frequently eroded at posterior margin (Figs 179, 180); median sternites usually longer than tergites. Wing-retaining setae usually weak; tube greatly expanded with margins convex, often ridged near base, apex constricted (Fig. 161).

Fifteen species (including two from *Diopsothrips* and one from *Lathrobiothrips*) have been studied and found to agree with the above definition, and a further species is referred to this genus from *Diopsothrips* on the basis of its original description. A short series of specimens of *metulicauda*, collected in Malaya and Java, suggests that the size and colour of the tube are variable in this species at least. Moreover, antennal segment IV usually bears four sense cones, but individuals have been studied with only two, or even with two on one antenna and four on the other. Contrary to Mound (1968), the damaged holotype of *macrurus* has four sense cones on antennal segment IV. Unfortunately, many of the described species have only been collected once, and so little information is available on intraspecific variation in this genus.

Most *Acallurothrips* species have antennal segments VII–VIII broadly joined, but these segments are fused without trace of a suture in *flavus* (Fig. 168) and *louisianae* (also *brunneus*?). This difference is not accepted as a basis for recognising *Diopsothrips* as a useful genus. The pronotal epimeral sutures are complete in *flavus* but incomplete in the closely similar species *louisianae*. Hood compared *Diopsothrips* to *Symphyothrips* in his original description, and this led Stannard (1957) to place the genus in synonymy with *Polyphemothrips*.

Most of the species listed below in *Acallurothrips* are small in size. However, *quadraticeps* is large, with the head almost as long as wide, the stylets only one-third of the head width apart, and the sense cones on antennal segments III–IV not lateral in origin. This species resembles *Phacothrips ocelloides* in general appearance. *Acallurothrips* is probably most closely related to *Neosmerinthothrips* (q.v.) in which the species usually have the tube margins slightly convex. *Pygothrips* is here regarded as being more distantly related, despite the many similarities in tube and abdomen, because of the long closely approximated maxillary stylets. Faure described *judithae* in *Lathrobiothrips* because of the enlarged tube, but that genus is here placed in the Phlaeothripinae – Docessissophothripini as a synonym of *Holothrips*.

SPECIES INCLUDED

amplus (Faure, 1949*c*: 118–22) (*Pygothrips*). Holotype ♀, SOUTH AFRICA (NCIP). **Comb. n.**
badius (Faure, 1955: 35–40) (*Pygothrips*). Holotype ♀, SOUTH AFRICA (NCIP). **Comb. n.**
breviceps (Hood, 1934: 419–20) (*Pygothrips*). Holotype ♀, PANAMA (USNM). **Comb. n.**
****brunneus*** (Hood, 1934: 424–5) (*Diopsothrips*). Lectotype ♀, PANAMA (USNM). **Comb. n.**
conifer (Hood, 1925*b*: 67) (*Pygothrips*). Holotype ♀, TRINIDAD (USNM). **Comb. n.**
fasciolatus (Hood, 1952*c*: 165–6) (*Pygothrips*). Holotype ♀, BRAZIL (USNM). **Comb. n.**
flavus (Hood, 1934: 423–4) (*Diopsothrips*). Lectotype ♀, PANAMA (USNM). **Comb. n.**
judithae (Faure, 1956: 321–30) (*Lathrobiothrips*). Holotype ♀, SOUTH AFRICA (NCIP). **Comb. n.**
latus Moulton, 1944: 289–90. Holotype ♀, FIJI (BPBM).
louisianae (Hood, 1936*a*: 98–100) (*Diopsothrips*). Holotype ♀, U.S.A.: Louisiana (USNM). **Comb. n.**
macrurus Bagnall, 1921*a*: 270–1. Holotype ♀, SEYCHELLES (BMNH).
mamillicauda (Hood, 1954*c*: 208–10) (*Pygothrips*). Holotype ♀, TRINIDAD (USNM). **Comb. n.**
metulicauda (Karny, 1923: 336–40) (*Pygothrips*). Syntypes ?♀, JAVA (SMF). **Comb. n.**
noguttii (Kurosawa, 1932: 234–8) (*Pygothrips*). Holotype ♀, JAPAN (?NIAT). **Comb. n.**

quadraticeps (Hood, 1952*c*: 166) (*Pygothrips*). Holotype ♀, Brazil (USNM). **Comb. n.**
spinicauda (Priesner, 1939*b*: 57–9) (*Pygothrips*). Holotype ♀, Congo (SMF). **Comb. n.**

CAMPULOTHRIPS Moulton

(Figs 133, 148, 151, 162)

Campulothrips Moulton, 1944: 310–1. Type-species: *Campulothrips gracilis* Moulton, by monotypy.

This genus has previously been considered to be related to the Idolothripini, but this is not accepted here because of the presence of short metathoracic sternopleural sutures (Fig. 151) and a single pair of wing-retaining setae on each tergite. These characters, together with the large pair of setae between the posterior ocelli (Fig. 133) and the enlarged L-shaped femora of males (Fig. 148), suggest that the genus is derived from *Nesothrips*, within whose zoogeographic range (the Pacific) it occurs. However, the elongate antennae, long median setae on the metanotum, tube with prominent lateral setae at least in the basal half (Fig. 162) and rather swollen katepimera (albeit with complete anapleural sutures) are remarkable examples of convergent evolution toward the typical body form of some South American Idolothripini.

Species included
gracilis Moulton, 1944: 311. Holotype ♀, Fiji (BPBM).

CARIENTOTHRIPS Moulton

(Figs 135–137, 164, 181–185)

Bolothrips (*Carientothrips*) Moulton, 1944: 306. Type-species: *Bolothrips* (*Carientothrips*) *fijiensis* Moulton, by monotypy.

This group was first recognised as a full genus by Mound (1974*a*) who defined it and discussed the generic relationships together with a key to 17 species (1974*b*). These species are found mainly in the Australian and Pacific regions, although *denticulatus* is known only from Tierra del Fuego and the Falkland Islands. In general appearance several species resemble *Bolothrips* species, the body being slender, pelta broad (Figs 181–185) and eyes prolonged ventrally (Fig. 137), but this is probably due to convergent evolution through adaption to a similar habitat at the base of grasses. The species found on dead branches tend to be less slender and in macropterae the pelta has distinctive broad lateral wings (Fig. 183). The metathoracic sternopleural sutures in most species of *Carientothrips* are clearly defined, but in a few species are narrow and difficult to see, and in *badius* are not developed at all. The genus appears to represent an holophyletic species-group derived from *Nesothrips*, or it may represent the sister-group of that genus. Individual species of these two groups are frequently difficult to place in a genus.

Species included
acti Mound, 1974*a*: 25–6. Holotype ♀, Australia (ANIC).
badius (Hood, 1918*b*: 143–4) (*Cryptothrips*). Holotype ♀, Australia (USNM).
    apterus Girault, 1928*b*: 2 (*Elaphrothrips*). Holotype ♂, Australia (QMB).
biformis (Moulton, 1939: 146–7) (*Bolothrips*). Holotype ♀, Tahiti (BPBM).
capricornis (Mound, 1974*a*: 23–4) (*Bolothrips*). Holotype ♀, Australia (ANIC).
casuarinae Mound, 1974*a*: 26–9. Holotype ♀, Australia (ANIC).
denticulatus (De Santis, 1963*b*: 66) (*Nesothrips*). Holotype ♀, Argentina (MLPA).
fijiensis (Moulton, 1944: 306–7) (*Bolothrips*). Holotype ♀, Fiji (BPBM).
grayi Mound, 1974*b*: 129. Holotype ♀, New Guinea (BMNH).
japonicus (Bagnall, 1921*b*: 355–6) (*Cryptothrips*). Holotype ♀, Japan (BMNH).
loisthus Mound, 1974*a*: 29–30. Holotype ♀, Australia (ANIC).
magnetis Mound, 1974*a*: 30–1. Holotype ♀, Australia (ANIC).
miskoi Mound, 1974*a*: 31. Holotype ♀, Australia (ANIC).
mjobergi (Karny, 1920*c*: 42) (*Cryptothrips*). Holotype ♀, Australia (NRS).
    incisus Girault, 1927*c*: 1 (*Cryptothrips*). Syntypes ♀, Australia (QMB).
    australicus Priesner, 1928*b*: 649–51 (*Cryptothrips*). Holotype ♀, Australia (SMF).
    flavitibia Moulton, 1968: 117–8 (*Bolothrips*). Holotype ♀, Australia (CAS).

pedicillus Mound, 1974*a*: 32–3. Holotype ♀, AUSTRALIA (ANIC).
pictilis Mound, 1974*a*: 33–4. Holotype ♀, AUSTRALIA (ANIC).
reedi Mound, 1974*a*: 34–5. Holotype ♀, AUSTRALIA (ANIC).
semirufus (Girault, 1928*b*: 4) (*Elaphrothrips*). Holotype ♀, AUSTRALIA (QMB).
vesper Mound, 1974*a*: 35–6. Holotype ♀, AUSTRALIA (ANIC).

DICERATOTHRIPS Bagnall

(Figs 35, 130, 131, 149, 152, 163, 165, 171)

Diceratothrips Bagnall, 1908*b*: 193. Type-species: *Diceratothrips bicornis* Bagnall, by monotypy.

Eulophothrips Schmutz, 1909: 278. Type-species: *Eulophothrips robustus* Schmutz, by monotypy. [Synonymised by Priesner, 1949: 129.]

Megalomerothrips Watson, 1919: 99. Type-species: *Megalomerothrips eupatorii* Watson, by monotypy. [Synonymised by Priesner, 1949: 136–7.]

Diceratothrips (*Endacnothrips*) Priesner, 1933*c*: 147–9. Type-species: *Diceratothrips* (*Endacnothrips*) *horridus* Priesner, by monotypy.

This genus has been subject to much confusion. Mound (1968), following Stannard (1957), treated *Diceratothrips* as a senior synonym of *Dichaetothrips* and also included the *Ethirothrips*-group of species from the Old World. At that time, however, Mound (and probably Stannard) had not examined the type-species of *Dichaetothrips*. Subsequently, it has been realised that *Diceratothrips* is a genus of Neotropical species which can be distinguished from similar-looking Old World species by the presence of long, well-developed sternopleural sutures on the metathorax (Fig. 152). Males, but not females, of all species of *Diceratothrips* examined in this study have a stridulatory file on the external margin of the forecoxae, and the flattened edge of the forefemora apparently functions as a plectrum (Fig. 149). The members of this genus share the following characteristics.

Usually large, black to dark brown species; head often with anteocellar setae long or stout, and cheeks with stout setae; stylets wide apart (Figs 130, 131). Antennae 8-segmented, III relatively long, VII–VIII distinct but sometimes forming a single unit (Fig. 165); III with 2 sense cones, IV with 4 sense cones; IV–VI prolonged ventrally. Pronotum broad and flat, scarcely thickened at anterior or medially; reticulate in anterior third; am, aa and ml setae small (Fig. 131). Praepectus present, mesopraesternum with posterolateral corners almost forming a right-angle; metathoracic sternopleural sutures well-developed (Fig. 152). Forefemora often with stout spines on inner surface in both sexes; foretarsal tooth large or very reduced; forewings broad, with numerous duplicated cilia. Pelta not exceptionally broad, curving away from tergite II laterally (Figs 35, 171); tergites each with one pair of wing-retaining setae.

In contrast to the Old World *Ethirothrips* group of species, allometric growth patterns are found commonly in *Diceratothrips* species. Therefore, since many of these species have been described from few specimens and, moreover, have never been compared directly with their congeners, a number of synonyms can be expected. For example, Hood (1934: 70) in describing a new species *princeps*, listed several characteristics of four species, *armatus, bicornis, persimilis* and *robustus*, none of which he personally had ever examined. Many of the details he gives are incorrect, and the first three of these names are here treated as synonymous. Moreover, *princeps* is almost certainly the same species, *robustus* and *cornutus* are possibly only variants with exceptionally long anteocellar setae, and even *inferorum* may also be the same but with antennal segment III slightly paler. Material identified as *bicornis* has been examined from the following countries: Trinidad, Venezuela, Brazil, Peru and Mexico (in BMNH). Moreover, the unique holotype of *williamsi* Karny from Guatemala has been studied and is here regarded as the same species as *bicornis*. Contrary to the original description and illustration of *williamsi*, the stout ocellar setae arise anterolateral to the ocellar triangle, not behind the posterior ocelli in this holotype.

Not only does *bicornis* exhibit considerable allometric variation in both sexes, it also shows marked sexual dimorphism in the shape of the head and forefemora. Most of the other species of *Diceratothrips*, in both sexes, resemble the females of *bicornis* rather than the males. Moreover, several species have the anteocellar and cheek setae reduced in size, e.g. *delicatus, harti, setigenis* and *validipennis*. Of these, only *delicatus* has stout setae on the inner surface of the forefemora, whereas the other species have the femora long and broad. The two species *setigenis* and *pallidior*, described from the coast of the Gulf of Mexico, may represent one variable species. The new species *bennetti*, described below from Trinidad, is exceptionally small and *Pygothrips*-like, with the tube swollen, antennal projections reduced, forefemora short and swollen without stout setae on the inner surface, and head short and broad with two pairs of stout cheek setae. Similarly, *nigricauda* which was described in *Pygothrips* has the tube enlarged, the stylets about one-third of the head width apart, the forewing with seven duplicated cilia, pelta not eroded (Fig. 35), and the forecoxae with transverse striations.

SPECIES INCLUDED
****anahuacensis*** Johansen, 1976: 59–61. Holotype ♀, MEXICO (UNAM).
bennetti sp. n. Holotype ♂, TRINIDAD (BMNH).
bicornis Bagnall, 1908*b*: 194–5. Holotype ♀, BRAZIL (BMNH).
  armatus Bagnall, 1910*a*: 385–6. Syntypes ♀ ♂, VENEZUELA (BMNH). **Syn. n.**
  williamsi Karny, 1920*a*: 92–4 (*Dichaetothrips*). Holotype ♀, GUATEMALA (DEI). **Syn. n.**
  persimilis Priesner, 1925*b*: 25–6. Holotype ♀, SURINAM (SMF). **Syn. n.**
****cornutus*** Hood, 1952*c*: 156–7. Holotype ♀, BRAZIL (USNM).
****cubensis*** Hood, 1941: 178–80. Lectotype ♀, CUBA (USNM).
delicatus Hood, 1941: 171–4. Holotype ♀, U.S.A.: Florida (USNM).
harti Hood, 1912*a*: 12–4. Holotype ♂, U.S.A.: Texas (USNM).
  **eupatorii* Watson, 1919: 99–100 (*Megalomerothrips*). Holotype ♀, U.S.A.: Florida (FDA).
****hercules*** Johansen, 1977*b*: 59–61. Holotype ♂, MEXICO (UNAM).
horridus Priesner, 1933*c*: 147–9. Holotype ♂, MEXICO (SMF).
inferorum (Priesner, 1933*a*: 62–3) (*Adiaphorothrips*). Holotype ♀ (not ♂), MEXICO (SMF).
****longipes*** Hood, 1912*a*: 14–5. Holotype ♂, U.S.A.: Texas (USNM).
nigricauda (Hood, 1925*b*: 67–8) (*Pygothrips*). Holotype ♀, TRINIDAD (USNM). **Comb. n.**
****obscuricornis*** Hood, 1941: 174–6. Holotype ♀, CUBA (USNM).
pallidior Priesner, 1933*c*: 151. Holotype ♀, MEXICO (SMF).
picticornis Hood, 1914: 166–7. Holotype ♀, PANAMA (USNM).
  **wolcotti* Morgan, 1925: 8–9. Holotype ♀, PUERTO RICO (USNM).
princeps Hood, 1934: 68–71. Holotype ♂, PANAMA (USNM).
****robustus*** (Schmutz, 1909: 278–81) (*Eulophothrips*). Holotype ♂, BRAZIL (? lost).
****sakimurai*** Johansen, 1977*b*: 61–2. Holotype ♀, MEXICO (UNAM).
setigenis Hood, 1941: 176–8. Lectotype ♀, U.S.A.: Texas (USNM).
****timidus*** Johansen, 1976: 61–2. Holotype ♀, MEXICO (UNAM).
validipennis (Hood, 1938*c*: 403–6) (*Gastrothrips*). Holotype ♀, U.S.A.: Florida (USNM).

Diceratothrips bennetti sp. n.

(Figs 131, 152, 163, 165, 171)

Macropterous ♂. Colour dark brown, tube black; distal half of antennal segment II, and segment III except at apex, brownish yellow; major setae dark brown; wings shaded particularly at base and apex, but with no longitudinal line.

Head short and broad with two pairs of cheek setae (Fig. 131); anteocellar setae short. Antennae with sense cones on III very short (Fig. 165). Forefemora swollen on inner surface but with no stout setae, posterior angle acute and extending to striate area on forecoxae; foretarsal tooth almost as long as tarsal width. Forewing sub-basal seta B_2 arising posterolateral to B_1. Pelta broadly triangular (Fig. 171); tergites II–VI each with one pair of wing-retaining setae; median sternites slightly longer than tergites; posterolateral abdominal setae long and stout; tube stoutly conical.

Measurements (holotype ♂ in μm). Body length 2350. Head, length 285 (tilted); width 220; postocular setae 105. Pronotum, length 150; width 300; major setae – am 15, aa 15, ml 15, epim 110/15, pa 25. Forewing, length 950; width 90; sub-basal setae 40, 60, 100; number of duplicated cilia 18. Tergite IX setae B_1 220; B_2 ?; B_3 220. Tube, length 240; basal width 120; terminal setae 90. Antennal segments III–VIII length 105, 93, 75, 65, 60, 30.

Macropterous ♀. Colour and structure similar to ♂ but larger; forefemora swollen, with posterior angle rounded and not extending to forecoxae; anteocellar setae stout; pronotum not as broad and flat as in most species of this genus, with a weak line of thickening anteromedially.

Measurements (paratype ♀ in μm). Body length 2750. Head, length 270; width 255; postocular setae

140. Pronotum, length 165; width 350; major setae – am 18, aa 18, ml ?15, epim 150, pa 45. Metanotal median setae 45. Forewing, length 1100; distal width 120; sub-basal setae 40, 60, 120; number of duplicated cilia 22. Tergite IX setae B_1 ?; B_2 ?; B_3 240. Tube, length 255; basal width 140; terminal setae 90. Antennal segments III–VIII length, 115, 100, 80, 70, 70, 30.

SPECIMENS STUDIED

Holotype ♂, **Trinidad**: Curepe, on grasses, 8.xi.1970 (*L. A. Mound* 921) (BMNH).
Paratype. 1 ♀ collected with holotype (BMNH).

COMMENTS. This new species was collected whilst studying at the headquarters of the Commonwealth Institute of Biological Control at the invitation of the Director, Dr Fred Bennett. Only two specimens were found, and these were in rough grassland. However, the structural adaptations of *bennetti* are such as might be expected of a species of *Diceratothrips* adapted to grass-living rather than the typical habitat of dead branches. The sternites are relatively long, the posterior abdominal setae stout, and the tube enlarged, all of which suggest that the species raises the tube over the head in life, as do species of *Acallurothrips* and *Pygothrips*, as well as *Nesothrips propinquus*.

ELGONIMA Zur Strassen

Elgonima Zur Strassen, 1972: 91. Type-species: *Elgonima seticeps* Zur Strassen, by monotypy.

This genus is based on a single, imperfect, macropterous female. Due to contraction of the pterothorax it is impossible to determine the presence or absence of metathoracic sternopleural sutures. However, *seticeps* is apparently typical of the Diceratothripina. Antennal segment VIII is slender, but the sense cones on III–IV are unusually long for species in diceratothripine genera. The pronotal epimeral sutures are incomplete, and all the major setae have expanded apices, including those on tergite IX and one pair of postocellars. The relationships of *Elgonima* cannot be determined with certainty at present.

SPECIES INCLUDED

seticeps Zur Strassen, 1972: 91–3. Holotype ♀, KENYA (NRS).

NEOSMERINTHOTHRIPS Schmutz

(Figs 132, 138, 139, 153–156, 169, 172, 173)

Neosmerinthothrips Schmutz, 1913: 1051. Type-species: *Neosmerinthothrips fructuum* Schmutz, by monotypy.

Coenurothrips Bagnall, 1921*a*: 271. Type-species: *Coenurothrips brevicollis* Bagnall, by original designation. [Synonymised by Mound, 1974*b*: 148.]

Galactothrips Moulton, 1933*a*: 404. Type-species: *Galactothrips diversicolor* Moulton, by monotypy. [Synonymised by Mound, 1974*b*: 148.]

This genus was redefined and discussed by Mound (1974*b*) with a key to 18 species. These comprise a small New World species-group, and a larger and more diverse Old World species-group. However, the genus is distinguished with difficulty from the equally widespread tropical genus *Acallurothrips*. Members of the latter genus have the tube more strongly swollen, antennal segments VII–VIII broadly joined or fused, and the body sclerites frequently reduced. Thus future research may indicate that neither of these genera represent holophyletic groupings. *Pseudoeurhynchothrips bidens* is similar to some *Neosmerinthothrips* but has the tube long with straight margins. The poorly preserved syntypes of *Barythrips grandicauda* have been examined and are here interpreted as the only known micropterous species of *Neosmerinthothrips*. However, they are similar to *Acallurothrips* species in having the setae on tergite IX scarcely half as long as the tube, the pelta reduced and eroded medially on the posterior margin, and the metanotum transverse with a pair of long setae. These two syntypes were probably collected in the Oriental Region, the name 'Frauenfeld' on the slide almost certainly refers to the well-known entomologist who worked in southern Europe. In some *Neosmerinthothrips* the postocellar setae are elongate; in *nigrisetis* they are as long as the sides of the ocellar triangle, but in the new species *hamiltoni* described below they are even longer (Fig. 132).

SPECIES INCLUDED

affinis (Bagnall, 1921*b*: 361–2) (*Coenurothrips*). Holotype ♀, SRI LANKA (BMNH).
annulipes (Hood, 1950: 13–6) (*Gastrothrips*). Holotype ♀, BRAZIL (USNM).
  milleforme De Santis, 1963*a*: 12–4 (*Nesothrips*). Holotype ♀, ARGENTINA (MLPA).
brevicollis (Bagnall, 1921*a*: 271–2) (*Coenurothrips*). Syntypes ♂ ♀, SEYCHELLES (BMNH).
collaris (Bagnall, 1917: 26–7) (*Cryptothrips*). Lectotype ♀, ST VINCENT (BMNH).
  fuscicauda Morgan, 1925: 6–7 (*Gastrothrips*). Holotype ♂, PUERTO RICO (USNM).
  marshalli Priesner, 1934: 58–60 (*Bolothrips*). Lectotype ♀, SIERRA LEONE (BMNH).
  dominicanus Hood, 1935*b*: 170–4 (*Gastrothrips*). Holotype ♂, DOMINICAN REPUBLIC (USNM).
diversicolor (Moulton, 1933*a*: 404–6) (*Galactothrips*). Holotype ♀, BRAZIL (CAS).
fijiensis (Moulton, 1944: 286–7) (*Gastrothrips*). Holotype ♀, FIJI (BPBM).
fructuum Schmutz, 1913: 1052–3. Lectotype ♂, SRI LANKA (Ceylon) (SMF).
  ceylonicus Karny, 1925*c*: 137–9 (*Oedemothrips*). Holotype ♀, SRI LANKA (BMNH).
grandicauda (Priesner, 1925*b*: 21) (*Barythrips*). Syntypes ♂ ♀, ?ORIENTAL REGION (SMF). **Comb. n.**
hamiltoni sp. n. Holotype ♀, BRAZIL (BMNH).
hilaris (Priesner, 1937*b*: 624–6) (*Bolothrips*). Holotype ♂, SIERRA LEONE (BMNH).
hoodi (Faure, 1954*a*: 9–13) (*Gastrothrips*). Holotype ♀, SOUTH AFRICA (NCIP).
***inquilinus** Ananthakrishnan, 1960: 32–3. Holotype ♀, INDIA (?TNA).
nigrisetis (Hood, 1935*b*: 161–5) (*Gastrothrips*). Holotype ♀, PANAMA (USNM).
parvidens (Hood, 1935*b*: 165–8) (*Gastrothrips*). Holotype ♀, PANAMA (USNM).
paulistarum (Hood, 1950: 25–7) (*Gastrothrips*). Holotype ♀, BRAZIL (USNM).
picticornis (Hood, 1936*c*: 272–5) (*Gastrothrips*). Holotype ♀, BRAZIL (USNM).
plaumanni (Hood, 1950: 20–2) (*Gastrothrips*). Holotype ♀, BRAZIL (USNM).
robustus (Ananthakrishnan, 1964*a*: 102–3) (*Nesothrips*). Syntypes ♂ ♀, INDIA (TNA).
variipes (Hood, 1950: 16–20) (*Gastrothrips*). Holotype ♀, BRAZIL (USNM).
xylebori Priesner, 1935*c*: 370. Lectotype ♀, JAVA (SMF).

Neosmerinthothrips hamiltoni sp. n.

(Figs 132, 154, 169, 172)

Macropterous ♀. Colour dark brown, head and tube black; antennal segment III yellow with apical third light brown, IV yellowish brown in basal half, V slightly paler at base than apex, II yellow apically; major setae dark brown; forewing clear except around sub-basal setae.

Head slightly narrowed to base, weakly sculptured laterally (Fig. 132); postocellar setae extending to apex of antennal segment II; maxillary stylets wide apart, retracted to postocular setae; mouth cone broadly rounded. Antennal segment III slender with two sense cones; IV with four sense cones; VIII slightly narrowed to base (Fig. 169). Pronotum transverse, epimeral sutures complete (Fig. 132); anteromarginal setae short; praepectus present, mesopraesternum broadly boat-shaped. Foretarsal tooth slender, two-thirds as long as tarsal width. Mesonotal lateral setae very small. Metanotum scarcely sculptured medially. Anapleural sutures complete, katepisternum eroded anteriorly; metathoracic sternopleural sutures long. Forewing broad, sub-basal setae arising close together in a straight line. Pelta with short broad lateral wings (Fig. 172). Tergites II–VII with one pair of wing-retaining setae, sigmoid on III–VI; setae on IX elongate; tube with slightly sinuate, convex margins (Fig. 154). Sternites with about 12 rather weak discal setae.

Measurements (holotype ♀ in μm). Body length 3400. Head, length 360; width behind eyes 275; postocellar setae 190; postocular setae 240. Pronotum, length 150; width 360; major setae – am 25, aa 60, ml 135/165, epim 225, pa 195. Metanotal median setae 30. Forewing, length 1300; distal width 150; sub-basal setae 30, 150, 180; number of duplicated cilia 20. Tergite IX setae B_1 360, B_2 420. Tube, length 345; basal width 120; terminal setae 270. Antennal segments III–VIII length, 135, 120, 100, 75, 50, 40.

Macropterous ♂. Colour and structure similar to ♀ but smaller, body length 2500, head length 270; postocellar setae 160.

SPECIMENS STUDIED

Holotype ♀, **Brazil**: S.P., Ribeirao Preto, FFCLRP Campus, in hollow twig of *Glyricidia,* 7.ix.1975 (*W. D. Hamilton*) (BMNH).

Paratypes. 9 ♀, 2 ♂ collected with holotype (BMNH).

COMMENTS. This belongs to the South American species-group of *Neosmerinthothrips* which includes *nigrisetis* and *variipes*, but is readily distinguished by its larger size with more slender antennae and tube, and the remarkably long postocellar setae. This new species was at first considered to represent a *Dichaetothrips*, but the presence of metathoracic sternopleural sutures as well as the structure of the pelta and short antennal sense cones indicate that it belongs in *Neosmerinthothrips*.

NESIDIOTHRIPS Mound

(Figs 134, 157, 174)

Nesidiothrips Mound, 1974*b*: 156–7. Type-species: *Nesothrips alius* Ananthakrishnan, by original designation.

This genus was erected for two species which have most characters similar to those of *Nesothrips* species, but with a pair of stout setae within the ocellar triangle (Fig. 134) and the females with a large foretarsal tooth.

Species included

alius (Ananthakrishnan, 1970: 52–5) (*Nesothrips*). Holotype ♀, India (TNA).
validus (Bagnall, 1921*a*: 272–3) (*Coenurothrips*). Holotype ♀, Seychelles (BMNH).

NESOTHRIPS Kirkaldy

(Figs 142–144, 159, 160, 167, 175–178)

Nesothrips Kirkaldy, 1907: 103. Type-species: *Nesothrips oahuensis* Kirkaldy, by monotypy.
Oedemothrips Bagnall, 1910*b*: 680. Type-species: *Oedemothrips laticeps* Bagnall, by monotypy. [Synonymised by Bianchi, 1944.]
Rhaebothrips Karny, 1913*c*: 128. Type-species: *Rhaebothrips lativentris* Karny, by monotypy. **Syn. n.**

Mound (1974*b*) discussed the relationship between *Nesothrips* and *Rhaebothrips* and gave keys to the world species of these two genera. At that time they were distinguished on the basis of the relatively short tube in *Nesothrips* and the relatively long and closely approximated ocellar setae in *Rhaebothrips*, but it was predicted that further studies on the Pacific fauna would erode these small differences. The new species described below from New Zealand further reduces the distance between the two groups and so they are here treated as one genus.

The type-species of *Rhaebothrips* is now found in most parts of the tropics, associated with coconut fronds and fruits, but it is almost certainly native to the Pacific area. This species, *lativentris*, is variable and has eight junior synonyms; like *nigrisetis* to which it is closely related, it has a relatively slender head and pale antennal segment III. A further Pacific species, *major*, is larger with dark antennae and even longer, more closely set ocellar setae. None of these species, in common with all the species described in *Nesothrips*, has a foretarsal tooth in the females. In contrast *leveri* from Fiji has a shorter head but long and close-set ocellar setae, and the female bears a foretarsal tooth. Moreover, three species from New Zealand described by Mound (1974*b*) have the head intermediate in length with the ocellar setae relatively far apart and arising between or behind the posterior ocelli (Fig. 144); one of these, *doulli*, has a foretarsal tooth in the female. Finally the new species *rangi*, described below, has the head even broader and more typically *Nesothrips*-like, but has long ocellar setae (Fig. 143). The head shape and length of the ocellar setae already exhibit a wide range in *Nesothrips* species (Figs 142–144).

Almost all the species of *Nesothrips* have well-developed metathoracic sternopleural sutures, although these are not present in *oahuensis* and *melinus* and are highly variable (from well-developed to absent) in *propinquus* (Mound & Walker, 1983). *Carientothrips* (q.v.) is closely related to *Nesothrips* and cannot be distinguished on any single character. *Campulothrips* with one species appears to be a specialised derivative of the *lativentris–major* species-group.

Species included

aoristus Mound, 1974*a*: 68. Holotype ♀, Australia (ANIC).
artocarpi (Moulton, 1942*b*: 14–5) (*Bolothrips*). Holotype ♀, Guam (BPBM).
brevicollis (Bagnall, 1914*b*: 29–30) (*Oedemothrips*). Holotype ♀, Japan (BMNH).
  minor Bagnall, 1921*a*: 287–8 (*Coenurothrips*). Holotype ♀, Rodrigues (BMNH).

formosensis Priesner, 1935*c*: 368–70 (*Neosmerinthothrips*). Lectotype ♀, TAIWAN (SMF).
formosensis var. *karnyi* Priesner, 1935*c*: 369–70. Lectotype ♀, JAVA (SMF).
carveri Mound, 1974*a*: 71. Holotype ♀, AUSTRALIA (ANIC).
doulli (Mound, 1974*b*: 171–3) (*Rhaebothrips*). Holotype ♀, NEW ZEALAND (BMNH). **Comb. n.**
eastopi (Mound, 1974*b*: 173–4) (*Rhaebothrips*). Holotype ♀, NEW ZEALAND (BMNH). **Comb. n.**
fodinae Mound, 1974*b*: 163–4. Holotype ♀, FIJI (BMNH).
hemidiscus Mound, 1974*a*: 71–2. Holotype ♀, AUSTRALIA (ANIC).
lativentris (Karny, 1913*c*: 129–30) (*Rhaebothrips*). Holotype ♂, TAIWAN (? lost). **Comb. n.**
claripennis Hood, 1919*b*: 90 (*Cryptothrips*). Holotype ♀, AUSTRALIA (USNM).
seychellensis Bagnall, 1921*a*: 274–6 (*Cryptothrips*). Lectotype ♂, SEYCHELLES (BMNH).
difficilis Bagnall, 1921*a*: 276 (*Cryptothrips*). Holotype ♀, SEYCHELLES (BMNH).
magnus Moulton, 1928*c*: 299 (*Cryptothrips*). Holotype ♀, TAIWAN (CAS).
yuasai Moulton, 1928*d*: 315 (*Gynaikothrips*). Holotype ♀, TAIWAN (CAS).
ipomoeae Ishida, 1932: 12–4 (*Machatothrips*). Holotype ♀, PONAPE (Hokkaido Univ.).
fuscus Moulton 1942*b*: 15–6 (*Rhaebothrips*). Holotype ♀, GUAM (BPBM).
australiensis Moulton, 1968: 118–9 (*Bolothrips*). Holotype ♀, LORD HOWE Is. (CAS).
leveri (Mound, 1974*b*: 175) (*Rhaebothrips*). Holotype ♀, FIJI (BMNH). **Comb. n.**
major (Bagnall, 1928: 75–6) (*Rhaebothrips*). Holotype ♂, SAMOA (lost).
malaccae Mound, 1974*b*: 164–6. Holotype ♀, WEST MALAYSIA (BMNH).
melinus Mound, 1974*a*: 72–3. Holotype ♀, AUSTRALIA (ANIC).
niger (Moulton & Steinweden, 1932: 167–8) (*Bolothrips*). Holotype ♀, MARQUESAS (BPBM).
nigrisetis (Sakimura, 1972: 400–2) (*Rhaebothrips*). Holotype ♂, FIJI (BPBM). **Comb. n.**
oahuensis Kirkaldy, 1907: 103. Syntype ♀, OAHU (? BPBM).
laticeps Bagnall, 1910*b*: 680–1 (*Oedemothrips*). Syntypes ♂ ♀, OAHU (BMNH).
hawaiiensis, lapsus for *oahuensis*, Bianchi, 1944: 31–8.
propinquus (Bagnall, 1916: 408–9) (*Oedemothrips*). Holotype ♀, AUSTRALIA (BMNH).
dimidiatus Hood, 1918*b*: 145–6 (*Cryptothrips*). Holotype ♀, AUSTRALIA (USNM).
cestosa Karny, 1920*c*: 41; 1921*b*: 33–6 (*Bagnalliella*). Holotype ♀, AUSTRALIA (NRS).
propinquus var. *breviceps* Bagnall, 1924: 634–5 (*Oedemothrips*). Syntypes ♀, NEW ZEALAND (BMNH).
propinquus f. *obscuricornis* Bagnall, 1924: 634. Types not designated.
oleriae Moulton, 1949: 492–4 (*Neosmerinthothrips*). Holotype ♀, SOUTH AFRICA (CAS).
similis Hartwig, 1948: 103–8 (*Bolothrips*). Holotype ♀, SOUTH AFRICA (NCIP).
rangi sp. n. Holotype ♂, NEW ZEALAND (NZAC).
rhizophorae (Girault, 1927: 2) (*Cryptothrips*). Syntypes ♂ ♀, AUSTRALIA (QMB).
semiflavus (Moulton, 1939: 147–8) (*Bolothrips*). Holotype ♀, RAPA (BPBM).
yanchepi Mound, 1974*a*: 75. Holotype ♀, AUSTRALIA (ANIC).
zondagi (Mound, 1974*b*: 176–7) (*Rhaebothrips*). Holotype ♀, NEW ZEALAND (NZAC). **Comb. n.**

Nesothrips rangi sp. n.

(Figs 143, 167, 178)

♀ macroptera. Body dark brown, head and tube darkest; legs dark, extreme apex of femora and base of tibiae yellow, foretibiae yellowish brown, all tarsi paler; antennae variable in colour, III yellow with apex more or less brown, IV yellow in basal half but sometimes light brown, V with pedicel yellow or uniformly brown, I and VI–VIII dark brown, II variably yellow at apex; forewings dark at base, weakly shaded distally; major setae dark brown.

Head almost as wide as long, weakly projecting in front, cheeks rounded, compound eyes not large (Fig. 143); ocelli present but rather small, ocellar setae arising between posterior ocelli and about as long as distance between their bases; postocular setae long and fine; stylets wide apart and retracted halfway into head; mouth cone broadly rounded. Antennae 8-segmented; VIII narrowed to base; VI–VII with constricted pedicels; III with 2 sense cones, IV with 4 sense cones (Fig. 167).

Pronotum transverse, weakly sculptured near posterior margin; all 5 pairs of major setae present but epimerals longest; praepectal plates well developed (Fig. 143); mesopraesternum broadly boat-shaped. Mesonotal lateral setae small. Metanotum not elongate (i.e. not fully macropteroid), median setae slender; sternopleural sutures elongate; anapleural sutures complete. Foretarsi with no tooth. Forewings parallel-sided with 3 sub-basal setae arising almost in a straight line. Pelta broad, rounded medially (Fig. 178); wing-retaining setae present on tergites II–VII, sigmoid only on IV–VI;

anterior tergites with lateral setae short; tergite IX setae more than half as long as tube; tube margins weakly convex in distal third.

Measurements (holotype ♀ in μm). Body length 2600. Head, length 270; median width 260; postocular setae 90; ocellar setae 60. Pronotum, length 170; median width 320; major setae – am 30, aa 35, ml 40, epim 110, pa 60. Forewing, length 1000; distal width 100; sub-basal setae 30, 65, 65; number of duplicated cilia 8(11). Tergite IX setae B_1 120; B_2 120; B_3 160. Tube, length 220; basal width 95. Antennal segments III–VIII length 105, 100, 78, 70, 50, 35.

♀ microptera. Colour and structure very similar to macroptera, body size a little smaller; meso- and metanota slightly more transverse; forewing lobe length 150.

♂ microptera. Colour similar to ♀; usually small in size but variable due to allometry; small ♂ similar to ♀ but with foretarsal tooth present and weak median thickening on pronotum; large ♂ with head and pronotum more elongate, epimeral setae stout and posteroangular setae long and fine, forefemora greatly swollen, tarsal tooth large.

Measurements (small and large paratype ♂ collected with holotype in μm). Body length 1800 (2100). Head, length 225 (260). Pronotum, length 160 (200); major setae – epim 75 (75), pa 52 (90). Tube length 180 (195).

SPECIMENS STUDIED

Holotype ♀ macroptera, **New Zealand**: South Island, 5 ml south of Blenheim, Taylors Pass, at base of *Juncus* in seepage by roadside, 7.ii.1979 (*L. A. Mound* 1418) (NZAC).

Paratypes (8 ♀ mac., 29 ♀, 6 ♂ mic.). **New Zealand**. South Island: 1 ♀ mac, 4 ♀ mic, 2 ♂ collected with holotype; 1 ♀ mac, 7 ♀ mic, 1 ♂, also 1 ♀ mac, 5 ♀ mic collected at two similar sites about 10 miles south of holotype locality (*L. A. Mound* 1422; *A. K. Walker* 56); Nelson, Lee Valley, 1 ♀ hemimac, 1 ♂ on *Juncus*, 22.iii.1977 (*A. K. Walker*); Nelson, Rough Is., 1 ♀ mac, 1 ♀ mic on grass, 24.i.1976 (*A. K. Walker*); St Arnaud, Lake Rotoiti, 1 ♀ mac, 6 ♀ mic, 1 ♂ swept from swampy grassland, 9.xii.1980 (*A. K. Walker*); 10 ml north of Reefton, 1 ♀ on *Juncus*, 6.ii.1979 (*L. A. Mound* 1409); Beaumont, 1 ♀ at roadside, 17.ii.1976 (*G. W. Ramsay*); Invercargill, 3 ♀ mac, 1 ♀ mic on *Juncus*, 15–17.iii.1977 (*A. K. Walker*). North Island: Whakatane, 1 ♀ mic, 18.x.1978; 10 ml north of Helensville, 1 ♀, 1 ♂ in *Cotula* swamp, 23.ix.1973 (*B. A. Holloway*) (NZAC & BMNH).

COMMENTS. This new species bears some resemblance to *rhizophorae* Girault from Australia (Mound, 1974*a*) but has the head much less narrowed to the base, the forewings pale, and the mid and hind femora not yellow on the distal posterior margins. It appears to be closely related to the other New Zealand species which were originally described in *Rhaebothrips*, but unlike all of them has the median antennal segments more or less yellow basally. The species is evidently associated with damp grassland rather than native woodland in New Zealand, but unfortunately no attempt was made to identify the *Juncus* species on which it was collected to determine whether or not this was itself native. Micropterae, as opposed to apterae, are not common in Diceratothripina; one female paratype is hemimacropterous with the wing lobe extending to tergite II and bearing fringe cilia.

PHACOTHRIPS Mound

(Figs 141, 158, 166, 186)

Phacothrips Mound, 1974*b*: 170. Type-species: *Gastrothrips ocelloides* Hood, by monotypy.

The single species in this genus is difficult to interpret. The body form, with its swollen tube (Fig. 158), elongate median sternites, and no forewing duplicated cilia, is similar to *Acallurothrips quadraticeps*. However, the mesopraesternum is well developed, antennal segment VIII slender and distinct from VII (Fig. 166) and the pelta (Fig. 186) similar to *Gastrothrips* species. Moreover, the head is unusual in bearing a pair of isolated 'ommatidia' on the cheeks (Fig. 141). Mound (1974*b*) interpreted the genus as being derived from *Neosmerinthothrips*, several species of which have very similar antennae and also a rather 'heavy' tube.

SPECIES INCLUDED

ocelloides (Hood, 1950: 9–12) (*Gastrothrips*). Holotype ♀, BRAZIL (USNM).

PSEUDOEURHYNCHOTHRIPS Moulton

Pseudoeurhynchothrips Moulton, 1949: 482–3. Type-species: *Pseudoeurhynchothrips bidens* Moulton, by monotypy.

This genus was based on a single crushed and distorted female specimen with the following characteristics: antennae 8-segmented, 2 sense cones on III, 4 on IV; eyes slightly reduced?; postocellar setae about as long as distance between 2 ocelli; stylets broad, wide apart in head?; praepectus present; mesopraesternum boat-shaped; metathoracic sternopleural sutures short; anapleural sutures complete; pronotal epimeral sutures complete; foretarsal tooth almost as long as tarsal width; pelta with short slender lateral wings; tergites II–VI with one pair of sigmoid wing-retaining setae; tube and setae on tergite IX long. This combination of characters is also found in *Dichaetothrips mameti* which is therefore also transferred to this genus. Only females of *mameti* are known; these have a smaller foretarsal tooth, and the postocellar setae arise in line with the hind margins of the posterior ocelli. A male labelled as part of the *mameti* type-series in the Paris Museum apparently represents *Ethirothrips stenomelas*. The genus *Pseudoeurhynchothrips* cannot be distinguished satisfactorily from *Nesothrips*, but is probably derived from *Neosmerinthothrips* through development of a straight-sided tube.

SPECIES INCLUDED
bidens Moulton, 1949: 483. Holotype ♀, SOUTH AFRICA (BMNH).
mameti (Priesner, 1951: 363) (*Dichaetothrips*). Holotype ♀, MAURITIUS (SMF). **Comb. n.**

SPOROTHRIPS Hood

(Figs 140, 147, 150, 170)

Sporothrips Hood, 1938*c*: 410. Type-species: *Adiaphorothrips amplus* Hood, by monotypy.

The single species in this genus could equally well be considered as an aberrant member of *Diceratothrips*. The similarities in body form are most evident between the females of the two genera, although males of *amplus* bear a similar sound-producing structure on the forecoxae to that found in *Diceratothrips* males. The metathoracic sternopleural sutures are very short in *amplus* (Fig. 150), but the anapleural sutures are long and curved, ending opposite a small tubercle, particularly in males. The antennal sense cones are short as in *Diceratothrips* species, but VIII is not broadly joined to VII (Fig. 170) and the anteocellar setae are stout (Fig. 140). In addition to a long foretarsal tooth the males have a long tubercle at the apex of the foretibiae (Fig. 147). Females simply have the inner apex of the foretarsi slightly prolonged. Specimens of *amplus* have been studied from Florida, Georgia and south Carolina (in BMNH).

SPECIES INCLUDED
amplus (Hood, 1925*a*: 221–2) (*Adiaphorothrips*). Holotype ♀, U.S.A.: Florida (USNM).

Genera of Macrothripina

This group was erected by Karny (1921*a*) as a subfamily to include seven genera of large thrips most of which are retained in the group in the present revision. Priesner (1961) did not use this group name, and he placed the nominate genus *Macrothrips* in his 'Elaphrothrips-group' of the Idolothripini. Macrothripina is used here for an apparently monophyletic group of 12 genera from the Old World tropics plus *Diplacothrips* from the Neotropics. All of the included species lack metathoracic sternopleural sutures in contrast to most Pygothripini. The area of greatest diversity of the subtribe is evidently South East Asia.

Within the Macrothripina two major genus-groups can be distinguished, the *Aesthesiothrips*- and *Ethirothrips*-groups. *Aesthesiothrips* (Fig. 200), *Polytrichothrips* (Fig. 195) and *Tarassothrips* (Fig. 196) all have long maxillary stylets which are close together medially, and antennal segment III shorter than IV (Figs 251–253). Moreover, *Dichaetothrips* (Fig. 199) and *Celidothrips* (Fig. 201), which resemble each other, as well as *Peltariothrips* (Fig. 194) and *Tarassothrips* (Fig. 196), in the presence of an ommatidium-like structure on each cheek, also have long stylets. *Aesthesiothrips, Peltariothrips, Tarassothrips* and some *Dichaetothrips* species have unusually long antennal sense-cones (Fig. 254). The pelta is unusually variable between species in this *Aesthesiothrips* genus-group, being particularly aberrant in *Peltariothrips* (Fig. 212), although in most Macrothripina it is either *Ethirothrips*-like or *Diaphorothrips*-like (Figs 228–234). Despite this structure, *Peltariothrips* appears to be intermediate between the *Aesthesiothrips* group and the *Ethirothrips* group in having the stylets further apart. Both genus-groups exhibit a tendency for a tubercle to be developed at the inner apex of the foretibia (Figs 220–221), this characteristic being variable within some genera.

The *Ethirothrips* genus-group includes many more species than the *Aesthesiothrips* group referred to above. *Ethirothrips* itself is a large, diverse genus from which *Herathrips* is a monobasic derivative with short stylets (Fig. 188). *Diaphorothrips* is another small derivative from this large genus in which the four species have stout ocellar setae and a sub-apical tubercle on the foretibiae. *Machatothrips* species are very similar to *Diaphorothrips* species in the form of the head and pelta, although the forefemora bear a series of tubercles in females usually (Figs 217–219). *Ischyrothrips* is used for a single species with forelegs like *Machatothrips*, but with short ocellar setae and the pelta similar to *Ethirothrips* species rather than *Diaphorothrips* species. Finally, small females of *Macrothrips* are essentially similar to *Diaphorothrips* species, although large males of *Macrothrips* are subject to allometric growth and develop large tubercles on the head and thorax (Fig. 206).

AESTHESIOTHRIPS Ananthakrishnan

(Figs 200, 216, 221, 238, 251)

Aesthesiothrips Ananthakrishnan, 1961*a*: 253. Type-species: *Aesthesiothrips jatrophae* Ananthakrishnan, by monotypy.

This monobasic genus, from India and Malaya, was redefined by Palmer & Mound (1978). It is similar to *Polytrichothrips* in having very long maxillary stylets which are close together in the middle of the head (Fig. 200), and in having antennal segment III shorter than IV (Fig. 251). However, the antennal sense cones are unusually long, as in *Tarassothrips* and some *Dichaetothrips* species but unlike *Polytrichothrips* (Fig. 243). The pelta is roughly triangular (Fig. 216) but recessed into the anterior margin of tergite II, and the foretibiae in both sexes bear a small apical tubercle (Fig. 221).

SPECIES INCLUDED

jatrophae Ananthakrishnan, 1961*a*: 253–4. Holotype ♀, INDIA (TNA).

CELIDOTHRIPS Priesner

(Figs 201, 215, 241)

Celidothrips Priesner, 1951: 361. Type-species: *Docessissophothrips adiaphorus* Karny, by monotypy.

Ommatidothrips Mound, 1970: 120–2. Type-species: *Ommatidothrips lawrencei* Mound, by monotypy. [Synonymised by Mound, 1974: 36.]

This genus was redefined with a key to the four known species by Mound (1974*a*). Since then several females from Singapore and Kuala Lumpur have been examined which may represent *adiaphorus* although the postocellar setae are relatively longer than the holotype and the tube relatively shorter. A single male from New Guinea also represents this genus and has the metanotum raised into a flange-like tubercle as in *dolichos* and *lawrencei.* Characterisation of species within the genus is at present unsatisfactory due to patterns of allometric growth and sexual dimorphism. The species resemble those placed in *Dichaetothrips* in having an isolated ommatidium-like structure behind the eye on each cheek (Fig. 201), although the pelta is different in structure (Fig. 215) and the antennal sense cones short (Fig. 241).

SPECIES INCLUDED

adiaphorus (Karny, 1923: 328–31) (*Docessissophothrips*). Holotype ♀, JAVA (SMF).

camelus (Karny, 1920*c*: 43) (*Adiaphorothrips*). Lectotype ♂, Australia (NRS).
dolichos (Hood, 1918*b*: 144) (*Cryptothrips*). Holotype ♂, Australia (USNM).
lawrencei (Mound, 1970: 122–3) (*Ommatidothrips*). Holotype ♀, Guadalcanal (BMNH).

DIAPHOROTHRIPS Karny

(Figs 205, 207, 208, 214, 220)

Diaphorothrips Karny, 1920*a*: 186. Type-species: *Diaphorothrips unguipes* Karny, by monotypy.
Diaphorothrips (*Cnemidothrips*) Priesner, 1940: 403. Type-species: *Diaphorothrips hamipes* Karny, by original designation.

Palmer & Mound (1978) redefined *Diaphorothrips* with a key to the three Oriental species, but Sakimura (1979) has described a further species from Fiji. A foretibial tubercle is present in both sexes arising sub-apically (Fig. 220), whereas only a few species in related genera have such a tubercle and in these it is apical in position. The unique holotype of *kraussi* has not been studied, but the other three species have a pair of pores on the metanotum, an unusual characteristic in the *Ethirothrips*-group of genera, although found in *E. brevis*, and the pelta is triangular with the lateral corners recurved (Fig. 214). The type-species *unguipes* has the anteocellar setae longer than the postocellars although the reverse is true in other members of the genus (Fig. 205). This is another example of the ineffectiveness of the lengths of the ocellar setae as indicators of relationship. Variation in length of these setae is discussed under the related genera *Ethirothrips* and *Dichaetothrips*, as well as under *Diceratothrips* and *Neosmerinthothrips* in the Diceratothripina.

Species included
clavipes Priesner, 1940: 403–5. Holotype ♀, Riau Is. (SMF).
hamipes Karny, 1923: 296–9. Syntype ♀, Java (SMF).
***kraussi** Sakimura, 1979: 313–5. Holotype ♀, Fiji (BPBM).
unguipes Karny, 1920*a*: 186–9. Syntype ♀, Sri Lanka (SMF).
    thevetii Ananthakrishnan, 1957: 101–2. Holotype ♀, India (TNA).
    spinosus Ananthakrishnan, 1959: 321–2. Holotype ♀, India (TNA).

DICHAETOTHRIPS Hood

(Figs 199, 202, 225–227, 235, 236, 248, 254–256)

Dichaetothrips Hood, 1914: 164. Type-species: *Dichaetothrips brevicollis* Hood, by monotypy.

This genus has had a confused nomenclatural history, although the solitary female specimen from Guyana on which it was based does not appear to have been studied by any subsequent author. The generic name is derived from a pair of large postocellar setae, as figured in the original description, and because of these setae *brevicollis* has been associated with a variety of other species in which the ocellar setae are more or less developed.

Stannard (1957) treated *Dichaetothrips* as a subgenus of *Diceratothrips*, but species of the latter genus can be distinguished by the presence of well-developed metathoracic sternopleural sutures. The unique holotype of *D. brevicollis* lacks these sutures as do all species of Macrothripina. Moreover, no other specimen which the present authors would accept as congeneric with *brevicollis* has been studied from the New World, whereas at least two species from South East Asia appear to be very closely related. Since *brevicollis* has not been collected again it seems possible that the original specimen may have been artificially introduced. However, *Diplacothrips*, with two species from South America, is closely related to *Dichaetothrips*.

The holotype of *brevicollis* has a most unusual D-shaped pelta (Fig. 226), and despite its size and well developed wings the tergal wing-retaining setae are straight (Fig. 235). Moreover, antennal segments III–IV are unusually slender and slightly clubbed (Fig. 254), and the sense cones are elongate. Finally, there is an isolated, weakly developed ommatidium on the cheek just behind each eye. The Asian specimens here related to this species share these characters but do not have the elongate postocellar setae of *brevicollis* (Fig. 202). However, the length of the ocellar setae is variable in *Ethirothrips* (even within species, e.g. *stenomelas*), *Diaphorothrips* and *Diceratothrips*, and also varies between species in *Neosmerinthothrips*. The lack of elongate ocellar setae is therefore not accepted here as grounds for excluding these Asian species from *Dichaetothrips* and the genus is redefined as follows.

Large dark Pygothripini; head (Figs 199, 202) with cheeks almost parallel and straight, with a few pairs of stout setae and an isolated ommatidium-like structure behind each compound eye; maxillary stylets retracted almost to postocular setae, sub-parallel and about one-third of head width apart. Antennae (Fig. 256) 8-segmented, VIII slender and constricted at base; sense cones long and curved, 2 on III, 4 on IV; segment IV usually longer than III. Pronotum short but wide, anterior margin heavily thickened, anterior setae short; epimeral sutures complete; praepectus present, probasisternal plates large; mesopraesternum boat-shaped. Mesonotal lateral setae and metanotal median setae small. Metathoracic sternopleural sutures not developed. Foretarsal tooth present in both sexes. Wings, when present, broad with many duplicated cilia, sub-basal setae B_2 and B_3 elongate. Pelta occupying scarcely one-third of anterior margin of tergite II, without lateral lobes (Figs 225–227). Tergites II–VI with one pair of straight or weakly sigmoid wing-retaining setae (Figs 235–236); tube variable, sometimes exceptionally broad and heavy.

SPECIES INCLUDED

brevicollis Hood, 1914: 164–5. Holotype ♀, GUYANA (USNM).
okajimai sp. n. Holotype ♀, SINGAPORE (OCT).
secutor sp. n. Holotype ♀, THAILAND (OCT).

Dichaetothrips okajimai sp. n.

(Figs 202, 227, 236, 256)

Macropterous ♀. Colour dark brown, tube darkest, tarsi paler; median area of antennal segment III, also pedicels of IV–V, yellowish; forewing with apical fifth pale but extensively shaded along median margins and with one longitudinal dark line in basal two-thirds; major setae shaded (specimens all cleared).

With the characters in the generic definition. Head slightly constricted behind eyes (Fig. 202), ommatidium-like structure reduced or absent; postocular setae much longer than pronotal setae; postocellar setae small. Foretibia with a small but stout apical tubercle; foretarsal tooth long and curved. Pelta reticulate distally, apex constricted. Sternites IV–VI (VII in large individuals) with paired transverse areas of specialised sculpture (Fig. 236).

Measurements (holotype ♀ in μm). Body length 5500. Head, length 600; maximum width 340; postocular setae 240. Pronotum, length 250; width 540; major setae – am 40; aa 40; ml 40; epim 90; pa 130. Forewing, length 2200; distal width 200; sub-basal setae 30, 90, 150; number of duplicated cilia 36/39. Tergite IX setae, B_1 600; B_2 550; B_3 550. Tube, length 800; basal width 200; terminal setae 200. Antennal segments I–VIII length, 120; 100; 180; 200; 200; 150; 115; 115.

Macropterous ♂. Very similar to ♀ in colour and structure; sculptured areas on sternites IV–VII almost continuous medially.

Measurements (paratype ♂ in μm). Body length 3200. Head, length 570; postocular setae 240. Pronotum, length 270; width 570; major setae – epim 150; pa 180. Tube length 600.

SPECIMENS STUDIED

Holotype ♀, **Singapore**: Macritchie Park, on dead branches, 22.vii.1976 (*S. Okajima*) (OCT).
Paratypes. 2 ♀, 1 ♂ collected with holotype (OCT; 1 ♀ BMNH).

COMMENTS. This species differs from the other two members of the genus in the slight constriction of the head behind the eyes, and in the presence of sternal reticulate areas. Moreover the pronotal midlateral setae are shorter and the median antennal segments paler than in the other species. The tube is longer than the head in the type-series, but this is probably subject to allometric growth and may not be true of smaller specimens. Unlike *brevicollis* the foretibiae bear a stout apical tubercle.

Dichaetothrips secutor sp. n.

(Figs 199, 225, 255)

Macropterous ♀. Colour dark brown, extreme base of antennal segment III and all tarsi paler; tube black; major setae weakly shaded; forewing largely pale with two longitudinal dark lines (specimens all cleared).

Head similar to *brevicollis* but with postocellar setae short and stout (Fig. 199); one pair of ommatidia-like structures weakly developed on cheek just behind compound eyes. Antennal segment III asymmetrical (Fig. 255), otherwise similar to *okajimai*. Foretibiae with a small apical tubercle. Pelta (Fig. 225) and anapleural suture as in *brevicollis*; wing-retaining setae on tergites IV–VI straight and not directed mesad. Tube very heavy and tapering. Sternites without reticulate areas.

Measurements (holotype ♀ in μm). Body length 5400. Head, length 560; width 340; postocular setae 320. Pronotum, length 230; width 550; major setae – am 15; aa 75; ml 220; epim 320; pa 130. Mesonotal lateral setae 6. Metanotal median setae 65. Forewing, length 2300; distal width 240; sub-basal setae 60, 180, 180; number of duplicated cilia 50. Tergite IX setae B_1 500; B_2 450. Tube, length 570; basal width 250, terminal setae 200. Antennal segments III–VIII length, 175; 195; 185; 135; 95; 80.

SPECIMENS STUDIED

Holotype ♀, **Thailand**: North, Doi suthep, in dead leaves, 800 m, 7.viii.1976 (*S. Okajima*) (OCT).

Specimens excluded from type-series. **Thailand:** East, Chanta Buri, 1 ♀ mic. in dead leaves, 30.iii.1975 (*S. Yamaguchi*). **Laos:** Vang-Viong, 1 ♀ mac. in dead leaves, 21.iii.1975 (*S. Yamaguchi*). **West Malaysia:** Tanah Rata, 1 ♀ mic., 5.iii.1976 (*W. Suzuki*). **Japan:** Amami-ohshima, Hatsuno, 1 ♀ mic. in dead leaves, 4.vii.1972 (*S. Okajima*) (OCT).

COMMENTS. The four specimens listed above are excluded from the type-series for the following reasons. The macropterous female from Laos is slightly smaller than the holotype, with only one dark longitudinal line on the forewing, and with the ommatidium-like structure on the cheeks more evident; this is almost certainly conspecific with the *secutor* holotype. The micropterous female from Japan has larger setae (po 400 μm) but is also probably the same species. However, the micropterous female from Malaya has the tube rather shorter (500 μm) with the margins very slightly convex. This specimen has longer wing remnants and larger ocelli than the specimen from Japan. Finally the micropterous female from eastern Thailand is almost apterous and has the tube remarkably broad (length 390 μm; width 260) with the lateral tubercles distinctly more emergent. If this material all represents *secutor* then the range of variation, particularly of the tube, is remarkable. From *brevicollis* this species can be recognised by the tubercle on the foretibiae, and from *okajimai* by the head shape and antennal colour as well as the lack of sternal reticulate sculpture.

DIPLACOTHRIPS Hood **gen. rev.**

(Figs 197, 222, 239, 245)

Diplacothrips Hood, 1937*c*: 506–7. Type-species: *Diplacothrips borgmeieri* Hood, by monotypy.

This genus was treated by Stannard (1957) as a synonym of *Dichaetothrips* which was itself placed as a subgenus of *Diceratothrips*. In the course of the present studies *Diceratothrips* has been recognised as a genus of Neotropical species and placed in the Diceratothripina, all species of which have well developed metathoracic sternopleural sutures. *Diplacothrips* is here treated as a valid genus, very similar to *Dichaetothrips* but distinguished by short antennal sensoria (Fig. 245) and long preocellar setae (Fig. 197). Both species in the genus have the tube broadly conical (Fig. 239), both of them have a D-shaped pelta as in *Dichaetothrips* (Fig. 222), but neither of them have sternal reticulate areas. The generic definition of *Dichaetothrips* (q.v.) applies to *Diplacothrips* with the exceptions noted above. This is the only genus of Macrothripina endemic to the New World.

SPECIES INCLUDED

borgmeieri Hood, 1937*c*: 507–9. Holotype ♀, PERU (USNM).
piceus Hood, 1952*c*: 161–2. Holotype ♀, BRAZIL (USNM).

ETHIROTHRIPS Karny

(Figs 187, 189–193, 228–234, 244, 249, 250)

Liothrips (*Ethirothrips*) Karny, 1925: 133. Type-species: *Liothrips thomasseti* Bagnall (here regarded as a synonym of *Phlaeothrips stenomelas* Walker, 1859), by subsequent designation, Priesner, 1949: 129.

Scotothrips Priesner, 1939*a*: 75. Type-species: *Adiaphorothrips elephas* Karny, by original designation. **Syn. n.**

Paracryptothrips Moulton, 1944: 281. Type-species: *Paracryptothrips inermis* Moulton, by original designation. **Syn. n.**

Percipiothrips Ananthakrishnan, 1964*a*: 72. Type-species: *Mesothrips indicus* Bagnall, by monotypy. **Syn. n.**

Elaphridia Ananthakrishnan, 1964*a*: 90. Type-species: *Elaphrothrips agasthya* Ramakrishnan, by monotypy. **Syn. n.**

Eurynotothrips Moulton, 1968: 119. Type-species: *Eurynotothrips latapennis* Moulton, by monotypy. **Syn. n.**

Uredothrips Ananthakrishnan, 1969*a*: 184–5. Type-species: *Uredothrips indicus* Ananthakrishnan, by monotypy. **Syn. n.**

Decothrips Ananthakrishnan, 1969*a*: 182. Type-species: *Decothrips anacardii* Ananthakrishnan, by monotypy. **Syn. n.**

Mound (1974*a*: 45, 92) has indicated some of the problems of relationships between the species of *Ethirothrips*, although at that time they were treated under the names *Dichaetothrips* and *Scotothrips*. Unfortunately for nomenclatural stability, *Dichaetothrips* is now recognised as a small genus of highly aberrant large species with the pelta remarkably small and D-shaped (Figs 225–227) and the wing-retaining setae reduced (Fig. 235). The next available generic name is *Ethirothrips*, and the type-species of both this and *Scotothrips* are very similar. Mound (1974*a*) chose to distinguish between these two on the basis of the length of the postocellar setae, although it was indicated that these setae are variable in length. Re-examination of almost all the described species in this group, together with several undescribed species, has convinced the authors that there is at present no way in which genera, or even satisfactory species-groups, can be defined in this complex. As a result *Ethirothrips* is used here for a wide range of species in which the postocellar setae are usually short but sometimes long, the cheeks usually bear a few setae but these may be very reduced or as numerous and strong as in *Machatothrips* species, the cheeks are usually straight but vary from convex or even sinuate to being sharply constricted basally, and the pelta usually has weak lateral lobes but is sometimes broad and entire. A foretarsal tooth is present in all males, but is absent in females of a few species; moreover in some species the foretibiae bear a small apical tubercle in one or both sexes. Thus, although apparently monophyletic, *Ethirothrips* is a diverse complex of species comprising a major element of the Old World Pygothripini. Generic relationships are discussed under Macrothripina.

Within *Ethirothrips* as treated here, the only species-group which is partially distinct is that represented by the name *Uredothrips*. This group includes *indicus, brevisetosus* and *tirumalaiensis* from India, together with *tibialis* from Japan and Malaya. These species have the eyes reduced in size and the maxillary stylets deeply retracted, but about one-third of the head width apart (Fig. 189). However, these characters do not distinguish the species sharply from *vitreipennis* from Africa (and India?), and *vitreipennis* cannot be distinguished at more than species level from *elephas*. Moreover, although *tibialis* and an undescribed species from Japan have a foretibial tubercle, this is not true of the three Indian species in *Uredothrips*, and although the tube is short and heavy in *indicus* but long in *brevisetosus*, it is intermediate in *tibialis* and *tirumalaiensis*. All these species have short ocellar setae.

Decothrips is available for a single species of the *Ethirothrips* group in which the head is deep and narrowed basally as in *brevis* (Fig. 193) but in which the metanotal pores are absent, the pelta broad and the antennae unusually slender (Fig. 244). This species seems to be at one end of the range of variation of *Ethirothrips*.

Elaphridia has been used for a single species *agasthya* (Figs 187, 228) and cannot be distinguished satisfactorily from other members of *Ethirothrips*. Contrary to Ananthakrishnan (1973*a*: 282) *agasthya* is not only unrelated to *crassiceps* Bagnall (now placed in *Dinothrips*), but neither of them are closely related to *Elaphrothrips*.

Percipiothrips was erected for a single species now in the *Ethirothrips*-group but at that time regarded as belonging in Phlaeothripinae. As Mound (1968: 82) has pointed out, the postocellar setae of the *indicus* syntypes range in size from 35 to 60 μm, and this species is very similar to *stenomelas* (Fig. 190), apart from the pale antennal III. Although *indicus* Ananthakrishnan now stands as a secondary homonym of *indicus* Bagnall, a new name is not proposed here pending further studies at species level into potential synonyms.

Scotothrips was used by Mound (1974*a*) for a group of species mainly from Australia with stout cheek setae (Figs 191, 192). Within this group *latapennis*, the type-species of *Eurynotothrips*, is particularly large, and *australiensis* has a particularly short, broad head (Fig. 192). However, the majority of species in this group cannot be distinguished readily from the Oriental members of *Ethirothrips*, although a foretibial tubercle is found in several Australian but in no Oriental species. The type-species *elephas* can be distinguished from *stenomelas* mainly by the broader, entire pelta which lacks lateral wings.

Paracryptothrips was erected for two species, of which the type-species has a complete suture between antennal segments VII and VIII, although these segments are broadly joined. Apart from this character, and the yellow legs, *inermis* is very similar to several Australian species previously treated in *Scotothrips*. The second species (*fijiensis*) which was described in *Paracryptothrips* has 7-segmented antennae with no suture between VII and VIII, but although the female holotype lacks a foretarsal tooth a male specimen (in BMNH) apparently representing this species has a slender tooth almost as long as the foretarsal width.

The type-species of *Ethirothrips* was treated as a synonym of *brevicornis* by Mound (1974*a*: 46). However, the unique holotype of *Phlaeothrips stenomelas* Walker (Figs 190, 234, 250) from Sri Lanka was discovered recently in the BMNH, mounted dry on a card. This specimen, in excellent condition, is now mounted in balsam on a microscope slide and is evidently the same species as *brevicornis* and *thomasseti*. This species is widespread in the Old World tropics and material has now been studied from Seychelles, Rodrigues, Mauritius, Madagascar, Sri Lanka, Singapore, Malaya, Thailand, Java, Philippines, Ryukyus, Bonins, Fiji, Samoa, Hawaii, New Guinea, Solomon Is. and Australia. Moreover, a female specimen in the Zoologisches Museum, Berlin, labelled 'Liothrips gigas' and 'New Britannien/Ralum/F. Dahl S' is here accepted as the holotype of *gigas* Karny and this is synonymised with *stenomelas*.

Another widespread species of which the name is changed in this paper is *claripennis*, here accepted as a junior synonym of *brevis*. Mound (1968) observed that the tube of the damaged unique holotype of *brevis* is heavily sculptured, but this is now interpreted as being an artefact due to excessive bleaching of this very crushed specimen. The form of the pelta and the presence of a pair of pores on the metanotum distinguish this species (Mound, 1974*b*: 177).

Chen (1980) also refers to a sculptured tube when describing a new species, *virgulae*, from Taiwan. Examination of a paratype of this species has revealed that this effect is also due to excessive bleaching and crushing in a water-soluble mountant. This sculpture, although an integral part of the structure of the tube, is not normally visible except in heavily bleached specimens. Mounting techniques of this sort are quite unsuitable for serious taxonomic work. The original illustration by Chen of *virgulae* indicates clearly the damaged condition of the paratype studied; the head is flattened and swollen medially and the pronotum distorted. Fortunately *virgulae* appears to be a common species extending from Taiwan along the Ryuku chain of islands.

Several names from India are now placed in synonymy under *obscurus*, and to these are here added *fungivorus* from the Congo and *neivei* from Cuba. This species has long postocellar setae and a small pelta with lateral wings (Fig. 233). In contrast, *uredinis*, which looks similar at first sight, has a broad pelta without lateral wings, similar to that of *firmus* (Fig. 229) and more typical of species previously referred to *Scotothrips*. Although *indicus* Bagnall is similar in general appearance to *obscurus*, it is unusual in having long antennal sense cones as in *Dichaetothrips* (Fig. 249).

SPECIES INCLUDED

acanthus (Hood, 1919*b*: 88–90) (*Cryptothrips*). Holotype ♀, AUSTRALIA (USNM). **Comb. n.**
    sjostedti Karny, 1920*c*: 42 (*Cryptothrips*). Holotype ♂, AUSTRALIA (NRS).
    sismondini Girault, 1926: 1 (*Adiaphorothrips*). Holotype ♀, AUSTRALIA (QMB).

nox Girault, 1928*a*: 2 (*Adiaphorothrips*). Holotype ♀, Australia (QMB).
differens Priesner, 1928*b*: 656–7 (*Adiaphorothrips*). Holotype ♀, Australia (SMF).
adventor (Bianchi, 1945: 259–60) (*Dichaetothrips*). Holotype ♀, New Caledonia (BPBM). **Comb. n.**
agasthya (Ramakrishna, 1934: 10–12) (*Elaphrothrips*). Syntypes ♀, India (TNA). **Comb. n.**
anacardii (Ananthakrishnan, 1969*a*: 182–4) (*Decothrips*). Syntypes ♂ ♀, India (TNA). **Comb. n.**
australiensis (Moulton, 1968: 95–6) (*Gastrothrips*). Holotype ♀, Australia (CAS). **Comb. n.**
barretti (Mound, 1974*a*: 94–7) (*Scotothrips*). Holotype ♀, Australia (ANIC). **Comb. n.**
beesoni (Moulton, 1928*e*: 5–6) (*Dichaetothrips*). Holotype ♀, India (CAS). **Comb. n.**
brevis (Bagnall, 1921*a*: 276–7) (*Adiaphorothrips*). Holotype ♂, Seychelles (BMNH). **Comb. n.**
claripennis Moulton, 1934: 503 (*Dichaetothrips*). Holotype ♀, Hawaii (CAS). **Syn. n.**
trinidadensis Hood, 1935*b*: 168–70 (*Gastrothrips*). Holotype ♀, Trinidad (USNM). **Syn. n.**
indicus Ananthakrishnan, 1968*c*: 967–9 (*Nesothrips*). Syntype ♂ ♀, India (TNA). **Syn. n.**
diversus Ananthakrishnan, 1972*b*: 434–6 (*Nesothrips*). Holotype ♀, India (TNA). **Syn. n.**
brevisetosus (Ananthakrishnan & Jagadish, 1970: 266–8) (*Diceratothrips*). Holotype ♀, India (TNA). **Comb. n.**
distasmus (Mound, 1974*a*: 97–8) (*Scotothrips*). Holotype ♀, Australia (ANIC). **Comb. n.**
dracon (Karny, 1920*c*: 43) (*Adiaphorothrips*). Holotype ♂, Australia (NRS). **Comb. n.**
elephas (Karny, 1920*c*: 43) (*Adiaphorothrips*). Lectotype ♀, Australia (NRS). **Comb. n.**
fijiensis (Moulton, 1944: 282–3) (*Paracryptothrips*). Holotype ♀, Fiji (BPBM). **Comb. n.**
****firmus*** (Hood, 1952*c*: 162) (*Gastrothrips*). Lectotype ♀, Brazil (USNM). **Comb. n.**
giraulti (Hood, 1918*b*: 148–9) (*Adiaphorothrips*). Holotype ♂, Australia (USNM). **Comb. n.**
hibisci (Moulton & Steinweden, 1933: 32–3) (*Neoheegeria*). Holotype ♀, Society Is. (BPBM). **Comb. n.**
longus Moulton, 1944: 297–300 (*Neoheegeria*). Holotype ♀, Fiji (BPBM).
latus fijiensis Moulton, 1944: 270–1 (*Cryptothrips*). Holotype ♂, Fiji (BPBM).
indicus (Ananthakrishnan, 1969*a*: 185) (*Uredothrips*). Syntype ♀ ♂, India (TNA). **Comb. n.**
indicus (Bagnall, 1921*b*: 365–6) (*Mesothrips*). Lectotype ♀, India (BMNH). **Comb. n.**
inermis (Moulton, 1944: 281–2) (*Paracryptothrips*). Holotype ♀, Fiji (BPBM). **Comb. n.**
io (Girault, 1926: 1) (*Adiaphorothrips*). Lectotype ♂, Australia (QMB). **Comb. n.**
latapennis (Moulton, 1968: 119–21) (*Eurynotothrips*). Holotype ♀, Australia (CAS). **Comb. n.**
longisetis (Ananthakrishnan & Jagadish, 1970: 268–9) (*Diceratothrips*). Holotype ♀, India (TNA). **Comb. n.**
madagascariensis (Bagnall, 1936: 220–1) (*Cryptothrips*). Holotype ♀, Madagascar (MNHN). **Comb. n.**
****meridionalis*** (Zur Strassen, 1976: 247) (*Diceratothrips*). Holotype ♀, St Helena (MRAC). **Comb. n.**
obscurus (Schmutz, 1913: 1074–6) (*Ischyrothrips*). Holotype ♀, Sri Lanka (NMV). **Comb. n.**
karnyi Bagnall, 1924: 639–40 (*Mesothrips*). Lectotype ♀, India (BMNH). **Syn. n.**
fungivorus Priesner, 1939*b*: 52–4 (*Dichaetothrips*). Syntypes ♀ ♂, Congo (SMF). **Syn. n.**
gloveri Ramakrishna & Margabandhu, 1939: 31–2 (*Neosmerinthothrips*). Lectotype ♀, India (TNA). **Syn. n.**
neivei Hood, 1940*a*: 576–9 (*Dichaetothrips*). Holotype ♀, Cuba (USNM). **Syn. n.**
usitatus Ananthakrishnan & Jagadish, 1970: 273–4 (*Diceratothrips*), replacement name for *indicus* Ananthakrishnan, 1961*b*: 270–1 (*Dichaetothrips*). Holotype ♀, India (TNA). **Syn. n.**
stenomelas (Walker, 1859: 224) (*Phlaeothrips*). Holotype ♀, Sri Lanka (BMNH). **Comb. n.**
brevicornis Bagnall, 1910*b*: 696–8 (*Diceratothrips*). Holotype ♂, Hawaii (BMNH). **Syn. n.**
niger Schmutz, 1913: 1080–4 (*Ischyrothrips*). Syntypes ♀ ♂, Sri Lanka (NMV). **Syn. n.**
gigas Karny, 1913*b*: 133–4 (*Liothrips*). Holotype ♀, New Britain (ZMB). **Syn. n.**
thomasseti Bagnall, 1921*a*: 288–9 (*Liothrips*). Lectotype ♀, Rodrigues (BMNH). **Syn. n.**
nigricornis Bagnall, 1921*a*: 278–9 (*Liothrips*). Lectotype ♀, Seychelles (BMNH). **Syn. n.**
intrepidus Bagnall, 1921*a*: 279 (*Liothrips*). Holotype ♀, Seychelles (BMNH). **Syn. n.**
setidens Moulton, 1928*a*: 129–30 (*Mesothrips*). Holotype ♀, Hawaii (BPBM). **Syn. n.**
niger Moulton & Steinweden, 1935: 165 (*Cryptothrips*). Holotype ♀, Marquesas Is. (BPBM). **Syn. n.**
madagascariensis Bagnall, 1936: 222. Holotype ♀, Madagascar (MNHN). **Syn. n.**
sybarita (Mound, 1974*a*: 100) (*Scotothrips*). Holotype ♀, Australia (ANIC). **Comb. n.**
tibialis (Okajima, 1975: 16–9) (*Uredothrips*). Holotype ♀, Ryuku Is. (OCT). **Comb. n.**
tirumalaiensis (Ananthakrishnan, 1969*b*: 298–9) (*Uredothrips*). Holotype ♀, India (TNA). **Comb. n.**
uredinis (Ananthakrishnan & Jagadish, 1970: 269–71) (*Diceratothrips*). Holotype ♀, India (TNA). **Comb. n.**
virgulae (Chen, 1980: 180–1) (*Scotothrips*). Holotype ♀, Taiwan (BCIQ). **Comb. n.**
vitreipennis (Priesner, 1939*b*: 54–5) (*Scotothrips*). Syntypes ♀, Congo (SMF). **Comb. n.**

SPECIES REMOVED TO PHLAEOTHRIPINAE
Teuchothrips burroughsi (Girault) (Mound, 1974*a*: 45) (*Dichaetothrips*).
Akainothrips pallicornis (Karny) (Palmer & Mound, 1978: 186) (*Adiaphorothrips*).

HERATHRIPS Mound

(Fig. 188)

Herathrips Mound, 1974*a*: 54. Type-species: *Adiaphorothrips nativus* Girault, by monotypy.

This genus was erected for a single large Australian species with a broad pronotum as in *Macrothrips*, but a small head with the stylets not deeply retracted (Fig. 188).

SPECIES INCLUDED
nativus (Girault, 1928*c*: 2) (*Adiaphorothrips*). Lectotype ♂, AUSTRALIA (QMB).

ISCHYROTHRIPS Schmutz

(Fig. 213)

Ischyrothrips Schmutz, 1913: 1074. Type-species: *Ischyrothrips crassus* Schmutz, by subsequent designation, Priesner, 1949: 134.

Of the four species described by Schmutz in this genus *obscurus* is placed in *Ethirothrips, spinosus* in *Dinothrips* and *niger* is a synonym of *Ethirothrips stenomelas*. The unique female holotype of *crassus* has very broad forefemora bearing 7 to 10 small tubercles on the inner margin and the foretibia is ridged on the inner surface. Although closely related to *Machatothrips* this genus can be distinguished by the absence of a pair of long ocellar setae, and the form of the pelta (Fig. 213, cf. Fig. 210).

SPECIES INCLUDED
crassus Schmutz, 1913: 1076–8. Holotype ♀, SRI LANKA (NMV).

MACHATOTHRIPS Bagnall

(Figs 203, 204, 210, 217–219, 237, 246, 247)

Machatothrips Bagnall, 1908*b*: 189. Type-species: *Machatothrips biuncinatus* Bagnall, by monotypy.
Adiaphorothrips Bagnall, 1909*c*: 536. Type-species: *Adiaphorothrips simplex* Bagnall, by original designation. [Synonymised by Priesner 1939: 75.]
Cnestrothrips Priesner, 1932: 344; 1939: 75. Type-species: *Cnestrothrips dammermani* Priesner, by original designation. [Synonymised by Palmer & Mound 1978.]

This genus was revised recently by Palmer & Mound (1978) with keys to 14 species. However, species recognition in the genus is exceptionally difficult and recently collected material in the collections of Dr Shuji Okajima indicates that it is still not possible to distinguish satisfactorily between intraspecific and interspecific variation in *Machatothrips*. In most species of this genus females rather than males bear the obvious sexually dimorphic characteristics; however, Palmer & Mound described two species from Malaya in which males share the female sex-linked character of a row of teeth on the fore femora. *Machatothrips* is closely related to *Diaphorothrips* and *Macrothrips*.

SPECIES INCLUDED
antennatus (Bagnall, 1915*b*: 594) (*Adiaphorothrips*). Lectotype ♀, BORNEO (BMNH).
    dammermani Priesner, 1932: 344 (*Cnestrothrips*). Holotype ♀, RIAU Is. (SMF).
artocarpi Moulton, 1928*c*: 322. Holotype ♀, TAIWAN (CAS).
biuncinatus Bagnall, 1908*b*: 189. Holotype ♀, NEW GUINEA (BMNH).
    simplex Bagnall, 1909*c*: 537 (*Adiaphorothrips*). Lectotype ♂, BORNEO (BMNH).
    montanus Priesner, 1932: 344. Holotype ♀, BORNEO: Sarawak (SMF).
braueri Karny, 1912*a*: 23. Holotype ♀, CAMEROUN (ZMB).
    braueri f. *karnyi* Priesner, 1932: 340. Holotype ♀, CONGO (? lost).
    multidens Bagnall, 1934*a*: 487. Lectotype ♀, GHANA (BMHN).
    paucidens Bagnall, 1934*a*: 489. Lectotype ♀, GHANA (BMNH).

paucidens var. *bicolorisetosus* Bagnall, 1934*a*: 489. Lectotype ♀, Sierra Leone (BMNH).
celosia Moulton, 1928*c*: 325. Holotype ♀, Taiwan (CAS).
corticosus Ananthakrishnan, 1972*c*: 443. Holotype ♀, India (TNA).
decorus Palmer & Mound, 1978: 193. Holotype ♀, West Malaysia (BMNH).
****diabolus*** (Priesner, 1928*c*: 56) (*Adiaphorothrips*). Holotype ♀, East Africa (lost).
haplodon Karny, 1925: 141. Holotype ♀, Uganda (BMNH).
braueri var. *buffai* Karny, 1925: 142. Holotype ♂, Uganda (BMNH).
simplicidens Bagnall, 1934*a*: 490. Holotype ♀, Congo (MNHN).
heveae Karny, 1921*c*: 61. Holotype ♀, Java (SMF).
indicus Ananthakrishnan & Jagadish, 1970: 279. Holotype ♀, India (TNA).
lentus Palmer & Mound, 1978: 194–5. Holotype ♀, West Malaysia (BMNH).
quadrudentatus Moulton, 1947*a*: 179. Holotype ♀, New Guinea (CAS).
silvaticus Ananthakrishnan, 1972*b*: 436. Holotype ♀, India (TNA).

MACROTHRIPS Bagnall

(Figs 206, 209, 240)

Macrothrips Bagnall, 1908*a*: 359. Type-species: *Macrothrips papuensis* Bagnall, by original designation.

As discussed by Palmer & Mound (1978) this genus is very close to *Machatothrips*. All the specimens which have been studied are here interpreted as representing a single variable species. The males vary in size very considerably, the largest being bigger than any other Thysanoptera. However, the available males do not vary greatly in structure; large and smaller individuals all have recurved tubercles on the forecoxae, the postero-median pronotal margin prolonged backwards, the antero-lateral pronotal margins slightly emarginate, and a pair of short stout setae on tubercles behind the eyes (Fig. 206). Females vary much less in size, but are structurally more variable. The forecoxae have at most a short straight tubercle and the forefemoral tubercle is absent in small individuals. In contrast to males, however, large females have a prominent pronotal epimeral tubercle, although this is not present in small females. The foretibial tubercles also seem remarkably variable; the 'typical' condition involves two short, acute tubercles, one apical, the other subapical. However, the following variants have been studied: 2 ♀ lacking subapical tubercles; 1 ♀ lacking subapical but with apical also reduced; 1 ♀ lacking apical tubercle but with subapical well developed.

Species included
papuensis Bagnall, 1908*a*: 359–60. Holotype ♂, Papua New Guinea (BMNH).
dubius Bagnall, 1908*a*: 361. Holotype ♀, Papua New Guinea (BMNH). **Syn. n.**
intermedius Bagnall, 1908*b*: 187–9. Holotype ? ♂, Papua New Guinea (? lost).

PELTARIOTHRIPS gen. n.

(Figs 194, 198, 212, 242)

Type-species: *Peltariothrips insolitus* sp. n.

Dark brown species of Macrothripina. Head slightly wider than long, narrowed to base; cheeks with 5–6 spine-like setae, also an ommatidium-like structure ventro-laterally in posterior third (Fig. 194). Two pairs of postocular setae (1 short, 1 long); postocellar and anteocellar setae short; maxillary stylets retracted to compound eyes, about one-third of head width apart. Antennae 7-segmented, suture between VII–VIII incomplete; III shorter than IV; sense cones long and slender, two on III, four on IV (Fig. 242). Pronotum short, epimeral sutures complete; epimeral setae long; praepectus small. Foretarsal tooth present in both sexes. Metanotal median setae slender; metathoracic sternopleural sutures absent. Forewings with 10 duplicated cilia. Pelta triangular but with posterior margin concave, anterior margin of tergite II protruding into pelta (Fig. 212); tergites II–VII with one pair of wing-retaining setae; tergite IX setae about 0·8 times as long as tube. Tube about as long as head, sides straight and tapering. Sternites with a transverse row of discal setae; median sternites of ♂ with a pair of reticulate (? glandular) areas laterally.

The type-species of this new genus is unusual in the Macrothripina in having antennal segments VII–VIII fused. Segment III is shorter than IV, with the sense cones long and slender (Fig. 242), but these characters are also found in *Aesthesiothrips* and *Tarassothrips*. The pelta is unique (even in the entire family Phlaeothripidae) (Fig. 212), although this structure is also unusual in the related genera *Dichaetothrips*, *Polytrichothrips* and one species of *Tarassothrips*. Moreover, a single specimen of a *Machatothrips* has been studied (in BMNH) from Singapore, which is generally similar to *M. antennatus* but has the pelta intermediate in structure between *Machatothrips* and *Peltariothrips*.

Peltariothrips insolitus sp. n.

Macropterous ♀. Colour dark brown, pterothorax and pelta paler, tube black with apex pale; antennal segment I whitish yellow, II–IV brownish yellow, V–VI brown distally; femora pale in distal half, foretibiae and all tarsi brownish yellow; major setae dark; forewings shaded, slightly paler medially but with a longitudinal dark line.

With the structural characters indicated in generic definition; head and median area of metanotum without sculpture; sub-basal wing setae short.

Measurements (holotype ♀ in μm). Body length 2515. Head, length 276, maximum width 310; basal width 240; postocular seta – inner 6/20, outer 38/52. Pronotum, length 150; width 348; major setae – am 26/40, aa 22, ml 28/38, epim 174, pa 26, pm 18. Metanotal median setae 46/56. Forewing, length 1055; median width 104; sub-basal setae 15, 40, 40; number of duplicated cilia 9/12. Tergite IX setae, B_1 210; B_2 200; B_3 200. Tube, length 270; basal width 124; terminal setae 120. Antennal segments III–VII length, 80; 96; 82, 65; 90.

Macropterous ♂. Similar to ♀ in colour and structure; mesothoracic spiracle slightly enlarged and toothed in profile; sternites III–V with a pair of reticulate areas anterolaterally.

Measurements (paratype ♂ in μm). Body length 2050. Head, length 234; maximum width 252; width at base 195; postocular setae – inner 12, outer 40. Pronotum, length 132; width 290; epimeral setae 60/88. Forewing, length 820; number of duplicated cilia 4. Tergite IX setae, B_1 195; B_2 210: B_3 210. Tube, length 200; basal width 98. Antennal segments III–VII length, 70, 75, 85, 50, 70.

Specimens studied

Holotype ♀, **Singapore:** Singapore City, on dead twigs, 15.i.1979 (*L. A. Mound*) (BMNH).

Paratypes. **Singapore:** 1 ♀, same data as holotype (BMNH); Macritchie Park, 2 ♀, 1 ♂ on dead *Areca*, 22.vii.1976 (*S. Okajima*) (OCT).

Specimens excluded from type-series. **Philippines:** Mindanao, Agko, Mt Apo, 57 ♀, 3 ♂ on *Alpinia* sheath, 2 ♀ on Palmae leaves, viii.1979; Luzon, Quezon National Forest Park, 9 ♀ on dead Palmae leaves, vii.1979 (*S. Okajima*) (OCT).

Comments. The sternal reticulate areas on the male of this species are similar in appearance to those found in *Dichaetothrips* and *Tarassothrips*. However, the production of the mesothoracic spiracle into a dentate structure is not found in any other genus of Macrothripina. Through the courtesy of Dr Shuji Okajima, several series of specimens have been studied from the Philippines which are very similar to the types of *insolitus*. The specimens from Mindanao are much larger than the types from Singapore and by themselves would certainly be regarded as a distinct species. However, the specimens from Luzon are intermediate in size and structure. Most of the Mindanao individuals were collected from *Alpinia* (Zingiberaceae), and the Luzon individuals from Palmae. Since the only two individuals from Palmae on Mindanao are themselves intermediate in size between the two main series (Fig. 198), the pattern of variation might reflect the existence of two or more host-limited or locality-limited species. The alternative interpretation is adopted here that only one, widely distributed and variable species is involved. One male from *Alpinia* on Mindanao is micropterous with the mesothoracic spiracular processes greatly enlarged.

POLYTRICHOTHRIPS Priesner

(Figs 195, 211, 243)

Polytrichothrips Priesner, 1939*a*: 77. Type-species: *Polytrichothrips pilosus* Priesner (here regarded as a synonym of *Docessissophothrips laticeps* Bagnall), by monotypy.

The only species in this genus lacks metathoracic sterno-pleural sutures, but unlike most Macrothripina, it has elongate maxillary stylets (Fig. 195). As in *Aesthesiothrips*, these stylets are very long, retracted to the eyes, and lie close together medially in the head; however, in contrast to that genus the antennae do not have greatly elongate sense cones (Fig. 243). The pelta, which is almost devoid of sculpture as is the metanotum, bears a pair of pores in the holotype of *pilosus* although these are not present in the holotype of *laticeps* (Fig. 211). The genus is known only from these two individuals which are here regarded as representing one species.

SPECIES INCLUDED

laticeps (Bagnall, 1915*a*: 322–3) (*Docessissophothrips*). Holotype ♀, BORNEO: Sarawak (BMNH). **Comb. n.**
pilosus Priesner, 1939*a*: 77–8. Holotype ♀, BORNEO: Sarawak (SMF). **Syn. n.**

TARASSOTHRIPS gen. n.

(Figs 196, 223, 224, 252, 253)

Type-species: *Tarassothrips akritus* sp. n.

Large, blackish brown species of Macrothripina. Head about 1·5 times as long as wide; cheeks with short spine-like setae, also, in anterior third, a pair of ommatidia-like structures; post ocular setae long, ocellar setae small; maxillary stylets deeply retracted and close together medially (Fig. 196). Antennae 8-segmented, III shorter than IV; sense cones long and slender, two on III, four on IV (Figs 252, 253). Pronotum short, epimeral sutures complete, posteroangular and epimeral setae long; praepectus present. Both sexes with forefemora enlarged, inner margin often rugose; foretibiae with inner apical tooth; foretarsal tooth well developed. Metanotal median setae small and slender. Forewings with two longitudinal dark bands and about 70 duplicated cilia. Pelta recessed into tergite II, either similar to *Diaphorothrips* and *Aesthesiothrips* or broadly rounded (Figs 223, 224). Tergites II–VI each with one pair of wing-retaining setae; setae on IX about 0·8 times as long as tube. Tube about 1·2 times as long as head, slightly constricted at apex. Sternites with transverse row of discal setae; median sternites of both sexes (usually) with paired reticulate areas anterolaterally.

This new genus is closely related to *Aesthesiothrips* but has a shorter head without long ocellar setae. It resembles *Celidothrips, Peltariothrips* and *Dichaetothrips* in having an ommatidium-like structure on each cheek, moreover some species of the last genus have similar reticulate areas on the sternites. Two species of *Tarassothrips* are known and these differ from each other in the form of the pelta (Figs 223, 224).

Tarassothrips akritus sp. n.

(Figs 196, 224, 253)

Macropterous ♀. Colour dark brown, antennal segment III and apex of tube paler. With the structural characters given in the generic definition; antennal III shorter than IV, major sense cones on IV about as long as that segment (Fig. 253), but three minor sense cones also present on dorsal surface. Head with one pair of anteocellar setae; post ocellar setae small (Fig. 196). Pelta triangular with narrow lateral lobes, recessed into anterior margin of tergite II (Fig. 224).

Measurements (holotype ♀ in μm). Body length 3900. Head, length 470; width 325; post ocular setae 96/114. Pronotum, length 200; width 438; major setae, am 46/50; aa 45/50; ml 58/90; epim 162/170; pa 176/185. Metanotal median setae 64. Forewing, length 1700; median width 136; sub-basal setae B_1 65; B_2 145; B_3 228. Tergite IX setae, B_1 460; B_2 488. Tube, length 556; basal width 142. Antennal segments III–VIII length, 124; 200; 194; 120; 95; 80.

Macropterous ♂. Colour and structure similar to ♀.

Measurements (paratype ♂ in μm). Body length 3350. Head length 438; width 276; postocular setae 110. Pronotum, length 180; width 380; major-setae, epim 148/168; pa 142. Tergite IX setae, B_1 396; B_2 420/430. Tube length 430; basal width 128. Antennal segments III–VIII length, 115; 156; 148; 100; 76; 68.

SPECIMENS STUDIED Holotype ♂, **Malaya:** Buklanyan, on dead branches, 26.xii.1971 (*Floyd Andre*) (BMNH).

Paratypes. **Malaya:** 1 ♀, same data as holotype; Kuala Lumpur, 2 ♂ on pods of 'Singapore', 27.xii.1969 (*R. G. & F. Andre*). **Singapore:** Macritchie Park, on dead twigs, 1 ♂, 11.viii.1980, 1 ♀, 19.viii.1980 (*L. A. Mound*) (BMNH).

COMMENTS. This new species is remarkable amongst Idolothripinae for the extreme length of the antennal sense cones. In the BMNH collections there is a single female on a slide without data which was acquired with the Andre Collection (Mound, 1974*c*) together with other material from Malaysia. Because of the lack of data this specimen is not formally named here, but it differs from *akritus* in its large size (body length 5800 μm), larger antennal segment III (III 266 μm: IV 286 μm), shorter sense cones (Fig. 252), absence of small dorsal sense cones on segment IV, broadly oval pelta (Fig. 223), and reduced foretarsal tooth. This specimen also has paired areas of specialised reticulation on the median sternites; however, the smallest female paratype of *akritus* (Macritchie Park) lacks these areas.

Tribe **IDOLOTHRIPINI**

Priesner (1961) and Jacot-Guillarmod (1978) recognised five subtribes in this group (Table 2). *Apelaunothrips* and *Dexiothrips* (Apelaunothripina) are here treated as Phlaeothripinae (p. 88) and Atractothripina is synonymised with Hystricothripina (= Zeugmatothripina). The genera listed by Priesner under the name Megathripina are here treated with *Idolothrips* in the Idolothripina. However, most of the genera listed by Priesner in Idolothripina are here treated in Hystricothripina. Moreover, the *Elaphrothrips*-group of Priesner is here considered as a subtribe although *Campulothrips, Macrothrips* and *Sporothrips* are re-assigned to the Pygothripini.

As a result, only three subtribes are now recognised, involving 33 genera and 277 species. The Hystricothripina (predominantly New World) and Idolothripina (predominantly Old World) are treated as sister-groups, on the grounds that they are the only members of the tribe with the tube hairy. These two probably constitute the sister-group of the Elaphrothripina, although this subtribe cannot be defined on any single characteristic. In fact, the Elaphrothripina show similarities to the Pygothripini in the plesiomorphic form of the anapleural sutures. Moreover, *Anactinothrips* has only one pair of sigmoid setae on each tergite as in all pygothripine species. None of the species in the Idolothripini has metathoracic sternopleural sutures developed, although these sutures are commonly found in species of Pygothripini with the exception of the Macrothripina.

Genera of Elaprothripina subtrib. n.

This group is used here in the same sense as that of the 'Elaphrothrips Gruppe' of Priesner (1961), although it is treated formally as a subtribe for the first time, and is restricted to 10 genera. The generic name *Hartwigia* q.v. was proposed for a new, monobasic subtribe by Stannard (1976), but this name was not constructed in accordance with the recommendations of the *Code of Zoological Nomenclature* and is not accepted here as being valid. The genus *Hartwigia*, however, is here treated within the *Elaphrothrips*-group for the first time. Species of Elaphrothripina, in contrast to those of the Idolothripina and Hystricothripina, do not have any dominant setae laterally on the tube (i.e. tube not hairy), and the anapleural sutures are much longer and stronger, completely separating the anepisterna from the katepisterna. The praepectal plates are well developed, the maxillary stylets widely spaced, the metathoracic sternopleural sutures not developed, and there are usually two pairs of wing-retaining setae on each tergite.

The majority of Elaphrothripina species are placed in *Elaphrothrips*, a widespread tropical genus which extends into the Nearctic. The species of *Anactinothrips*, a Neotropical genus, are unique in the Idolothripini in retaining the plesiomorphic character state of a single pair of wing-retaining setae on each tergite, and this genus may represent the sister-group of the rest of the Elaphrothripina. *Mecynothrips*, from the Austro–Oriental Region, has the remarkable apomorphic character state of three pairs of wing-retaining setae on each tergite, and may represent the sister-group of the other Old World genera of this subtribe. Finally, *Dinothrips* and *Tiarothrips* species share the apomorphic character state of the foreocellus just posterior to the major ocellar setae, in contrast to *Elaphrothrips* and its derivatives *Lamillothrips* and *Ophthalmothrips* which have the foreocellus arising far forward on the head. *Dermothrips* and *Malesiathrips* are also placed in this subtribe provisionally, although they do not appear to be closely related to the other genera.

ANACTINOTHRIPS Bagnall

(Figs 263, 295, 311)

Anactinothrips Bagnall, 1909*d*: 329. Type-species: *Anactinothrips meinerti* Bagnall, by monotypy.
Ophidothrips Schmutz, 1910: 273. Type-species: *Ophidothrips handlirschii* Schmutz, by monotypy.
Lophothrips Karny, 1911: 503. Type-species: *Lophothrips antennatus* Karny, by monotypy.

Both *Ophidothrips* and *Lophothrips* were placed as synonyms of *Anactinothrips* by Moulton (1933: 416), and this synonymy was retained by Stannard (1957). However, Jacot-Guillarmod (1978) listed the three genera separately. The syntype female of *antennatus* has been compared with the syntype male of *meinerti*, and these two specimens very probably represent the same species. In both of them, antennal segments V–VII bear a prominent apical lobe, and the rest of the body is very similar. These two species, together with *borgmeieri* and *silvicola*, have a relatively long tube, and there is no doubt that *Lophothrips* should be placed in synonymy with *Anactinothrips*. (The data on the *antennatus* holotype are 'Paraguay, leg. Fiebrig, 27.vii.05'.) In contrast, the tube of *distinguendus*, *longisetis* and *vigilans* is relatively short, as is that of *handlirschii* judging from the original illustration, but there appears to be no reason to use a separate generic name for these species.

Fifteen species are now placed in *Anactinothrips* but, since most of these have been collected only once and there is no knowledge of their structural variation, some synonymy is to be expected. These species are rather similar in general appearance to *Cyphothrips* in the Hystricothripina, with two pairs of stout setae on the vertex (Fig. 263), foretarsal tooth present in males but absent in females, metanotum with a pair of stout setae, metathorax rather bulbous laterally, and abdominal tergites with only one pair of wing-retaining setae (Fig. 295). However, in contrast to most Hystricothripina, the forewings are relatively broad, the praepectal plates are well developed, and the tube is relatively short without conspicuous hairs laterally. The similarities to Hystricothripina are here interpreted as being due to convergence, or more probably, parallel evolution if *Anactinothrips* is accepted as the sister-group of the other genera in Elaphrothripina. The males of *Anactinothrips* have a sharp angle on the posterior margin of the forefemora and a series of ridges on the forecoxae which are probably involved in sound production.

SPECIES INCLUDED
antennatus (Karny, 1911: 503) (*Lophothrips*). Syntypes ♂♀, PARAGUAY (ZMB).
borgmeieri Hood, 1950: 34–8. Holotype ♀, BRAZIL (USNM).
***brachyura** Hood, 1941: 227–230. Holotype ♀, PERU (USNM).
***cristatus** Hood, 1936*b*: 146–7. Holotype ♀, PERU (USNM).
distinguendus Bagnall, 1914*c*: 379–380. Holotype ♂, GUYANA (BMNH).
***fuscus** Moulton, 1933*a*: 418–9. Holotype ♂, BRAZIL (CAS).
gibbifer Zur Strassen, 1980: 48–53. Holotype ♀, BRAZIL (SMF).
***graphidura** Hood, 1938*d*: 245–7. Holotype ♀, PERU (USNM).
***handlirschii** (Schmutz, 1910: 273–276) (*Ophidothrips*). Syntypes ♀ ♂, ?BRAZIL (?lost).
longisetis Bagnall, 1926: 556–7. Holotype ♀, GUYANA (BMNH).
***marginipennis** Hood, 1941: 223–7. Holotype ♀, PERU (USNM).
meinerti Bagnall, 1909*d*: 330–2. Syntypes ♂♀, VENEZUELA (BMNH).
***nigricornis** Hood, 1936*b*: 143–6. Holotype ♀, GUYANA (USNM).
silvicola Hood, 1952*c*: 167–8. Holotype ♀, BRAZIL (USNM).
vigilans Hood, 1938*a*: 241–5. Holotype ♀, PERU (USNM).

DERMOTHRIPS Bagnall

(Figs 276, 281, 290, 300)

Dermothrips Bagnall, 1910*b*: 677–8. Type-species: *Dermothrips hawaiiensis* Bagnall, by monotypy.

The relationships of this monobasic genus are far from clear. It was placed in the Gastrothripina by Priesner (1961), but the metathoracic sternopleural sutures are not developed, and there are two sense cones on antennal segments III and IV (Fig. 290). One macroptera has been studied and this bears two pairs of wing-retaining setae on the median abdominal tergites. On the basis of these characters the genus is here provisionally referred to the Elaphrothripina. As in *Malesiathrips*, to which it is probably related, the metathoracic anapleural sutures appear to be long and complete (Fig. 281), but the basal antennal segments do not bear long setae. These two genera are not closely related to *Elaphrothrips* but may represent relicts associated with the evolution of the Hystricothripina.

SPECIES INCLUDED

hawaiiensis Bagnall, 1910*b*: 678–80. Lectotype ♀, MAUAI Is. (BMNH).

DINOTHRIPS Bagnall

(Figs 277–279, 298, 310)

Dinothrips Bagnall, 1908*b*: 190. Type-species: *Dinothrips sumatrensis* Bagnall, by monotypy.

Paxillothrips Ananthakrishnan, 1961*a*: 250. Type-species: *Paxillothrips longicauda* Ananthakrishnan, by monotypy. [Synonymised by Palmer & Mound, 1978: 166.]

The five species now recognized in this genus were revised recently by Palmer & Mound (1978) with a discussion of the patterns of variation and resultant complex synonymy. In both sexes the pelta is divided completely into three segments (Fig. 310); however the genus is usually recognised by the presence in males of a curiously expanded mesothoracic spiracular process (Fig. 278). Unfortunately, although typically forked in some species this process is simple in others, and is reduced or absent in small males (Fig. 279) as well as all females. *Dinothrips* species resemble short-bodied *Elaphrothrips* species in general appearance, but they share with *Tiarothrips* the apomorphic character state of having the foreocellus situated just posterior to the major ocellar setae (Fig. 277).

SPECIES INCLUDED

juglandis Moulton, 1933*b*: 6. Holotype ♂, INDIA (BMNH).
longicauda (Ananthakrishnan, 1961*a*: 250–3) (*Paxillothrips*). Holotype ♀, INDIA (TNA).
monodon Karny, 1920*b*: 204. Holotype ♂, PHILIPPINES (SMF).
spinosus (Schmutz, 1913: 1078) (*Ischyrothrips*). Holotype ♀, SRI LANKA (NMV).
    affinis Bagnall, 1915*c*: 270. Lectotype ♂, BORNEO (BMNH).
    crassiceps Bagnall, 1921*c*: 399 (*Dicaiothrips*). Holotype ♀, BURMA (BMNH).
    jacobsoni Karny, 1921: 283. Holotype ♂, JAVA (SMF).
    kemneri Karny, 1923: 294. Lectotype ♂, JAVA (SMF).
    anodon Karny, 1923: 295. Syntypes ♂ ♀, JAVA (unknown).
    gardneri Moulton, 1928*e*: 290. Holotype ♂, INDIA (CAS).
    malloti Moulton, 1933*b*: 6. Holotype ♂, INDIA (BMNH).
    celebensis Bagnall, 1934*a*: 485. Holotype ♂, SULAWESI (MNHN).
sumatrensis Bagnall, 1908*b*: 191. Lectotype ♂, SUMATRA (BMNH).
    furcifer Schmutz, 1913: 1026. Holotype ♂, SRI LANKA (?lost).
    fulmeki Priesner, 1959: 55. Holotype ♂, SUMATRA (SMF).

ELAPHROTHRIPS Buffa

(Figs 270–272, 282, 284–286, 293, 299, 307–309)

Elaphrothrips Buffa, 1909: 162–3. Type-species: *Idolothrips coniferarum* Pergande, by subsequent designation, Andre, 1940: 76.

Dicaiothrips Buffa, 1909: 169–70. Type-species: *Thrips schottii* Heeger, by subsequent designation, Bagnall, 1910: 370. [Synonymised by Hood, 1927: 238–9.]

Klinothrips Bagnall, 1918: 217–8. Type-species: *Klinothrips femoralis* Bagnall, by monotypy. [Synonymised by Priesner, 1952: 845.]

Elaphrothrips (*Elaphoxothrips*) Bagnall, 1932: 517. Type-species: *Kleothrips athletes* Karny, by monotypy.

Elaphridothrips Priesner, 1932: 320. Type-species: *Elaphridothrips andrapterus* Priesner, by monotypy. [Synonymised by Priesner, 1952: 861.]

Palinothrips Hood, 1952*c*: 168. Type-species: *Palinothrips palustris* Hood, by monotypy. **Syn. n.**

Elaphrothrips (*Paraclinothrips*) Priesner, 1952: 846. Type-species: *Elaphrothrips* (*Paraclinothrips*) *coniger* Priesner, by monotypy.

Elaphrothrips (*Cradothrips*) Ananthakrishnan, 1973*a*: 273. Type-species: *Elaphrothrips* (*Cradothrips*) *insignis* Ananthakrishnan, by monotypy.

Palmer & Mound (1978: 172) point out that *Elaphridia* is unrelated to *Elaphrothrips*, and the genus is here treated in the Pygothripini. *Elaphridothrips* was erected for a single apterous species with small eyes, reduced wing-retaining setae and a degenerate, transverse pelta. *Dicaiothrips* appears to have been erected for males, in contrast to the female characteristics stressed for *Elaphrothrips*. Bagnall erected *Elaphoxothrips* without discriminatory characters, adding 'should a subgeneric name appear desirable, I suggest . . .'. *Klinothrips* and *Paraclinothrips* were each proposed for single species with greatly enlarged forefemora in males (Fig. 285), but as the femora are subject to allometry, that is they are not enlarged in small males, the group names are of little significance. In contrast, *Cradothrips* was used for an Indian species, remarkable in this group, that has tuberculate femora in the females. Finally, *Palinothrips* was erected for a single species, taken from grasses in Brazil, which shows remarkable parallelism with the Old World *Ophthalmothrips* in that the eyes are prolonged ventrally (Fig. 270). However, this species has very stout cheek setae and is here interpreted as an aberrant species of *Elaphrothrips*.

More than 150 species-group names are available in *Elaphrothrips*, although 37 of these are listed below in synonymy. Much of this synonymy was established by Mound (1968) recognising sexual dimorphism and allometric variation, and by Palmer & Mound (1978) expanding the concept of polytypic species each with widespread distributions. Prior to these studies, many of the described species from the Oriental Region were known from single specimens or single collections, and further studies on new material from the Afrotropical Region will undoubtedly establish further synonymy. Hood (1955) and Hartwig (1948) have discussed some of the patterns of variation which occur in this genus. Antennal segment lengths, head and tube length, size of forelegs, also the pronotum and certain tubercles, are all subject to allometry, often being greatly enlarged in larger males. In contrast the postocular setae are sometimes smaller in larger individuals. This type of variation occurs within populations, but in addition different populations of a species can be expected to exhibit differences including different patterns of variation.

Elaphrothrips is the largest, most widespread, and probably the most diverse of the genera in the Idolothripinae. It is found throughout the tropics, although apparently replaced by *Mecynothrips* east of Sulawesi. There appear to be no essential differences between the species-groups found in South America, Africa and India which would enable geographically limited subgenera to be recognised. However, the pelta of several species in South America tends to have the anterior sculpture differentiated from the posterior sculpture (Fig. 307); this has not been reported in African and Oriental species. Africa is evidently the area of greatest diversity of the genus, with numerous species ranging in body form from the large elaborate males of *femoralis* to small, slender, almost featureless species on grasses. These latter species are very similar to small species of *Ophthalmothrips*, whereas *Lamillothrips* is evidently derived from the opposite extreme of the range of variation in *Elaphrothrips*. There appears to be no justification, neither practical nor theoretical, in subdividing this large genus at present.

SPECIES INCLUDED

acanthomerus Hood, 1941: 217–20. Holotype ♂, PERU (USNM).
***addendus** Priesner, 1928*c*: 59–60. Syntypes ♂, PARAGUAY (?lost).
***aethiopiae** Bagnall, 1936: 225–6. Holotype ♂, ? ETHIOPIA (MNHN).
affinis (Bagnall, 1908*b*: 213–4) (*Idolothrips*). Holotype ♀, NICARAGUA (BMNH).
    assimilis Bagnall, 1908*b*: 213 (*Idolothrips*). Holotype ♀, NICARAGUA (BMNH).
    distinctus Bagnall, 1910*a*: 378–9 (*Dicaiothrips*). Holotype ♂, NICARAGUA (BMNH).
***africanus** (Trybom, 1908: 16–7) (*Idolothrips*). Syntypes ♀, TANZANIA (unknown).
***albospinosus** Moulton, 1929*b*, 11–2. Holotype ♀, MEXICO (CAS).
amazonicus Johansen, 1978*b*: 95–7. Holotype ♀, PERU (BMNH).
***amoenus** Priesner, 1935*a*: 174, 241–2. Holotype ♂, NORTH VIETNAM (SMF).
andrapterus (Priesner, 1932: 321–2) (*Elaphridothrips*). Syntypes ♂, ZAIRE (MRAC).

angustatus (Bagnall, 1910*a*: 380–2) (*Idolothrips*). Holotype ♂, Venezuela (BMNH).
****angusticeps*** (Crawford, 1910: 168–70) (*Idolothrips*). Syntypes ♀ ♂, Mexico; Belize; Nicaragua; Cuba (?Canada D. of Agric.).
****angustifrons*** (Bergroth, 1888: xxx–xxxi) (*Phloeothrips*). ?Holotype, Brazil (?lost).
antennalis Bagnall, 1921*c*: 398. Holotype ♂, Japan (BMNH).
armatus (Hood, 1908*c*: 285–7) (*Idolothrips*). Lectotype ♀, U.S.A.: Illinois (USNM).
athletes (Karny, 1923: 355–8) (*Kleothrips*). Holotype ♂, Java (SMF).
aztecus Hood, 1941: 208–13. Holotype ♂, Mexico (USNM).
bagnallianus Priesner, 1952: 863. [Replacement name for *clarispinis* Bagnall nec Priesner, 1935.]
clarispinis Bagnall, 1935: 134–5. Holotype ♂, Zambia (BMNH).
bakeri (Karny, 1920*b*: 206–9) (*Dicaiothrips*). Holotype ♂, Philippines (SMF).
mentaweiensis Priesner, 1929*b*: 201–4. Holotype ♂, Mentawei Is. (SMF).
bakeri var. *depokensis* Priesner, 1935*a*: 159. Syntypes ♂ ♀, Java (SMF).
imitator Priesner, 1935*a*: 249–50. Holotype ♂, Java (SMF).
****bilineatus*** Priesner, 1933*c*: 152. Holotype ♂, Mexico (SMF).
blatchleyi Hood, 1938*c*: 410–3. Holotype ♀, U.S.A.: Florida (USNM).
borgmeieri Hood, 1955: 62–6. Holotype ♂, Brazil (USNM).
****bottegii*** (Buffa, 1909: 170) (*Dicaiothrips*). ?Holotype ♂, ?Africa (?lost).
brachypes Bagnall, 1934*a*: 495–7. Holotype ♂, East Africa (BMNH).
jeanneli Bagnall, 1935: 140–2. Holotype ♀, Kenya (BMNH).
brachyurus Bagnall, 1926: 555. Holotype ♀, South Africa (BMNH).
brasiliensis Johansen, 1978*b*: 104–5. Holotype ♂, Brazil (BMNH).
breviceps (Bagnall, 1921*c*: 399–400) (*Dicaiothrips*). Holotype ♀, Kenya (BMNH).
brevicornis (Bagnall, 1910*a*: 379–80) (*Dicaiothrips*). Holotype ♀, Venezuela (BMNH).
brunneipennis Bagnall, 1935: 130–2. Lectotype ♀, Sao Thomé (BMNH).
capensis Faure, 1942: 81–3. Holotype ♀, South Africa (NCIP).
****carayoni*** Bournier, 1971: 149–155. Holotype ♂, Central African Republic (MNHN).
****cognatograndis*** Johansen, 1976: 63–5. Holotype ♂, Mexico (UNAM).
congoensis Priesner, 1932: 334–5. Syntypes ♂ ♀, Zaire (MRAC).
conicurus Bagnall, 1934*a*: 497–8. Holotype ♀, Venezuela (MNHN).
coniferarum (Pergande, 1896: 63–4) (*Idolothrips*). Syntypes, U.S.A.: Washington, D.C. (USNM).
coniger Priesner, 1952*b*: 849–51 (subgenus *Paraclinothrips*). Holotype ♂, Guinea (MNHN).
f. *gynaecoides* Priesner, 1952*b*: 851–2. Holotype ♂, Guinea (MNHN).
constrictopeltatus Johansen, 1978*b*: 99–101. Holotype ♂, Peru (BMNH).
****coreanus*** Woo, 1974: 69–70. Holotype ♀, Korea (Seoul Univ.).
costalimai Hood, 1955: 57–60. Holotype ♂, Brazil (USNM).
curvipes Priesner, 1929*b*: 206–8. Syntype ♂, Mentawei Is. (SMF).
karnyi Priesner, 1935*a*: 246–7. Holotype ♀, Sumatra (SMF).
secus Ananthakrishnan, 1973*a*: 278. Holotype ♀, India (TNA).
dampfi Hood, 1940*b*: 500–4. Holotype ♀, Mexico (USMN).
decipiens Priesner, 1932: 331–3. Holotype ♂, Zaire (MNHN).
defectus Hood, 1941: 213–7. Holotype ♂, Peru (USNM).
denticollis (Bagnall, 1909*c*: 527) (*Dicaiothrips*). Holotype ♀, Nias (BMNH).
beesoni Ramakrishna, 1934: 7. Syntypes ♂ ♀, India (TNA).
mucronatus Priesner, 1935*a*: 167–8. Holotype ♂, Java (SMF).
sumbanus Priesner, 1935*a*: 169–70. Holotype ♂, Sumba (SMF).
productus Priesner, 1935*a*: 170–4. Holotype ♂, Sumba (SMF).
f. *obscuricornis* Priesner, 1935*a*: 171. Syntypes ♂ ♀, Sumba (SMF).
****devius*** Priesner, 1952*b*: 857–8. Holotype ♂, Cameroun (MNHN).
distans Bagnall, 1935: 132–4. Holotype ♀, Tanzania (BMNH).
****drepanatus*** (Priesner, 1927*c*: 82) (*Dicaiothrips*). Holotype ♂, Guinea (?lost).
drepanifer (Faure, 1925: 162–6) (*Dicaiothrips*). Holotype ♂, South Africa (NCIP).
edouardi Jacot-Guillarmod, 1939*b*: 46–52. Holotype ♂, South Africa (AMG).
falcatus (Karny, 1912*c*: 150–1) (*Dicaiothrips*). Syntypes ♂, West Africa (unknown).
****fallax*** Priesner, 1952*b*: 853–4. Holotype ♂, Cameroun (MNHN).
****faurei*** Jacot-Guillarmod, 1939*a*: 67–70. Holotype ♂, Mozambique (AMG).
femoralis (Bagnall, 1918: 218–9) (*Klinothrips*). Holotype ♂, Ghana (BMNH).
flavipes (Hood, 1908*a*: 377–8) (*Idolothrips*). Lectotype ♀, U.S.A.: Illinois (USNM).
foveicollis (Bagnall, 1908*b*: 214–5) (*Idolothrips*). Lectotype ♀, Guatemala (BMNH).

championi Bagnall, 1910*a*: 375 (*Dicaiothrips*). Holotype ♀, Guatemala (BMNH).

grandis Bagnall, 1910*a*: 373–4 (*Dicaiothrips*). Holotype ♂, Guatemala (BMNH).

fulmeki Priesner, 1935*a*: 242–3. Holotype ♂, Sumatra (SMF).

gaboniensis Bagnall, 1936: 224–5. Holotype ♀, Gabon (MNHN).

genaspinosus Moulton, 1928*b*: 245–7. Holotype ♀, Ethiopia (BMNH).

****gnidiicolus*** (Hesse, 1934: 434–440) (*Dicaiothrips*). Holotype ♂, South Africa (?lost).

***gracilis** Moulton, 1933*a*: 410–1. Holotype ♀, Brazil (CAS).

****gravis*** Priesner, 1952*b*: 852–3. Holotype ♀, Cameroun (MNHN).

greeni (Bagnall, 1914*b*: 289) (*Dicaiothrips*). Holotype ♂, Sri Lanka (BMNH).

bouvieri Vuillet, 1914: 276 (*Dicaiothrips*). Holotype ♂, India (BMNH).

micidus Ananthakrishnan, 1973*a*: 275–6. Holotype ♀, India (TNA).

****guachichilis*** Johansen, 1977*b*: 53–5. Holotype ♂, Mexico (UNAM).

****herricki*** Moulton, 1933*a*: 411–3. Holotype ♂, Peru (CAS).

impensus Morison, 1958: 595–7. Holotype ♀, Ethiopia (BMNH).

indagator Hood, 1936*d*: 436–40. Holotype ♂, Peru (USNM).

insignis Ananthakrishnan, 1973*a*: 273–5 (subgenus *Cradothrips*). Holotype ♀, India (TNA).

****insperatus*** Johansen, 1978*a*: 87–9. Holotype ♂, Mexico (UNAM).

****insularis*** Priesner, 1928*c*: 57–8. Holotype ♂, Java (lost).

jacobsoni Priesner, 1935*a*: 243–6. Holotype ♂, Sumatra (SMF).

jacotguillarmodi Johansen, 1978*b*: 101–4. Holotype ♂, Peru (BMNH).

laevicollis (Bagnall, 1910*a*: 375–6) (*Dicaiothrips*). Syntypes ♂ ♀, Venezuela (?lost).

laticeps Bagnall, 1935: 142–3. Holotype ♀, Tanzania (BMNH).

****laticornis*** Jacot-Guillarmod, 1941: 96–100. Holotype ♀, South Africa (AMG).

longiceps (Bagnall, 1908*b*: 211–3) (*Idolothrips*). Holotype ♂, Mexico (BMNH).

****longispinis*** Priesner, 1932: 329–30. Holotype ♂, Zaire (MRAC).

****mabirensis*** (Priesner, 1925: 308–9) (*Dicaiothrips*). Holotype ♀, Kenya (unknown).

****macateei*** Hood, 1955: 60–2. Holotype ♀, Brazil (USNM).

****madagascariensis*** Bagnall, 1935: 138–40. Holotype ♀, Madagascar (MNHN).

magnus Johansen, 1978*b*: 97–9. Holotype ♂, Peru (BMNH).

mahensis (Bagnall, 1921*a*: 283–4) (*Dicaiothrips*). Holotype ♂, Seychelles (BMNH).

rex Bagnall, 1921*a*: 281–3 (*Dicaiothrips*). Holotype ♂, Seychelles (BMNH).

hystrix Bagnall, 1921*a*: 284–6 (*Dicaiothrips*). Holotype ♀, Seychelles (BMNH).

malayensis (Bagnall, 1909*c*: 525) (*Dicaiothrips*). Holotype ♂, Nias (BMNH).

bruneitarsis Schmutz, 1913: 1070 (*Dicaiothrips*). Holotype ♂, Sri Lanka (NMV).

var. *levis* Schmutz, 1913: 1072 (*Dicaiothrips*). Holotype ♀, Sri Lanka (NMV).

coronatus Bagnall, 1934*b*: 631. Holotype ♀, Sri Lanka (BMNH).

maynei Priesner, 1932: 325–7. Syntypes ♂ ♀, Zaire (?MRAC).

medius Hartwig, 1948: 85–96. Holotype ♂, South Africa (NCIP).

microacanthomerus Johansen, 1978*b*: 105–7. Holotype ♀, Peru (BMNH).

****neodampfi*** Johansen, 1977*b*: 55–7. Holotype ♀, Mexico (UNAM).

****neoleonensis*** Johansen, 1977*b*: 51–3. Holotype ♂, Mexico (UNAM).

****neolongiceps*** Johansen, 1978*a*: 89–92. Holotype ♂, Mexico (UNAM).

****niger*** Jacot-Guillarmod, 1939*b*: 56–60. Holotype ♂, South Africa (AMG).

****nigricornis*** (Karny, 1912*c*: 139, 150) (*Idolothrips*). Syntypes ♀, Rio Muni (‘Spanish Guinea’) (SMF).

nigripes Jacot-Guillarmod, 1937: 28–31. Holotype ♂, Mozambique (AMG).

nitidus (Bagnall, 1910*a*: 372–3) (*Dicaiothrips*). Holotype ♂, Brazil (BMNH).

notabilis Ananthakrishnan, 1973*a*: 276–8. Holotype ♀, India (TNA).

****oculatoides*** Priesner, 1932: 333–4. Holotype ♂, Zaire (MRAC).

oculatus Moulton, 1928*b*: 243–5. Holotype ♀, Ethiopia (BMNH).

orangiae Jacot-Guillarmod, 1937: 31–4. Holotype ♀, South Africa (AMG).

palustris (Hood, 1952*c*: 168) (*Palinothrips*). Lectotype ♀, Brazil (USNM). **Comb. n.**

****paradampfi*** Johansen, 1977*b*: 57–9. Holotype ♀, Mexico (UNAM).

parallelus Hood, 1924: 315–7. Holotype ♀, U.S.A.: Florida (USNM).

****parvus*** Priesner, 1936*b*: 102. Holotype ♂, Sudan (SMF).

peruviensis Hood, 1936*d*: 443–6. Holotype ♂, Peru (USNM).

powelli Jacot-Guillarmod, 1937: 25–8. Holotype ♂, South Africa (AMG).

****priesneri*** Bagnall, 1926: 554. [Replacement name for *breviceps* Priesner, nec Bagnall.]

breviceps Priesner, 1921: 219 (*Dicaiothrips*). Syntypes ♂ ♀, Paraguay (ZMB).

procer (Schmutz, 1913: 1063) (*Dicaiothrips*). Holotype ♂, Sri Lanka (NMV).

novus Schmutz, 1913: 1066 (*Dicaiothrips*). Holotype ♂, Sri Lanka (NMV).
dallatorensis Schmutz, 1913: 1067 (*Dicaiothrips*). Holotype ♂, Sri Lanka (NMV).
proximus Bagnall, 1914*b*: 289 (*Dicaiothrips*). Holotype ♂, Sri Lanka (BMNH).
achaetus Bagnall, 1934*b*: 633. Holotype ♀, Sri Lanka (BMNH).
approximatus Bagnall, 1934*b*: 635. Holotype ♂, Sri Lanka (BMNH).
chandana Ramakrishna, 1934: 9. Holotype ♂, India (unknown).
eranthemi Seshadri & Ananthakrishnan, 1954: 224. Holotype ♂, India (TNA).
propinquus (Bagnall, 1910*a*: 377–8) (*Dicaiothrips*). Holotype ♂, Venezuela (BMNH).
****prospector*** Hood, 1936*d*: 440–3. Holotype ♂, Peru (USNM).
****schottii*** (Heeger, 1852*a*: 139) (*Thrips*). Holotype ♂, Brazil (?lost).
****schoutedeni*** Priesner, 1932: 327–9. Holotype ♀, Zaire (MRAC).
****schultzei*** Priesner, 1933*c*: 152. Holotype ♀, Mexico (ZMB).
sensitivus Priesner, 1929*b*: 204–6. Holotype ♂, Mentawei Is. (SMF).
****separatus*** Priesner, 1928*c*: 58–9. Holotype ♀, Tanzania (lost).
seychellensis (Bagnall, 1921*a*: 280) (*Dicaiothrips*). Holotype ♀, Seychelles (BMNH).
****snodgrassi*** Hood, 1955: 66–9. Holotype ♂, Brazil (USNM).
spiniceps Bagnall, 1932: 514. Holotype ♀, India (BMNH).
graveleyi Bagnall, 1934*b*: 628. Holotype ♀, India (BMNH).
clarispinis Priesner, 1935*a*: 247–9. Holotype ♂, Java (SMF).
spiniprivus Priesner, 1952*b*: 855–6. Holotype ♂, Malawi (BMNH).
spinosus Moulton, 1933*a*: 413–4. Holotype ♀, Colombia (CAS).
stenocephalus (Bagnall, 1914*b*: 288–9) (*Dicaiothrips*). Holotype ♂, Tanzania (BMNH).
nigrospinosus Bagnall, 1932: 515–6. Holotype ♂, Tanzania (BMNH).
atrispinus Bagnall, 1935: 135–7. Holotype ♂, East Africa (BMNH).
variispinis Bagnall, 1935: 137–8. Holotype ♀, Tanzania (BMNH).
****surinamensis*** Priesner, 1925: 306–8. Syntype ♀, Surinam (?SMF).
****tener*** Priesner, 1925: 305–6. Holotype ♂, Mexico (SMF).
****transvaalensis*** Jacot-Guillarmod, 1939*b*: 60–2. Holotype ♂, South Africa (AMG).
tuberculatus (Hood, 1908*c*: 287–9) (*Idolothrips*). Lectotype ♀, U.S.A.: Illinois (USNM).
unicolor Moulton, 1933*a*: 415–6. Holotype ♀, Brazil (CAS).
****uniformis*** Buffa, 1909: 164. ?Holotype ♀, Guinea-Bissau (?lost).
vittipennis Hood, 1940*a*: 579–83. Holotype ♂, U.S.A.: Arizona (USNM).
****zetetis*** Hood, 1936*d*: 432–6. Holotype ♂, Peru (USNM).

HARTWIGIA Faure

(Figs 268, 283, 294, 304)

Hartwigia Faure, 1949*b*: 208–10. Type-species: *Hartwigia tumiceps* Faure, by monotypy.

Faure compared this genus to *Docessissophothrips*, although the only known species has broad maxillary stylets (Fig. 268) and the antennae bear four sense cones on segment III. Priesner (1961) placed the genus in the Compsothripini, and Stannard (1976) erected a monobasic subtribe 'Hartwigia'. This family-group name is rejected here on the grounds that it is incorrectly formed. *Hartwigia* is recognised as related to *Elaphrothrips* because of the two pairs of wing-retaining setae on each tergite (Fig. 294) and the complete absence of metathoracic sternopleural sutures. The ant-like body form is not unlike that of some *Ophthalmothrips* species, and the fore femora of the males bear a group of stout setae on the external margin basally.

Species included
tumiceps Faure, 1949*b*: 210–2. Holotype ♂, South Africa (NCIP).

LAMILLOTHRIPS Bagnall

(Figs 275, 312)

Lamillothrips Bagnall, 1923: 630–1. Type-species: *Lamillothrips typicus* Bagnall, by monotypy.
Hylothrips Priesner, 1932: 336. Type-species: *Hylothrips aethiopicus* Priesner, by original designation. **Syn. n.**

The five African species which have been placed in these two genera remain very poorly known. There is no doubt that the species are congeneric, the male holotype of *vitulus* and a female paratype of *aethiopicus* having been compared with the type-material of Bagnall's three species. There is so little difference between these few available specimens that they may, in fact, represent only a single variable and widespread species. If this should prove to be so, then *Lamillothrips* itself may best be regarded as a synonym of *Elaphrothrips* in view of the few differences by which it may be distinguished. *Machatothrips*, to which *Lamillothrips* has previously been compared, belongs in the Macrothripina.

SPECIES INCLUDED
aethiopicus (Priesner, 1932: 337–9) (*Hylothrips*). Holotype ♂, CONGO (MRAC). **Comb. n.**
typicus Bagnall, 1923: 631. Lectotype ♂, GHANA (BMNH).
    pennicollis Bagnall, 1923: 631. Holotype ♂, GHANA (BMNH).
    longidens Bagnall, 1934*a*: 491–2 (*Machatothrips*). Holotype ♂, SIERRA LEONE (BMNH).
vitulus (Karny, 1920*a*: 109–111) (*Macrothrips*). Holotype ♂, CAMEROUN (SMF).

MALESIATHRIPS Palmer & Mound

(Figs 273, 274, 280, 291, 292, 296, 305)

Malesiathrips Palmer & Mound, 1978: 196. Type-species: *Malesiathrips malayensis* Palmer & Mound, by original designation.

This genus, with three species from the Oriental and Pacific Regions, appears to be closely related to *Dermothrips* from Hawaii. They differ in that *Malesiathrips* species bear a large seta on the dorsal surface of antennal segment II (Figs 291, 292) as in some species of Hystricothripina. The two genera are here included in the Elaphrothripina provisionally, because of their lack of metathoracic sternopleural sutures, and the presence of long, complete anapleural sutures (Fig. 280). Two species of *Malesiathrips* have two pairs of wing-retaining setae on each tergite (Fig. 296) although *solomoni* only has one pair.

SPECIES INCLUDED
guamensis Palmer & Mound, 1978: 196–8. Holotype ♀, GUAM (BMNH).
malayensis Palmer & Mound, 1978: 198–9. Holotype ♀, MALAYA (BMNH).
solomoni (Mound, 1970: 116–8) (*Atractothrips*). Holotype ♀, SOLOMON Is. (BMNH).

MECYNOTHRIPS Bagnall

(Figs 257–262, 287, 288, 297, 306)

Mecynothrips Bagnall, 1908*a*: 356. Type-species: *Mecynothrips wallacei* Bagnall, by monotypy.
Phoxothrips Karny, 1913*c*: 132. Type-species: *Phoxothrips pugilator* Karny, by monotypy.
Kleothrips Schmutz, 1913: 1057. Type-species: *Kleothrips gigans* Schmutz, by monotypy.
Dracothrips Bagnall, 1914*b*: 290. Type-species: *Dracothrips ceylonicus* Bagnall, by monotypy.
Acrothrips Karny, 1920*c*: 43. Type-species: *Acrothrips sorex* Karny, by monotypy.
Kleothrips (*Synkleothrips*) Priesner, 1935*a*: 330. Type-species: *Kleothrips* (*Synkleothrips*) *innocens* Priesner, by monotypy.
Kleothrips (*Akleothrips*) Priesner, 1935*a*: 332. Type-species: *Kleothrips* (*Akleothrips*) *karimonensis* Priesner, by original designation.

The generic synonymy listed above, also the structural variation shown by several species, has been discussed extensively by Palmer & Mound (1978: 200). The large number of names available has arisen because of earlier failures to recognise the variability of several species. The forefemora of large males, for example, often bear one or more large tubercles (Figs 287, 288), whereas the forefemora of small males of the same species are slender and lack tubercles. Similarly variable can be the position of the foreocellus (Figs 257–259), the form of the antennal setae, or even the number and position of the cheek setae on the head. Palmer & Mound (1978) recognised three species-groups in the genus: the *simplex*-group from East Africa to the Philippines and Japan; the *wallacei*-group from New Guinea, Australia and the Solomon Islands; and the *acanthus*-group from Java, Sumba and Australia. *Mecynothrips* is evidently closely related to *Elaphrothrips*, which it replaces in the Old World Tropics east of Sulawesi. However, the remarkable presence of three pairs of major tergal wing-retaining setae (the anterior pair arises, close to the tergal antecostal ridge) suggests that *Mecynothrips* is the phylogenetic sister-group of the other Old World Elaphrothripina (Fig 297).

SPECIES INCLUDED

acanthus (Hood, 1918*a*: 77) (*Kleothrips*). Holotype ♂, AUSTRALIA (USNM).
    serex Karny, 1920*c*: 43 (*Acrothrips*). Lectotype ♂, AUSTRALIA (SMF).
    gargantua Girault, 1926: 1 (*Acrothrips*). Lectotype ♂, AUSTRALIA (QMB).
    giganteus Girault, 1926: 4 (*Phoxothrips*). Holotype ♂, AUSTRALIA (QMB).
atratus (Hood, 1919*a*: 69) (*Kleothrips*). Holotype ♀, EAST AFRICA (USNM).
    zuluensis Jacot-Guillarmod, 1939*a*: 70 (*Kleothrips-Akleothrips*). Holotype ♂, SOUTH AFRICA (AMG).
goliath (Priesner, 1935*a*: 327) (*Kleothrips*). Holotype ♂, SUMBA (SMF).
hardyi (Priesner, 1928*b*: 657) (*Kleothrips*). Holotype ♀, AUSTRALIA (SMF).
***kanoi** (Takahashi, 1937: 343) (*Kleothrips*). Syntypes ♀, TAIWAN (unknown).
karimonensis (Priesner, 1935*a*: 332) (*Kleothrips-Akleothrips*). Holotype ♂, JAVA (SMF).
    f. *parvidens* Priesner, 1935*a*: 334. Lectotype ♂, JAVA (SMF).
kraussi Palmer & Mound, 1978: 205–6. Holotype ♂, SOLOMON Is. (BMNH).
lacerta (Priesner, 1935*a*: 329) (*Kleothrips*). Lectotype ♀, SUMBA (SMF).
    innocens Priesner, 1935*a*: 331 (*Kleothrips-Synkleothrips*). Holotype ♂, SUMBA (SMF).
priesneri Mound, 1971*b*: 281. Holotype ♂, NEW GUINEA (BPBM).
    minor Mound, 1971*b*: 282. Holotype ♂, NEW GUINEA (BPBM).
pugilator (Karny, 1913*c*: 132) (*Phoxothrips*). Holotype ♂, TAIWAN (unknown).
    takahashii Priesner, 1935*c*: 372 (*Elaphrothrips*). Holotype ♀, JAPAN (SMF).
simplex Bagnall, 1912: 216. Holotype ♂, PHILIPPINES (BMNH).
    gigans Schmutz, 1913: 1058 (*Kleothrips*). Syntypes ♂ ♀, SRI LANKA (NMV).
    ceylonicus Bagnall, 1914*b*: 290 (*Dracothrips*). Syntypes ♂, SRI LANKA (lost).
    agama Priesner, 1935*a*: 323 (*Kleothrips*). Holotype ♂, JAVA (SMF).
snodgrassi Hood, 1952*d*: 294. Holotype ♂, SOLOMON Is. (USNM).
taiwanus Okajima, 1979*b*: 127. Holotype ♂, TAIWAN (OCT).
wallacei Bagnall, 1908*a*: 357. Holotype ♂, NEW GUINEA (BMNH).
    magnus Girault, 1929: 1. Syntypes ♂, AUSTRALIA (QMB).
    bagnalli Priesner, 1935*a*: 335. Holotype ♀, KEI Is. (SMF).
    f. *imbecilla* Priesner, 1935*a*: 338. Syntypes ♂ ♀, KEI Is. (SMF).

OPHTHALMOTHRIPS Hood

(Figs 264–267, 289, 302, 303)

Ophthalmothrips Hood, 1919*a*: 67. Type-species: *Ophthalmothrips pomeroyi* Hood, by monotypy.
Pyrgothrips Karny, 1924: 35–6. Type-species: *Pyrgothrips conocephalus* Karny, by monotypy. **Syn. n.**
Fulgorothrips Faure, 1933: 62–3. Type-species: *Fulgorothrips priesneri* Faure, by monotypy. [Synonymised with *Pyrgothrips* by Mound, 1974*a*: 89.] **Syn. n.**
Derothrips Jacot-Guillarmod, 1940: 133. Type-species: *Derothrips amyae* Jacot-Guillarmod, by monotypy. **Syn. n.**

This genus has not been recognised since its original description, although both Mound (1974*a*) and Haga (1975) have given an account of several species under the name *Pyrgothrips*. The recognition of species within the genus remains problematical, due to structural variation related to sex, morph and size, and particularly due to the rarity with which species have been collected in series. For example, several series collected recently in eastern Africa did not include macropterae and micropterae together at any one site. Not only is the variation within species poorly understood at present, but the range of form produces difficulties in defining the genus itself. In the holotype of *pomeroyi,* as well as in two macropterae from Malawi and two from Lourenco Marques, the foreocellus clearly overhangs the bases of the antennae (Fig. 267). However, this is not usually true of macropterae identified as *priesneri* (Fig. 264). The pelta is characteristically triangular throughout the genus except for *amyae* in which it is broadly rounded as in *Bolothrips* species (Figs 302, 303). The species of *Ophthalmothrips* are all small, with rather slender bodies and the eyes prolonged ventrally (Figs 264–7). They apparently all live at the base of grass tussocks, and the genus appears to have been derived from small-bodied species of *Elaphrothrips* which have become specialised to this habitat. One undescribed species of *Elaphrothrips*, from grass tussocks in Tanzania, has been studied which has the general body form of *Ophthalmothrips* species but has small rounded eyes which are not prolonged ventrally. *O. amyae* is here interpreted as representing the extreme of a tendency within this group for the body to foreshorten, the head in particular being short and broad. The species *lesnei* (head production 103/50 to 60 μm) is very probably the same as *pomeroyi* (head production 110/57 μm). However, all the available names in the genus are listed separately below with no subjective synonymy in view of the differences of interpretation between Mound (1974*a*) and Haga (1975).

SPECIES INCLUDED
amyae (Jacot-Guillarmod, 1940: 135–8) (*Derothrips*). Holotype ♀, SOUTH AFRICA (AMG). **Comb. n.**
breviceps (Bagnall, 1914*c*: 380–1) (*Phoxothrips*). Holotype ♂, INDIA (BMNH). **Comb. n.**
conocephalus (Karny, 1924: 36) (*Pyrgothrips*). Holotype ♂, AUSTRALIA (NRS). **Comb. n.**
faurei (Ananthakrishnan, 1964*a*: 96) (*Fulgorothrips*). Holotype ♀, INDIA (TNA). **Comb. n.**
formosanus (Karny, 1913*c*: 130–1) (*Idolothrips*). Holotype ♀, TAIWAN (ZMB). **Comb. n.**
lesnei (Priesner, 1952*b*: 878) (*Fulgorothrips*). Holotype ♀, MOZAMBIQUE (MNHN). **Comb. n.**
longiceps (Haga, 1975: 270) (*Pyrgothrips*). Holotype ♀, JAPAN (MNHO). **Comb. n.**
miscanthicola (Haga, 1975: 273) (*Pyrgothrips*). Holotype ♀, JAPAN (MNHO). **Comb. n.**
pomeroyi Hood, 1919*a*: 67. Holotype ♀, EAST AFRICA (USNM).
priesneri (Faure, 1933: 63–5) (*Fulgorothrips*). Holotype ♂, SOUTH AFRICA (AMG). **Comb. n.**

TIAROTHRIPS Priesner

(Figs 269, 301)

Tiarothrips Priesner, 1935*a*: 251. Type-species: *Kleothrips subramanii* Ramakrishna, by monotypy.

The only species in this genus shares with *Dinothrips* (and some *Mecynothrips*) the position of the foreocellus just posterior to the major ocellar setae (Fig. 269). This may suggest that *Tiarothrips* and *Dinothrips* are sister-groups, and together constitute the sister-group of *Elaphrothrips, Lamillothrips* and *Ophthalmothrips*. The species *subramanii* is remarkable for the extreme allometry in the length of the preocular head process as well as the third antennal segment.

SPECIES INCLUDED
subramanii (Ramakrishna, 1925: 788) (*Kleothrips*). Holotype ♂, INDIA (? TNA).

Genera of Idolothripina

As used here, this group includes 10 genera and corresponds to the Megathripina of Priesner (1961) with the notable addition of *Meiothrips* and *Idolothrips*. The genus *Meiothrips* is closely related to *Bactrothrips*, females being allocated between these genera only with difficulty, and *Meiothrips* is also related to *Idolothrips*. Priesner, however, placed these genera with *Actinothrips* and related Neotropical genera with a slender body-form which are here treated in the Hystricothripina.

Males in the Idolothripina frequently bear tubercles (drepanae) laterally on the abdomen (Figs 324, 325). However, it must be emphasised that, despite this tendency, species lacking tubercles in the male are now known in both *Megathrips* and *Bactrothrips*. Similarly, the abdominal tube of Idolothripina species usually bears a number of distinct setae laterally (tube hairy), but these setae are sometimes decumbent or weakly developed. The metathoracic sternopleural sutures are not developed, as in the rest of the Idolothripini, but the metathoracic anapleural sutures (Fig. 327) tend to be shorter in the Idolothripina than in the Elaphrothripina and Hystricothripina.

Within the Idolothripina only one genus contains more than 10 species; this is *Bactrothrips* which is widespread throughout the Old World Tropics. *Megathrips* is a Holarctic derivative of

Bactrothrips from which it can only be distinguished by the superficial characteristic of the rather shorter head with maxillary stylets more deeply retracted (Fig. 321). Similarly, *Ceuthothrips* appears to be a Neotropical, monobasic, derivative of *Megathrips*. In contrast *Meiothrips* and *Idolothrips* are the eastern Oriental and Australian derivatives of *Bactrothrips*, and *Cylindrothrips* with one species from South Africa may also be related. *Bacillothrips* and *Megalothrips* appear quite distinct from the other genera in the Idolothripina (except possibly *Lasiothrips*) in having the maxillary stylets greatly elongate and close together in the middle of the head. These genera are normally regarded as Holarctic, but a new species of *Megalothrips* is described below from Malaya. However, elongation of the maxillary stylets is undoubtedly polyphyletic, possibly an adaptation to feeding on fungal spores in more confined situations. For example, the genus *Zeuglothrips* alone amongst the Hystricothripina has elongate stylets.

BACILLOTHRIPS Buffa

(Figs 315, 330)

Bacillothrips Buffa, 1908: 385–6. Type-species: *Bacillothrips linearis* (now regarded as a synonym of *Megalothrips longiceps* Reuter), by monotypy.

This genus is usually treated as monobasic, including just the Mediterranean species *longiceps*. However, the present authors consider that both *Megathrips nobilis* and *Docessissophothrips longiceps* should also be placed in *Bacillothrips*, and as a result the latter species is here renamed *bagnalli*. These three species have the head long and slender with the maxillary stylets deeply retracted and close together medially (Fig. 315). Moreover, the lateral lobes of the pelta are sharply cut off from the median lobe (Fig. 330), whereas these lateral lobes in *Megalothrips* species are more slender (Fig. 329). The metanotum of *longiceps* and *nobilis* has reticulate sculpture, whereas the sculpture on *bagnalli* is transverse. The head of *bagnalli* is clearly elevated in the mid line, although the heads of all three species appear to be essentially similar.

SPECIES INCLUDED

***bagnalli* nom. n.** for *longiceps* Bagnall not *longiceps* Reuter.
  longiceps Bagnall, 1916: 407–8 (*Docessissophothrips*). Holotype ♀, MADEIRA (BMNH).
longiceps (Reuter, 1901: 215–6) (*Megalothrips*). Syntypes ♂, CORFU (unknown).
  linearis Buffa, 1908: 386–7. Syntypes ♀ ♂, ITALY; SARDINIA (unknown).
nobilis (Bagnall, 1909*b*: 130–1) (*Megathrips*). Lectotype ♂, ENGLAND (BMNH). **Comb. n.**

BACTROTHRIPS Karny

(Figs 314, 316, 332, 333)

Bactrothrips Karny, 1912*c*: 131. Type-species: *Bactrothrips longiventris* Karny, by monotypy.
Eidothrips Bagnall, 1918: 219. Type-species: *Eidothrips alluaudi* Bagnall, by monotypy. **Syn. n.**
Krinothrips Bagnall, 1918: 220. Type-species: *Krinothrips divergens* Bagnall, by monotypy. [Synonymised by Bagnall, 1921.]
Bactridothrips Karny, 1919: 116. Type-species: *Bactridothrips idolomorphus* Karny, by monotypy. **Syn. n.**
Caudothrips Karny, 1921*a*: 230. Type-species: *Caudothrips buffai* Karny, by monotypy. **Syn. n.**
Bactrianothrips Bagnall, 1936: 226–7. Type-species: *Bactrianothrips alluaudi* Bagnall, by monotypy. [Synonymised by Bournier, 1968: 157.]
Cervothrips Bagnall, 1936: 229. Type-species: *Cervothrips berlandi* Bagnall, by monotypy. **Syn. n.**

This group of genera was treated as a subfamily by Karny (1919). However, all of the genera are recognisable only from secondary sexual characters of the male abdomen; none of them can be recognised in the female sex. The primary characteristic of *Bactrothrips* is the presence in the males of a pair of long tubercles laterally on the sixth abdominal segment. From this condition the other genera have been defined as follows.

Bactrianothrips. A pair of truncate tubercules on VI; however, in the unique male holotype it is evident that these represent the bases of broken long tubercles.

Cervothrips. Elongate tubercles on VI forked; however Bournier (1968) demonstrated that, in small males, one branch of the fork is scarcely developed. This suggests that the difference is of no more than specific value.

Eidothrips. Elongate tubercles on segments V and VI; only one species is known with this characteristic and, in view of the similarity of the females, there seems little advantage in segregating it to a separate genus.

Bactridothrips. Elongate tubercles on VI, also small tubercles on *either* or *both* of segments VII and VIII; this has been treated as a sub-genus by Bournier (1968) but in view of the variation it is not a useful segregate.

In addition to the variation indicated above, *Bactrothrips pitkini* sp. n. is described below from an apterous male *without any* abdominal tubercles. If the traditional generic concepts were accepted then *pitkini* would need to be placed in yet another new genus.

The spiracles of abdominal segment eight are elongate dorsoventrally in the males of *divergens* and *kenyensis* (Mound, 1968), but this is not true of the other available species. However, the validity of many species described from the African continent is in doubt, because so many are based on unique specimens or short series. Thus little or no account has been taken of allometric growth patterns in the abdominal tubercles of large and small males. Moreover, several species are based solely on females which cannot satisfactorily be associated with male specimens. Therefore, of the 39 available names in the genus, several are likely to be recognised as synonyms as soon as effective collecting is carried out. For this reason the homonymy of *alluaudi* Bagnall, 1918 with *alluaudi* Bagnall, 1936 is here allowed to stand until such time as the group can be re-examined comprehensively. It may not be entirely irrelevant to point out that the range of variation in the abdominal tubercles of male *Bactrothrips* species, as interpreted here, is no greater than that recognised in the *two species* of the genus *Idolothrips*.

The European species *buffai* and the Californian species *hesperus* are the only species placed in this genus from outside the Old World Tropics. These two species have rather shorter heads than the tropical species of *Bactrothrips*, and as a result the ocellar triangle is more nearly equiangular. However, the difference when measured is so slight that there seems no useful purpose in segregating the two species to separate genera. *Caudothrips* is therefore placed as a synonym of *Bactrothrips*. One unusual specimen has been studied from Japan with the eyes prolonged on the ventral surface of the head, a characteristic otherwise not found in *Bactrothrips* (although variable within *Ophthalmothrips* q.v. Elaphrothripina). The generic relationships of *Bactrothrips* are discussed under *Meiothrips* and *Idolothrips*.

SPECIES INCLUDED

alluaudi (Bagnall, 1918: 219–20) (*Eidothrips*). Lectotype ♂, KENYA (BMNH). **Comb. n.**
alluaudi (Bagnall, 1936: 227–8) (*Bactrianothrips*). Syntypes ♂ ♀, MADAGASCAR (MNHN: 2 ♀ BMNH).
aterrimus Priesner, 1936*a*: 213–4. Holotype ♂, UGANDA (BMNH).
****atrispinis*** Priesner, 1932: 220–1. Holotype ♀, ZAIRE (MRAC).
****bancoensis*** Priesner, 1952*b*: 867–8. Holotype ♀, IVORY COAST (MNHN).
berlandi (Bagnall, 1936: 229–30) (*Cervothrips*). Holotype ♂, CONGO (MNHN).
brevitubus Takahashi, 1935: 61–3. Holotype ♂, RYUKYU IS. (DART).
****bucculentus*** Bournier, 1968: 139–42. Holotype ♀, ANGOLA (MDA).
buffai (Karny, 1921*a*: 230) (*Caudothrips*). ITALY (types not designated). **Comb. n.**
    lesnei Bagnall, 1933*b*: 659–61 (*Megathrips*). Holotype ♂, ALGERIA (MNHN).
congoensis Priesner, 1932: 215–6. Syntypes ♂ ♀, ZAIRE (MRAC).
****delamarei*** Priesner, 1952*b*: 868–70. Holotype ♂, GUINEA (MNHN).
divergens (Bagnall, 1918: 220–1) (*Krinothrips*). Syntypes ♂ ♀, GHANA (BMNH).
    ritchianus Bagnall, 1932: 517–8 (*Actinothrips*). Holotype ♀, TANZANIA (BMNH).
****furcatus*** Priesner, 1932: 216–8. Syntypes ♂ ♀, ZAIRE (MRAC).
****grandis*** Priesner, 1932: 219–20. Holotype ♀, ZAIRE (MRAC).
****guineaensis*** Moulton, 1947*a*: 177–8. Holotype ♂, NEW GUINEA (CAS).
****guineensis*** Priesner, 1952*b*: 866–7. Holotype ♀, GUINEA (MNHN).
hesperus (Moulton, 1907: 65–6) (*Megalothrips*). Syntypes ♂ ♀, U.S.A.: California (CAS). **Comb. n.**
honoris (Bagnall, 1921*c*: 395) (*Megathrips*). Holotype ♂, JAPAN (BMNH). **Comb. n.**
****hoodi*** Bournier, 1968: 142–6. Holotype ♂, ANGOLA (MDA).
idolomorphus (Karny, 1919: 117–8) (*Bactridothrips*). Holotype ♂, MALAYA (SMF).
    serraticornis Bagnall, 1921*c*: 397 (*Bactridothrips*). Holotype ♂, SRI LANKA (BMNH).

****inermis*** (Karny, 1912*c*: 138–9) (*Panurothrips*). Syntypes (sex not stated), RIO MUNI ('Spanish Guinea') (unknown).
****kawamurai*** (Ishida, 1932: 2–3) (*Idolothrips*). Holotype ♀, JAPAN (unknown). **Comb. n.**
kenyensis Priesner, 1935*b*: 129–30. Syntypes ♂ ♀, KENYA (BMNH).
laingi Bagnall, 1926: 558 (*Bactridothrips*). Holotype ♂, SIERRA LEONE (BMNH).
  hargreavesi Bagnall, 1926: 555–6. (*Actinothrips*). Holotype ♀, SIERRA LEONE (BMNH).
****lamottei*** Priesner, 1952*b*: 870–1. Holotype ♂, GUINEA (MNHN).
****levidens*** Priesner, 1932: 218–9. Holotype ♂, ZAIRE (MRAC).
****longisetis*** Bournier, 1968: 154–7. Holotype ♀, ANGOLA (MDA).
****longiventris*** Karny, 1912*c*: 131–2. Holotype ♂, RIO MUNI ('Spanish Guinea') (ZMB).
luteus Ananthakrishnan, 1973*b*: 81–4. Holotype ♀, INDIA (TNA; 5 ♂ paratypes, BMNH).
****macropteryx*** (Trybom, 1910: 523–5) (*Megalothrips*). Holotype ♂, MADAGASCAR (MNHN).
malgassus Bournier, 1967: 1022–6. Holotype ♂, MADAGASCAR (MNHN; ♀ ♂ paratypes BMNH).
moultoni (Bagnall, 1932: 513–4) (*Bactridothrips*). Holotype ♂, SOUTH AFRICA (BMNH).
natalensis Moulton, 1930: 415–6. Holotype ♂, SOUTH AFRICA (BMNH).
nativus (Girault, 1928*c*: 2) (*Idolothrips*). Holotype ♂, AUSTRALIA (QMB).
****nigripes*** Priesner, 1932: 212–3. Holotype ♂, ZAIRE (MRAC).
****pallidicrus*** Priesner, 1952*b*: 871–2. Holotype ♀, CAMEROUN (MNHN).
***parvidens** Priesner, 1932: 213–4. Holotype ♂, ZAIRE (MRAC).
pitkini sp. n. Holotype ♂, TANZANIA (BMNH).
priesneri Bournier, 1967: 1018–22. Holotype ♂, MADAGASCAR (MNHN).
propinquus (Bagnall, 1936: 228–9) (*Bactridothrips*). Syntypes ♂ ♀, CONGO (MNHN & BMNH).
quadrituberculatus (Bagnall, 1908*b*: 210–1) (*Idolothrips*). Holotype ♀, JAPAN (BMNH).
****titschacki*** Bournier, 1968: 135–9. Holotype ♂, ANGOLA (MDA).

Bactrothrips pitkini sp. n.

(Figs 314, 333)

Apterous ♂. Colour dark brown; antennal segments not bicoloured, III–IV yellow, V–VIII slightly darker; distal half of tibiae, basal half of hind femora and all tarsi yellow.

Head more than twice as long as wide (Fig. 314); slightly prolonged in front of eyes; dorsal setae well developed, cheeks with a few fine setae; maxillary stylets wide apart, retracted into head about half way to posterior margin of eyes.

Pronotal epimeral sutures weak; anteroangular setae small. Median metanotal setae well developed. Pelta with lateral lobes narrowly joined to median lobe (Fig. 333). Abdominal tergites II–VIII with one pair of small wing-retaining setae (anterior pair reduced or straight); lateral abdominal tubercles not developed; tube surface smooth but set with fine setae, tapering more strongly at apex, about 4·0 times as long as broad; setae B_1 on tergite IX 0·25–0·30 as long as tube.

Measurements (holotype ♂ in μm). Body length 4225. Head, length 520, maximum breadth 220; interocellar setae 70/74; postocellar setae 68/72; postocular setae I 70/74; postocular setae II 133/138. Pronotum length 233; breadth 333; major setae, am 54/62, aa 23/25, ml 72, pa 108/114, epim 100/106. Median metanotal setae 117/131. Tergite IX setae B_1 126/157. Tube, length 527; maximum breadth 134. Antennal segments III–VIII length, 290/295; 214; 176/181; 138/142; 90; 71.

Apterous ♀. Colour and structure similar to male. Setae B_1 on tergite IX longer, almost 0·5 times as long as tube. Tube longer, 5·5 times as long as broad, and 1·4 times as long as head.

Measurements (paratype ♀ in μm). Body length 4540. Head, length 520; maximum breadth 230; interocellar setae 67/68; postocellar setae 58/62; postocular setae I 74/76; postocular setae II 148/150. Pronotum, length 224; breadth 342; major setae, am 70/72, aa 24/36, ml 92/104, pa 134, epim 126/130. Median metanotal setae 168/172. Tergite IX setae B_1 369/372. Tube, length 728; maximum breadth 134. Antennal segments III–VIII length, 276/285; 204/209; 171; 135/138; 95/100; 71/74.

Macropterous ♀. Structure similar to apterous female, colour slightly darker. Abdominal tergites II–VII with two pairs of wing-retaining setae, anterior pair small. Wings pale, with a pale brown median line in basal half and 3 or 4 stout sub-basal setae.

Measurements (paratype ♀ in μm). Body length 5365. Head, length 543; maximum breadth 238; interocellar setae 68/75; postocellar setae 60/66; postocular setae I 66/75; postocular setae II 160/168. Pronotum, length 248; breadth 370; major setae, am 105, aa 34/38, ml 110/126, pa 144/149, epim 158. Median metanotal setae 190. Forewings, length 1728/1746; maximum breadth 194; number of duplicated cilia 20/23. Tergite IX setae B_1 338/363. Tube, length 855; maximum breadth 143. Antennal segments III–VIII length, 309/314; 223/233; 185/190; 128/143; 90/95; 71/76.

SPECIMENS STUDIED

Holotype ♂ aptera, **Tanzania:** Pare Mountains, Gonja, in grass tussock at 1000 m, 16.vi.1974 (*B. R. Pitkin* 604) (BMNH).

Paratypes. 1 ♀ aptera taken with holotype; 1 ♀ macroptera with similar data, 13.vi.1974 (BMNH).

COMMENTS. This species is unique in the genus, not only in lacking lateral abdominal tubercles in the male, but also in the production of apterae. The apterae are smaller than the macroptera but retain well-developed ocelli. The metaepimera of the two morphs are essentially similar, but the tergal wing-retaining setae are reduced in the apterae. The lack of abdominal tubercles in the male, a characteristic which is usually diagnostic of this genus, finds a parallel in *Megathrips inermis* Priesner q.v. The description of *pitkini* includes separately the lengths of setae and antennal segments from the left and right hand sides of the body in order to emphasise the variation, and taxonomic problems associated with reliance on such characters.

CEUTHOTHRIPS Hood

(Figs 319, 328, 338)

Ceuthothrips Hood, 1938*c*: 406–7. Type-species: *Ceuthothrips timuqua* Hood, by monotypy.

This monobasic genus is known only from the type-series of six females and two males collected in Florida. The metathoracic sternite and epimera are typical of the Idolothripina, but, unlike other members of this group, both sexes bear a small foretarsal tooth. The head (Fig. 319) is similar to *Megathrips*, the pelta (Fig. 328) similar to *Megalothrips*, but the antennae have a curiously ill-formed, almost larval appearance (Fig. 338). The anterior pair of wing-retaining setae is not developed on the tergites, but this is probably a secondary reduction (as in *Megathrips*) associated with the evident reduction in length of the wings. *Ceuthothrips* is here considered to be a Neotropical derivative of the Holarctic genus *Megathrips*.

SPECIES INCLUDED

timuqua Hood, 1938*c*: 407–10. Holotype ♀, U.S.A.: Florida (USNM).

CYLINDROTHRIPS Moulton

(Figs 320, 335)

Cylindrothrips Moulton, 1949: 496. Type-species: *Cylindrothrips niger* Moulton, by monotypy.

This unusual monobasic genus was erected for a single male specimen collected in South Western Africa. However, the unique male holotype of *Derothrips turneri* Moulton from the same locality is here regarded as a larger specimen of the same species as *niger*. As first revisers, within the meaning of the *International Code of Zoological Nomenclature,* the present authors have placed *turneri* as a synonym of *niger* despite its page precedence. Moreover, the genus *Derothrips* is here treated as a synonym of *Ophthalmothrips* q.v.

The original illustrations of the heads and pronota of both *niger* and *turneri* are inaccurate, although both specimens are severely damaged. Despite these illustrations, the ocellar and postocular setae of the specimens are essentially similar, and the median setae on the vertex of *niger* have simply been removed in mounting. The main difference between the specimens lies in the structure of the tube. In *turneri* the base of the tube bears laterally and dorsally numerous stout teeth arising from the margins of each sculptured reticle, whereas in the much smaller *niger* only a very few, small teeth are developed. This difference is here interpreted as being an expression of allometric growth.

The genus *Cylindrothrips* is similar to *Lasiothrips, Megalothrips* and *Ceuthothrips* in having the pronotum transverse. However, unlike *Megalothrips* the pronotal midlateral setae are well separated from the anteroangulars, and moreover, the basal sculpture of the tube resembles that of *Idolothrips dissimilis* and *Meiothrips nepalensis*. The head (Fig. 320) and antennae of

Cylindrothrips niger are reminiscent of *Ophthalmothrips* species; however, the anapleural suture is short and the anterior border of the anepisternum almost entire as in the other members of the Idolothripina.

SPECIES INCLUDED
niger Moulton, 1949: 496–8. Holotype ♂, SOUTH WEST AFRICA (BMNH).
turneri Moulton, 1949: 494–6 (*Derothrips*). Holotype ♂, SOUTH WEST AFRICA (BMNH). **Syn. n.**

EGCHOCEPHALOTHRIPS Bagnall **gen. rev.**

Egchocephalothrips Bagnall, 1916: 408. Type-species: *Docessissophothrips monstrosus* Bagnall, by monotypy.

Although treated as a synonym of *Docessissophothrips* by Mound (1968), this genus is here accepted as valid. It is based on a single damaged specimen (?♀) which lacks the abdominal tube as well as the distal antennal segments. However, the metathoracic sternopleural sutures are not developed, the anapleural sutures are short and incomplete, the praepectus well developed, the maxillary stylets are deeply retracted and parallel medially in the head, the anteocellar pair of setae are elongate, the pelta has slender lateral wings, the median metanotal setae are very stout, the tergites have two pairs of wing-retaining setae with one or more additional setae directed mesad, and there are two sense cones on antennal segment III and four on segment IV. These characters are all shared with *Megalothrips*. The pronotum of the unique holotype is very short (correlating with the exceptional dorsal elevation of the head) and the fact that the pronotal sutures are complete may be due to cover-slip pressure. Both this genus and *Lasiothrips* (q.v.) may eventually prove to be synonyms of *Megalothrips*.

SPECIES INCLUDED
monstrosus (Bagnall, 1909*c*: 538–9) (*Docessissophothrips*). Holotype ?♀, NEW CALEDONIA (BMNH).

IDOLOTHRIPS Haliday

(Figs 317, 325, 334)

Idolothrips Haliday *in* Walker, 1852: 1096. Type-species: *Idolothrips marginatus* Haliday (now regarded as a synonym of *Idolothrips spectrum* Haliday), by subsequent designation, Bagnall, 1908: 356.
Acanthinothrips Bagnall, 1908: 207. Type-species: *Idolothrips spectrum* Haliday, by monotypy.

Froggatt (1904) demonstrated that the species *spectrum* Haliday is not only sexually dimorphic, but that the males exhibit a wide range of variation in the size and the number of the lateral tubercles and their setae depending on the overall body size. This variation is not always bilaterally symmetrical (Mound, 1968: fig. 55), and is complicated by the fact that long tubercles bear short stout setae whereas short tubercles bear long slender setae. This variation is reflected in the number of available names for *spectrum*.

The two species currently placed in *Idolothrips* are both known only from Australia (Mound, 1974*a*). However, the females of these species, also the head and thorax of the males, are very similar to species of *Meiothrips* and *Bactrothrips*, and no reliable characters for distinguishing between these genera have been found apart from those given in the key. The base of the tube in male *I. dissimilis* is similar to that of *Meiothrips nepalensis* in having a paired row of recurved tubercles dorsally and numerous small teeth laterally (Fig. 325), and the relationships of these genera are further discussed under *Meiothrips*. The tube of male *Cylindrothrips* is also similar but shorter.

Jacot-Guillarmod (1978) retains *halidayi* Newman, 1855 under *Idolothrips*; however, this species would be known more conveniently as *Gigantothrips halidayi* (Newman) **comb. n.** (Phlaeothripinae). The two species currently remaining in *Idolothrips* have been keyed by Mound (1974*a*).

SPECIES INCLUDED
dissimilis Girault, 1927*a*: 2. Holotype ♂, AUSTRALIA: Queensland (QMB).
spectrum Haliday *in* Walker, 1852: 1097. ? Syntypes ♂, NEW HOLLAND (depository unknown).

marginata Haliday *in* Walker, 1852: 1097. ? Syntypes ♂, NEW HOLLAND (depository unknown).
lacertina Haliday *in* Walker, 1852: 1097. ? Syntypes ♂, NEW HOLLAND (depository unknown).
marginatus f. invalida Priesner, 1928: 654. ? Syntypes ♂, AUSTRALIA: Queensland (SMF).
lacertinus f. *infirma* Priesner, 1928: 654. ? Syntypes ♂, AUSTRALIA: Queensland (SMF).
terrigena Girault, 1928*c*: 2 ? Syntypes ♂, AUSTRALIA: Queensland (QMB).
fasciatipennis Girault, 1930: 1. ? Syntypes (? ♂, sex not stated), AUSTRALIA: Queensland (QMB).
kellyanus Bagnall, 1932: 518–9. Holotype ♀, AUSTRALIA: South Australia (BMNH).

LASIOTHRIPS Moulton

(Fig. 322)

Lasiothrips Moulton, 1968: 121. Type-species: *Lasiothrips perplexus* Moulton, by monotypy.

This monobasic genus is based on a single male specimen from Australia. The maxillary stylets of this specimen are about one-third of the head width apart medially (Fig. 322), but since they are extended beyond the mouth cone by at least 100 μm it is possible that when at rest they might lie close together. Moreover, the epimeral sutures of this specimen are apparently complete but this could be an artefact due to coverslip pressure. If this pair of characters is disregarded then the specimen resembles a male *Megalothrips* which lacks abdominal tubercles. (Zoogeographical objections to this suggestion could be waived in view of the description below of *Megalothrips andrei* sp. n. from Malaya.) The pronotum of *perplexus* is short and wide; however, the lateral wings of the pelta are not exceptionally slender. Until further specimens are collected the relationships of *Lasiothrips* cannot be assessed. It cannot be distinguished satisfactorily from *Egchocephalothrips* on present evidence, although *monstrosus* has the head more strongly elevated in the mid-line with the two pairs of postocular setae arising side by side.

SPECIES INCLUDED
perplexus Moulton, 1968: 122–3. Holotype ♂, AUSTRALIA: Queensland (CAS).

MEGALOTHRIPS Uzel

(Figs 318, 324, 329, 337)

Megalothrips Uzel, 1894: 224–5. Type-species: *Megalothrips bonannii* Uzel, by subsequent designation, Bagnall, 1909*a*: 350.

This genus has been used for five species from the Holarctic Region, three North American and two European. In contrast, *andrei* sp. n., described below, was collected at Kuala Lumpur in Malaya. This extension in range is remarkable, but specimens of *Megalothrips* species have also been studied in the collection of Dr Shuji Okajima (Tokyo) which were collected in Japan (Kanagwa and Ohdaru) as well as in the Iriomote and Ishigaki Islands near Taiwan. Moreover, one specimen similar to *andrei* has been seen from Sumatra. Two further genera which are known only from single specimens, *Lasiothrips* from Australia and *Egchocephalothrips* from New Caledonia, may also prove to be synonyms of *Megalothrips* eventually.

Megalothrips species have the maxillary stylets deeply retracted into the head and close together medially (Fig. 318) as in *Bacillothrips*, but the pelta is characteristic with slender lateral lobes (Fig. 329).

The tube length is sexually dimorphic, being shorter in males than females. Moreover, in *andrei* sp. n., and to a lesser extent in *bonannii* but not in the other species, the tube of the female is longer than the head. The two European species *bonannii* and *delmasi*, together with *schuhi* from Oregon, U.S.A., form a closely related species-group in which antennal segment III is mainly yellow, IV and V have yellow pedicels, and even VI is pale basally. In contrast, *picticornis*, from the western U.S.A., has only the basal 0·75 of segment III yellow and the pedicel of IV slightly pale, whereas *spinosus*, which is widespread from Virginia to Washington State, U.S.A., has all the antennal segments dark. The new species, *andrei* from Malaya, differs from *picticornis* in the greater length of the tube, and in having the basal 0·8 or more of antennal segment III yellow but the pedicel of IV brown. Moreover, all the major setae on the body are dark brown or black instead of light brown to colourless. Apart from these relatively superficial differences in colour and proportions the six species of *Megalothrips* are very similar to each other in structure.

SPECIES INCLUDED

andrei sp. n. Holotype ♂, MALAYA (BMNH).
bonannii Uzel, 1895: 227–8. Holotype ♂, CZECHOSLOVAKIA (depository unknown).
delmasi Bournier, 1956: 163–9. Holotype ♂, FRANCE (BCM; 2 ♀, 2 ♂ paratypes BMNH).
picticornis Hood, 1927*b*: 204. Lectotype ♀, U.S.A.: California (USNM).
  animus Moulton, 1929*c*: 242–4. Holotype ♂, U.S.A.: California (CAS).
schuhi Crawford, 1947: 197–9. Holotype ♀, U.S.A.: Oregon (USNM).
spinosus Hood, 1908*b*: 306–7. Lectotype ♀, U.S.A.: Pennsylvania (USNM).
  fuscus Watson, 1921: 84–5. Holotype ♀, U.S.A.: New York (FSAC).

Megalothrips andrei sp. n.

(Figs 324, 329, 337)

Macropterous ♂. Colour dark brown; antennal segment III pale, yellow, slightly darker in apical fifth; wings pale with pale brown median line in basal half. Head 2·3 times as long as broad; interocellar setae long, stout pair of setae on cheeks immediately behind eyes; postocular setae pair II long; maxillary stylets close together in centre of head, retracted to posterior margin of eyes. Pronotum short, about 3 times as broad as long; epimeral sutures weakly developed. Median metanotal setae well developed, longer than the distance between their bases. Wings with 3 sub-basal setae. Pelta with lateral lobes narrowly joined to median lobe (Fig. 329). Abdominal tergites II to VI with 2 pairs of well-developed sigmoid wing-retaining setae; tergite VI with a pair of tubercles laterally; setae B_1 on abdominal tergite IX about 0·5 times length of tube. Tube 3·6 times as long as broad, shorter than head, tapering more strongly at apex, set with stout dark setae (Fig. 324).

Measurements (holotype ♂ in μm). Body length 3744. Head, length 575; maximum breadth 248; interocellar setae 116/120; postocellar setae 42/46; postocular setae pair I 88/92; postocular setae pair II 164/241. Pronotum, length 124; width 364; major setae, am 116/46, aa 40/38, ml 97/76, pa 161/152, epim 184/216. Median metanotal setae 142/151. Wings, length 1630; maximum width 143; number of duplicated cilia 28/30. Tergite IX setae B_1 284/272. Tube, length 476; maximum width 119. Antennal segments III–VIII length, 152/157; 124/128; 128/133; 102/112; 69/71; 67/66.

Macropterous ♀. Colour and structure similar to ♂. Tergite VII with 2 pairs wing-retaining setae. Tube longer, about 5 times as long as broad and longer than head.

Measurements (2 ♀ paratypes in μm). Body length 4568 (5010). Head, length 632 (633); maximum width 296 (287); interocellar setae 135/140 (148/152); postocellar setae 56/48 (55/42); postocular setae pair I 67 (64/67); postocular setae pair II 135/137 (160/156). Pronotum, length 124 (133); maximum width 448 (422); major setae, am 38/43 (42), aa 31/34 (39), ml 53/54 (35/44), pa 113/143 (130/144), epim 171 (180/182). Median metanotal setae 103/128 (117/124). Wings, length 1727 (1872); maximum width 134 (172); number of duplicated cilia 27/30 (29/31). Tergite IX setae B_1 301/312 (315/332). Tube, length 729 (758); maximum width 147 (162). Antennal segments III–VIII length 176/181 (180/182); 143/147 (152); 147/152 (152/157); 114 (114/119); 62/64 (66); 71 (70/71).

SPECIES STUDIED

Holotype ♂, **Malaya:** Kuala Lumpur, on dead branches, 24.xii.1969 (*R. G. & Floyd Andre*) (BMNH).
Paratypes. 1 ♀ taken with holotype; 1 ♀ similar data except 29.xii.1969 (BMNH).

COMMENT. The specimen from Sumatra referred to above is much larger (head length 900 μm; tube length 1150 μm).

MEGATHRIPS Targioni-Tozzetti

(Figs 321, 326, 331)

Megathrips Targioni-Tozzetti, 1881: 124–5. Type-species: *Megathrips piccioli* Targioni-Tozzetti (now regarded as a synonym of *Phloeothrips lativentris* Heeger), by monotypy.
Siphonothrips Buffa, 1908: 389. Type-species: *Siphonothrips elegans* Buffa, by monotypy. **Syn. n.**

This genus, which is used here for six nominal species, appears to be a Holarctic derivative of the large genus *Bactrothrips* from the Old World tropics. The species in the two genera are essentially similar, and can be distinguished only by the slightly larger head and more deeply retracted maxillary stylets of *Bactrothrips*.

The type-species, *lativentris*, is highly successful and widespread, but probably evolved from *Bactrothrips* through an earlier phase of wing-reduction. The forewings are pale; the anterior pair of wing-retaining setae on each tergite is reduced (Fig. 326); the pelta has the lateral lobes relatively broad rather than slender (Fig. 331); the head is foreshortened, less than 2·5 times as long as wide (Fig. 321). This constellation of characters suggests that *lativentris* has evolved from a micropterous or apterous ancestor, but has redeveloped the fully winged condition without redeveloping all of the characters associated with macroptery.

Five other species are placed in *Megathrips*, but of these both *elegans* and *timidus* are known only from their original descriptions. Moreover, *brevis* is known only from a single damaged male which has very short straight lateral tubercles on the sixth tergite and is smaller than any known male of *lativentris*. *M. flavipes* is the only member of the genus recorded from *Pinus* leaf litter. This species closely resembles the description of *timidus* in colour, having completely pale femora, but differs in the tube being shorter than the head. Finally, *inermis* is particularly interesting because, like *Bactrothrips pitkini* sp. n. described above, it lacks all trace in both sexes of the lateral abdominal tubercles usually regarded as diagnostic of this group of genera.

The genus *Siphonothrips* is here placed as a synonym of *Megathrips* because there is nothing in the description which can be used to distinguish between these taxa. The original figure of *elegans* is apparently of a dry, carded specimen. The head appears relatively broad and the abdomen shrunken, thus making the length of the tube and shape of the lateral tubercles as illustrated unreliable. Unfortunately, the original descriptions and illustrations of both *picciolli* and *lativentris* are also equivocal, and the concept of the type-species of *Megathrips* owes much to convention. The oldest available unequivocal name for this concept is *longispina* Reuter, and to ensure stability of the generic name it may become necessary to apply to the International Commission on Zoological Nomenclature to have *longispina* declared the type-species of *Megathrips*.

SPECIES INCLUDED

brevis (Bagnall, 1914*b*: 291–2) (*Siphonothrips*). Holotype ♂, YUGOSLAVIA (BMNH).
***elegans** (Buffa, 1908: 389–90) (*Siphonothrips*). Holotype ♂, SARDINIA (depository unknown). **Comb. n.**
flavipes (Reuter, 1901: 216) (*Cryptothrips*). Syntypes ♀, CRETE (depository unknown).
inermis Priesner, 1937*a*: 348–50. Holotype ♂, SARDINIA (DEI).
lativentris (Heeger, 1852*b*: 479) (*Phloeothrips*). Syntypes ♂, AUSTRIA (depository unknown).
    longispina Reuter, 1879: 214–5 (*Phloeothrips*). Holotype ♂, SWEDEN (depository unknown).
    tibialis Reuter, 1879: 215–6 (*Phloeothrips*). Holotype ♀, SWEDEN (depository unknown).
    piccioli Targioni-Tozzetti, 1881: 124–5. Syntypes ♀, ITALY (depository unknown).
    niger Schmutz, 1909: 346–7 (*Megalothrips*). Holotype ♀, RUMANIA: Herkulesbad (depository unknown).
    padewiethi Karny, 1919: 114–5 (*Bacillothrips*). Syntypes ♂ ♀, YUGOSLAVIA: 'Kroatischen Littorale' (?SMF).
***timidus** Cott, 1956: 177–9. Holotype ♀, U.S.A.: California (depository unknown).

MEIOTHRIPS Priesner

(Figs 313, 323, 327, 336)

Idolothrips (*Meiothrips*) Priesner, 1929*b*: 197. Type-species: *Idolothrips* (*Meiothrips*) *annulatus* Priesner (now regarded as a synonym of *Acanthinothrips annulipes* Bagnall), by monotypy.
Meiothrips Priesner; Bagnall, 1934: 494. [Raised to genus.]
Meiothrips (*Aculeathrips*) Kudo, 1975: 421. Type-species: *Meiothrips* (*Telothrips*) *nepalensis* Kudo & Ananthakrishnan, by monotypy. [Replacement name for *Meiothrips* (*Telothrips*) Kudo & Ananthakrishnan, 1974: 385 nec *Telothrips* Priesner, 1929*a*.] [Synonymised by Palmer & Mound, 1978.]

This genus, which is used for three species found between Borneo, Thailand and India, has been redefined by Palmer & Mound (1978). Each of these species could be placed in a separate monobasic genus, as also could the two species of *Idolothrips*, if the generic concepts traditionally employed in the *Bactrothrips* complex were accepted. However, the *Meiothrips* species are intermediate between *Idolothrips* and *Bactrothrips* both structurally and zoogeographically, and a series of monobasic genera would obscure this important relationship. Palmer & Mound (1978: 212) refer to a small male of *nepalensis* from Thailand with the metanotal setae short as in *Idolothrips*. These authors also point out that the ornamentation of the tube in the males of *M. nepalensis* and *I. dissimilis* is very similar, and that the females in these genera are difficult to separate from some females of *Bactrothrips*. In all three genera the anapleural sutures are short and straight.

SPECIES INCLUDED

annulipes (Bagnall, 1914*c*: 378–9) (*Acanthinothrips*). Lectotype ♂, SARAWAK (BMNH).
  annulatus Priesner, 1929*b*: 197–201 (*Idolothrips* subgen. *Meiothrips*). Syntypes ♂ ♀, SUMATRA (SMF; 1 ♂ BMNH).
menoni Ananthakrishnan, 1964*a*: 99–101. Holotype ♀, INDIA (TNA).
nepalensis Kudo & Ananthakrishnan, 1974: 385–7. Syntypes ♂ ♀, NEPAL (TNA, 2 ♂ BMNH).

Genera of Hystricothripina

Most of the genera placed in this subtribe in the present paper were listed by Priesner (1961) in the Idolothripina. However, as interpreted here, the Idolothripina comprises a group of predominantly old world genera characterised by the presence of well-developed praepectal plates, two pairs (or more) of tergal wing-retaining setae, well-developed forewing duplicated cilia, and a tendency for the males to bear one or more pairs of elongate tubercles or drepanae laterally on the abdomen. In contrast, the Hystricothripina (= Zeugmatothripina) comprises a group of predominantly new world genera characterised by the praepectal plates being absent or very weakly developed, the tergites usually bear only one pair of wing-retaining setae, the forewing duplicated cilia are absent or weakly developed, and there are no lateral drepanae on the male abdomen (although the posterolateral tergal setae usually arise on tubercles in both sexes).

Thirteen genera are recognised here in the Hystricothripina, of which eight, involving 33 species out of a total of 42, are found only in the Neotropics. These Neotropical genera appear to fall into two major groupings: the *Actinothrips*-group (including *Hybridothrips* and *Zactinothrips*) of 14 species, and the *Zeugmatothrips*-group (including *Azeugmatothrips, Cyphothrips, Saurothrips* and *Zeuglothrips*) of 19 species. Stannard (1954: 72) included these genera as subgenera of *Actinothrips*, and it may be that there are too many genera for the number of species involved. This phenomenon is not unusual when species differ from each other in very obvious, rather than somewhat subtle, characters. One of our colleagues has written to say that he would classify the group mainly on the number of elongate setae on the dorsal surface of the head. However, in this group there are three pairs of dorsal setal-bases – postocellars, postoculars and mid dorsals. Each of these may bear long or short setae, and, moreover, their position is also variable. In the opinion of the present authors, the size and position of these setae, *in this group*, are so variable that they are probably under relatively simple genetic control, and are poor indicators of phyletic relationships. This suggestion may apply also to the foretarsal tooth (absent in females) and forewing duplicated cilia in this group, as these characters are developed in a variety of different combinations in different species with no apparent evolutionary trend.

The five genera of Hystricothripina found outside the Neotropics are more diverse. *Hystricothrips*, with two species from western Africa, is most closely related to the Neotropical genera, whereas *Atractothrips*, with two species from Florida and Mexico, is similar to the Oriental genera in having a pair of stout pre-ocellar setae. These Oriental genera, *Holurothrips*, with three species, and the two monobasic genera described below, *Neatractothrips* and *Paractinothrips*, constitute a unique group in which the mesopraesternum is transverse, parallel-sided and apparently continuous with the sclerites laterally. In contrast, the rest of the Hystricothripina are remarkable in having the mesopraesternum reduced to a small *median* sclerite, whereas the rest of the Phlaeothripidae have a boat-shaped mesopraesternum which is frequently reduced to two small lateral triangles.

ACTINOTHRIPS Bagnall

(Figs 345, 353)

Actinothrips Bagnall, 1909*d*: 332–333. Type-species: *Actinothrips longicornis* Bagnall, by monotypy.
Dasythrips Hood, 1937*c*: 521–522. Type-species: *Dasythrips regalis* Hood, by monotypy. **Syn. n.**

The type-species of this genus, *longicornis* Bagnall, was described from a single dry specimen. Mound (1968) stated that only the tube of this specimen survived, mounted on a microscope slide, but subsequently the rest of the specimen was discovered dry in a glass vial at the British Museum (Natural History). This holotype, however, is a male, not a female, as can be deduced from the original illustration by Bagnall of the short, stout setae on tergites VII and VIII. Moreover, there is a *lapsus* in the original description, because it is the *meso- and metasterna*, not the 'meso and metascutum' which are 'rather closely set with numerous short hairs'.

Hood was never able to study the type-species of *Actinothrips*, and in fact *longicornis* is very similar to a major male of *Dasythrips regalis* in having a pair of forwardly directed tubercles on tergite III and a pair of stout metanotal setae arising from tubercles, as well as densely hairy thoracic sternites. Moreover, a large paratype of *Actinothrips femoralis* bears as many setae ventrally as a small paratype of *Dasythrips fraterculus*. For these reasons *Dasythrips* is here regarded as a synonym of *Actinothrips*. Moreover, the description of *D. chiapensis* from Mexico does not distinguish this species satisfactorily from the female of *A. trichaetus* from Panama.

Actinothrips is mostly closely related to *Zactinothrips*, although both in that genus and in *Hybridothrips* the eighth abdominal segment is elongate, twice as long as wide. Duplicated cilia are present on the forewing in species of all three genera; however, in only three species of *Actinothrips* does the male bear a foretarsal tooth: *femoralis, gargantua* and *pedalis*. This presence of a foretarsal tooth in these species is remarkable because *femoralis* and *polychaetus* appear to be closely related in having numerous stout setae on the inner margin of the male forefemora, although *polychaetus* lacks a foretarsal tooth. Moreover, females of *pedalis* are similar to females of *bondari*.

Allometry and sexual dimorphism in *Actinothrips* species, together with the few specimens available for study, make species delineations unsatisfactory at present. One species-group includes six nominal species which are distinguished mainly on characters associated with size. In decreasing order of body size these are: *regalis* (Peru), *longicornis* (Venezuela), *fraterculus* (Peru), *chiapensis* (Mexico), *trichaetus* (Panama, Trinidad, Ecuador), *bondari* (Brazil). The first five species have three major setae in an obliquely transverse row near the apex of the forefemora in both sexes. However, in *bondari* there is only one large seta, on the inner apical margin, and two smaller setae dorsally and externally. The apices of the tibiae are dark in the larger species, paler in *bondari*, but yellow in *pedalis*. Despite the similarity between the females of these last two species the males are readily distinguished by the bulbous femora of *pedalis*, an unusual characteristic in *Actinothrips*. Finally, the females of *monochaetus*, although individually larger than *bondari* females, have a single major seta apically on the forefemora, but the males are unusual in having all three pairs of posteroangular setae on tergite VIII short and stout.

SPECIES INCLUDED
bondari Hood, 1928: 147–150. Holotype ♀, BRAZIL (USNM).
***chiapensis** (Johansen & Garcia, 1976: 235–241) (*Dasythrips*). Holotype ♀, MEXICO (UNAM). **Comb. n.**
femoralis Hood, 1950: 5–9. Holotype ♀, BRAZIL (USNM; ♂ ♀ paratypes BMNH).
fraterculus (Hood, 1941: 236–240) (*Dasythrips*). Holotype ♂, PERU (USNM; ♂ ♀ paratypes BMNH). **Comb. n.**
gargantua Santis, 1960: 57–60. Holotype ♂, BRAZIL (MLPA).
longicornis Bagnall, 1909*d*: 333–334. Holotype ♂, VENEZUELA (BMNH).
monochaetus Hood, 1935*c*: 252–254. Holotype ♀, GUYANA (BMNH).
pedalis Hood, 1949: 76–78. Holotype ♀, BRAZIL (USNM; ♂ ♀ paratypes BMNH).
***polychaetus** Hood, 1941: 221–223. Holotype ♂, VENEZUELA (USNM).
regalis (Hood, 1937*c*: 522–527) (*Dasythrips*). Holotype ♂, PERU (USNM). **Comb. n.**
trichaetus Hood, 1935*c*: 248–252. Lectotype ♀, PANAMA (USNM; ♂ ♀ paralectotypes BMNH).

ATRACTOTHRIPS Hood

(Fig 346)

Atractothrips Hood, 1938*a*: 27–28. Type-species: *Atractothrips bradleyi* Hood, by monotypy.

Two Oriental species described in this genus are now placed in *Neatractothrips* and *Malesiathrips* q.v. The two remaining species are found in Mexico, and in Florida and the extreme south-east of Georgia, U.S.A. They have a combination of characters which are intermediate between those of Neotropical and Oriental Hystricothripina. Antennal segments I and II bear large dorsal setae, moreover III is shorter than IV as in *Zeugmatothrips*, but in contrast VIII is short and stout instead of lanceolate. The head has stout cheek setae, and the maxillary stylets are wide apart (Fig. 346), but the preocellar setae are enlarged as in the Oriental members of the group. The praepectus and mesopraesternum are absent, and the mesothoracic epimeral setae well developed, but the metanotal setae and forewing sub-basal setae are very small in *bradleyi* (although longer in *mockfordi*), and the lateral setae of tergite I arise anterior to the lateral lobes of the pelta. The abdominal tergites bear two pairs of wing-retaining setae, although the anterior pair is straight, not sigmoidal, and the tergal posterolateral angles are produced into two pairs of tubercles. Unlike the Neotropical species, the tube is long with the lateral setae short and sparse. *Atractothrips* appears to represent the sister-group of the three Oriental genera *Holurothrips, Neatractothrips* and *Paractinothrips.*

SPECIES INCLUDED

bradleyi Hood, 1938*a*: 28–32. Holotype ♂, U.S.A.: Florida (USNM; ♂ ♀ paratypes BMNH).
***mockfordi** Stannard, 1974: 45–8. Holotype ♀, MEXICO (INHS).

AZEUGMATOTHRIPS gen. n.

(Figs 349, 357, 374, 382)

Type-species: *Azeugmatothrips rectus* sp. n.

Antennal segments III–IV with 2 stout dorsal setae, I and V with one stout dorsal seta, III shorter than IV. Head with 3 pairs of major dorsal setae (postocellars elongate); maxillary stylets wide apart. Pro-, meso- and metanota similar to *Zeugmatothrips*; foretarsus of ♂ with a stout tooth; forewing with duplicated cilia. Pelta bearing two pairs of setae laterally; tergites with one pair of wing-retaining setae; tube with lateral setae long and erect.

The two species in this new genus appear to be derived from *Zeugmatothrips*. The antennae, with segment III short and VIII lanceolate, also the pelta, are similar to that genus. Moreover, the mesothoracic epimeral setae and the mesonotal lateral setae are elongate as in *Saurothrips*, and the postocellar setae are elongate as in *Saurothrips, Zeuglothrips* and *Hybridothrips*. However, this combination of characters, together with the forewing bearing duplicated cilia, and the male with a foretarsal tooth, is found only in the two species treated below. One of these, *obrieni,* was described in *Zeuglothrips* because of the similar head chaetotaxy although the type-species of that genus has the maxillary stylets very long and close together medially (Fig. 342). The new species, *rectus*, differs from *obrieni* in its much smaller size, in having two large setae on antennal segment II instead of only one, and in having four stout setae on each forefemora instead of about eight such setae.

SPECIES INCLUDED

obrieni (Johansen, 1975: 188–92) (*Zeuglothrips*). Holotype ♂, PANAMA (UNAM). **Comb. n.**
rectus sp. n. Holotype ♂, TRINIDAD (BMNH).

Azeugmatothrips rectus sp. n.

Macropterous ♂. Colour dark brown to black, mid- and hindtarsi also foretibiae paler; foretarsi and apices of foretibiae yellowish brown; antennal segment IV, V and stem of VI yellow, III with club pale but stem brown except for extreme base; dorsal setae on antennae, fore- and midfemora, also tergites VIII–IX, dark brown; major setae on vertex, pronotum and tergites II–VI pale or colourless; setae on tergite VII, also genal setae, shaded; forewing weakly shaded, with a median longitudinal dark line, sub-basal setae pale.

Head (Fig. 349) produced in front of rounded eyes; postocellar setae elongate, mid-dorsal setae arising between postoculars; cheeks with two pairs of stout setae; maxillary stylets wide apart; dorsal surface weakly sculptured with anastomosing lines. Antennae 8-segmented, VIII lanceolate, II–IV with 2 stout dorsal setae. I and V with one stout seta (Fig. 357); 2 sense cones on III, 4 on IV.

Pronotum (Fig. 349) transverse, aa and ml setae close together on a tubercle; epimeral sutures complete; pm setae minute; praepectus absent, mesopraesternum reduced to a small median sclerite. Forefemur with 4 stout setae; foretarsus with stout recurved tooth. Mesonotal mid-lateral and epimeral setae well developed. Metanotum reticulate, median setae stout. Metaepimeron moderately swollen, with one large seta. Forewing parallel-sided, curving forward distally, sub-basal setae well developed.

Pelta (Fig. 382) broad basally, bearing 2 pairs of setae; tergites II–VII with one pair of wing-retaining setae; lateral tergal setae well developed, II with 2 pairs, III with 3 pairs. Tube densely setose, setae long and erect (Fig. 374). Sternites with one row of discal setae, posteromarginal setae small.

Measurements (holotype ♂ in μm). Body length 4000 (extended). Head, total length 390; length in front of eyes 60; width behind eyes 230; major setae – postocellars 150, postoculars 190, mid-dorsals 110, genals 45–60. Pronotum, length 200; width 360; major setae – am 120, aa 180, ml 135, epim 165, pa 120. Mesonotal setae – midlaterals 60, epimerals 90. Metanotal median setae 130. Forewing, length 1700; distal width 90; sub-basal setae 120, 100, 140; number of duplicated cilia 9 (12). Tergite VI posteroangular setae B_1 260, B_2 180, B_3 230. Tergite IX setae, B_1 180, B_2 220, B_3 180. Tube, length 900; terminal setae 200; longest lateral setae 260. Antennal segments III–VIII length, 155, 180, 190, 130, 80, 110.

SPECIMENS STUDIED

Holotype ♂, **Trinidad:** Arima Valley, Simla, dead branch of *Anona,* 4.xi.1970 (*L. A. Mound,* 908).

COMMENTS. This new species is unique in having the mid-dorsal head setae arising so far forward, in line with the postocular setae.

CYPHOTHRIPS Hood

(Figs 339, 352, 363, 384)

Cyphothrips Hood, 1952: 172. Type-species: *Cyphothrips dorsalis* Hood, by monotypy.

This monobasic genus appears to be a specialised derivative of *Zeugmatothrips*. The head, pronotum (Fig. 339), sternites and pelta (Fig. 384) are similar to species of that genus, although the ventro-lateral pale tubercles on the head are similar to those found in *Zactinothrips* q.v. The first antennal segment bears a stout dorsal seta, but segments II–V do not have any stout setae (Fig. 363), although this is also true of *Zeugmatothrips hoodi*. The main differences from *Zeugmatothrips* species are that the forewing bears 2 to 4 weak duplicated cilia, and the lateral setae on the tube are weak and decumbent. Moreover, in the male, the foretarsus bears a tooth, and the metanotal median setae are borne on a pair of elongate tubercles (Fig. 352).

SPECIES INCLUDED

dorsalis Hood, 1952: 172–173. Lectotype ♀, BRAZIL (USNM).

HOLUROTHRIPS Bagnall

(Figs 341, 354, 361, 383)

Holurothrips Bagnall, 1914*c*: 376. Type-species: *Holurothrips ornatus* Bagnall, by monotypy.

This genus, with three species between Japan, Malaya and Queensland, is placed in the Hystricothripina because of the following characters: antennal segment VIII lanceolate, segments I–II with stout dorsal setae (Fig. 361); head with 2 pairs of stout cheek setae; pronotal aa and ml setae arising close together (Fig. 341); mesothoracic epimeral setae present, although small; tergal posteroangular setae arising from small tubercles; tergite IX setae short; tube long with many short, widely spaced setae. *Holurothrips* resembles the Oriental genera *Neatractothrips* and *Paractinothrips*, and differs from the Neotropical genera in having praepectal plates, preocellar setae, a completely transverse mesopraesternum and reduced metanotal setae. In this genus the setae of the first abdominal segment arise close to the lateral extremities of the pelta (Fig. 383), the thoracic sternites bear numerous setae, and the abdominal sternites have two rows of discal setae. The most remarkable feature of the genus is the ventral prolongation of the eyes (Fig. 341). Contrary to Mound (1974: 57) tergites IV–VI (sometimes also III) have three, not two, pairs of wing-retaining setae in *ornatus*. However, the closely related species *morikawai* has only two pairs of these setae.

SPECIES INCLUDED
collessi Mound, 1974: 58. Holotype ♀, AUSTRALIA: Queensland (ANIC).
morikawai Kurosawa, 1968: 55. Holotype ♀, JAPAN (NIAT).
ornatus Bagnall, 1914*c*: 376–377. Lectotype ♂, SARAWAK (BMNH).
 leeuweni Priesner, 1934: 62–63. Syntypes ♂ ♀, JAVA (SMF; BMNH).

HYBRIDOTHRIPS Stannard

(Figs 340, 360)

Actinothrips (*Hybridothrips*) Stannard, 1954*b*: 71–74. Type-species: *Actinothrips* (*Hybridothrips*) *oneillae* Stannard, by monotypy.
Hybridothrips Stannard, 1957: 100–101. [Raised to genus.]

This genus appears to be derived, with *Zactinothrips* q.v., from *Actinothrips*. The heads are similar in the latter two genera, but the head shape of *Hybridothrips* is distinctive amongst Neotropical species in that the eyes are a little reduced and flattened (Fig. 340), much as in *Atractothrips*. There are three pairs of major dorsal setae on the head, as in *Zeuglothrips*, but the maxillary stylets are wide apart, the pelta does not bear setae laterally, and the pronotal pa setae are very small but the pm setae enlarged. The pronotum of *Zactinothrips* is intermediate in that both pa and pm setae are very small; however, the males of *Hybridothrips* and *Zactinothrips* are similar in having abdominal segment VIII much larger than in *Actinothrips*. Antennal segments III–IV bear supernumerary sense cones ventrally near the apex in *Hybridothrips* (Fig. 360), but both dorsally and ventrally in *Zactinothrips*, at least in the males. The holotype female of *guerreronsis* has been compared with the holotype male of *oneillae* and they are regarded as the same species. According to Dr Roberto Johansen (*in litt.*) this species is widespread in the *Quercus*/*Pinus* forests of Mexico at the transitional zone between the Neotropics and the Nearctic.

SPECIES INCLUDED
oneillae (Stannard, 1954*b*: 74) (*Actinothrips* subgenus *Hybridothrips*). Holotype ♂, MEXICO (USNM).
 guerreronsis Johansen & Garcia, 1973: 55–61 (*Zeuglothrips*). Holotype ♀, MEXICO (UNAM). **Syn. n.**

HYSTRICOTHRIPS Karny

(Figs 344, 358, 370, 375)

Hystricothrips Karny, 1912*c*: 132. Type-species: *Hystricothrips phasgonura* Karny, by monotypy.
Zeugmatothripoides Bagnall, 1929: 71–72. Type-species: *Zeugmatothripoides africanus* Bagnall, by monotypy. [Synonymised by Mound, 1968: 124–125.]

This genus, from western Africa, appears to be the sister-group of the Neotropical Hystricothripina. It differs mainly in the heavily sculptured, and densely setose tube, and the lack of elongate setae on the metanotum and mesothoracic epimera. The forewings, when present, bear up to about 25 duplicated cilia, although these are very fine. In the male the foretarsus bears a stout tooth, and the posterolateral angles of the tergites are drawn out into tubercles (Fig. 370). Antennal segments III–VIII (Fig. 358) are similar to those of *Zeugmatothrips* species, the mesopraesternum is similarly reduced, but the postocellar setae are well developed (Fig. 344) and there are two pairs of wing-retaining setae in macropterae.

Contrary to Pitkin & Mound (1973) *africanus* can be distinguished from *phasgonura* as follows.

1 Antennal segment I with inner dorsal seta half as long as external dorsal seta; segment II with one dorsal seta more than half as long as segment III; ♂ with seta B_1 on tergite VII stout but rounded apically, setae B_1 and B_2 on VIII short and thorn-like [Sierre Leone, Ivory Coast, Nigeria, São Thomé] ***africanus***

– Antennal segment I with both dorsal setae extending beyond apex of II; segment II with no long dorsal setae; ♂ with B_1 on tergite VII thorn-like on a stout tubercle, but B_1 and B_2 on VIII setaceous (Zaire, Equatorial Guinea, Angola) .... ***phasgonura***

SPECIES INCLUDED

africanus (Bagnall, 1929: 72–73) (*Zeugmatothripoides*). Holotype ♀, SIERRA LEONE (BMNH).
phasgonura Karny, 1912*c*: 132–133. Holotype ♀, EQUATORIAL GUINEA (ZMB).
hystrix Priesner, 1932: 198–201. Holotype ♂, ZAIRE (MRAC).

NEATRACTOTHRIPS gen. n.

(Figs 372, 377)

Type-species: *Atractothrips macrurus* Okajima.

Antennae 8-segmented, I and II with dorsal setae enlarged, III longer than IV but without stout setae. Head elongate, prolonged in front of eyes with stout preocellar setae and cheek setae; maxillary stylets wide apart. Pronotum with epimeral sutures not quite complete; aa and ml setae close; praepectus present but reduced to a pair of small, setal bearing sclerites laterally. Foretarsus in both sexes without a tooth but with inner margin slightly raised; femora with several large setae. Mesothoracic epimeral setae well developed; mesopraesternum transverse, not clearly delimited from lateral sclerites (Fig. 372). Metanotal setae not elongate; metathoracic episterna moderately enlarged, anapleural sutures short. Forewings broad, without duplicated cilia. Lateral setae of abdominal segment I anterior to lateral lobes of pelta (Fig. 377); tergites III–V with 5 pairs of wing-retaining setae; tergites produced into 2 pairs of tubercles posterolaterally; setae on tergite IX very short; tube exceptionally long, marginal setae short and sparse; sternites with more than one row of discal setae.

This new monobasic Oriental genus is closely related to *Paractinothrips,* and, together with that genus and *Holurothrips*, constitutes the sister-group of *Atractothrips*. The holotype has an ill-defined foretarsal tooth, but this is not present in 14 ♀, 4 ♂ collected in the Philippines with the paratypes of *Paractinothrips peratus* q.v. The unusual structure of the mesopraesternum (Fig. 372) is similar to that found in *Holurothrips* and *Paractinothrips*, but quite different from that found in *Atractothrips* and the rest of the Hystricothripina. The three Oriental genera tend to have the tube longer and more sparsely setose, the tergites with more numerous wing-retaining setae, and the head with larger preocellar setae than their Neotropical counterparts.

The original description of *macrurus* states that the praepectus is absent. However, examination of the ventral surface of the holotype through the back of the slide mount, using a ×40 water immersion lens, has revealed the presence of two seta-bearing sclerites anterolateral to the probasisternum (Fig. 372). These sclerites, which are also present in the specimens from the Philippines, are here interpreted as praepectal plates because they appear to be homologous with the external parts of the praepectus of *Paractinothrips peratus* (Fig. 373), and because cervical sclerites do not usually bear setae.

SPECIES INCLUDED

macrurus (Okajima, 1975: 13–16) (*Atractothrips*). Holotype ♀, RYUKU IS. (OCT). **Comb. n.**

PARACTINOTHRIPS gen. n.

(Figs 347, 348, 355, 359, 369, 373, 378)

Type-species: *Paractinothrips peratus* sp. n.

Head with preocular projection and well-developed preocellar setae; postocellar, postocular and mid-dorsal setae elongate; cheek setae stout; maxillary stylets wide apart. Antennae 8-segmented; III shorter than IV; VIII slender; I with an elongate dorsal seta. Pronotal aa and ml setae fairly close; epimeral sutures not complete; praepectus present but weak. Both sexes without a foretarsal tooth; femora with several stout setae (Fig. 348). Mesopraesternum transverse; metanotal median setae not elongate; metathoracic episterna swollen, with a series of setae (Fig. 355); forewings slender, without duplicated cilia. Pelta broad with setae of abdominal segment I anterior to lateral lobes; tergites III–VII with 3 or 4 pairs of fan-shaped wing-retaining setae; posteroangular tergal setae arising from 2 pairs of tubercles; tergite IX setae short; tube elongate with many fine, semi-erect setae; sternites with more than one row of discal setae.

This new monobasic Oriental genus belongs in the Hystricothripina because of the form of the antennae and head (Figs 347, 359), the proximity of the pronotal aa and ml setae, the enlarged metathoracic anepisterna, the posterolateral tergal tubercles (Fig. 369),, and the long setose tube. The praepectus, which is absent in the Neotropical genera, is more fully developed than in *Neatractothrips*, although these two genera are similar in the structure of the mesopraesternum. *P. peratus* differs from *N. macrurus* most obviously in the form of the antennae with a short third segment, and in the slender wings.

Paractinothrips peratus sp. n.

Macropterous ♂. Colour brown with red internal pigment, tarsi paler; antennal segments III–VI and basal half of VII yellow; also apices of all tibiae yellow; major setae pale except on head and antennal segment I; small dorsal setae on antennal segments III–V dark brown; wings slightly shaded, with a very dark longitudinal median line.

Head prolonged in front of eyes; dorsal surface sculptured, bearing 2 rows of stout setae and 3 pairs of long setae (Fig. 347); maxillary stylets wide apart. Antennae 8-segmented, I with dorsal seta extending to apex of II; sense cones long and slender, 2 on III, 4 on IV; segment III shorter than IV, dorsal setae small, dark, but with apices expanded (Fig. 359).

Pronotum with complex sculpture; major setae, particularly epimerals, on tubercles (Fig. 347); praepectus weakly sclerotised (Fig. 373). Forefemur with at least 6 stout setae on tubercles, 1 or 2 of which are on inner margin (Fig. 348); foretarsus without a tooth. Mesonotum with 2 pairs of stout setae, similar in form to mesothoracic epimeral and metanotal median setae. Forewing with cilia arising unusually distant from wing margin.

Pelta with lateral wings, tergite I setae stout (Fig. 378); tergites with wing-retaining setae enlarged and fan-shaped; posterolateral tergal angles with 4 setae arising close together (Fig. 369); tergite IX setae very short, pair B_1 close together dorsally; tube long, apex constricted, lateral setae numerous and emerging at an angle of about 30°. Sternites IV–VI each with about 16 scattered discal setae, marginal setae not elongate.

Measurements (holotype ♂ in μm). Body length 4800 (extended). Head, total length 420; length of preocular process 60; maximum width behind eyes 210; dorsal setae – preocellar 30, postocellar 120, postocular 90, mid-dorsal 65, cheek setae 30. Pronotum, length 210; median width 300; major setae – am 30, aa 60, ml 40, epim 110, pa 60, pm 30. Mesothoracic epimeral seta 40. Forewing, length 1800; distal width 75; sub-basal setae 50, 45, 45. Metanotal median setae 40. Tergite V posteroangular setae B_1 110, B_2 90, B_3 60. Tergite IX setae B_1 50, B_2 50. Tube, length 1350; longest lateral setae 65; terminal setae 170. Antennal segments I–VIII length, 60 (seta 80), 50, 105, 170, 170, 115, 70, 40.

Macropterous ♀. With no significant difference from ♂.

SPECIMENS STUDIED

Holotype ♂, **Malaya:** Kuala Lumpur, on dead palm leaves, 29.xii.1969 (*R. G. & Floyd Andre*) (BMNH).

Paratypes. **Malaya:** 1 ♀ collected with holotype; 1 ♂ with similar data except 27.xii.1969; 1 ♀, Buklanyan, on dead branches, 26.xii.1971 (*Floyd Andre*) (BMNH). **Philippines:** Luzon, Quezon National Park, near Lucena City, 13 ♀, 18 ♂ on dead leaves of wild Palmaceae, 16.viii.1979 (*S. Okajima*) (BMNH & OCT).

COMMENTS. The paratypes from the Philippines have the tibiae and antennal segment VI darker than the Malayan specimens. Moreover, the ratio antennal segment III/IV varies from 0·66–0·89 apparently independently of both sex and body size.

SAUROTHRIPS Hood

(Figs 343, 356, 368, 381)

Saurothrips Hood, 1952*c*: 171. Type-species: *Saurothrips assai* Hood, by monotypy.

The only species in this genus appears to be a specialised, long-bodied, derivative of *Zeugmatothrips*. However, the eighth abdominal segment is not elongate and narrowed medially as in *Zactinothrips* and to a lesser extent *Actinothrips*. *S. assai* has two stout setae on antennal segment II (Fig. 356), as well as the stout setae on segments I and III–V which are found in *Zeugmatothrips*. Moreover, the lateral setae on the tube are erect although rather short, and the forewing bears no duplicated cilia. However, there is a stout foretarsal tooth in the male, and the postocellar setae are elongate (Fig. 343) as in *Zeuglothrips, Hybridothrips, Hystricothrips* and *Azeugmatothrips*. Unlike the other Neotropical Hystricothripina the metanotal setae and the forewing sub-basal setae are unusually short (50 μm), and tergites III–VI bear a second pair of wing retaining setae near the antecostal ridge.

SPECIES INCLUDED
assai Hood, 1952*c*: 171–172. Lectotype ♀, BRAZIL (USNM).

ZACTINOTHRIPS Hood

(Fig. 362)

Zactinothrips Hood, 1936*d*: 446–447. Type-species: *Zactinothrips elegans* Hood, by monotypy.

The most remarkable feature of this genus, the numerous small sense cones near the apex of antennal segments III and IV (Fig. 362), is also found in *Hybridothrips*, although in the latter genus these sense cones are only developed ventrally even in males. Moreover, in both these genera the forewings bear duplicated cilia and the male has a foretarsal tooth. However, the head of *Zactinothrips* resembles that of *Actinothrips* species, whereas the head of *Hybridothrips* has more than one pair of stout setae on the vertex as in the *Zeugmatothrips* group of genera. Despite the differences in the head chaetotaxy *Zactinothrips* from Peru and *Hybridothrips* from Mexico are probably sister-groups, and together constitute the sister-group of *Actinothrips*.

The number of small additional, antennal sense cones is sex-linked in *Zactinothrips*, but may also be subject to allometry and/or variation between populations. The available samples are not sufficient to provide firm evidence. In large males these sense cones are present on segments III, IV and V, although they are most numerous ventrally and there are fewer on V than on III. Small females may have no additional sense cones on the dorsal surface of IV and V, and even ventrally there are less than half as many as are found in males. The ventrolateral tubercles on the head, referred to by Hood, are also found in *Cyphothrips* and may be homologous with similar structures referred to as ommatidia by Mound (1974*a*; 1974*b*) in *Celidothrips* species and *Phacothrips ocelloides* (Hood) (Pygothripini).

Two species of *Zactinothrips* are known, both from Peru. The most common species, *elegans*, has the apical area of the third antennal segment dark brown, whereas in *modestus* this area is not darkened according to the original description.

SPECIES INCLUDED
elegans Hood, 1936*d*: 447–452. Holotype ♂, PERU (USNM).
***modestus** Hood, 1941: 230–233. Holotype ♂, PERU (USNM).

ZEUGLOTHRIPS Hood

(Figs 342, 376)

Zeuglothrips Hood, 1936*d*: 452–453. Type-species: *Zeuglothrips echinus* Hood, by monotypy.

The type-species of this monobasic genus is unique in the Hystricothripina in having the maxillary stylets greatly elongate, retracted into the head as far as the eyes, and close together medially (Fig. 342). The postocellar setae are elongate as in *Hybridothrips* (also *Azeugmatothrips, Hystricothrips* and *Saurothrips*), but the pronotal posteroangular setae are elongate rather than the posteromedials as in *H. oneillae.* Antennal segments I–V bear enlarged dorsal setae in *Z. echinus*, and the pelta bears two setae laterally (Fig. 376) as in the *Zeugmatothrips* group of genera rather than the *Actinothrips*-group. Only two other species have been described in *Zeuglothrips*; *guerreronsis* is here transferred to *Hybridothrips* as a synonym of *oneillae*, and *obrieni* is transferred to *Azeugmatothrips*.

SPECIES INCLUDED
echinus Hood, 1936*d*: 453–457. Holotype ♀, PERU (USNM).

ZEUGMATOTHRIPS Priesner

(Figs 350, 351, 364–367, 371, 379, 380)

Zeugmatothrips Priesner, 1925*c*: 313. Type-species: *Zeugmatothrips hispidus* Priesner, by monotypy.

The 15 species described in this Neotropical genus exhibit a considerable range of variation, although most of them can be placed into one of two species-groups. The *cinctus*-group includes *borgmeieri, cinctus, gracilis, pallidulus* and *peltatus*. These five species have the mid-dorsal setae on the head relatively close to the postoculars (Fig. 350), antennal segments III–IV with two stout dorsal setae (Fig. 366), and the pelta reduced with the setae of the first abdominal segment on small sclerites laterally (cf. Fig. 380). The *priesneri*-group includes *annulipes, badiicornis, badiipes, femoralis, niger, mumbaca* and *priesneri*. These seven species have the mid-dorsal setae arising well posterior to the postoculars (Fig. 351), antennal segments III–IV with one stout dorsal seta (Fig. 364), and the setae of the first abdominal segment borne on the lateral lobes of the broad pelta (Fig. 379). The other three described species are intermediate between these two groups: *bispinosus*, according to the description, has the antennae of *cinctus*-group, but the head of *priesneri*-group; *hoodi* has the head and pelta of *priesneri*-group, but antennal segments III–IV each bear two *small*, pale dorsal setae (Fig. 367); *hispidus* has the pelta of *cinctus*-group (Fig. 380); the mid-dorsal setae small but distant from the postoculars, and antennal segments III–IV each with one long and one short, dark dorsal seta (Fig. 365). Moreover, the authors have studied a further species from Trinidad which differs from *hoodi* in being micropterous, with mid-femora pale, and tergites II and III with only one and two posteroangular setae respectively.

The genus *Zeugmatothrips* can be recognised by the form of the antennae with stout dorsal setae, short segment III and lanceolate segment VIII; also the absence of duplicated cilia on the forewing, the absence of a foretarsal tooth in both sexes, and the stout setose tube. The variation between species in the colour of the legs is remarkable, but as Hood (1949: 84–5) has pointed out these colours may be disruptive coloration associated with their habitat and sluggish habits.

SPECIES INCLUDED
annulipes Hood, 1941: 233–236. Holotype ♀, PERU (USNM; ♀ paratype BMNH).
****badiicornis*** Hood, 1936*d*: 457–460. Holotype ♀, PERU (USNM).
badiipes Hood, 1937*a*: 292–296. Lectotype ♀ PERU (USNM; ♀ paralectotype BMNH).
****bispinosus*** Hood, 1937*c*: 527–530. Holotype ♀, PERU (USNM).
borgmeieri Hood, 1949: 80–85. Holotype ♀, BRAZIL (USNM).
cinctus Hood, 1952*c*: 170–171. Lectotype ♀, BRAZIL (USNM: ♀ paralectotype BMNH).
****femoralis*** Hood, 1952*c*: 169. Holotype ♀, BRAZIL (USNM).
gracilis Hood, 1952*c*: 171. Syntypes ♂ ♀, BRAZIL (USNM).
hispidus Priesner, 1925*c*: 314–316. Holotype ♀, MEXICO (SMF).
hoodi Priesner, 1927*b*: 189–192. Syntypes ♀, COSTA RICA (SMF).
mumbaca Hood, 1952*c*: 169–170. Lectotype ♀, BRAZIL (USNM; ♂ ♀ paralectotypes BMNH).
niger Hood, 1952*c*: 168–169. Lectotype ♀, BRAZIL (USNM, ♀ paralectotype BMNH).
pallidulus Hood, 1958: 225–228. Holotype ♀, BRAZIL (USNM: ♀ paratype BMNH).
****peltatus*** Hood, 1949: 85–88. Holotype ♀, BRAZIL (USNM).
priesneri Hood, 1935*a*: 102–106. Holotype ♀, PANAMA (USNM; ♂ ♀ paratypes BMNH).

Taxa transferred from Idolothripinae to Phlaeothripinae

In the opinion of the present authors, several genera listed by Priesner (1961) in his subfamily 'Megathripinae' (= Idolothripinae) are not closely related phylogenetically to that group. In particular, a series of genera placed in the Cryptothripini by Priesner are here transferred to the Docessissophothripini in the Phlaeothripinae (Table 5). Moreover, the subtribe Apelaunothripina is here recognised as a distinct tribe and transferred to the Phlaeothripinae from the Idolothripinae. All of the species concerned have the stylets only moderately broad (i.e. about 5 μm), except for a few very large or extremely advanced forms (e.g. *Tropothrips*), and no member of the group has been found with large fungal spores in the abdomen. Some of the species treated here under *Holothrips* have been found to contain small fungal spores and even pieces of fungal hyphae. It is here assumed that these two tribes represent independent evolutionary lines from fungus-feeding ancestors involving partial adaptation to the spore-feeding habit. Almost all of the species have the typical phlaeothripine characteristic of short, stout B_2 setae on tergite nine of the males. Both tribes are therefore assumed to have arisen independently from *Hoplandrothrips*-like ancestors in the Phlaeothripini which also had elongate maxillary stylets and stout maxillary guides.

Table 5 Genera transferred from Idolothripinae to Phlaeothripinae

- Tribe **APELAUNOTHRIPINI stat. n.**
    - ***APELAUNOTHRIPS*** Karny
        - *Baphothrips* Priesner
    - ***DEXIOTHRIPS*** Hartwig
- Tribe **DOCESSISSOPHOTHRIPINI**
    - ***ABIASTOTHRIPS*** Priesner
        - *Cratothrips* Priesner
    - ***ASEMOTHRIPS*** Hood **gen. rev.**
        - *Coenothrips* Bagnall **syn. n.**
        - *Eucoenothrips* Bagnall **syn. n.**
        - *Empresmothrips* Karny **syn. n.**
    - ***DOCESSISSOPHOTHRIPS*** Bagnall
        - *Polyphemothrips* Schmutz **syn. n.**
    - ***HOLOTHRIPS*** Karny
        - *Adelothrips* Hood **syn. n.**
        - *Agnostothrips* Moulton **syn. n.**
        - *Cordylothrips* Hood **syn. n.**
        - *Erythrinothrips* Ananthakrishnan **syn. n.**
        - *Holmiella* Zur Strassen **syn. n.**
        - *Ischnothrips* Moulton **syn. n.**
        - *Lathrobiothrips* Hood **syn. n.**
        - *Panceratothrips* Bagnall **syn. n.**
        - *Stinothrips* Ananthakrishnan **syn. n.**
    - ***MAXILLATA*** Faure **gen. rev.**
    - ***OIDANOTHRIPS*** Moulton
    - ***PONGOLA*** Zur Strassen
    - ***SYMPHYOTHRIPS*** Hood & Williams
        - *Mesopotamothrips* Liebermann & Gemignani
    - ***TROPOTHRIPS*** Hood **gen. rev.**

Tribe APELAUNOTHRIPINI stat. n.

The subtribe Apelaunothripina was erected by Priesner (1961: 288) for two genera in his tribe Megathripini. These genera were placed in 'Megathripinae' because of the moderately broad stylets. However, Priesner indicted that unlike all other members of that subfamily the males have setae B_2 on the ninth tergite short and stout. Because of these setae, and because no large fungal spores have been found in the gut and the maxillary stylets are only slightly broader than in typical phlaeothripines, Mound (1974*a*) treated *Apelaunothrips* in the Phlaeothripinae. This relationship was endorsed by Okajima (1979*a*), who indicated that the second genus, *Dexiothrips*, is closely related to *Apelaunothrips* despite the different arrangement of the maxillary stylets. At present the tribe can be defined as those Phlaeothripidae which have B_2 setae on tergite nine of the males short and stout but in which the maxillary stylets are relatively broad and the maxillary guides stout. In contrast to the Docessissophothripini, which also share these characters, the Apelaunothripini have long slender antennae with eight segments, and no metathoracic sternopleural sutures.

APELAUNOTHRIPS Karny

Apelaunothrips Karny, 1925*c*: 82. Type-species: *Ophidothrips medioflavus* Karny, by monotypy.
Baphothrips Priesner, 1933*b*: 69–70. Type-species: *Baphothrips tricolor* Priesner, by monotypy. [Synonymised by Mound, 1974*a*: 17.]

Nineteen Old World species are known in this genus, mostly from dead leaves in the eastern Oriental Region.

SPECIES INCLUDED
armatus Okajima, 1979*a*: 42–4. Holotype ♀, MALAYA (OCT).
bhowalii (Ananthakrishnan, 1972*a*: 183) (*Stigmothrips*). Holotype ♀, INDIA (TNA).
bicolor Okajima, 1979*a*: 44–6. Holotype ♀, THAILAND (OCT).
consimilis (Ananthakrishnan, 1969*a*: 173–4) (*Stigmothrips*). Holotype ♀, INDIA (TNA).
femoralis Okajima, 1979*a*: 48–9. Holotype ♀, SINGAPORE (OCT).
gabonensis (Bournier, 1970: 159–162) (*Baphothrips*). Holotype ♀, GABON (?BCM).
indicus (Ananthakrishnan, 1968*a*: 125–6) (*Philothrips*). Holotype ?♀, INDIA (TNA).
japonicus Okajima, 1979*a*: 49–50. Holotype ♀, JAPAN (OCT).

leios (Mound, 1970: 94–6) (*Baphothrips*). Holotype ♀, SOLOMON Is. (BMNH).
lieni Okajima, 1979*a*: 50–2. Holotype ♀, TAIWAN (OCT).
luridus Okajima, 1979*a*: 52–3. Holotype ♀, MALAYA (BMNH).
maculipennis (Okajima, 1976: 125–8) (*Stigmothrips*). Holotype ♀, OKINAWA Is. (OCT).
malayensis Okajima, 1979*a*: 54–6. Holotype ♀, MALAYA (OCT).
medioflavus (Karny, 1925*a*: 50–2) (*Ophidothrips*). Holotype ♀, JAVA (SMF).
montanus Okajima, 1979*a*: 57–9. Holotype ♀, JAPAN (OCT).
nigripennis Okajima, 1979*a*: 59–61. Holotype ♀, TAIWAN (OCT).
ocularis Okajima, 1979*a*: 61–2. Holotype ♀, MALAYA (OCT).
tasmani Mound, 1974*a*: 18–9. Holotype ♀, AUSTRALIA (ANIC).
tricolor (Priesner, 1933*b*: 70–2) (*Baphothrips*). Holotype ♀, JAVA (SMF).

DEXIOTHRIPS Hartwig

Dexiothrips Hartwig, 1952: 452. Type-species: *Dexiothrips pensus* Hartwig, by monotypy.

This genus has been discussed by Okajima (1979*a*) who transferred into it a second species.

SPECIES INCLUDED
madrasensis (Ananthakrishnan, 1964*b*: 109–10) (*Malacothrips*). Syntypes ♀ ♂, INDIA (TNA).
pensus Hartwig, 1952: 453–457. Holotype ♀, SOUTH AFRICA (NCIP).

Tribe **DOCESSISSOPHOTHRIPINI**

This tribe was erected by Karny (1921*a*: 257; as a subfamily) for the two genera *Docessissophothrips* and *Egchocephalothrips*, although the latter is here removed to the Idolothripina (p. 76). Nine genera are here placed in the tribe (*Abiastothrips, Asemothrips, Docessissophothrips, Holothrips, Maxillata, Oidanothrips, Pongola, Symphyothrips, Tropothrips*), although a further 15 generic names are placed in synonymy. The species in these genera share the following characters.

Antennae with segments VII–VIII more or less fused, III with three sense cones (two in *Asemothrips*, *Pongola, Symphyothrips*, four in *Oidanothrips*), IV with four sense cones (two in *Symphyothrips* and sometimes *Pongola*). Maxillary stylets moderately broad, retracted to compound eyes, usually parallel in middle of head but sometimes looped; maxillary guides stout. Pronotum with epimeral sutures complete; praepectus absent; metathoracic sternopleural sutures well-developed, anapleural sutures complete (Figs 412, 413). Wings usually present; forewings with duplicated cilia (except *Asemothrips*). Pelta (Figs 404–406) usually elongate triangular (relatively broad in *Pongola*); tergites with two pairs of sigmoid wing-retaining setae, although these are sometimes reduced; tube usually with straight sides but in various species the tube is broadened, ridged or sculptured; tergite IX setae B_2 of male short and stout (except *Pongola* and *Symphyothrips*); median sternites of male (usually III–V) with one or a pair of transverse areas of reticulate sculpture which is irridescent under phase contrast microscopy (Fig. 391).

The long maxillary stylets, stout maxillary guides, narrow pelta, thoracic sutures, and the short, stout B_2 setae on tergite nine of males indicate that this group is related to the Phlaeothripini. However, members of the latter group are usually associated with Basidiomycete fungi and apparently feed on the external digestion products of the fungal hyphae. In contrast, small pale spores and even branched hyphae have been found in the gut contents of some Docessissophothripini, and it seems possible that this group of species has specialised on some different source of fungal food. Unlike typical Phlaeothripini the males do not have a glandular area on sternite eight, although they usually have characteristic reticulate areas just anterior to the discal setae on the median sternites (Fig. 391). Somewhat similar glandular areas are found in Plectrothripini (Okajima, 1981) and the Idolothripinae genus *Dichaetothrips* (p. 52).

The Docessissophothripini comprises one large, complex and world-wide genus, *Holothrips*, with several small or monobasic genera each of which is geographically restricted and definable from *Holothrips* only on rather weak characters. This pattern of speciation is to be expected in a recently evolved group, and reinforces the view that this tribe has evolved relatively recently from the Phlaeothripini and is phylogenetically distinct from the Idolothripinae.

ABIASTOTHRIPS Priesner

(Fig. 398)

Trichothrips (*Abiastothrips*) Priesner, 1925*d*: 153. Type-species: *Trichothrips schaubergeri* Priesner, by original designation.
Abiastothrips Priesner; Priesner, 1927*a*: 556. [Raised to genus.]
Cratothrips Priesner, 1927*a*: 494–5. Type-species: *Cratothrips angulatus* Priesner, by monotypy. [Synonymised by Zur Strassen, 1974: 119–20.]

The type-species of this genus has a broad inter-antennal projection, small eyes and rounded cheeks; however, *soror* has a more slender head (Fig. 398) which is similar to some species of *Holothrips*. These two species appear to be a Holarctic derivative from the large tropical complex of Docessissophothripini. *Bolothrips lativerticis*, from Oregon and Washington State, in north-western U.S.A., was transferred to *Adelothrips* by Mound (1974*b*: 181) but is here recognised as a synonym of *schaubergeri* from Europe.

SPECIES INCLUDED
***angulatus** Priesner, 1927*a*: 495–6. Holotype ♀, CORSICA (destroyed).
schaubergeri (Priesner, 1920: 86–7) (*Trichothrips*). Holotype ♀, AUSTRIA (SMF).
  priesneri Bagnall, 1933*b*: 658 (*Cratothrips*). Holotype ♀, AUSTRIA (BMNH).
  lativerticis Post, 1961: 141–3 (*Bolothrips*). Holotype ♀, CANADA (CAS). **Syn. n.**
soror Zur Strassen, 1974: 111–20. Holotype ♀, MADEIRA (SMF).

ASEMOTHRIPS Hood **gen. rev.**

(Figs 391, 411)

Asemothrips Hood, 1919*b*: 83. Type-species: *Asemothrips picturatus* Hood, by monotypy.
Empresmothrips Karny, 1920*c*: 40. Type-species: *Empresmothrips combustipes* Karny, by monotypy. **Syn. n.**
Coenothrips Bagnall, 1924: 629. Type-species: *Coenothrips fallax* Bagnall, by monotypy. **Syn. n.**
Eucoenothrips Bagnall, 1926: 553. [Replacement name for *Coenothrips* Bagnall, see Mound, 1968: 75.] **Syn. n.**

Mound (1974*a*), in establishing the above generic synonymies, used the name *Empresmothrips* in error despite the priority of *Asemothrips*. The genus is used for a group of five Australian species which share a series of characters with *Holothrips* species: maxillary stylets and guides, metathoracic sternopleural and anapleural sutures, males with reticulate glandular areas on median sternites (Fig. 391) and short B_2 setae on tergite nine. However, the species of *Asemothrips* lack forewing duplicated cilia, have only two sense cones on the third antennal segment and these both arise ventrally, and the sixth antennal segment is broadly truncate apically (Fig. 411).

SPECIES INCLUDED
combustipes (Karny, 1920*c*: 41) (*Empresmothrips*). Holotype ♀, AUSTRALIA (NRS). **Comb. n.**
fallax (Bagnall, 1924: 629–30) (*Coenothrips*). Holotype ♀, AUSTRALIA (BMNH). **Comb. n.**
  rhopaloides Karny, 1924: 31–2 (*Cryptothrips*). Holotype ♀, AUSTRALIA (NRS).
  froudei Girault, 1927*e*: 1 (*Cryptothrips*). Holotype ♀, AUSTRALIA (QMB).
  silvae Girault, 1927*e*: 1 (*Cryptothrips*). Holotype ♀, AUSTRALIA (QMB).
finlayi (Girault, 1927*b*: 1) (*Cryptothrips*). Holotype ♀, AUSTRALIA (QMB). **Comb. n.**
folii (Girault, 1928*c*: 2) (*Empresmothrips*). Holotype ♂, AUSTRALIA (QMB). **Comb. n.**
pallipes (Karny, 1925*a*: 22–4) (*Empresmothrips*). Holotype ♀, JAVA (SMF). **Comb. n.**, but see Mound, 1971*a*: 400.
picturatus Hood, 1919*b*: 83–4. Holotype ♂, AUSTRALIA (USNM).
  longfellowi Girault, 1926: 1 (*Empresmothrips*). Lectotype ♀, AUSTRALIA (QMB).

DOCESSISSOPHOTHRIPS Bagnall

(Figs 394, 395, 405, 413)

Docessissophothrips Bagnall, 1908*b*: 201–2. Type-species: *Docessissophothrips ampliceps* Bagnall, by monotypy.

Polyphemothrips Schmutz, 1909: 276. Type-species: *Polyphemothrips brasiliensis* Schmutz, by monotypy. **Syn. n.**

The male holotype of *ampliceps*, described originally when mounted dry on a card, is now cleared and mounted in balsam on a microscope slide (Fig. 394). This specimen has been compared with two females from Brazil (in BMNH) which are determined as *brasiliensis* from the original description of that species. In all three specimens the head is strongly elevated medially, and the maxillary stylets lie close together but have a single lateral loop in the prothoracic region. Moreover, the *ampliceps* holotype as well as two specimens determined as *brasiliensis* (in USNM) have the stylets crossing over each other near the posterior margin of the head, although the cross-over itself is scarcely wider than the width of the stylets and might be an artefact. In the unique holotype of *dotatus* this cross-over is, however, more pronounced; the stylet arrangement of this specimen thus approaches that found in the species of *Tropothrips* q.v. The existence of a lateral loop in the stylets of the following species has kindly been confirmed by Steve Nakahara (U.S.D.A., Washington): *corticis, cuneatus, dotatus, tenuiceps, tibialis, travassosi, woytkowski* and *yupanqui*. In *tenuiceps* the stylets are angulate on one side but looped on the other. In *villicornis* the stylets can only be seen on one side and that is angulate. In *cuneatus* the stylets are looped laterally in the holotype (also one male in BMNH) but not in the male labelled 'allotype'. The species *bursarius* has the stylets without lateral loops and is here listed under *Holothrips*. Moreover, the following three species described by Bagnall in *Docessissophothrips* are here listed under the genera indicated: *laticeps* (*Polytrichothrips*); *longiceps* (*Bacillothrips*); *frontalis* (*Oidanothrips*). The type-species of *Docessissophothrips* and *Polyphemothrips* are very similar and must be regarded as congeneric; however, in *ampliceps* the mid-vertex setae on the head lie in the same transverse plane as the postocular setae whereas they lie posterior to the postoculars in *brasiliensis* and the closely related species *major* (Fig. 395). *D. amplus* is also unusual in having yellow mid- and hindcoxae. *D. dotatus* is unique in this group in having four sense cones on antennal segment III as in *Oidanothrips*.

SPECIES INCLUDED

ampliceps Bagnall, 1908*b*: 202–3. Holotype ♂, MEXICO (BMNH).
****annuus*** Moulton; nomen nudum *in* Priesner, 1933*a*: 61. NORTH AMERICA.
brasiliensis (Schmutz, 1909: 276–8) (*Polyphemothrips*). Holotype ? ♂, BRAZIL (? lost). **Comb. n.**
***corticis** (Hood, 1914: 167–9) (*Polyphemothrips*). Holotype ♀, PANAMA (USNM). **Comb. n.**
cuneatus (Hood, 1939*a*: 217–20) (*Polyphemothrips*). Holotype ♀, PERU (USNM). **Comb. n.**
***dotatus** (Hood, 1955: 108–110) (*Polyphemothrips*). Holotype ♀, BRAZIL (USNM). **Comb. n.**
major Bagnall, 1912: 215. Holotype ♀, no data (BMNH).
***tenuiceps** (Hood, 1937*a*: 285–8) (*Polyphemothrips*). Holotype ♀, PERU (USNM). **Comb. n.**
tibialis (Hood & Williams, 1915: 136–7) (*Polyphemothrips*). Holotype ♀, U.S.A.: Louisiana (USNM). **Comb. n.**
***travassosi** (Hood, 1949: 55–9) (*Polyphemothrips*). Holotype ♀, BRAZIL (USNM). **Comb. n.**
***villicornis** (Hood, 1949: 59–62) (*Polyphemothrips*). Holotype ♀, BRAZIL (USNM). **Comb. n.**
***woytkowskyi** (Hood, 1937*a*: 288–92) (*Polyphemothrips*). Holotype ♀, PERU (USNM). **Comb. n.**
***yupanqui** (Hood, 1937*c*: 509–13) (*Polyphemothrips*). Holotype ♀, PERU (USNM). **Comb. n.**

HOLOTHRIPS Karny

(Figs 388–390, 393, 399–404, 407, 409, 412)

Holothrips Karny, 1911: 502. Type-species: *Holothrips ingens* Karny, by monotypy.

Lathrobiothrips Hood, 1933: 421. Type-species: *Lathrobiothrips ramuli* Hood, by monotypy. **Syn. n.**

Panceratothrips Bagnall, 1936: 219–20. Type-species: *Panceratothrips typicus* Bagnall, by monotypy. **Syn. n.**

Adelothrips Hood, 1938*c*: 380. Type-species: *Adelothrips xanthopus* Hood, by original designation. **Syn. n.**
Cordylothrips Hood, 1937*c*: 517–8. Type-species: *Cordylothrips peruvianus* Hood, by monotypy. **Syn. n.**
Ischnothrips Moulton, 1944: 305. Type-species: *Ischnothrips zimmermani* Moulton, by monotypy. **Syn. n.**
Agnostothrips Moulton, 1947*a*: 172–3. Type-species: *Agnostothrips semiflavus* Moulton, by monotypy. **Syn. n.**
Agnostothrips (*Erythrinothrips*) Ananthakrishnan, 1956: 341. Type-species: *Agnostothrips* (*Erythrinothrips*) *indicus* Ananthakrishnan, by monotypy. [Raised to genus by Ananthakrishnan, 1964: 94.] **Syn. n.**
Stinothrips Ananthakrishnan, 1969: 55. Type-species: *Ischnothrips typicus* Ananthakrishnan, by monotypy. **Syn. n.**
Holmiella Zur Strassen, 1972: 95–8. Type-species: *Holmiella nigrita* Zur Strassen, by monotypy. **Syn. n.**

The type-species of *Holothrips* does not appear to have been re-examined since its original description. Hood (1952) described three species in the genus, but he is the only other author to have used the name. Of the three species, only *procerus* has been examined in the present study, and this has the head much longer than *ingens* (Figs 390, 403). In fact, *ingens* is here regarded as the senior synonym of *fenestralis*, described by Hood in *Adelothrips*, and it is closely related to *lanei*. Both of these have the major posteroangular setae on the abdominal tergites long and pale but flattened and remarkably wide (10 μm medially). However, this may be subject to sexual dimorphism because a male identified as *lanei* (in BMNH) has these setae more slender. Both *ingens* and *lanei* have striate sculpture on tergite II, and the head and pelta are very similar, but *lanei* has yellow markings on the hindtibiae and hind margins of the anterior tergites, and *ingens* has a curious pale area ventrally on the midfemora.

Most of the species described in *Adelothrips* are rather small, but no good characters have been found for segregating these small species into a separate genus from *Holothrips*. *Panceratothrips* was erected for a single species with rather stout antennae and with the head elongate and projecting a little in front of the eyes (Fig. 401). *Cordylothrips* (Figs 388, 409) was also erected for a single species with stout antennae, but with segment VI broadly fused to VII+VIII. An undescribed species (in BMNH) from Peru has been studied, however, with antennae intermediate in structure (N.B. this species and *peruvianus* are very similar in head shape and body structure to *Docessissophothrips yupanqui* but do not have looped stylets).

The type-series of *Ischnothrips* (Fig. 389) has the head elongate and elevated dorsally with the stylets closely approximating to the *Docessissophothrips* condition, whereas the type-species of *Agnostothrips* (Fig. 400) has the head shorter as in *ingens*. Neither *Stinothrips* (based on a micropterous holotype, Fig. 399) nor *Erythrinothrips* can be distinguished from *Holothrips*. Similarly the unique holotype of *Holmiella nigrita* is here regarded as a large member of *Holothrips* with the head relatively elongate, but similar in shape to *buccalis* and *bellulus*. Finally, *Lathrobiothrips* was erected originally for one species with the tube exceptionally broad. However, not only do the two subsequent members of this genus have a more elongate tube (Fig. 393), there are other species described in *Adelothrips* with the tube stout but apically constricted (*macrura*) or broad and heavily sculptured (*adelos*). None of these can be distinguished satisfactorily from *Holothrips*.

The interpretation of the genus *Holothrips* adopted here thus involves a wide range of body size, head shape and tube shape. However, the range of form appears to be more or less continuous with no subgroups being evident above the level of relatively small species-groups. All the species studied have antennal segments VII+VIII more or less fused, there being four sense cones on IV and three on III (except *phaeura* and *aberrans* with only two on III). The maxillary guides are well developed, the stylets moderately broad, deeply retracted and parallel in the middle of the head. The metathoracic sternopleural sutures are well developed, and the anapleural sutures complete. The pelta is small and bell-shaped or elongate-triangular, the tergites usually have two pairs of wing-retaining setae (although these are sometimes reduced), and in males the median sternites have transverse bands of reticulation which probably represent glandular areas.

Docessissophothrips appears to represent a small group of large-bodied species derived from *Holothrips*, and *Pongola* and *Symphyothrips* are probably also derived from this genus.

Species included
*__*aberrans*__ (Hood, 1955: 88–90) (*Adelothrips*). Holotype ♀, Brazil (USNM). **Comb. n.**
acutus (Stannard, 1956: 108–9 (*Adelothrips*). Holotype ♀, U.S.A.: Illinois (INHS). **Comb. n.**
*__*adelos*__ (Mound, 1968: 146) (*Polyphemothrips*). [Replacement name for *caudatus* Hood.] **Comb. n.**
  caudatus Hood, 1955: 90–2 (*Adelothrips*). Holotype ♀, Brazil (USNM).
ambitus (Hinds, 1902: 191–2) (*Trichothrips*). Holotype ♀, U.S.A.: Massachusetts (? USNM). **Comb. n.**
*__*amplus*__ Hood, 1952: 160–1. Lectotype ♀, Brazil (USNM).
*__*aspericauda*__ Hood, 1952: 161. Holotype ♀, Brazil (USNM).
australis (Mound, 1974*a*: 12–5) (*Adelothrips*). Holotype ♀, Australia: A.C.T. (ANIC). **Comb. n.**
*__*bellulus*__ (Hood, 1955: 92–4) (*Adelothrips*). Holotype ♀, Brazil (USNM). **Comb. n.**
*__*bicolor*__ (Stannard, 1956: 109) (*Adelothrips*). Holotype ♀, Mexico (INHS). **Comb. n.**
bipartitus (Hood, 1954*b*: 281–2) (*Adelothrips*). Holotype ♀, U.S.A.: Florida (USNM). **Comb. n.**
bratleyi (Watson, 1935: 61–2, & 1937: 12–13) (*Trichothrips*). Syntypes ♀ ♂, U.S.A.: Florida & Alabama (FSAC). **Comb. n.**
  flavus Moulton & Andre, 1936: 225–6 (*Hoplothrips*). Holotype ♀, U.S.A.: Iowa (CAS).
*__*buccalis*__ (Hood, 1955: 94–6) (*Adelothrips*). Holotype ♀, Brazil (USNM). **Comb. n.**
*__*bursarius*__ (Hood, 1957: 174) (*Polyphemothrips*). Holotype ♀, Brazil (USNM). **Comb. n.**
*__*caribbeicus*__ (Stannard, 1956: 109–10) (*Adelothrips*). Holotype ♀, Mexico (INHS). **Comb. n.**
caudatus (Bagnall, 1915*b*: 595–6) (*Allothrips*). Holotype ♀, Sarawak (BMNH). **Comb. n.**
citricornis (Bagnall, 1913: 296) (*Cryptothrips*). Holotype ♂, Tanzania (BMNH). **Comb. n.**
*__*conicura*__ (Hood, 1942: 611–5) (*Adelothrips*). Holotype ♀, Peru (USNM). **Comb. n.**
*__*connaticornis*__ (Hood, 1925*b*: 65–6) (*Cryptothrips*). Holotype ♂, Trinidad (USNM). **Comb. n.**
*__*cornutus*__ (Hood, 1955: 96–9) (*Adelothrips*). Holotype ♀, Brazil (USNM). **Comb. n.**
cracens (Ananthakrishnan, 1968*b*: 55–6) (*Polyphemothrips*). Holotype ♀, India (TNA). **Comb. n.**
*__*eucharis*__ (Hood, 1955: 84–8) (*Adelothrips*). Holotype ♀, Brazil (USNM). **Comb. n.**
formosus (Hood, 1952*c*: 158–9) (*Adelothrips*). Holotype ♀, Brazil (USNM). **Comb. n.**
*__*fumidus*__ (Ananthakrishnan, 1972*b*: 429–30) (*Polyphemothrips*). Holotype ♀, India (TNA). **Comb. n.**
*__*graminicola*__ (Hood, 1952*c*: 157) (*Adelothrips*). Holotype ♀, Brazil (USNM). **Comb. n.**
*__*grandis*__ (Stannard, 1956: 110–1) (*Adelothrips*). Holotype ♀, Mexico (INHS). **Comb. n.**
*__*hammockensis*__ (Stannard, 1956: 111–2) (*Adelothrips*). Holotype ♀, U.S.A.: Florida (INHS). **Comb. n.**
indicus (Ananthakrishnan, 1956*a*: 341–2) (*Agnostothrips: Erythrinothrips*). Holotype ♀, India (TNA). **Comb. n.**
  associatus Ananthakrishnan, 1968*b*: 56–7 (*Symphyothrips*). Holotype ♀, India (TNA).
insignis (Hood, 1938*b*: 162–5) (*Lathrobiothrips*). Holotype ♀, Peru (USNM). **Comb. n.**
ingens Karny, 1911: 502–3. Holotype ♀, Paraguay (DEI).
  fenestralis Hood, 1949: 67–70 (*Adelothrips*). Holotype ♀, Brazil (USNM). **Syn. n.**
junctus (Hood, 1912*b*: 139–42) (*Cryptothrips*). Lectotype ♀, U.S.A.: Michigan (USNM). **Comb. n.**
  quercus Moulton & Andre, 1936: 225 (*Hoplothrips*). Holotype ♀, U.S.A.: Iowa (CAS).
lanei (Hood, 1949: 63–6) (*Adelothrips*). Holotype ♀, Brazil (USNM). **Comb. n.**
*__*lucyae*__ (Gaud, 1961: 117–8) (*Polyphemothrips*). Holotype ♂, Puerto Rico (RPAESIC). **Comb. n.**
luteus (Faure, 1954*b*: 147–52) (*Polyphemothrips*). Holotype ♀, South Africa (NCIP). **Comb. n.**
*__*macrura*__ (Hood, 1941: 185–7) (*Adelothrips*). Holotype ♀, Cuba (USNM). **Comb. n.**
minor (Hood, 1937*c*: 513–7) (*Polyphemothrips*). Holotype ♂, Peru (USNM). **Comb. n.**
*__*mirandus*__ (Ananthakrishnan, 1969*c*: 305) (*Polyphemothrips*). Holotype ♀, India (TNA). **Comb. n.**
*__*nepalensis*__ (Pelikan, 1970: 366–8) (*Adelothrips*). Holotype ♀, Nepal (Innsbruck University). **Comb. n.**
nigrita (Zur Strassen, 1972: 96–8) (*Holmiella*). Holotype ♀, Kenya (NRS). **Comb. n.**
palmarum (Hood, 1952*c*: 157) (*Adelothrips*). Holotype ♀, Brazil (USNM). **Comb. n.**
*__*pericles*__ (Hood, 1938*c*: 383–6) (*Adelothrips*). Holotype ♀, U.S.A.: Florida (USNM). **Comb. n.**
peruvianus (Hood, 1937*c*: 518–21) (*Cordylothrips*). Holotype ♀, Peru (USNM). **Comb. n.**
*__*phaeura*__ (Hood, 1941: 183–5) (*Adelothrips*). Holotype ♀, U.S.A.: Florida (USNM). **Comb. n.**
procerus Hood, 1952: 160. Holotype ♀, Brazil (USNM).
ramuli (Hood, 1933: 421–2) (*Lathrobiothrips*). Lectotype ♀, Panama (USNM). **Comb. n.**
*__*robustus*__ (Hood, 1954*b*: 280–1) (*Adelothrips*). Holotype ♀, U.S.A.: Florida (USNM). **Comb. n.**
*__*ruidus*__ (Ananthakrishnan, 1969*c*: 305–6) (*Polyphemothrips*). Holotype ♀, India (TNA). **Comb. n.**
*__sculptilis__ (Hood, 1942: 609–11) (*Adelothrips*). Holotype ♀, Peru (USNM). **Comb. n.**
semiflavus (Moulton, 1947*a*: 173) (*Agnostothrips*). Holotype ♀, New Guinea (CAS). **Comb. n.**
skwarrae (Priesner, 1933*c*: 146–7) (*Symphyothrips*). Syntype ♀, Mexico (SMF). **Comb. n.**
*__*splendidus*__ (Johansen, 1977*a*: 39–40) (*Adelothrips*). Holotype ♀, Mexico (UNAM). **Comb. n.**
*__*sporophagus*__ (Stannard, 1956: 112) (*Adelothrips*). Holotype ♀, Venezuela (INHS). **Comb. n.**

speciossissimus (Karny, 1920*c*: 42) (*Nesothrips*). Holotype ♂, AUSTRALIA: Queensland (NRS). **Comb. n.**
***stannardi** (Ananthakrishnan, 1972*b*: 431–2) (*Polyphemothrips*). Holotype ♀, INDIA (TNA). **Comb. n.**
***subtilis** (Ananthakrishnan, 1972*b*: 430–1) (*Polyphemothrips*). Holotype ♀, INDIA (TNA). **Comb. n.**
***titschaki** (Priesner, 1928*c*: 53–4) (*Docessissophothrips*). Holotype ♀, SOUTH AFRICA (Hamburg, destroyed). **Comb. n.**
f. *debilis* Priesner, 1928*c*: 54. Holotype ♀, SOUTH AFRICA (SMF).
***tumidus** De Santis, 1963*a*: 7–10. Holotype ♂, ARGENTINA (MLPA).
typicus (Bagnall, 1936: 220) (*Panceratothrips*). Lectotype ♀, MADAGASCAR (MNHN).
typicus (Ananthakrishnan, 1967: 235) (*Ischnothrips*). Holotype ♀, INDIA (TNA). **Comb. n.**
***umbricola** (Hood, 1952*c*: 159–60) (*Adelothrips*). Holotype ♀, BRAZIL (USNM). **Comb. n.**
woytkowski (Hood, 1942: 615–7) (*Lathrobiothrips*). Holotype ♀, PERU (USNM). **Comb. n.**
***xanthopus** (Hood, 1938*c*: 380–3) (*Adelothrips*). Holotype ♀, U.S.A.: Florida (USNM). **Comb. n.**
zimmermanni (Moulton, 1944: 305–6) (*Ischnothrips*). Holotype ♂, FIJI (BPBM). **Comb. n.**

MAXILLATA Faure **gen. rev.**

(Fig. 385)

Maxillata Faure, 1949*a*: 852–3. Type-species: *Maxillata priesneri* Faure, by monotypy.

This genus was treated in synonymy with *Tropothrips* and *Docessissophothrips* by Stannard (1957). However, unlike the species of those two genera, *priesneri* does not have any part of the maxillary stylets parallel medially in the head. The stylets cross over each other between the compound eyes, and each then follows an independent, undulating course to the mouth aperature (Fig. 385). This stylet arrangement could be interpreted as part of a single transformation series, that is with *Maxillata* regarded as a more advanced and complicated form of *Tropothrips*, and the two genera placed in synonymy. However, the alternative interpretation is adopted here, that the two genera represent independent lines of evolution from *Holothrips*. Two specimens of an unidentified species from Jamaica (in BMNH) have the stylets arranged similarly to *priesneri* as figured by Faure (1949: 855). These specimens cannot, by themselves, be taken as indicating that the *Maxillata* stylet arrangement has evolved independently in both Old and New Worlds, because natural distribution patterns of fungus-feeding thrips are known to have been disrupted by human trading activity between Africa and the West Indies (Mound, 1974*b*: 111). In this connection a single specimen from Ghana (in BMNH) is also of interest. The head of this specimen is like an exaggerated form of *Tropothrips* (Fig. 386), but although the stylets are parallel medially they are both displaced laterally to the right-hand side in the posterior half of the head before producing one or more convolutions. This specimen is dark brown and much larger than *Tropothrips* or *Maxillata* species, although the body is essentially similar in structure to large species of *Holothrips*. It is here regarded as yet another independent off-shoot of *Holothrips*, but cannot be formally described because the specimen lacks antennae.

SPECIES INCLUDED
***priesneri** Faure, 1949*a*: 854–8. Holotype ♀, SOUTH AFRICA (NCIP).

OIDANOTHRIPS Moulton

(Figs 396, 408)

Oidanothrips Moulton, 1944: 308–9. Type-species: *Oidanothrips magnus* Moulton, by monotypy.

This genus is used here for four large Old World species which are similar to *Holothrips* species but have four sense cones on both the third and fourth antennal segments (Fig. 408). These species probably constitute a holophyletic group, but it is likely that this has developed from within the genus *Holothrips* rather than as a true sister-group. In the type-species sigmoid wing-retaining setae are developed only on tergites II to IV, and the anterior pair is reduced on each segment. The unique holotype of *frontalis* (Fig. 396) was rediscovered recently, dry in a tube (contrary to Mound, 1968), but lacks antennae. It is referred to this genus on the basis of fresh material from Japan and Malaya (Fig. 408). Moreover, *megacephalus* is probably the same species as *frontalis* judging from the description.

SPECIES INCLUDED

***enormis** (Ananthakrishnan, 1969*c*: 302–3) (*Polyphemothrips*). Holotype ♀, INDIA (TNA). **Comb. n.**
frontalis (Bagnall, 1914*a*: 26–7) (*Docessissophothrips*). Holotype ♀, JAPAN (BMNH). **Comb. n.**
  **femoralis* Ishida, 1932: 6–7 (*Machatothrips*). Holotype ♀, JAPAN (Hokkaido Univ.); Kurosawa, 1968: 58.
magnus Moulton, 1944: 309–10. Holotype ♀, FIJI (BPBM).
***megacephalus** (Ananthakrishnan, 1969*c*: 303–4) (*Polyphemothrips*). Holotype ♀, INDIA (TNA). **Comb. n.**

PONGOLA Zur Strassen

Pongola Zur Strassen, 1959: 186–7. Type-species: *Pongola rufianalis* Zur Strassen, by monotypy.

The only species in this genus has reduced, almost moniliform antennae with two sense cones on segment III and 4 or 3 (even 2) on segment IV. The pronotal epimeral sutures are incomplete and each tergite bears only a single pair of wing-retaining setae. However, the metathoracic sternopleural sutures are present, and the maxillary guides are long and stout although not densely sclerotised. The two most unusual (? apomorphic) characters of the species are the relatively broad pelta (in contrast to *Holothrips*) and the short, medially constricted tube. However, even the condition of these two characters could be regarded as the extremes of transformation series found within *Holothrips* – from which *Pongola* is almost certainly derived. The male has not been examined during the present studies.

SPECIES INCLUDED

rufianalis Zur Strassen, 1959: 187–97. Holotype ♀, SOUTH AFRICA (NCIP).

SYMPHYOTHRIPS Hood & Williams

(Figs 392, 397, 406, 410)

Symphyothrips Hood & Williams, 1915: 131. Type-species: *Symphyothrips punctatus* Hood & Williams, by monotypy.

Mesopotamothrips Liebermann & Gemignani, 1931: 212. Type-species: *Mesopotamothrips concordiensis* Liebermann & Gemignani, by monotypy. [Synonymised by De Santis, 1959: 248.]

Most of the species listed in this genus have not been studied by the present authors, and Hood (1952) indicated that possibly only *caliginosus* is congeneric with *punctatus*. A single specimen from Panama has been examined (in BMNH) with more slender antennal segments than *punctatus* and only one sense cone on segment III (Fig. 410), and this apparently represents a third species. The genus is closely related to *Holothrips* but with only 2 (or 1) sense cones on antennal segment III and 2 on IV. The suture between antennal segments VII and VIII is poorly developed or absent, but the pelta is shorter and broader than in most *Holothrips* species (Fig. 406), being very similar to many *Haplothrips* species. The maxillary stylets and maxillary guides are similar to *Holothrips* (Fig. 397), and the metathoracic sternopleural sutures are well developed, but the anterior pair of wing-retaining setae is often absent on each tergite, even in macropterae. Males of *punctatus* have the typical iridescent reticulate areas anterior to the discal setae on sternites IV–VI, but setae B_2 on tergite nine are long and slender. The short swollen tube of *Symphyothrips* (Fig. 392) species has also evolved in *Holothrips,* amongst the species described under the name *Lathrobiothrips*. The position of *Mesopotamothrips* requires further confirmation, because the illustration of the antenna given by de Santis (1959: 249) suggests that *concordiensis* might be a species of *Holothrips*.

SPECIES INCLUDED

***aberrans** Ananthakrishnan, 1971: 201–2. Holotype ♀, INDIA (TNA).
***alifanensis** Bianchi, 1949: 348–50. Holotype ♀, GUAM (BPBM).
***caliginosus** Hood, 1952*c*: 163–4. Lectotype ♀, BRAZIL (USNM).
***concordiensis** (Liebermann & Gemignani, 1931: 213–4) (*Mesopotamothrips*). Syntypes ♀, ARGENTINA (MACN).
***longicauda** Priesner, 1924: 150. Holotype ♂, Baltic amber fossil (? lost).
***longicornis** Priesner, 1921: 200–2. Syntypes ♀ ♂, PARAGUAY (SMF).

***potosiensis** Moulton, 1947*b*: 419–20. Holotype ♀, MEXICO (CAS).
punctatus Hood & Williams, 1915: 131–3. Holotype ♀, U.S.A.: Florida (USNM).
***reticulatus** Watson, 1925: 29–30, 45. Holotype ♀, ARGENTINA (FSAC).

TROPOTHRIPS Hood **gen. rev.**

(Fig. 387)

Tropothrips Hood, 1949: 70–1. Type species: *Tropothrips borgmeieri* Hood, by monotypy.

This genus has been treated as a synonym of *Docessissophothrips* (Stannard, 1957), but although closely related these two genera are here distinguished by the arrangement of the maxillary stylets. In species of both genera the stylets lie close together and parallel medially for at least a short distance, but in *Docessissophothrips* each stylet has only one lateral loop whereas in *Tropothrips* the stylets cross over each other to form a large median loop as well as the pair of lateral loops (Fig. 387). This is not a fundamental difference, however, because *D. dotatus* and *D. ampliceps* each has a small posteromedian cross-over loop. The genus *Maxillata* (q.v.) is also recognised here because of the even more complex arrangement of the stylets. Apart from the maxillary stylets, the rest of the body of *Tropothrips* species, including the antennae, pelta and tergites, is essentially similar to that of *Holothrips* species. The male holotype of *dampfi* has the typical median transverse band of reticulation (? glandular area) on sternites V–VI anterior to the discal setae.

SPECIES INCLUDED
***borgmeieri** Hood, 1949: 71–6. Holotype ♀, BRAZIL (USNM).
dampfi (Priesner, 1933*a*: 59–61) (*Docessissophothrips*). Holotype ♂, MEXICO (SMF).
***nigripes** Stannard, 1954*a*: 84. Holotype ♀, COSTA RICA (INHS).
***richardsi** Stannard, 1954*a*: 82–4. Holotype ♀, U.S.A.: Florida (INHS).
***tuxtlae** Johansen, 1977*a*: 37–9. Holotype ♀, MEXICO (UNAM).

References

Ananthakrishnan, T. N. 1956*a*. *Erythrinothrips*, nov. – A new subgenus of *Agnostothrips* Moulton (Tubulifera, Thysanoptera) from India. *Indian Journal of Entomology* **17** (1955): 341–342.
—— 1956*b*. Studies on some Indian Thysanoptera III. *Zoologischer Anzeiger* **157**: 130–139.
—— 1957. Studies on Indian Thysanoptera IV. *Zoologischer Anzeiger* **159**: 92–102.
—— 1958. Two new species of Tubuliferous Thysanoptera from India (Thysanoptera, Phlaeothripidae). *Proceedings of the Entomological Society of Washington* **60**: 277–280.
—— 1959. Studies on some Indian Thysanoptera V. *Zoologischer Anzeiger* **162**: 313–324.
—— 1960. *Neosmerinthothrips inquilinus* sp. nov., an inquiline Tubuliferan (Thysanoptera) from India. *Bulletin of Entomology, Loyola College, Madras* **1**: 32–33.
—— 1961*a*. New Tubuliferan Thysanoptera from India. *Journal of the Zoological Society of India* **12** (1960): 250–258.
—— 1961*b*. Studies on some Indian Thysanoptera VI. *Zoologischer Anzeiger* **167**: 259–271.
—— 1964*a*. A contribution to our knowledge of the Tubulifera (Thysanoptera) from India. *Opuscula Entomologica* Suppl. 25: 1–120.
—— 1964*b*. Thysanopterologica Indica – I. *Entomologisk Tidskrift* **85**: 99–120.
—— 1966. Thysanopterologica Indica – IV. *Bulletin of Entomology, Loyola College, Madras* **7**: 1–12.
—— 1967. New Indian Thysanoptera. *Annales de la Société Entomologique de France* **3**: 227–237.
—— 1968*a*. Studies on new and little known Indian Thysanoptera. *Oriental Insects* **1**: 113–138.
—— 1968*b*. Thysanopterologica Indica – V. *Oriental Insects* **2**: 41–58.
—— 1968*c*. Two new species of *Nesothrips* with further remarks on *Nesothrips robustus* (*Thysan. Tubulifera*). *Annales de la Société Entomologique de France* **4**: 967–973.
—— 1969*a*. Mycophagous Thysanoptera – I. *Indian Forester* **95**: 173–185.
—— 1969*b*. Mycophagous Thysanoptera – II. *Oriental Insects* **3**: 289–299.
—— 1969*c*. The genus *Polyphemothrips* Schmutz from India. *Oriental Insects* **3**: 301–310.
—— 1969*d*. Indian Thysanoptera. *CSIR Zoological Monograph* **1**, 171 pp. New Delhi.
—— 1970. On some species of *Nesothrips* Kirkaldy with notes on the influence of oedymerism and

gynaecoidism in species of allied genera of Cryptothripini (Tubulifera: Thysanoptera). *Journal of the Zoological Society of India* **22**: 51–62.

—— 1971. Mycophagous Thysanoptera – III. *Oriental Insects* **5**: 189–208.

—— 1972*a*. New species of *Stigmothrips* Ananthakrishnan with keys to Indian species. *Journal of the Zoological Society of India* **23**: 175–185.

—— 1972*b*. Mycophagous Thysanoptera – IV. *Oriental Insects* **6**: 425–437.

—— 1972*c*. Mycophagous Thysanoptera – V. *Oriental Insects* **6**: 439–447.

—— 1973*a*. Studies on some Indian species of the genus *Elaphrothrips* Buffa (Megathripinae: Tubulifera: Thysanoptera). *Pacific Insects* **15**: 271–284.

—— 1973*b*. Mycophagous Tubulifera of India (Thysanoptera: Insecta). *Occasional Publications of the Entomological Research Unit, Loyola College, Madras* **2**: 144 pp., 26 pls.

—— 1978. Thrips galls and gall thrips. *Zoological Survey of India, Technical Monograph* no. 1, 69 pp., 26 pls.

Ananthakrishnan, T. N. & Jagadish, A. 1970. The species of *Diceratothrips* Bagnall and allied genera from India (Thysanoptera: Megathripinae: Insecta). *Oriental Insects* **4**: 265–280.

Andre, F. 1940. The Nearctic species of *Elaphrothrips* Buffa (Thysanoptera: Phlaeothripidae). *Proceedings of the Entomological Society of Washington* **42**: 75–90.

Bagnall, R. S. 1908*a*. On some new and curious Thysanoptera (Tubulifera) from Papua. *Annals and Magazine of Natural History* (8) **1**: 355–363.

—— 1908*b*. On some new genera and species of Thysanoptera. *Transactions of the Natural History Society of Northumberland* **3**: 183–217.

—— 1909*a*. Synonymical notes; with description of a new genus of Thysanoptera. *Annales de la Société Entomologique de Belgique* **52**: 348–352.

—— 1909*b*. Notes on Thysanoptera (Tubulifera) new to the British fauna, with description of a new species of *Megathrips*. *Entomologist's Monthly Magazine* **45**: 129–132.

—— 1909*c*. On some new and little-known exotic Thysanoptera. *Transactions of the Natural History Society of Northumberland* **3**: 524–540.

—— 1909*d*. On two new genera of Thysanoptera from Venezuela: *Anactinothrips* and *Actinothrips*. *Journal of the Linnaean Society* (Zoology) **30**: 329–335.

—— 1910*a*. A contribution towards a knowledge of the neotropical Thysanoptera. *Journal of the Linnaean Society* (Zoology) **30**: 369–387.

—— 1910*b*. Thysanoptera. *In*: *Fauna Hawaiiensis* **3**: 669–701. London.

—— 1911. Descriptions of three new Scandinavian Thysanoptera (Tubulifera). *Entomologist's Monthly Magazine* **46**: 60–63.

—— 1912. Preliminary descriptions of three new species of Thysanoptera. *Annals and Magazine of Natural History* (8) **9**: 214–217.

—— 1913. Brief descriptions of new Thysanoptera. – I. *Annals and Magazine of Natural History* (8) **12**: 290–299.

—— 1914*a*. Brief descriptions of new Thysanoptera. – II. *Annals and Magazine of Natural History* (8) **13**: 22–31.

—— 1914*b*. Brief descriptions of new Thysanoptera. – III. *Annals and Magazine of Natural History* (8) **13**: 287–297.

—— 1914*c*. Brief descriptions of new Thysanoptera. – IV. *Annals and Magazine of Natural History* (8) **14**: 375–381.

—— 1915*a*. Brief descriptions of new Thysanoptera. – V. *Annals and Magazine of Natural History* (8) **15**: 315–324.

—— 1915*b*. Brief descriptions of new Thysanoptera. – VI. *Annals and Magazine of Natural History* (8) **15**: 588–597.

—— 1915*c*. A preliminary account of the Thysanoptera of Borneo. *Sarawak Museum Journal* **2**: 267–272.

—— 1916. Brief descriptions of new Thysanoptera. – VIII. *Annals and Magazine of Natural History* (8) **17**: 397–412.

—— 1917. On a collection of Thysanoptera from St Vincent, with descriptions of four new species. *Journal of Zoological Research* **2**: 21–27.

—— 1918. Brief descriptions of new Thysanoptera. – IX. *Annals and Magazine of Natural History* (9) **1**: 201–221.

—— 1921*a*. On Thysanoptera from the Seychelles Islands and Rodrigues. *Annals and Magazine of Natural History* (9) **7**: 257–293.

—— 1921*b*. Brief descriptions of new Thysanoptera. – XI. *Annals and Magazine of Natural History* (9) **7**: 355–368.

—— 1921*c*. Brief descriptions of new Thysanoptera. – XII. *Annals and Magazine of Natural History* (9) **8**: 393–400.
—— 1923. Brief descriptions of new Thysanoptera. – XIII. *Annals and Magazine of Natural History* (9) **12**: 624–631.
—— 1924. Brief descriptions of new Thysanoptera. – XIV. *Annals and Magazine of Natural History* (9) **14**: 625–640.
—— 1926. Brief descriptions of new Thysanoptera. – XVI. *Annals and Magazine of Natural History* (9) **18**: 545–560.
—— 1927. Contributions towards a knowledge of the European Thysanoptera. – II. *Annals and Magazine of Natural History* (9) **19**: 564–575.
—— 1928. On some Samoan and Tongan Thysanoptera, with special reference to *Ficus* gall-causers and their inquilines. Thysanoptera. *In*: *Insects of Samoa* **7**: 55–76, London.
—— 1929. On some new and interesting Thysanoptera of economic importance. *Bulletin of Entomological Research* **20**: 69–76.
—— 1932. Brief descriptions of new Thysanoptera. – XVII. *Annals and Magazine of Natural History* (10) **10**: 505–520.
—— 1933*a*. More new and little-known British thrips. *Entomologist's Monthly Magazine* **69**: 120–123.
—— 1933*b*. Contributions towards a knowledge of the European Thysanoptera. – IV. *Annals and Magazine of Natural History* (10) **11**: 647–661.
—— 1934*a*. Brief descriptions of new Thysanoptera. – XVIII. *Annals and Magazine of Natural History* (10) **13**: 481–498.
—— 1934*b*. Contributions towards a knowledge of the Thysanopterous genus *Elaphrothrips* Buffa. – I. *Annals and Magazine of Natural History* (10) **13**: 627–636.
—— 1935. Contributions towards a knowledge of the Thysanopterous genus *Elaphrothrips* Buffa. – II. *Annals and Magazine of Natural History* (10) **15**: 130–146.
—— 1936. Descriptions of some new Thysanoptera from tropical Africa and Madagascar. *Revue Française d'Entomologie* **3**: 219–230.
Bergroth, E. 1888. Diagnose d'une nouvelle espèce de Thysanoptères. *Bulletin de la Société Entomologique de Belgique* **1888**: xxx.
Bianchi, F. A. 1944. *Nesothrips* Kirkaldy supersedes *Oedemothrips* Bagnall. *Proceedings of the Hawaiian Entomological Society* **12**: 31–38.
—— 1945. Introduction to the Thysanoptera of New Caledonia. *Proceedings of the Hawaiian Entomological Society* **12**: 249–278.
—— 1947. Thysanoptera Hawaiiensis – I. *Proceedings of the Hawaiian Entomological Society* **13**: 37–42.
—— 1949. New thrips records and species from the Marianas. *Proceedings of the Hawaiian Entomological Society* **13**: 347–350.
—— 1953. Thysanoptera of Samoa. *Proceedings of the Hawaiian Entomological Society* **15**: 93–108.
Bournier, A. 1956. Trois espèces nouvelles de Phloeothripidae (Thysanopt.). *Bulletin de la Société Entomologique de France* **61**: 160–174.
—— 1962. Thysanoptères de France, II. Descriptions sommaire de quelques espèces nouvelles du Languedoc Méditerranéen. *Bulletin de la Société Entomologique de France* **67**: 41–43.
—— 1967. Thysanoptères de Madagascar. *Annales de la Société Entomologique de France* (N.S.) **3**: 1015–1027.
—— 1968. Thysanoptères de l'Angola. IV. *Publicações Culturais de Companhia de Diamantes de Angola* **77**: 135–164.
—— 1970. Thysanoptères du Gabon. *Biologia Gabonica* **6**: 151–168.
—— 1971. Thysanoptères d'Afrique noire. *Bulletin de l'I.F.A.N.* (A) **33**: 145–167.
—— 1974. Thysanoptères de l'Angola: VI. *Publicações Culturais de Companhia de Diamantes de Angola* **88**: 153–165.
Buffa, P. 1908. Esame della raccolta di Tisanotteri Italiani esistente nel Museo Civico di Storia Naturale di Genova. *Redia* **4**: 382–391.
—— 1909. I Tisanotteri esotici esistenti nel Museo Civico di Storia Naturale di Genova. *Redia* **5**: 157–172.
Chen, L. S. 1980. Thrips associated with Mulberry plant (*Morus* sp.) in Taiwan. *Proceedings of the National Science Council, Taiwan* **4**: 169–182.
Cott, H. E. 1956. Systematics of the suborder Tubulifera (Thysanoptera) in California. *University of California Publications in Entomology* **13**: 1–216.
Crawford, D. L. 1910. Thysanoptera of Mexico and the South. II. *Pomona College Journal of Entomology* **2**: 153–170.

Crawford, J. C. 1947. The North American species of the genus *Megalothrips* Uzel (Thysanoptera, Phlaeothripidae). *Proceedings of the Entomological Society of Washington* **49**: 197–199.

—— 1948. A new *Parallothrips* from Cyprus. *Proceedings of the Entomological Society of Washington* **50**: 213–215.

De Santis, L. 1943. Especies nuevas y conocidas de la Republica Argentina. *Revista de la Facultad de Agronomia de La Plata* **25**: 89–96.

—— 1957. Dos nuevos Tubuliferos de la Republica Argentina (Thysanoptera: Tubulifera). *Revista de la Uruguaya de Entomologia* **2**: 1–4.

—— 1958. Las especies Argentinas del genero *Leptogastrothrips* (Thysanoptera: Tubulifera). *Revista de la Facultad de Agronomia* **34**: 95–102.

—— 1960. Un nuevo Tisanoptero gigante del Brasil. *Actas y trabajos del Primer Congreso Sudamericano de Zoologia* **3**: 57–60.

—— 1963*a*. Adiciones a la Fauna Argentina de Tisanopteros III. *Notas Comision de Investigacion Cientifica, Provincia de Bueños Aires* **1**: 1–14.

—— 1963*b*. Tisanopteros de Tierra del Fuego. *Revista de la Sociedad Entomologica Argentina* **24**: 63–66.

Dyadechko, N. P. 1961. A new thrips species *Embothrips tubversicolor* sp. nov. (Thysanoptera). [In Russian.] *Dopovidi Akademie Nauk Ukrayin'skoi RSR. Kiev* **1961** (5): 688–690.

—— 1962. A new thrips species (Thysanoptera) from South Maritime Provinces – *Cryptothrips maritimus* Djadetschko sp. n. [In Russian.] *Zoologicheskii Zhurnal* **41**: 764–765.

—— 1964. *Thrips (Thysanoptera) of the European part of the U.S.S.R.* 387 pp. Kiev. [In Russian.]

Faure, J. C. 1925. A new genus and five new species of South African Thysanoptera. *South African Journal of Natural History* **5**: 143–166.

—— 1933. New genera and species of Thysanoptera from South Africa. *Bulletin of the Brooklyn Entomological Society* **28**: 1–20, 55–75.

—— 1942. Records and descriptions of South African Thysanoptera – III. *Journal of the Entomological Society of Southern Africa* **5**: 74–83.

—— 1943. Two new species of *Bolothrips* (Thysanoptera) from South Africa. *Journal of the Entomological Society of Southern Africa* **6**: 86–89.

—— 1945. Two new species of *Allothrips* (Thysanoptera) from South Africa. *Proceedings of the Royal Entomological Society of London* (B) **14**: 150–154.

—— 1949*a*. *Maxillata priesneri* gen. et spec. nov., a thrips (Thysanoptera) with exceedingly long maxillae. *Annals and Magazine of Natural History* (12) **2**: 851–858.

—— 1949*b*. Three remarkable new genera of Phlaeothripidae (Thysanoptera) from South Africa. *Entomology Memoirs. Department of Agriculture, Union of South Africa* **2**: 204–217.

—— 1949*c*. A new species of *Pygothrips* Hood (Pygothripidae, Thysanoptera) from Zululand. *Journal of the Entomological Society of Southern Africa* **12**: 118–122.

—— 1954*a*. South African Thysanoptera – I. *Journal of the Entomological Society of Southern Africa* **17**: 9–26.

—— 1954*b*. South African Thysanoptera – II. *Journal of the Entomological Society of Southern Africa* **17**: 145–166.

—— 1955. South African Thysanoptera – 3. *Journal of the Entomological Society of Southern Africa* **18**: 13–41.

—— 1956. South African Thysanoptera – 5. *Journal of Entomological Society of Southern Africa* **19**: 313–341.

Froggatt, W. W. 1904. Studies on Australian Thysanoptera: the genus *Idolothrips*, Haliday. *Proceedings of the Linnean Society of New South Wales* **1904**: 54–57.

Gaud, S. M. 1961. The Thysanoptera of Puerto Rico. *Technical Papers of the Agricultural Experimental Station, Puerto Rico* **32**: 1–160.

Gauld, I. D. & Mound, L. A. 1982. Homoplasy and the delineation of holophyletic genera in some insect groups. *Systematic Entomology* **7**: 73–86.

Girault, A. A. 1926. *New pests from Australia, V.* Published privately. 4 pp. Brisbane.

—— 1927*a*. *Some new wild animals from Queensland.* Published privately. 3 pp. Brisbane.

—— 1927*b*. *New Australian animals so far overlooked by outsiders.* Published privately. 2 pp. Brisbane.

—— 1927*c*. *Thysanoptera nova Australiensis from Queensland.* Published privately. 1 pp. Brisbane.

—— 1927*d*. *Thysanoptera nova Australiensis, II.* Published privately. 2 pp. Brisbane.

—— 1927*e*. *A discourse on wild animals.* Published privately. 2 pp. Brisbane.

—— 1928*a*. *A prodigeous discourse on wild animals.* Published privately. 3 pp. Brisbane.

—— 1928*b*. *Some Insecta and a new All Highness. (Notes compiled in fear and sorrow.).* Published privately. 4 pp. Brisbane.

—— 1928*c*. *Notice of a curious professor and of native wasps and wood lice.* Published privately. 4 pp. Brisbane.

—— 1929. *New pests from Australia VI.* Published privately. 1 pp. Brisbane.

—— 1930. *New pests from Australia, VII.* Published privately. 3 pp. Brisbane.

Greenwood, P. H. 1980. Towards a phyletic classification of the 'genus' *Haplochromis* (Pisces, Cichlidae) and related taxa. Part II; The species from Lakes Victoria, Nabugabo, Edward, George and Kivu. *Bulletin of the British Museum (Natural History)* (Zoology) **39**: 1–101.

Haga, K. 1975. A revision of the genus *Pyrgothrips* Karny with keys to the world species (Thysanoptera, Tubulifera). *Kontyû* **43**: 263–280.

Haliday, A. H. 1852. Order III. Physapoda. *In* Walker, F., *List of the specimens of Homopterous insects in the collection of the British Museum* Pt IV: 1094–1118.

Hartwig, E. K. 1948. Six new species of South African Thysanoptera, with statistical analyses of measurements. *Journal of the Entomological Society of Southern Africa* **11**: 83–126.

—— 1952. Taxonomic studies of South African Thysanoptera, including genitalia, statistics and a revision of Trybom's types. *Entomology Memoirs. Department of Agriculture, Union of South Africa* **2**: 339–499.

Heeger, E. 1852*a*. Beiträge zur Naturgeschichte der Physapoden (Blassenfusse). *Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften, Wien* **9**: 123–141.

—— 1852*b*. Beiträge zur Insecten-Fauna Österreichs. *Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften, Wien* **9**: 473–490.

Hennig, W. 1966. *Phylogenetic Systematics.* Translated by D. D. Davis & R. Zangerl, 263 pp. Urbana.

Hesse, A. J. 1934. Some insects associated with the plant *Gnidia (Arthrosolen) laxa* Gilg.-Thysanoptera. *Annals of the South African Museum* **30**: 434–440.

Hinds, W. E. 1902. Contribution to a monograph of the insects of the order Thysanoptera inhabiting North America. *Proceedings of the United States National Museum* **26**: 79–242, 11 pls.

Hood, J. D. 1908*a*. New genera and species of Illinois Thysanoptera. *Bulletin of the Illinois State Laboratory of Natural History* **8**: 361–379.

—— 1908*b*. Three new North American Phloeothripidae. *Canadian Entomologist* **40**: 305–309.

—— 1908*c*. Two new species of *Idolothrips. Annals of the Entomological Society of America* **1**: 285–289.

—— 1912*a*. Three new Phloeothripidae (Thysanoptera) from Texas and Michigan. *Proceedings of the Biological Society of Washington* **25**: 11–15.

—— 1912*b*. On North American Phloeothripidae (Thysanoptera), with descriptions of two new species. *Canadian Entomologist* **44**: 137–144.

—— 1912*c*. Descriptions of new North American Thysanoptera. *Proceedings of the Entomological Society of Washington* **14**: 129–160.

—— 1914. Studies on tubuliferous Thysanoptera. *Proceedings of the Biological Society of Washington* **27**: 151–172.

—— 1915. A remarkable new thrips from Australia. *Proceedings of the Biological Society of Washington* **28**: 49–51.

—— 1916. *Oedaleothrips hookeri,* a new genus and species of Thysanoptera. *Bulletin of the Brooklyn Entomological Society* **11**: 64–65.

—— 1918*a*. A new *Kleothrips* (Thysanoptera) from North Queensland. *Bulletin of the Brooklyn Entomological Society* **13**: 77–79.

—— 1918*b*. New genera and species of Australia Thysanoptera. *Memoirs of the Queensland Museum* **6**: 121–150.

—— 1919*a*. On some new Idolothripidae. *Insecutor Inscitiae Menstruus* **7**: 66–74.

—— 1919*b*. Two new genera and thirteen new species of Australian Thysanoptera. *Proceedings of the Biological Society of Washington* **32**: 75–91.

—— 1924. New Thysanoptera from the United States. *Entomological News* **35**: 312–317.

—— 1925*a*. On some new Phloeothripidae (Thysanoptera) from the Transvaal. *Psyche* **31**: 292–301.

—— 1925*b*. New neotropical Thysanoptera collected by C. B. Williams. *Psyche* **32**: 48–69.

—— 1925*c*. Six new Thysanoptera from the western United States. *Entomological News* **36**: 101–105, 134–138.

—— 1925*d*. Four new Phloeothripidae from the United States (Thysanoptera). *Canadian Entomologist* **57**: 218–222.

—— 1927*a*. A contribution toward the knowledge of New York Thysanoptera, with descriptions of new genera and species II. *Entomologica Americana* **7**: 209–245.

—— 1927*b*. New western Thysanoptera. *Proceedings of the Biological Society of Washington* **40**: 197–204.

—— 1928. A new *Actinothrips* (Thysanoptera) from Brazil. *Bulletin of the Brooklyn Entomological Society* **23**: 147–150.

—— 1933. New Thysanoptera from Panama. *Journal of the New York Entomological Society* **41**: 407–434.

—— 1934. Some further new Thysanoptera from Panama. *Proceedings of the Biological Society of Washington* **47**: 57–81.

—— 1935*a*. Ten new Thysanoptera from Panama. *Proceedings of the Biological Society of Washington* **48**: 83–106.

—— 1935*b*. Some new or little known Thysanoptera of the family Phlaeothripidae. *Revista de Entomologia, Rio de Janeiro* **5**: 159–199.

—— 1935*c*. The thysanopterous genus *Actinothrips*. *Stylops* **4**: 247–254.

—— 1936*a*. Nine new Thysanoptera from the United States. *Journal of the New York Entomological Society* **44**: 81–100.

—— 1936*b*. Two new *Anactinothrips* from South America (Thysanoptera). *Proceedings of the Royal Entomological Society of London* (B) **5**: 143–147.

—— 1936*c*. Studies in Neotropical Thysanoptera. I. *Revista de Entomologia, Rio de Janeiro* **6**: 248–279.

—— 1936*d*. Studies in Neotropical Thysanoptera. II. *Revista de Entomologia, Rio de Janeiro* **6**: 424–460.

—— 1937*a*. Studies in Neotropical Thysanoptera. IV. *Revista de Entomologia, Rio de Janeiro* **7**: 255–296.

—— 1937*b*. A new ant-like thrips from Florida. *Proceedings of the Biological Society of Washington* **50**: 111–113.

—— 1937*c*. Studies in Neotropical Thysanoptera. V. *Revista de Entomologia, Rio de Janeiro* **7**: 486–530.

—— 1938*a*. A new genus and species of Phlaeothripidae (Thysanoptera) from Palmetto. *Proceedings of the Biological Society of Washington* **51**: 27–32.

—— 1938*b*. Studies in Neotropical Thysanoptera. VI. *Revista de Entomologia, Rio de Janeiro* **8**: 161–187.

—— 1938*c*. New Thysanoptera from Florida and North Carolina. *Revista de Entomologia, Rio de Janeiro* **8**: 348–420.

—— 1938*d*. Studies in Neotropical Thysanoptera. VII. *Revista de Entomologia, Rio de Janeiro* **9**: 218–247.

—— 1939*a*. A new *Polyphemothrips* (Thysanoptera) from Peru. *Revista Chilena de Historia Natural* **42**: 217–220.

—— 1939*b*. New North American Thysanoptera, principally from Texas. *Revista de Entomologia, Rio de Janeiro* **10**: 550–619.

—— 1940*a*. A century of new American Thysanoptera. I. *Revista de Entomologia, Rio de Janeiro* **11**: 540–583.

—— *1940b*. The cause and significance of macropterism and brachypterism in certain Thysanoptera, with description of a new Mexican species. *Anales de la Escuela Nacional de Ciencias Biologicas* **1**: 497–505.

—— 1941. A century of new American Thysanoptera. II. *Revista de Entomologia, Rio de Janeiro* **12**: 139–243.

—— 1942. A century of new American Thysanoptera. III. *Revista de Entomologia, Rio de Janeiro* **12**: 547–678.

—— 1949. Brasilian Thysanoptera. I. *Revista de Entomologia, Rio de Janeiro* **20**: 3–88.

—— 1950. Brasilian Thysanoptera. II. *Revista de Entomologia, Rio de Janeiro* **21**: 1–113.

—— 1951. A new *Oedaleothrips* from Italy. *Memorie della Società Entomologica Italiana* **30**: 133–140.

—— 1952*a*. A new *Oedaleothrips* from the Belgian Congo. *Revue de Zoologie et de Botanique Africaine* **45**: 204–209.

—— 1952*b*. Brasilian Thysanoptera. III. *Proceedings of the Biological Society of Washington* **65**: 141–174.

—— 1952*c*. *Mecynothrips snodgrassi*, a new thrips from the Solomon Islands. *Proceedings of the Entomological Society of Washington* **54**: 294–301.

—— 1954*a*. Brasilian Thysanoptera. IV. *Proceedings of the Biological Society of Washington* **67**: 17–54.

—— 1954*b*. New Thysanoptera, principally Floridian. *Proceedings of the Biological Society of Washington* **67**: 277–286.

—— 1954*c*. Three new Thysanoptera from Trinidad and British Guiana. *Proceedings of the Royal Entomological Society of London* (B) **23**: 205–212.

—— 1955. Brasilian Thysanoptera. VI. *Revista Brasileira de Entomologia, São Paulo* **4**: 51–160.

—— 1957. New Brazilian Thysanoptera. *Proceedings of the Biological Society of Washington* **70**: 129–180.

—— 1958. A new *Zeugmatothrips* from Brazil. *Proceedings of the Biological Society of Washington* **60**: 225–228.

Hood, J. D. & Williams, C. B. 1915. New Thysanoptera from Florida and Louisiana. *Journal of the New York Entomological Society*, **23**: 121–138.

International Commission on Zoological Nomenclature. 1961. *International Code of Zoological Nomenclature*. 176 pp. London.

Ishida, I. 1932. Fauna of the Thysanoptera in Japan. *Insecta Matsumurana* **7**: 1–16.

Jacot-Guillarmod, C. F. 1937. Ten new species of Thysanoptera and a catalogue of the known South African forms. *Publications of the University of Pretoria.* (Series II, Natural Science) **3**: 1–62.

—— 1939*a*. New species of Phlaeothripidae (Thysanoptera) from South Africa. *Journal of the Entomological Society of Southern Africa* **1**: 47–77.

—— 1939*b*. Phlaeothripidae (Thysanoptera) new to South Africa, with descriptions of new genera and species. *Journal of the Entomological Society of Southern Africa* **2**: 36–62.

—— 1940. Studies on South African Thysanoptera – I. *Journal of the Entomological Society of Southern Africa* **3**: 131–138.

—— 1941. Studies on South African Thysanoptera – II. *Journal of the Entomological Society of Southern Africa* **4**: 80–100.

—— 1942. Studies on South African Thysanoptera – III. *Journal of the Entomological Society of Southern Africa* **5**: 64–74.

—— 1978. Catalogue of the Thysanoptera of the World. Part 5. *Annals of the Cape Provincial Museums* (Natural History) **7**: 1257–1556.

Johansen, R. M. 1974. Siete nuevos Tisanopteros de Tabasco, Veracruz, y el Pedregal de San Angel, Mexico, D. F. (Thysanoptera: Terebrantia: Tubulifera). *Revista de la Sociedad Mexicana de Historia Natural* **35**: 249–276.

—— 1975. Un nuevo *Zeuglothrips* Hood Panameno, y descripcion del macho de *Z. guerreronis* Johansen y Garcia Aldrete, 1973 (Thysanoptera: Phlaeothripidae). *Revista de la Sociedad Mexicana de Historia Natural* **36**: 187–194.

—— 1976. Nuevos thrips tubuliferous (Insecta: Thysanoptera), de Mexico, I. *Anales del Instituto de Biologia, Universidad de Mexico* (Zoologia) **47**: 57–68.

—— 1977*a*. Nuevos thrips tubuliferous (Insecta: Thysanoptera), de Mexico. III. *Anales del Instituto de Biologia, Universidad de Mexico* (Zoologia) **48**: 37–50.

—— 1977*b*. Nuevos thrips tubuliferous (Insecta: Thysanoptera), de Mexico. IV. *Anales del Instituto de Biologia, Universidad de Mexico* (Zoologia) **48**: 51–69.

—— 1978*a*. Dos nuevas especies de *Elaphrothrips* Buffa, 1909 (Thysanoptera: Phlaeothripidae), del sureste de Mexico. *Anales del Instituto de Biologia, Universidad de Mexico* (Zoologia) **49**: 87–94.

—— 1978*b*. Seis nuevas especies de *Elaphrothrips* Buffa, 1909 (Thysanoptera: Phlaeothripidae) de Brasil y Peru. *Anales del Instituto de Biologia, Universidad de Mexico* (Zoologia) **49**: 95–113.

—— 1978*c*. Notas sinonimicas acerca de Tisanopteros de Mexico. I. *Anales del Instituto de Biologia, Universidad de Mexico* (Zoologia) **49**: 277–280.

—— 1979. Nuevos thrips tubuliferous (Insecta: Thysanoptera), de Mexico. VI. *Anales del Instituto de Biologia, Universidad de Mexico* (Zoologia) **50**: 179–191.

Johansen, R. M. & Garcia Aldrete, A. N. 1973. Una nueva especie Mexicana de *Zeuglothrips* Hood. (Thysanoptera: Phlaeothripidae). *Revista de la Sociedad Mexicana de Historia Natural* **34**: 55–61.

—— —— 1976. A new Mexican *Dasythrips* (Thysanoptera; Phlaeothripidae). *Revista de Biologia Tropical* **24**: 235–241.

Karny, H. 1911. Neue Phloeothripiden – Genera. *Zoologischer Anzeiger* **38**: 501–504.

—— 1912*a*. Ueber einige afrikanische Thysanopteren. *Entomologische Zeitschrift, Fauna Exotica* **2** (5): 19–20, 22–26.

—— 1912*b*. Gallenbewohnende Thysanopteren aus Java. *Marcellia* **11**: 115–169.

—— 1912*c*. Einige weitere Tubuliferen aus dem tropischen Afrika. *Entomologische Rundschau* **29**: 130–133, 138–139, 150–151.

—— 1913*a*. Uber gallenbewohnende Thysanopteren. *Verhandlungen der Zoologisch-Botanischen Gesellschaft in Wien* **63**: 5–12.

—— 1913*b*. Beitrag zur Thysanopteren-Fauna von Neu-Guinea und Neu-Britannien. *Archiv für Naturgeschichte* **79** (1): 123–136.

—— 1913*c*. H. Sauter's Formosa-Ausbeute. *Supplementa Entomologica* **2**: 127–134.

—— 1913*d*. Thysanoptera von Japan. *Archiv fur Naturgeschichte* **79** (2): 122–128.

—— 1916. Beiträge zur Kenntnis der Gallen von Java. Zweite Mitteilung über die javanischen Thysanopterocecidien und deren Bewohner [in part]. *Zeitschrift für Wissenschaftliche Insektenbiologie* **12**: 84–94.

—— 1919. Synopsis der Megathripidae (Thysanoptera). *Zeitschrift für Wissenschaftliche Insektenbiologie* **14**: 105–118.

—— 1920*a*. Die exotischen Tubuliferen (Thysanoptera) des Deutschen Entomologischen Museums (Berlin-Dahlem). *Entomologische Mitteilungen* **9**: 88–94, 104–111, 186–191.

—— 1920*b*. Some Thysanoptera from the Philippine Islands. *Philippine Journal of Science* **17**: 203–211.

—— 1920*c*. Nova Australska Thysanoptera, jez nashbiral Mjöberg. *Časopis Ceskoslovenské Společnosti Entomologické* **17**: 35–44.

—— 1921*a*. Zur Systematik der Orthopteroiden Insekten, & Beitraege zur Malayischen Thysanopterenfaune. *Treubia* **1**: 163–269, 277–291.

—— 1921*b*. Ergaenzung zu Priesner's "*Haplothrips*-studien" die Australischen Haplothripinen. *Treubia* **2**: 21–36.

—— 1921*c*. Beitraege zur Malayischen Thysanopterenfauna. *Treubia* **2**: 37–83.

—— 1923. Beiträge zur Malayischen Thysanopterenfauna. *Treubia* **3**: 277–380.

—— 1924. Results of Dr E. Mjöberg's Swedish Scientific Expeditions to Australia 1910–1913. 38. Thysanoptera. *Arkiv für Zoologi* **17**A (2): 1–56.

—— 1925*a*. Die an Tabak auf Java und Sumatra Angetroffenen Blasenfüsser. *Bulletin van het Deli Proefstation, Medan, Sumatra* **23**: 1–55.

—— 1925*b*. On some tropical Thysanoptera. *Bulletin of Entomological Research* **16**: 125–142.

—— 1925*c*. Über *Phloeothrips sanguinolentus* Bergroth nebst einer Revision der Diceratothripinen-Genera. *Notulae Entomologicae* **5**: 77–84.

Kelly, R. & Mayne, R. J. B. 1934. *The Australian Thrips, a monograph of the Order Thysanoptera in Australia*. 81 pp. Sydney.

Kirkaldy, G. W. 1907. On two Hawaiian Thysanoptera. *Proceedings of the Hawaiian Entomological Society* **1**: 102–103.

Knechtel, W. K. 1936. Zur Kenntnis der Thysanopterenfauna Rumaniens. *Bulletin de la Section Scientifique de l'Académie Roumaine* **17**: 159–162.

Kudô, I. 1975. New name for the subgenus *Telothrips* Kudô et Ananthakrishnan, not Priesner (Thysanoptera, Phlaeothripidae). *Kontyû* **43**: 421.

Kudô, I. & Ananthakrishnan, T. N. 1974. A new subgenus and species of *Meiothrips* Priesner (Thysanoptera, Megathripinae) from Nepal. *Kontyû* **42**: 385–387.

Kurosawa, M. 1932. Descriptions of three new thrips from Japan. *Kontyû* **5**: 230–242.

—— 1968. Thysanoptera of Japan. [In Japanese, English summary.] *Insecta Matsumurana* Suppl. 4: 1–94.

Lieberman, J. & Gemignani, E. V. 1931. Un nuevo género y dos nuevas especies de Thysanópteros argentinos. *Revista de la Sociedad Entomologica, Argentina* **3**: 211–216.

Maltbaek, J. 1928. Tillaeg til Thysanoptera Danica, Danske Frynsevinger. *Entomologiske Meddelelser* **16**: 369–381.

Maynard Smith, J. 1958. *The theory of evolution.* 344 pp. Harmondsworth, Middlesex.

Morgan, A. C. 1925. A new genus, a new subgenus and seven new species of Thysanoptera from Porto Rico. *Florida Entomologist* **9**: 1–9.

Morison, G. D. 1958. Thysanoptera from South-West Arabia and Ethiopia. *Journal of the Linnean Society of London* (Zoology) **43**: 587–598.

Moulton, D. 1907. A contribution to our knowledge of the Thysanoptera of California. *Miscellaneous Papers, Technical Series of the Bureau of Entomology, United States Department of Agriculture* **12**: 39–68.

—— 1928*a*. Thysanoptera of the Hawaiian Islands. *Proceedings of the Hawaiian Entomological Society* **7**: 105–134.

—— 1928*b*. Thysanoptera from Abyssinia. *Annals and Magazine of Natural History* (10) **2**: 227–248.

—— 1928*c*. New Thysanoptera from Formosa. *Transactions of the Natural History Society of Formosa* **18**: 287–328.

—— 1928*d*. The Thysanoptera of Japan: new species, notes, and a list of all known Japanese species. *Annotationes Zoologicae Japonenses* **2**: 287–337.

—— 1928*e*. New Thysanoptera from India. *Indian Forest Records* **13**: 285–292.

—— 1929*a*. New California Thysanoptera. *Pan-Pacific Entomologist* **4**: 125–136.

—— 1929*b*. New Mexican Thysanoptera. *Pan-Pacific Entomologist* **6**: 11–20.

—— 1929*c*. Contribution to our knowledge of American Thysanoptera. *Bulletin of the Brooklyn Entomological Society* **24**: 224–244.

—— 1930. Thysanoptera from South Africa. *Annals and Magazine of Natural History* (10) **5**: 414–416.

—— 1933*a*. The Thysanoptera of South America (IV). *Revista de Entomologia, Rio de Janeiro* **3**: 385–419.

—— 1933*b*. New Thysanoptera from India. *Indian Forest Records* **19**: 1–6.

—— 1934. New Thysanoptera of the Hawaiian Islands. *Proceedings of the Hawaiian Entomological Society* **8**: 499–503.

—— 1935. New species of thrips from South-Western Australia. *Journal of the Royal Society of Western Australia* **21**: 97–100.

—— 1938. Thysanoptera from Minas Geraes, Brazil. *Revista de Entomologia, Rio de Janeiro* **9**: 374–383.

—— 1939. Thysanoptera collected by the Mangarevan Expedition. *Occasional Papers of the Bernice P. Bishop Museum, Hawaii* **15**: 141–148.

—— 1941. Thysanoptera from Minas Gerais, Brazil. *Revista de Entomologia, Rio de Janeiro* **12**: 314–323.

—— 1942*a*. Seven new genera of Thysanoptera from Australia and New Zealand. *Bulletin of the Southern California Academy of Sciences* **41**: 1–13.

—— 1942*b*. Insects of Guam-I, Thysanoptera. *Bulletin of the Bernice P. Bishop Museum, Hawaii* **172**: 7–16.

—— 1944. Thysanoptera of Fiji. *Occasional Papers of the Bernice P. Bishop Museum, Hawaii* **17**: 267–311.

—— 1947*a*. Thysanoptera from New Guinea, the Philippine Islands and the Malay Peninsula. *Pan-Pacific Entomologist* **23**: 172–180.

—— 1947*b*. New Thysanoptera from Mexico. *Anales de la Escuila Nacional de Ciencias Biologicas* **4**: 419–421.

—— 1949. New Thysanoptera from Africa. *Annals and Magazine of Natural History* (12) **2**: 481–499.

—— 1968. New Thysanoptera from Australia. *Proceedings of the California Academy of Sciences* (4) **36**: 93–124.

Moulton, D. & Andre, F. 1936. Four new Thysanoptera, with a preliminary list of the species occurring in Iowa. *Iowa State College Journal of Science* **10**: 223–234.

Moulton, D. & Steinweden, J. B. 1932. New Marquesan Thysanoptera. *Bulletin of the Bernice P. Bishop Museum, Hawaii* **98**: 165–168.

—— —— 1933. Thysanoptera from the Society Islands. *Bulletin of the Bernice P. Bishop Museum, Hawaii* **113**: 29–33.

—— —— 1935. Two new species of *Cryptothrips* (Thysanoptera) from the Maquesas. *Bulletin of the Bernice P. Bishop Museum, Hawaii* **114**: 163–165.

Mound, L. A. 1968. A review of R. S. Bagnall's Thysanoptera Collections. *Bulletin of the British Museum (Natural History)* (Entomology) Suppl. 11: 1–181.

—— 1969. Revision of three Australian genera of Phlaeothripidae (Thysanoptera) with seven new species, and one new generic synonym. *Journal of the Australian Entomological Society* **8**: 173–186.

—— 1970. Thysanoptera from the Solomon Islands. *Bulletin of the British Museum (Natural History)* (Entomology) **24**: 83–126.

—— 1971*a*. Gall-forming thrips and allied species (Thysanoptera: Phlaeothripinae) from *Acacia* trees in Australia. *Bulletin of the British Museum (Natural History)* (Entomology) **25**: 387–466.

—— 1971*b*. A review of the Melanesian genus *Mecynothrips* (Thysanoptera). *Journal of Natural History* **5**: 279–283.

—— 1972*a*. Polytypic species of spore-feeding Thysanoptera in the genus *Allothrips* Hood (Phlaeothripidae). *Journal of the Australian Entomological Society* **11**: 23–36.

—— 1972*b*. Species complexes and the generic classification of leaf-litter thrips of the tribe Urothripini (Phlaeothripidae). *Australian Journal of Zoology* **20**: 83–103.

—— 1974*a*. Spore-feeding thrips (Phlaeothripidae) from leaf litter and dead wood in Australia. *Australian Journal of Zoology* (Suppl. Series) **27**: 1–106.

—— 1974*b*. The *Nesothrips* complex of spore-feeding Thysanoptera (Phlaeothripidae: Idolothripinae). *Bulletin of the British Museum (Natural History)* (Entomology) **31**: 107–188.

—— 1974*c*. *Andrethrips floydi* – a remarkable new Thysanopteron. *Journal of Entomology* (B) **43**: 109–113.

—— 1977. Species diversity and the systematics of some New World leaf litter Thysanoptera (Phlaeothripinae: Glyptothripini). *Systematic Entomology* **2**: 225–244.

Mound, L. A., Heming, B. S. & Palmer, J. M. 1980. Phylogenetic relationships between the families of recent Thysanoptera (Insecta). *Zoological Journal of the Linnean Society* **69**: 111–141.

Mound, L. A., Morison, G. D., Pitkin, B. R. & Palmer, J. M. 1976. Thysanoptera. *Handbooks for the Identification of British Insects* **1** (11): 1–79.

Mound, L. A. & Palmer, J. M. 1981. Phylogenetic relationships between some genera of Thripidae (Thysanoptera). *Entomologica Scandinavica* Suppl. 15: 153–170.

Mound, L. A. & Walker, A. K. 1982. Thysanoptera: Terebrantia. *In*: *Fauna of New Zealand,* D.S.I.R., Wellington **1:** 1–113.

—— —— 1983. Thysanoptera: Tubulifera. *In*: *Fauna of New Zealand*, D.S.I.R., Wellington. [in prep.]

Newman, E. 1855. Characters of two undescribed species of *Thrips*, Lin. *Transactions of the Entomological Society of London* **3**: 264–267.

Okajima, S. 1975. Notes on the Thysanoptera from the Ryukyu Islands. I. Descriptions of two new species. *Kontyû* **43**: 13–19.

—— 1976. Notes on the Thysanoptera from the Ryukyu Islands. II. On the genus *Stigmothrips* Ananthakrishnan. *Kontyû* **44**: 119–129.

—— 1979*a*. A revisional study of the genus *Apelaunothrips* (Thysanoptera: Phlaeothripidae). *Systematic Entomology* **4**: 39–64.

—— 1979*b*. Notes on the Thysanoptera from Southeast Asia VI. A new species of the genus *Mecynothrips* from Taiwan (Phlaeothripidae). *Transactions of the Shikoku Entomological Society* **14**: 127–130.

—— 1979*c*. Two new species of the genus *Gastrothrips* Hood (Thysanoptera: Phlaeothripidae) from Japan and Taiwan. *Kontyû* **47**: 511–516.

—— 1981. A revision of the tribe Plectrothripini of fungus-feeding Thysanoptera (Phlaeothripidae: Phlaeothripinae). *Systematic Entomology* **6**: 219–336.

Palmer, J. M. & Mound, L. A. 1978. Nine genera of fungus-feeding Phlaeothripidae (Thysanoptera) from the Oriental Region. *Bulletin of the British Museum (Natural History)* (Entomology) **37**: 153–215.

Pelikan, J. 1961. Two new species of *Oedaleothrips* (Thysanoptera) from Asia. *Casopis Ceskoslovenské Společnosti Entomologické* **58**: 302–309.

—— 1965. Ergebnisse der zoologischen Forschungen von Dr. Z. Kaszab in der Mongolei. 29. Thysanoptera. *Annales Historico-Naturales Musei Nationalis Hungarici* **57**: 229–239.

—— 1970. Thysanopteren aus Nepal (Ins., Thysanoptera). *Khumbu Himal* **3**: 361–369.

Pergande, T. 1896. Description of a new species of *Idolothrips*. *Entomological News* **7**: 63–64.

Pitkin, B. R. 1978. Lectotype designations of certain species of thrips described by J. D. Hood and notes on his collection (Thysanoptera). *Proceedings of the Entomological Society of Washington* **80**: 264–295.

Pitkin, B. R. & Mound, L. A. 1973. A catalogue of West African Thysanoptera. *Bulletin de l'I.F.A.N.* (A) **35**: 407–449.

Post, R. L. 1961. Five new Oregon Thysanoptera. *Pan-Pacific Entomologist* **37**: 137–143.

Priesner, H. 1919. Zur Thysanopteren-Fauna der ostadriatischen Küstenländer. *Zeitschrift des Österreichischen Entomologen-Vereines* **4**: 104–106.

—— 1920. Kurze Beschreibungen neuer Thysanopteren aus Österreich. *Sitzungberichte der Akademie der Wissenschaften, Mathematisch-naturwissenschaftliche Klasse, Wien* **129**: 71–88.

—— 1921. Neue und wenig bekannte Thysanopteren der neotropischen Fauna aus der Sammlung des Berliner Zoologischen Museums. *Deutsche Entomologishe Zeitschrift* **1921**: 187–223.

—— 1922. Ueber albanische Thysanopteren. *Wiener Entomologische Zeitung* **39**: 105–107.

—— 1924. Bernstein-Thysanopteren. *Entomologische Mitteilungen* **13**: 130–151.

—— 1925*a*. Zwei neue, beachtenswerte Thysanopteren-typen aus Ungarn. *Zeitschrift des Oesterreichischen Entomologen-Vereines* **10**: 5–7.

—— 1925*b*. Neue Thysanopteren. *Deutsche Entomologische Zeitschrift* **1925**: 13–28.

—— 1925*c*. Thysanopterologica I. *Zoologische Jarbücher, Jena* **50**: 305–319.

—— 1925*d*. Katalog der europäischen Thysanopteren. *Konowia* **4**: 141–159.

—— 1926*a*. Die Jugendstadien der malayischen Thysanopteren. *Treubia* **8** (Suppl.): 1–264.

—— 1926*b*. Un genero nuevo y curioso del orden physopodos o Thysanopteros (insectos) de Mexico. *Memorias y Revista de la Sociedad Cientifica 'Antonio Alzate'* **44**: 485–489.

—— 1927*a*. *Die Thysanopteren Europas* pp. 343–568. Wien.

—— 1927*b*. Ein neuer *Zeugmatothrips* (Thysanoptera: Tubulifera) aus Costarica. *Bollettino del Laboratorio di Zoologia generale e agraria della R. Scuola superiore di Agricoltura di Portici* **20**: 189–190.

—— 1927*c*. Neue und wenig bekannte Thysanopteren, gesammelt in Westafrika von Prof. Dr. F. Silvestri. *Bollettino del Laboratorio di Zoologia generale e agraria dell R. Scuola superiore di Agricoltura di Portici* **21**: 61–83.

—— 1928*a*. *Die Thysanopteren Europas* pp. 569–755. Wien.

—— 1928*b*. Über australische Thysanopteren. *Sitzungberichte der Akademie der Wissenschaften. Mathematisch-Naturwissenschaftliche Klasse, Wien* **137**: 643–659.

—— 1928*c*. Thysanopterologica III. *Zoologische Jarbücher, Jena* **56**: 43–66.

—— 1929*a*. Bernstein-Thysanopteren II. *Bernstein-Forschungen* **1**: 111–138.

—— 1929*b*. Spolia Mentawiensia: Thysanoptera. *Treubia* **11**: 187–210.

—— 1932. Thysanopteren aus dem Belgischen Congo. *Revue de Zoologie et de Botanique Africaines* **22**: 321–344.

—— 1933*a*. Neue Thysanopteren aus Mexiko, gesammelt von Prof. Dr. A. Dampf. *Wiener entomologische Zeitung* **50**: 49–63.

—— 1933*b*. Indomalayische Thysanopteren IV. *Konowia* **12**: 69–85.

—— 1933*c*. Neue exotische Thysanopteren. *Stylops* **2**: 145–156.

—— 1934. Drei neue Phloeothripiden (Thysanoptera). *Stylops* **3**: 58–63.

—— 1935*a*. Indomalayische Thysanopteren VI. *Konowia* **14**: 159–174, 241–253, 323–339.

—— 1935*b*. Neue exotische Thysanopteren. *Stylops* **4**: 125–131.

—— 1935*c*. New or little known Oriental Thysanoptera. *Philippine Journal of Science* **57**: 351–375.

—— 1936*a*. Ueber einege neue und wenig bekannte Thysanopteren. *Proceedings of the Royal Entomological Society of London* (B)**5**: 208–214.

—— 1936*b*. On some further new Thysanoptera from the Sudan. *Bulletin de la Société Royale Entomologique d'Egypte* **20**: 83–104

—— 1937*a*. Thysanopterologica V: Zwei neue Phlaeothripiden. *Arbeiten über morphologische und taxonomische Entomologie* **4**: 347–350.

—— 1937*b*. Two new Phlaeothripidae from Sierra Leone. *Annals and Magazine of Natural History* (10) **20**: 624–629.

—— 1939*a*. Thysanopterologica VIII. *Proceedings of the Royal Entomological Society of London* (B)**8**: 73–78.

—— 1939*b*. Thysanopteren aus dem Belgischen Congo. *Revue de Zoologie et de Botanique Africaines* **33**: 49–66.

—— 1940. Thysanopterologica IX. *Philippine Journal of Science* **71**: 403–411.

—— 1949. Genera Thysanopterorum. Keys for the identification of the genera of the Order Thysanoptera. *Bulletin de la Societe Fouad Ier d'Entomologie* **33**: 31–157.

—— 1950. Contributions towards a knowledge of the Thysanoptera of Egypt, XV. *Bulletin de la Societe Fouad Ier d'Entomologie* **34**: 25–37.

—— 1951. Thysanopterologica XI. *Annals and Magazine of Natural History* (12)**4**: 355–371.

—— 1952*a*. On some new genera and species of Thysanoptera from the Oriental region. *Indian Journal of Entomology* **13**: 183–200.

—— 1952*b*. On some central African Thysanoptera. *Bulletin de l'Institut Français d'Afrique Noire* **14**: 842–880.

—— 1959. On the genus *Dinothrips* Bgn. (Thysanoptera). *Idea* **12**: 52–59.

—— 1961. Das System der Tubulifera (Thysanoptera). *Anzeiger Österreichische Akademie der Wissenschaften* **1960**: 283–296.

—— 1964. Ordnung Thysanoptera. *Bestimmungsbücher zur Bodenfauna Europas* **2**, 242 pp. Berlin.

Ramakrishna Ayyar, T. V. 1925. Two new Thysanoptera from South India. *Journal of the Bombay Natural History Society* **30**: 788–792.

—— 1928. A contribution to our knowledge of the Thysanoptera of India. *Memoirs of the Department of Agriculture in India* (Entomological series) **10**: 217–316.

—— 1934. Entomological investigations on the spike disease of Sandal (21), Thysanoptera. *Indian Forest Records* **20**: 1–12.

Ramakrishna Ayyar, T. V. & Margabandhu, V. 1939. Notes on new and known Indian Thysanoptera. *Records of the Indian Museum* **41**: 21–33.

Rayment, T. 1948. Observations on Thrips, with description of a new species. *Australian Zoologist* **11**: 255–258.

Reuter, O. M. 1879. Diagnoser öfver nya Thysanoptera från Finland. *Öfversigt af Finska Vetenskaps-Societetens förhandlingar* **1878–1879**: 207–223.

—— 1885. Thysanoptera Fennica, descripsit. I. Tubulifera. *Bidrag till Kännedom af Finlands Natur och Folk* **40**: 1–26.

—— 1901. Thysanoptera tria Mediterranea. *Öfversigt af Finska Vetenskaps-Societetens Förhandlingar* **43**: 214–215.

Sakimura, K. 1971. A review of the genus *Rhaebothrips* Karny (Thysanoptera: Phlaeothripidae). *Pacific Insects* **13**: 391–403.

—— 1979. Notes on some Cryptothripine species from Polynesia, with description of a new species (Phlaeothripidae: Thysanoptera). *Pacific Insects* **20**: 313–317.

Sakimura, K. & Bianchi, F. A. 1977. A review of the Hawaiian species of Idolothripinae (Phlaeothripidae: Thysanoptera). *Proceedings of the Hawaiian Entomological Society* **22**: 495–523.

Schmutz, K. 1909. Zur Kenntnis einiger neuen Thysanopterengenera (Tubulifera). *Annalen des Naturhistorischen Museums, Wien* **23**: 273–281. 342–347.

—— 1913. Zur Kenntnis der Thysanopterenfauna von Ceylon. *Sitzungsberichte der Akademie der Wissenschaften in Wien* **122**: 991–1089.

Seshadri, A. R. & Ananthakrishnan, T. N. 1954. Some new Indian Thysanoptera I. *Indian Journal of Entomology* **16**: 210–256.

Solowinow, P. 1924. Neue Arten Blasenfüsse. *Entomologische Zeitschrift* **38**: 25–26.

Stannard, L. J. 1953. *Illinothrips rossi,* new genus and species (Thysanoptera; Phlaeothripidae). *Transactions of the Illinois Academy of Science* **46**: 193–196.

—— 1954*a*. *Tropothrips* in North America (Thysanoptera; Phlaeothripidae). *Proceedings of the Biological Society of Washington* **67**: 81–84.

—— 1954*b*. *Actinothrips (Hybridothrips) oneillae*, new subgenus and species. *Proceedings of the Entomological Society of Washington* **56**: 71–74.

—— 1955. The species and subspecies of North American *Allothrips* (Thysanoptera: Phlaeothripidae). *Annals of the Entomological Society of America* **48**: 151–157.

—— 1956. Six new species of *Adelothrips* from the New World with critical remarks on this genus and related genera (Thysanoptera: Tubulifera). *Proceedings of the Biological Society of Washington* **69**: 105–114.

—— 1957. The phylogeny and classification of the North American genera of the suborder Tubulifera (Thysanoptera). *Illinois Biological Monographs* **25**: 1–200.

—— 1974. *Atractothrips mockfordi*, a new species from Mexico (Thysanoptera: Phlaeothripidae). *Proceedings of the Entomological Society of Washington* **76**: 45–48.

—— 1976. A synopsis of some ant-mimicking thrips, with special reference to the American fauna (Thysanoptera: Phlaeothripidae: Idolothripinae). *Journal of the Kansas Entomological Society* **49**: 492–508.

Stys, P. 1967. Monograph of Malcinae, with reconsideration of morphology and phylogeny of related groups (Heteroptera, Malcidae). *Acta Entomologica Musei Nationalis, Pragae* **37**: 351–516.

Takahashi, R. 1935. An interesting thrips from Amami-Oshima, Loochoos. *Mushi* **8**: 61–63.

—— 1937. Descriptions of new Thysanoptera from Formosa, with notes on the species found on the high elevations of the island. *Tenthredo* **1**: 339–350.

Targioni-Tozzetti, A. 1881. Relazione intoro ai lavori della R. Stazione di entomologia agraria di Firenze per gli anni 1877–78. Art. V. Fisapodi (Thrips). *Annali di Agricoltura* **34**: 120–134.

Thomasson, G. L. & Post, R. L. 1966. I. North Dakota Tubulifera (Thysanoptera). *North Dakota Insects* **6**: 1–56.

Titschack, E. 1964. Zur Variation der Borstenlänge von *Cryptothrips nigripes* O. M. Reuter 1880 (Thysanoptera). *Verhandlungun des Vereins für Naturwissenschaftliche Heimatforschung* **36**: 45–51.

—— 1965. *Cryptothrips nigripes* O. M. Reuter, subspec. *phariacus* nom. nov. *Verhandlungen des Vereins fur Naturwissenschaftliche Heimatforschung* **36**: 147.

Trybom, F. 1908. Physapoda, *In* Sjöstedt, *Wissenschaftliche Ergebnisse der schwedischen Zoologischen Expedition nach der Kilimanjaro und Meru, 1905–1906* **16**: 1–23.

—— 1910. Zwei neue Physapoden aus Madagaskar. *Voeltzkow's Reise in Ostafrika in den Jahren 1903–1905, Wissenschaftliche Ergebnisse* **2**: 521–525.

—— 1912. Physapoden aus Natal und dem Zululande. *Arkiv für Zoologi* **7**(33): 1–52.

Uzel, H. 1895. *Monographie der Ordnung Thysanoptera*. 472 pp. Königgrätz.

Vuillet, A. 1914. Description d'un *Dicaiothrips* nouveau de l'Inde (Thysanopt. Idolothripidae). *Bulletin de la Société Entomologique de France* **1914**: 276–278.

Walker, F. 1859. Characters of some apparently undescribed Ceylon insects. *Annals and Magazine of Natural History* (3) **4**: 217–224.

Watson, J. R. 1919. New Thysanoptera from Florida-IV. *Florida Buggist* **2**: 97–102.

—— 1920. New Thysanoptera from Florida-VII. *Florida Entomologist* **4**: 18–23, 27–30.

—— 1921. New Thysanoptera from New York. *Bulletin of the Brooklyn Entomological Society* **16**: 78–86.

—— 1923. Synopsis and catalog of the Thysanoptera of North America. *Technical Bulletin of the Agricultural Experimental Station, University of Florida* **168**: 1–98.

—— 1925. A new species of *Symphyothrips* (Thysanoptera) from Argentina. *Florida Entomologist* **9**: 29–30, 45.

—— 1931. A collection of Thysanoptera from Western Oklahoma. *Publications of the University of Oklahoma Biological Survey* **3**: 339–345.

—— 1933. Two new species of *Oedaleothrips* with notes on other species. *Florida Entomologist* **17**: 48–50; 63–64.

—— 1934/35/37. Thysanoptera of the Geenton. *Florida Entomologist* **18**: 44–46, 55–62; **20**: 12–15, 17–21.

Woo, K. S. 1974. Thysanoptera of Korea. *Korean Journal of Entomology* **4**: 1–90.

Yakhontov, V. V. 1956. New genus and species of thrips from Zailisk Ala-Tai. [In Russian.] *Zoologicheskii Zhurnal* **35**: 554–555.

Zur Strassen, R. 1959. Studies in African Thysanoptera, 2. *Journal of the Entomological Society of Southern Africa* **22**: 174–198.

—— 1966. Neue Fransenflüglearten aus der Unterordnung Tubulifera von den Kanarischen Inseln (Ins., Thysanoptera). *Commentationes Biologicae* **29**: 1–34.

—— 1968. Ökologische und zoogeographische Studien über die Fransenflüger-Fauna (Ins., Thysanoptera) des südlichen Marokko. *Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft* **515**: 1–125.

—— 1972. Äthiopische Thysanopteran überwiegend aus dem Massiv des Mount Elgon in Kenya (Insecta, Thysanoptera). *Zoologica Scripta* **1**: 85–105.

—— 1974. Neue silvicole Fransenflügler von den makaronesischen Inseln (Ins.: Thysanoptera). *Senckenbergiana Biologica* **55**: 105–134.

—— 1976. La faune terrestre de l'Ile de Sainte-Hélène. Part 3. 18. Thysanoptera. *Annales Musée Royal de l'Afrique Centrale,* Sciences Zoologiques (8) **215**: 236–256.

—— 1977. Internationales Forschungsprojekt Makaronesischer Raum. Studie zur Frühjahrsfauna der Fransenflügler auf den Madeira-Inseln im Atlantik nebst Daten zur Abundanz und Faunistik (Insecta: Thysanoptera). *Boletim do Museu Municipal do Funchal* **31**: 5–78.

—— 1979. Insects of Saudi Arabia. Thysanoptera. *Fauna of Saudi Arabia* **1**: 90–104.

—— 1980. *Anactinothrips gibbifer* n. sp. aus Baumkronen im Amazonas-Gebiet (Insecta: Thysanoptera: Phlaeothripidae). *Senckenbergiana Biologica* **61**: 47–56.

Table 6 Distribution of species in Pygothripina genera

	NT	NA	PA	AT	O	A	P
Cleistothrips	—	—	—	—	—	—	1
Heptathrips	—	—	—	3	—	—	5
Ozothrips	—	—	—	—	—	—	3
Pelinothrips	—	—	—	—	—	2	—
Phaulothrips	—	—	—	1	—	10	1
Emprosthiothrips	—	—	—	—	—	6	—
Priesneriana	—	—	—	—	2	2	—
Cryptothrips	—	3	4	—	1	—	—
Pygothrips	5	4	—	—	—	2	1

Table 7 Distribution of species in Allothripina genera

	NT	NA	PA	AT	O	A	P
Allidothrips	—	—	1	1	—	—	—
Allopisothrips	—	—	—	—	—	—	1
Allothrips	3	5	2	2	3	3	—
Faureothrips	—	—	—	1	—	—	—
Priesneriella	—	3	4	—	—	—	1
Pseudocryptothrips	1	—	1	1	—	—	—

Table 8 Distribution of species in Compsothripina genera

	NT	NA	PA	AT	O	A	P
Anaglyptothrips	—	—	—	—	—	—	1
Bolothrips	—	5	6	5	—	—	—
Compsothrips	8	7	4	3	3	—	—
Illinothrips	—	1	—	—	—	—	—
Loyolaia	—	—	—	—	1	—	—

Table 9 Distribution of species in Gastrothripina

	NT	NA	PA	AT	O	A	P
Gastrothrips	18	5	1	3	6	—	—

Table 10 Distribution of species in Diceratothripina genera

	NT	NA	PA	AT	O	A	P
Carientothrips	1	—	—	—	2	13	2
Nesothrips	—	—	—	—	3	9	13
Campulothrips	—	—	—	—	—	—	1
Elgonima	—	—	—	1	—	—	—
Pseudoeurynchothrips	—	—	—	2	—	—	—
Neosmerinthothrips	11	—	—	4	6	—	1
Phacothrips	1	—	—	—	—	—	—
Nesidiothrips	—	—	—	1	1	—	—
Acallurothrips	7	1	—	5	2	—	1
Diceratothrips	16	5	—	—	—	—	—
Sporothrips	—	1	—	—	—	—	—

Table 11 Distribution of species in Macrothripina genera

	NT	NA	PA	AT	O	A	P
Aesthesiothrips	—	—	—	—	1	—	—
Celidothrips	—	—	—	—	1	2	1
Diaphorothrips	—	—	—	—	2	—	2
Dichaetothrips	1	—	—	—	2	—	—
Diplacothrips	2	—	—	—	—	—	—
Ethirothrips	1	—	—	4	13	10	4
Herathrips	—	—	—	—	—	1	—
Ischyrothrips	—	—	—	—	1	—	—
Machatothrips	—	—	—	3	11	—	—
Macrothrips	—	—	—	—	1	—	—
Peltariothrips	—	—	—	—	1	—	—
Polytrichothrips	—	—	—	—	1	—	—
Tarassothrips	—	—	—	—	1	—	—

Table 12 Distribution of species in Elaphrothripina genera

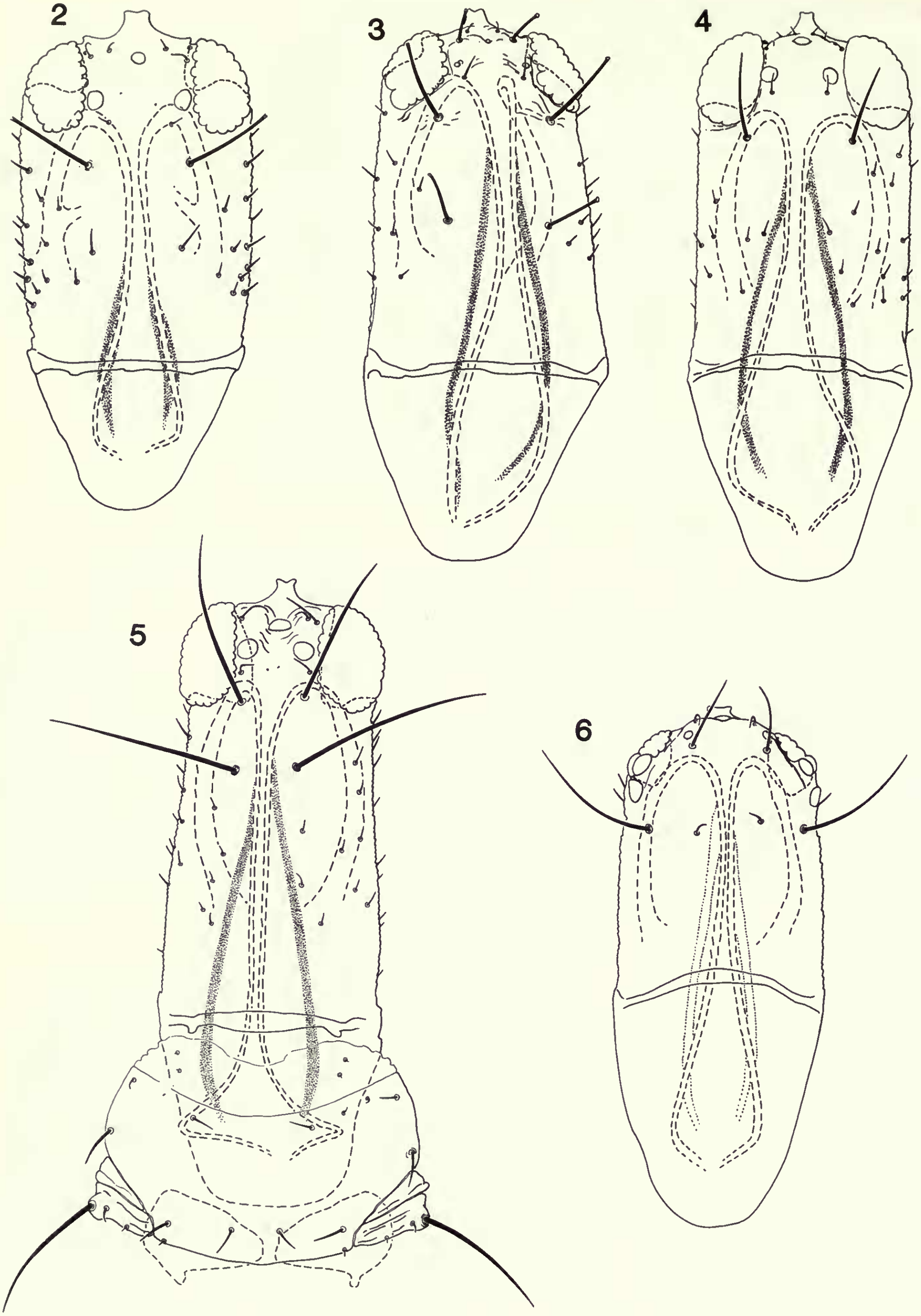
	NT	NA	PA	AT	O	A	P
Anactinothrips	15	—	—	—	—	—	—
Elaphrothrips	46	7	—	49	19	—	—
Ophthalmothrips	—	—	—	4	5	1	—
Mecynothrips	—	—	—	1	9	3	2
Lamillothrips	—	—	—	3	—	—	—
Dinothrips	—	—	—	—	5	—	—
Tiarothrips	—	—	—	—	1	—	—
Hartwigia	—	—	—	1	—	—	—
Malesiathrips	—	—	—	—	1	—	2
Dermothrips	—	—	—	—	—	—	1

Table 13 Distribution of species in Idolothripina genera

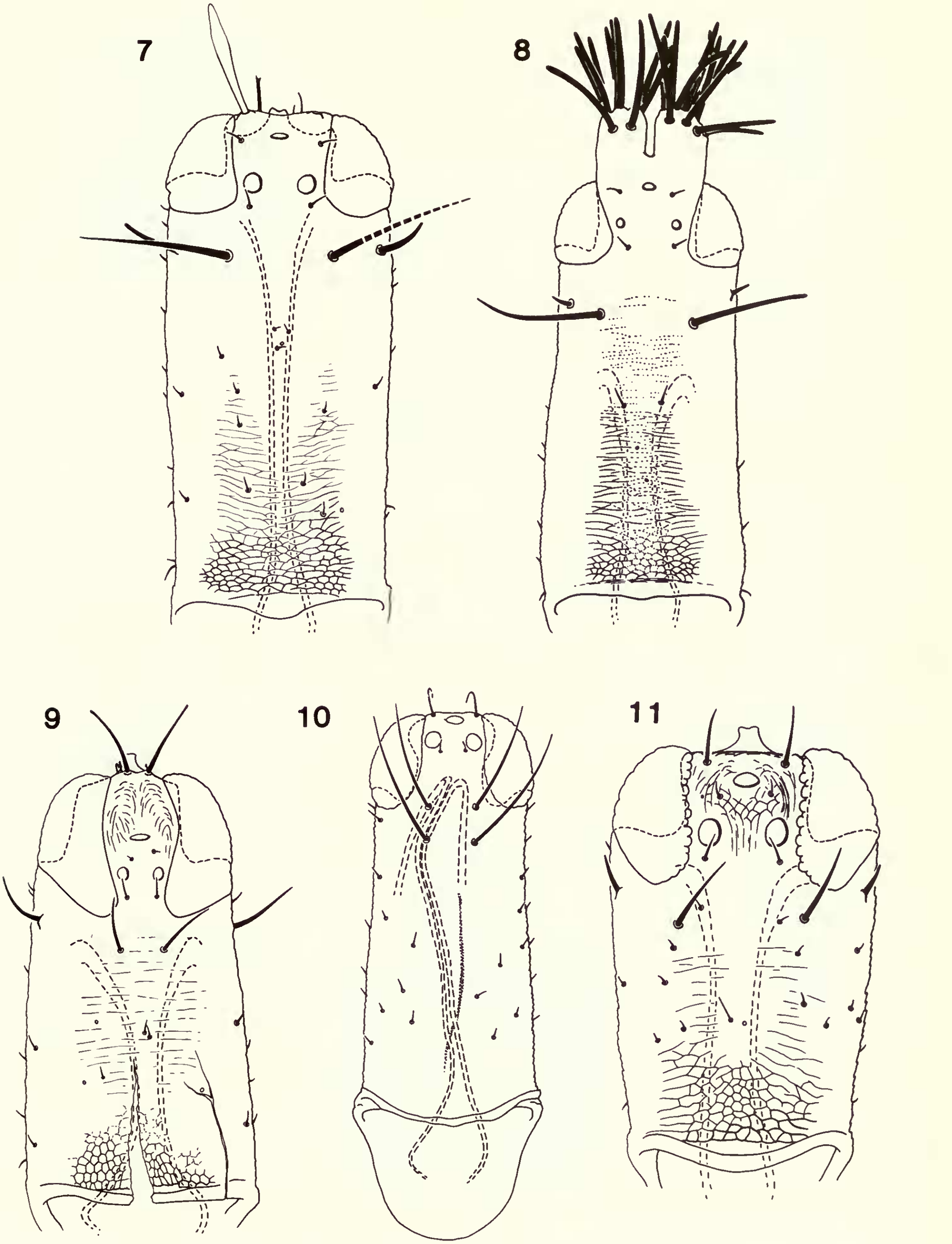
	NT	NA	PA	AT	O	A	P
Idolothrips	—	—	—	—	—	2	—
Meiothrips	—	—	—	—	3	—	—
Lasiothrips	—	—	—	—	—	1	—
Egchocephalothrips	—	—	—	—	—	—	1
Megalothrips	—	3	2	—	1	—	—
Bacillothrips	—	—	3	—	—	—	—
Bactrothrips	—	1	1	32	7	1	—
Megathrips	—	1	5	—	—	—	—
Ceuthothrips	—	1	—	—	—	—	—
Cylindrothrips	—	—	—	1	—	—	—

Table 14 Distribution of species in Hystricothripina genera

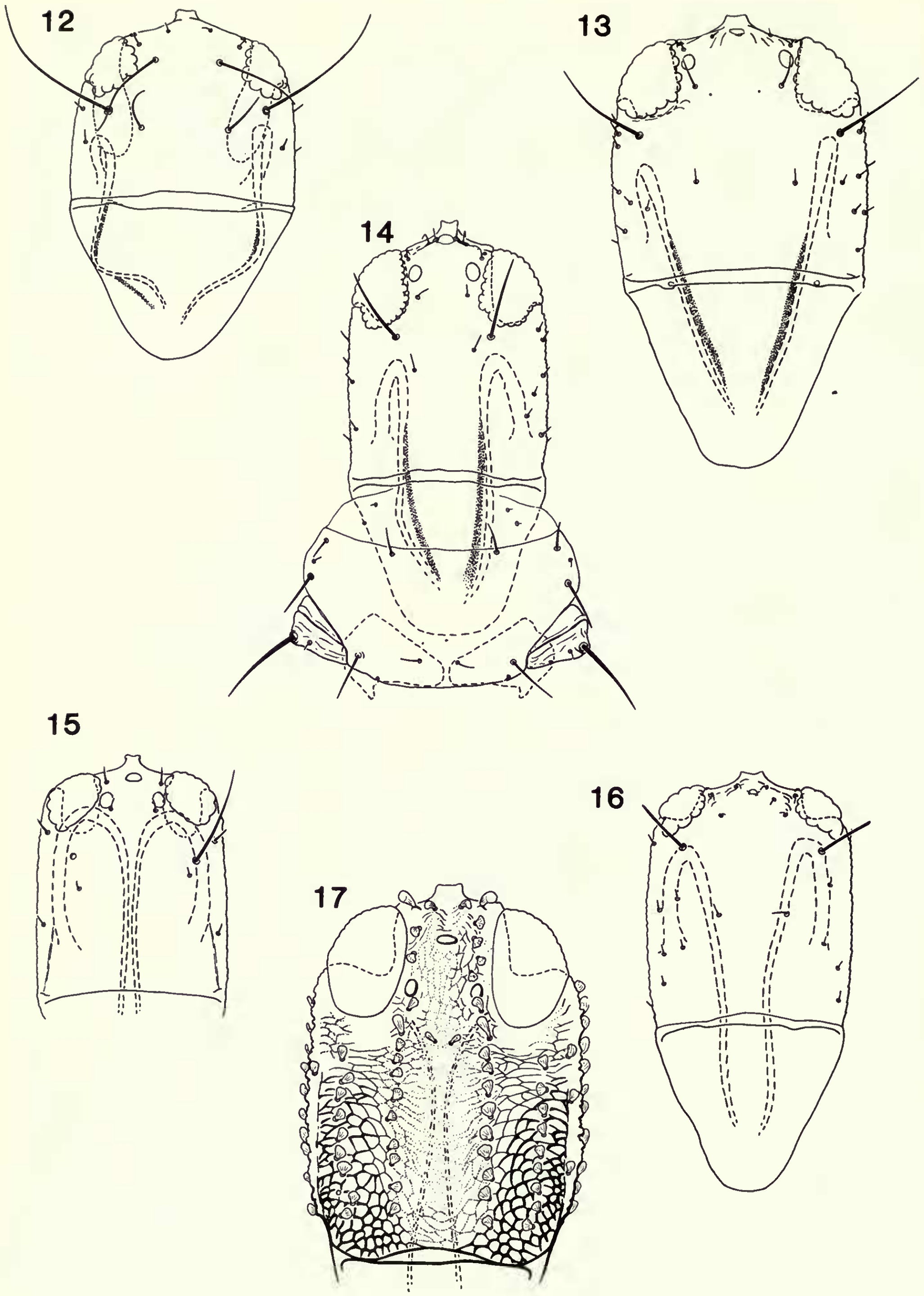
	NT	NA	PA	AT	O	A	P
Hystricothrips	—	—	—	2	—	—	—
Holurothrips	—	—	—	—	2	1	—
Paractinothrips	—	—	—	—	1	—	—
Neatractothrips	—	—	—	—	1	—	—
Actinothrips	11	—	—	—	—	—	—
Atractothrips	1	1	—	—	—	—	—
Azeugmatothrips	2	—	—	—	—	—	—
Cyphothrips	1	—	—	—	—	—	—
Hybridothrips	1	—	—	—	—	—	—
Saurothrips	1	—	—	—	—	—	—
Zactinothrips	2	—	—	—	—	—	—
Zeuglothrips	1	—	—	—	—	—	—
Zeugmatothrips	15	—	—	—	—	—	—



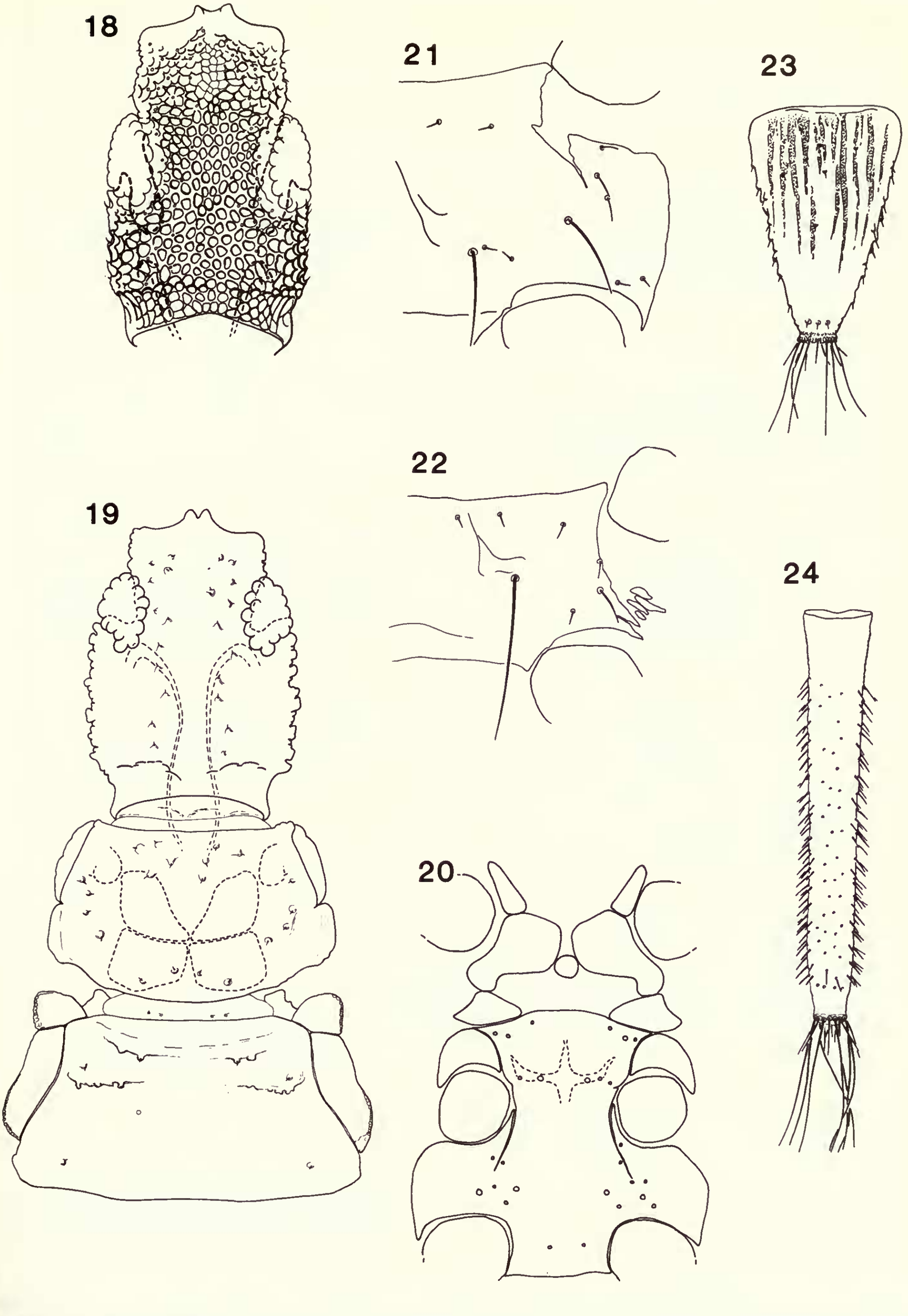
Figs 2–6 Pygothripina. 2, *Cryptothrips nigripes* mac.; 3, *Heptathrips magnifica* ♀ paratype; 4, *H. tonnoiri* ♀ mac.; 5, *Cleistothrips idolothripoides* ♀ mac.; 6, *Pygothrips fortis* ♂ apt.



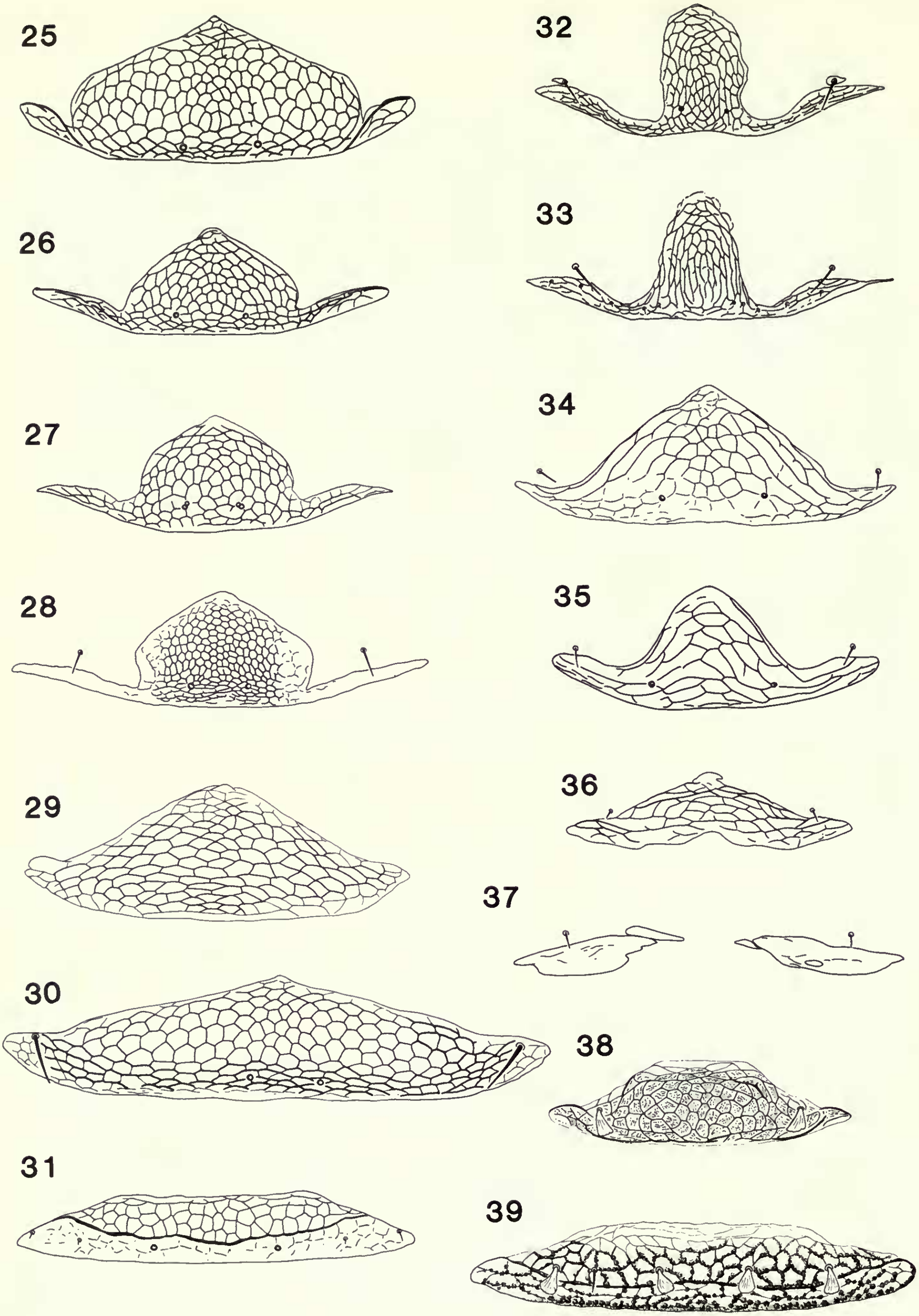
Figs 7–11 Pygothripina: *Phaulothrips* species. 7, *P. vuilleti* ♀; 8, *P. inquilinus* ♀; 9, *P. uptoni* ♀ holotype; 10, *P. magnificus* ♂ allotype; 11, *P. barretti* ♀ holotype.



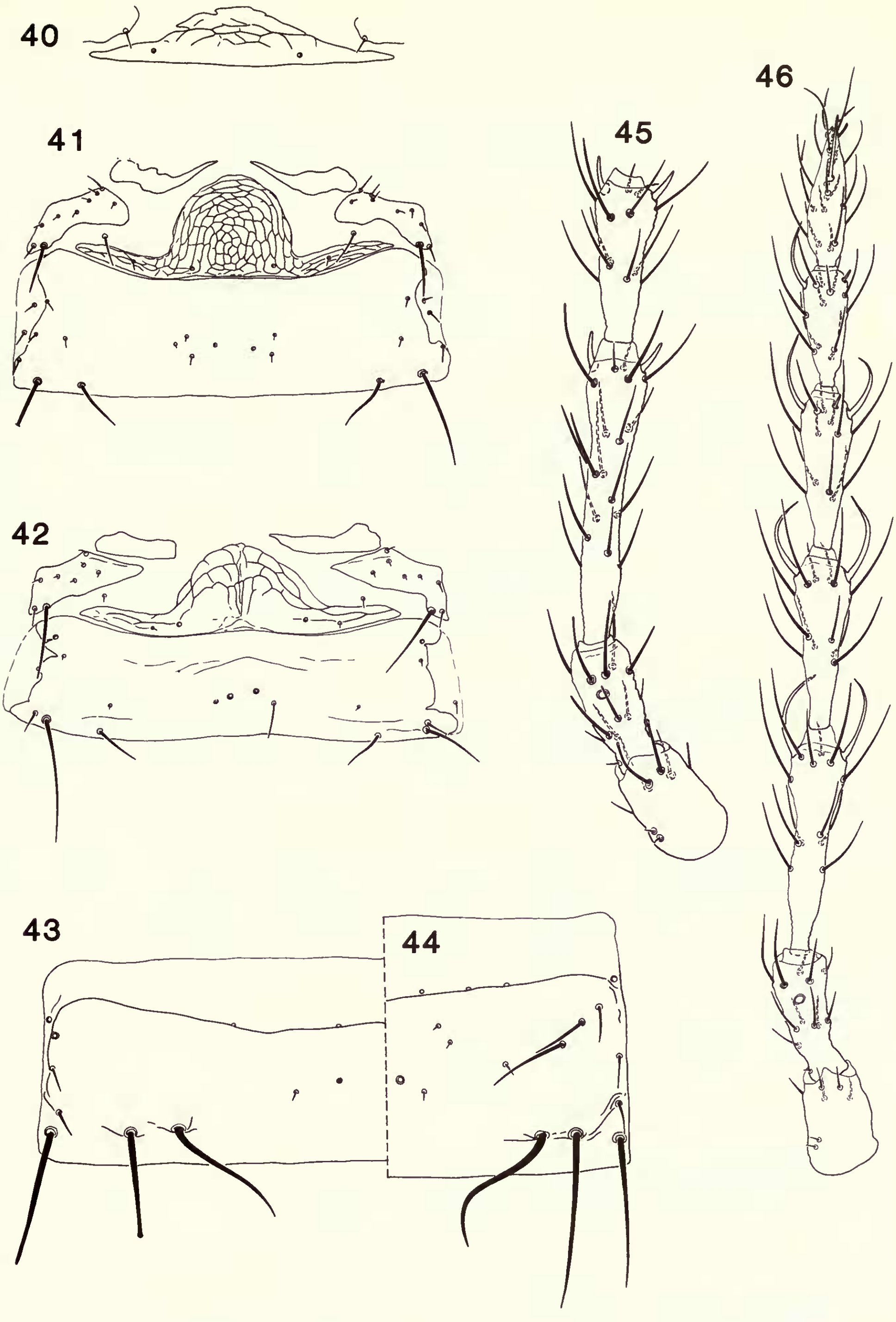
Figs 12–17 Pygothripina. 12, *Ozothrips janus* ♀ holotype; 13, *O. eurytis* ♀ holotype; 14, *O. priscus* ♀ holotype; 15, *Pygothrips mikrommatos* ♀ holotype; 16, *Priesneriana kabandha* ♀; 17, *Pelinothrips brochotus* ♀ holotype.



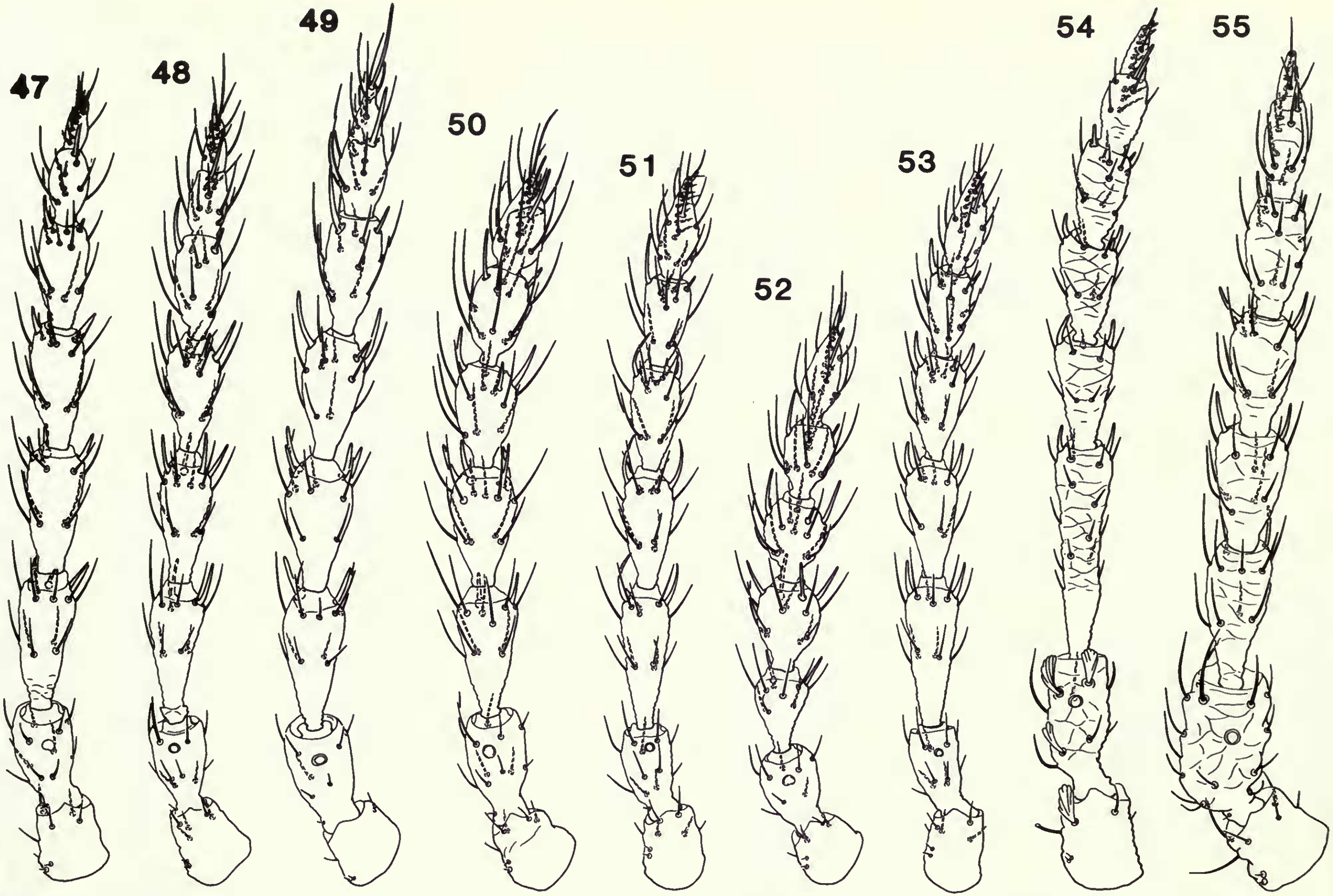
Figs 18–24 Pygothripina. 18, *Emprosthiothrips brimblecombei* ♀ holotype; 19, *E. epallelus* ♀ holotype; 20, *E. niger* thoracic sternites; 21–22, *Pygothrips fortis* eroded metathoracic sternopleural sutures in ♀ (21) and ♂ (22); 23, *P. fortis* ♂ tube; 24, *Cleistothrips idolothripoides* ♀ tube.



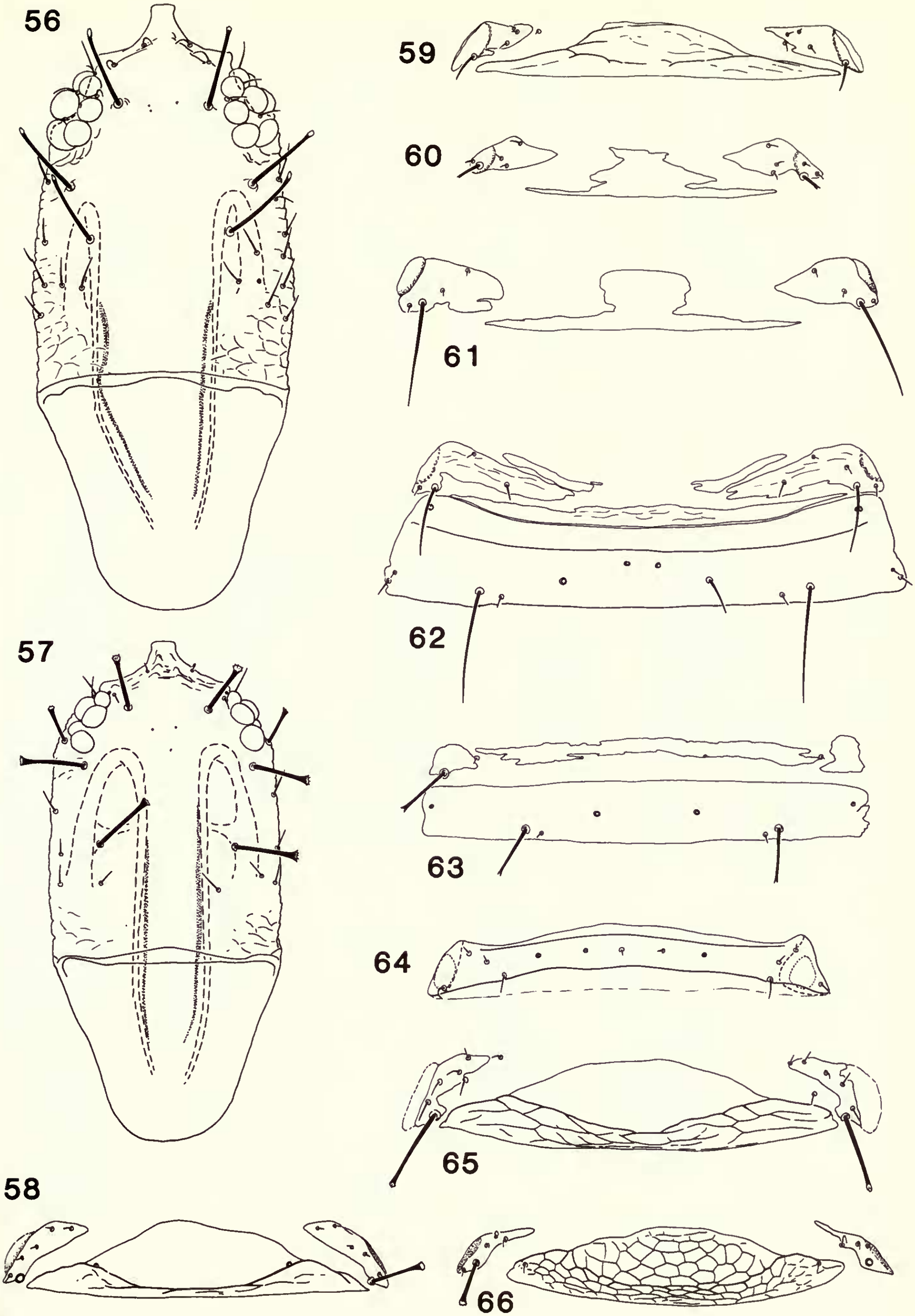
Figs 25–39 Pelta of Pygothripina (and Diceratothripina) species. 25, *Phaulothrips sibylla* ♀ mac.; 26, *P. vuilleti*; 27, *P. barretti* holotype; 28, *P. magnificus* ♂ allotype; 29, *P. anici* holotype; 30, *P. sibylla* ♀ mic.; 31, *Emprosthiothrips niger*; 32, *Cleistothrips idolothripoides*; 33, *Heptathrips tonnoiri*; 34, *Cryptothrips nigripes*; (35, *Diceratothrips nigricauda*;) 36, *Phaulothrips sculpticauda* ♀; 37, *P. sculpticauda* ♂ holotype; 38, *Pelinothrips brochotus* holotype; 39, *P. ornatus*.



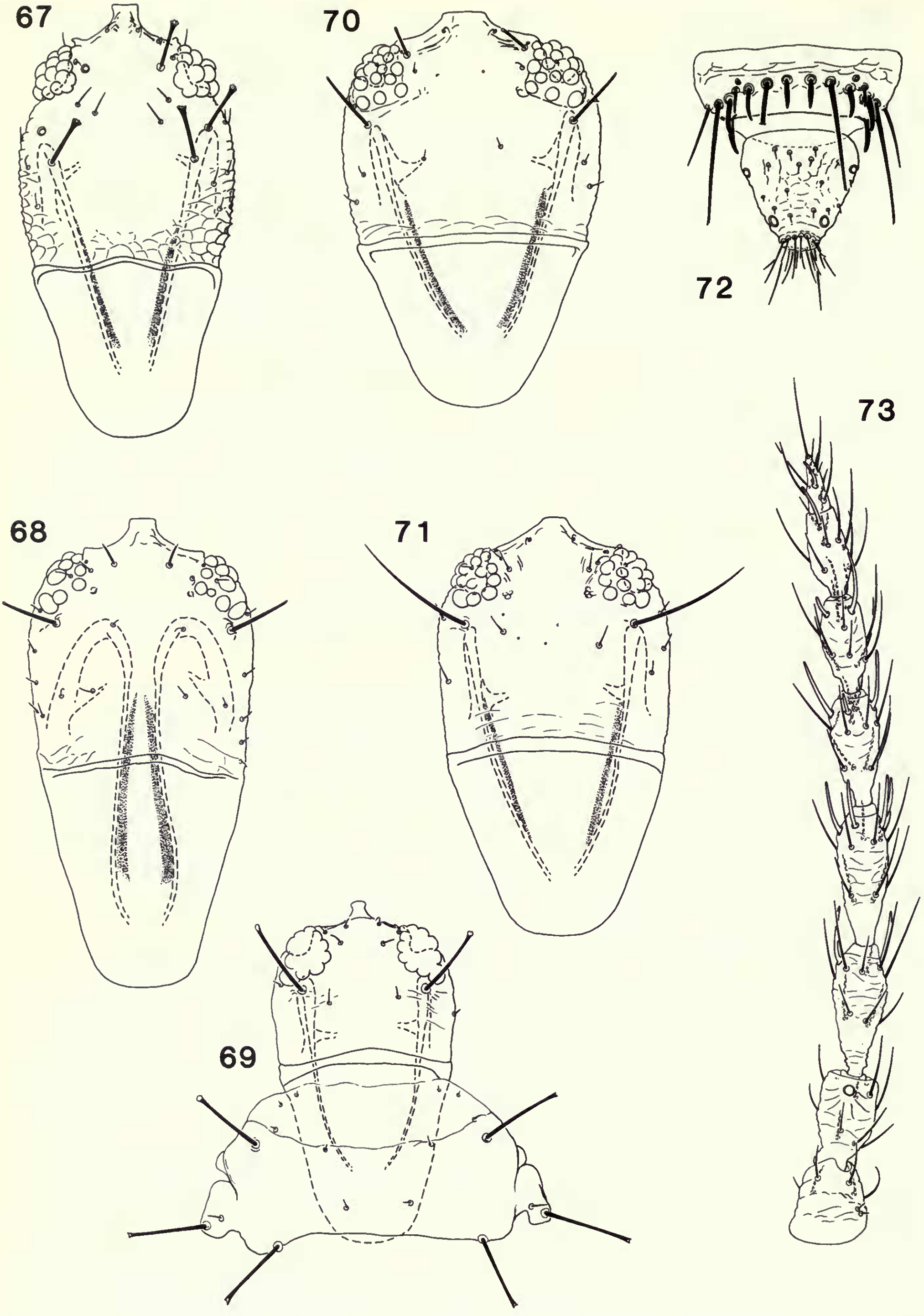
Figs 40–46 Pygothripina. 40, *Ozothrips janus*, holotype pelta; 41, *O. priscus* holotype pelta & tergite II; 42, *O. eurytis* holotype; 43, *Phaulothrips vuilleti* tergite III; 44, *P. agrestis* tergite III; 45, *P. agrestis* antennal segments I–IV; 46, *Cleistothrips idolothripoides*.



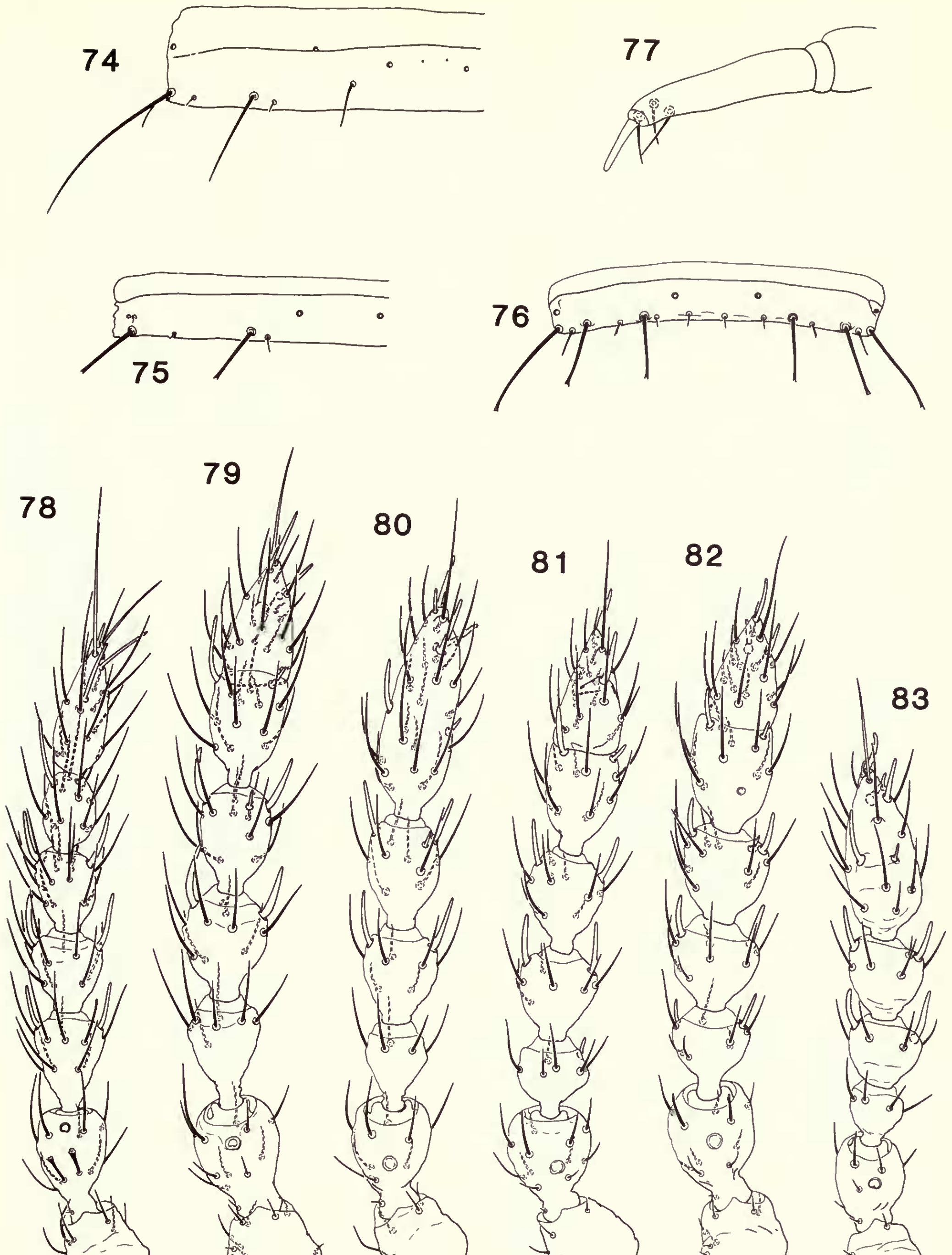
Figs 47–55 Pygothripina. 47, *Cryptothrips nigripes* mac.; 48, *Priesneriana kabandha*; 49, *Pygothrips sculpticauda* ♀; 50, *Ozothrips eurytis* holotype; 51, *O. priscus* holotype; 52, *O. janus* holotype; 53, *Heptathrips tonnoiri*; 54, *Pelinothrips ornatus*; 55, *Emprosthiothrips niger*.



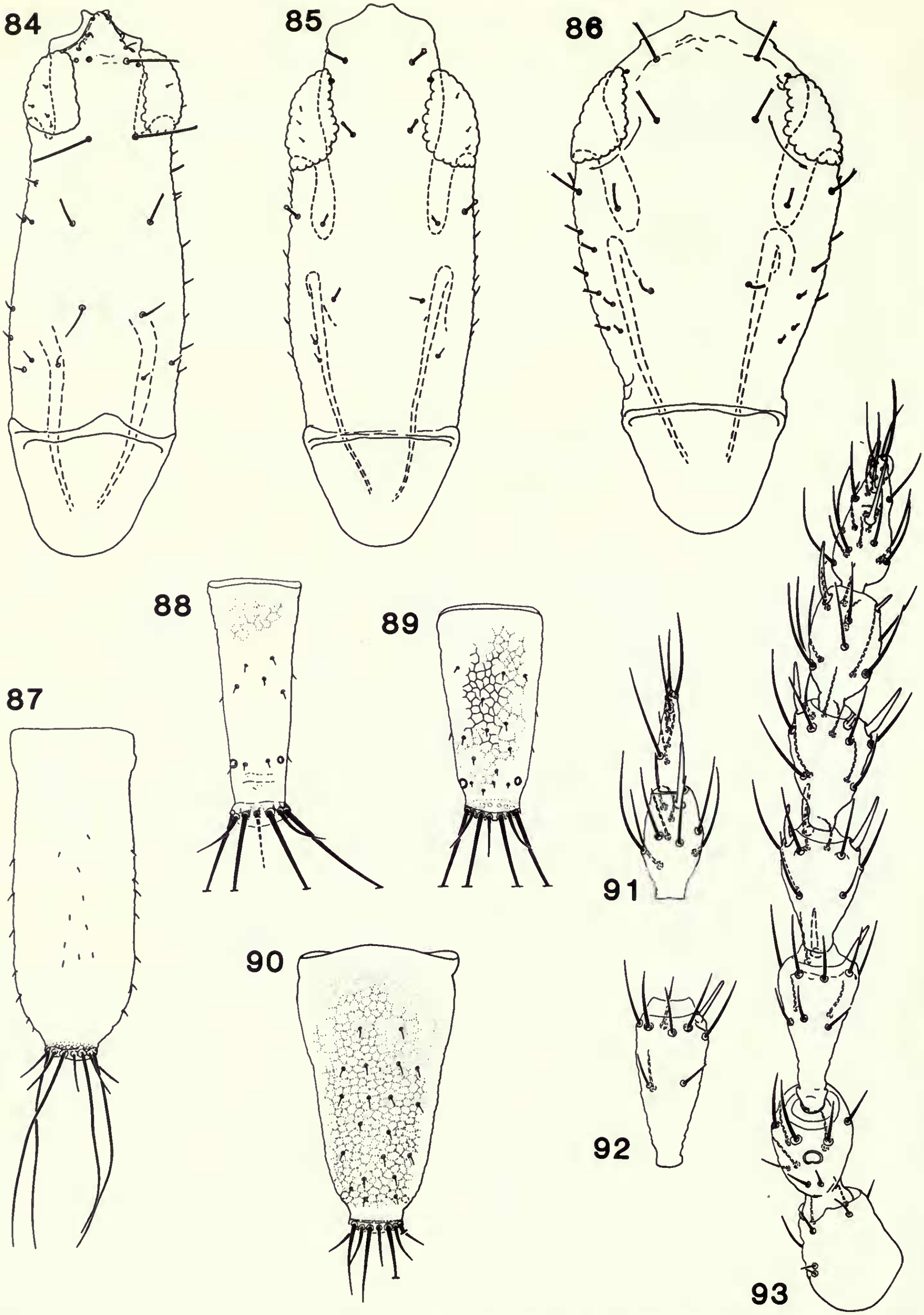
Figs 56–66 Allothripina. 56, *Pseudocryptothrips* sp.; 57, *Allothrips megacephalus stannardi*; 58, *A. m. stannardi* pelta; 59, *Priesneriella clavicornis*; 60, *P. thomasi*; 61, *P. citricauda*; 62, *P. gnomus* holotype pelta & tergite II; 63, *P. seminole* pelta & tergite II; 64, *Allidothrips tricolor* tergite I (pelta); 65, *Pseudocryptothrips* sp.; 66, *Faureothrips reticulatus*.



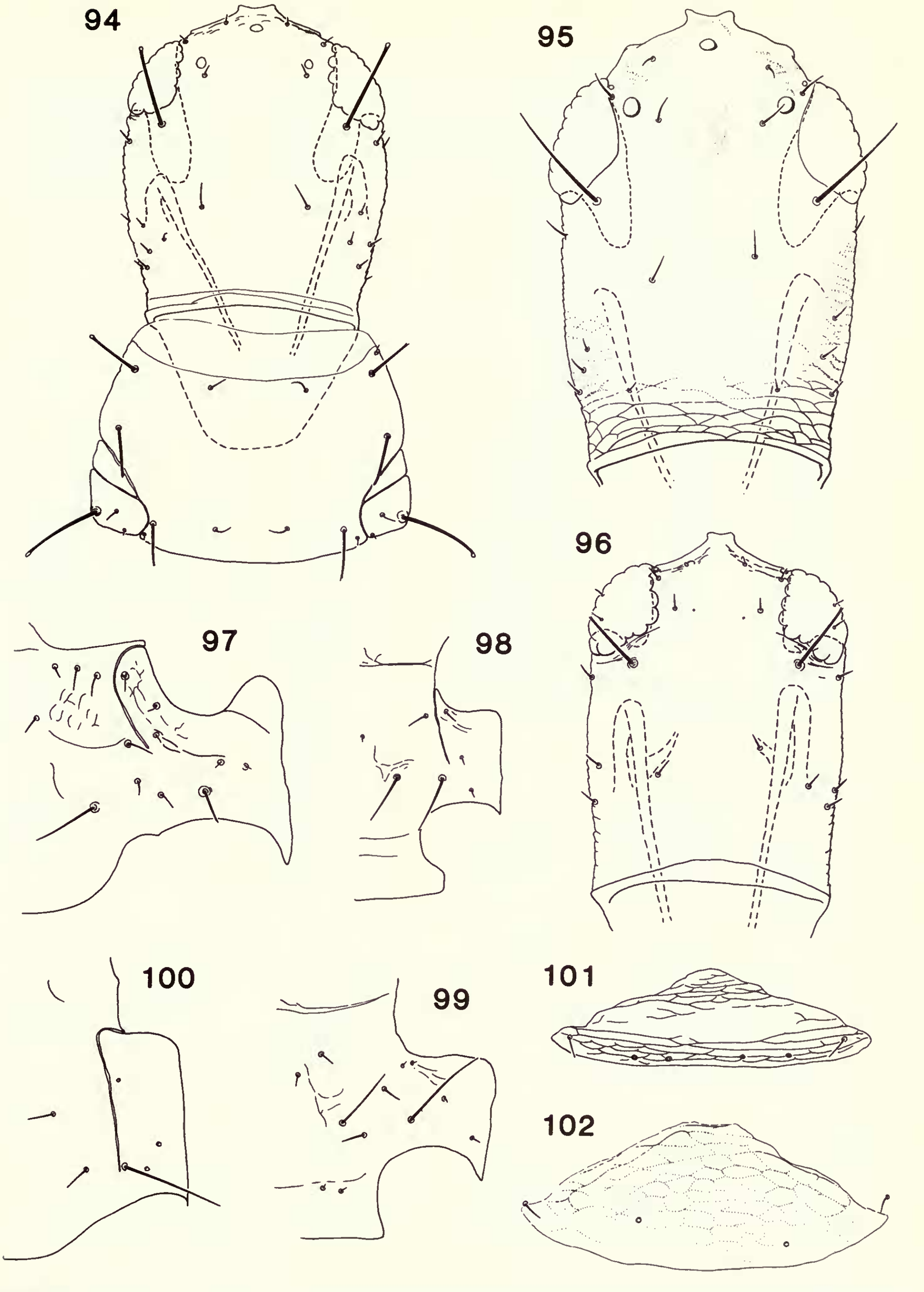
Figs 67–73 Allothripina. 67, *Faureothrips reticulatus*; 68, *Priesneriella thomasi*; 69, *P. seminole* head & pronotum; 70, *P. clavicornis*; 71, *P. gnomus* holotype; 72, *P. seminole* tergite IX & tube; 73, *Pseudocryptothrips* sp.



Figs 74–83 Allothripina. 74, *Priesneriella gnomus* tergite IV; 75, *P. seminole* tergite IV; 76, *P. seminole* tergite VII; 77, *Priesneriella* sp. left maxillary palp; 78, *Allothrips megacephalus stannardi*; 79, *Priesneriella gnomus*; 80, *P. citricauda*; 81, *P. clavicornis*; 82, *P. thomasi*; 83, *P. seminole*.



Figs 84–93 Compsothripina and Gastrothripina. 84, *Compsothrips albosignatus*; 85, *C. reuteri*; 86, *C. hookeri*; 87–90, tubes of (87) *Gastrothrips proturus* holotype; (88) *G. falcatus*; (89) *G. ruficauda*; (90) *G. intonsus*; 91, *G. ruficauda* antennal segments VII–VIII; 92, *G. ruficauda* antennal segment III; 93, *G. turbinatus*.



Figs 94–102 Compsothripina. 94, *Bolothrips bicolor*; 95, *B. italicus*; 96, *B. pratensis*; 97–100, metasternum of (97) *Anaglyptothrips dugdalei*; (98) *Bolothrips cingulatus*; (99) *B. icarus*; (100) *Compsothrips reuteri*; 101, *Bolothrips bicolor* pelta; 102, *B. italicus* pelta.

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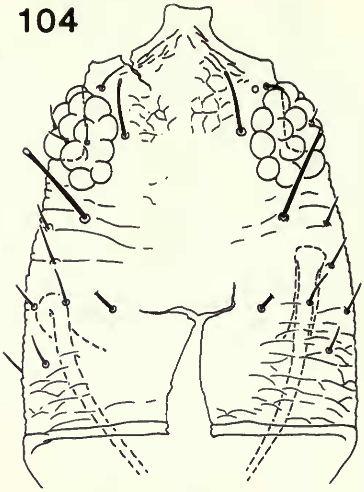

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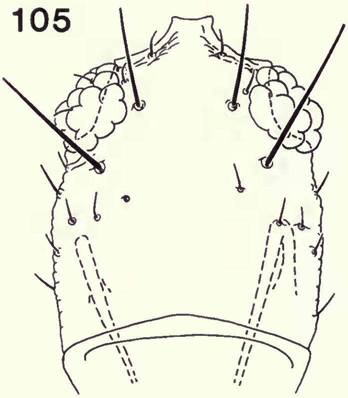

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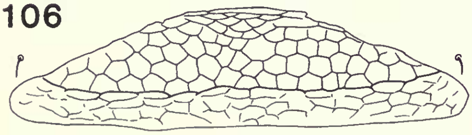

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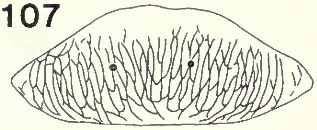

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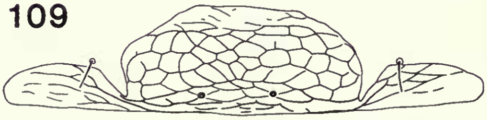

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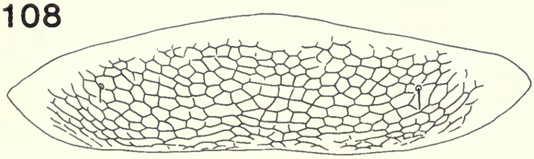

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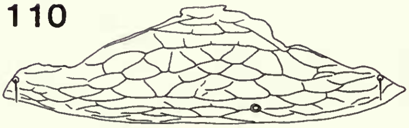
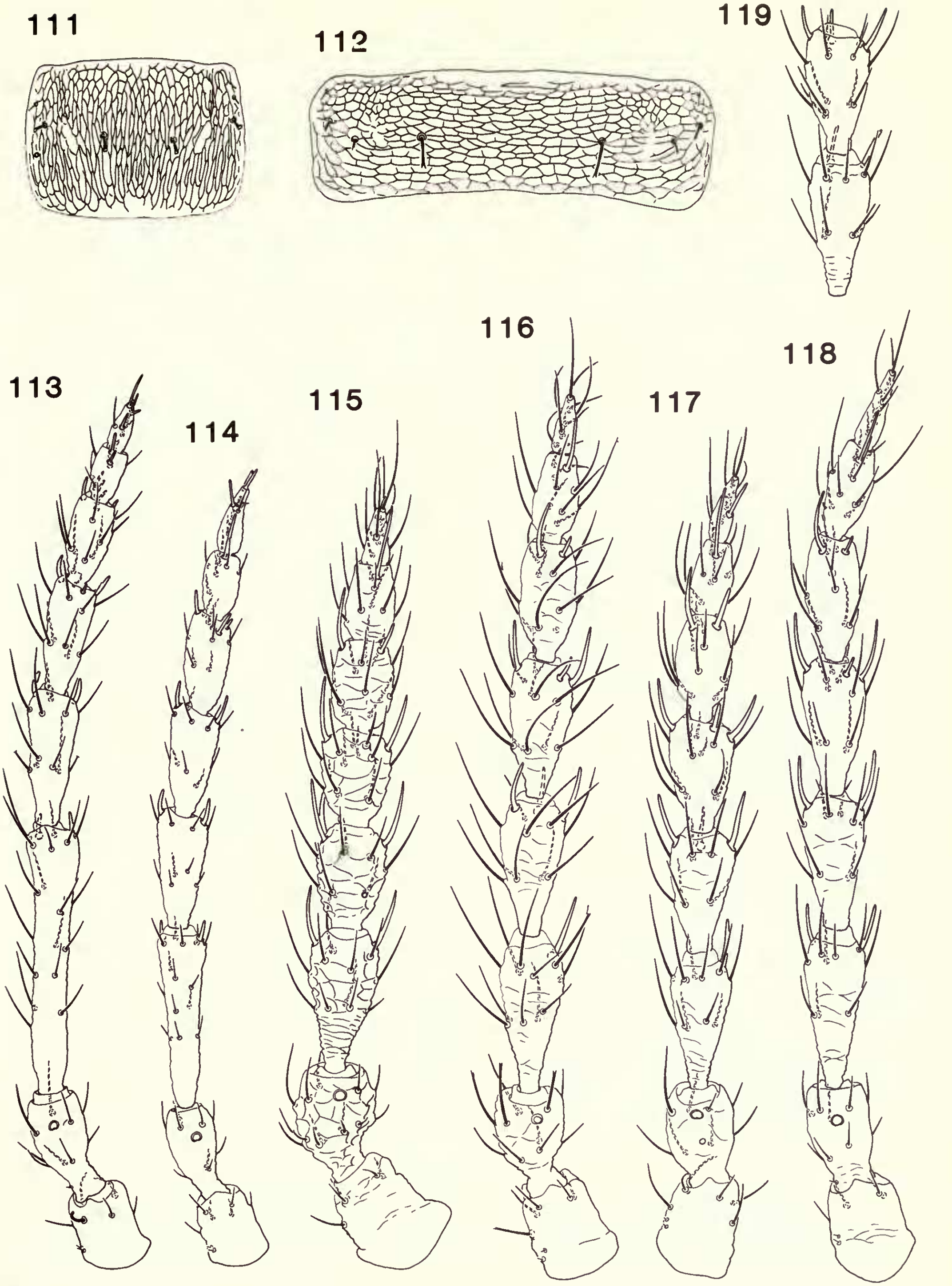


Figs 103–110 Compsothripina. 103. *Anaglyptothrips dugdalei* ♀; 104, *Illinothrips rossi* ♀; 105, *Loyolaia indica*; 106–110, pelta of (106) *Anaglyptothrips dugdalei*; (107) *Compsothrips reuteri*; (108) *C. albosignatus*; (109) *Loyolaia indica*; (110) *Illinothrips rossi*.



Figs 111–119 Compsothripina. 111, *Compsothrips reuteri* metanotum; 112, *C. albosignatus* metanotum; 113, *C. albosignatus*; 114, *C. reuteri*; 115, *Anaglyptothrips dugdalei*; 116, *Illinothrips rossi*; 117, *Loyolaia indica*; 118, *Bolothrips bicolor*; 119, *B. cingulatus* III–IV.

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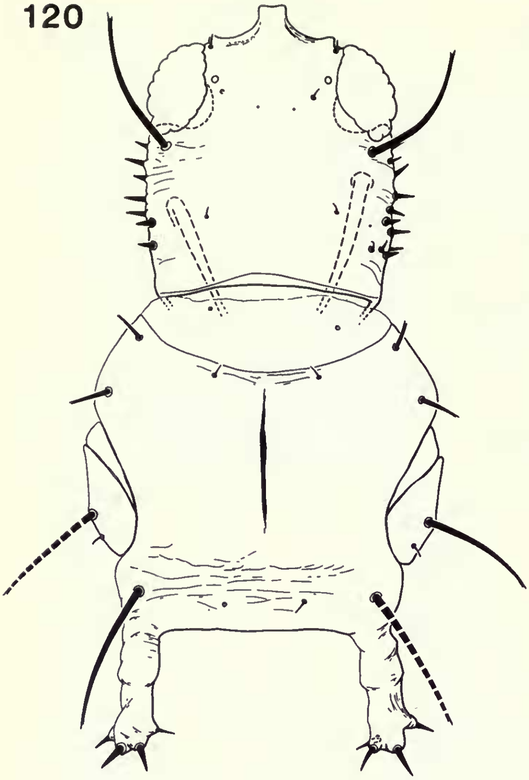

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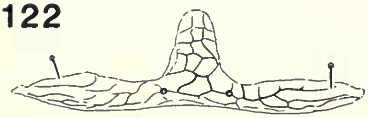

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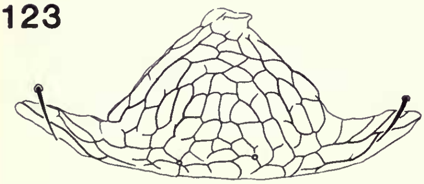

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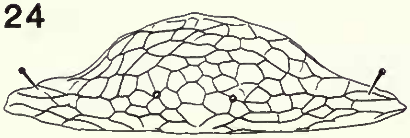

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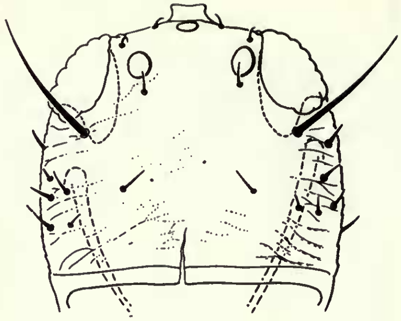

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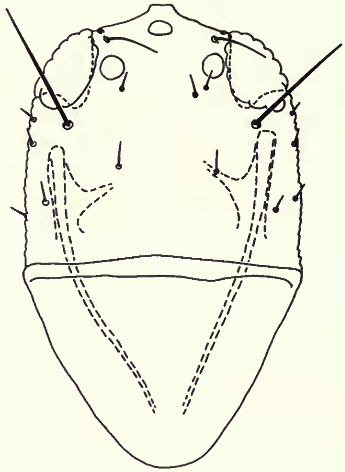

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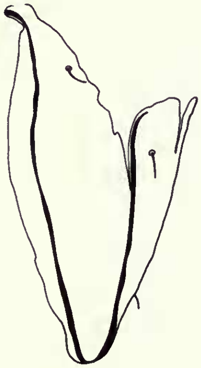

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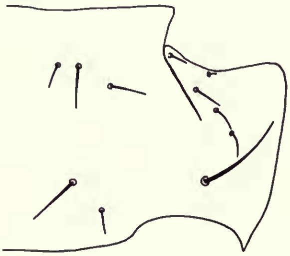

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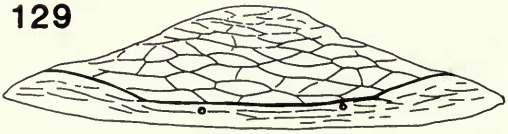
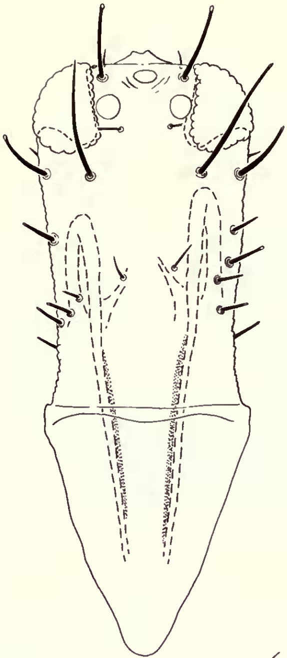


Figs 120–129 Gastrothripina. 120, *Gastrothrips anolis* ♂; 121–124, pelta of (121) *G. anolis*; (122) *G. ruficauda*; (123) *G. mandiocae*; (124) *G. intonsa*; 125, *G. ruficauda*; 126, *G. turbinatus*; 127, *G. mauli* anapleural suture; 128, *G. acuticornis* metasternum; 129, *G. fulviceps* pelta.

130



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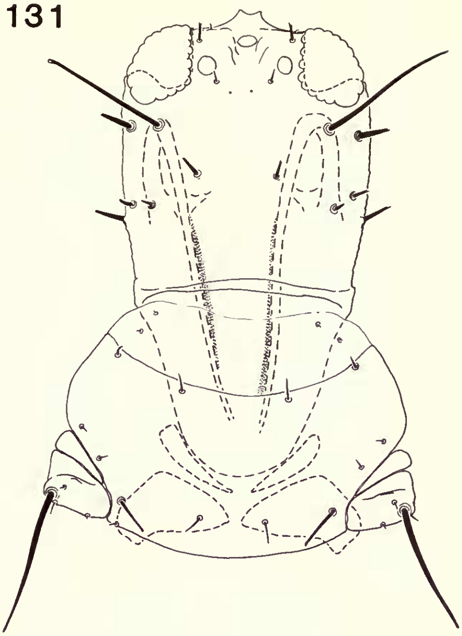

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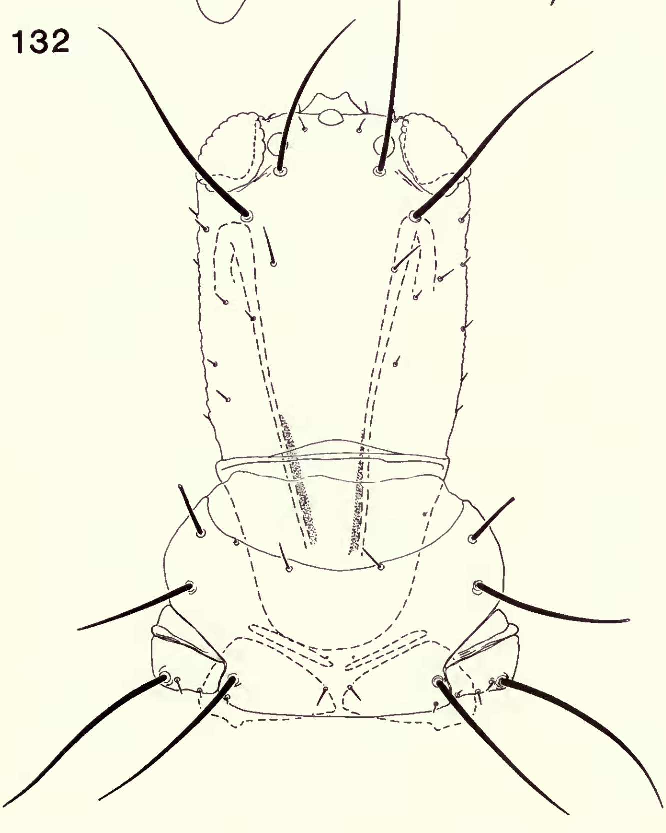

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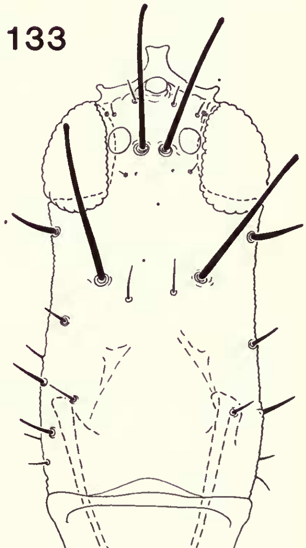
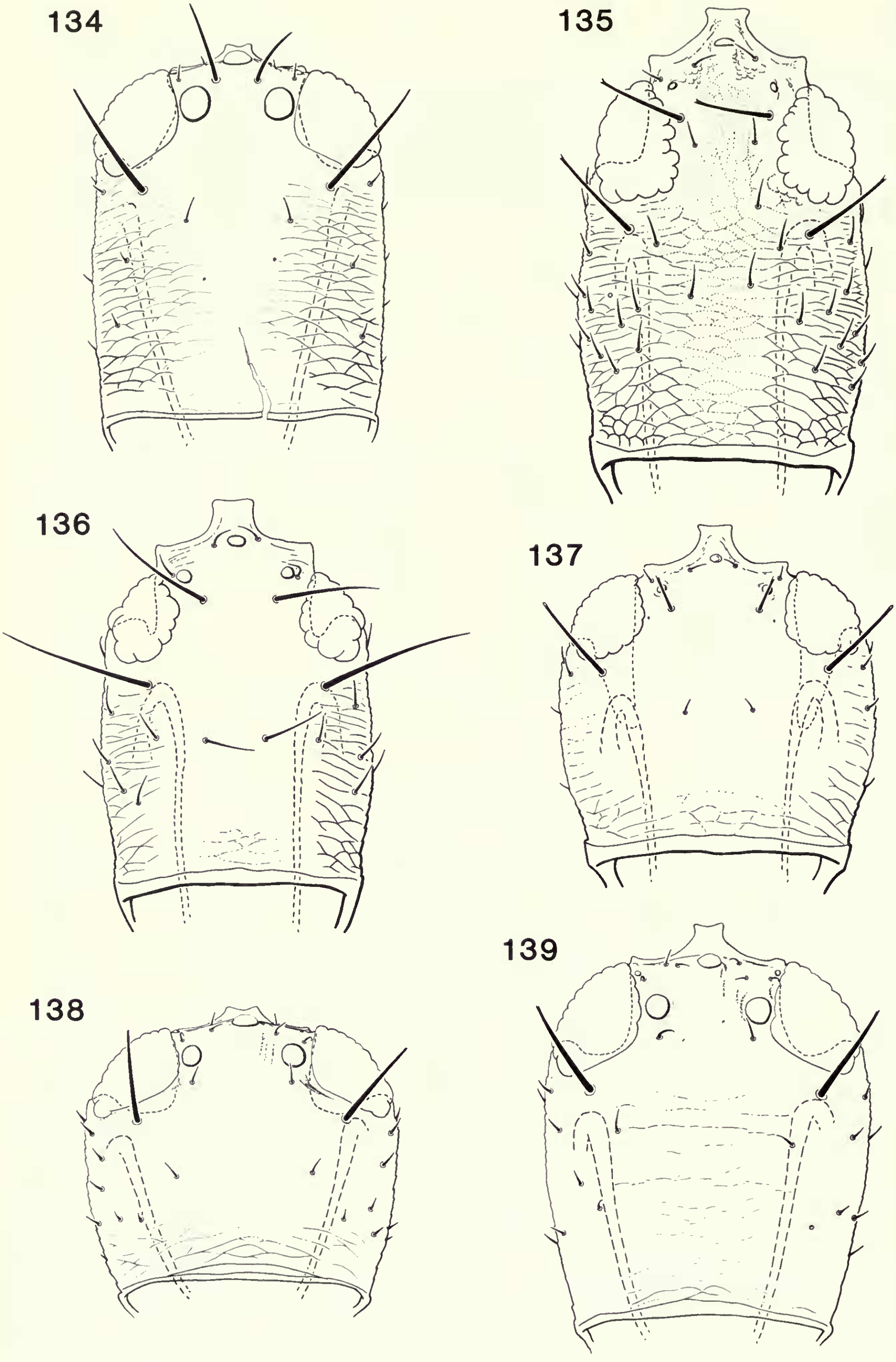
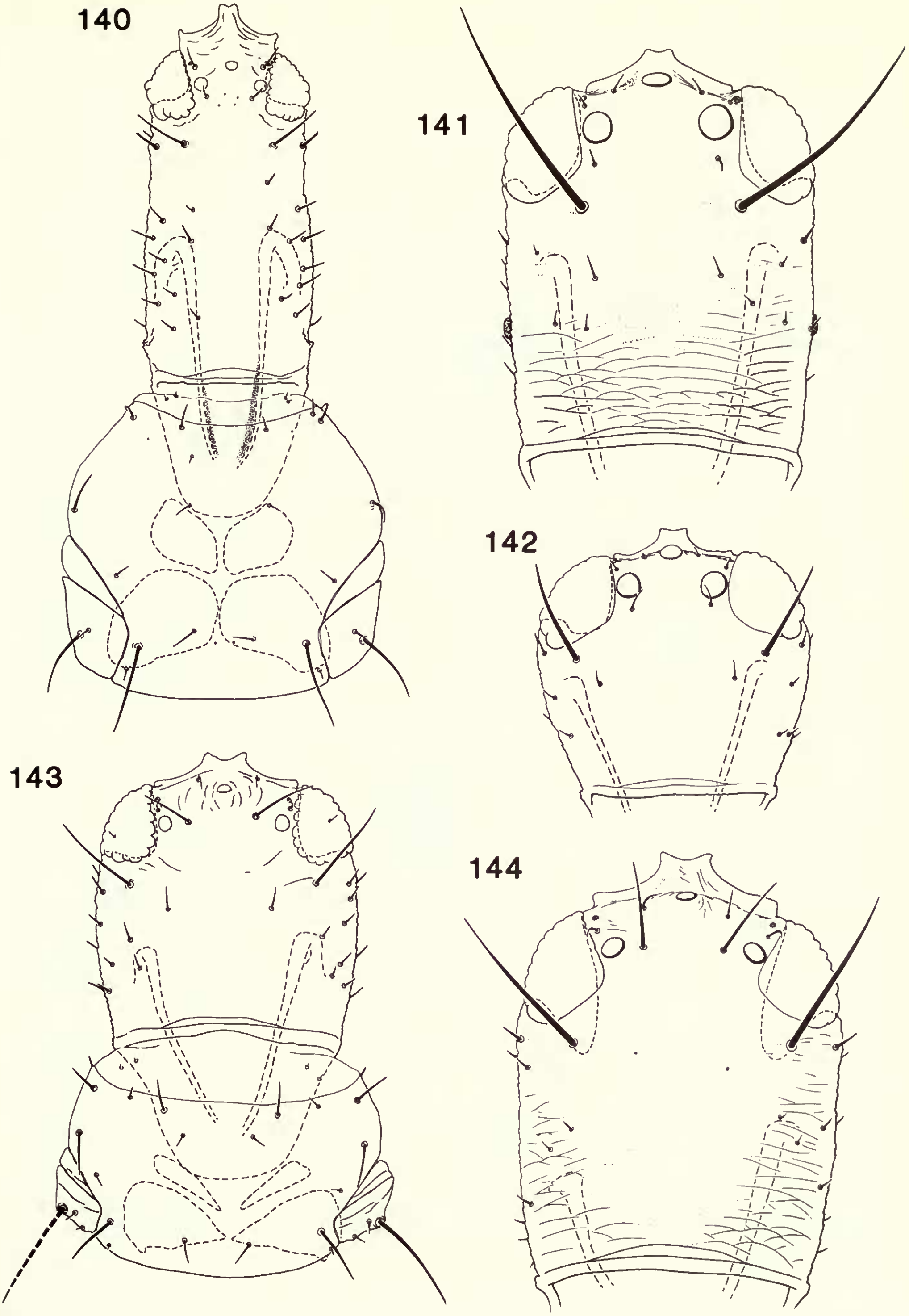


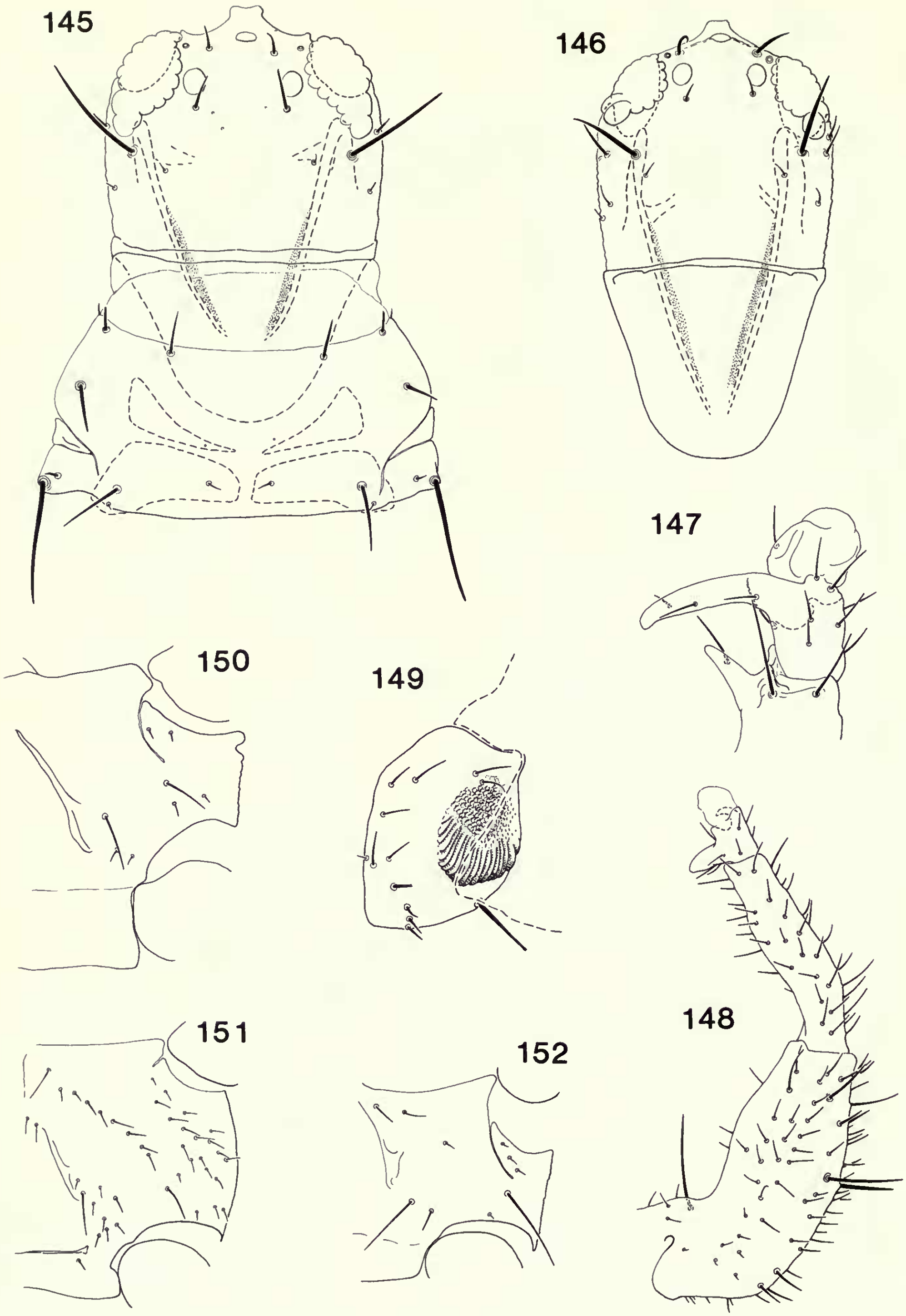
Figs 130–133 Diceratothripina. 130, *Diceratothrips bicornis* ♂; 131, *D. bennetti* ♀ paratype; 132, *Neosmerinthothrips hamiltoni* ♀ holotype; 133, *Campulothrips gracilis*.



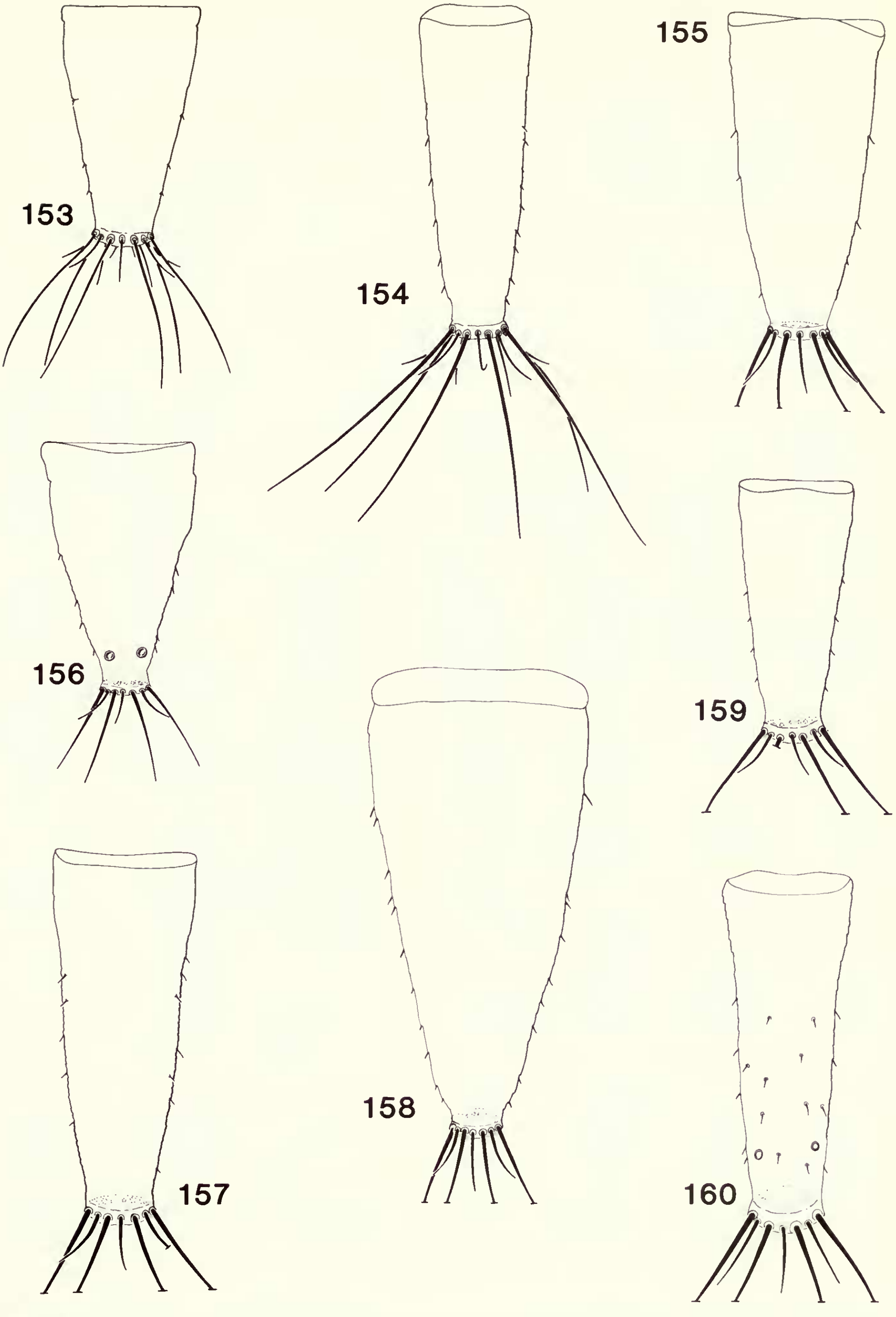
Figs 134–139 Diceratothripina. 134, *Nesidiothrips alius*; 135, *Carientothrips magnetis* holotype; 136, *C. loisthus* holotype; 137, *C. pedicillus* holotype; 138, *Neosmerinthothrips fructuum*; 139, *N. hilaris*.



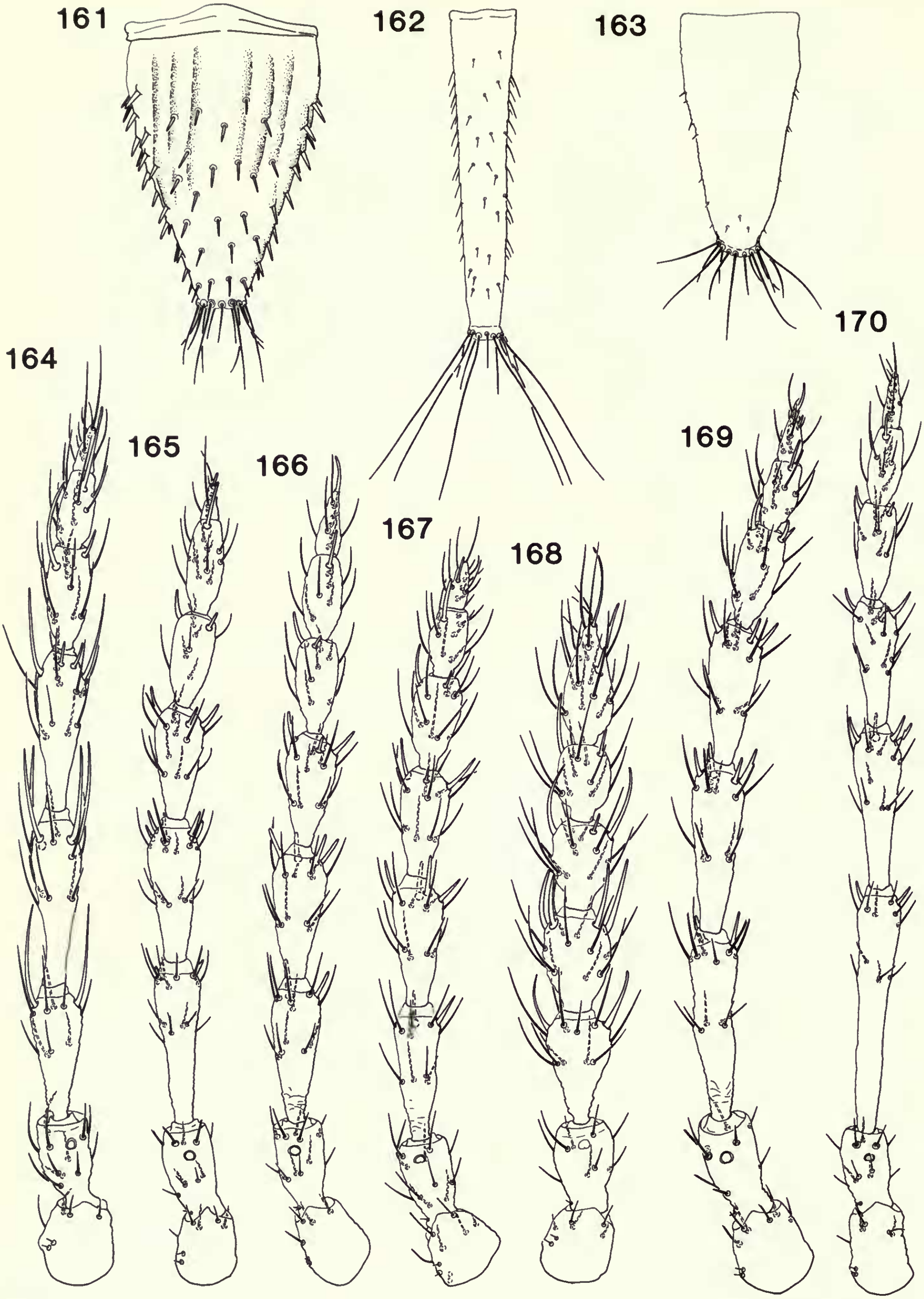
Figs 140–144 Diceratothripina. 140, *Sporothrips amplus* ♂; 141, *Phacothrips ocelloides*; 142, *Nesothrips malaccae*; 143, *N. rangi* ♀ holotype; 144, *N. eastopi* ♀ holotype.



Figs 145–152 Diceratothripina. 145, *Acallurothrips spinicauda*; 146, *A. flavus* ♀ paratype; 147, *Sporothrips amplus* ♂ foretarsus; 148, *Campulothrips gracilis* ♂ foreleg; 149, *Diceratothrips bicornis* ♂ forecoxal stridulatory ridges; 150–152, metasternum of (150) *Sporothrips amplus*; (151) *Campulothrips gracilis*; (152) *Diceratothrips bennetti*.



Figs 153–160 Diceratothripina tubes. 153, *Neosmerinthothrips hoodi*;154, *N. hamiltoni*; 155, *N. variipes*; 156, *N. xylebori*; 157, *Nesidiothrips alius*; 158, *Phacothrips ocelloides*; 159, *Nesothrips brevicollis*; 160, *N. eastopi*.



Figs 161–170 Diceratothripina. 161, *Acallurothrips spinicauda* tube; 162, *Campulothrips gracilis* tube; 163, *Diceratothrips bennetti* ♀ tube; 164, *Carientothrips grayi*; 165, *Diceratothrips bennetti* ♀; 166, *Phacothrips ocelloides*; 167, *Nesothrips rangi* ♀ holotype; 168, *Acallurothrips flavus*; 169, *Neosmerinthothrips hamiltoni* ♀ holotype; 170, *Sporothrips amplus*.

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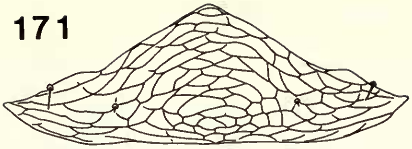

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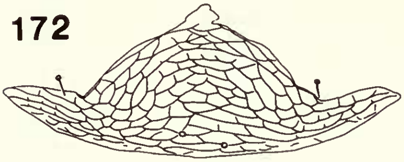

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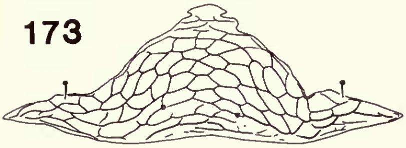

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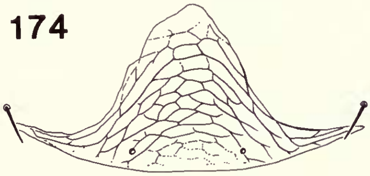

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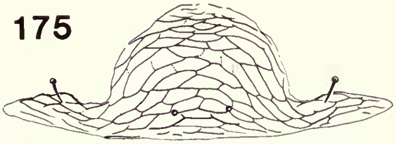

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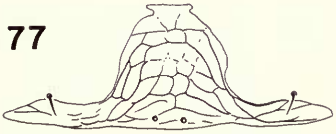

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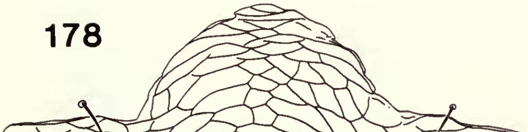

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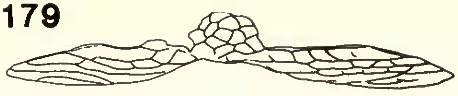

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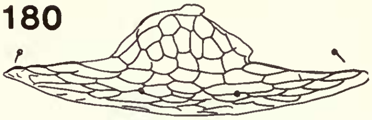

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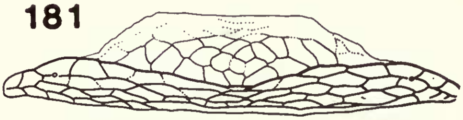

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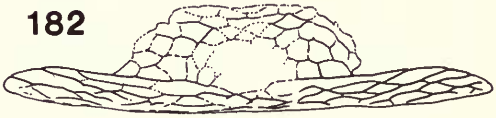

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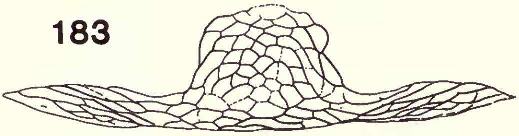

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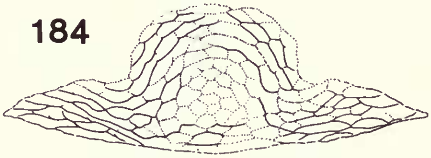

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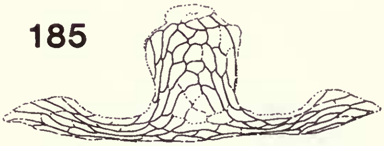

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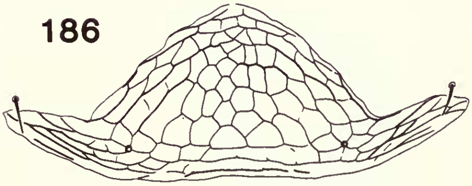
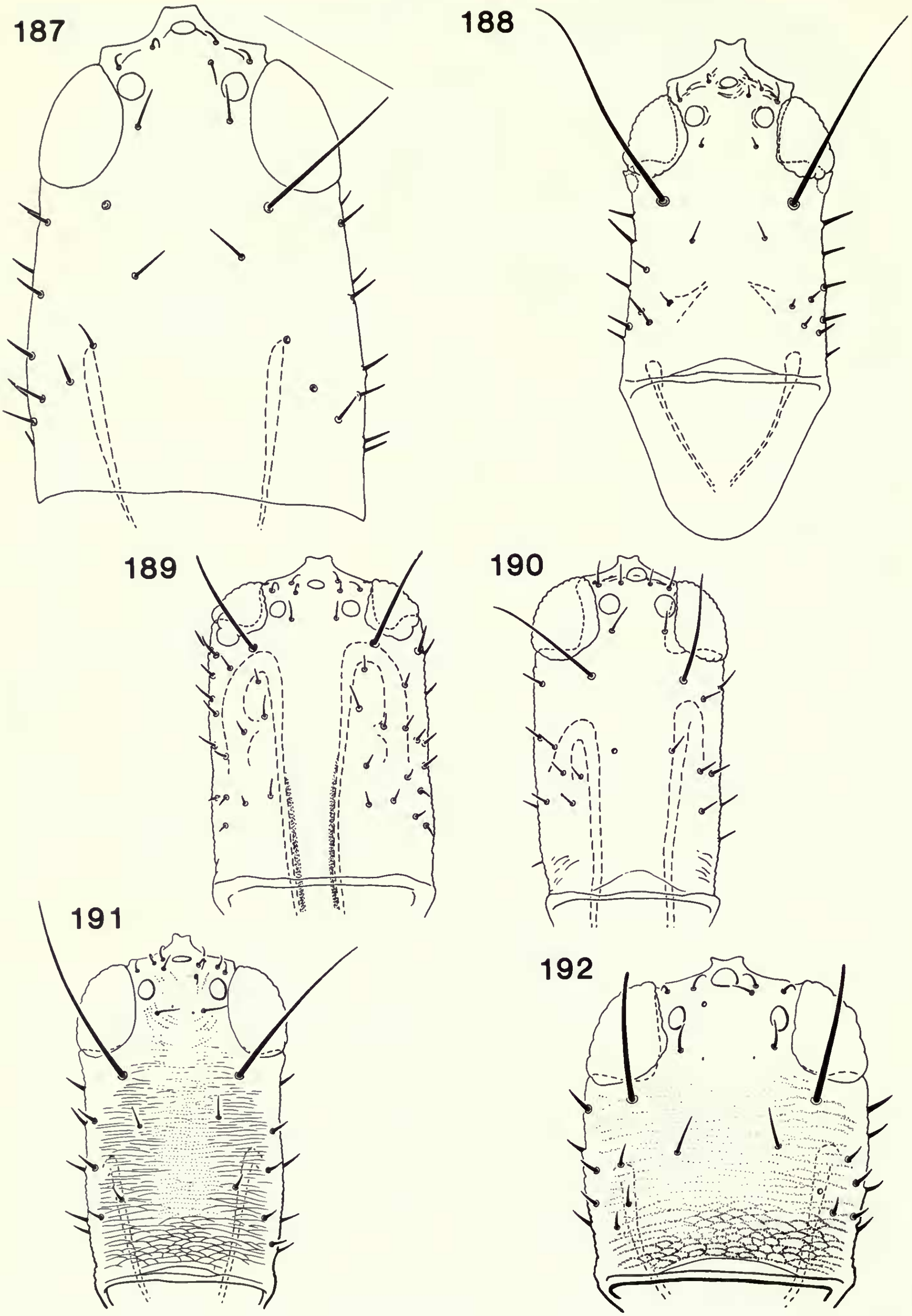
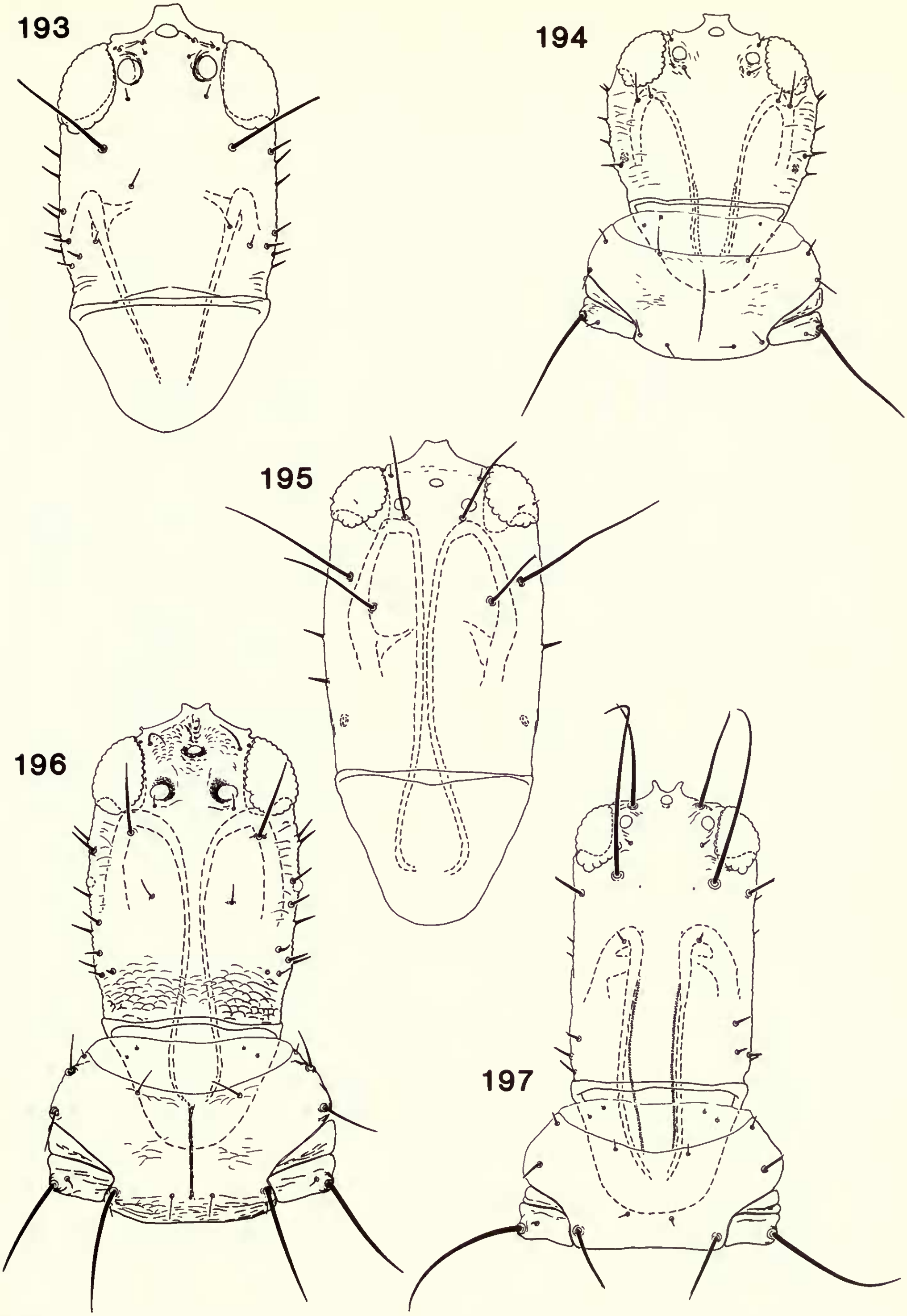


Figs 171–186 Pelta of Diceratothripina species. 171, *Diceratothrips bennetti* ♂ holotype; 172, *Neosmerinthothrips hamiltoni* ♀ holotype; 173, *N. fructuum*; 174, *Nesidiothrips alius*; 175, *Nesothrips brevicollis*; 176, *N. fodinae*; 177, *N. leveri*; 178, *N. rangi* ♀ holotype; 179, *Acallurothrips badius*; 180, *A. flavus*; 181, *Carientothrips acti*; 182, *C. mjobergi* ♀ apt.; 183, *C. mjobergi* ♀ mic.; 184, *C. magnetis*; 185, *C. mjobergi* ♀ mac.; 186, *Phacothrips ocelloides*.



Figs 187–192 Macrothripina. 187, *Ethirothrips agasthya*; 188, *Herathrips nativus*; 189, *Ethirothrips tibialis*; 190, *E. stenomelas* ♀ holotype; 191, *E. sybarita*; 192, *E. australiensis*.



Figs 193–197 Macrothripina. 193, *Ethirothrips anacardii*; 194, *Peltariothrips insolitus* ♀ holotype; 195, *Polytrichothrips laticeps* ♀ holotype; 196, *Tarassothrips akritus* ♀ holotype; 197, *Diplacothrips piceus*.

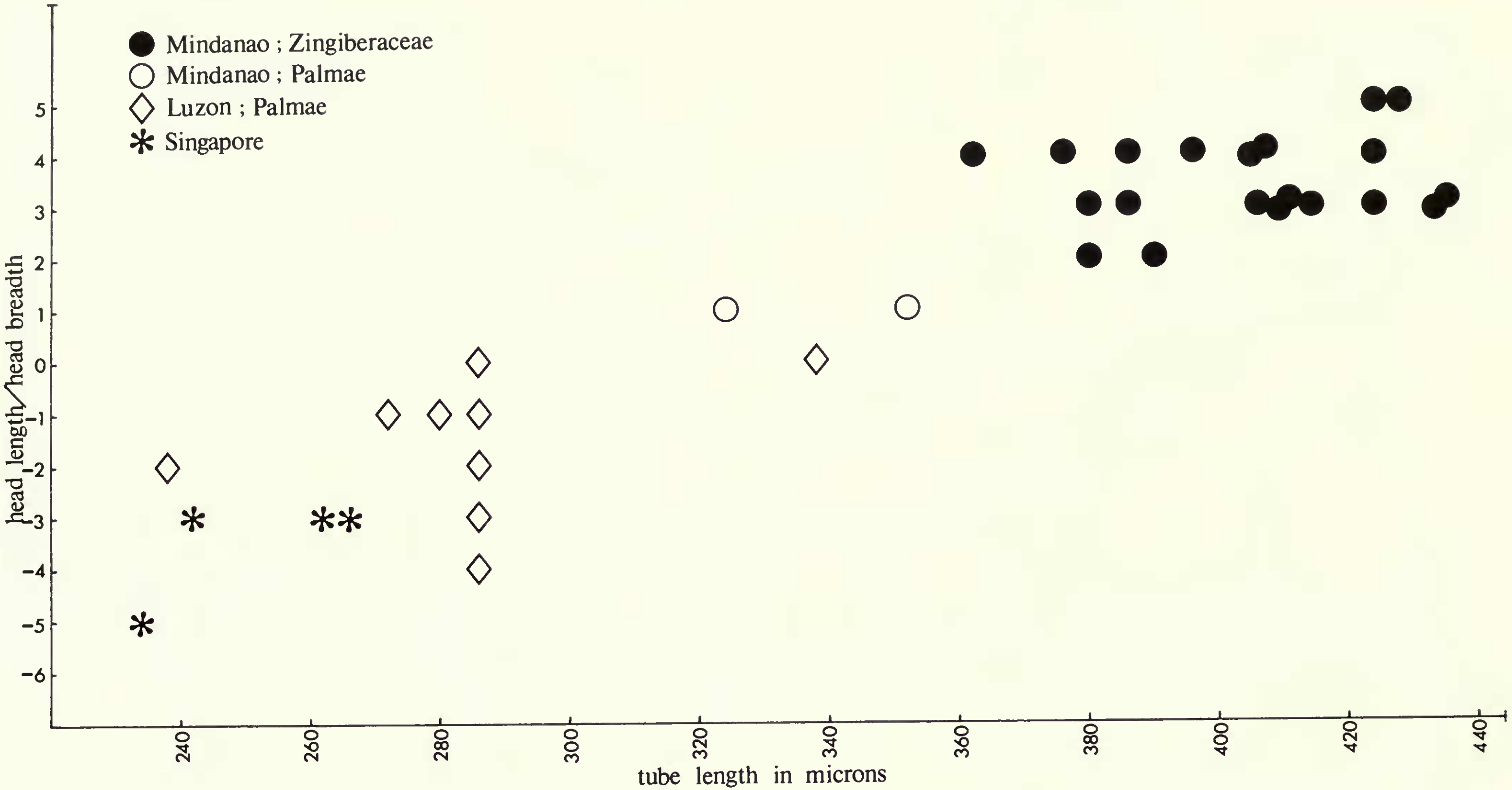
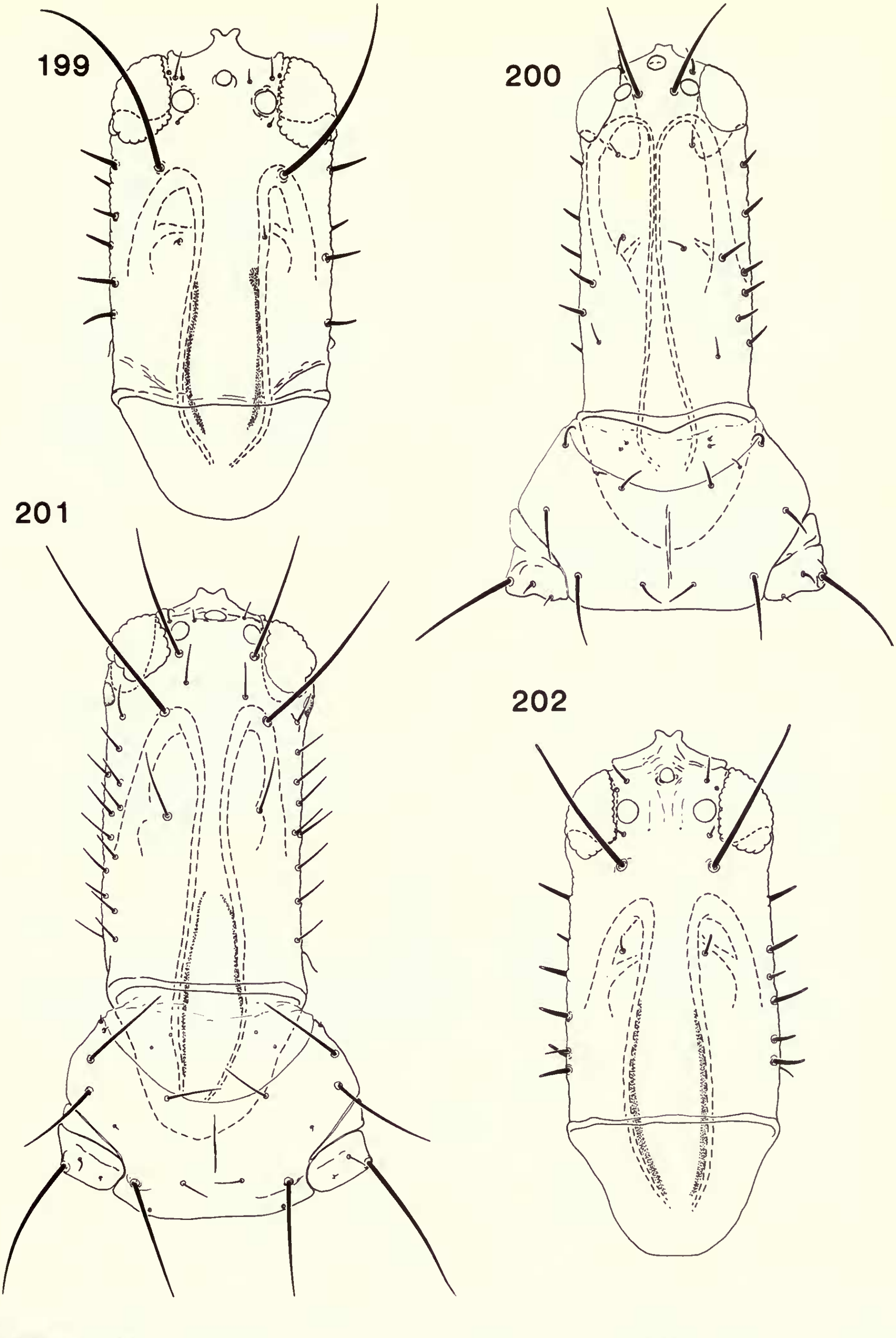
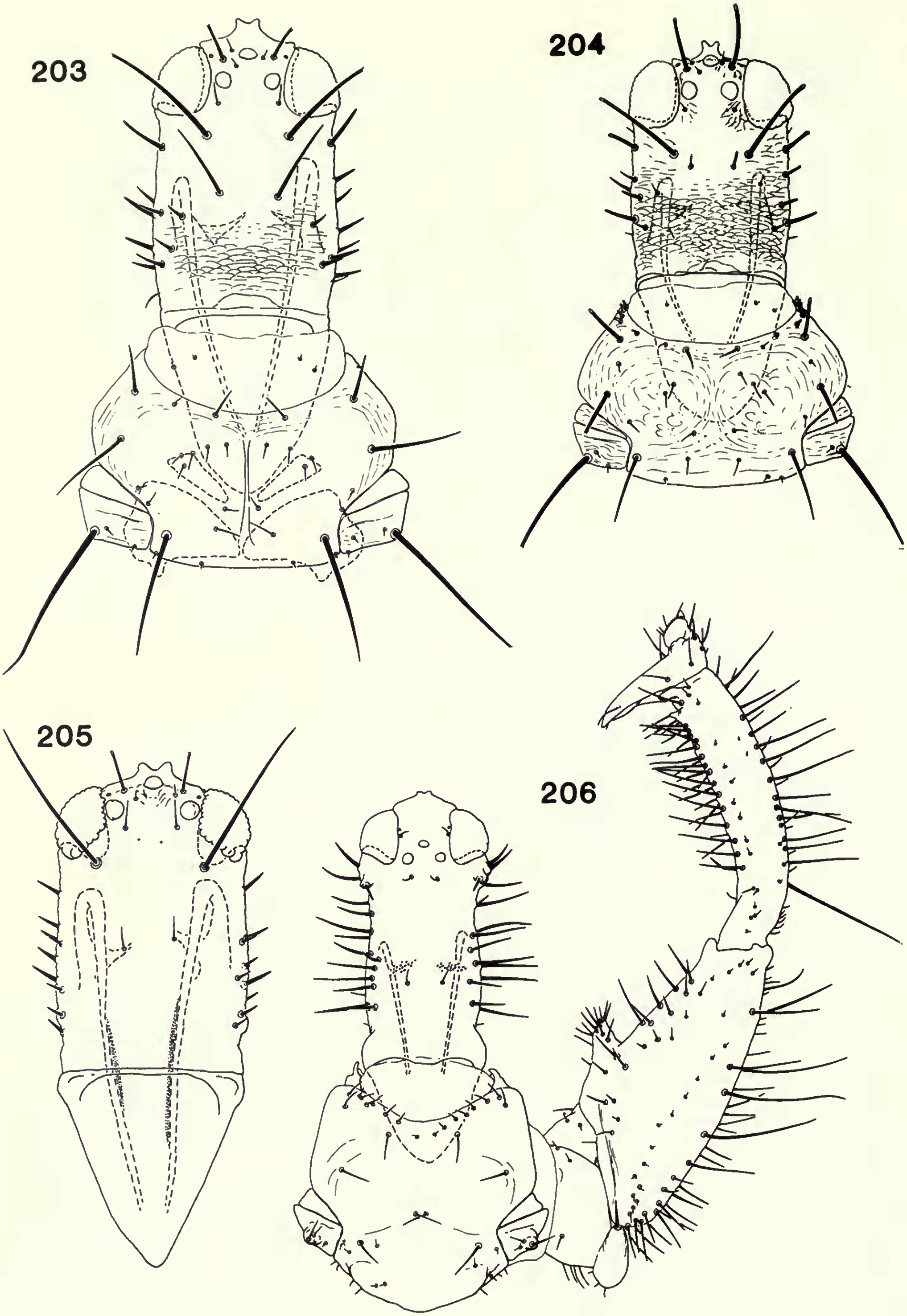


Fig. 198 *Peltariothrips insolitus*, variation in females from Singapore and the Philippines.



Figs 199–202 Macrothripina. 199, *Dichaetothrips secutor* ♀ holotype; 200, *Aesthesiothrips jatrophae*; 201, *Celidothrips lawrencei*; 202, *Dichaetothrips okajimai* ♀ holotype.



Figs 203–206 Macrothripina. 203, *Machatothrips biuncinatus*; 204, *M. antennatus*; 205, *Diaphorothrips clavipes*; 206, *Macrothrips papuensis* ♀.

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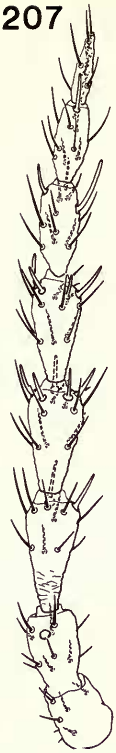

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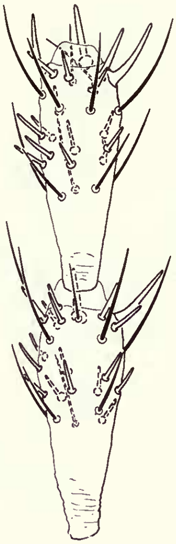

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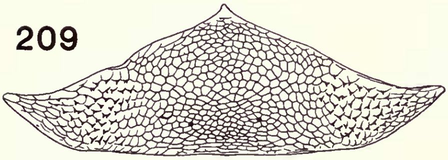

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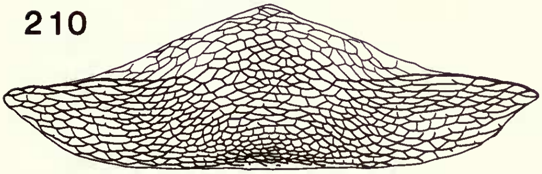

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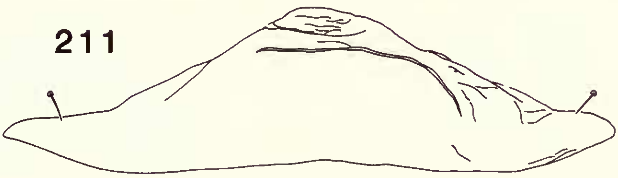

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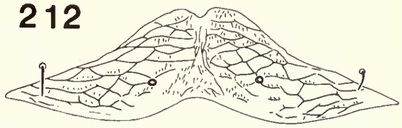

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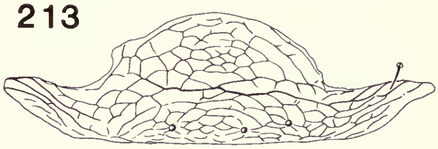

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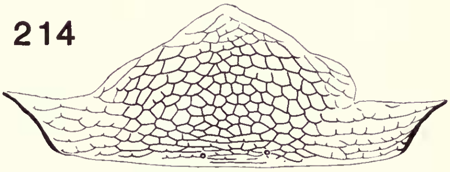

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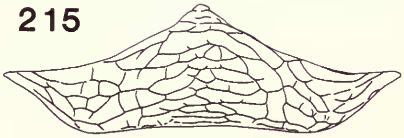

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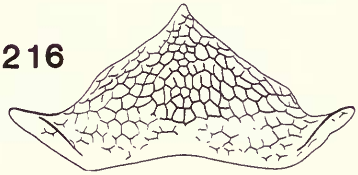
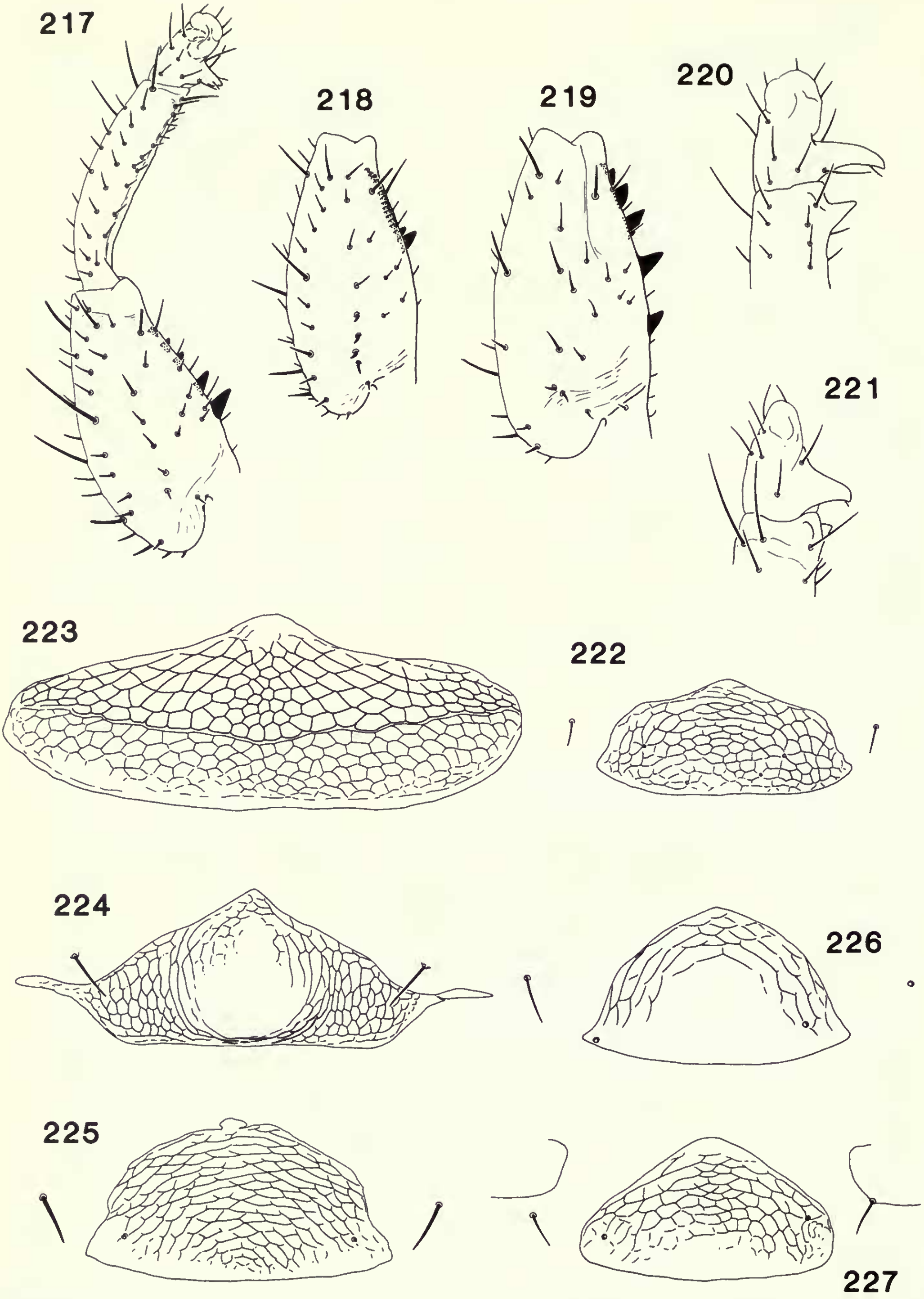
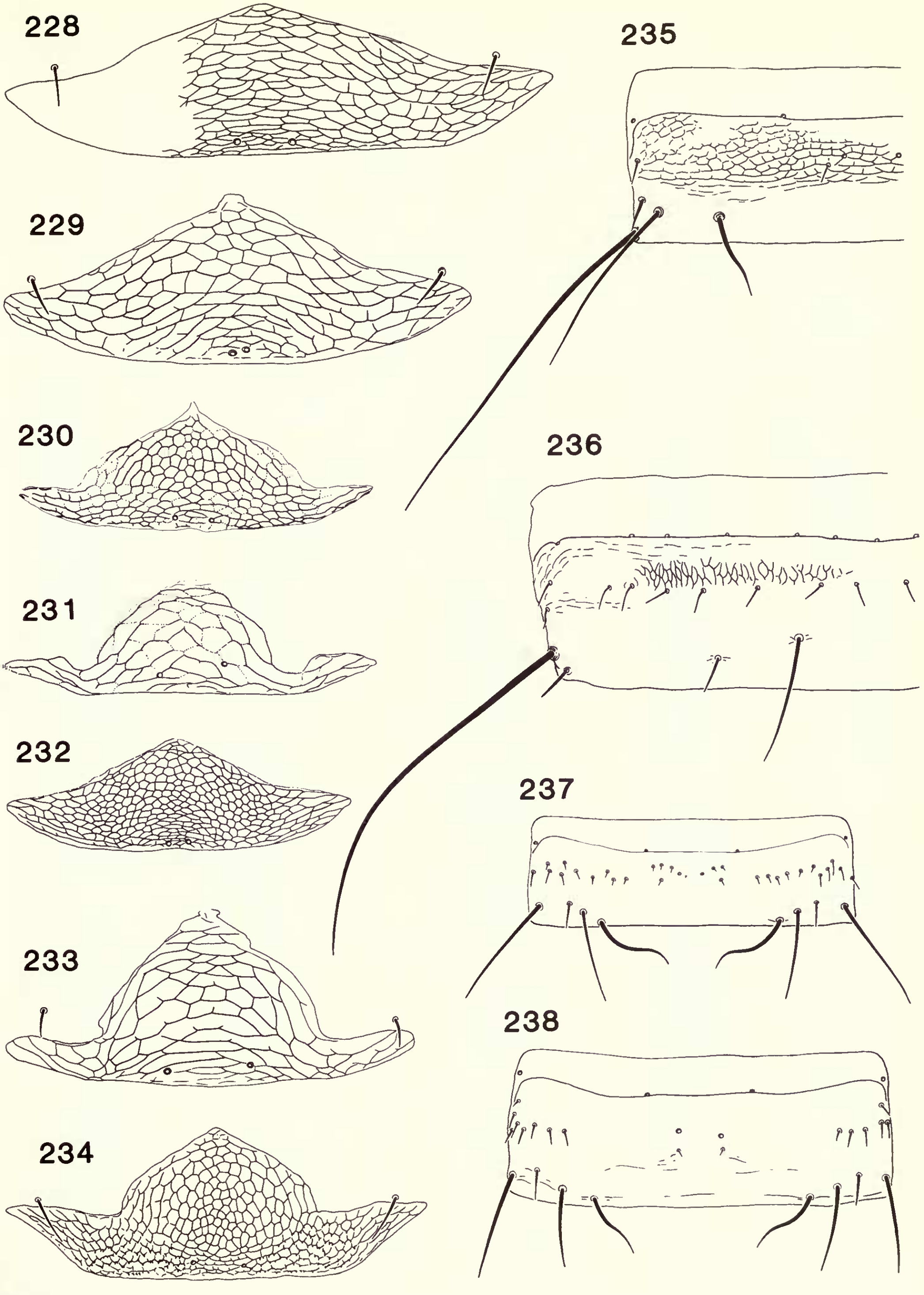


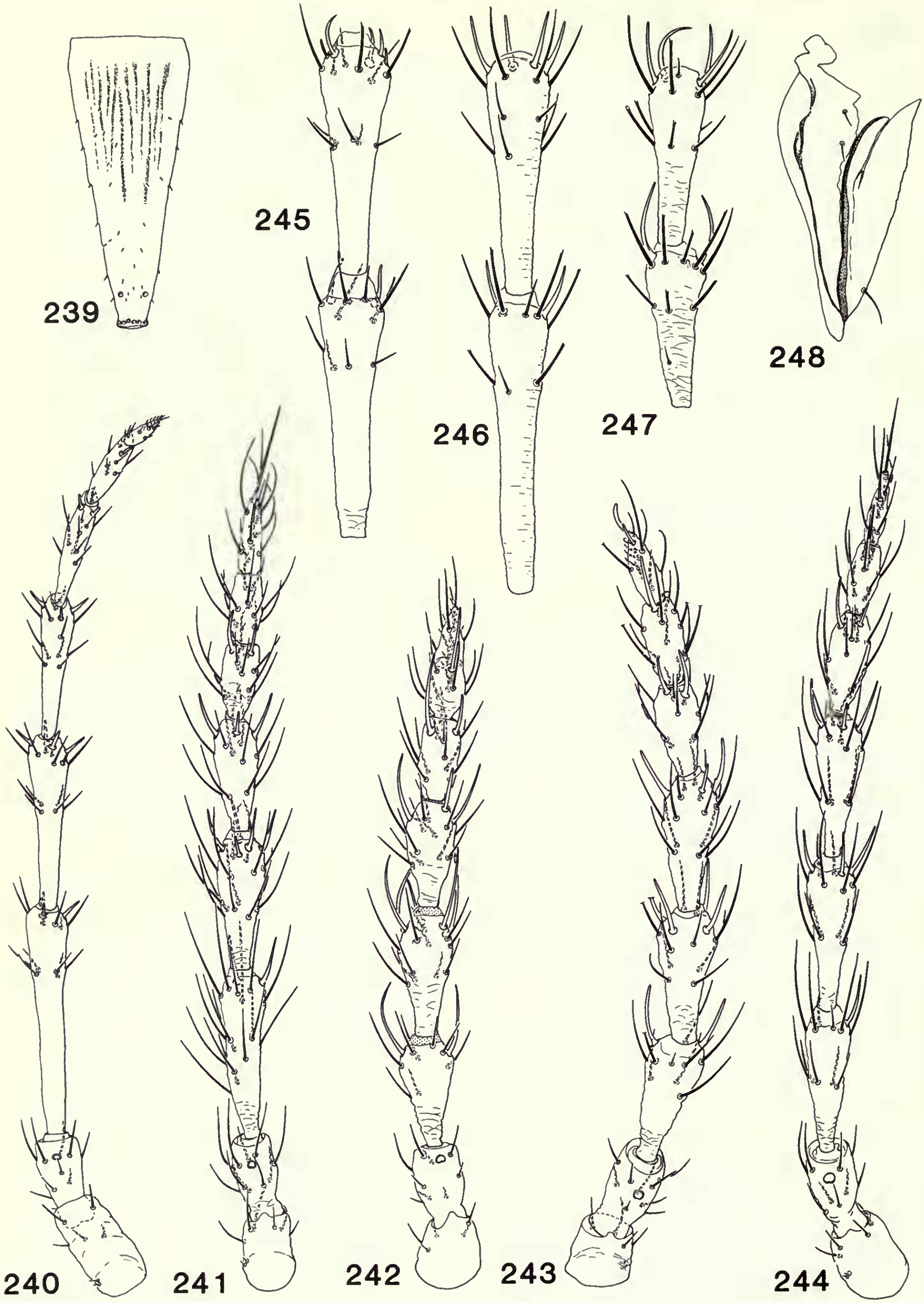
Figs 207–216 Macrothripina. 207, *Diaphorothrips hamipes*; 208, *D. clavipes* III–IV; 209–216, pelta of (209) *Macrothrips papuensis*; (210) *Machatothrips biuncinatus*; (211) *Polytrichothrips laticeps*; (212) *Peltariothrips insolitus*; (213) *Ischyrothrips crassus* ♀ holotype; (214) *Diaphorothrips clavipes*; (215) *Celidothrips* ? *adiaphorus*; (216) *Aesthesiothrips jatrophae*.



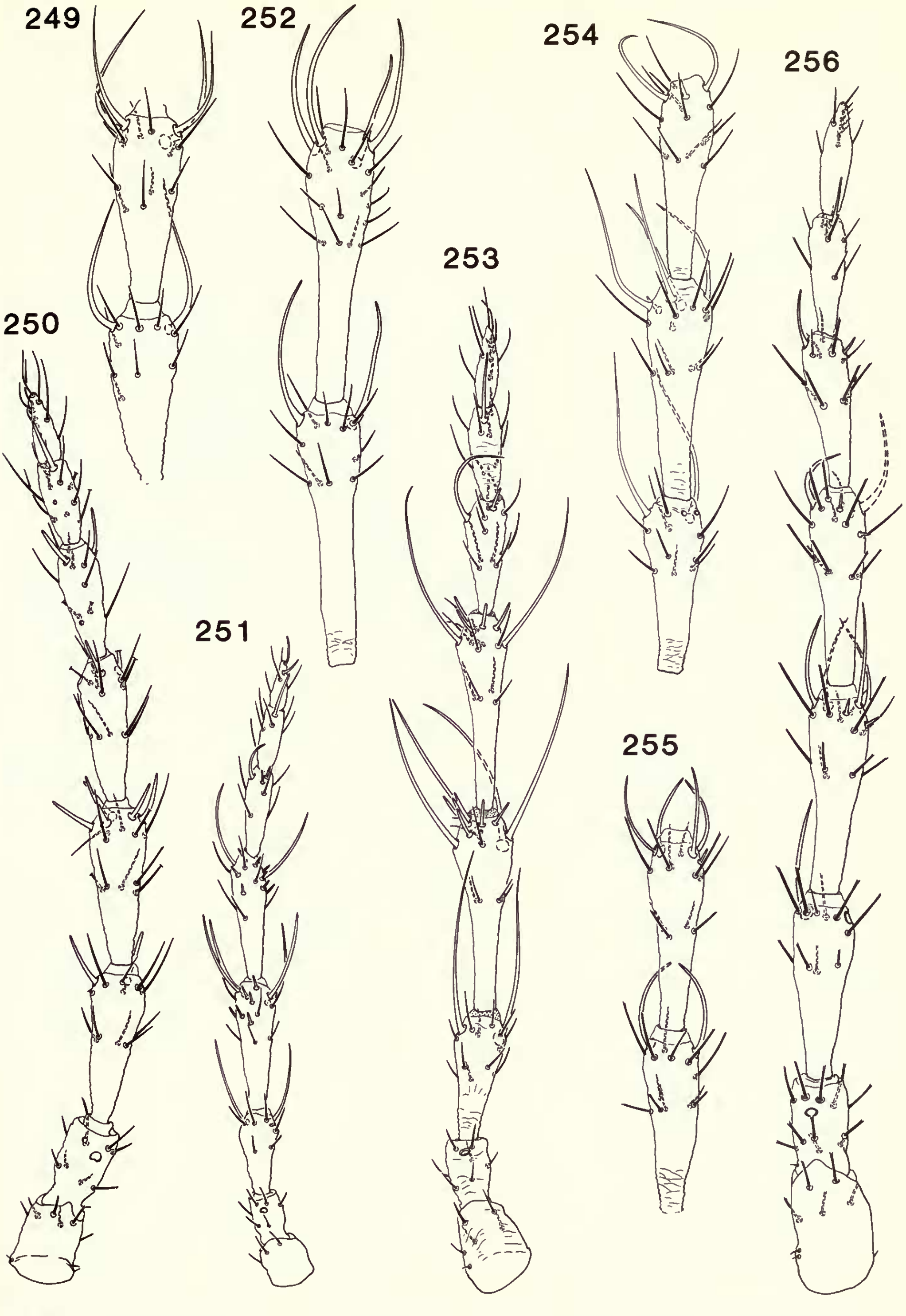
Figs 217–227 Macrothripina. 217, *Machatothrips haplodon* foreleg; 218, *M. antennatus* forefemur; 219, *M. heveae* forefemur; 220, *Diaphorothrips clavipes* foretarsus; 221, *Aesthesiothrips jatrophae* foretarsus; 222–227, Pelta of (222) *Diplacothrips borgmeieri*; (223) *Tarassothrips* sp. indet.; (224) *T. akritus*; (225) *Dichaetothrips secutor*; (226) *D. brevicollis* holotype; (227) *D. okajimai*.



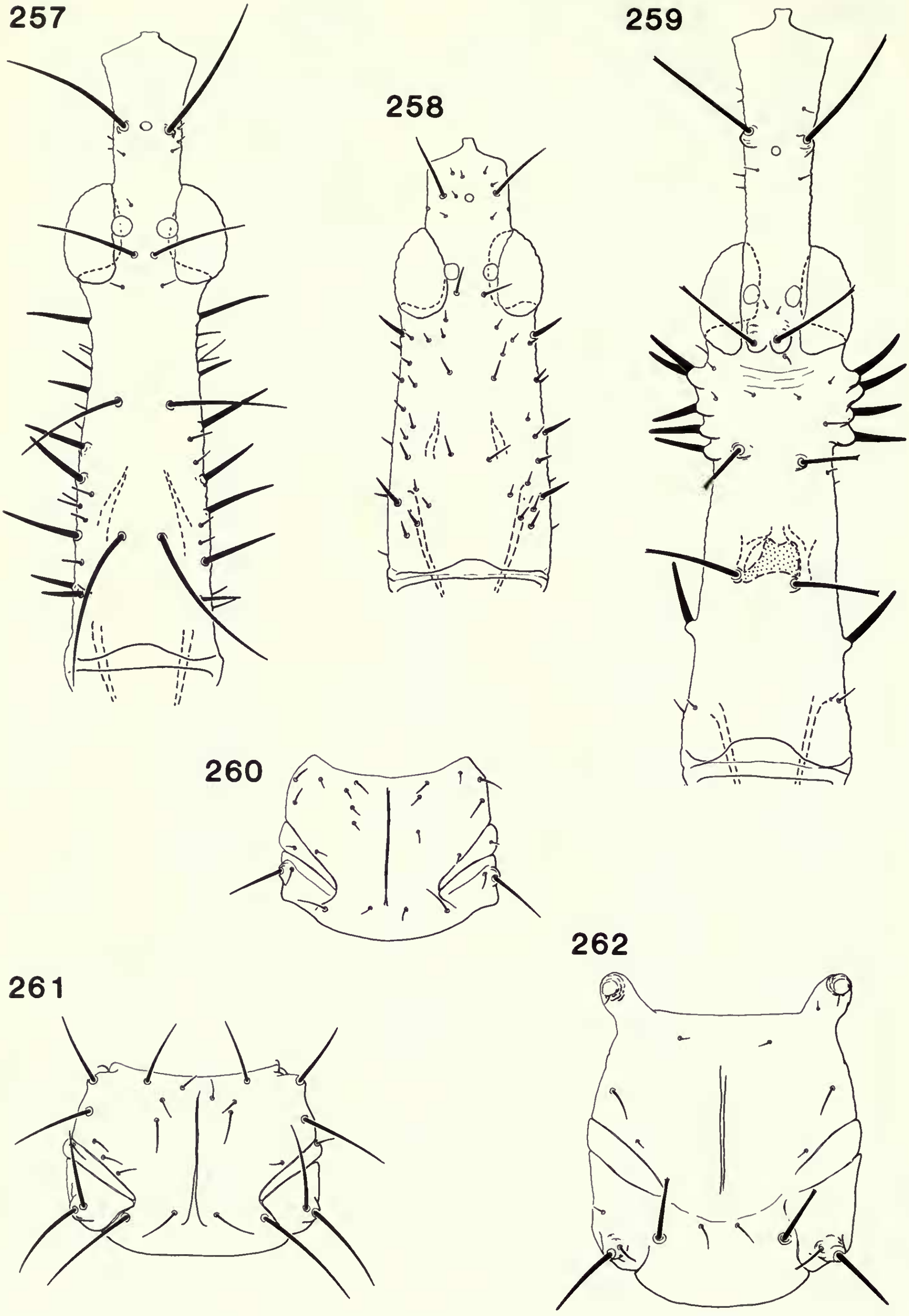
Figs 228–238 Macrothripiaa. 228–234, pelta of (228) *Ethirothrips agasthya*; (229) *E. firmus*; (230) *E. australiensis*; (231) *E. distasmus*; (232) *E. sybarita*; (233) *E. obscurus* (*neivai* holotype); (234) *E. stenomelas*; 235, *Dichaetothrips brevicollis* tergite V; 236, *D. okajimai* sternite V; 237, *Machatothrips lentus* tergite III; 238, *Aesthesiothrips jatrophae* tergite III.



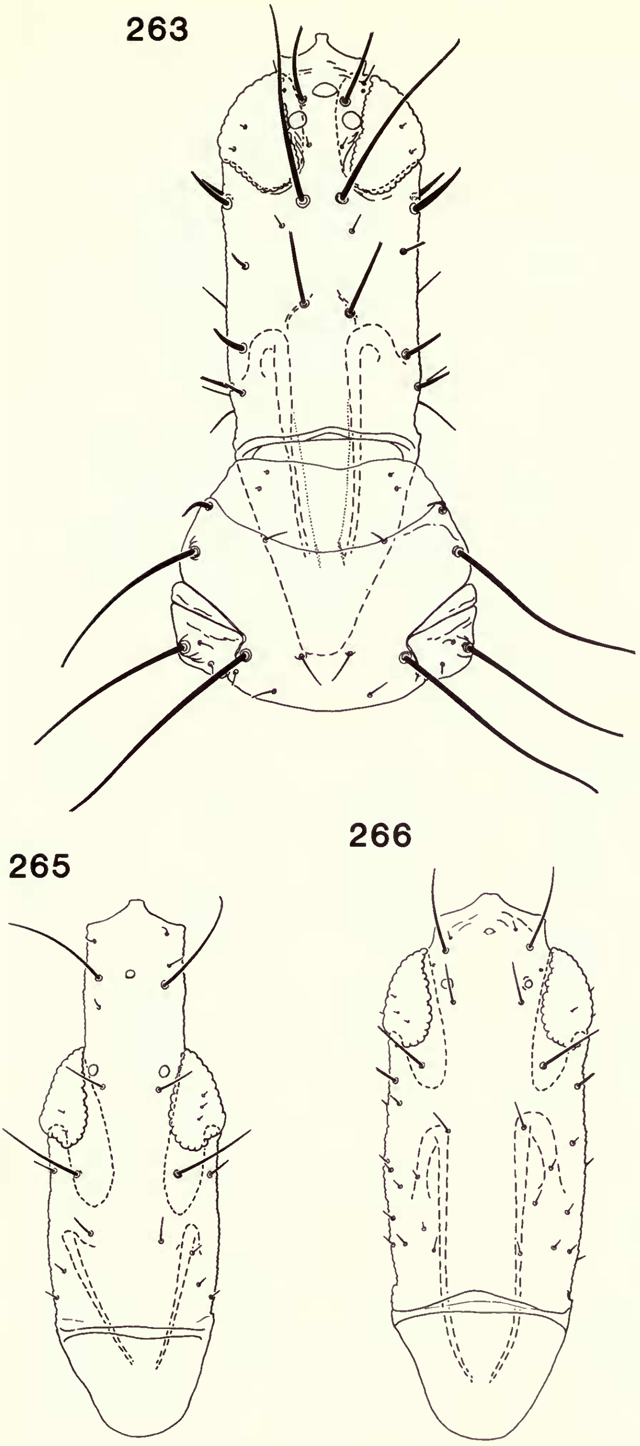
Figs 239–248 Macrothripina. 239, *Diplacothrips borgmeieri* tube; 240, *Macrothrips papuensis*; 241, *Celidothrips lawrencei*; 242, *Peltariothrips insolitus* holotype; 243, *Polytrichothrips laticeps* (left); 244, *Ethirothrips anacardii*; 245, *Diplacothrips borgmeieri* III–IV; 246, *Machatothrips biuncinatus* III–IV; 247, *M. antennatus* III–IV; 248, *Dichaetothrips brevicollis* anapleural suture.



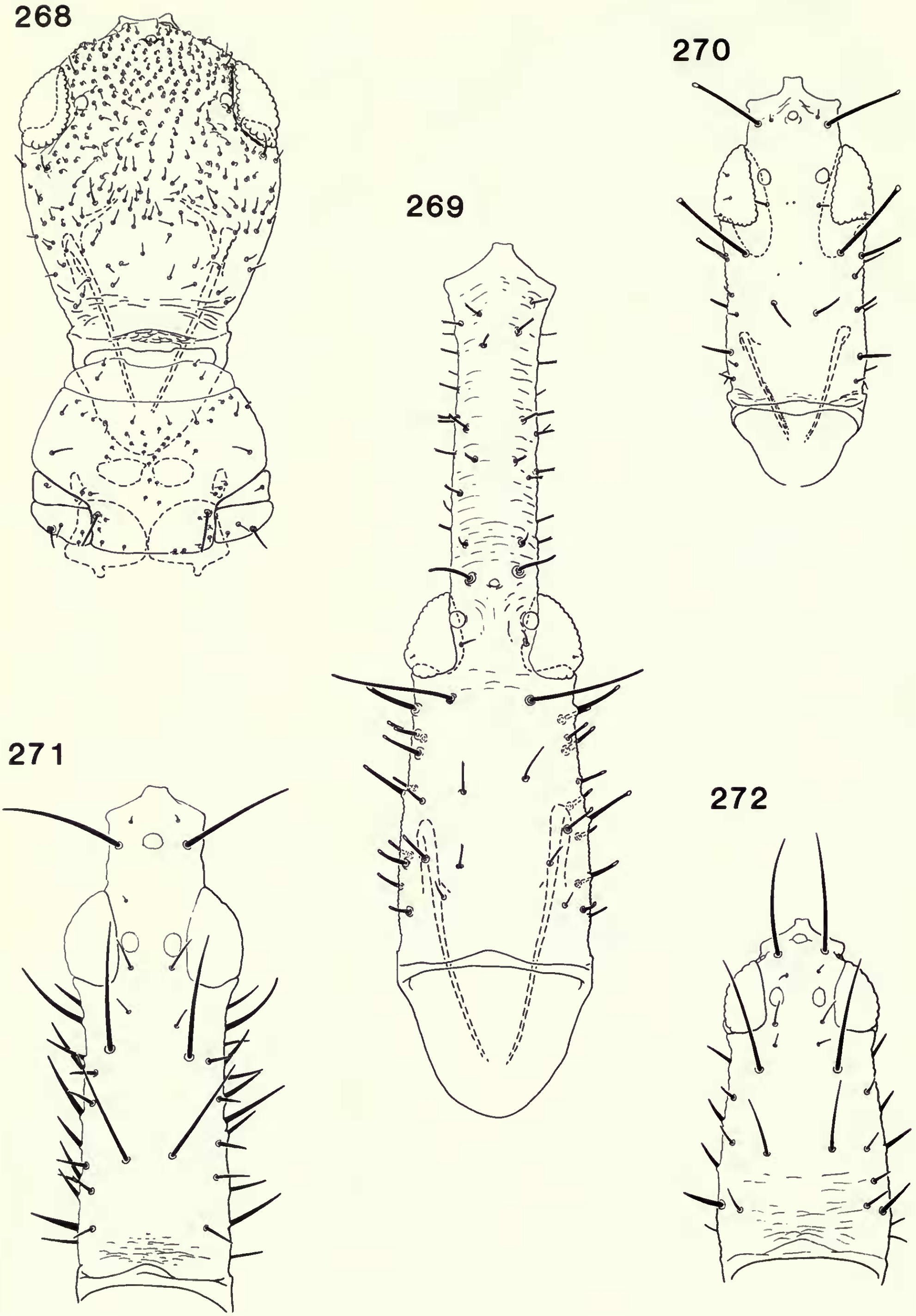
Figs 249–256 Macrothripina. 249, *Ethirothrips indicus* (Bagnall) III–IV; 250, *E. stenomelas* (left); 251, *Aesthesiothrips jatrophae*; 252, *Tarassothrips* sp. indet. III–IV; 253, *T. akritus*; 254, *Dichaetothrips brevicollis* holotype III–V; 255, *D. secutor* III–IV; 256, *D. okajimai*.



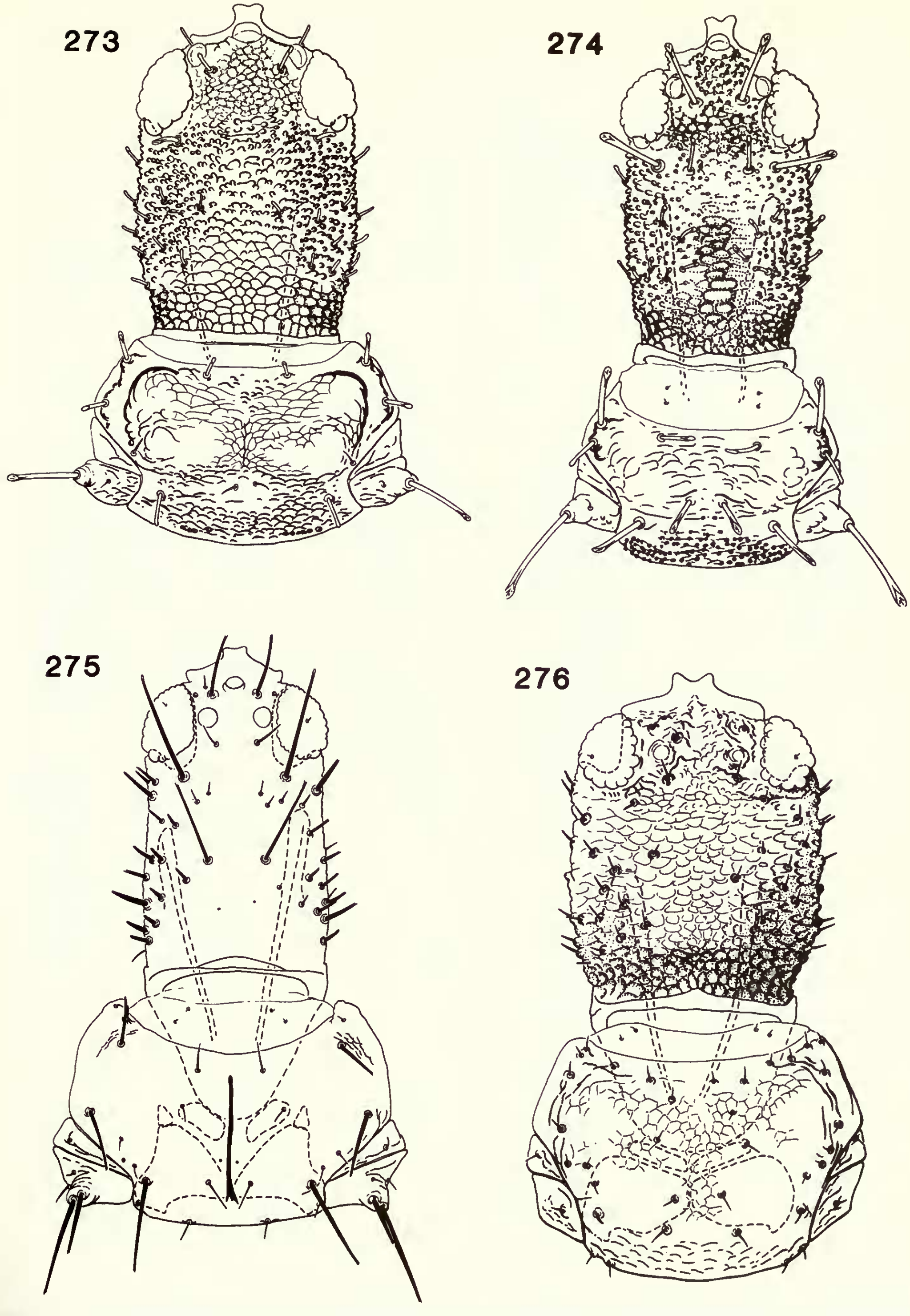
Figs 257–262 Elaphrothripina. 257, *Mecynothrips acanthus*; 258, *M. pugilator*; 259, *M. kraussi*; 260, *M. atratus* (*zuluensis* holotype) pronotum; 261, *M. hardyi*; 262, *M. kraussi*.



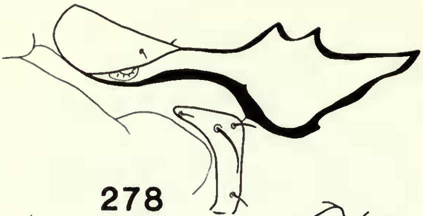
Figs 263–267 Elaphrothripina. 263, *Anactinothrips vigilans*; 264, *Ophthalmothrips* ? *priesneri* mac. from Kenya; 265, *O.* ? *priesneri* mic. from Tanzania; 266, *O. amyae* mac.; 267, *O. pomeroyi* mac. from Malawi.



Figs 268–272 Elaphrothripina. 268, *Hartwigia tumiceps*; 269, *Tiarothrips subramanii*; 270, *Elaphrothrips palustris*; 271, *E. greeni* (*bouvieri* holotype); 272, *E. spiniceps*.



Figs 273–276 Elaphrothripina. 273, *Malesiathrips guamensis*; 274, *M. malayensis*; 275, *Lamillothrips typicus*; 276, *Dermothrips hawaiiensis*.



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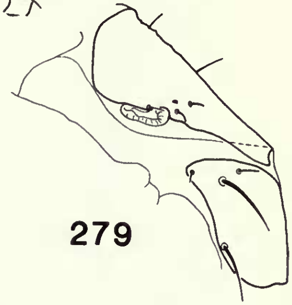

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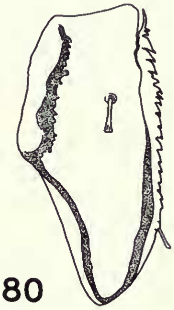

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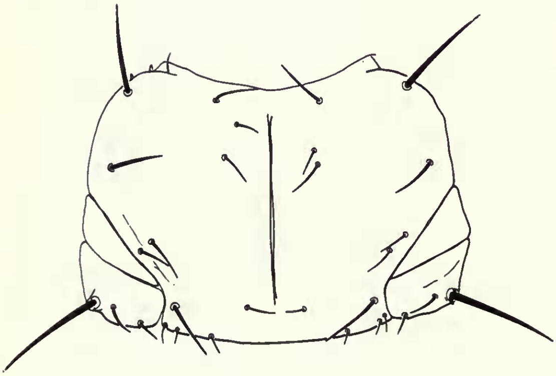

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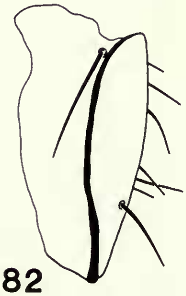

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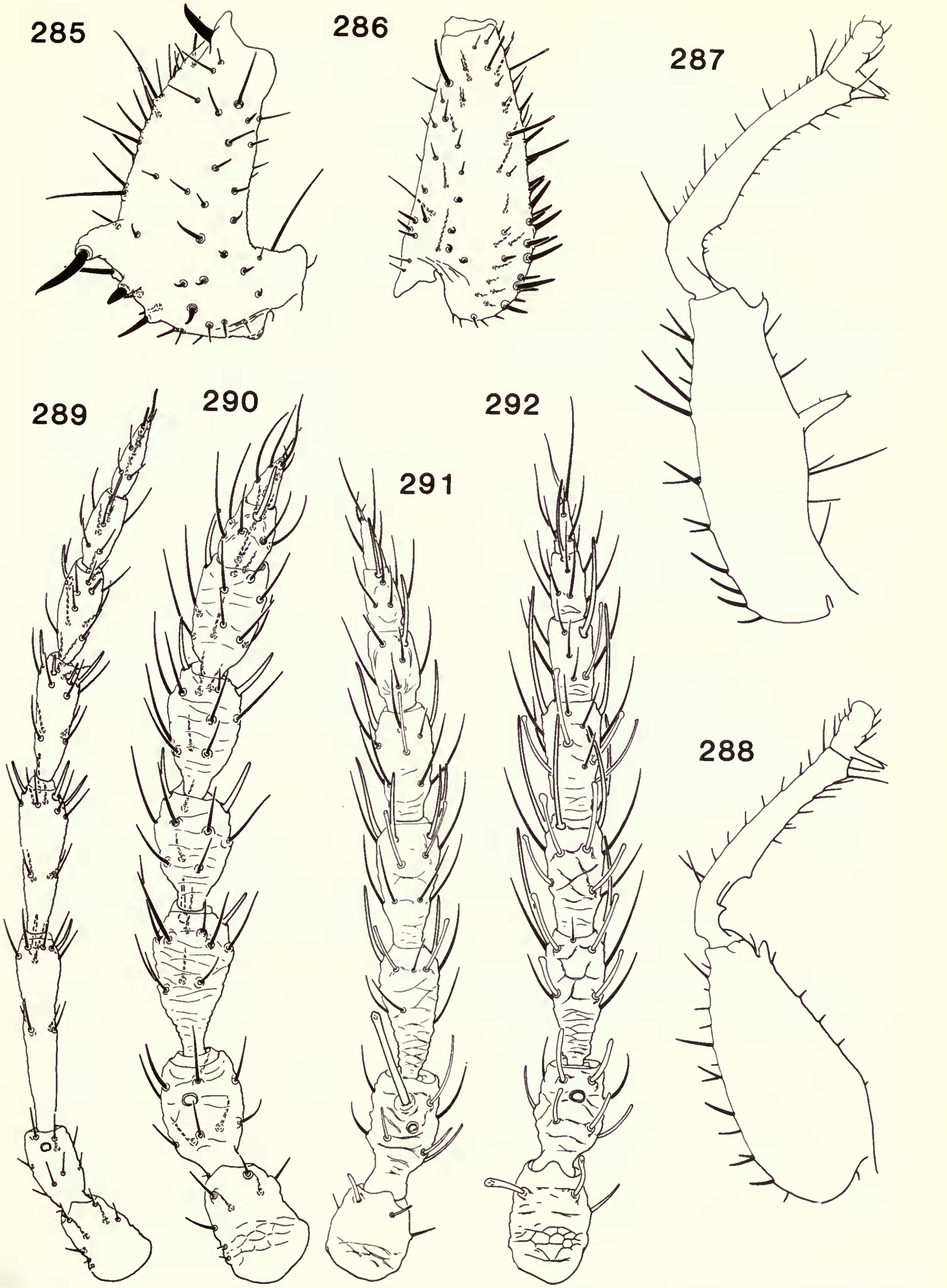
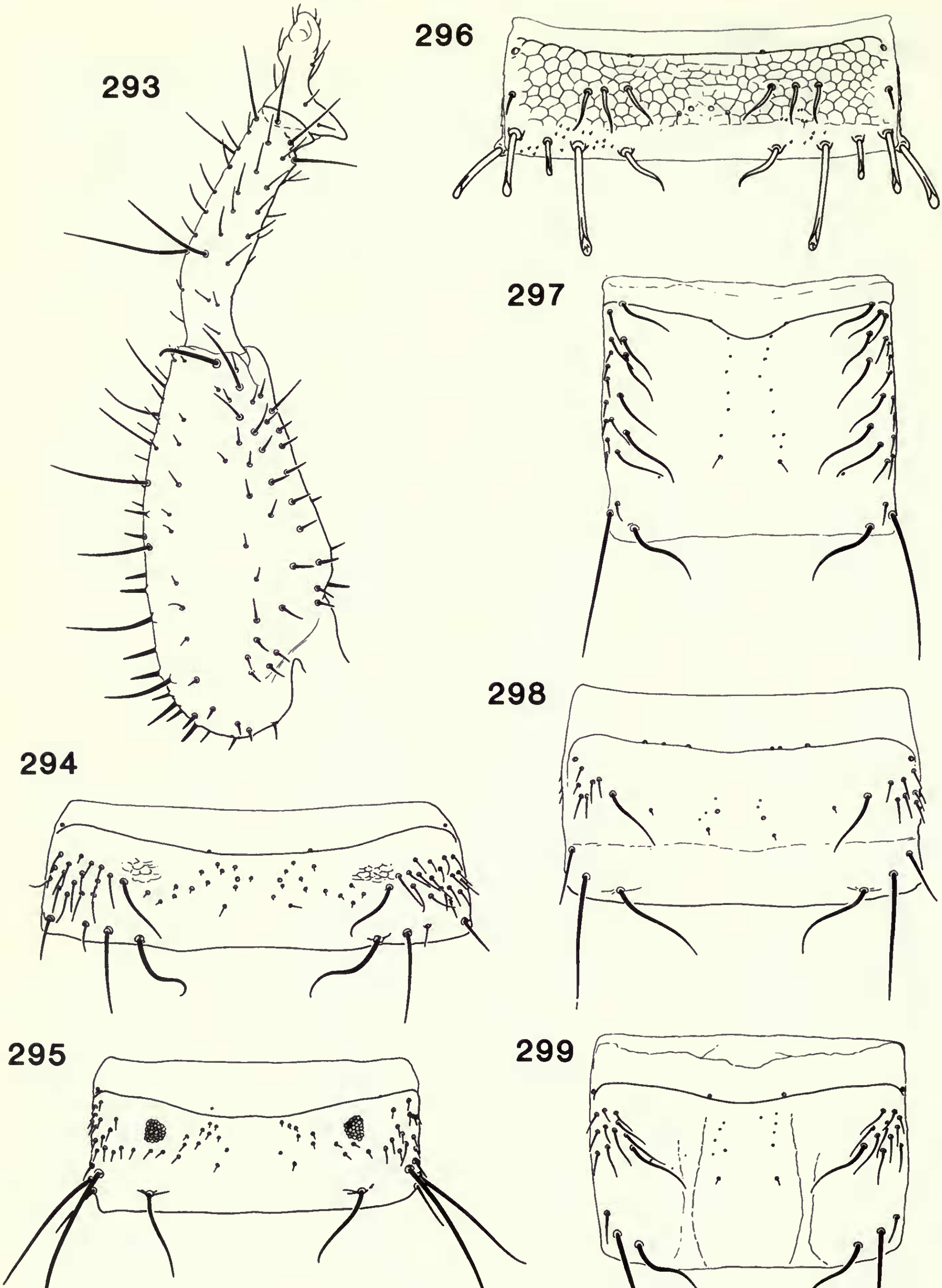
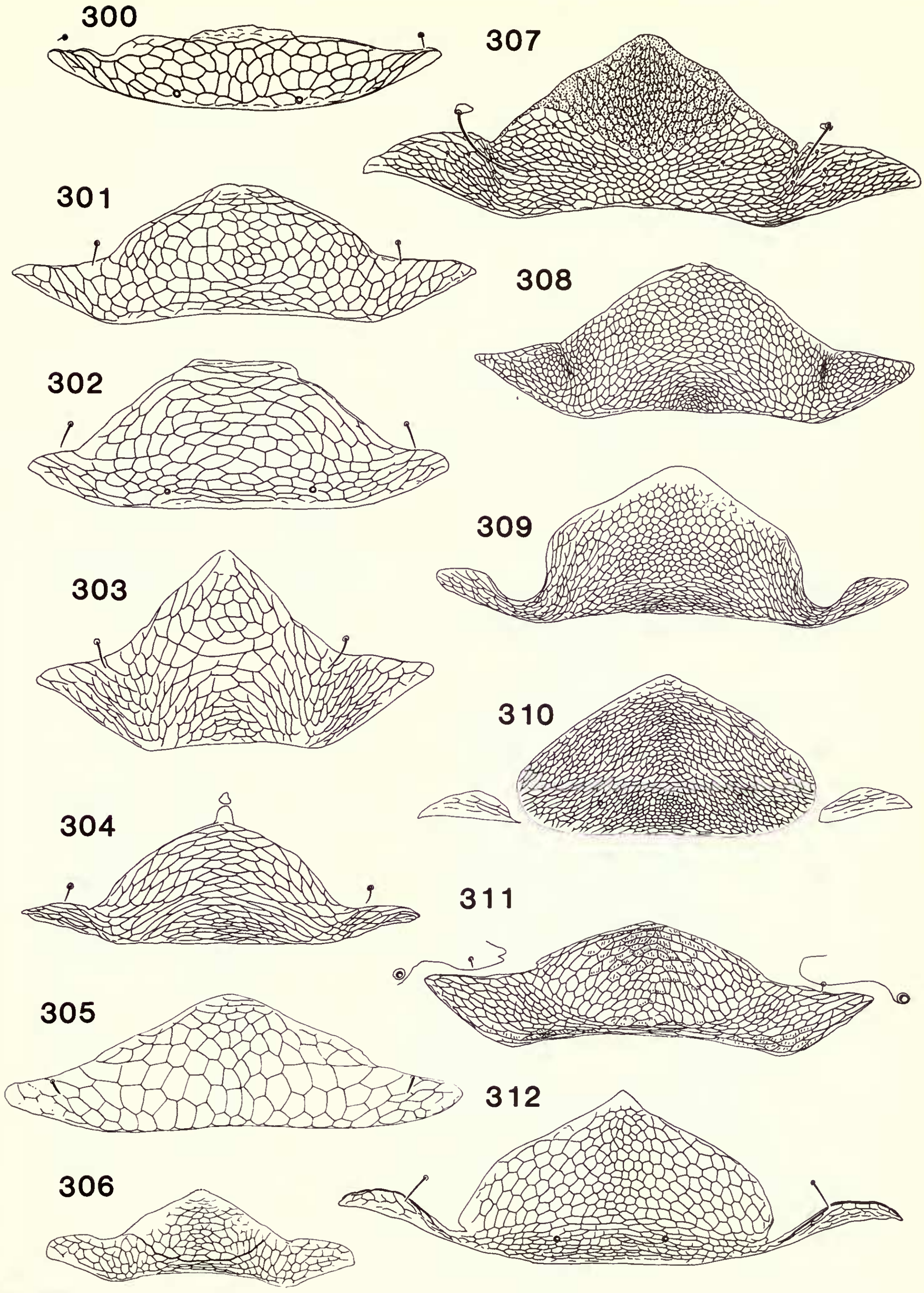
Figs 277–284 Elaphrothripina. 277, *Dinothrips spinosus* ♀; 278, *D. monodon* ♂ mesothoracic spiracular process; 279, *D. spinosus* small ♂ mesothoracic spiracle; 280–283, anapleural sutures of (280) *Malesiathrips malayensis*; (281) *Dermothrips hawaiiensis*; (282) *Elaphrothrips laevicollis*; (283) *Hartwigia tumiceps*; 284, *Elaphrothrips jacobsoni* ♂ pronotum.



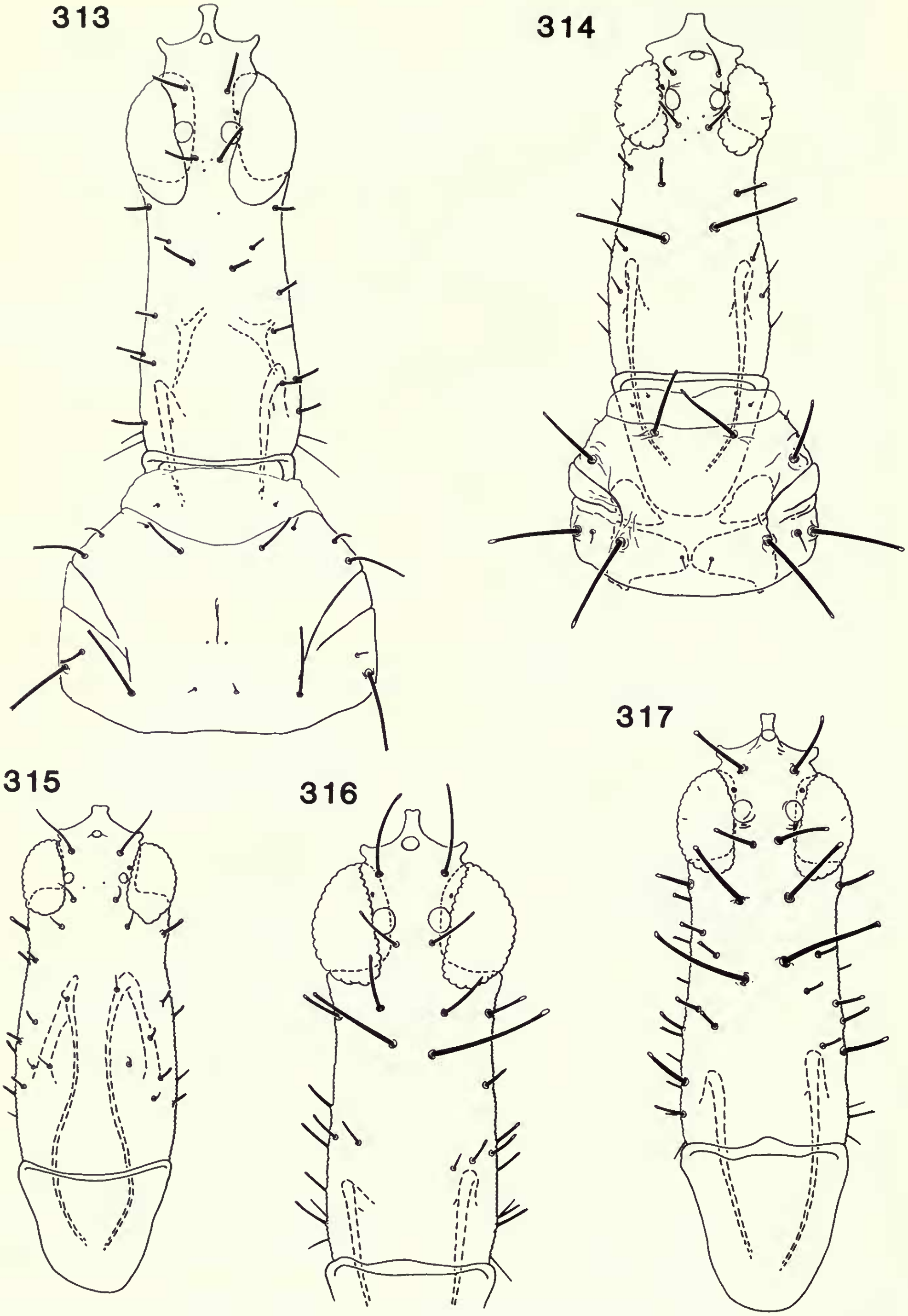
Figs 285–292 Elaphrothripina. 285, *Elaphrothrips femoralis* large ♂ forefemur; 286, *E. palustris* ♂ forefemur; 287, *Mecynothrips priesneri* ♂ foreleg; 288, *M. simplex* ♂ foreleg; 289, *Ophthalmothrips* ? *priesneri*; 290, *Dermothrips hawaiiensis*; 291, *Malesiathrips guamensis*; 292, *M. malayensis*.



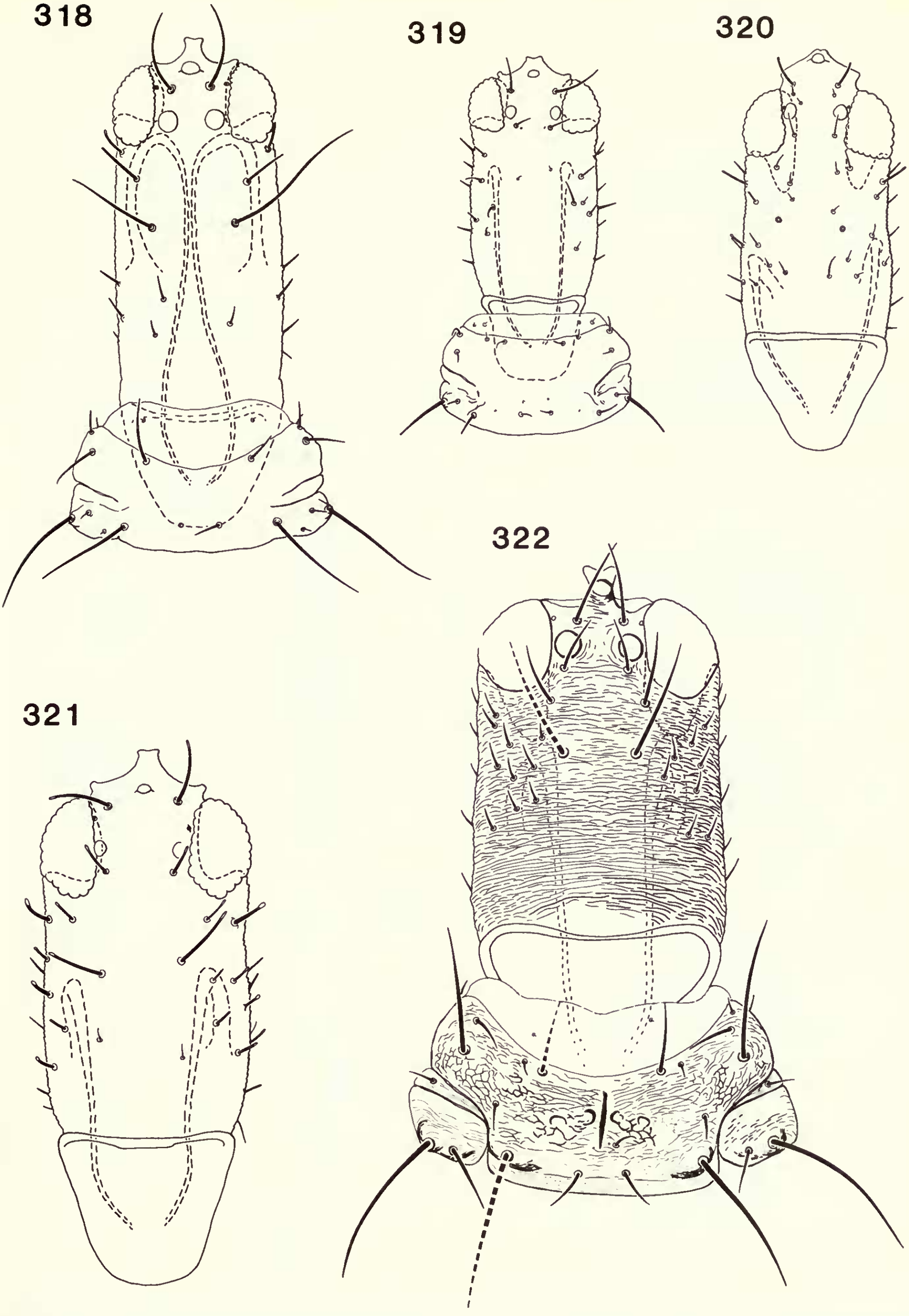
Figs 293–299 Elaphrothripina. 293, *Elaphrothrips denticollis* (*productus* holotype) ♂ foreleg; 294, *Hartwigia tumiceps* mac. tergite III; 295, *Anactinothrips vigilans* tergite III; 296, *Malesiathrips malayensis* mac. tergite IV; 297, *Mecynothrips simplex* tergite III; 298, *Dinothrips sumatrensis* tergite III; 299, *Elaphrothrips bakeri* ♂ tergite III.



Figs 300–312 Pelta of Elaphrothripina species. 300, *Dermothrips hawaiiensis*; 301, *Tiarothrips subramanii*; 302, *Ophthalmothrips amyae*; 303, *O. longiceps*; 304, *Hartwigia tumiceps*; 305, *Malesiathrips malayensis*; 306, *Mecynothrips atratus*; 307, *Elaphrothrips laevicollis*; 308, *E. denticollis*; 309, *E. spiniceps*; 310, *Dinothrips sumatrensis*; 311, *Anactinothrips vigilans*; 312, *Lamillothrips typicus*.



Figs 313–317 Idolothripina. 313, *Meiothrips annulipes*; 314, *Bactrothrips pitkini* ♀ paratype; 315, *Bacillothrips nobilis*; 316, *Bactrothrips idolomorphus* ♂ from Java; 317, *Idolothrips spectrum* ♀.



Figs 318–322 Idolothripina. 318, *Megalothrips andrei* ♂ holotype; 319, *Ceuthothrips timuqua*; 320, *Cylindrothrips niger* holotype; 321, *Megathrips lativentris*; 322, *Lasiothrips perplexus* holotype.

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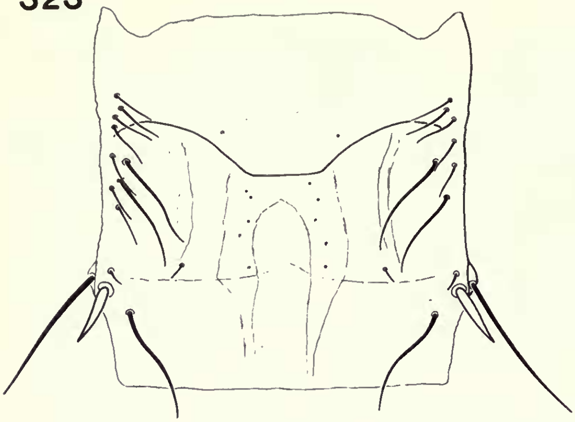

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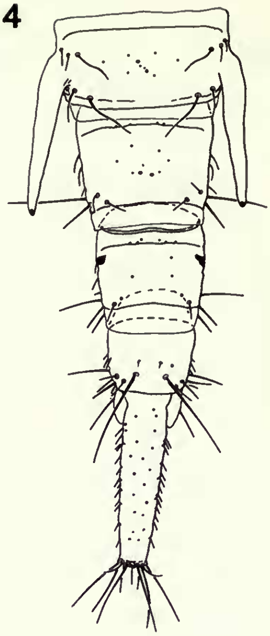

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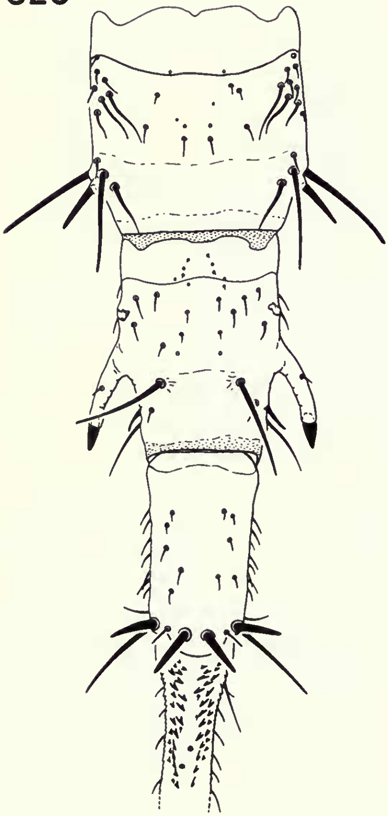

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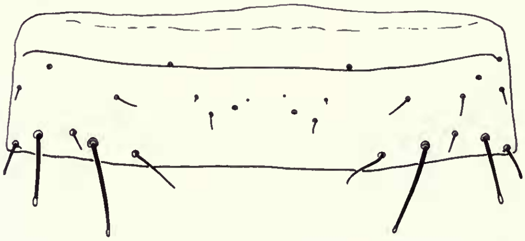

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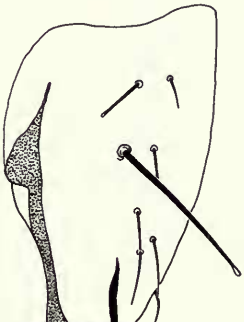
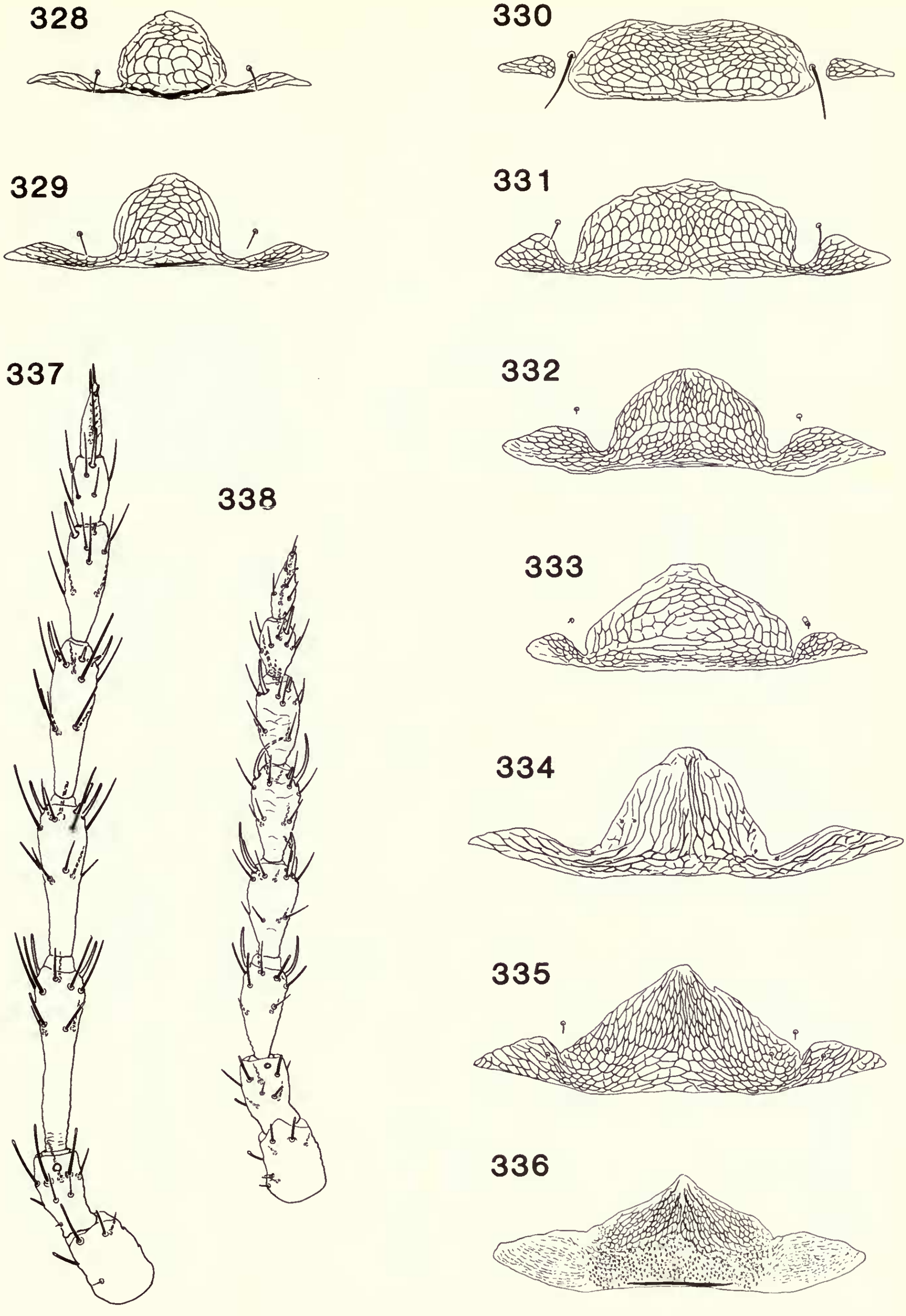


Figs 323–327 Idolothripina. 323, *Meiothrips annulipes* ♂ tergite V; 324, *Megalothrips andrei* ♂ holotype; 325, *Idolothrips dissimilis* ♂; 326, *Megathrips lativentris* ♀ mac. tergite IV; 327, *Meiothrips annulipes* anapleural suture.



Figs 328–338 Idolothripina. 328–336, pelta of (328) *Ceuthothrips timuqua*; (329) *Megalothrips andrei*; (330) *Bacillothrips longiceps*; (331) *Megathrips lativentris*; (332) *Bactrothrips idolomorphus*; (333) *E. pitkini* ♀ mac.; (334) *Idolothrips nativus*; (335) *Cylindrothrips niger* (*turneri* holotype); (336) *Meiothrips annulipes*; 337, *Megalothrips andrei*; 338, *Ceuthothrips timuqua*.

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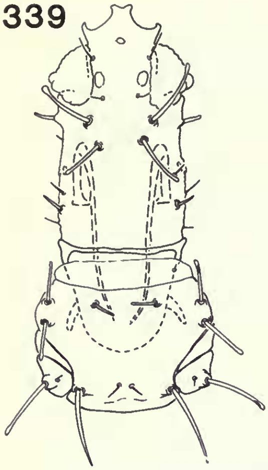

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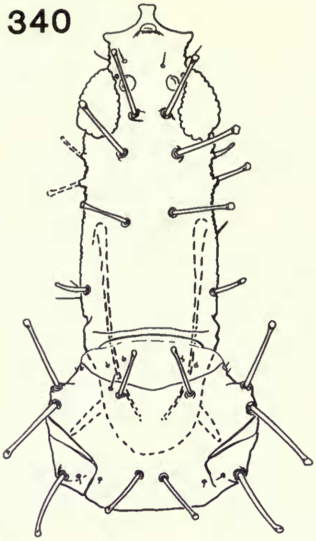

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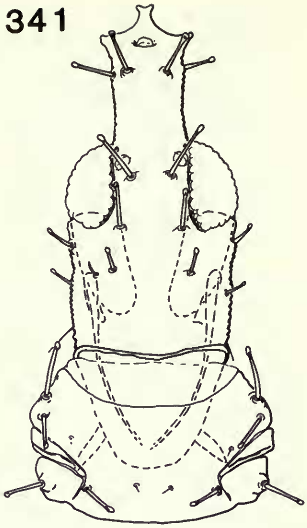

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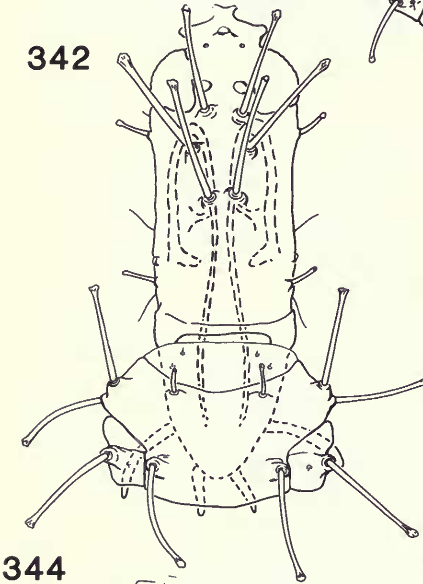

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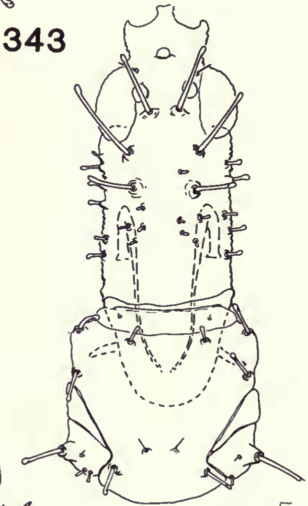

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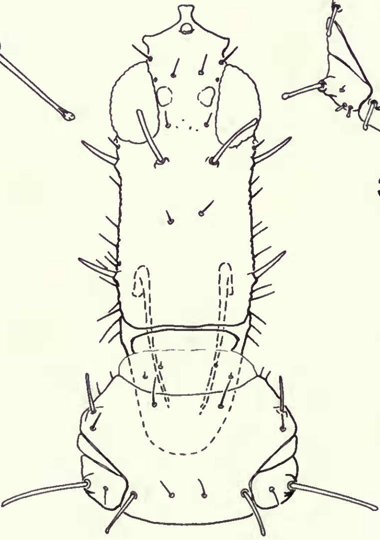

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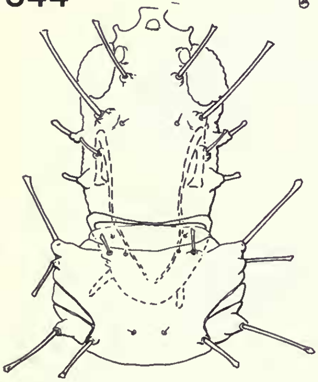

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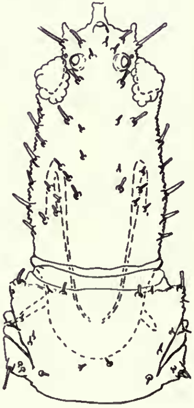
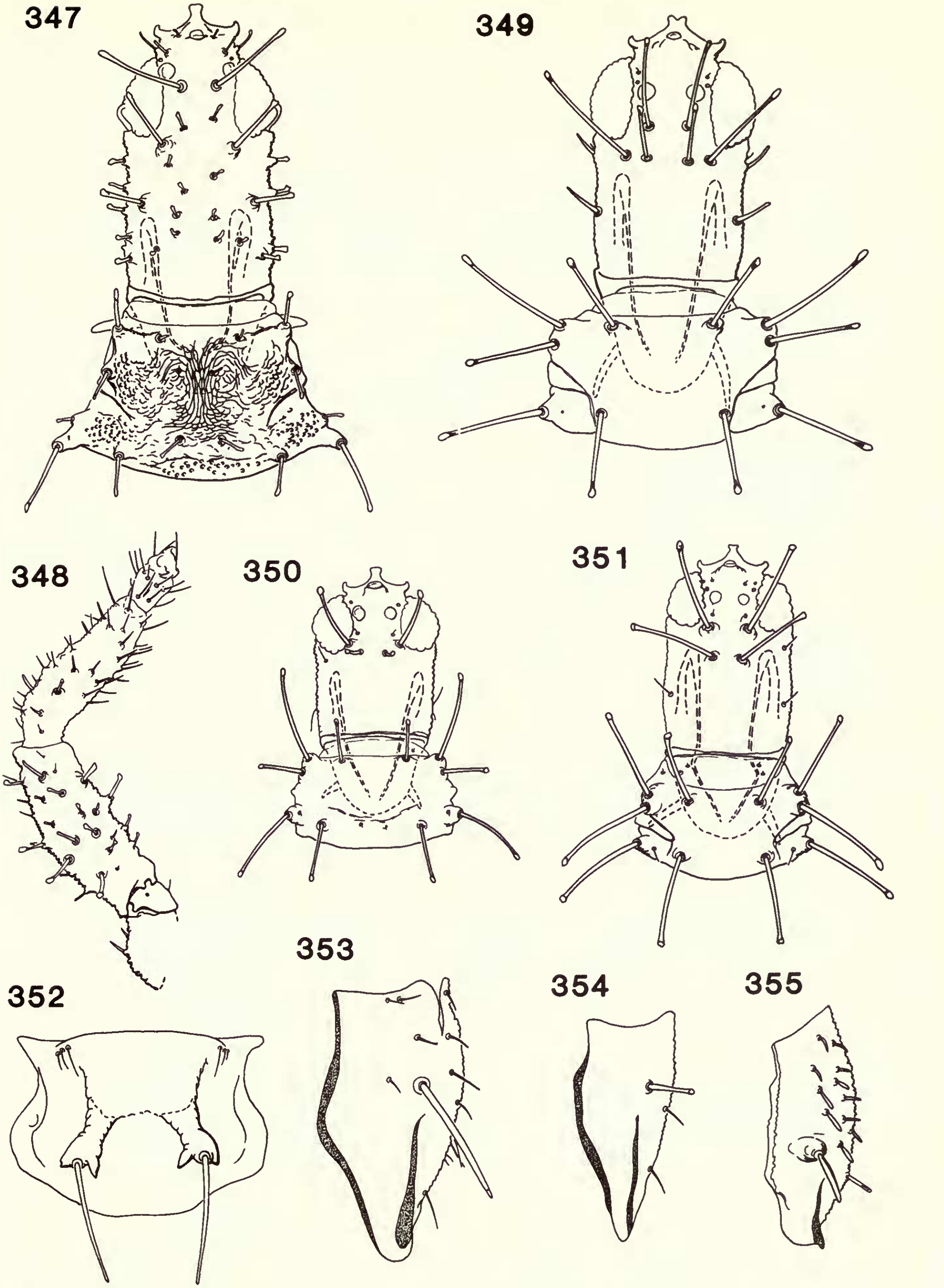
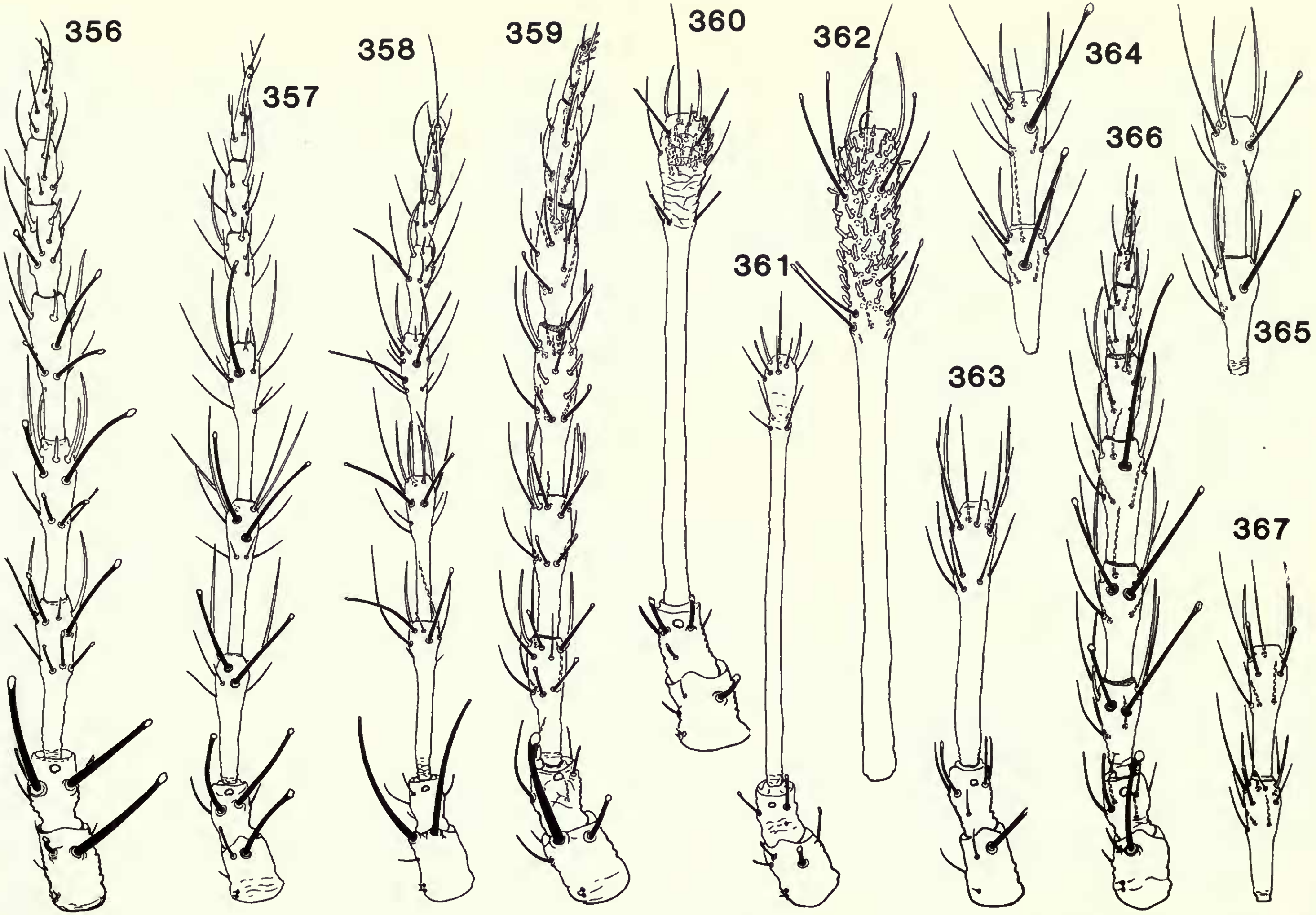


Figs 339–346 Hystricothripina. 339, *Cyphothrips dorsalis* ♂; 340, *Hybridothrips oneillae* holotype; 341, *Holurothrips ornatus*; 342, *Zeuglothrips echinus* holotype; 343, *Saurothrips assai*; 344, *Hystricothrips phasgonura* ♂; 345, *Actinothrips fraterculus* ♀; 346, *Atractothrips bradleyi*.



Figs 347–355 Hystricothripina. 347, *Paractinothrips peratus*; 348, *P. peratus* ♂ foreleg; 349, *Azeugmatothrips rectus*; 350, *Zeugmatothrips cinctus*; 351, *Z. priesneri*; 352, *Cyphothrips dorsalis* ♂ metanotum; 353, *Actinothrips femoralis* anapleural suture; 354, *Holurothrips ornatus* anapleural suture; 355, *Paractinothrips peratus* anapleural suture.



Figs 356–367 Hystricothripina. 356, *Saurothrips assai*; 357, *Azeugmatothrips rectus*; 358, *Hystricothrips phasgonura*; 359, *Paractinothrips peratus*; 360, *Hybridothrips oneillae* I–III; 361, *Holurothrips ornatus* I–III; 362, *Zactinothrips elegans* III; 363, *Cyphothrips dorsalis* I–III; 364, *Zeugmatothrips priesneri* III–IV; 365, *Z. hispidus* III–IV; 366, *Z. cinctus*; 367, *Z. hoodi* III–IV.

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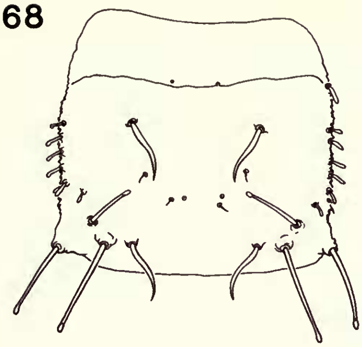

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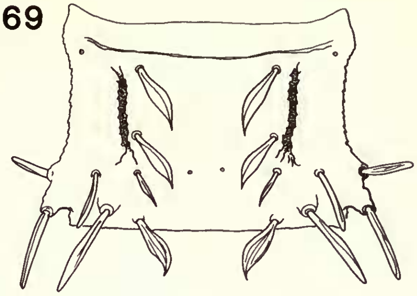

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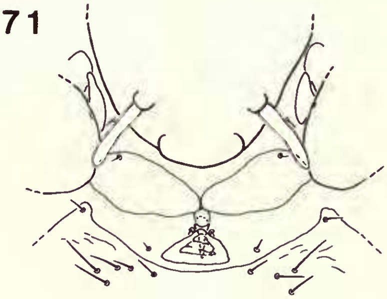

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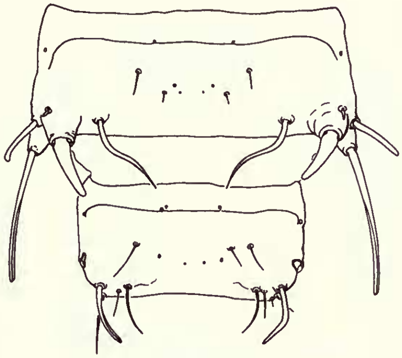

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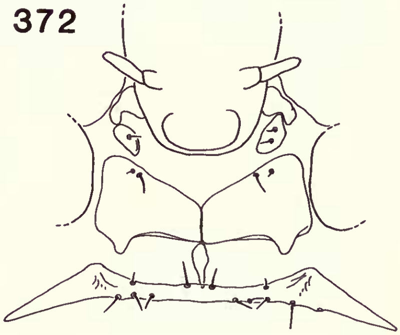

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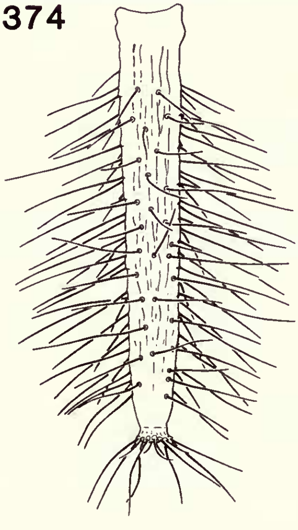

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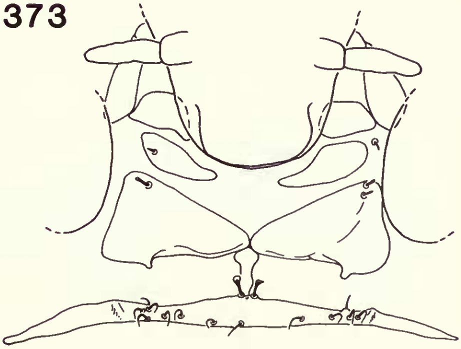
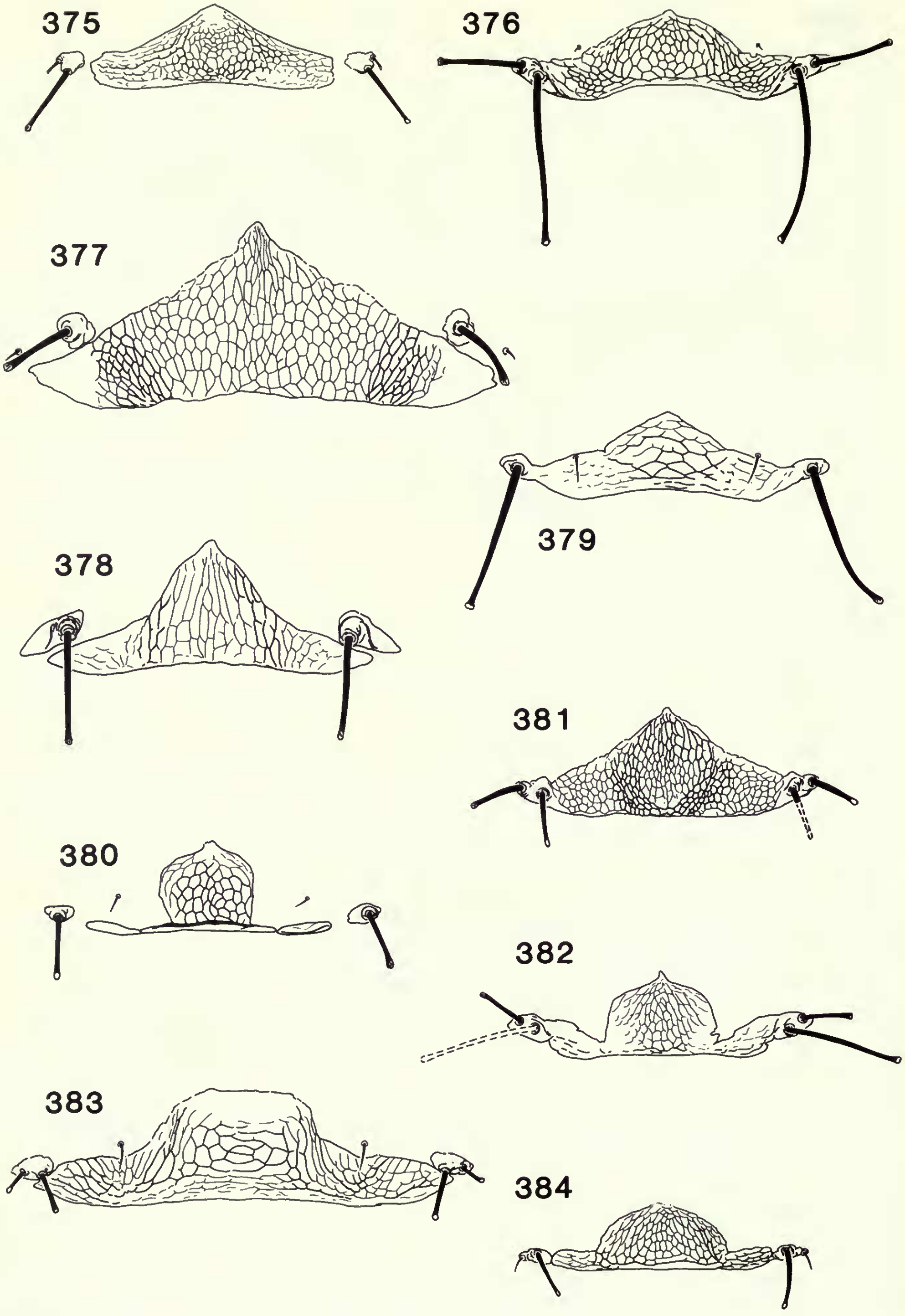
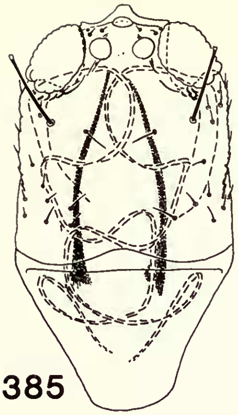


Figs 368–374 Hystricothripina. 368, *Saurothrips assai* tergite III; 369, *Paractinothrips peratus* tergite III; 370, *Hystricothrips phasgonura* ♂ VII–VIII; 371–373, mouth cone and prosternal plates of (371) *Zeugmatothrips priesneri*; (372) *Neatractothrips macrurus*; (373) *Paractinothrips peratus*; 374, *Azeugmatothrips rectus* tube.



Figs 375–384 Pelta of Hystricothripina species. 375, *Hystricothrips phasgonura*; 376, *Zeuglothrips echinus*; 377, *Neatractothrips macrurus*; 378, *Paractinothrips peratus*; 379, *Zeugmatothrips priesneri*; 380, *Z. hispidus*; 381, *Saurothrips assai*; 382, *Azeugmatothrips rectus*; 383, *Holurothrips ornatus*; 384, *Cyphothrips dorsalis*.



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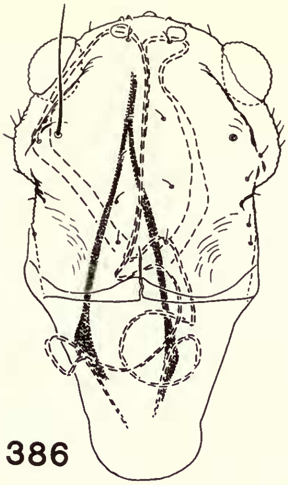

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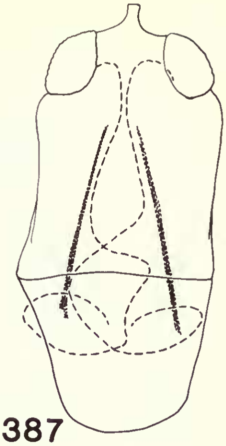

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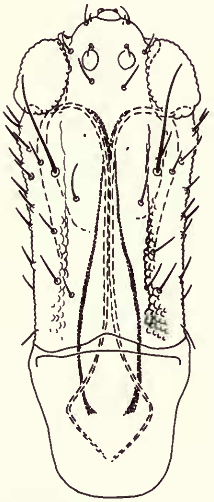

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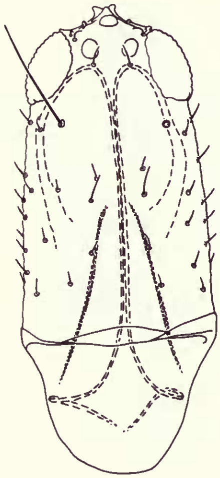

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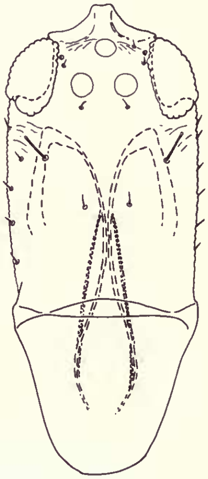

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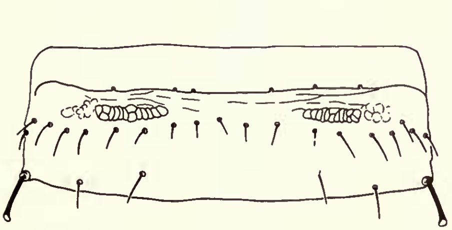

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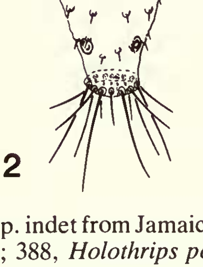

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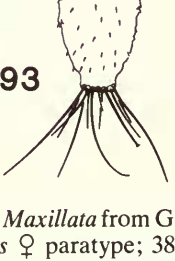

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Figs 385–393 Docessissophothripini. 385, *Maxillata* sp. indet from Jamaica; 386, ? *Maxillata* from Ghana; 387, *Tropothrips dampfi* holotype (setae omitted); 388, *Holothrips peruvianus* ♀ paratype; 389, *H. zimmermanni* holotype; 390, *H. procerus* ♀ paratype; 391, *Asemothrips picturatus* ♂ sternite IV; 392, *Symphyothrips* nr. *punctatus* tube; 393, *Holothrips* (? *Lathrobiothrips*) sp. indet. tube.

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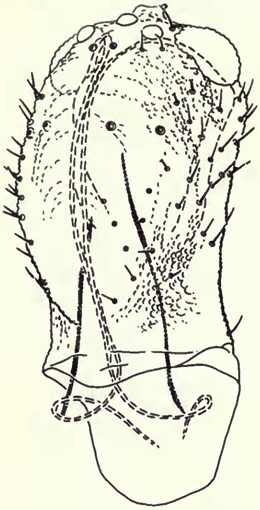

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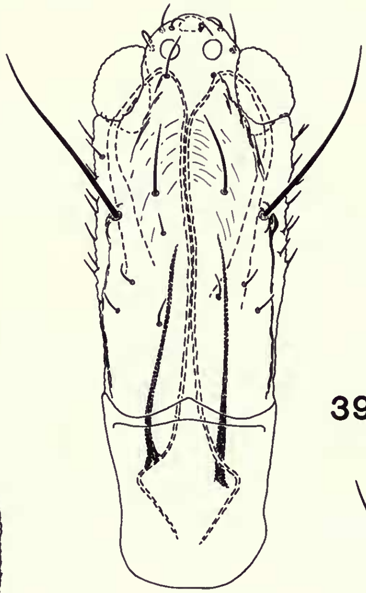

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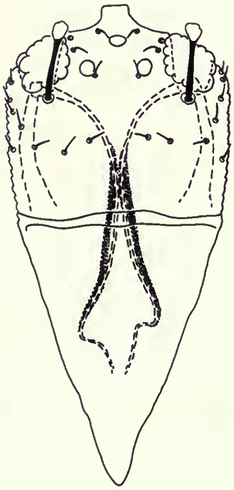

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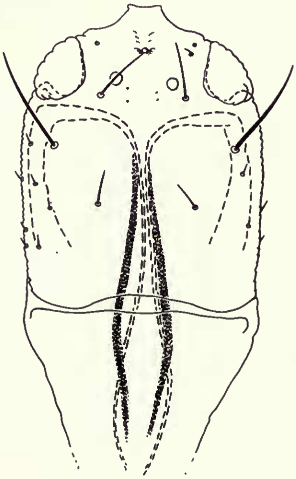
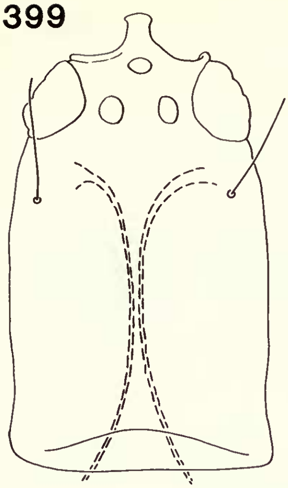


Figs 394–398 Docessissophothripini. 394, *Docessissophothrips ampliceps* ♂ holotype; 395, *D. major* ♀ holotype; 396, *Oidanothrips frontalis* ♀ holotype; 397, *Symphyothrips* near *punctatus* from Panama; 398, *Abiastothrips soror*.

399



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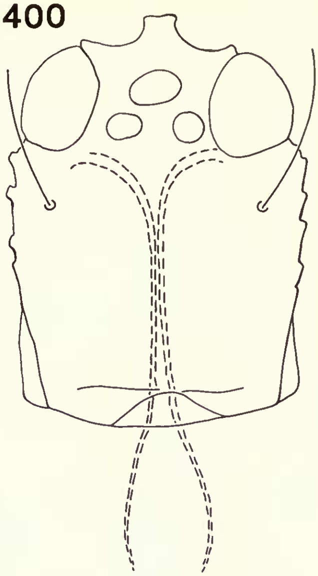

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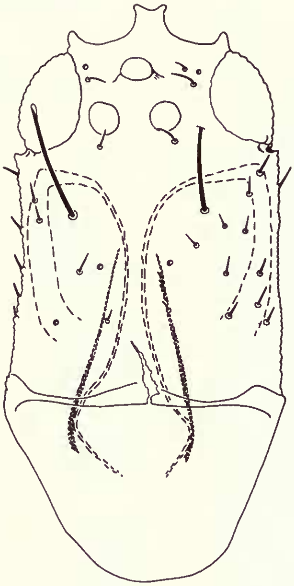

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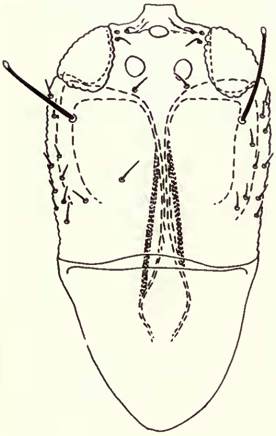

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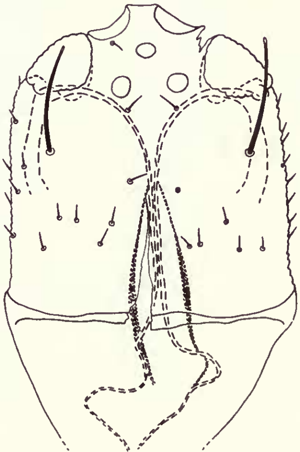
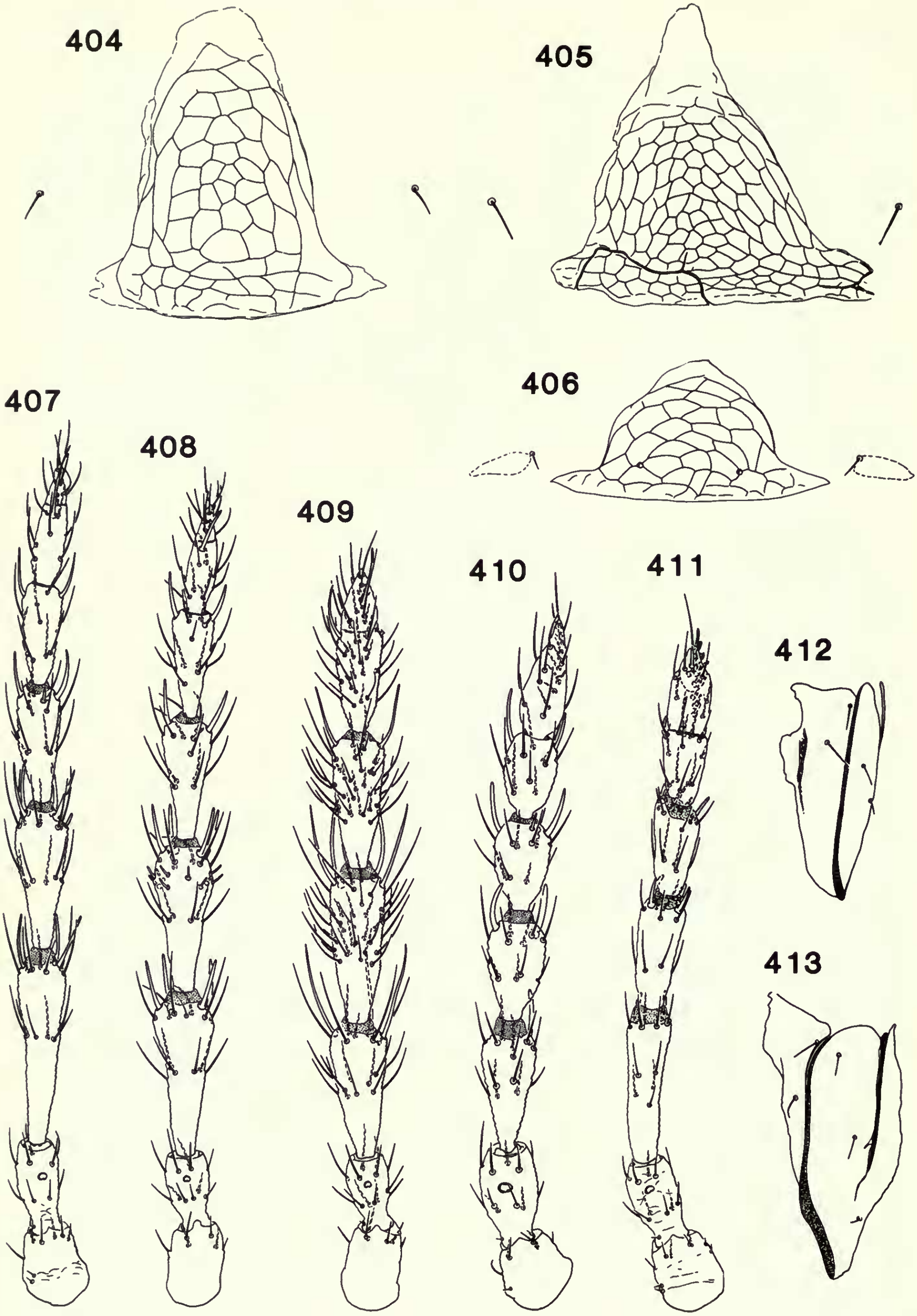


Figs 399–403 Docessissophothripini. 399, 400, outline sketches of (399) *Holothrips typicus* (Ananthakrishnan) holotype; (400) *H. semiflavus* holotype; 401, *H. typicus* (Bagnall) holotype; 402, *H. ambitus*; 403, *H. ingens* ♀ holotype.



Figs 404–413 Docessissophothripini. 404, *Holothrips ingens* pelta; 405, *Docessissophothrips ampliceps* pelta; 406, *Symphyothrips* near *punctatus* pelta; 407, *Holothrips ingens*; 408, *Oidanothrips frontalis*; 409, *Holothrips peruvianus*; 410, *Symphyothrips* near *punctatus*; 411, *Asemothrips finlayi*; 412, *Holothrips ingens* anapleural suture; 413, *Docessissophothrips ampliceps* anapleural suture.

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Synonyms are in *italics*; original generic combinations are indicated for identical specific epithets.