

Revision of *Thrips* species described by SCHMUTZ

(Insecta: Thysanoptera: Thripidae)

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(Mit 32 Abbildungen)

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Abstract

The ten species of *Thrips* LINNAEUS described by SCHMUTZ in 1913 are revised. The entire original material consisting of more than 200 specimens in alcohol has been mounted on slides to enable satisfactory study. Seven nominal species described by SCHMUTZ, *florum*, *magnipes*, *nigriflavus*, *pallidus*, *parvus*, *rhodamniae*, and *sulphurea*, are found to be conspecific with *hawaiiensis* (MORGAN, 1913), which is a senior synonym, based upon comparison with topotypic material of the latter species. *Thrips coloratus* SCHMUTZ remains a valid species. *Thrips longalatus* SCHMUTZ is now taken back from synonymy, validated as a good species, and redescribed. *Thrips striatopennatus* SCHMUTZ is now removed from *Thrips* and transferred to *Bolacothrips* UZEL 1895, which is here considered a senior synonym of *Bolacidothrips* PRIESNER 1930. A direct comparison of *striatopennatus* with the holotype of *Bolacidothrips orizae* MOULTON 1942 shows that the two are conspecific, thereby necessitating the suppression of MOULTON's species as a junior synonym; *orizae* reported and described by FAURE (1953) from South Africa is not conspecific with *orizae* of MOULTON, and is here described as a new species, *B. faurei*. *Bolacothrips orientalis* PRIESNER, 1935 represents the male of *striatopennatus*; both sexes of the species are fully redescribed and illustrated, with fresh material from India. *Plesiothrips pulcher* GIRAULT, 1929 from Australia is transferred to *Bolacothrips* UZEL. A checklist is provided for the known species of *Bolacothrips*; *graminis* subspecies *indicus* (ANANTHAKRISHNAN, 1966), originally described under *Bolacidothrips*, is here raised to the rank of a full species.

SCHMUTZ (1913), in his studies on Thysanoptera collected from Sri Lanka (Ceylon) by UZEL during 1901 and 1902, described ten new species of *Thrips* LINNAEUS, viz. *colorata*, *florum*, *longalata*, *magnipes*, *nigriflava*, *pallida*, *parva*, *rhodamniae*, *striatopennata*, and *sulphurea*. The original material of these species was studied by KARNY, who in 1924 relegated seven of these species names to synonymy under *florum*. Only three species, *florum*, *parva*, and *striatopennata*, were thus recognised as valid by him. KARNY did not mount the material and it has ever since remained in alcohol. Apparently no other worker studied it subsequently. PRIESNER (1934) while revising the dark Indomalayan species of *Thrips*, does not seem to have studied SCHMUTZ's

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types. But on the basis of other material before him he revalidated *coloratus* which was earlier suppressed under *florum* (KARNY 1924). Following KARNY and PRIESNER, only four of the species described by SCHMUTZ were recognised as valid. Recently it was proposed (ANANTHAKRISHNAN & JAGADISH, 1966) that *florum* is a senior synonym of *hawaiiensis* (MORGAN, 1913), but these workers had seen apparently neither Ceylonese nor Hawaiian specimens. SAKIMURA (1969) however established that *florum* was published on 6 Dec. 1913, so that *hawaiiensis* published on 23 August 1913 has priority. One of SCHMUTZ's species, *striatopennatus*, has never been critically commented upon subsequent to its original description.

There appear two different names on different reprints of SCHMUTZ's paper (Heft 7 of Band 122) on pages 1002 and 1015. In one case the species name *Thrips pallida* is printed on both these pages, and in the other the name *Thrips peradenyae* appears. The name *pallida* appears in the copies in which the genus name *Brachythrips* (pages 992, 997, 1088) is printed, whereas *peradenyae* is found in those copies where the genus name *Deuterobrachythrips* appears on the same pages. It seems that once *Brachythrips* appeared in print, SCHMUTZ found that it was a homonym of the earlier name *Brachythrips* REUTER. Sensing also a possibility of homonymy of *pallida*, he might then have changed *pallida* to *peradenyae* and *Brachythrips* to *Deuterobrachythrips*, and then managed to get further copies printed before the type was dismantled. Thus *peradenyae*, on this assumption, should be a replacement name for *pallida*. According to SAKIMURA (1969) the records of Bibliothek der Österreichischen Akademie der Wissenschaften show that the Heft 7 containing SCHMUTZ's paper was first issued on 6 December 1913. The prints containing the emended names therefore must have appeared later, presumably in late December 1913 or in early January 1914.

The collection data on the ten species of *Thrips* as published by SCHMUTZ are as follows:

UZEL No. 29 (Peradenya, 19. xii. 1901, *Ciramonum* flowers):

Thrips colorata, florum, longalata, parva, sulphurea.

UZEL No. 30 (Peradenya, 18. xii. 1901, *Clerodendron flagrans* (sic)):

Thrips longalata, magnipes.

UZEL No. 35 (see also data on *Neophysopus medioflavus*) (Peradenya, 21. xii. 1901, on grass in front of laboratory):

Thrips nigriflava.

UZEL No. 37 (Peradenya, 31. xii. 1901, in flowers of ? ?):

Thrips pallida (peradenyae).

UZEL No. 41 (Peradenya, 22. xii. 1901, *Rhodamnia trinervis*):

Thrips rhodamniae.

UZEL No. 185 (Nuwara Eliga, 14. v. 1902, low grass and plant leaves):

Thrips striatopennata.

It is significant to note that SCHMUTZ reported and described the male sex only for one species, *longalata*. The entire original material pertaining to these species by SCHMUTZ was borrowed from the Naturhistorisches Museum, Vienna. It comprised eight vials in all, containing 229 specimens. The labels which are mostly handwritten, are by and large in KARNY's hand, but some labels are in another hand, apparently that of SCHMUTZ.

The specimens were all much bleached due to being preserved in alcohol for about 70 years and details of colour could not be ascertained with certainty. The details of sculpture were visible only after making permanent mounts, or after treatment with NaOH. Then alone could the specimens be segregated into different species. All specimens were mounted in Canada Balsam on glass slides.

Each vial carried a species name label written by KARNY, and according to these names the eight vials are arranged alphabetically below. The specimens in each tube have been segregated into species and lectotypes selected wherever necessary. The data mentioned in parentheses is that which is printed on the labels. Some discrepancies between the published data and the data on the labels are discussed under the concerned species. Dr. KALTENBACH states (letter of 20. iii. 1973) that he cannot comment on these discrepancies, since he does not know anything further than the material examined by SCHMUTZ and his reprint on the material. The vial numbers given below are those by the present writer to facilitate their arrangement serially.

Vial 1. "*Thrips florum*, det. KARNY"

Locality label (in SCHMUTZ's hand): "41, *Rhodamnia trinervis*" (UZEL Ceylon Peradenya).

Published data: In *Ciramonum*-Blüten (flowers). 19 Dezember 1901. UZEL, Ceylon, Peradenya 29. (The published data on *colorata* and *parva* are similar, but there are no separate tubes bearing these names).

Specimens: *Thrips coloratus* SCHMUTZ: Lectotype ♀, Paralectotypes 3 ♀.

Thrips florum SCHMUTZ: Lectotype ♀, Paralectotypes 13 ♀.

Thrips parvus SCHMUTZ: Lectotype ♀.

The discrepancy between the data on the label and the published data might be due to a mix up of labels. The locality label found in this tube might actually be the original label for *rhodamniae*, whose vial had the locality label written in KARNY's hand. Because the tube contained specimens of *coloratus*, the host data can only be that carrying UZEL No. 29, unless SCHMUTZ copied the wrong habitat for several species in his manuscript, a possibility that should be obviously ignored.

Vial 2. "*Thrips longalata*, det. KARNY"

Locality label (in KARNY's hand): "UZEL Ceylon 30 Blüte von *Clerodendron fragrens*".

Published data: In Blüten (flowers) von *Ciramonum* und *Clerodendron fragrans* (sic). 18 Dezember 1901. UZEL, Ceylon, Peradenya, 29, 30.

Specimens: *Thrips longalatus* SCHMUTZ: Paralectotypes 2 ♀ 26 ♂.

Thrips magnipes SCHMUTZ: Paralectotypes 8 ♀ 2 ♂.

There appears to have taken place, subsequent to SCHMUTZ's original study, a mix up of specimens between the vials here serialised as No. 2 and 3 (both carrying UZEL No. 30), since the former ("*longalata*") had several specimens of *magnipes*, and the latter ("*magnipes*") had several specimens of *longalata*.

Vial 3. "*Thrips magnipes*, det. KARNY"

("*Thr. florum* and *magnipes*" in SCHMUTZ's hand)

Locality label (in SCHMUTZ's hand): „Blüte von *Clerodendron fragrans*“.

Published data: In Blüten (flowers) von *Clerodendron fragrans* (sic). Fundzeit? (time of collecting?). Kollekt. UZEL 30. UZEL, Ceylon 20.

Specimens: *Thrips magnipes* SCHMUTZ: Lectotype ♀, Paralectotypes 77 ♀.

Thrips longalatus SCHMUTZ: Lectotype ♀, Paralectotypes 24 ♀.

Thrips orientalis (BAGNALL): 1 ♀.

Vial 4. "*Thrips nigriflava* = *florum*, det. KARNY"

Locality label (in KARNY's hand): "UZEL 35 Ceylon Peradenya. Auf Gras".

Published data: Auf Gras vor dem Laboratorium (from grass in front of the laboratory) in Peradenya. 21 Dezember 1901. Kollekt. UZEL, Ceylon, Peradenya.

Specimens: *Thrips nigriflavus* SCHMUTZ: Lectotype ♀, Paralectotypes 2 ♀.

Vial 5. "*Thrips pallida* = *florum*, det. KARNY"

("*Thr. florum*, *Anth. soror*" in SCHMUTZ's hand)

Locality label: "37" (UZEL, Ceylon Peradenya).

Published data: Peradenya, in Blüten von ?? an den Ufern des Mahaveli (in flowers of ?? at the Mahaveli beach). 31 Dezember 1901. Kollekt. UZEL, Ceylon, Nr. 37.

Specimens: *Thrips pallidus* SCHMUTZ: Lectotype ♀, Paralectotypes 47 ♀.

Thrips longalatus SCHMUTZ: 1 specimen (only head and thorax).

Haplothrips soror SCHMUTZ: 2 ♀ (= *gowdeyi* (FRANKLIN))

Scirtothrips sp. (nr. *dorsalis*): 1 ♀.

Vial 6. "*Thrips rhodamniae* (= *florum*), det. KARNY"

Locality label (in KARNY's hand): "UZEL Ceylon 41 Peradenya, A. *Rhodamnia trinervis*".

Published data: Auf *Rhodamnia trinervis*. 22 Dezember 1901. Kollekt. UZEL, Peradenya, 41.

Specimens: *Thrips rhodamniae* SCHMUTZ: Lectotype ♀, Paralectotypes 7 ♀.

Vial 7. "*Thrips striatopennata*, det. KARNY"

Locality label (in KARNY's hand): "UZEL Ceylon 185 Nuwara Eliga Plantagoblätter".

Published data: Nuwara Eliga, Gesiebt aus niedrigem Grase und Plantagoblättern, ohne Blüten (sifted from low grass and plantation leaves, without flowers). ♂ unbekannt (unknown). 14 Mai 1902. UZEL, Ceylon 185.

Specimen: *Thrips striatopennatus* SCHMUTZ: Holotype ♀.

Vial 8. "*Thrips sulphurea* = *florum* ♂, det KARNY"

Locality label (in KARNY's hand): "UZEL Ceylon 40 Peradenya, *Cassipourea* sp.".

Published data: In *Ciramonum*-Blüten (flowers) in Peradenya. 19 Dezember 1901. UZEL, Ceylon, Peradenya 29.

Specimens: *Thrips sulphureus* SCHMUTZ: Lectotype ♂, Paralectotypes 1 ♂, 1 ♀ (abdomen only).

Thrips longalatus SCHMUTZ: Paralectotype 1 ♂.

Stenchaetothrips sp.: 1 specimen (head and thorax only).

Out of a total of 45 nominal species of Thysanoptera described by SCHMUTZ, not a single species is described with the data given on this label. This discrepancy cannot be explained. It is here preferred to rely on the published data in order to avoid further confusion. Moreover SCHMUTZ recorded *longalata* from the series of UZEL 29, a specimen of which has now been found in this vial.

The present study warrants the following conclusions:

(i) The nominal species *Thrips florum*, *magnipes*, *nigriflavus*, *pallidus*, *parvus*, *rhodamniae*, and *sulphureus*, described by SCHMUTZ, should be considered conspecific with *hawaiiensis* (MORGAN), which thus becomes the valid name for all these species.

(ii) The nominal species *peradenyae* SCHMUTZ appears to be a replacement name for *pallida* SCHMUTZ, and hence should be regarded as a junior synonym of *hawaiiensis* (MORGAN).

(iii) *Thrips longalatus* SCHMUTZ has to be taken back from synonymy, and revalidated as a good species.

(iv) *Thrips coloratus* SCHMUTZ remains a distinct species.

(v) *Thrips striatopennatus* SCHMUTZ has to be transferred to *Bolacothrips* UZEL.

(vi) *Bolacothrips* UZEL 1895 needs to be considered a senior synonym of *Bolacidothrips* PRIESNER 1930.

(vii) *Bolacothrips striatopennatus* (SCHMUTZ) is a senior synonym of *Bolacido-*

thrips orizae MOULTON 1942, as revealed by a direct comparison of type-specimens of the two nominal species.

(viii) *Bolacothrips orientalis* PRIESNER 1935, described from a unique male specimen from Taiwan, represents the male of *striatopennatus*. Hence *orientalis* is to be suppressed as a junior synonym of SCHMUTZ's species.

(ix) Specimens reported and described from South Africa by FAURE (1953) as *Bolacidothrips orizae* are not conspecific with *orizae* MOULTON. These specimens are here treated as a new species *B. faurei*.

(x) *Plesiothrips pulcher* GIRAULT 1929, described from Australia, has to be removed to *Bolacothrips* UZEL.

Thrips coloratus SCHMUTZ

Thrips colorata SCHMUTZ, 1913, Sitz. Ber. Akad. Wiss. Wien, math.-naturw. Kl., Abt. I, 122 (7): 1013—1015, pl. I, fig. 7. ♀. Lectotype ♀, Sri Lanka (Ceylon): Peradenya. (here designated) (Naturhistorisches Museum, Vienna).

Material: Lectotype ♀, paralectotypes 3 ♀, Sri Lanka: Peradenya, 19. xii. 1901, *Ciramonum* flowers, leg. UZEL, No. 29.

KARNY (1924: 13) synonymised *coloratus* under *florum*, whereas PRIESNER (1934: 265) treated it as a valid species. There are 4 ♀ in the collection from the vial labelled as *florum* along with 15 other specimens pertaining to *florum* and *parvus*. The original specimens of *coloratus* still retain some of the colour described by SCHMUTZ. Similar colour is also seen in fresh specimens in my collection. The placement of the median pair of metanotal setae is also different from that in *florum*. Although the data on the label written in KARNY's hand agrees with that of *rhodamniae*, the presence of *coloratus* specimens clearly shows that this was wrongly labelled. The original data of *coloratus* carries UZEL No. 29 and is the same as for *florum* and *parvus*.

The following account of the colour is extracted from the original description: Head and thorax yellow, abdomen yellowish brown, a pale brown trapezoidal spot being present in the middle of each of terga II—VIII, abdominal segments IX and X pale brown. Antennal segments I and II yellow, III yellow with brownish tinge; IV yellow at base, remainder brownish yellow; V yellow in basal half, brownish yellow in distal half; VI and VII brownish yellow. Legs yellow. Fore wing brownish gray, hind wing hyaline.

The brownish tinge on head and thorax noted by SCHMUTZ is not seen in any of the original specimens, nor in fresh material at hand. Hence this feature is excluded from the above characterisation.

Thrips hawaiiensis (MORGAN)

Euthrips hawaiiensis MORGAN, 1913 (August), Proc. U. S. Nat. Mus., 46: 3, figs. 5—8. ♀.

Syntypes ♀, Hawaii: Honolulu (United States National Museum, Washington).

Thrips florum SCHMUTZ, 1913 (December), Sitz. Ber. Akad. Wiss. Wien, math.-naturw. Kl., Abt. I, 122 (7): 1003—1004. ♀. Lectotype ♀, Sri Lanka: Peradenya (here designated) (Naturhistorisches Museum, Vienna) (synonymised by ANANTHAKRISHNAN & JAGADISH 166: 88).

- Thrips parva* SCHMUTZ, 1913, Sitz. Ber. Akad. Wiss. Wien, math.-naturw. Kl., Abt. I, 122 (7): 1004—1006. ♀. Lectotype ♀, Sri Lanka: Peradenya (here designated) (Naturhistorisches Museum, Vienna) New synonymy.
- Thrips magnipes* SCHMUTZ, 1913, Sitz. Ber. Akad. Wiss. Wien, math.-naturw. Kl., Abt. I, 122 (7): 1006—1008, Pl. I, fig. 6. ♀. Lectotype ♀, Sri Lanka: Peradenya (here designated) (Naturhistorisches Museum, Vienna) (synonymised by JACOT-GUILLARMOD 1975).
- Thrips rhodamniae* SCHMUTZ, 1913, Sitz. Ber. Akad. Wiss. Wien, math.-naturw. Kl., Abt. I, 122 (7): 1008—1009. ♀. Lectotype ♀, Sri Lanka: Peradenya (here designated) (Naturhistorisches Museum, Vienna) (synonymised by JACOT-GUILLARMOD 1975).
- Thrips sulphurea* SCHMUTZ, 1913, Sitz. Ber. Akad. Wiss. Wien, math.-naturw. Kl., Abt. I, 122 (7): 1011—1012. ♂♂. Lectotype ♂, Sri Lanka: Peradenya (here designated) (Naturhistorisches Museum, Vienna) New synonymy.
- Thrips nigriflava* SCHMUTZ, 1913, Sitz. Ber. Akad. Wiss. Wien, math.-naturw. Kl., Abt. I, 122 (7): 1012—1013. ♀. Lectotype ♀, Sri Lanka: Peradenya (here designated) (Naturhistorisches Museum, Vienna) (synonymised by JACOT-GUILLARMOD 1975).
- Thrips pallida* SCHMUTZ, 1913, Sitz. Ber. Akad. Wiss. Wien, math.-naturw. Kl., Abt. I, 122 (7): 1015—1016. ♀. Lectotype ♀, Sri Lanka: Peradenya (here designated) (Naturhistorisches Museum, Vienna) (synonymised by JACOT-GUILLARMOD 1975).
- Thrips peradenyae* SCHMUTZ, 1913 (?), Sitz. Ber. Akad. Wiss. Wien, math.-naturw. Kl., Abt. I, 122 (7): 1015—1016. (Replacement name for *pallida*!) (synonymised by JACOT-GUILLARMOD 1975).

Material: 1) *Thrips florum* SCHMUTZ: Lectotype ♀, paralectotypes 13 ♀, Sri Lanka: Peradenya, 19. xii. 1901, in flowers of *Ciramonum*, leg. UZEL, No. 29.

2) *Thrips parvus* SCHMUTZ: Lectotype ♀, with the same data as above.

3) *Thrips magnipes* SCHMUTZ: Lectotype ♀, paralectotypes 85 ♀ 2 ♂, Sri Lanka: Peradenya, 18. xii. 1901, in flowers of *Clerodendron fragrans*, leg. UZEL, No. 30.

4) *Thrips nigriflavus* SCHMUTZ: Lectotype ♀, paralectotype 2 ♀, Sri Lanka: Peradenya, 21. xii. 1901, on grass in front of laboratory, leg. UZEL, No. 35.

5) *Thrips pallidus* SCHMUTZ (*peradenyae* SCHMUTZ): Lectotype ♀, paralectotypes 47 ♀, Sri Lanka: Peradenya, 31. xii. 1901, in flowers of unidentified plant, leg. UZEL, No. 37.

6) *Thrips rhodamniae* SCHMUTZ: Lectotype ♀, paralectotypes 7 ♀, Sri Lanka: Peradenya, 22. xii. 1901, on *Rhodamnia trinervis*, leg. UZEL, No. 41.

7) *Thrips sulphurea* SCHMUTZ: Lectotype ♂, paralectotypes 1 ♀ (damaged), 1 ♂, Sri Lanka: Peradenya, 19. xii. 1901, in flowers of *Ciramonum*, leg. UZEL, No. 29.

The material of the seven nominal species of SCHMUTZ, here considered conspecific with *hawaiiensis*, was included in vial nos. 1—6 and 8 listed in this paper. The inconsistencies in the data in vials and the published data are discussed under the respective vials. However in the interest of minimising confusion the published data is accepted here, particularly because the confusion might well have been caused by an inadvertent mix up of specimens by KARNY when he studied the material.

The type material of *florum*, *magnipes*, *nigriflavus*, *pallidus* (*peradenyae*), *parvus*, *rhodamniae*, and *sulphurea* is now found to be conspecific with topotypic

specimens of *hawaiiensis*. Although SCHMUTZ did not describe the male of any of the nominal species here treated under *hawaiiensis*, KARNY (1924) stated that *sulphurea* represents the male of *florum*. PRIESNER (1934) considered *parvus* as a good species, but his conclusion is not substantiated by the present study.

Thrips longalatus SCHMUTZ, revalidated status

Thrips longalata SCHMUTZ, 1913, Sitz. Ber. Akad. Wiss. Wien, math.-naturw. Kl., Abt. I, 122 (7): 1009—1011. ♀♂. Lectotype ♀, Sri Lanka: Peradenya (here designated) (Naturhistorisches Museum, Vienna).

Material: Lectotype ♀, paralectotypes 26 ♀ 26 ♂, Sri Lanka: Peradenya, 18. xii. 1901, *Clerodendron fragrans*, leg. UZEL, No. 30. Paralectotype 1 ♂, Peradenya, 19. xii. 1901, *Ciramonum* flowers, leg. UZEL, No. 29. 1 example (head and thorax only), Peradenya, 31. xii. 1901, in flowers of unidentified plant, leg. UZEL, No. 37.

The species was synonymised under *florum* by KARNY (1924: 13) and has since been treated as such. It is here recognised as a valid species. The original description records specimens bearing UZEL Nos. 29 and 30. There is a single specimen in the vial containing *sulphurea*, and many specimens of both sexes from collection No. 30.

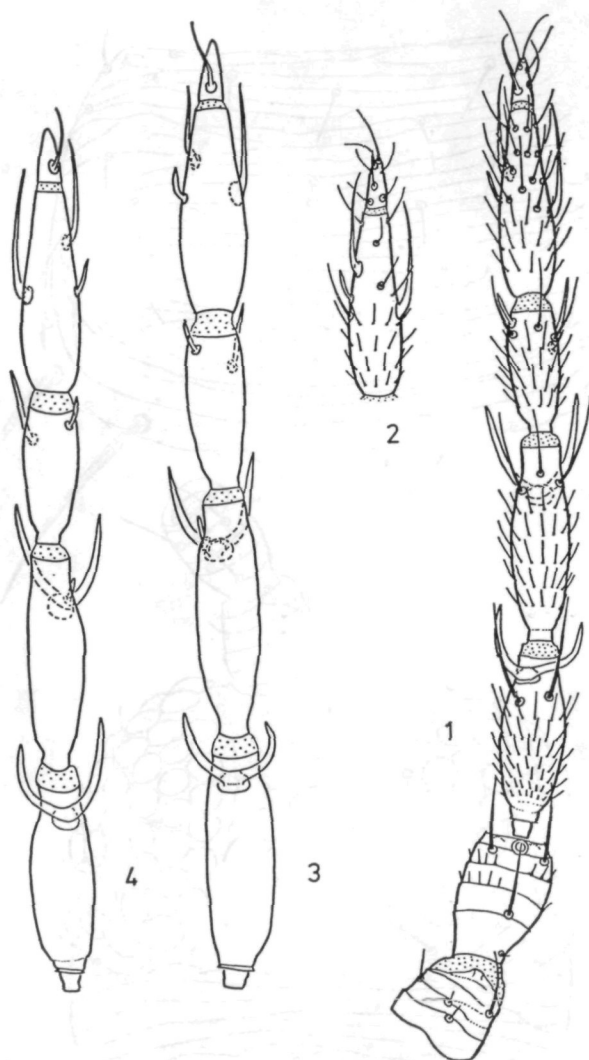
In the following redescription the colour is extracted from the original description. The data on the lectotype is often followed in brackets by that taken on paralectotypes. The measurements are all in micrometers (μm) in this and subsequent descriptions in this paper. .

Female (macropterous): Body pale yellow including legs. Antennal segments I to III pale yellow, IV to VII yellowish brown. Wings yellowish gray except for the basal fourth.

Head L 136 (105—), W at eyes 160 (138—), at cheeks 159 (138—). Intercellular setae inserted behind the fore ocellus, 20—23 long; anteocellars shorter and thinner, 19 long. Postocular I 25—29 long; II 2 long; III 19—20; IV 4; V 17; VI 13 long; II and IV rudimentary. Antennae 287—297 long; L (and W) of segments: I 24 (24), II 38 (24), III 54 (18), IV 55—56 (17), V 38 (16), VI 55—56 (16), VII 16 (6). Setae on antennal segments: I 6+5, II 7, III 5, IV 5, V 6, VI 17, VII 9.

Pronotum L 131, W 210; surface transversely striate; surface sparsely setose, with 16—17 pairs of discal setae in addition to the posterior marginals and angulars. Posteroangular inner setae 71—74 (61—) long, outer 73 (61—81) long; with 2 to 3 pairs of setae inner to the major angulars, there being 2—2 on 6 ♀♀ each, 3—2 on 5 ♀♀, and 3—3 on 4 ♀♀. None of the disc setae especially developed; am 22 long, sl 25—26 long; other disc setae 16—20 long. Mesonotum with median pair of setae far ahead of posterior margin. Metanotum with inner pair of setae far back of anterior margin; inner setae 40—41 long, outer setae 28—31 long; surface reticulate, with a few wrinkles among reticules in anterior

part; discal pores absent. Hind tibia L 187; fore femur W 55. Fore wing L 811; W at middle 64; costal setae at middle of wing 45—48 long; costa with 25—28 (25—30) setae, out of 41 wings studied, 3 wings each have 25 and 26 setae,

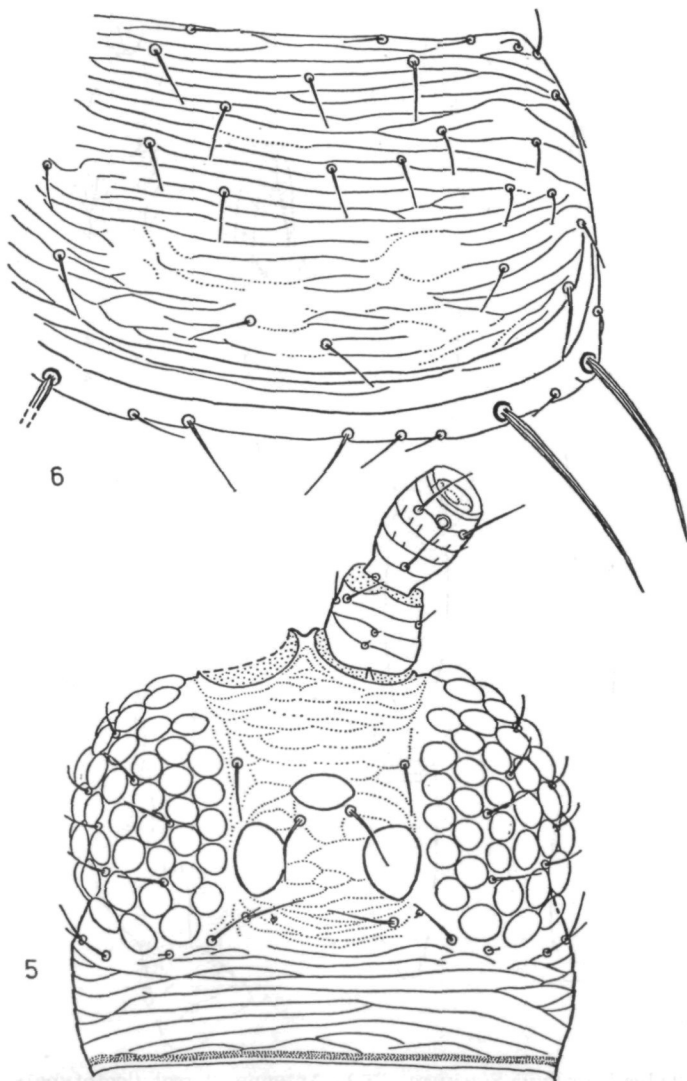


Figs. 1—4. *Thrips longalatus* SCHMUTZ, ♀: 1: Antenna, dorsal (lectotype); 2: Antennas VI—VII, ventral (lectotype); 3, 4: Outline of part of antenna to show variation in shape of segments

7 wings have 27 setae, 14 wings have 28 setae, 9 wings have 29 setae, and 5 wings have 30 setae each; upper vein with 4+3 basal and 3 distal setae, only one wing has 3+4 basal and 4 distal setae; lower vein with 13 (11—16) setae, out of 41 wings studied, 2 wings have 11 setae each, one wing has 12 setae, 10

wings have 13 setae each, 14 wings have 14 setae each, 11 wings have 15 setae each, and 3 wings have 16 setae each; scale with 5+1 setae.

Abdominal tergum II with 4 lateral marginal setae. Intermediate terga unsculptured medially. Seta S4 reduced on terga VI—VIII. Comb on posterior



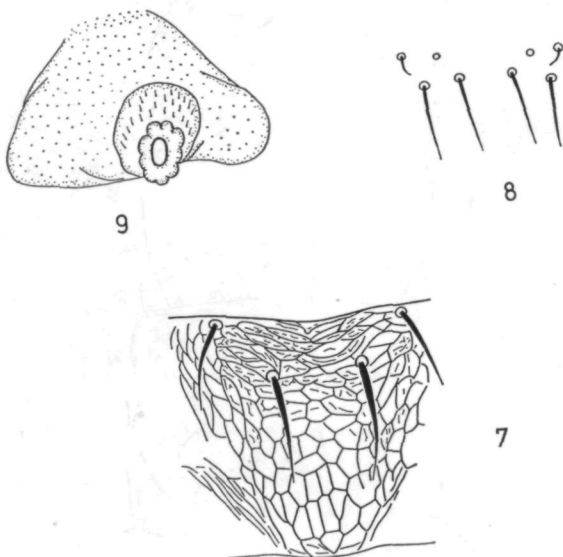
Figs. 5—6. *Thrips longalatus* SCHMUTZ, ♀ (lectotype): 5: Head, dorsal; 6: Part of pronotum

margin of tergum VIII absent. Setae on tergum VIII: S3, 45—57 long; S6, 55—68 long; S6 longer than S3. Setae on tergum IX: md 42 long; S1, — (84—105); S2, 107 (90—); S3, 100—103 (94—); S4, 76; On segment X: S1, 103—107 (90—); S2, 90—96 (84—) long. Accessory setae absent on sterna. Sternum VII with median pair of primary setae (S1) inserted far ahead of

posterior margin. Sternum VIII with one seta reduced. Ovipositor L 220 (194—) long. Total body length 1158 (contracted).

Male (macropterous): Colour (after SCHMUTZ) similar to ♀. Abdominal tergum II with 4 lateral marginal setae. Comb on posterior margin of tergum VIII absent. Abdominal sterna III—VII each with a transverse gland area, its width being, on III 24—31, IV 27—32, V 27—32, VI 28—34, VII 23—35, its length 3.5—4.

Thrips longalatus is readily distinguishable from *flavus* SCHRANK with which it appears to have superficial resemblance by the reticulate metanotal sculpture and absence of comb on posterior margin of abdominal tergum VIII in both sexes.



Figs. 7—9. *Thrips longalatus* SCHMUTZ: 7: Part of metascutum, ♀; 8: Chaetotaxy of middle of abdominal tergum IX, ♂; 9: Membranous phallus, dorsal

Bolacothrips UZEL

Bolacothrips UZEL, 1895, Monographie der Ordnung Thysanoptera, p. 211—212. Type-species *Bolacothrips jordani* UZEL 1895, l. c., p. 212, by monotypy.

Bolacidothrips PRIESNER, 1930, Bull. Soc. Ent. Egypte, 14 (1): 6. Type-species *Bolacidothrips graminis* PRIESNER, 1930, l. c., pp. 6—9, by original designation and monotypy.

Bolacidothrips is structurally so similar to *Bolacothrips* that it seems more useful to treat them as a single genus. The segmentation of the maxillary palps has been used to separate *Bolacidothrips* with 2-segmented palps from *Bolacothrips* with 3-segmented maxillary palps. The shape of maxillary palps in the species included in the two genera is similar, although the segmentation is different. The structure of body, chaetotaxy of head, prothorax, antennae, etc. are similar in species of both.

Bolacothrips striatopennatus (SCHMUTZ)

Thrips striatopennata SCHMUTZ, 1913, Sitz. Ber. Akad. Wiss. Wien, math.-naturw. Kl., Abt. I, **122** (7): 1002—1003. ♀. Holotype ♀, Sri Lanka (Ceylon): Peradenya (Naturhistorisches Museum, Vienna).

Bolacothrips orientalis PRIESNER, 1935, Philippine J. Sci., **57** (3): 359. ♂. Holotype ♂, China: Taipei, Taiwan. (Senckenberg Museum, Frankfurt/Main) New synonymy.

Bolacidothrips orizae MOULTON, 1942, Bull. Bishop Mus., **172**: 10. ♀. Holotype ♀, Island of Guam: Inarajan (California Academy of Sciences, San Francisco) New synonymy.

Bolacidothrips oryzae (sic): SAKIMURA, 1958, Mushi, **31** (9): 76—77, fig. 2 (♀, redescription); BHATTI, 1962, Bull. Ent., **3**: 46. (misspelling for *orizae*).

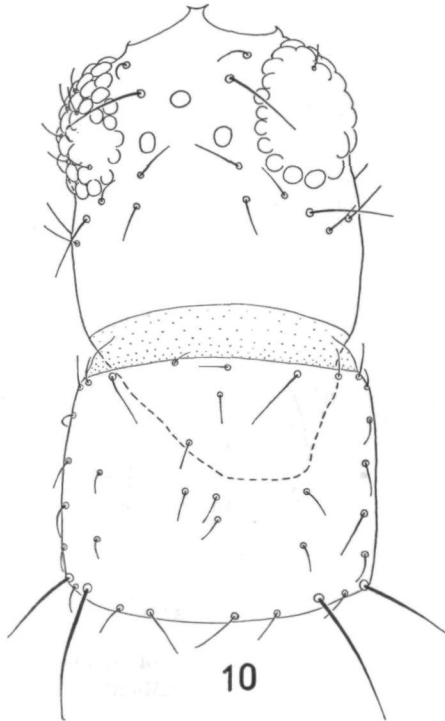
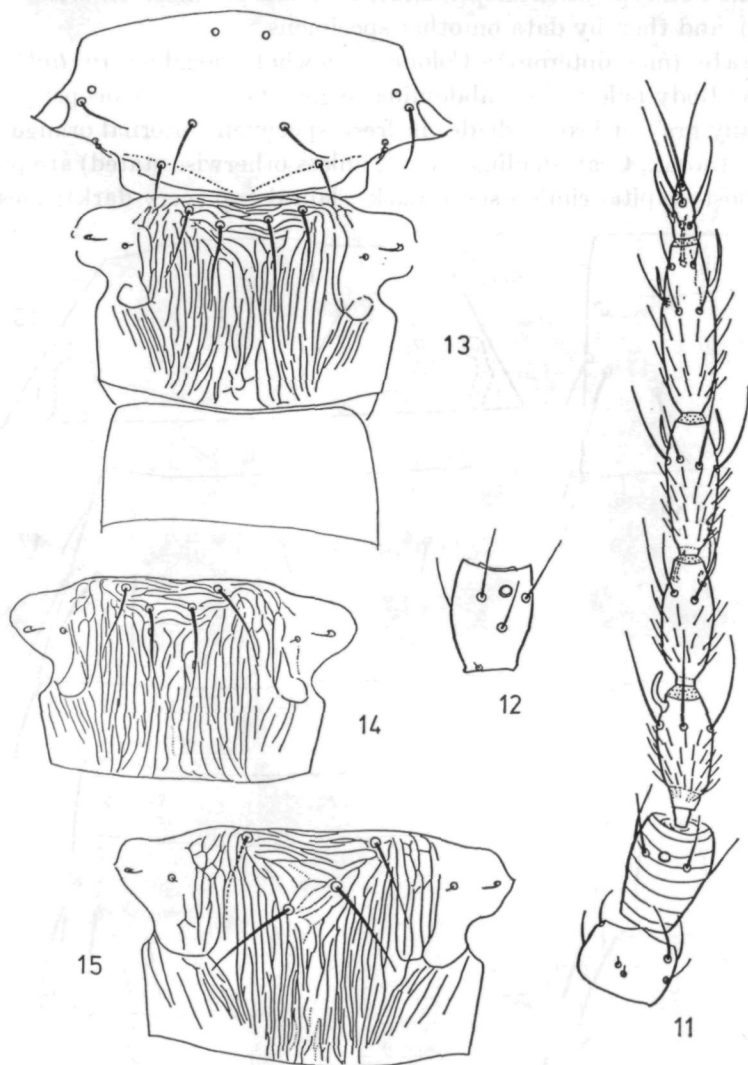


Fig. 10. *Bolacothrips striatopennatus* (SCHMUTZ), ♀: Head and pronotum (*orizae* holotype). Sculpture omitted

The holotype of *striatopennatus* is much bleached in colour, although it still gives indications of the essential colour features of the species. The colour characters extracted from the original description are as follows: Body pale yellow; abdomen slightly darker towards tip, ovipositor deep yellow; antennal segments I—III pale yellow, IV yellowish brown, V—VII pale brown; legs yellow; fore wings grayish yellow with two broad darkened cross bands, one at middle and the other subapically. The colour given in the description below is based upon wide ranging material listed here.

Diagnosis. Yellow species with macropterous or brachypterous ♀ and brachypterous ♂. ♀ with gray shadings on pronotum, meso and metanotum,

mesopleura, and abdominal segment II; apex of abdomen not shaded gray; antennal V completely shaded mostly, VI—VII dark; fore wing with 2 gray brown cross bands alternating with 3 clear areas; interocellar setae 38—50 μm , postocular IV 28—42 μm long; 2-segmented maxillary palps; antennal VI with 9 setae, II without microtrichia; pronotum with posteroangular inner seta 55—81, outer 42—54 μm long, anteromarginal 28—40 μm long; upper vein of fore wing with 11—14 setae in a discontinuous row; abdominal terga I—VIII unsculptured medially in macropterous form, completely sculptured in

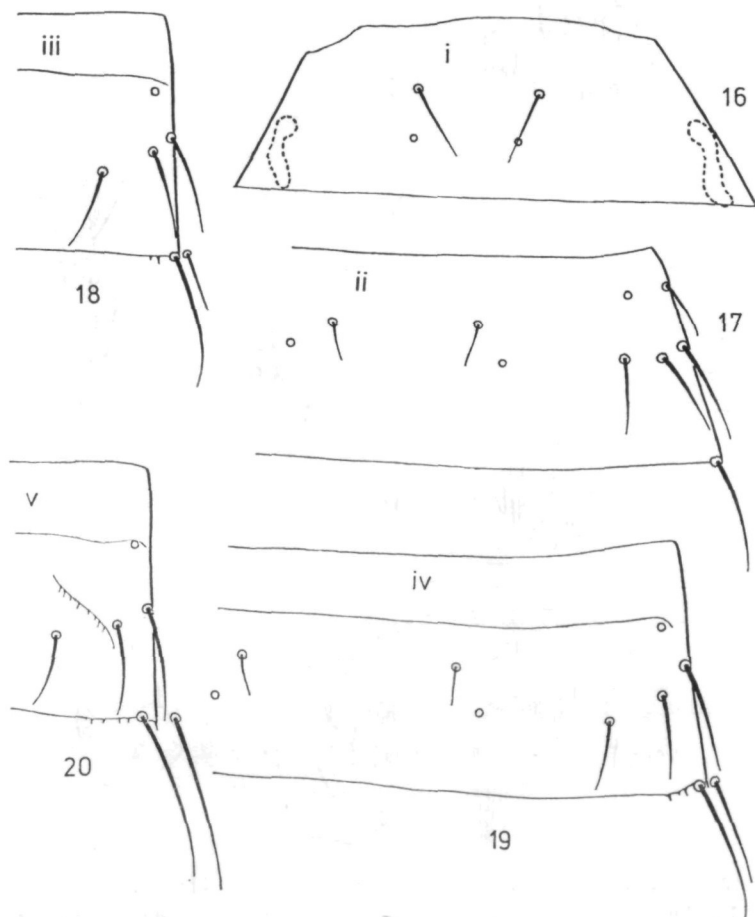


Figs. 11—15. *Bolacothrips striatopennatus* (SCHMUTZ), ♀: 11: Antenna, dorsal (*orizae* holotype); 12: Antennal segment II, dorsal (*orizae* paratype) to show the normal chaetotaxy; 13: Meso and metanotum (*orizae* holotype), sculpture shown only on metascutum; 14: Metascutum (*orizae* paratype); 15: Metascutum (*striatopennatus* holotype)

brachypterous form; median setae (S1) well developed on tergum I, and in brachypterous form also on II—VIII; spiracle on I 20—27 μm long; accessory setae on each sternum (II—VII) in a nearly single row; comb on tergum VIII incomplete, made of short microtrichia restricted to sides. ♂ without ocelli, with 73—88 μm long fore wing stubs; antennal V yellow in proximal half; no shadings on dorsum of body; abdominal sterna III—VII each with a transverse 60—92 μm wide gland area.

The redescription below records the numerical data on ♀ (macropterous) first on the holotype of *striatopennatus*, followed by those on *orizae* types (in bold-face), and then by data on other specimens.

Female (macropterous): Colour somewhat variable. In *light coloured specimens*: Body pale yellow, abdominal segments VIII—X deeper yellow but without any gray or brown shade; in fresh specimens internal orange pigment present in thorax. Gray shadings (weak unless otherwise stated) are present as follows: postoccipital rim on sides (dark); labral cup (very dark); mesonotum



Figs. 16—20. *Bolacothrips striatopennatus* (SCHMUTZ), ♀ (*orizae* holotype): Abdominal terga I—V or parts of them. Sculpture omitted

on sides; metascutum at middle (triangular area with base at anterior); unguitractor plates (dark); tegula (darker on lateral edges); mesopleura; sides of abdominal terga I—V (particularly on II); cheeks and median spots on pronotum (very weak, often indiscernible shade). Antennals I—IV pale yellow, IV very faintly clouded with gray; V—VII dark gray brown, rarely V pale at base. Fore wing with proximal half or two-thirds of scale gray brown, and with two short dark cross bands alternating with three clear areas, the first one at middle (about as long as scale) and the second one before the wing apex (about one and a half times as long as the first); both gray brown cross bands embracing the entire width of the wing touching both the anterior and posterior margins of wing. Legs yellow. Ocellar crescents red. Major setae at apex of abdomen, and those on shaded parts of wing, weakly shaded, subhyaline; others clear hyaline. In *darkest specimen* (♀, Madras): Pronotal spots clear and spread out across middle, and with smaller spots anteriorly; abdominal segments II—IV (particularly II) clearly and more extensively shaded on sides; all femora clearly clouded with gray brown on outer margin at middle; mid and hind tibiae weakly clouded across middle.

Head a little longer than wide, about 1.20, 1.03—1.05, 1.01—1.06 times as long as wide at cheeks; 161, 130—144, 133—147 long; 146, 132—142, 130—142 wide at eyes; 134, 123—139, 122—134 wide at cheeks. Frontal costa weakly concave in front, but usually straight, 12, 10, 8—12 wide. Interocellar setae 49, 38—42, 38—50 long; antecellars 27, 25, 30 long. Postocular setae: I 24; II (placed back of I) 19; III 17; IV 37—39, 34—36, 28—42; V 22; VI 21 long. Maxillary palps 2-segmented.

Antennae 7-segmented. Number of setae on segments: I 6+5, II 7 (including middorsal seta basad of areola), III 5, IV 5, V 6, VI 9 (5 around middle and 4 around apex), VII 9 (a proximal ring of 3 along with sense cone, 3 subapical, and 3 apical). The holotype of *orizae* is abnormal in having only 6 setae on antennal II, the middorsal seta basad of areola being absent; this is however present in the paratype. Microtrichia absent on segments I and II; VII with 2 ventral subapical microtrichia; those on III—VI are summarised in Table 1 below:

Table 1. Microtrichia rows (annular) on antennal segments III—VI of *Bolacothrips striatopennatus*, ♀

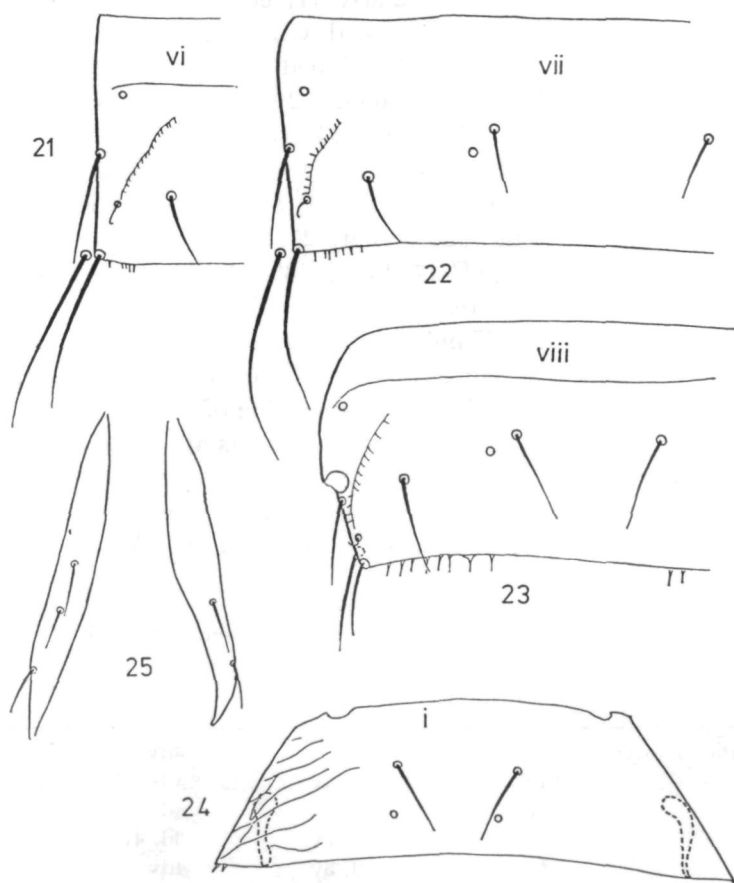
	III	IV	V	VI
<i>striatopennatus</i> holotype	5dv	4dv	4dv	3d, 3½v
<i>orizae</i> holotype	4dv	3d, 4v	4dv	3dv
♀ Sibpore	4dv	5d, 3v	4dv	3dv
		4d, 3v	3d, 4v	
♀ Jabalpur	4dv	4d, 3v	4dv	3dv
♀ Madras	4dv	4dv	4dv	3dv
	5d, 4v	4d, 3v	4d, 3v	3d, 4½v
	4d, 5v			3d, 3½v

d = dorsal, v = ventral, 3½ = 3 complete and one incomplete rows

Antennae 1.69, 1.70, 1.73—2.06 times as long as head; 271, 250, 246—260 long. L/W index of antennal segments: III 2.53, 2.16—2.23, 2.22—2.50; IV 2.56, 2.25—2.41, 2.44—2.86; V 2.88, 2.41—2.44, 2.50—2.86; VI 3.50, 3.05—3.06, 3.19—3.50; VII 3.33, 2.38—2.57, 2.50—3.33.

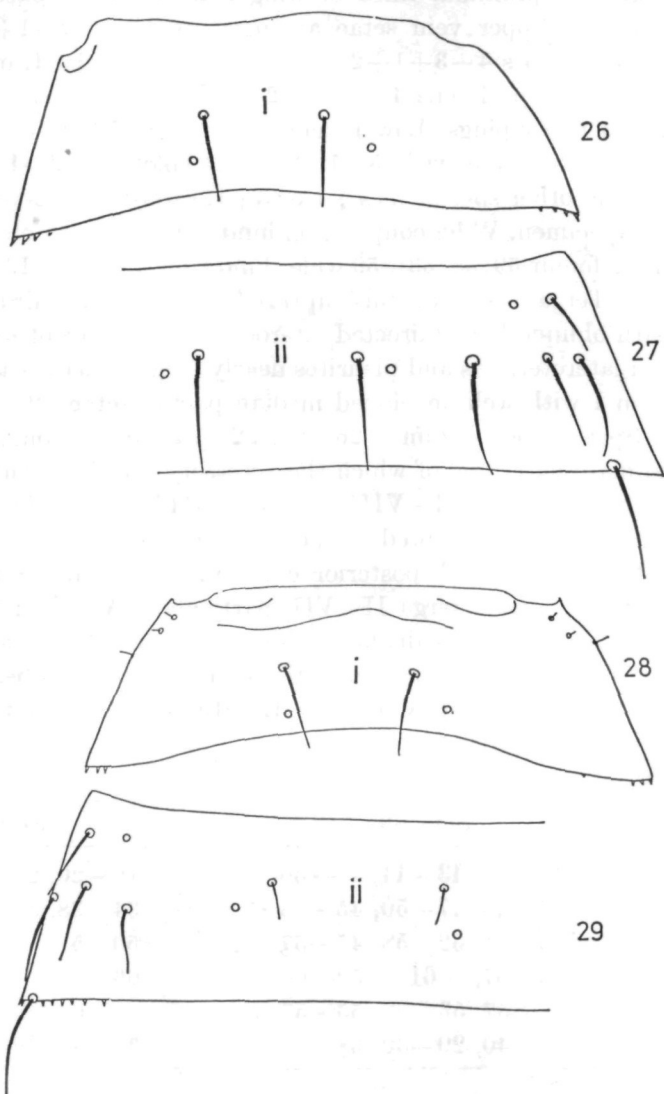
Measurements of antennal segments:

Segment	Length	Width
I	26, 23, 24—26	30, 27, 26—30
II	36, 32—36, 30—36	25—26, 24—26, 24—25
III	43, 38—39, 30—36	17, 17—18, 16—19
IV	41, 36—41, 39—44	16, 16—17, 14—16
V	46, 39—41, 40—43	16, 16—17, 15—16
IV	56, 49—52, 51—56	16, 16—17, 16
VII	20, 18—19, 20	6, 7—8, 6—8



Figs. 21—25. *Bolacothrips striatopennatus* (SCHMUTZ), ♀: 21—23: Parts of abdominal terga VI—VIII (*orizae* holotype); 24: Abdominal tergum I (*striatopennatus* holotype); 25: Left and right metaepimera (*orizae* holotype). Sculpture shown only in part in Fig. 24, omitted in others

Thorax. Pronotum 130, 128, 122—133 long; 158, 149, 137—158 wide; surface with weak closely placed transverse anastomosing striae. Inner posteroangular seta 71—72, 64—66, 55—81 long; outer 54, 42—44, 44—52 long (the outer seta of right side of holotype reduced and subequal to minor posteroangular seta); anteromarginal 35, 30—32, 28—40 long; sublateral 25—31, 23, 19—26 long. Posterior margin inner to major angulars with 5, 4, 4—6 setae. Mesonotum with median pair of setae far ahead of posterior margin. Metascutum with longitudinal lines of sculpture; discal pores absent; inner pair of setae removed



Figs. 26—29. *Bolacothrips striatopennatus* (SCHMUTZ), ♀: 26—27: Abdominal terga I—II (brachypterous ♀, India); 28—29: Abdominal terga I—II (macropterous ♀, India).
Sculpture omitted

from anterior margin. Mesoanepimeron with a dense pubescence of microtrichia; mesokatepimeron with 2 setae. Metaepimeron with 2 setae, rarely 3 as on left side of *orizae* paratype. Metasternellum rounded at apex. Fore femur 59, 55, 53—59 wide; hind tibia 146, 136, 134—154 long. Fore wing 716, 634, 640—752 long; 51, 47—48, 47—59 wide at middle. Costal setae at middle of wing 57—60, 39—55, 44—58 long; about 1.1—1.2, 0.83—1.17, 0.96—1.17 times as long as width of wing at middle. Costa with 24, 21—23, 21—27 setae. Upper vein with 12, 11—13, 12—14 setae in all; these arranged in an irregular series, those beyond proximal third of wing mostly wider spaced than the proximal ones. The upper vein setae arranged as 1+5+2+1+1+1+1 in holotype; in *orizae* types 4+3+1+2+1, or 4+3+1+1+1+1, or 4+5+1+1+1+1; or in other specimens 4+4+2+2+1, or 3+2+3+1+1+1+2+1, or in several other groupings. Lower vein with 10, 9—10, 11—13 setae in a nearly regular series. Scale with 5+1 setae on holotype; 2+1 or 4+1 on *orizae* holotype; in other specimens 4+1 or 5+1, rarely 7+1 as on right wing of one Madras specimen. Wing coupling on hind wing 3+1, on one wing alone 4+1. Legs: Fore femur 59, 55, 53—59 wide; hind tibia 146, 136, 134—154 long.

Abdomen. Terga I—VIII unsculptured in median third, distinctly sculptured with oblique lines (directed laterocaudad) laterad of seta S2; lines of sculpture on laterotergites and pleurites nearly longitudinal, without microtrichia. Tergum I with well developed median pair of setae, 26—31, 27—28, 26—28 long. Spiracle on tergum I 26—27, 22—25, 20—24 long. Tergum II with 4 lateral marginal setae, of which the accessory seta is mesad of the seta S4. Seta S4 reduced on terga VI—VIII or on V—VIII in 1 ♀. Posterior marginal comb on tergum VIII interrupted in median third, on sides made of short widely spaced microtrichia. A posterior comb of weak dentate microtrichia present on extreme sides of terga II—VII, particularly V—VII; laterotergite areas with dentate microtrichia all along posterior margin. Pleurites at posterior with large pointed teeth, their number in the various specimens being: III 2 to 3, IV 3 to 4, V 4 to 6, VI 4 to 5, VII 3 to 4. Length of setae S3 and S6 on terga III—VIII:

Tergum	Seta S3	Seta S6
III	47—50, 43—44, 42—50	19—20, 21—22, 19—25
IV	52—55, 47—50, 45—53	34—38, 34—39, 34—39
V	55—61, 52—58, 45—57	50—57, 52, 51—59
VI	63—67, 61, 52—60	66—68, 59, 56—70
VII	57, 53—58, 55—57	69, 69—71, 57—73
VIII	40, 29—30, 38—42	38—40, 36—37, 35—40

Length of setae on tergum IX: md 83—84, 87, 68—89; S1, 128—129, 122—126, 112—130; S2, 163, 159—161, 152—171; S3, —, 161, 150—173; On X: S1, 138—142, 138—142, 132—150; S2, 137—146, 134, 130—150. Length of

terga: VIII 82, 71, 63—79; IX 74, 82, 77—79; X 60, 60, 61—63. Tergum X split longitudinally through most of its length, except at extreme base. Sternum II with 2 pairs of primary setae, III—VII each with 3 pairs. Sterna II—VII with accessory setae, the number of these setae being: on II 3,—, 2—3; III 8, 8, 6—7; IV 8, 8, 8—9; V 11, 8, 8—11; VI 10, 8, 7—11; VII 8, 8, 7—10; the accessory setae arranged in a nearly regular single row across each sternum; those at middle a little shorter. Length of setae on sternum VIII: S1, 42, 42—43, 39—41; S2, 36—39, 41—44, 32—34; S3, 53—56, 46—58, 49—55. Ovipositor 187, 185—190, 193—212 long. Total body length 1408 (distended), 1092—1180 (contracted), 1392—1408 (distended).

Female (brachypterous): Colour as in the macropterous form; but gray patches not discernible except on pterothorax and abdominal segment II. Wing stub shaded at base of scale.

Structure and chaetotaxy mostly similar to macropterous form. Wing stub 118—122 long. Costa with 6—7 setae; upper vein with 2—3 setae; lower vein setae absent; scale with 3 setae (2+1). Median pair of setae on abdominal terga II—VII very strong. Seta S4 reduced on abdominal terga V—VIII.

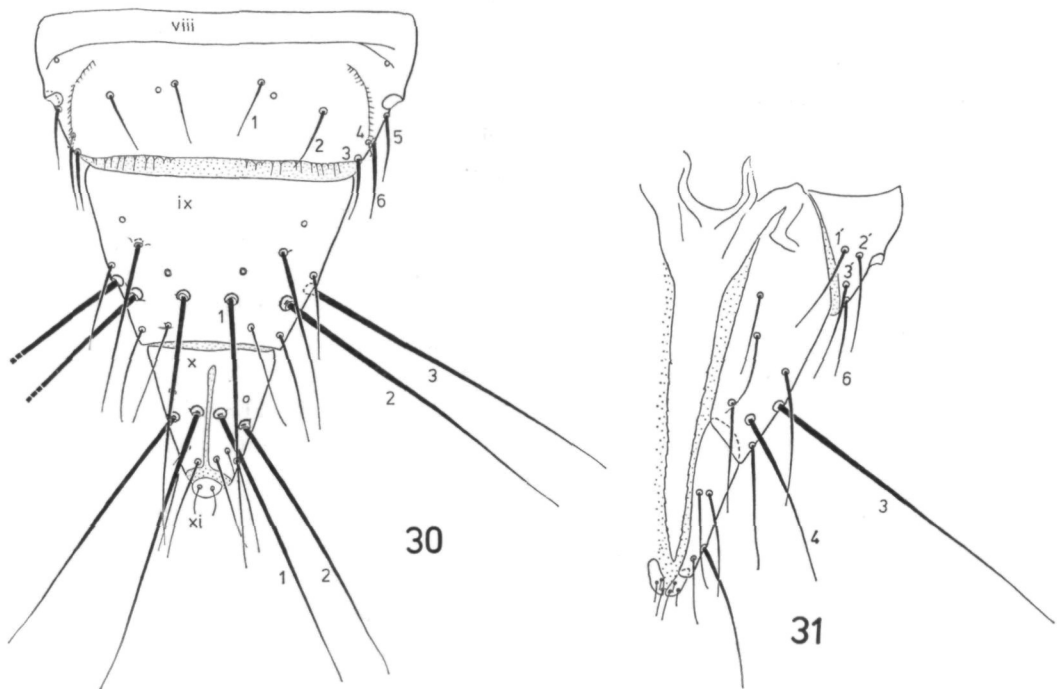
Male (brachypterous): Body pale yellow, including legs; without patches of gray brown. Postoccipital rim weakly shaded on sides; labral cup dark. Antennal segments I—IV pale yellow, V brown in distal half, VI—VIII dark brown. Setae hyaline.

Head about as long as wide, 114—122 long, 114—115 wide at eyes, 106—108 wide at cheeks. Ocelli absent. Interocular (= interocellar) setae. 36—47 long. Postocular seta IV 24—40 long. Antennae with structure similar to that in female; with the same number of setae on segments. Microtrichia on segments: III 4d5v, 4dv, 3d4v; IV 3d4v, 4d3v, 3dv, 4dv; V 4dv, 4d3v; VI 3dv, 3d3½v. L/W index of segments: III 2.06—2.12, IV 2.13—2.57, V 2.29—2.64, VI 2.93—3.06, VII 2.29—2.43. Antenna 212—220 long; L (&W) of segments: I 20—25 (24—27), II 30—32 (21—25), III 33—34 (16), IV 32—36 (14—15), V 32—37 (14), VI 44—46 (15), VII 16—17 (7).

Pronotum 102—107 long, 122 wide; inner posteroangular seta 46—63 long, outer 30—44 long; anteromarginal 24—42 long; posterior margin inner to the major angulars with 4—5 setae, usually 4. Meso- and metanotum with chaetotaxy similar to that of female, but metascutal sculpture at middle weak and indiscernible. Fore wing stub 73—88 long; costa with 5—7 setae; upper vein with 2—3 setae; lower vein with 1—2 setae; scale with 2—3 venal setae and none discal seta. Fore femur W 44—53; hind tibia L 106—124.

Abdomen with median tergal setae (S1) enlarged on segments I—VIII as in brachypterous female. Seta S4 reduced either on tergum VII alone, or on both VII and VIII, and in one case also on the left side on VI. Spiracle on tergum I 14—18 long. Terga I—VIII completely sculptured across middle. Posterior margin of terga I—VII on sides with finely tipped triangular teeth, on VIII similar teeth irregularly arranged on entire posterior margin or only part of it. Seta S3 much longer than S6 on III—V, usually longer (but except-

ionally shorter) on VI, longer or shorter or the two subequal on VII, slightly longer or subequal on VIII. Length of setae S3 and S6 respectively on tergo-pleura: III 45—55, 13—25; IV 51—54, 31—41; V 54—60, 47—52; VI 55—63, 44—59; VII 41—61, 47—62; VIII 25—36, 24—35. Accessory setae on sterna II—VII in a single row, but on VIII either in one or two irregular rows, their number being: on II 2—3, III 4—6, IV 5—8, V 6—9, VI 7, VII 5—8, VIII 6—9. Median pair of setae (S1) on sternum VIII a little ahead of posterior margin. A transverse gland area present on each of sterna III—VII, usually



Figs. 30—31. *Bolacothrips striatopennatus* (SCHMUTZ), ♀ (*orizae* paratype): 30: Terminal abdominal segments, dorsal; 31: Part of terminal abdominal segments, ventral. Sculpture omitted

somewhat narrowed in middle, its width: on III 62—90, IV 63—90, V 60—92, VI 62—81, VII 59—81; the areas about 14—24 wide on sides. Segment IX with median dorsal pair of setae 83—111 long, posterior median pair 38—52 long, lateral setae 118—138 long. Hypophallus 61—77 long. Tergum X split longitudinally. Total body length 982—1048 (distended).

Material: Sri Lanka (Ceylon): Holotype ♀ macropterous, Nuwara Eliya, 14. v. 1902, low grass and plant leaves, leg. UZEL, No. 185 (Naturhistorisches Museum, Vienna). — Island of Guam: 2 ♀ macropterous (Holotype and paratype of *Bolacidothrips orizae* MOULTON), Inarajan, leg. R. L. USINGER, coll. MOULTON No. 5488 (California Academy of Sciences, San Francisco). —

India: Tamil Nadu: 1 ♀ macropterous, Madras, 25. ix. 1959, *Panicum maximum*, leg. T. N. ANANTHAKRISHNAN; 8 ♀ macropterous, 6 ♂ brachypterous, Coimbatore, 23—24. vi. 1973, grass clumps, leg. J. S. BHATTI; 1 ♀ macropterous, Madras, 8—9. vii. 1973, *Ficus*, leg. J. S. BHATTI; Madhya Pradesh: 1 ♀ macropterous, Jabalpur, viii. 1963, grass, leg. J. S. BHATTI; 1 ♀ brachypterous, Jabalpur, iv. 1964, grass, leg. J. S. BHATTI; West Bengal: 1 ♀ macropterous, Sibpore, Howrah district, 9. iii. 1963, grass, leg. J. S. BHATTI; Delhi, 4 ♀ macropterous, iv. 1970, wheat, leg. J. S. BHATTI; Uttar Pradesh: Pant Nagar, 1 ♀ macropterous, 16. ix. 1966, on maize, leg. Y. S. ROTHAN (British Museum of Natural History, London). — Indonesia: Java: Bogor Gardens, 1 ♀ macropterous, 25. x. 1973, *Axonopus* grass, leg. L. A. MOUND (British Museum of Natural History, London). — Malaysia: Malaya: Gombak, 1 ♀ brachypterous, 29. ix. 1973, grass, leg. L. A. MOUND (British Museum of Natural History, London). China: Taiwan, 1 ♂ brachypterous (Holotype of *orientalis* PRIESNER), 4. viii. 1934, onion, leg. R. TAKAHASHI (Senckenberg Museum, Frankfurt/Main).

Distribution: India, Sri Lanka, China (Taiwan), Indonesia, Malaysia, Guam.

The brachypterous form of ♀ is being reported for the first time. The meso and metanotum are similar to the macropterous form, but the seta S4 is reduced on abdominal terga V—VIII. In the macropterous form this seta is not reduced on tergum V. The brachypterous ♀ from Malaya surprisingly lacks ctenidium on sides of abdominal terga, only tergum VIII seems to have a vestige of ctenidium mesad of spiracle. This casts doubt on the universal reliance on this feature as a generic criterion. However in other groups the feature has been found to be constant. The fore wing stub of the Malayan ♀ is 129 µm long, and there are 4—6 costal setae, 3—4 upper vein setae, 1 lower vein seta, and 2+1 or 2+0 scale setae.

Although the number of setae on antennal segment VI is found to be constant in other material, the ♀ from Java shows 9 setae on one antenna and 10 on the other.

The holotype and paratype of *orizae* are conspecific with the holotype of *striatopennatus*. The holotype of *orizae* seems to be an atypical specimen, since it lacks the median dorsal seta basad of areola on antennal segment II on both antennae. The paratype and all other specimens have this seta. The median pair of setae (S1) on abdominal tergum I is strongly developed in all specimens. But these setae on terga II—VII are weak in the macropterous form, although they are strongly developed in the brachypterous form. The sculpture on metascutum shows some variability as shown in Figs. 13—15. The inner pair of setae on metascutum are far back of anterior margin in the holotype of *striatopennatus*, but further anteriad in *orizae* types. However their position varies in different specimens between these two extremes. The length of setae on abdominal sternum VIII of ♀ is also variable. In the holotype of *striatopennatus* the setae S1 to S3 measure respectively 42, 36—39, and 53—

56 μm , and in the *orizae* paratype these measure 42—43, 41—44, and 46—58 μm . Usually however S3 is much longer than the other two setae which are subequal.

The position of median discal pores on abdominal tergum IX is variable. In the holotype they are close to seta S1 (5—9 μm distant), but 22—23 μm away from the mediodorsal seta on either side. But the distance from these two setae may be respectively 10—11 and 16—17 μm with specimens showing intermediate condition.

Bolacothrips orientalis PRIESNER (1935) described from a single male taken at Taipei (= Taihoku) in Taiwan (Formosa) by TAKAHASHI agrees with the concept of the species, and is considered a junior synonym. The species is a grass inhabiting species, although PRIESNER's specimen was from onion.

Bolacothrips continuus (KARNY 1925), described from 2 ♀ from Andalas (Sumatra) in Indonesia, is very close to *striatopennatus*. According to its original description *continuus* differs from our species in having 18—19 upper vein setae in a nearly continuous series (vs. 11—14 setae). SAKIMURA (1958: 77) (who had not seen *continuus* types) states that *continuus* has shorter antero-marginal setae of pronotum, less than 30 μm long, whereas these setae are now found to measure 28—40 μm long in *striatopennatus*. KARNY (1925) described *continuus* from 2 ♀ macropterae from Medan, Andalas. All that remains of the specimens are broken pieces of glass, but with the labels still intact. The specimens are not to be found. It appears that the slides were received in this condition by the Senckenberg Museum in 1974 at the time of acquisition of the PRIESNER collections. Subsequent efforts by Dr. ZUR STRASSEN to salvage the insects from the debris of glass remained unsuccessful. No insects were to be seen in any of the glass pieces with balsam. Unfortunately therefore the types have been lost and the status of the species cannot be solved at present, until perhaps topotypic specimens become available. In any case the species is very likely a junior synonym of *striatopennatus*.

Bolacothrips faurei, sp. nov.

Bolacidothrips orizae: FAURE, 1953, J. Ent. Soc. S. Africa, 16 (2): 203—206, figs. 5, 10, 11 (In part) (not *orizae* MOULTON 1942).

FAURE reported numerous specimens of both sexes from Pretoria. Although FAURE described cross bands on the fore wing, these are practically indiscernible in the unpotashed females before me. He mentioned "two very pale grayish cross bands, each about one-fifth as long as wing, situated approximately in the second and fourth fourths of the wing". At best, as in the ♀ holotype and another ♀ a short incomplete faint cross band restricted to the anterior half of the wing and located at the fork of vein, the second cross band extremely faint present along anterior margin of wing in the proximal half of the fourth quarter of wing. The species was described in detail by FAURE, but in view of the several characters now needed for comparison with other species, a fresh

description is provided below. The numerical data taken on two females is followed in parentheses by data given by FAURE.

Female (macropterous): Body yellow including legs. Antennal segments I—IV pale yellow, IV with faint gray at apex; V yellow in proximal half or more, gray brown in distal half; VI yellow in less than proximal half, or rarely only somewhat paler at base, otherwise VI and all of VII dark gray brown. Fore wing with a short faint grayish spot along anterior margin, restricted to the anterior half of the wing, in the second quarter of wing, and another more indistinct shading along anterior margin in proximal half of the fourth quarter

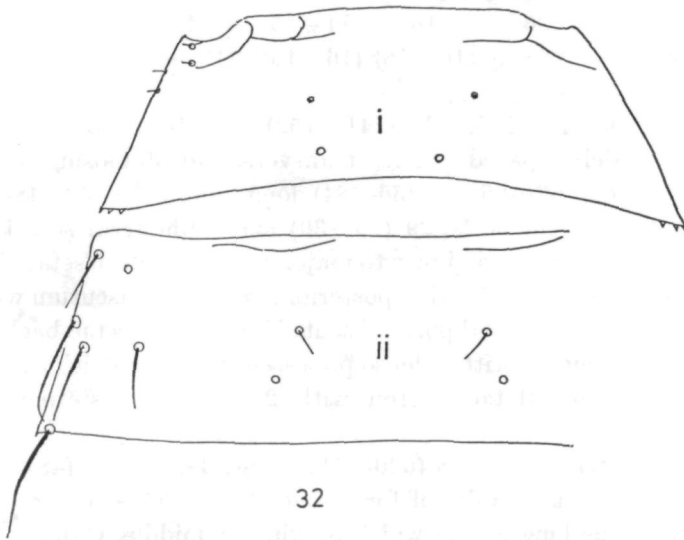


Fig. 32. *Bolacothrips faurei*, sp. nov., ♀ (Paratype): Abdominal terga I—II. Sculpture omitted

Setae numbered 1—6 (tergum VIII), 1—4 (segment IX) or 1—2 (X) are numbered from the dorsal side (Figs. 30, 31); setae numbered 1'—3' in Fig. 31 are the sternal setae

of wing; scale indistinctly shaded; however the wing shading is usually not discernible. Ocellar crescents red. Setae hyaline.

Head about as long as wide, 1.07 (1.0—1.2) times as long as wide at cheeks, L 144, 154 (146—163); W at eyes 145, 149 (149—163); at cheeks 134, 137 (138—152). Frontal costa slightly concave, 10, 12 wide. Interocellar setae placed one on either side of the fore ocellus, 40—44, 46—47 (28—52) long; anteocellar setae minute, not measurable. Postocular setae: I 20—22, II 16, III 16, IV 28, V 13—15, VI 17 long. Maxillary palp 2-segmented; Length/Width of segments: I 10 (10—12)/7 (6—8), II 20 (18—22)/4 (4).

Antennae 7-segmented. Number of setae on segments: I 6+5, II 7 (including middorsal seta basad of areola), III 5, IV 5, V 6, VI 11 (5 around middle, and 6 distal to these), VII 9 (a proximal ring of 3 along with seta-like

sense cone, 3 subapical, and 3 apical). Antennal II with 2—3 incomplete rows of microtrichia (distinct only in macerated specimen); III 4dv or 5d, 4v; IV 4d, 3v; V 4dv or 3d, 4v or 4d, 3v; VI 3dv or 4d $\frac{1}{2}$ v. Antennae about 1.90 (1.7) times as long as head, 275, 268 (247—283) long. L/W index of segments: III 2.75 (2.62—2.75), IV 2.87—3.07 (2.50), V 2.63—2.69 (2.50—3.00), VI 3.44 (3.38—3.75), VII 2.71 (2.50—2.88). Measurements of antennal segments:

Segment	I	II	III	IV	V	VI	VII
Length	25 (16—25)	34—36 (24—36)	44 (42—48)	43, 44 (40—45)	42—43, 44 (40—48)	55, 55—59 (54—61)	19 (20—23)
Width	28 (28—32)	26 (28)	16 (16—18)	14—15 (16—18)	16 (16—17)	16	7 (7—8)

Thorax. Pronotum 128, 132 (141—152) long; 149, 158 (163—185) wide; surface with widely spaced, faint, transverse anastomosing striae. Inner posteroangular seta 63—65, 63 (56—84) long; outer 55, 50 (48—73) long; prominent anteromarginals 28, 29 (20—39) long; sublateral seta 19 long, not conspicuous. Posterior margin inner to major angulars with 6 setae. Mesonotum with inner pair of setae far ahead of posterior margin. Metascutum with longitudinal lines of sculpture; discal pores absent; inner pair of setae back of anterior margin. Mesoanepimeron with a dense pubescence of microtrichia; mesokatepimeron with 2 setae. Metaepimeron with 2 setae. Metasternellum bluntly pointed at apex.

Wings. Fore wing 656, 688 (620—717) long; 48, 50—51 (48—56) wide at middle. Costal setae at middle of fore wing 61—65, 55—59 long; 1.27—1.35, 1.08—1.18 times as long as the width of wing at middle. Costa with 22—24, 21—22 (17—22 *) setae. Upper vein with 15, 13 (10—16) setae; the setae being arranged as 4+2+2+6+1 or 4+4+6+1 in holotype, or 4+4+1+1+2+1 or 4+3+6 (the setae of the last group widely spaced) in paratype. Lower vein with 11, 11—12 (8—12) setae. Hind wing coupling 3+1, on one wing 4+1. Legs: fore femur 59, 58 (52—67) wide; hind tibia 144, 142—144 (135—157) long.

Abdomen. Terga I—VIII unsculptured in median third, distinctly sculptured with oblique lines laterad of seta S1; lines of sculpture on laterotergites and pleurites nearly longitudinal, without microtrichia. Tergum I with seta S1 vestigial, represented only by indistinct setal bases lying at a level anterior to the median discal pores. Spiracle on tergum I 16 long. Tergum II with 4 lateral marginal setae, of which the accessory seta is mesio-caudad of seta S4. Seta S4 reduced on terga VI—VIII. Posterior marginal comb on VIII weak and restricted to each lateral third, comb hair about 4 long. A posterior comb of weak dentate microtrichia present on extreme sides of terga I—VII;

*) FAURE recorded 15—20 setae but two setae are added to his recording since it seems he had not counted the seta at extreme base and the one at tip of wing.

laterotergites with dentate microtrichia all along posterior margin. Pleurites at posterior margin with large pointed teeth. Length of setae S3 and S6 on terga III—VIII:

Tergum	Seta S3	Seta S6
III	44—46, 40	28—31, 21—22
IV	47, 46—50	44—46, 40—42
V	54—55, 54—61	67—69, 59—65
VI	55—59, 59	69—71, 71
VII	54—62, 61—67	75, 71—73
VIII	30—35, 40—44	38—40, 40

Length of setae on tergum IX: md 79—81, 87—89; S1, 124—129, 106; S2, 163—165, 165—171; S3, 167—173, 161—171 (according to FAURE, S2 and S3 measure 152—180 long). Length of terga: VIII 62, 67; IX 63, 60; X 60, 59. Tergum X split longitudinally through most of its length, except at extreme base. Sternum II with 2 pairs of primary setae, III—VII each with 3 pairs. Sterna II—VII with accessory setae, their number being: on II 3, III 10, IV 13 (9—16), V 14 (10—18), VI 14 (11—17), VII 14; the accessory setae being arranged in two or three irregular rows on most of the sterna; the accessory setae on sides shorter than primary marginal setae. Length of setae on sternum VIII: S1, 41; S2, 33; S3, 60. Ovipositor —, 187 long. Total body length (distended): 1488 (1213—1543).

Male (macropterous): Colour as in the female. Head 123 (126—140) long; 123 (119—133) wide at eyes; 123 (119—133) wide at cheeks. Interocellar setae 34 (20—44) long. Postocular seta IV 21—22 long.

Antennae similar in structure to female. Segment VI with 11 setae on one antenna and 10 on the other, there being only 5 distal setae in the latter case. Segment II with a single row of microtrichia basad of areola; III 4dv; IV 3dv or 3d4v; V 4dv; VI 3dv. Antennae 1.82—1.91 (1.8) times as long as head, 224—236 (210—247) long; L/W index of segments: III 2.25 (2.13—2.50), IV 2.20 (2.00—2.79), V 2.33—2.46 (2.25—2.50), VI 2.69—2.94 (3.13—3.38), VII 2.86—3.00 (2.25—2.50). Measurements of segments:

Segment	I	II	III	IV	V	VI	VII
Length	21—22 (16—20)	30 (24—32)	36 (34—40)	33 (32—40)	35—37 (36—40)	43—47 (50—54)	18—20 (18—20)
Width	26 (26—28)	24 (24—26)	16 (16)	15 (14—16)	15 (16)	16 (16)	6—7 (8)

Pronotum 106 (105—119) long, 125 (126—161) wide. Inner posteroangular seta 66 (32—68) long, outer 46—49 (32—56) long; anteromarginal 23 (20—36)

long; sublateral 12—19 long. Posterior margin with 6 setae inner to the major angulars.

Fore wing 472—492 (412—510) long, 36 (38—42) wide at middle. Costal setae at middle of wing 41—48 long, 1.14—1.33 times the width of wing at middle. Costa with 20 setae. Upper vein with 10—11 (10—13) setae, of which there are 3+3 in proximal half and 4 or 5 scattered in distal half. Lower vein with 9 (7—10) setae. Scale with 4+1 setae. Fore femur 48—50 (45) wide; hind tibia 118 (112—133) long.

Abdomen. Chaetotaxy as in female. Tergum I almost completely sculptured with widely spaced weak transverse lines which scarcely anastomose; II unsculptured medially in posterior third; III—VII unsculptured medially in posterior half mesad of median discal pores, the sculpture in middle very faint, discernible with difficulty; VIII completely sculptured across middle. Tergum I with seta S1 vestigial on left side, but 4 μ m long on right side. Spiracle on tergum I 9—11 long. Comb on posterior margin of VIII complete, sparse and made of shorter hair in middle. Length of setae S3 and S6 on terga III—VIII:

Tergum	III	IV	V	VI	VII	VIII
Seta S3	32—34	33	40	47	47	29, 35.
Seta S6	15	26—29	42—50	53	53—57	33, 28.

Sterna II—VIII with accessory setae usually in about two irregular rows, their number being: on II 4, III 7, IV 9, V 8, VI 10, VII 11, VIII 8. A transverse gland area present on each of sterna III—VII, its width: on III 65, IV 69, V 71, VI 65, VII 65; these areas 56—92 wide according to FAURE. Setae on segment IX: dorsal pair 106—108; lateral pair 142—150 long; posterior median pair 54 long. Hypophallus 82 long. Total body length (distended) 1168 (900—1275).

Material: South Africa: 1 ♀ holotype, Pretoria, Transvaal, ii. 1948, *Pennisetum clandestinum* Hochst., leg. J. C. FAURE (in South African National collection of Insects). Paratypes ♀♂ with the same data, but some of them collected iii. 1947 and v. 1950. Some paratypes are present in the author's collection, in the Senckenberg Museum and in the British Museum.

Bolacothrips faurei is separable from *striatopennatus* by these features: (i) median pair of setae on abdominal tergum I vestigial, exceptionally in male 4 μ m long (vs. 26—31 μ m long), (ii) gray shadings on abdominal segment II and others apparently absent, (iii) shadings on pronotum absent, (iv) antennal segment V and VI yellow in about proximal half (vs. completely dark gray brown), (v) antennal II with one or two rows of microtrichia (vs. absent), (vi) antennal VI with 11 setae (vs. 9 setae), (vii) spiracle on abdominal tergum I 16 μ m long, in male 9—11 μ m (vs. 20—27 μ m long), (viii) accessory seta on

tergum II placed mesiocaudad or caudad of seta S4 (vs. mesad and often somewhat anterior of S4), (ix) accessory setae on abdominal sterna arranged in two to three irregular cross rows on most of the sterna (vs. arranged in a nearly regular single row), and (x) accessory setae on sides of sterna shorter than primary marginal setae (vs. subequal). The new species is separable from *graminis* (PRIESNER) by the unshaded apex of abdomen and terminal setae, shorter antennals III and IV (♀, ♂ respectively: III 42—48, 34—40 µm; IV 40—45, 32—40 µm; vs. in *graminis* III 56—59, 45; IV 53, 45 µm), and stouter antennal III (♀, ♂ respectively: III 2.6—2.8, 2.1—2.5; vs. in *graminis* 3.3—3.9, 3.2).

Bolacothrips pulcher (GIRAULT), comb. nov.

Plesiothrips pulcher GIRAULT, 1929, Description of a case of lunacy in Homo and of new six-legged Articulates, p. 2. ♀. Holotype ♀, Australia: Mt. Cootha, Queensland (Brisbane Museum).

Material: Australia: Queensland: 2 ♀, Mt. Coot-tha, 22. iii. 1968, on *Themeda australis*, leg. L. A. MOUND; 8 ♀ 3 ♂, Mt. Tamborine, 21. iii. 1968, grasses, leg. L. A. MOUND; 2 ♀, Mt. Tamborine, 21. iii. 1968, *Abelia* sp. flowers, leg. L. A. MOUND; 1 ♀ 2 ♂, Mt. Malloy, 35 km SE of Mossman, 23. vii. 1968, grass, leg. L. A. MOUND; 1 ♂, Red Lynch Crystal, Cascade Road, 24. vii. 1968, on *Themeda australis*, leg. L. A. MOUND. New South Wales: 1 ♂, 64 km S of Mackay, 18. vi. 1968, on Casuarina, leg. L. A. MOUND. All of the above material in the collection of the British Museum (Natural History), London.

One slide of the above material from Mt. Tamborine (21. iii. 1968, grasses) also bears a note by Dr. MOUND: "compared with Type". Dr. MOUND upon my request checked his notes and found that GIRAULT's type, 1 ♀ was studied during xi. 1969 and had the following data: Mt. Cootha, 27. xii. 1928, Taringa. The species is readily recognizable by the dark terminal abdominal segments. However it needs to be studied in detail and compared with *graminis* (PRIESNER).

A second Australian species of *Bolacothrips* is also represented in the British Museum collections. This species has unshaded distal abdominal segments and is close to *striatopennatus*, with which it might even be identical. The present author has not studied these specimens in detail to enable a specific determination.

Checklist of species of *Bolacothrips* UZEL:

- africanus* FAURE 1942 ♀♂. Mozambique, South Africa.
- bicolor* ANANTHAKRISHNAN 1960 ♀. India (Tamil Nadu).
- continuuus* (KARNY 1925), comb. nov. ♀. Indonesia (Andalas = Sumatra).
(= *Fulmekiola continuua* KARNY 1925)
- evittatus* (SAKIMURA 1958), comb. nov. ♀. Japan, India (Tamil Nadu).
(= *Bolacidothrips evittatus* SAKIMURA 1958)
- faurei* sp. nov. ♀♂. South Africa.
(= *Bolacidothrips orizae*, FAURE 1953, nec MOULTON 1942)

graminis (PRIESNER 1930), comb. nov. ♀♂. Egypt.

(= *Bolacidothrips graminis* PRIESNER 1930)

indicus (ANANTHAKRISHNAN 1966), comb. nov., stat. nov. ♀♂.

India (Tamil Nadu, Kerala, Gujerat).

(= *Bolacidothrips graminis indicus* ANANTHAKRISHNAN 1966)

jordani UZEL 1895 ♀♂. Europe.

(= *Thrips incompletus* OETTINGEN 1942)

pulcher (GIRAULT 1929), comb. nov. ♀♂. Australia.

(= *Plesiothrips pulcher* GIRAULT 1929)

striatopennatus (SCHMUTZ 1913), comb. nov. ♀♂.

India, Sri Lanka, Indonesia, Malaysia (Malaya), China (Taiwan), Guam.

(= *Thrips striatopennata* SCHMUTZ 1913)

(= *Bolacothrips orientalis* PRIESNER 1935, syn. nov.)

(= *Bolacidothrips orizae* MOULTON 1942, syn. nov.)

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