INSECTA MATSUMURANA

NEW SERIES 52: 81-103

DECEMBER 1995

SOME PANCEAETHOTHripinae FROM NEPAL, MALAYSIA
AND THE PHILIPPINES
[THYSANOPTERA: TEREBRANTIA: THRIPIDAE]

By IWAO KUDÔ

Research Trips for Agricultural and Forest Insects in the Subcontinent of India,
Scientific Report No. 50.
Systematic and Ecological Surveys on Some Plant-Parasitic Microarthropods
in Southeast Asia, Scientific Report No. 22.

Abstract

KUDÔ, I. 1995. Some Pancaheatothripinae from Nepal, Malaysia and the Philippines
Helonothrips longisensibilis and Onilliella pallidizonata n. spp. are described from Semenan-
jung Malaysia. The males of three species, Astrothrips chisinioensis, Copidothrips octarticulatus
and Panchaetothrips stephani, are described for the first time. New locality records are given for
17 species. Geographic distribution is noted for 47 species occurring in Japan, Southern China,
Nepal and Southeast Asia.

Author's address. Ōya 2483-43, Sizuoka-si, 422 Japan.

Contents. Introduction — Descriptions and records — Geographic distribution — Acknowl-
edgements — References.

Supported by Grants-in-Aid, Ministry of Education, Science and Culture, Japanese Govern-
ment, No. 58041001, No. 59043001, No. 02041005 and No. 05041078.
INTRODUCTION

The present paper is a report on the taxonomic study of the Panchaetothripinae collected by myself in connection with the projects Systematic and ecological surveys on some plant-parasitic microarthropods in Southeast Asia and Research trips for agricultural and forest insects in the Subcontinent of India. The Panchaetothripinae are mostly distributed in the tropics and subtropics, having many peculiar features. Although the present collection covers only about half the species of the subfamily known in Southeast Asia, the collected specimens are valuable because of insufficient information in this area.

About half the specimens of Malaysian species and those of Philippine species, including the holotypes of the new species, will be deposited in Entomology Section, Forest Research Institute of Malaysia (FRIM), Kepong, Selangor, Malaysia, and in Museum of Natural History, University of the Philippines at Los Baños (UPLB), Laguna, the Philippines, respectively. The host plants of Malaysian material, those of Philippine material and those of Nepalese material were identified by Mr. K.M. Kochummen, ex-Botanist, FRIM, by Dr. E.S. Fernando, UPLB, and at the Katmandu Herbarium, respectively. The abbreviations used below are as in Kudo (1984).

DESCRIPTIONS AND RECORDS

Anisopilothrips venustulus

*Heliothrips venustulus* Priesner 1923: 89-91.


This species, so far known mainly from the Pacific Islands in the tropics, is newly recorded from Sarawak. It is similar to *Elixothrips brevisetis* but differs in having peculiar paired areas of sculpture on abdominal segments III-VII.


Astrothrips chisinliaoensis

**Chen 1980: 174-175; Chen 1981: 118-119.**

This species, so far known only from Taiwan with the female, is newly recorded from Semenanjung Malaysia. Some quantitative characters in the female are as follows: A₃-A₆ L/W 3.54-4.00, 2.00-2.25, 1.38-1.65 and 2.50-3.13 respectively. Metascutellum W/L 3.50-4.46. Fore wing with 28-30 anterior and 53-54 posterior FH; with 13-18 setae on costa, 10-14 on fore vein and 6-10 on hind vein. Hind wing with 68-70 FH. T₉/T₁₈ L/W 0.76-0.83. B₁-B₃ on T₉ 0.53-0.66, 0.47-0.56 and 0.39-0.72 as long as T₉ respectively. B₁ on T₁₀ 0.58-0.76 as long as T₁₀. Ovipositor 2.35-2.48 times as long as pronotum.

The male is recorded here for the first time: Abdomen lighter than head and thorax; metascutellum W/L 4.81; B₁ on T₁₀ as long as T₁₀ (Fig. 1.5); S₆ and S₇ with
Astrothrips chisinliaoensis. 1, ♀, head and pronotum. 2, ♀, right antenna. 3, ♀, meso- and metanotum. 4, ♀, T₃. 5, ♂, T₅-T₁₀. 6, ♂, S₆ and S₇.

U-shaped glandular area (Fig. 1.6). Body L 0.9 mm.

The Malaysian specimens examined are slightly different from the Taiwanese ones in their smaller size and the abdominal terga (Fig. 1.4) more clearly polygonally reticulate by sharp striae, while in the Taiwanese specimens the terga are more longitudinally elongately reticulate posteriorly by dull striae.

A. chisinliaoensis differs from the congeners in having a pair of apically expanded setae on T₁₀. This species almost agrees with A. aucubae in the head with a strongly elevated ocellar hump (Fig. 1.1), the pronotum with raised sculpture on
posterolateral areas and without a transverse carina close to the posterior margin, and A₄ with an additional sense cone reaching or surpassing the apex of simple primary cone (Fig. 1.2). Besides the expanded setae on T₁₀ the following differences are noted: metascutum (Fig. 1.3) without a median longitudinal ridge of sculpture against with the ridge in A. aucubae and ovipositor 2.35–2.48 times as long as pronotum against 1.91–2.13 times in A. aucubae.


Astrothrips globiceps

_Heliothrips globiceps_ Karny 1913, Arch. Naturgesch. 79: 125.


This species is similar to _A. aucubae_, but differs in the pronotum with a transverse ridge of raised sculpture close to posterior margin, the metascutum with a median longitudinal ridge of sculpture indistinct, and the abdominal terga covered with more clearly polygonal reticules. This Oriental species probably feeds on the leaves of various plants.


Astrothrips lantana


This species, so far known only from Madhya Pradesh, India, is newly recorded from Nepal. The Nepalese specimens have a weak median longitudinal ridge of sculpture on the metascutum. This species differs from _A. aucubae_ in the head with an ocellar hump small and the pronotum posterolaterally without raised sculpture.


Astrothrips tumiceps


This polyphagous species has so far been known from India, Burma, Java and the Philippines. It differs from the congeners in having the mesonotum deeply notched anteriorly, and the A₃ and A₄ with sense cones forked in the male and simple in the female.
Specimens examined. The Philippines — Palawan: Batarasa: Tagwayan, 1♀
(Mallotus glandulosus, Euphorbiaceae), 2♂ (Centrosema plumieri, Leguminosae),
VIII.18.1993; Brooke's Point: Maasin, 1♀ (Lantana camara, Verbenaceae), VIII.24.
1993; Mindoro: Calapan: Suqui, 9♀ (Dysoxylum decandrum, Meliaceae), VIII.12.
1994.

Caliothrips graminicola

Hercothrips graminicola Bagnall and Cameron 1932: 417-419.
This grass· living species, widely distributed in India, Sri Lanka, Thailand, South
Africa and Australia, is newly recorded from Nepal.
Specimens examined. Nepal — Bagmati: Katmandu Valley: Kakani (2,000
m), 3♀ (grass), VIII.30.1983.

Copidothrips octarticulatus

Heliothrips (Parthenothrips) octarticulata Schmutz 1913: 993-994.
Copidothrips formosus Hood 1954: 188-191; Mound 1970: 52; Wilson 1975: 100-101; Reyes
1994: 146-147.
This species, so far known from Seychelles, Sri Lanka and some Pacific Islands,
is recorded from the Asian continent for the first time. The eye has six dark facets.
The male is recorded here for the first time: Head and thorax brown, partly
yellowish; abdomen generally orange yellow, brown on entire of segments I and II,
anterior parts of III–VII, posterior parts of III–VI and X, and median part of IX. T₉
(Fig. 2.1) with a pair of median setae thick, B₁ 0.47, B₂ 0.87, B₃ 2.52 times and B₄
1.84 times as long as T₉ respectively. S₄–S₇ (Fig. 2.2) each with a large, U-shaped
glandular area. Body L 1.2 mm.
Specimens examined. Semenanjung Malaysia — Perlis: Anak Chelong:
Hutan Bintang, 2♀ 1♂ (Calopogonium mucunoides, Leguminosae), XI.14.1991. The
Philippines — Palawan: Puerto Princesa: Canigaran Beach, 7♀ (Asystacea

Elixothrips brevisetis

Tryphactothrips brevisetis Bagnall 1919: 257.
Elixothrips brevisetis, Stannard and Mitri 1962: 203-205; Wilson 1975: 111-112; Okajima
This species, mainly known from the Pacific Islands, is newly recorded from
Sarawak. It is found on various plants but may breed on ferns, e.g., Angiopteris
evecta, judging from the collection data in Kepong, Malaysia, and Mt. Makiling and
Mt. Halcon, the Philippines. The eye has six dark facets. In the male specimens
from Mt. Halcon, Mindoro, abdominal glandular areas show some variations: on S₆
mostly absent, when present small and circular; on S₇ usually U-shaped, medially
separated, occasionally L-shaped, short transverse, or small and circular; and on S₈
mostly U-shaped, medially separated but rarely completely (see Kudô 1980: Fig. 9).
Specimens examined. Semenanjung Malaysia — Selangor: Kuala Lumpur:
Kepong, 3♀ (Pleocnemia irregularis, Dryopteridaceae), VIII.5-23.1990, 25♀ (An-
Fig. 2. *Copidothrips ocutarticulatus*, ♂. 1, *T*<sub>1</sub>–*T*<sub>10</sub>. 2, *S*<sub>5</sub>–*S*<sub>7</sub>.


*Helionothrips aino*

*Helionothrips aino* Ishida 1931: 34-36.

This species, so far known from Sakhalien, Korea, Japan, Taiwan and Southern China, is newly recorded from Nepal. The eye has six dark facets. The Nepalese specimens listed below slightly differ from the Japanese form in the mid and hind tibiae yellow in apical half, in male S7 and S8 with a little larger glandular area, and in some quantitative characters, particularly ovipositor L/pronotum L larger, and metascutellum W/L and B2 on T9/T9L smaller (Fig. 3). These differences are here regarded as geographic variations, because the Japanese form is also considerably variable in many quantitative characters (Kudo 1992b: 275). Closer studies are required on various populations in respective areas.


*Helionothrips annosus*


This species was described from five females and one male collected on *Litsea* sp., Lauraceae, by R. Takahashi in Taiwan in 1936, and is newly recorded from the Philippines, Semenanjung Malaysia and Sarawak. It feeds on *Cinnamomum iners*.

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Fig. 3. Differences between the Japanese form (J) and the Nepalese form (N) of *Helionothrips aino* in three ratios. 1, ovipositor length per pronotum length. 2, metascutellum width per metascutellum length. 3, seta B2 length on T9 per T9 medial length.
Fig. 4. *Helionothrips annosus*. 1, ♀, meso- and metanotum. 2, ♀, T₉. 3, ♂, T₉ and T₁₀.

and *Litsea* spp., Lauraceae. The eye has no dark facets. The metasclerite (Fig. 4.1) has a raised triangle of sculpturing extending onto the metasclerite. The abdominal terga (Fig. 4.2) are reticulate nearly throughout and have wrinkles in reticules on posterior two-thirds of each tergum. Male T₉ (Fig. 4.3) has two pairs of thick setae.

This species is very distinct in having a complete comb of microtrichia on T₈ and slender abdominal segments IX and X. The Philippine *H. guttatus* Reyes (1994: 150-153) almost agrees with *H. annosus* in having the above characters, but the original description of *H. guttatus* states that the male has a transversely elongate glandular area on each of S₂ to S₄.


**Helionothrips cephalicus**


This grass-living species, so far known from Japan, Taiwan and Hongkong, is newly recorded from Nepal and Semenanjung Malaysia. It differs from the con­
geners in having a large abdominal segment IX and in the head and thorax with many prominent wrinkles in reticules. The eye has six dark facets.


**Helionothrips longisensibilis** n.sp.

Diagnosis. Sense cones extremely long, forked sense cones on A3 and A4 more than 2.0 times as long as respective segments. Head and thoracic nota with
wrinkles in reticules. Fore wing fasciate, with a cluster of dark and enlarged
microtrichia at fork of veins. In male T9 with 2 pairs of stout setae subequal in
length, without wartlets on posterior median area; S7 and S8 with oval glandular area.

Female. Dark brown, extreme anterior margin of head paler. Fore leg brown, mid and hind legs dark brown, extreme apex of mid tibia and apical fourth of hind

sensilla placed on posterior sixth to third; metascutellum entirely reticulate, transversely elongate, W/L 3.81–4.67 (4.14 ± 0.23, 12). Fore wing (Fig. 5.4) with a cluster of dark and enlarged microtrichia at fork of veins; with 24–29 (25.6 ± 1.4, 13) anterior and 63–68 (65.1 ± 1.9, 12) posterior FH; with 23–28 (26.1 ± 1.6, 13) setae on costa, 8–9 on fore vein and 5–6 on hind vein. Hind wing with 69–81 (76.3 ± 3.0, 12) FH.

Abdomen with wrinkles in almost all of lateral reticules on T2–T8 (Fig. 5.6); T1
(Fig. 5.5) completely and T9 almost completely reticulate; antecostal lines on T9–T8
divided into broad arches, but not issuing caudad into scallop areas; T8 with comb
Fig. 5. *Helionothrips longisensibilis*. 1, ♀, head and pronotum. 2, ♂, right antenna. 3, ♀, meso- and metanotum. 4, ♀, fore wing. 5, ♂, T₁. 6, ♀, T₅. 7, ♂, T₅-T₁₀. 8, ♂, S₁ and S₅.
interrupted medially by the distance of combined intervals of 5–7 microtrichia; segments IX and X short and broad, ca 1.8 times and 1.6 times as wide as long respectively; T_9/L/T_{10}L 1.75–1.95 (1.88±0.07, 11); B_1 on T_9 0.68–0.86 (0.77±0.05, 11), B_2 0.75–0.89 (0.80±0.04, 11) and B_3 0.53–0.60 (0.56±0.02, 11) as long as T_9 respectively; B_1 on T_{10} 1.10–1.37 (1.23±0.09, 11) times and B_2 1.00–1.21 times as long as T_{10} respectively; ovipositor long, 2.17–2.35 (2.26±0.06, 10) times as long as pronotum.

Measurements (µm). Body L 1.1–1.2 mm. Head L 90–100, W 176–192; pronotum L 98–108; T_9/L 70–80; T_{10}L 37–42; B_1 on T_9 50–64, B_2 54–65, B_3 40–44; B_1 on T_{10} 44–54, B_2 40–46; ovipositor L 228–248. Antenna 246–266 in total L; L(W) of antennal segments as follows: A_1 20–22 (22–24), A_2 32–36 (28–29), A_3 52–58 (22–25), A_4 50–56 (22–24), A_5 37–43 (17–19), A_6 21–24 (16–17), A_7 6–8 (8–10), A_8 22–25 (4–5); forked sense cone on A_3 0.50–0.64, on A_5 2.94–3.60 times as long as respective segments. Metascutellum W/L 3.92–4.36. Fore wing with 21–23 anterior and 53–57 posterior FH; with 20–22 setae on costa, 7 on fore vein and 5 on hind vein. Hind wing with 58–63 FH. T_9 (Fig. 5.7) with 2 pairs of stout setae subequal in length, anterior setae (32–34 µm) 0.48–0.56 and the posterior (29–33 µm) 0.45–0.51 as long as T_9 respectively; without chitinous wartlets on posteromedian area. Sterna clearly polygonally reticulate; S_7 and S_8 (Fig. 5.8) with small to medium-sized oval glandular area, that on S_7 smaller. Body L 0.9–1.0 mm.

Male. Colored as in female. A_3–A_8 L/W 2.17–2.41, 2.14–2.27, 2.06–2.38 and 1.13–1.25 respectively; forked sense cone on A_3 2.00–2.28 times, that on A_4 2.38–2.46 times and inner cone on A_4 2.94–3.60 times as long as respective segments. Metascutellum W/L 2.78–3.03 (2.88±0.09, 11). Fore wing with 23–29 (25.7±2.1, 13) anterior and 48–58 (52.1±2.8, 10) posterior FH; with 22–27 (23.6±1.4, 13) setae on costa, 7–9 (7.8±0.7, 15) on fore vein and 4–6 (4.5±0.7, 13) on hind vein. Hind wing with 62–69 FH. T_{9}L/T_{10}L 1.54–1.77 (1.66±0.06, 11). B_1 on T_9 0.74–0.81 (0.77±0.02, 11), B_2 0.73–0.85 (0.79±0.04, 11) and B_3 0.50–0.58 (0.55±0.03, 11) as long as T_9 respectively. B_1 on T_{10} 0.93–1.12 (1.06±0.05, 11) times and B_2 0.92–1.05 times as long as T_{10} respectively. Ovipositor 1.96–2.19 (2.09±0.10, 11) times as long as pronotum.


_Helionothrips parvus_


This grass-living species, so far known only from Uttar Pradesh, India, is newly recorded from Nepal. Some quantitative characters in the female are as follows: IOD/OOD 2.00–3.33, OOD/IOD 2.25–2.80. A_3–A_8 L/W 2.36–2.71, 1.82–2.09, 1.65–1.79 and 1.37–1.58 respectively; forked sense cone on A_3 0.65–0.79, that on A_4 1.16–1.29 times and inner cone on A_4 1.93–2.31 times as long as respective segments. Metascutellum W/L 2.78–3.03 (2.88±0.09, 11). Fore wing with 23–29 (25.7±2.1, 13) anterior and 48–58 (52.1±2.8, 10) posterior FH; with 22–27 (23.6±1.4, 13) setae on costa, 7–9 (7.8±0.7, 15) on fore vein and 4–6 (4.5±0.7, 13) on hind vein. Hind wing with 62–69 FH. T_{9}L/T_{10}L 1.54–1.77 (1.66±0.06, 11). B_1 on T_9 0.74–0.81 (0.77±0.02, 11), B_2 0.73–0.85 (0.79±0.04, 11) and B_3 0.50–0.58 (0.55±0.03, 11) as long as T_9 respectively. B_1 on T_{10} 0.93–1.12 (1.06±0.05, 11) times and B_2 0.92–1.05 times as long as T_{10} respectively. Ovipositor 1.96–2.19 (2.09±0.10, 11) times as long as pronotum.

**Heliothrips haemorrhoidalis**


_Thrips haemorrhoidalis_, Burmeister 1838, Handbuch der Entomologie 2: 412.

This widely distributed and highly polyphagous species is newly recorded from Nepal and Sarawak.


**Oneilliella pallidizonata** n. sp.

**Diagnosis.** Abdominal segment II pale. Legs yellow except for basal two-thirds of mid femur dark brown. A₁—A₄ pale yellow. Fore wing with submedian and apical pale patches along with a subbasal pale area. T₂-T₅ smooth on median half.

Female. Dark brown (Fig. 6.1); head yellowish anterior of fore ocellus and between antennal bases; abdominal segment I pale, brownish medially, II entirely pale; segments VIII–X paler. Antenna yellow, A₅ brown, A₇ and A₈ pale brown or gray. Legs yellow, coxae and basal two-thirds of mid femur dark brown. Fore wing brown, with three pale areas large and almost hyaline, submedian and apical pale areas slightly tinged with brown; wing setae white on pale areas, brown on dark areas.

Head (Fig. 6.2) W/L 1.57–1.70; polygonally reticulate, the reticules with weak longitudinal wrinkles except posteromedian ones with minute dots; hind ocelli large, IOD/HOW 1.14–1.33; OOD/IOD 3.13–3.50; eye without dark facets. Antenna (Fig. 6.3) 2.6–2.9 times as long as head; A₄ longest, L/W 3.11–3.53, constricted apex much shorter than median swollen part, and shorter and wider than the apex of A₄; A₄/L/W 2.35–2.53, simple sense cone surpassing apex of forked cone and 1.28–1.39 times as long as A₄; A₅ L/W 2.10–2.56; A₆ pedicellate, L/W 1.88–2.06, inner sense cone surpassing apex of A₆ and 2.00–2.31 times as long as A₆; A₇ L/W 1.60–1.86; A₈ L/W 6.2–8.0; A₉ L/W/A₉ L 2.3–3.2; apical seta on A₉ 1.63–1.86 times as long as A₉; A₉ with 2–3 dorsal and 3 ventral rows of microtrichia, A₈ with 3–4 rows, A₈ with 1–2 dorsal and 2–3 ventral rows.

Pronotum (Fig. 6.2) polygonally reticulate, with weak longitudinal wrinkles in reticules, with about 15 reticules on longitudinal middle line and on transverse middle respectively; with 26–29 setae in all. Mesonotum with weak transverse wrinkles in reticules; metanotum (Fig. 6.4) entirely polygonally reticulate, scutum with weak longitudinal wrinkles in reticules, a pair of campaniform sensilla close together at middle; scutellum W/L 3.70–4.17, without internal wrinkles. Mesosternum with about 28 setae, metasternum with 12–14. Fore wing with 20–21 anterior
Fig. 6. Oneilliella pallidizonata, ♀. 1, total view showing color pattern. 2, head and pronotum. 2, right antenna. 4, meso- and metanotum. 5, T₁ and T₂. 6, T₃.

and 50–55 posterior FH; with 19–21 setae on costa, the seta at middle of wing 0.95–1.07 times as long as wing W at middle; with 7–8 basal and 2 apical setae on fore vein, and 5–8 on hind vein. Hind wing with 60–63 FH.

Abdominal terga unsculptured at about median half; T₁ (Fig. 6.5) with about 13 reticules, with weak wrinkles in some posterior reticules; T₂ with some incomplete reticules between B₁, with longitudinal reticules on sides, without internal wrinkles;
T₃–T₈ (Fig. 6.6) longitudinally striate on sides, with numerous weak internal wrinkles; T₈ with comb of long microtrichia interrupted at median third of posterior margin; T₉ with weakly transverse and broken striae; T₁₀ with a few weak striae; T₉L/T₁₀L 1.57–1.76; B₁–B₃ on T₈ 0.73–0.78, 0.95–1.02 and 0.68–0.75 as long as T₈ respectively; B₁ and B₂ on T₁₀ subequal, 0.93–1.02 as long as T₁₀. Sterna with transverse and partly anastomosing striae, with B₃ anterior to B₁ and B₂; S₇ with 2 pairs of small setae between B₁ and B₂ at posterior margin; ovipositor 2.32–2.50

Fig. 7. *Panchaetothrips holtmanni*, ♀. 1, head and pronotum. 2, right antenna. 3, metascutum. 4, T₁. 5, T₇–T₁₀.
times as long as pronotum.

Male. Unknown.


Remarks. This is a second species of the genus, feeding on fern, and easily distinguishable from the Trinidadian *O. williamsi* by the characters given above. In *O. williamsi*, the body is entirely blackish brown including legs except for extreme apex of tibiae and tarsi pale, basal two-thirds of A₃ and median half of A₄ are brown, the fore wing has a subbasal pale patch only, the T₂ is completely covered with polygonal reticules, and the T₃ to T₅ are smooth on posteromedian half.

*Panclawetothrips holtmanni*


Some additional female characters are as follows: Head (Fig.7.1) entirely polygonally reticulate except on occipital collar; IOD/HOW 2.40-3.00, OOD/IOD 1.85-2.00; eye without dark facets. Antenna (Fig.7.2) with forked sense cones on A₃ and A₄, those about 0.6-0.7 as long as respective segments; A₃-A₄ L/W 3.76-3.77, 3.35-3.56, 2.70-2.83 and 1.40-1.43 respectively. Pronotum with 21-22 setae. Metascutum (Fig.7.3) with median setae and campaniform sensilla widely spaced; the setae situated nearly at anterior third and the setal alveoli separated by 4-5 times their diameter; the sensilla situated nearly at posterior third and separated by 3-4 times their own diameter; metascutellum W/L ca 2.5. Fore wing with 19-21 anterior and 52-58 posterior FH; with 15-16 setae on costa and 10 on fore vein. T₁ (Fig.7.4) with a pair of median setae nearly contiguous. B₃ on T₇ (Fig.7.5) 0.68-0.80 as long as B₂; B₄ on T₉ 0.53-0.62 as long as B₃; T₁₀L/T₉L 3.24-3.37; B₁ on T₉ 3.56-3.76 times, B₂ 3.15-3.18 times and B₃ 4.15-4.16 times as long as T₉ respectively; B₁ on T₁₀ 0.78-0.88 and B₂ 0.73-0.79 as long as T₁₀ respectively. Ovipositor 3.36-3.76 times as long as pronotum.

Measurements (µm). Body L 1.1-1.2 mm. Head L 108-110, W 172-174; pronotum L 72-84, W 200; fore wing L 595-610, longest costal seta 92-96; T₉ L 50-54, T₁₀ L 162-182; B₁ on T₉ 188-192, B₂ 159-170, B₃ 208-224; B₁ on T₁₀ 140-144, B₂ 122-132; ovipositor L 278-282, L(W) of anteninal segments: A₃ 64-66 (17-18), A₄ 57-64 (17-18), A₅ 51-54 (18-20), A₆ 20-21 (14-15), A₇ 13-14 (6-8), A₈ 36-38 (4-5).

This species, so far known from New Guinea and the Krakatau Islands, is newly recorded from Sarawak and Semenanjung Malaysia. *P. holtmanni* differs from *P. kikiri* and *P. stephani* in the following characters: larger IOD/HOW; smaller OOD/IOD; eye with small facets widely separated; shorter forked sense cones on A₃ and A₄; metascutal campaniform sensilla widely separated; larger setae B₃ on T₇ and B₄ on T₈, and shorter setae on T₉ and T₁₀. Although there is no seta nearly midway between each eye and hind ocellus in the three Indonesian specimens examined by zur Strassen (1992), in the two Malaysian specimens there is a minute seta as mentioned in the original description.

Panchaetothrips kikiri


This species was described from two females collected in Japan and Nepal. The eye has no dark facets. Two errors in the original description should be corrected as follows: 1) Indistinct campaniform sensilla probably present just in front of inner apical setae on T_{16} in the holotype but absent in the Nepalese specimen, and 2) antecostal lines on T_{3}-T_{8} with some posteriorly directed notches, especially on T_{7} and T_{8} as shown in Fig. 3.6, Kudô 1992a.

This species is similar to the Philippine *P. stephani* in the long forked sense cones on A_{3} and A_{4}, the head with a small seta nearly midway between each eye and hind ocellus, IOS just placed within ocellar triangle, median metascutal setae nearly at anterior third, metascutal sensilla usually closely placed, smaller B_{3} on T_{7} and B_{4} on T_{8}, and antecostal lines on T_{3}-T_{8} with some posteriorly directed notches. Differences between the two species are as follows. 1) In *P. kikiri*, head with transversely elongate reticules on A_{3} against entirely with polygonal reticules except on occipital collar in *P. stephani*. 2) Metascutal campaniform sensilla very close to the posterior margin against placed at posterior third of the scutum. 3) Metascutellum less than 2.1 times as wide as long against more than 2.6 times. 4) Median minute setae on T_{1} very closely placed, their alveoli being almost contiguous against widely separated by about 4-10 times the alveolus diameter. 5) B_{1} on T_{2} shorter than half the length of B_{2} against longer than half the length of B_{2}. 6) B_{1}-B_{3} on T_{8} longer, being 4.6-5.1 times, 5.5-5.7 times and 5.6-5.8 times as long as T_{9} respectively against 3.9-4.4 times, 4.0-4.4 times and 4.7-5.2 times as long as T_{9} respectively.


Panchaetothrips stephani


This Philippine species differs from *P. holtmanni* in its large size, widely separated median setae on the T_{1}, and the characters mentioned under the latter species. Some additional characters are as follows.

Female. Head (Fig. 8.1) entirely polygonally reticulate except on occipital collar; with a small seta nearly midway between each eye and hind ocellus; IOS placed within ocellar triangle; IOD/HOW 1.25-1.75; OOD/IOD 2.29-2.67; eye without dark facets. Forked sense cone on A_{3} reaching the base of simple cone on A_{4}, that on A_{4} reaching the base to middle of A_{6}; A_{5}-A_{6} L/W 3.28-3.63, 3.65-4.00, 3.10-3.40 and 1.76-1.88 respectively. Pronotum with 21-27 setae. Metascutum (Fig. 8.2) with median setae at anterior third, and with campaniform sensilla at posterior third, usually separated by twice their own diameter but occasionally contiguous or more widely separated by 5-6 times the diameter; metascutellum W/L 2.67-3.26. Fore wing with 22-26 anterior and 68-80 posterior FH, with 16-19 setae on costa and 9-12 on fore vein. Hind wing with 84-90 FH. Antecostal lines on T_{3}-T_{8} with some weak and posteriorly directed notches. Median minute setae on T_{1} (Fig. 8.3) more widely separated by 4-10 times their alveolus diameter; B_{1} on T_{2} 0.61-0.78 as long.
as $B_2$; $B_3$ on $T_7$ 0.44-0.65 as long as $B_2$; $B_4$ on $T_8$ 0.35-0.42 as long as $B_3$; $T_{10} L/T_9$ L 3.56-4.21; $B_1$ on $T_9$ 3.88-4.41 times, $B_2$ 4.03-4.41 times and $B_3$ 4.69-5.18 times as long as $T_9$ respectively; $B_1$ and $B_2$ on $T_{10}$ subequal, 0.85-1.03 times as long as $T_{10}$; ovipositor 3.29-3.47 times as long as pronotum.

Male. Head and thorax brown, abdomen dull orange yellow. IOD/HOW 1.00-1.22; OOD/IOD 2.82-3.00. Pronotum with 23-28 setae. $T_7$ and $T_8$ (Fig. 8.4) medially with longitudinal striae, reticules in part; $B_1$ on $T_9$ 1.30-1.34 times, $B_2$ 2.63-3.13 times, $B_3$ 1.80-2.03 times and $B_4$ 3.12-3.30 times as long as $T_9$ respectively; $T_{10}$
reticulate, undivided longitudinally, with a pair of long apical setae (114-130 µm). S₇-S₈ (Fig. 8.5) with a transverse and linear glandular area. Body L 1.4–1.6 mm.


**Phibalothrips peringueyi**

_Reticulothrips peringueyi_ Faure 1925: 145–150.


This grass-living species, so far known from South Africa, India, Sri Lanka, Thailand, Southern China, Java, the Philippines, Taiwan and Japan, is newly recorded from Nepal, Semenanjung Malaysia and Sarawak.


**Phibalothrips rugosus**


This species, so far known only from Kuala Lumpur, Semenanjung Malaysia, is newly recorded from Sarawak by a second female.


**Retithrips javanicus**


This species has so far been known from Burma, Java, the Krakatau Islands and the Philippines. It has been reported to be rare in the former three localities but is probably common in Luzon (Reyes 1994). This species is probably polyphagous.


**Rhipiphorothrips concoloratus**

Zhang and Tong 1993: 52–53.

This species, so far known only from Yunnan, China, is newly recorded from Semenanjung Malaysia. The Malaysian specimens were compared with a female and a male paratype. Although the original description stated that a pair of posterolateral setae on male T₉ are pointed apically, their tips are distinctly expanded. In the male paratype the setae look pointed because they are oriented laterally.
The eye has no dark facets.

*R. concoloratus* and the African *R. africanus* and *R. miemsae* are similar, being separated from one another only by minor differences as summarized below based on the descriptions and figures of the two African species (Jacot-Guillarmod 1937, Priesner 1939 and Wilson 1975).

*R. concoloratus*: Brown, abdomen slightly paler; fore wing with scale brown; fore and mid legs brown, hind leg yellow with apical half of tibia brownish; sense cones on A₃ and A₄ with stalked base short and indistinct; T₁ nearly completely sculptured but indistinctly at submiddle.

*R. africanus*: Dark brown; fore wing with scale pale; all tibiae yellow at apical third; sense cones on A₃ and A₄ with stalked base short and indistinct; T₁ completely reticulate.

*R. miemsae*: Brown, abdomen slightly paler; fore wing with scale brown; sense cones on A₃ and A₄ with stalked base short and indistinct; T₁ largely smooth.


*Rhipiphorothrips pulchellus*


This polyphagous species, so far known from India, Sri Lanka, Burma, Thailand, Java, the Philippines, Taiwan and Southern China, is newly recorded from Semenanjung Malaysia and Sarawak. The eye has no dark facets.


*Selenothrips rubrocinctus*

*Physapus rubrocinctus* Giard 1901: 263-265.


This pantropical and polyphagous species is additionally recorded from Nepal and Sarawak. Males of this species are usually rare, showing ratio 0.14% to 2.33% (Wilson 1975), although reported to be occasionally abundant (Hood 1913). Reyes (1944) reported some higher ratios of males in the Philippines, e.g., 1 female and 5 males on *Psidium guajava* in Luzon and 8 females and 7 males on unidentified plant flowers in Mindanao. Also in my collection, males were rather abundant from the Philippines while absent from Malaysia as shown below. The sex ratio of this species may be variable in different areas as in *Thrips tabaci*, *Haplothrips gowdeyi* and others.
Table 1. Geographic distribution of Panchaetothripinae species in Japan, Nepal, Southern China, and Southeast Asia.

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| No. of species | 14 | 18 | 16 | 9  | 6  | 8  | 16 | 19 | 9  | 10 |


**GEOGRAPHIC DISTRIBUTION**

As two species have been described in the present study, 47 species in the Panchaetothriinae are now recorded from Nepal, Southern China, Southeast Asia and Japan. Table 1 presents a synopsis of the geographic distribution of each species excluding *Hercinothrips femoralis* which was collected in Japan only in glasshouses. It is still premature to discuss zoogeographic peculiarities due to lack of sufficient data in this area, in particular Burma, Thailand, Indochina and Indonesia, but some of them are noted. First, the Japanese fauna is very rich, represented by 14 species in 10 genera, especially in comparison with Europe, where no species occur in field. It is particularly remarkable that *Helionothrips aino* extends from Nepal to Southern China, and from Taiwan via the Japanese Archipelago to Saghalien, since the subfamily is principally tropical. Next, the Taiwanese fauna is also rich despite the small island, although some dubious or old records are included. This, however, probably suggests the paucity of collections in other areas of Asia.

To measure the faunal similarities between 10 areas, Jaccard’s Coefficient, Sørensen’s Coefficient and Nomura-Simpson’s Coefficient were used. These are formulated as follows — Jaccard’s: $c/(a+b-c)$, Sørensen’s: $2c/(a+b)$, Nomura-Simpson’s: $c/b$, where $a$ and $b$ are the total number of species in respective areas, $a \geq b$, and $c$ is the number of common species between them. Then results were
analyzed by cluster analysis using average-linkage method. Figure 9 shows three dendrograms based on the values of the three kinds of coefficient. The faunal similarities between the mentioned areas are different according to respective coefficients. In any case three groups are clearly recognized, namely Japan and Taiwan, Malaya and Borneo, and Burma and Indonesia. The former two are natural from their geographic positions, while the last may be caused from our poor knowledge.

ACKNOWLEDGEMENTS

I would like to express my deep gratitude to the following members of the projects for their kindly helping me in various ways during my surveys: Mr. J. Kumar, Dr. K.C. Sharma, Mr. N.R. Sharma and Dr. V.K. Thapa in Nepal; Mr. Aban Abdul Hamid, Dr. Khoo Soo Ghee, Mr. K.M. Kochummen, Mr. Azmi Mahyudin and the late Dr. Tho Yow Pong in Malaysia; Dr. V.J. Calilung, Mr. Edison A. Cosico, Mr. Orly Eusebio, Dr. E.S. Fernando, Dr. W.S. Gruezo and Mr. I.L. Lit, Dr. C.P. Reyes in the Philippines; Dr. F. Komai, Dr. T. Kumata, Dr. M. Suwa and Dr. S. Takagi in Japan. In particular, sincere thanks are due to Prof. Zhang Weiique, South China Agricultural University, for loaning the paratypes of *R. concoloratus*.

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