

REVISION OF THE ORIENTAL SPECIES OF ALLUAUDOMYIA KIEFFER (Diptera, Ceratopogonidae)

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Abstract: The Oriental species of the genus *Alluaudomyia* Kieffer are classified into 5 groups which are characterized. A check list is given of the 97 species known from the world, of which 79 are assigned to the aforementioned group. A key is presented for the identification of the 30 known Oriental species, of which the following 25 are described as new: *abdominalis*, *adunca*, *albigena*, *angulata*, *annulata*, *annulipes*, *bifurcata*, *brevis*, *fuscipennis*, *fuscipes*, *griffithi*, *huberti*, *inaequalis*, *infuscata*, *macclurei*, *maculosissima*, *magna*, *marginalis*, *parafurcata*, *pseudomarginalis*, *punctulata*, *quinquenebulosa*, *sternalis*, *subannulata*, and *thurmanorum*. Descriptions and figures are given for all 30 Oriental species. A new name, *tokunagai* Wirth & Delfinado, is proposed for *splendida* Tokunaga 1963, preoccupied by *splendida* (Winnertz) 1852.

This revision of the Oriental species of the genus *Alluaudomyia* Kieffer is the first of what hopefully will be a series of revisions of Oriental Ceratopogonidae. ("Oriental" is used in its more restricted sense). A large amount of ceratopogonid material has been sorted and mounted on slides from extensive light trap collections brought to the U. S. National Museum as a result of a study by Wirth & Hubert (in preparation) on the *Culicoides* of SE Asia. We hope to revise various ceratopogonid genera from this nucleus of material as time allows, and hope that other workers will utilize this collection for their further study. Such studies are badly needed, because very little intensive work has been done on the Oriental Ceratopogonidae since the appearance of older incidental papers by Kieffer, de Meijere, Edwards, Macfie and others (see references).

There has until now been no comprehensive work on a worldwide basis, or attempt to recognize natural groups within the genus *Alluaudomyia*. Prior to 1942, only 25 species had been described, which de Meillon (1939) and Okada (1942) listed and keyed. Extensive studies and descriptions of new species since that time by Wirth (1952a), Clastrier (1958a, b, 1960, 1961), Clastrier & Wirth (1961), Tokunaga & Murachi (1959), and Tokunaga (1963) have laid the foundation for the present study, in which 25 new species are described, bringing the world total to 99 species. Only the Neotropical and Australian species are now poorly known, but undescribed material indicates that the genus is not well represented in the extreme south. Only 3 or 4 species collected in Australia and only 2 Neotropical species, all undescribed, are known to us.

There seem to be no very strong characters for the recognition of subgenera, but the

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better known species can be placed in what are believed to be natural groups (Table I), which are indicated and characterized below for the Oriental Region. Consideration and refinement of these groups by future workers dealing with other faunas are invited, in hope that a more formal classification may be established. From the world list of 99 species presented in the appendix, we have been able to place only 79 in the 5 major groups to which the Oriental species belong.

For their generous cooperation in collecting and sending us Oriental material we are

Table I. Systematic list of the Oriental *Alluaudomyia* and comparison of certain quantitative characters.

	Costal ratio	Antennal ratio	Tarsal ratio	No. of spermath.	No. of wing spots
<i>Parva Group</i> :					
1. fuscipes*	0.60	1.26	2.5	2	1
2. abdominalis*	0.42	1.08	2.3	2	1
3. brevis*	0.55	1.10	3.6	2	1
<i>Marmorata Group</i> :					
4. adunca*	0.45	0.89	2.5	2	2
5. angulata*	0.53	0.86	3.1	2	2
6. fuscipennis*	0.64	—	2.7	2	2
7. inaequalis*	0.65	0.99	2.5	2	2
8. spinosipes Tok.	0.48	1.00	2.3	2	2
<i>Xanthocoma Group</i> :					
9. xanthocoma (Kief.)	0.61	1.00	2.6	1	3
10. sternalis* (♂)	0.51	—	2.2	—	5
<i>Maculipennis Group</i> :					
11. albigena*	0.70	0.89	2.5	1	3
12. quinquebulosa*	0.57	0.82	3.7	1	2(♀); 5(♂)
13. infuscata*	0.58	1.03	2.7	1	3
14. macclurei*	0.58	0.82	3.0	1	2
15. huberti*	0.50	0.70	2.6	1	2
16. maculosissima* (♂)	0.55	—	2.7	—	12-15
17. marginalis*	0.79	0.92	2.3	1	12-15
18. maculosipennis Tok.	0.73	0.82	2.2	1	12-15
19. pseudomarginalis*	0.64	0.91	2.1	1	12-15
20. thurmanorum*	0.47	0.93	2.0	1	9
21. tripartita Ok.	0.53	0.97	1.6	1	12
22. magna*	0.80	1.04	2.7	1	9
23. formosana Ok.	0.52	0.97	2.5	1	7
<i>Annulata Group</i> :					
24. bifurcata*	0.63	1.00	3.3	1	9
25. griffithi*	0.60	0.89	2.2	1	9
26. subannulata*	0.64	0.75	2.7	1	9
27. annulipes*	0.62	0.91	2.4	1	9
28. annulata*	0.64	0.91	2.4	1	9
29. punctulata*	0.70	0.88	4.0	1	9
30. parafurcata*	0.64	0.86	3.3	1	9

* Described as new.

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We are greatly indebted to Mr Jack Scott, staff photographer of the Smithsonian Institution, for the photographs of the wings. The drawings were made by the junior author.

In this paper, measurements are of single specimens or of series with values given as "mean (minimum value—maximum value, n=number of measurements)." Wing length is measured from the basal arculus to the wing tip. Proportions given for antennal flagellomeres and palpal segments refer to relative lengths of segment; antennal ratio is determined by dividing the combined length of the last 5 by that of the preceding 8 flagellomeres. Hind tarsal ratio is determined by dividing the length of the hind basitarsus by the length of the second tarsomere. Length of the spermatheca is obtained by measuring from the tip of the sclerotized portion of the neck to the apex of the spermatheca. All descriptions are based upon slide mounted material; for this reason details of the pruinose color pattern of the thorax, which are often striking and characteristic, have usually been necessarily omitted.

The types of our new species are deposited in the U. S. National Museum in Washington. Paratypes, when available, will be deposited in Bishop Museum, Honolulu; British Museum (Nat. Hist.), London; Indian Museum, Calcutta; School of Public Health, University of Sydney; and the Commonwealth Scientific and Industrial Research Organization, Canberra, Australia.

Genus *Alluaudomyia* Kieffer

- Alluaudomyia* Kief., 1913, Voyage Ch. Alluaud et R. Jeannel en Afrique Orientale, Dipt. 1: 12.—de Meillon, 1939, J. Ent. Soc. S. Africa 2: 7.—Okada, 1942, Trans. Nat. Hist. Soc. Formosa 32: 315.—Wirth, 1952, Ann. Ent. Soc. Amer. 45: 423.—Tokunaga & Murachi, 1959, Ins. Micronesia. 12: 352. Type-species: *A. imparunguis* Kief.; monobasic.
- Neoceratopogon* Malloch, 1915, Bull. Ill. St. Lab. Nat. Hist. 11: 310. Type-species: *Ceratopogon bellus* Coquillett; orig. desig.
- Prionognathus* Carter, Ingram & Macfie, 1921, Ann. Trop. Med. Parasit. 16: 309. Type-species: *P. marmoratus* Car., Ingr. & Macf.; orig. desig.
- Thysanognathus* Ingram & Macfie, 1922, Ann. Trop. Med. Parasit. 16: 244 (new name for *Prionognathus* Car., Ingr. & Macf., not LaFerté-Sénéctère).
- Isoeacta* Garrett, 1925, Seventy New Diptera, p. 9. Type-species: *I. poeyi* Garr., monobasic; = *bella* (Coquillett).

Diagnosis (modified from Tokunaga & Murachi 1959): Body moderately slender, not strongly hairy, usually small, about 1–2 mm long. Eyes hairy or bare, contiguous to narrowly separated above. ♀ antenna apparently 15-segmented, 5 distal flagellomeres slightly

more elongated than the preceding 8 flagellomeres. ♂ antenna with plume of long hairs, 3 distal flagellomeres elongated. Maxillary palpus slender, 5-segmented; segment 3 not swollen, but bearing distally a small round pit or sensory area bearing a few elongate sensilla. Mandible with distal teeth very strong, teeth gradually becoming weaker proximad, usually 10–15 teeth present. Wing with microtrichia absent, membrane usually appearing milky or slightly infuscated, adorned with 1 to as many as 15–20 small black spots and often with additional grayish streaks, especially along veins; macrotrichia usually present toward apex of wing, sometimes wing quite hairy, sometimes entirely bare in ♂; veins R1 and Rs anastomosing basally, thus 1st radial cell absent, Rs ending in costa at or beyond middle of wing and thickened at tip, media forked and petiolate. Legs slender, without strong spines, although long spinose hairs may be numerous in species of the Marmorata Group; mid basitarsus elongated; hind basitarsus bearded ventrally; tarsomere 4 cordate, 5 slender; empodium vestigial; ♂ claws small and equal; ♀ claws long and slender, simple without basal barbs, usually very unequal but sometimes subequal on 1 or more pairs of legs. Abdomen moderately stout, without conspicuous armature or bristling; 1 or 2 sclerotized spermathecae present, sometimes an aberrant 3rd one may be present. ♂ genitalia with highly diverse specific modifications, thus making generic diagnosis difficult; tergum 9 usually elongate, often with long apicolateral processes; sternum 9 usually short with caudomedian excavation; basistyle usually elongate and simple; dististyle usually slender and curving; aedeagus usually with slender basal arch and distinct caudomedian stem; parameres usually separate, with lateral basal arm, elongate main portion, and distal armature of 1 or more spines, lobes, or filaments.

KEY TO ORIENTAL SPECIES OF ALLUAUDOMYIA

1. Wing with conspicuous dark spots on veins only (♂ of *quinquenebulosa* has a dark cloud in middle of cell R5; sometimes wing membrane may be generally darkened, especially along veins); 1 or 2 spermathecae present; tarsal claws equal or unequal.....2
 Wing with conspicuous dark spots in cells as well as on veins; 1 spermatheca present; tarsal claws unequal 23
- 2 (1). Wing with only 1 or 2 conspicuous dark spots, at end of costa and sometimes near r-m crossvein; 2 spermathecae present; tarsal claws equal or unequal..... 3
 Wing usually with more than 2 conspicuous dark spots; 1 spermatheca present; tarsal claws unequal 10
- 3 (2). Wing with only 1 conspicuous dark spot, lying over end of costa, or a small 2nd dot on vein Rs distad of r-m crossvein; spermatheca without diverticulum 4
 Wing with 2 conspicuous dark spots, the 2nd lying just proximad of r-m crossvein; spermatheca with long, slender, lateral diverticulum 6
- 4 (3). Tibiae without subapical pale bands; claws subequal; eyes hairy..... 1. **fuscipes***
 Tibiae with subapical pale bands, at least on hind legs; claws subequal or unequal; eyes bare..... 5
- 5 (4). All tibiae with subapical pale bands; spermathecae very unequal; claws unequal; ♀ abdominal segment 9 heavily darkened; wing with 1 black spot 2. **abdominalis***

* Described as new.

- Fore and mid tibiae without subapical pale bands; spermathecae subequal; claws small and subequal; ♀ segment 9 not contrasting; wing with 2nd small black dot on vein Rs..... 3. **brevis***
- 6 (3). Legs dark, broad basal bands of femora and middle bands of tibiae on fore and mid legs as dark as knee spots and bands on hind legs; mid femur dark brown to base 7
 Legs paler, basal bands of femora and middle bands of tibiae of fore and mid legs much paler than knees or bands on hind legs; mid femur yellow basad or on broad mid portion..... 9
- 7 (6). Mid tibia with subapical pale band; claws of ♀ all subequal; ♂ dististyle in form of an extremely long sinuate hook 4. **adunca***
- Mid tibia dark to tip; ♀ claws unequal, at least on hind leg; ♂ dististyle straight in *angulata*..... 8
- 8 (7). Fore and mid legs of ♀ with subequal claws; wing membrane scarcely infuscated..... 5. **angulata***
- Fore and mid legs of ♀ with long, slender, very unequal claws; wing membrane deeply infuscated 6. **fuscipennis***
- 9 (6). Mid tibia with dark band in midportion broken by a broad median pale band; ♀ claws unequal on all legs 7. **inaequalis***
- Mid tibia with 1 entire dark band in midportion, just distad of middle; ♀ claws equal on fore and mid legs, unequal on hind legs.....8. **spinosipes** Tok.
- 10 (2). Wing with 2-5 conspicuous dark spots, not including distal infuscation often present on branches of media and cubitus; ♀ antenna dark, or only extreme bases of flagellomeres 3-10 may be pale; legs usually dark with narrow pale rings 11
 Wing with 9 conspicuous dark spots exclusive of mottling on radial veins; ♀ antenna annulate, apices of flagellomeres pale; legs paler with many small black spots and crossbands 17
- 11 (10). Legs dark with narrow pale rings on each side of knees 12
 Legs with knees and adjacent portions of femora and tibiae extensively pale 11. **albigena***
- 12 (11). ♂ genitalia with sternum 9 caudally produced in 2 distinct submedian lobes ... 13
 ♂ genitalia with sternum 9 excavated on caudal margin 14
- 13 (12). ♂ parameres stout at base, slender and abruptly bent distally; dististyle slightly curved; tergum 9 with very slender apicolateral processes; sternum 9 with short rounded lobes; wing with 3 conspicuous dark spots, none at end of anal vein; spermatheca pear-shaped; ♀ claws all unequal 9. **xanthocoma** (Kief.)
 ♂ parameres slender with fine recurved tip; dististyle markedly hook-shaped; tergum 9 with large, stout, apicolateral processes; sternum 9 with long angular lobes; wing with 2 conspicuous dark spots, plus 3 smaller dark spots, one of them at end of anal vein; ♀ unknown..... 10. **sternalis***
- 14 (12). ♂ aedeagus with long, rounded, very slender basal arms to basal arch; ♀ claws unequal on all legs; wing membrane markedly infuscated 15
 ♂ aedeagus with short stout basal arch, basal arms short; ♀ claws equal or unequal; wing infuscated mainly in streaks along veins..... 16

- 15 (14). ♂ dististyle abruptly bent at base, straight distally; apicolateral processes absent; parameres each with 2 distal appendages; ♀ spermatheca longer than broad; ♂ wing with 5 conspicuous dark cloud-like spots, including 1 in middle of cell R5; ♀ wing with only 2 prominent dark spots..... 12. **quinquenebulosa***
- ♂ dististyle slightly curved; apicolateral processes long and stout, approximated; parameres each with 1 distal appendage; ♀ spermatheca broader than long; ♂ and ♀ wing with only 3 conspicuous dark spots, none in middle of cell R5..... 13. **infuscata***
- 16 (14). ♂ genitalia very short and stout; apicolateral processes absent; aedeagus without caudally produced distal stem; parameres short, each with short distal appendage; ♀ claws equal on fore and mid legs, unequal on hind legs..... 14. **macclurei***
- ♂ genitalia extremely elongate; apicolateral processes long and slender; aedeagus with extremely elongate distal stem; parameres elongate and crooked, with recurved slender distal point and a sharp lateral subapical process; ♀ claws all unequal 15. **huberti***
- 17 (10). Femora with broad pale band on proximal 1/2, at least on fore and mid legs; scutum and pleuron dark brown mottled..... 18
- Femora entirely dark on proximal 1/3 or 1/2; scutum and pleuron dark brown mottled, or yellow above and dark brown below 19
- 18 (17). ♀ spermatheca subspherical; hind femur with subbasal pale band; ♂ aedeagus with elongate forked distal stem; paramere with round tip bearing a short spine..... 24. **bifurcata***
- ♀ spermatheca elongate ovate; hind femur dark on proximal 1/2; ♂ unknown 25. **griffithi***
- 19 (17). Scutum yellow with or without small black dots; pleuron yellow above and dark brown below 20
- Scutum and pleuron dark brown mottled..... 22
- 20 (19). Scutum with small brown dots; tibiae and distal portions of femora extensively annulate; spermatheca elongate oval.....21
- Scutum entirely yellow, without dots; tibiae and distal portions of femora very faintly annulate or punctate; spermatheca subspherical.....26. **subannulata***
- 21 (20). Mandible with 20 teeth; spermatheca broader (0.083 mm); ♂ genitalia elongate, aedeagus with long, simple, distal stem, with short distal bifurcation bent ventrad..... 27. **annulipes***
- Mandible with 14 teeth; spermatheca narrower (0.068 mm broad); ♂ genitalia short, aedeagus with very short, distal stem bearing a pair of lateral spurs and a short distal fork 28. **annulata***
- 22 (19). ♂ paramere with long, microspinose, hyaline, distal appendage; spermatheca slightly elongate, tapering toward neck29. **punctulata***
- ♂ paramere with heavily sclerotized claw-like distal fork; spermatheca elongate oval..... 30. **parafurcata***
- 23 (1). Wing with 2 dark spots within mediocubital fork; a longitudinal series of dark spots extending basad in anal cell 24
- Wing with 1 dark spot within mediocubital fork; anal cell usually without se-

- ries of dark spots..... 27
- 24 (23). Cell R5 with 2 large dark spots in distal portion, at 1/3 and 2/3, respectively, of distance between end of costa and wing tip; mid tibia with 2 dark bands in mid portion 16. *maculosissima** (part)
Cells R5 and M1 with only 1 dark spot in distal portion; mid tibia with 1 or 2 dark bands in mid portion 25
- 25 (24). Mid tibia with broad dark band in mid portion indistinctly subdivided by a faint median pale band; wing with extensive infuscation on hind margin to tip; legs very dark, fore and mid femora dark nearly to bases; scutum with extensive dark blotches 17. *marginalis**
Mid tibia with 1 narrower dark band at or just distad of mid portion..... 26
- 26 (25). Spermatheca large and longer (0.090 mm long); leg bands very distinct; scutum with extensive dark blotches and dark vittae; pleuron with prominent transverse dark band 18. *maculosipennis* Tok.
Spermatheca smaller and broader (0.065 mm long); leg band very faint; scutum yellow with small brown dots; pleuron without prominent band..... 19. *pseudomarginalis**
- 27 (23). Legs extensively pale banded; scutum yellow with small black spots..... 28
Legs dark with very narrow pale rings; scutum dark brown or with yellow mottling..... 29
- 28 (27). Wing with 9 black spots, 4 on veins and 5 in cells, veins not infuscated; spermatheca much longer than broad.....20. *thurmanorum**
Wing with 12 black spots, 5 on veins and 7 in cells, also veins dark margined their entire length; spermatheca nearly as broad as long ... 21. *tripartita* Ok.
- 29 (27). Cell R5 with 2 large dark spots in distal portion, at 1/3 and 2/3, respectively, of distance between end of costa and wing tip.....16. *maculosissima** (part)
Cells R5 and M1 with only 1 dark spot in distal portions.....30
- 30 (29). Large species, wing 1.31 mm long; wing darker with 10 distinct spots, 3 on veins, 7 in cells; halter very dark; spermatheca very large, elongate, ovate, not tapering to duct 22. *magna**
Small species, wing 0.92 mm long; wing with 8 faint spots, 3 on veins, 5 in cells; halter slightly infuscated; spermatheca moderately small, pyriform, tapering to duct..... 23. *formosana* Ok.

THE PARVA GROUP

This group of small, usually dark-colored species is characterized by the presence of only 1 or 2 conspicuous dark spots on the wing, none being present proximad of r-m crossvein; eyes frequently hairy; ♀ tarsal claws equal or unequal, 2 or 4 scutellar hairs, and 2 ♀ spermathecae without diverticula. The ♂ genitalia are usually short with rounded tergum 9, aedeagus massive, dististyle blunt, and parameres separate with detached basal arm or apodeme.

The following species apparently belong to the Parva Group: *A. congolensis* de Meillon, *hirsutipennis* Clastrier, *marmorea* Clast., *senta* de Meil., and *tauffliebi* Clast. from Africa; *parva* Wirth from North America; *insulana* Tokunaga & Murachi, *insulicola* Tok. & Mur., and *monopunctata* Tok. & Mur. from Micronesia; *bifasciata* Tok., *immaculata* Tok. and *pa-*

puae Tok. from New Guinea; and *abdominalis* n. sp., *brevis* n. sp. and *fuscipes* n. sp. from the Oriental Region.

1. *Alluaudomyia fuscipes* Wirth and Delfinado, n. sp. Figs. 1, 29.

♀. Length of wing 1.05 (0.97–1.12, n=2) mm. Head brownish; eyes contiguous, with long interfacetal hairs. Antenna with flagellomeres in proportion of 12–7–8–8–9–9–10–10–15–16–16–16–20, antennal ratio 1.26; proximal flagellomeres tapering, distal ones elongate. Palpal segments (fig. 1a) in proportion of 4–7–9–5–8, segment 3 with small, irregular, sensory area bearing several long hyaline sensilla. Mandible with 12 teeth. Thorax uniform dark brown; scutellum paler, with 2 hairs. Legs (fig. 1b) dark brown, fore and mid femora with subapical, and all tibiae with subbasal, narrow pale rings; mid tibia pale distally; tarsi whitish except hind basitarsus brownish; hind tarsal ratio 2.5; claws (fig. 1c) subequal, very long and slender. Wing (fig. 29) with costa extending to 0.60 of total length; 1 conspicuous dark spot, at end of costa, membrane whitish, veins slightly infuscated; halter pale. Abdomen brownish; 2 unequal, slightly ovoid spermathecae (fig. 1d), measuring 0.058 mm×0.043 mm and 0.043 mm×0.032 mm.

♂. Similar to ♀, with usual sexual differences. Genitalia (fig. 1 e, f) short and compact; sternum 9 moderately long, with small, shallow, caudomedian excavation, caudal membrane spiculate; tergum 9 short, abruptly narrower caudad in a rounded lobe without apicolateral processes. Basistyle moderately stout; dististyle slender, nearly straight, tip only slightly pointed. Aedeagus with basal arch low, basal arms slender; main portion massive and complex, ventrally with a pair of low, rounded submedian lobes on mid portion dorsally, with a heavy trapezoidal sclerite projecting caudad from basal arch, the slightly narrowed apex abruptly bent ventrad at tip in a pair of hyaline points. Parameres each with narrow, detached basal arm; main portion nearly straight, base slender, swollen in mid portion, distally prolonged in a slender apical process curving slightly laterad, and bearing ventrally a 2nd slender process curving basolaterad.

DISTRIBUTION: Malaya, Sarawak, Thailand.

Types: Holotype ♂, allotype ♀, Malaya, Pahang, Kuala Singgora, 26.I.1959, R. H. Wharton, light trap (Type no. 67230, USNM). Paratypes, 8 ♂♂, 20 ♀♀, as follows. MALAYA: 1 ♂, 4 ♀♀, same data as types; Kelantan, Lambok, Sungei Betis, Ulu Kelantan, 9.XI.1961, Wharton, light trap, 2 ♀♀; Pahang, Tahan River, King George V. Natl. Park, 4–6.XI.1959, H. E. McClure, light trap, 7 ♂♂, 10 ♀♀. THAILAND: Loei Prov., Dan Sai Dist., 6–7.VI.1959, R. Manop, light trap, 1 ♀; Nong Khai Prov., Meung Dist., 10–14.VI.1959, Manop, light trap, 2 ♀♀. SARAWAK: Kapit Dist., Nanga Pelagus, 28.XI.1958, R. Traub, light trap, 1 ♀.

Discussion: The subequal tarsal claws of the ♀ are unusual in the Parva Group; the other 2 Oriental species of this group differ by having bare eyes in the ♀, by their more extensive leg bands, and by details of the ♀ spermathecae and ♂ genitalia. The African species *tauffliebi* Clastrier has very similar ♂ genitalia, but the dististyles are stouter, the ♀ eyes are bare, and all the femora and tibiae have subapical pale rings.

2. *Alluaudomyia abdominalis* Wirth and Delfinado, n. sp. Figs. 2, 30.

♀. Length of wing 0.77 mm. Head pale brown; eyes narrowly separated, bare. An-

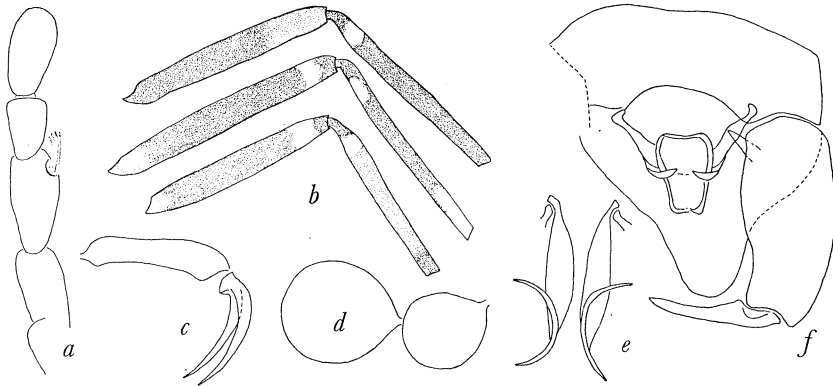


Fig. 1. *Alluaudomyia fuscipes*. a, palpus; b, femora and tibiae (in all figures the fore leg is shown innermost, the hind leg is outermost); c, claws; d, spermathecae; e, ♂ parameres; f, ♂ genitalia.

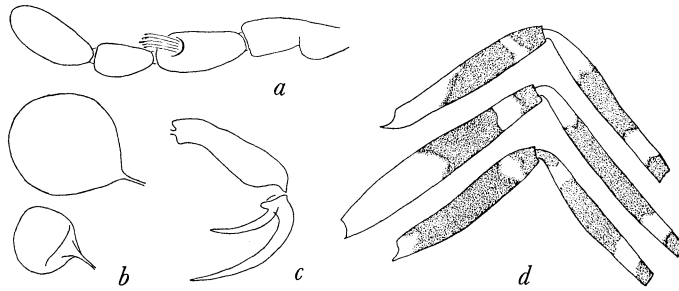


Fig. 2. *A. abdominalis*. a, palpus; b, spermathecae; c, claws; d, femora and tibiae.

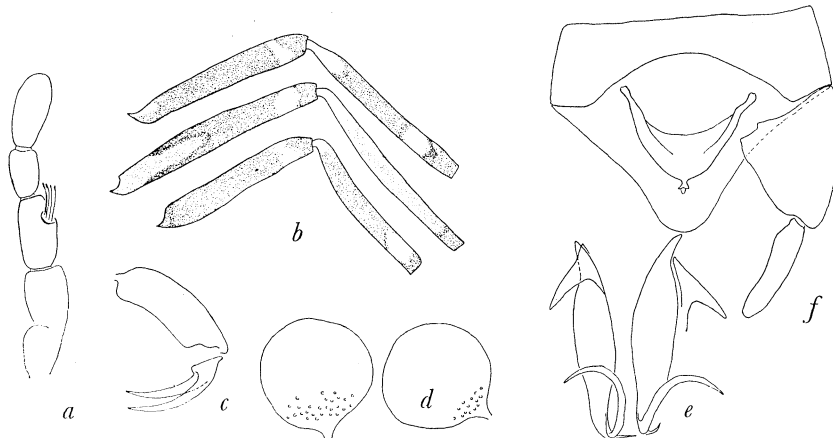


Fig. 3. *A. brevis*. a, palpus; b, femora and tibiae; c, claws; d, spermathecae; e, ♂ parameres; f, ♂ genitalia.

tenna with flagellomeres in proportion of 10-8-8-8-9-9-9-13-13-16-17-17, antennal ratio 1.08; flagellomeres moderately long and tapering. Palpal segments (fig. 2a) in proportion of 5-8-10-7-9, segment 3 with small distal depression bearing several long hyaline sensilla. Mandible with 12 teeth. Thorax uniformly brownish, scutellum paler on sides, with 2 hairs. Legs (fig. 2d) brown; mid and hind femora broadly pale at bases, femora with subapical and tibiae with subbasal and subapical, narrow pale rings; tarsi pale except hind basitarsus brownish; hind tarsal ratio 2.3; tarsal claws (fig. 2c) unequal on all legs. Wing (fig. 30) with costa extending to 0.42 of total length; membrane whitish; 1 conspicuous dark spot, at end of costa; base of radius slightly infuscated; halter pale. Abdomen pale brownish with striking markings; segments 7-8 paler, 9 with heavy dark brown sclerotization, last segment whitish; 2 spermathecae (fig. 2b), brown distally but pale at base of ducts; subspherical with slight taper to neck; unequal, measuring 0.086 mm by 0.061 mm and 0.050 mm by 0.039 mm. ♂. Unknown.

DISTRIBUTION: Malaya.

Types: Holotype ♀, Malaya, Selangor, Kuala Lumpur, III.1958, R. Traub, light trap (Type no. 67231, USNM). Paratype, 1 ♀, Malaya, Pahang, Tahan River, King George V. Natl. Park, 4-6.XI.1959, H. E. McClure, light trap.

Discussion: The bare eyes, unequal tarsal claws, bicolored abdomen, and complete leg bands will distinguish this species from others of the Parva Group.

3. *Alluaudomyia brevis* Wirth and Delfinado, n. sp. Figs. 3, 31.

♀. Length of wing 0.87 mm. Head pale brown; eyes contiguous, bare. Antenna with flagellomeres in proportion of 10-7-7-8-8-9-9-12-13-15-15-17, antennal ratio 1.1; proximal flagellomeres short and scarcely tapering. Palpal segments (fig. 3a) in proportion of 4-6-7-4-7, segment 3 with small round distal pit bearing several long sensilla. Mandible with 7 (?) teeth. Thorax brown, scutum and sides of scutellum yellowish brown; scutellum with 2 hairs. Legs (fig. 3b) brown; all femora with subapical, tibiae with basal, and fore and hind tibiae with subapical, narrow pale rings; tarsi brownish except 4 distal tarsomeres on hind leg pale; hind tarsal ratio 3.6; claws (fig. 3c) subequal and relatively short for the genus. Wing (fig. 31) with costa extending to 0.55 of total length; membrane whitish, 1 conspicuous dark spot at end of costa and a small black dot on radius halfway between the 1st spot and r-m crossvein; a definite elongate patch of retrorse setae distally in cell R5; halter pale. Abdomen brownish, distal segment whitish; 2 subspherical spermathecae (fig. 3d) with short, sclerotized necks, each spermatheca exclusive of the neck measuring 0.053 mm in diameter, portion near neck with small hyaline dots.

♂. Similar to ♀ with usual sexual differences; eyes bare; scutum with brownish mottling; halter infuscated; wing more smoky, especially streaks along veins, and the 2 dark spots more extensive, but in same position as in the ♀; cell R5 without patch of retrorse setae. Genitalia (fig. 3 e, f) short and broad; sternum 9 moderately short, with low caudo-medial excavation, caudal membrane indistinctly spiculate; tergum 9 very short with truncated, narrowed, caudal margin without definite apicolateral processes. Basistyle stout; dististyle very short and stubby with blunt tip. Aedeagus about as long as broad at base, with faintly sclerotized basal arch extending to 1/2 of total length; caudal margin of entire aedeagus convex, a very small papilliform distomedian stem present. Parameres each with detached basal arm; main portion very stout and straight, distal portion abruptly re-

curved mesad, then ventrolaterad and tapering to sharp point; a separate, small, slender, blade-like process extending ventrad from caudal margin of the sharp bend.

DISTRIBUTION: Malaya.

Types: Holotype ♀, Malaya, Selangor, Kuala Lumpur, VII.1958, R. Traub, light trap (Type no. 67232, USNM). Allotype ♂, Malaya, Pahang, Kuala Singgora, 18.VII.1958, R. H. Wharton, light trap.

Discussion: The short, subequal tarsal claws, bare eyes, and subspherical spermathecae of the ♀, the 2-spotted wing, the peculiar retrorse wing setae, the leg banding, and the short ♂ dististyles and peculiar parameres will distinguish this species.

THE MARMORATA GROUP

Species usually with dark mottled thorax and 2-spotted wing, the wing spots confined usually to the section between the radius and media just proximad of r-m crossvein, and to an area over and just behind the end of the costa; in addition there may be dark streaks along the veins and the membrane is often slightly infuscated. Legs often rather stout, and especially in the ♂ frequently with numerous, scattered, very strong spinose hairs; ♀ claws equal or unequal. ♀ antennae without conspicuous basal pale rings; eyes bare and usually contiguous. Two spermathecae present, of very characteristic shape, subspherical, with a short, slender sclerotized neck, this usually arising obliquely in one of the spermathecae; in addition each spermatheca with an elongate, slender, often apically swollen diverticulum or appendix arising subbasally. ♂ genitalia short and broad, tergum 9 usually short with moderately separated, small to large apicolateral processes; basistyle often expanded mesad at base; dististyle with slender tip and often strongly hooked; aedeagus usually in form of a trapezoidal plate or with rounded distolateral corners and short disto-median point; parameres with separately articulated basal arms or apodemes, the main portion usually short and straight and often stout; usually the pair partially fused midway on midline.

Included species: *A. brevicosta* Clastrier, *marmorata* (Carter, Ingram & Macfie), *similiforceps* Clastr., and *vicina* Clast. from Africa; *astera* Tokunaga, *brandti* Tok., *jimmensis* Tok., *novaguineana* Tok., *petersi* Tok., *smeei* Tok., and *tenuistylata* Tok. from New Guinea; and *adunca* n. sp., *angulata* n. sp., *fuscipennis* n. sp., *inaequalis* n. sp. and *spinosipes* Tok., from the Oriental Region.

4. *Alluaudomyia adunca* Wirth and Delfinado, n. sp. Figs. 4, 32.

♀. Length of wing 0.91 (0.89–0.92, n=2) mm. Head dark brown; eyes contiguous, bare. Antenna with flagellomeres in proportion of 11–8–8–9–10–10–10–13–13–13–12–17, antennal ratio 0.89; flagellomeres not very slender. Palpal segments (fig. 4a) in proportion of 5–9–11–9–11, segment 3 without pit, the long hyaline sensilla borne on surface of segment. Mandible with 12 teeth. Thorax dark brown, scutum with some yellowish lateral mottling; scutellum slightly paler, with 2 hairs. Legs (fig. 4b) dark brown; fore coxa paler; extreme base of fore and hind femora, narrow subapical rings on all femora, narrow subbasal and subapical rings on tibiae pale; broad pale bands on base of hind femur, and subbasally and subapically on hind tibia; tarsi pale except hind basitarsus brown; hind tarsal ratio 2.5; claws (fig. 4c) subequal, moderately short and stout, on all legs. Wing

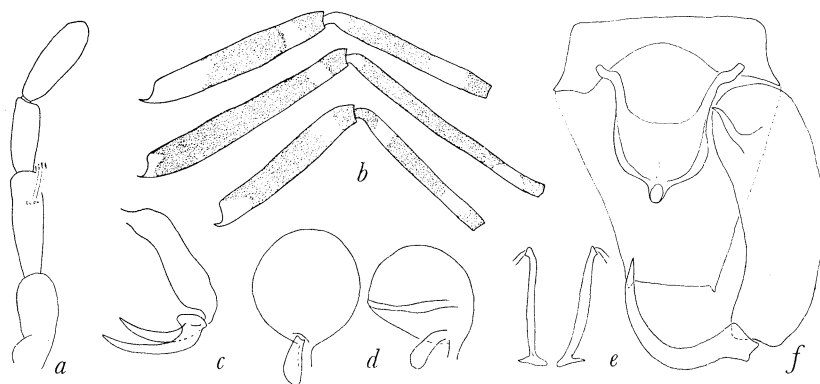


Fig. 4. *Alluaudomyia adunca*. a, palpus; b, femora and tibiae; c, claws; d, spermathecae; e, ♂ parameres; f, ♂ genitalia.

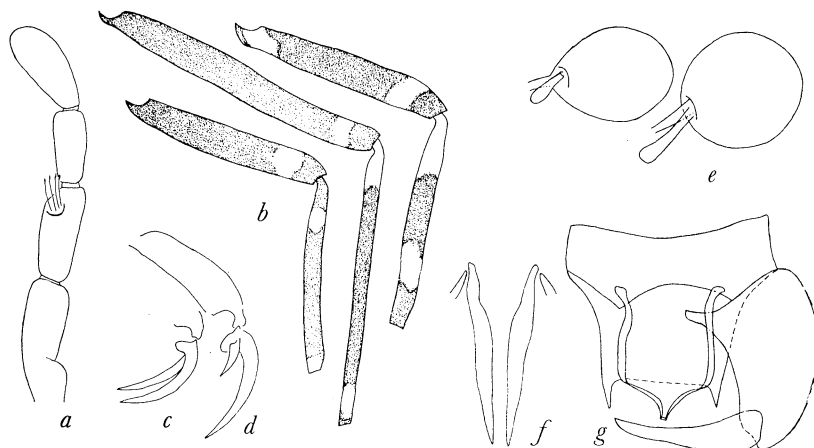


Fig. 5. *A. angulata*. a, palpus; b, femora and tibiae; c, claws of fore leg; d, claws of hind leg; e, spermathecae; f, ♂ parameres; g, ♂ genitalia.

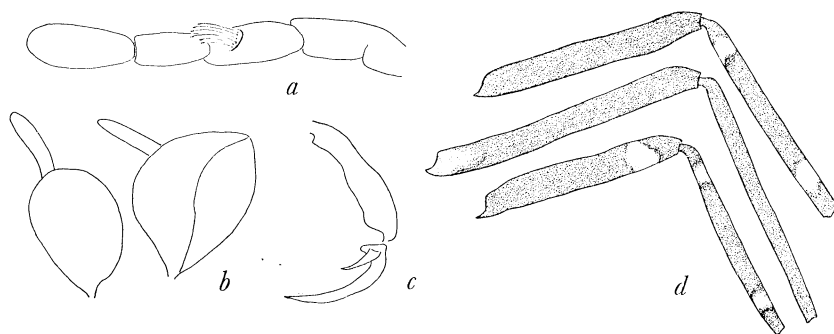


Fig. 6. *A. fuscipennis*. a, palpus; b, spermathecae; c, claws; d, femora and tibiae.

(fig. 32) with costa extending to 0.45 of total length; membrane milky white, brownish streaks along veins; 2 conspicuous dark spots, 1 proximad of r-m crossvein and other at end of costa; halter slightly infuscated. Abdomen pale brown, last segment whitish; 2 slightly unequal, subspherical spermathecae (fig. 4d), measuring 0.068 mm × 0.054 mm and 0.061 mm × 0.050 mm, with short, slender, sclerotized necks, the neck oblique in smaller spermatheca, both with slender diverticulum about 1/2 as long as diameter of spermatheca.

♂. Similar to ♀ with usual sexual differences, but femora somewhat stouter and femora and tibiae with numerous, stout, sharp, spinose hairs, longest about as long as diameter of femur; halter pale. Genitalia (fig. 4 e, f) short and broad; sternum 9 short with broad, shallow, caudomedian excavation, caudal membrane sparsely spiculate; tergum 9 narrowed distally with truncate tip bearing very small apicolateral processes. Basistyle slender and curved; dististyle in form of an extremely long, sinuate hook with slender distal portion. Aedeagus longer than broad, basal arch extending only to about 1/3 of total length, main body with round shoulders and a small, papilliform, ventrally bent, distomedian tip. Parameres each with slender detached basal apodeme; main portion straight, more slender toward base, tip truncate with short lateral process.

DISTRIBUTION: Thailand.

Types: Holotype ♀, allotype ♂, Thailand, Chiang Mai, IV-V.1958, V. Notananda, light trap (Type no. 67233, USNM). Paratypes, 6 ♂♂, 9 ♀♀, as follows. THAILAND: Same data as types 2 ♂♂, 3 ♀♀; Chiang Mai, Ampur Muang, XI.1962, J. E. Scanlon, light trap, 1 ♂; Bangkok, VIII-IX.1962, Scanlon, light trap, 2 ♂♂, 2 ♀♀; Choburi, Bangphra, X.1962, Scanlon, light trap, 1 ♂; Udonthani, Ampur Muang, IX.1962, Scanlon, light trap, 4 ♀♀.

Discussion: Recognized by its dark color, with dark brown thorax, mid femur dark to base, subequal ♀ tarsal claws, 3rd palpal segment without pit, and the sinuately hooked ♂ dististyle and distally truncate ♂ parameres. The African species *marmorata* (Carter, Ingram & Macfie) has similar wing pattern and equal ♀ tarsal claws, and nearly identical ♂ genitalia and ♀ spermathecae, but has all the femora and the mid tibia pale at the base.

5. *Alluaudomyia angulata* Wirth and Delfinado, n. sp. Figs. 5, 33.

♀. Length of wing 1.12 mm. Head brown; eyes contiguous, bare. Antenna with flagellomeres in proportion of 18-13-13-14-14-14-14-14-18-18-20-22, antennal ratio 0.86; flagellomeres long and slender, slightly tapering. Palpal segments (fig. 5a) slender, in proportion of 5-10-12-8-10, segment 3 with small round sensory pit distally. Mandible with 12 teeth. Thorax dark brown with yellowish mottling; scutellum with 4 bristles. Legs (fig. 5b) dark brown; femora with narrow subapical pale rings; fore tibia with subbasal pale ring, mid and hind tibiae with basal and subapical pale bands; tarsi pale, basitarsi brownish; hind tarsal ratio 3.1; claws subequal on fore and mid legs (fig. 5c) unequal on hind leg (fig. 5d). Wing (fig. 33) with costa extending to 0.53 of total length; membrane milky with slight grayish infuscation, especially in streaks over veins; 2 conspicuous dark spots, 1 proximad of r-m crossvein and other at end of costa; halter deeply infuscated. Abdomen brownish, last segment whitish; 2 slightly unequal spermathecae (fig. 5e), one subspherical, the other smaller one slightly tapering toward neck, measuring 0.072 mm × 0.065 mm and 0.072 mm × 0.054 mm respectively, excluding the necks which are sclerotized a distance of about 0.040 mm, each spermatheca with a slender, clavate diverticulum about 0.023 mm long.

♂. As in ♀ with usual sexual differences; but color much paler, yellowish brown with brown mottling; legs pale brown with traces of narrow rings additionally on mid tibia; leg spines only moderately strong; halter pale. Genitalia (fig. 5 f, g) short and broad; sternum 9 short with shallow caudomedian excavation, caudal membrane not spiculate; tergum 9 short, with truncate caudal margin and long, slender, apicolateral processes. Basistyle stout, basomesal corner produced mesad; dististyle nearly straight, slender, tapering to sharp tip. Aedeagus with basal arch slightly narrower than broadest portion of main body, arch indistinctly sclerotized mesad and extending to about 1/2 of total length; shoulders of main body distinctly angulate, distomedian point short, small and ventrally bent, caudal margin on each side slightly concave. Parameres each with short, detached basal apodeme; main portion a straight, spindleform bar with slightly narrowed, bluntly pointed, distal tip.

DISTRIBUTION: Malaya.

Types: Holotype ♀, allotype ♂, Malaya, Pahang, Tahan River, King George V Natl. Park, 4-6. XI. 1959, H. E. McClure, light trap (Type no. 67234, USNM). Paratypes, 2 ♂♂, 1 ♀, as follows. MALAYA: 1 ♀, same data as types; Pahang, Kuala Singgora, 18. VII. 1958, R. H. Wharton, light trap, 2 ♂♂.

Discussion: Distinguished from its close relatives by the dark legs of the ♀, with claws subequal on fore and mid legs, unequal on hind leg. There is some question that the sexes have been correctly associated, since the ♂ here described is paler with indistinctly banded mid tibia. The association is by locality and close resemblance in other characters. The ♂ genitalia are very distinctive, the combination of slender apicolateral processes, slender straight parameres, and angulate aedeagus affording easy recognition.

6. *Alluaudomyia fuscipennis* Wirth and Delfinado, n. sp. Figs. 6, 34.

♀. Length of wing 1.12 mm. Head brown; eyes bare. Antennae missing. Palpal segments (fig. 6a) in proportion of 5-10-12-8-11, segment 3 with shallow, round, distal sensory area. Mandible with 12 teeth. Thorax mottled dark brown; scutellum with 4 hairs. Legs (fig. 6d) dark brown; fore femur with narrow subapical, and fore tibia with faint narrow subbasal pale rings; mid leg entirely brown; hind femur brown, hind tibia with moderately broad basal and subapical pale rings; tarsi brownish except distal 3 tarsomeres on hind leg pale; hind tarsal ratio 2.7; claws (fig. 6c) very unequal, long and slender, on all legs. Wing (fig. 34) narrow; costa extending to 0.64 of total length; membrane deeply infuscated; 2 extensive conspicuous darker brownish spots, one proximad of r-m crossvein between radius and media extending a third way to basal arculus, the other broadly covering end of costa and extending caudad across cell R5 over halfway to vein M1; halter deeply infuscated. Abdomen dark brown, last segment whitish; 2 spermathecae (fig. 6d), collapsed in specimens examined, apparently slightly unequal and shaped as usual, but the diverticulum stouter and of uniform width. ♂. Unknown.

DISTRIBUTION: Thailand.

Types: Holotype ♀, Thailand, Udonthani, Ampur Muang, IX. 1962, J. E. Scanlon, light trap (Type no. 67235, USNM). Paratypes, 3 ♀♀ as follows: THAILAND: 2 ♀♀, same data as type; Bangkok, Thonglo, VIII-IX. 1962, Scanlon, light trap, 1 ♀.

Discussion: We are describing this species from 4 ♀♀ in only fair condition because

of the very distinctive, infuscated wing pattern, and the tarsal claws which are very unequal on all legs.

7. *Alluaudomyia inaequalis* Wirth and Delfinado, n. sp. Figs. 7, 35.

♀. Length of wing 1.25 mm. Head brown; eyes narrowly separated, bare. Antenna with flagellomeres in proportion of 18-13-14-15-15-15-16-16-22-23-23-25-28, antennal ratio 0.99; flagellomeres slender, slightly tapering. Palpal segments (fig. 7a) elongate, in proportion of 6-10-15-10-10, segment 3 with small, round, distal sensory pit. Mandible with 15 teeth. Thorax yellowish with dark brown mottling; scutellum yellowish, darker in middle, with 4 hairs. Legs (fig. 7b) yellowish, with prominent dark brown bands; coxae and fore trochanter brownish, mid and hind trochanters pale; fore femur brown with narrow subapical pale ring, fore tibia brown with moderately broad subbasal and subapical pale rings; mid femur pale on proximal 2/3, brown distally with narrow subapical pale ring, tibia brown with narrow subbasal and subapical, and broad median pale rings; hind femur pale on proximal 1/4, dark distally with narrow subapical pale ring, tibia yellow with broad median band and narrow apex dark brown; tarsi pale, hind basitarsus brown; hind tarsal ratio 2.5; claws (fig. 7c) very unequal on all legs, relatively strong. Wing (fig. 35) with costa extending to 0.65 of total length; membrane brownish white with considerable infuscation in streaks along veins; 2 conspicuous brown spots, proximad of r-m crossvein and at end of costa, the former spot elongate and filling area between base of radius and media nearly halfway to basal arculus, the distal spot broadly continued in cell R5 about halfway to vein M1; halter pale, the end of knob infuscated. Abdomen pale brownish distally, but last segment whitish; 2 subspherical spermathecae (fig. 7d), slightly unequal in size with slender sclerotized neck; diverticulum stouter and slightly shorter than in *adunca*.

♂. Similar to ♀ with usual sexual differences; legs with numerous heavy spines; halter pale. Genitalia (fig. 7e, f) short and broad; sternum 9 with shallow caudomedian excavation, caudal membrane not spiculate; tergum 9 short and tapering with truncated caudal margin and short, slender, apicolateral processes. Basistyle stout; dististyle nearly straight, slender, tapering to pointed tip. Aedeagus longer than broad, with low basal arch, extending to less than 1/3 of total length, basal arms short and slender; lateral margins subparallel, caudal margin rounded to short, slender, caudomedian point bent ventrad. Parameres each with slender, detached basal apodeme, main portion straight, slender with slightly stouter base, tapering distally to straight, blunt tip.

DISTRIBUTION: Thailand, ? Malaya.

Types: Holotype ♀, Thailand, Udonthani, Ampur Muang, IX.1962, J. E. Scanlon, light trap (Type no. 67236, USNM). Allotype ♂, Thailand, Nonthaburi, 20.XII.1958, R. Manop, light trap. Paratypes, 3 ♀♀, same data as holotype.

Discussion: This species is recognized by its large size, extensive wing spots, conspicuously pale banded legs, very strong unequal tarsal claws, and very slender, peg-like ♂ parameres. Three ♀♀ from Malaya are provisionally referred here, agreeing in all details except for their much smaller size, wing 0.80 mm long. There is 1 ♀ from Selangor, Ulu Gombok Forest Reserve, 6.X.1961, R. D. Soosai, light trap; 1 ♀, Selangor, Ulu Bernam, Ulu Selangor, 21-23.III.1961, H. E. McClure, light trap; and 1 ♀, Kelantan, Lambok, Sungei Betis, Ulu Kelantan, 9.XI.1961, R. H. Wharton, light trap.

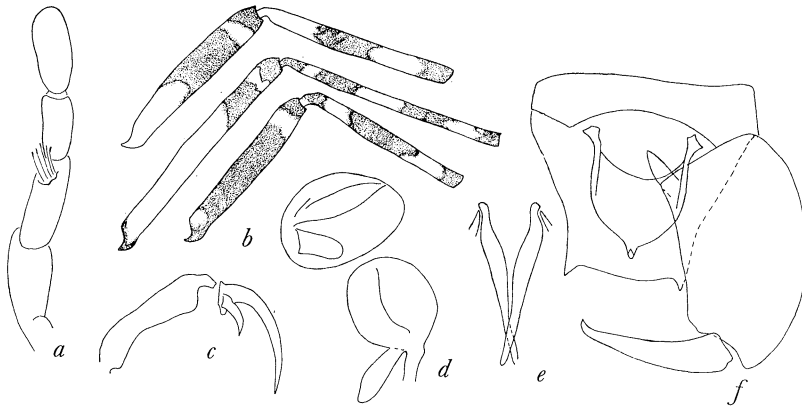


Fig. 7. *Alluaudomyia inaequalis*. a, palpus; b, femora and tibiae; c, claws; d, spermathecae; e, ♂ parameres; f, ♂ genitalia.

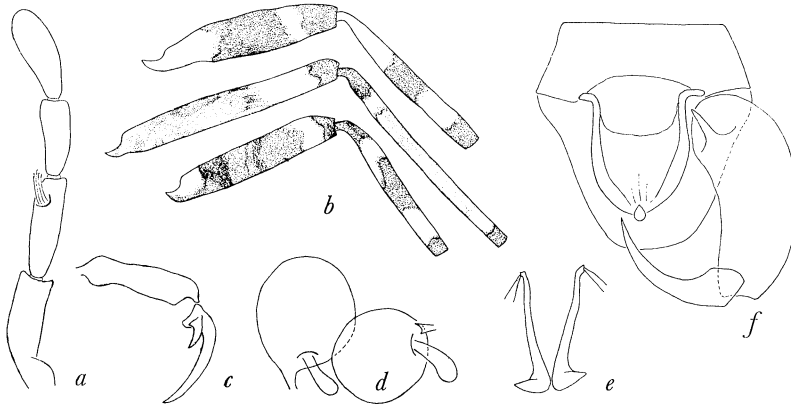


Fig. 8. *A. spinosipes*. a, palpus; b, femora and tibiae; c, claws of hind leg; d, spermathecae; e, ♂ parameres; f, ♂ genitalia.

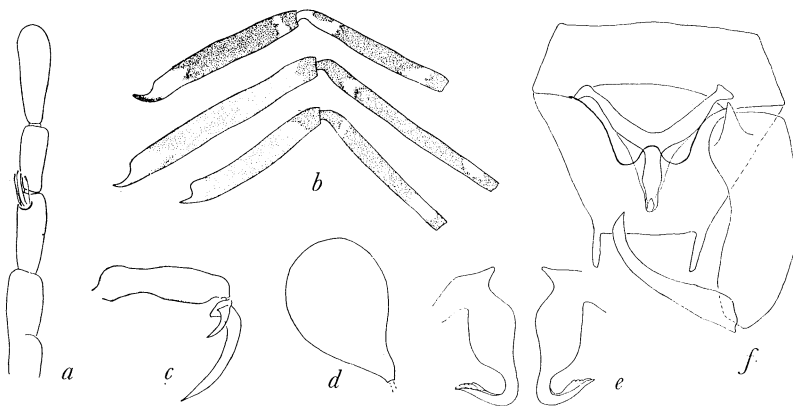


Fig. 9. *A. xanthocoma*. a, palpus; b, femora and tibiae; c, claws; d, spermatheca; e, ♂ parameres; f, ♂ genitalia.

8. *Alluaudomyia spinosipes* Tokunaga Figs. 8, 38.

Alluaudomyia spinosipes Tok., 1962, Pacific Ins. 4: 206 (Okinawa, Ryukyu Is.; fig. ♂ genitalia, spermathecae).

♀. Length of wing 0.91 (0.86–0.97, n=6) mm. Head brown; eyes contiguous, bare. Antenna with flagellomeres in proportion of 10–7–9–9–10–10–10–11–14–14–15–15–17, antennal ratio 1.0 (0.96–1.07, n=6); flagellomeres moderately slender and tapering. Palpal segments (fig. 8a) in proportion of 5–7–10–9–12, segment 3 very slender with small, round, distal sensory area. Mandible with 12 teeth. Thorax yellowish brown mottled with dark brown; scutum with faintly mottled or vittate grayish pollen; scutellum with 4 hairs. Legs (fig. 8b) yellowish; mid and hind coxae brownish, fore coxa and all trochanters pale; femora pale at bases; fore femur moderately brown on distal 3/4 except narrow subapical pale ring, fore tibia brown with narrow subbasal and subapical pale rings; mid femur with extreme apex brown, a subapical pale ring and broad basal portion faintly brownish, mid tibia dark brown at extreme base and apex with subbasal and subapical pale rings and very broad midportion faintly brownish; hind femur with distal 2/3 dark brown except narrow subapical pale ring, hind tibia pale with broad middle and short distal, dark brown bands; tarsi pale except hind basitarsus brown; hind tarsal ratio 2.3 (2.0–2.7, n=6); claws (fig. 8c) relatively short and stout, subequal on fore and mid legs, unequal on hind leg. Wing (fig. 38) with costa extending to 0.48 (0.45–0.53, n=6) of total length; membrane whitish, 2 conspicuous dark spots, one before r-m crossvein and other over end of costa, the latter not extending into cell R5; halter infuscated. Abdomen brownish, last segment whitish; subterminal sterna with characteristic infuscated pattern including a transverse row of 4 small pale hairspots on each segment; 2 slightly unequal spermathecae (fig. 8d) measuring 0.061 mm × 0.047 mm and 0.054 mm × 0.039 mm, each with a short, slender, sclerotized neck and a relatively short, distally swollen, slender diverticulum.

♂. Similar to ♀ with usual sexual differences; legs with long, stout, spine-like bristles; halter pale. Genitalia (fig. 8e, f) short and broad; sternum 9 with scarcely noticeable caudomedian excavation, caudal membrane spiculate only part way up aedeagal arch; tergum 9 rounded, without apicolateral processes. Basistyle moderately stout, curved, basomesal margin not produced; dististyle only moderately hooked from base, tapering to sharp tip. Aedeagus slightly longer than basal breadth, basal arch extending to about 0.4 of total length, middle shield-like portion rounded on caudolateral corners, distomedian stem a short, ventrally bent point. Parameres each with slender, detached basal apodeme; main portion slender at base, gradually expanded distally, apically stout and turned abruptly ventrolaterad in a flattened blade with a sharp lateral point visible; parameres more or less fused subapically on midline.

DISTRIBUTION: Ceylon, Java, Laos, Malaya, North Borneo, Philippines, Ryukyu Is., Sarawak, Thailand, Viet Nam.

MATERIAL EXAMINED. CEYLON: Colombo, Kalutaluwewa (Med. Res. Inst.), 30 ♀♀.

INDONESIA: West Java, Bogor (Adiwinata), 2 ♂♂, 4 ♀♀.

LAOS: Vientiane (Quate), 2 ♀♀.

MALAYA: Negri Sembilan, Telok Pelandok, Port Dickson (Traub); Pahang, Gudang Rasan, (Wharton); Pahang, Kuala Singgora (Wharton); Pahang, Kuantan (Traub, Wharton); Pahang, Pekan (Wharton); Pahang, Tasek Bera (Wharton); Selangor, Kuala Lumpur (Bar-

nett, Traub); Singapore, Pasir Panjang (Colless); Trengganu, Bukit Besi (Traub), 18 ♂♂, 53 ♀♀.

NORTH BORNEO: Labuan I. (Colless), 2 ♂♂, 7 ♀♀.

PHILIPPINES: Luzon, Pampanga Prov., Clark Air Base, Angeles (Balatbat); Mindanao, Agusan, Los Arcos and Esperanza (Quate); Mindanao, Cotobato Prov., Pikit (Werner), 3 ♂♂, 13 ♀♀.

SARAWAK: Santubong (Maa); Bau (Maa), 2 ♀♀.

THAILAND: Bangkok (Scanlon); Chiang Mai (Notananda); Cholburi, Bangphra (Scanlon); Khon Kaen (Manop); Loei (Manop); Minburi (Manop); Nakhon Ratchasima (Manop); Nakhon Prathom (Manop); Nong Khai (Manop); Nonthaburi (Manop); Songkla (collector ?); Thonburi (Manop); Udonthani (Scanlon); 14 ♂♂, 43 ♀♀.

VIET NAM: DiLinh (Djiring), 1200 m (Quate), 1♂.

Discussion: Very closely related to the African species *marmorata* (Carter, Ingram & Macfie), and to *novaguineana* Tokunaga from New Guinea. The African species is nearly identical in wing and leg pattern and in most details of the ♂ genitalia, but the ♀ claws are all equal, the ♀ spermathecae have a longer neck and appendix, and the ♂ parameres lack the lateral process at the tip. Of all the New Guinea species of this group described by Tokunaga, *novaguineana* comes closest, but it has the ♀ claws all unequal.

THE XANTHOCOMA GROUP

This group of species is very closely related to the Maculipennis Group, but the wing markings are restricted to 2 conspicuous dark spots, one proximad of r-m crossvein and the other at the end of the costa. In addition there may be more or less conspicuous streaks lying over the veins, especially near the base of vein M2 and at the end of the anal vein. Like the species of the Maculipennis Group, these species have the eyes usually bare and contiguous, the antennae moderately long and slender, and brownish except for very short basal pale rings on segments 3-10. The legs are dark with narrow pale rings and the tarsal claws are all unequal. There is 1 pear-shaped spermatheca, without appendage. The ♂ genitalia are characterized by the bilobed 9th sternum, short 9th tergum with long apicolateral processes, aedeagus with round basal arch and peg-shaped median stem, and parameres with stout mid portion and short, laterally bent, slender distal portion. This is a small group, including definitely only *maculithorax* (Carter, Ingram & Macfie) and *pseudomaculithorax* Clastrier from Africa, and *sternalis* n. sp. and *xanthocoma* (Kieffer) from the Oriental Region.

9. *Alluaudomyia xanthocoma* (Kieffer) Figs. 9, 36.

Culicoides xanthocoma Kief., 1913, Rec. Indian Mus. 9: 182 (♂; Orissa, India).

Alluaudomyia xanthocoma (Kief.): Kief., 1925, Arch. Inst. Pasteur Algérie 3: 422 (n. comb.).

—Edwards, 1932, Rec. Indian Mus. 34: 178 (Chilka Lake, India).

♀. Length of wing 1.0 (0.88-1.05, n=6) mm. Eyes bare, nearly contiguous. Antenna with flagellomeres in proportion of 10-8-8-8-9-9-10-12-13-14-12-16, antennal ratio 1.00 (0.92-1.07, n=6). Palpal segments (fig. 9a) in proportion of 5-8-10-9-12, segment 3 with small, round, preapical sensory pit. Thorax dark brown, with irregular pale mottling;

scutellum with 4 bristles. In pinned specimens scutum and scutellum with heavy silvery gray pollen, scutum with small brown dots at base of hairs, scutellum narrowly brown in middle. Legs (fig. 9b) dark brown, with narrow pale rings at bases of femora, knees dark with narrow pale rings adjacent at apices of all femora and bases of tibiae, subapical pale rings at apices of tibiae; hind tarsal ratio 2.6; claws (fig. 9c) unequal on all legs, the smaller claw less than 1/2 as long as the other. Wing (fig. 36) with costa extending to 0.61 (0.54–0.64, n=6) of total length; 3 conspicuous dark spots, one just proximad of r-m crossvein. 2nd lying at apex of costa, and 3rd on base of vein M2; veins slightly darkened on mediocubital fork; halter pale. One large pear-shaped spermatheca (fig. 9d), measuring 0.090 mm × 0.061 mm.

♂. Similar to ♀ with usual sexual differences. Genitalia (fig. 9 e, f) short; sternum 9 with 2 well-developed submedian lobes, surpassing basal arch of aedeagus; tergum 9 short, broader than long, with long, very slender, apicolateral processes. Basistyle elongate; dististyle slender and curving to slightly expanded, pointed tip. Aedeagus with low, broad basal arch, basal arms slender; distomedian stem long and finger-like. Parameres each with stout main portion markedly swollen ventrolaterally, then abruptly constricted toward midline with slender distal portion abruptly curving ventrolaterad and tapering to short, slender, blackened distal point.

DISTRIBUTION: Ceylon, India, Java, Malaya, Taiwan, Thailand.

SPECIMENS EXAMINED. 44 ♂♂, 18 ♀♀. CEYLON: Colombo, Kalutaluwewa (Med. Res. Inst.).

INDONESIA: West Java, Bogor (Adiwinata).

MALAYA: Kedah, Sungei Patani (Traub); Pahang, Kuala Singgora (Wharton); Pahang, Tasek Bera (Wharton); Selangor, Kuala Lumpur (Barnett, Hubert, Traub).

THAILAND: Ayudhaya (Manop); Bangkok (Scanlon); Chiang Mai (Notananda); Cholburi, Bangphra (Scanlon); Kohn Kaen (Manop); Loei (Manop); Minburi (Manop); Nakhon Phanom (Manop); Nakhon Prathom (Manop); Nong Khai (Manop); Nonthaburi (Manop); Pechaburi (Manop); Thonburi (Manop); Udonthani (Scanlon).

Discussion: Identified from Kieffer's original description, by virtue of the characteristic wing and leg patterns, which were clearly stated, and by the characteristic ♂ genitalia, the 9th tergum of which Kieffer described: "lamelle n'atteignat que le milieu des articles basaux, découpé en arc au bord postérieur, avec un stylet à chaque angle," clearly referring to the very slender, elongate apicolateral processes. The African species, *maculithorax* (Carter, Ingram & Macfie) and *pseudomaculithorax* Clastrier, are closely related, with very similar ♂ genitalia including the bilobed sternum 9; the parameres of *maculithorax* have the mid portion quite slender, while in *pseudomaculithorax* they are strongly swollen as in *xanthocoma* but the apices are more angulate.

10. *Alluaudomyia sternalis* Wirth and Delfinado, n. sp. Figs. 10, 37.

♂. Length of wing 0.98 mm. Head and thorax dark brown; palpal segments as figured (fig. 10a); scutum with yellowish mottling scutellum yellowish. Legs dark brown, including knees; narrow pale rings on each side of knees and subapically on hind tibia; tarsi pale except hind basitarsus brownish; hind tarsal ratio 2.2. Wing (fig. 37) with costa extending to 0.51 of total length; membrane faintly grayish, slightly darker along veins; 2

conspicuous dark spots, one proximad of r-m crossvein and other at end of costa, plus 3 smaller elongate gray spots, one in cell M2 below the 1st spot, another on base of vein M2 below 2nd spot, and the 3rd subapically on anal vein; halter infuscated. Abdomen dark brown; genitalia (fig. 10 f, g) with sternum 9 prolonged caudally in 2 long, pointed sublateral lobes; tergum 9 narrow caudad with prominent stout, apicolateral processes. Basistyle long and slender; dististyle markedly bent near base and curving hook-like. Aedeagus with rounded basal arch extending to nearly 1/2 of total length, basal arms moderately stout; distal stem moderately long with slender tip. Parameres each with slender basal arm, main portion slender and nearly straight, elongate, curving ventrad to simple, sharp, filamentous tip. ♀. Unknown.

DISTRIBUTION: Thailand.

Types: Holotype ♂, Thailand, Udonthani Prov., Nong Han Dist., 21-22. VI, R. Manop, light trap (Type no. 67238, USNM). Paratypes, 5 ♂♂, all from Thailand, collected by Manop, VI. 1959, light trap: 2, Udonthani Prov., Meung Dist.; 2 Loei Prov., Ta Lee Dist.; and 1, Nong Khai Prov., Meung Dist.

Discussion: The distinctive genitalia readily distinguish this species from the others of the Xanthocoma Group.

THE MACULIPENNIS GROUP

Species without large distinct wing spots on distal portions of media and cubitus, but these veins often with dark streaks; conspicuous spots present proximad of r-m crossvein and at end of costa, additional prominent spots or clouds often present in cells between the veins near wing margin. Legs usually dark with narrow pale rings; antennae dark with narrow basal pale rings on antennomeres 3-10; claws usually unequal on all legs; 1 spermatheca present, without diverticulum. ♂ genitalia with extremely diverse specific differences.

Species belonging to the Maculipennis Group but with restricted wing markings, lacking the distal spots in the cells, include: *claudia* de Meillon and *demeilloni* Clastrier & Wirth from Africa; *hygropetrica* Vaillant, *limosa* Clastr., and *quadripunctata* (Goetghebuer) from Europe; *megaparamera* Williams and *needhami* Thomsen from North America; *aterivena* Tokunaga and *quiuquepunctata* Tok. from Japan, *bipunctata* Tok. & Mur. from Micronesia; and *albigena* n. sp., *huberti* n. sp.; *infuscata* n. sp., *macclurei* n. sp., and *quinquenebulosa* n. sp., from the Oriental Region.

More typical species, with discal wing spots in the cells, include: *abonnenci* Clastr., *dekeyseri* Clastr., *fimbriatinervis* Clastr., *fragilicornis* Clastr., *maculipennis* (Clast., Ingram & Macfie), *memillani* Clastr. & Wirth, *melanosticta* (Ingr. & Macf.), *sordidipennis* Clastr. & Wirth, *vudu* de Meil. & Hardy, and *wasoni* de Meil. from Africa; *stictipennis* Wirth from California; *sagaensis* Tok. from Japan; and *formosana* Okada, *maculosipennis* Tok., *maculosissima* n. sp., *magna* n. sp., *marginalis* n. sp., *pseudomarginalis* n. sp., *thurmanorum* n. sp., and *tripartita* Okada from the Oriental Region.

11. *Alluaudomyia albigena* Wirth and Delfinado, n. sp. Figs. 10, 41.

♀. Length of wing 0.88 mm. Head brown; eyes contiguous, bare. Antenna with flagellomeres in proportion of 11-10-10-10-10-11-12-14-15-15-14-17, antennal ratio 0.89;

proximal flagellomeres moderately slender and tapering. Palpi broken; segment 3 (fig. 10b) with small round subapical pit. Mandible with 14 teeth. Thorax bright yellow; scutum without brown dots; pleuron dark brown on lower 1/2. Legs (fig. 10c) yellowish white; mid and hind coxae and all trochanters brownish; knees pale; fore femur brown in mid portion, pale on proximal and distal 1/4, mid and hind femora brown on proximal 1/2; fore tibia brown on distal 2/3, mid tibia with narrow apex and a narrow subapical ring brown, hind tibia brown on narrow apex and on incomplete rings at proximal and distal 1/3 of length; fore and hind basitarsi slightly brownish; hind tarsal ratio 2.5; claws (fig. 10d) unequal on all legs, long and slender. Wing (fig. 41) with costa very long, extending to 0.70 of total length; 3 very small dark spots, proximad of r-m crossvein, at end of costa, and near base of vein M_2 ; in addition very faint dark streaks at base of vein M_{3+4} and near apices of veins M_1 , M_2 , M_{3+4} , and Cul; halter pale. Abdomen slightly brownish except on extreme distal segments; 1 spermatheca (fig. 10e) measuring 0.058 mm \times 0.065 mm, subspherical, not tapering to duct. ♂. Unknown.

DISTRIBUTION: Thailand.

Type: Holotype ♀, Thailand, Samuthprakan, 22. XII. 1958, R. Manop, light trap (Type no. 67239, USNM).

Discussion: Readily distinguished from other members of the *Maculipennis* Group by its uniformly yellow scutum and very pale legs.

12. *Alluaudomyia quinquenebulosa* Wirth and Delfinado, n. sp. Figs. 11, 39, 40.

♀. Length of wing, 1.31 mm. Head dark brown, eyes nearly contiguous, bare. Antenna with flagellomeres in proportion of 18-14-14-14-15-15-15-17-20-20-20-20-22, antennal ratio 0.82; proximal flagellomeres slender and slightly tapering. Palpal segments (fig. 11a) in proportion of 7-10-12-12-15, segment 3 with a large, slightly irregular, shallow sensory pit on distal 1/3. Mandible with 13 teeth. Thorax dark brown with yellowish mottling, scutellum paler. Legs (fig. 11b) brownish with narrow pale rings; knee spots darker brown with narrow pale rings on each side; tibiae with narrow subapical pale rings; banding very indistinct on mid leg, more intense on hind leg; tarsi pale except hind basitarsus; hind tarsal ratio 3.7; claws (fig. 11c) unequal on all legs, long and slender. Wing (fig. 39) broad, nearly 1/2 as broad as long, with costa extending to 0.57 of total length; membrane heavily brownish infuscated, especially along veins and on anterior 1/2 of distal portion of cell R_5 ; only 2 conspicuous dark spots, 1 extending proximad from r-m crossvein halfway to wing base and from costa to media, the second lying over apex of costa; halter pale. Abdomen pale brown, segments 7-9 dark brown; spermatheca (fig. 11d) elongate, pear-shaped, measuring 0.140 mm long and 0.100 mm wide.

♂. Similar to ♀, except for usual sexual differences, and in wing pattern (fig. 40) as follows: Wing with 5 moderately large, but rather indistinct cloud-like spots, 1 proximad of r-m crossvein, 2nd at end of costa, 3rd at midlength of distal portion of cell R_5 , 4th lying near base of vein M_2 , and 5th near tip of anal vein. Genitalia (fig. 11 e, f) with caudomedian excavation of sternum 9 very broad and deep, caudal membrane not spiculate; tergum 9 short and tapering, without apicolateral processes. Basistyle moderately long, with distinct small, mesal lobe near base; dististyle abruptly bent near base, nearly straight distad, with distinct apical tooth. Aedeagus with very high, round basal arch, the basal arms very slender and evenly curved, the distomedian portion very short and simple.

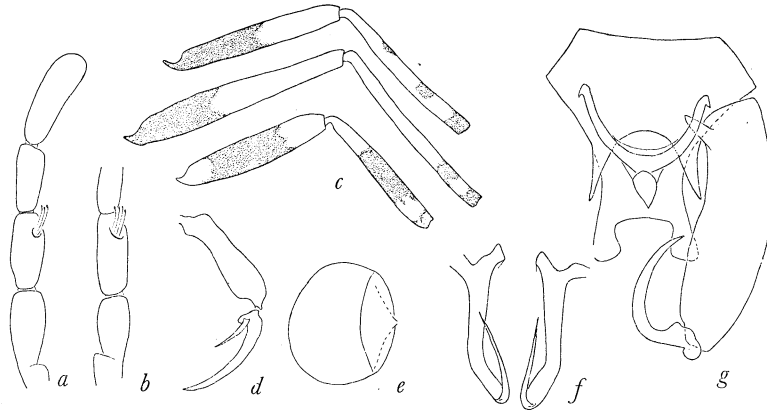


Fig. 10. *Alluaudomyia sternalis*. a, palpus; f, ♂ parameres; g, ♂ genitalia. *A. albigena*. b, palpus; c, femora and tibiae; d, claws; e, spermatheca.

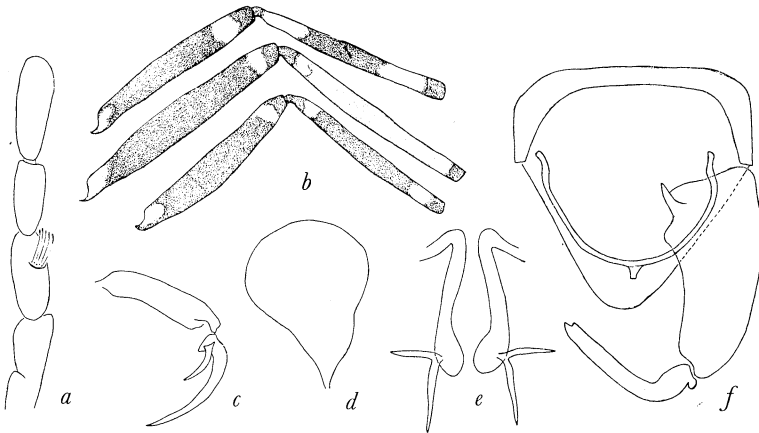


Fig. 11. *A. quinquenbulosa*. a, palpus; b, femora and tibiae; c, claws; d, spermatheca; e, ♂ parameres; f, ♂ genitalia.

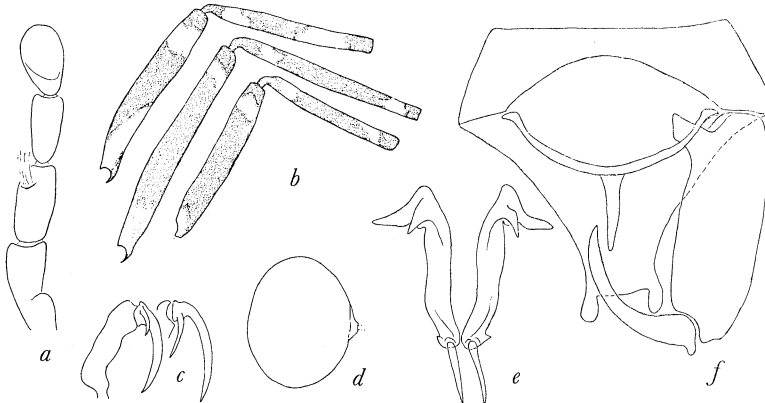


Fig. 12. *A. infuscata*. a, palpus; b, femora and tibiae; c, claws; d, spermatheca; e, ♂ parameres; f, ♂ genitalia.

Parameres each with moderately slender basal arm, mid portion a nearly straight, slightly club-tipped stem, bearing subapically on lateral side of pair of slender, straight appendages from a common base.

DISTRIBUTION: Malaya.

Types: Holotype ♂, allotype ♀, Malaya, Pahang, Mt Brinchang, 1500–1800 m, III. 1963, H. E. McClure, light trap (Type no. 67240, USNM). Paratypes, 1♂, 1♀, same data as types.

Discussion: The ♀ is very similar to other species of the *Maculipennis* Group with infuscated wings, but can be recognized by its large size and large, pear-shaped spermatheca. The ♂ is very distinctive because of its 5-clouded wing pattern as well as by the very characteristic genitalia.

13. *Alluaudomyia infuscata* Wirth and Delfinado, n. sp. Figs. 12, 42.

♀. Length of wing 0.84 mm. Head brown; eyes contiguous. Antenna with flagellomeres in proportion of 11–8–8–8–8–9–10–10–14–14–14–13–19, antennal ratio 1.03; proximal flagellomeres moderately slender and slightly tapering. Palpal segments (fig. 12a) in proportion of 5–7–8–8–9, 3rd segment with a small round distal pit. Mandible with 12 teeth. Thorax brownish with darker mottling, scutellum concolorous with scutum and pleuron. Legs (fig. 12b) pale brown with dark knees bordered by narrow pale rings; femora pale at bases; tibiae also with narrow, subapical pale rings; tarsi pale except hind basitarsus brown; hind tarsal ratio 2.7; claws (fig. 12c) unequal on all legs, long and slender. Wing (fig. 42) with costa extending to 0.58 of wing length; membrane distinctly brownish infuscated; wing with 3 conspicuous dark spots, 1 proximad of r-m crossvein, 1 at end of costa, and 1 near base of vein M_2 ; in addition with faint dark streaks along all veins; halter infuscated. Abdomen brownish near tip; 1 spermatheca (fig. 12d) broader than long, measuring 0.065 mm × 0.053 mm, very slightly tapering to the duct.

♂. Similar to ♀, including the wing pattern, except for usual sexual differences. Genitalia (fig. 12 e, f) with sternum 9 very short with very shallow caudomedian excavation, caudal membrane not spiculate; tergum 9 short and tapering to a pair of closely approximated, long, stout, apicolateral processes. Basistyle moderately short, dististyle moderately slender and curved. Aedeagus with very low, broad basal arch, basal arms very slender and evenly curved; distal stem long and slender, simple at tip. Parameres each with stout basal arm, mid portion stout and slightly sinuate, bearing distally a moderately long, slender appendage.

DISTRIBUTION: Malaya.

Types: Holotype ♂, allotype ♀, Malaya, Pahang, Tahan River, King George V Natl. Park, 4–6. XI. 1959, H. E. McClure, light trap (Type no. 67241, USNM). Paratypes, 2♂♂, 1♀, as follows: Malaya, 1♀, same data as types; Pahang, Kuala Singgora, 18. VII. 1958, R. H. Wharton, light trap, 2♂♂.

Discussion: Very similar to several others of the *Maculipennis* Group with infuscated wings, but can be recognized by the characteristic ♂ genitalia and turnip-shaped ♀ spermatheca.

14. *Alluaudomyia macclurei* Wirth and Delfinado, n. sp. Fig. 13.

♀. Length of wing 1.16 mm. Head brown; eyes nearly contiguous, bare. Antenna with flagellomeres in proportion of 16-11-11-12-12-13-13-13-16-16-16-15-20, antennal ratio 0.82; flagellomeres moderately slender and slightly tapering. Palpal segments (fig. 13a) in proportion of 5-8-10-8-13, segment 3 with irregular, shallow sensory pit on distal 1/2. Mandible damaged in available specimens. Thorax brownish with yellowish mottling, scutellum concolorous with scutum, with 2 hairs. Legs (fig. 13b) brownish, knee spots dark brown; narrow pale rings subapically on fore and hind femora; fore tibia with narrow subapical pale ring; hind tibia pale on proximal 1/4 and on a broad subapical band; tarsi pale except hind basitarsus brownish; hind tarsal ratio 3.0; tarsal claws equal on fore and mid legs (fig. 13d), very unequal on hind leg (fig. 13c), very long and slender. Wing with costa extending to 0.58 of total length; membrane milky white; wing with 2 conspicuous dark spots, 1 proximad of r-m crossvein, the other at end of costa, in addition with dark streaks along veins, prominent especially near base of vein M_2 , base of Cu, over mediocubital fork, and near apices of veins M_1 , M_2 , M_{3+4} , Cu_1 , and anal vein; halter slightly infuscated. Abdomen brownish; 1 pear-shaped spermatheca (fig. 13e) with conical sclerotized neck, measuring overall 0.078 mm long \times 0.063 mm broad.

♂. Similar to ♀, with usual sexual differences. Genitalia (fig. 13 f, g) very short; sternum 9 a very narrow anterior band bordering a deep, broad, caudomedian excavation, caudal membrane spiculate; tergum 9 short and caudally rounded without apicolateral processes. Basistyle short; dististyle slender and slightly curved. Aedeagus with a broad, low basal arch, basal arms moderately stout; caudal margin with 2 low, rounded, submedian lobes; median stem apparently comprised of a pair of small, internal, heavily sclerotized processes, and a pair of caudally directed, tapering, hyaline filaments. Parameres each with short basal arm, stout main portion lying obliquely dorsad in same position as lateral arm of aedeagus, with stout base and more swollen, clubbed tip near midline bearing a short, filamentous appendage.

DISTRIBUTION: Malaya.

Types: Holotype ♂, allotype ♀, Malaya, Pahang, Mt Brinchang, 1500-1800 m, III. 1963, H. E. McClure, light trap (Type no. 67242, USNM). Paratype, 1 ♀, same data as types.

Discussion: Very similar to *infuscata* n. sp. and *huberti* n. sp., but the ♀ has subequal tarsal claws on the fore and mid legs (a character exceptional in the Maculipennis Group), and the ♂ genitalia are very distinctive.

15. *Alluaudomyia huberti* Wirth and Delfinado, n. sp. Figs. 14, 43.

♀. Length of wing 1.1 mm. Head brown; eyes nearly contiguous, bare. Antenna with flagellomeres in proportion of 15-11-12-12-12-13-13-13-13-14-15-13-16, antennal ratio 0.70; flagellomeres moderately slender and slightly tapering. Palpal segments (fig. 14a) in proportion of 6-10-10-8-12, segment 3 with a shallow round sensory pit on distal 1/2. Mandible with 15 teeth. Thorax brownish with extensive yellowish mottling, scutellum yellowish. Legs (fig. 14b) brown, knee spots dark brown with adjacent pale rings, narrow on fore leg; subapical pale ring broad on mid femur and narrow on hind femur; mid tibia pale except for narrow brown apex and base; hind tibia pale except for narrow middle and apical brown bands; tarsi pale except all of fore tarsus and hind basitarsus brownish;

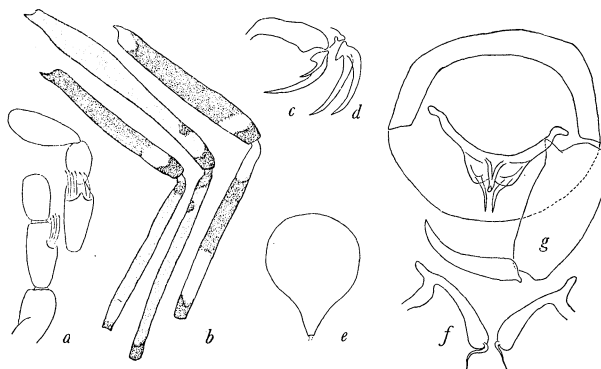


Fig. 13. *Alluaudomyia macclurei*. a, palpus; b, femora and tibiae; c, claws of hind leg; d, claws of fore leg; e, spermatheca; f, ♂ parameres; g, ♂ genitalia.

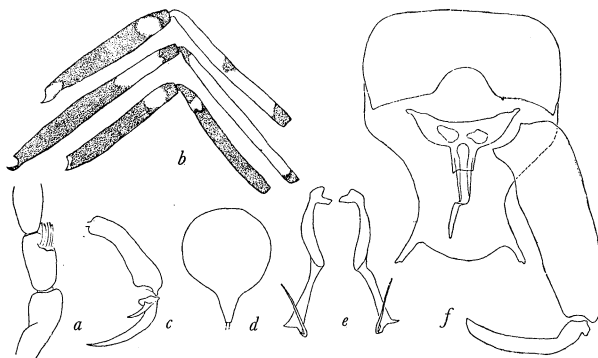


Fig. 14. *A. huberti*. a, palpus; b, femora and tibiae; c, claws; d, spermatheca; e, ♂ parameres; f, ♂ genitalia.

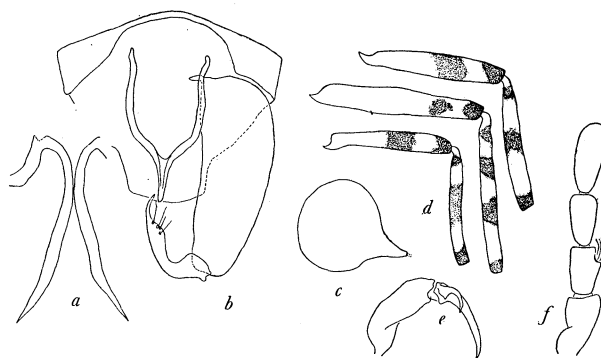


Fig. 15. *A. maculosissima*. a, ♂ parameres; b, ♂ genitalia. *A. tripartita*. c, spermatheca; d, femora and tibiae; e, claws; f, palpus.

hind tarsal ratio 2.6; tarsal claws (fig. 14c) very unequal on all legs, the long claw as long as 5th tarsomere, the short one 1/3 as long and very slender. Wing (fig. 43) with costa extending to 0.50 of total length; membrane milky white, with 2 conspicuous dark spots, 1 proximad of r-m crossvein, the other at end of costa, and fairly prominent streaks along veins, especially near bases of M_1 and M_2 and on mediocubital fork, and near apices of veins M_1 , M_2 , and M_{3+4} ; halter pale. Abdomen pale; 1 pear-shaped spermatheca (fig. 14d) with conical sclerotized neck, measuring overall 0.065 mm long \times 0.055 mm broad.

♂. Similar to ♀ with usual sexual differences, but wings slightly more infuscated with less contrasting veins, and legs with more extensive dark markings, mid tibia dark except narrow subbasal pale ring. Genitalia (fig. 14 e, f) very elongate; sternum 9 with small caudomedian excavation, the caudal membrane spiculate; tergum 9 narrow and flaring distad, with long, slender, divergent, apicolateral processes. Basistyle long and slender, dististyle slightly bent near base, distal portion slender and slightly curved. Aedeagus with basal arch forming a stout, curved, transverse sclerite, bearing caudally an elongate, tapering process distally bent ventrad to an extremely slender tip. Parameres each with short basal arm; mid portion crooked at base, straight distally, bearing laterally a sharp lateral process and distally a slender, ventrally curved, filamentous tip.

DISTRIBUTION: Malaya.

Types: Holotype ♂, allotype ♀, Malaya, Pahang, Mt Brinchang, 1500–1800 m, III. 1963, H. E. McClure, light trap (Type no. 67243, USNM). Paratype, 1 ♀, same data as types.

Discussion: This species can be separated from the closely related *infuscata* n. sp. most readily by the shape of the ♀ spermatheca and from *macclurei* n. sp. by the characteristic ♂ genitalia. The extensively pale mid and hind legs of the ♀ may be characteristic, but may be subject to variation, as indicated by the ♀ paratype, in which the hind femur is pale on the basal 1/2 in addition to the subapical pale ring.

16. *Alluaudomyia maculosissima* Wirth and Delfinado, n. sp. Figs. 15 a, b, 45.

♂. Length of wing 0.88 mm. Eyes bare; antenna and palpus brownish; antenna with distal 4 flagellomeres in proportion of 10–20–20–25. Thorax dark brown, scutum with irregular paler spots; scutellum yellowish. Legs dark brown with narrow pale bands; subapical pale rings on all femora and tibiae, subbasal pale rings on all tibiae, and fainter median pale bands on mid and hind tibiae; tarsi pale except hind basitarsus dark; hind tarsal ratio 2.7. Wing (fig. 45) with costa extending to 0.55 of total length; wing with extensive dark spots and streaks as figured; halter infuscated. Abdomen pale; genitalia (fig. 15 a, b) with basistyle elongate; dististyle bent in midportion, swollen and ventrally setose subapically, and abruptly narrowed to a very slender distal claw. Aedeagus with a very high basal arch, the basal arms slender, distal stem slender and simple. Parameres each a simple, slender, elongate blade with a slender, curved basal root. ♀. Unkown.

DISTRIBUTION: Java.

Type: Holotype ♂, Bogor, West Java, 28. XI. 1959, R. T. Adiwinata, light trap (Type no. 67244, USNM).

Discussion: The Japanese species *undecem punctata* is closely related, with nearly identical, but less extensive wing markings, and with 2 distal dark spots each in cells R_5 and M_1 , but it lacks the median pale bands on mid and hind tibiae, and differs in genitalic structure.

The genitalia of *undecempunctata*, which have not previously been described and illustrated, are here drawn from a specimen from Midoro Pond, Kyoto, Japan, VI. 1955, P. H. Arnaud, light trap (fig. 16 a, b). They are distinguished by the gradually curving dististyle with short terminal claw, and the paramere with a swollen apex bearing a slender distal process and slender, recurved lateral process.

17. *Alluaudomyia marginalis* Wirth and Delfinado, n. sp. Figs. 17, 44.

♀. Length of wing 1.2 (1.05–1.34, n=7) mm. Head brownish, including antenna and palpus; eyes contiguous a short way, bare. Antenna with flagellomeres in proportion of 12–10–10–10–11–11–13–14–15–16–17–18–21; antennal ratio 0.92 (0.83–0.97, n=6); proximal flagellomeres elongate and tapering. Palpal segments (fig. 17a) in proportion of 7–11–11–8–14, segment 3 with small round sensory pit. Mandible with 15 teeth. Thorax brownish, upper pleuron and sides of scutum yellowish, mid scutum with dark brown blotches. Legs (fig. 17b) brownish with narrow pale yellowish rings on bases of fore and hind femora, subapically on all femora, and subbasally and subapically on tibiae; mid tibia with additional broad, less distinct median pale band; apices of fore and mid, and all of hind basitarsi dark; hind tarsal ratio 2.33 (2.0–2.6, n=6); claws (fig. 17c) long, slender, unequal. Wing (fig. 44) with costa extending to 0.79 (0.68–0.89, n=7) of total length; with extensive dark markings as figured; 2 dark spots in mediocubital fork, the wing margin from base of wing to tip of vein M_1 narrowly dark bordered; halter pale. Abdomen light brown; 1 subspherical spermatheca (fig. 17d) with short, tapered, sclerotized neck, measuring overall 0.065 mm long \times 0.054 mm broad.

♂. Similar to ♀ with usual differences; wing spots usually much more reduced, with dark spots in mediocubital fork and dark margined border frequently entirely absent. Genitalia (fig. 17 e, f) with sternum 9 very short, with broad, shallow, caudomedian excavation; tergum 9 with rounded posterior border without well developed apicolateral processes. Basistyle short; dististyle elongate, slender, nearly straight, with slightly hooked tip. Aedeagus with a high basal arch of distinctive Gothic shape, with a median point and a distinct pair of caudolateral points; distomedian stem very short and rounded. Parameres each with straight, slender lateral arm, distal portion a long, slender, slightly curved blade with sharp tip.

DISTRIBUTION: Ceylon, Malaya to Java and the Philippines.

Types: Holotype ♀, allotype ♂, Malaya, Perlis, Kangar Rest House, 12.VII.1958, R. Traub, light trap (Type no. 67245, USNM). Paratypes, 1♂, 14♀♀, same data as type.

OTHER SPECIMENS EXAMINED. CEYLON: Colombo, Kalutaluwewa (Med. Res. Inst.), 1♂.

INDONESIA: West Java, Bogor (Adiwinata), 2♂♂, 1♀.

MALAYA: Pahang, Kuala Singgora (Wharton); Pahang, Tahan River, King George V Natl. Park (McClure); Selangor, Kuala Lumpur (Barnett, Traub).

NORTH BORNEO: Tarakan (Humes), 1♂.

PHILIPPINES: Luzon, Pampanga Prov., Clark Air Base, Angeles (Balatbat).

THAILAND: Ayudhaya (Manop); Bangkok (Scanlon); Chiang Mai (Notananda); Choburi (Scanlon); Khon Kaen (Manop); Loei (Manop); Minburi (Manop); Nakhon Phanom (Manop); Nakhon Prathom (Manop); Nakhon Ratchasima (Manop); Nonthaburi (Manop); Udonthai (Manop, Scanlon).

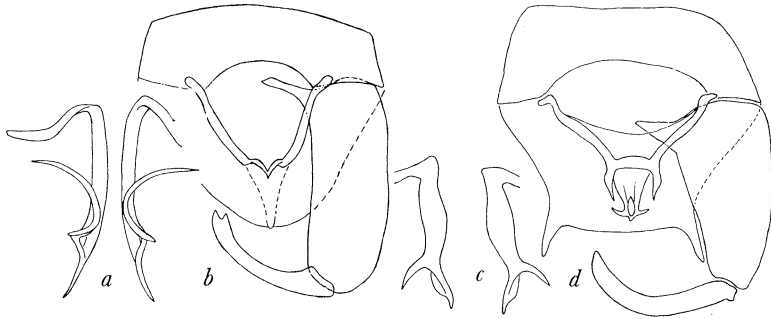


Fig. 16. *Alluaudomyia undecimpunctata*. a, ♂ parameres; b, ♂ genitalia. *A. sagaensis*. c, ♂ parameres; d, ♂ genitalia.

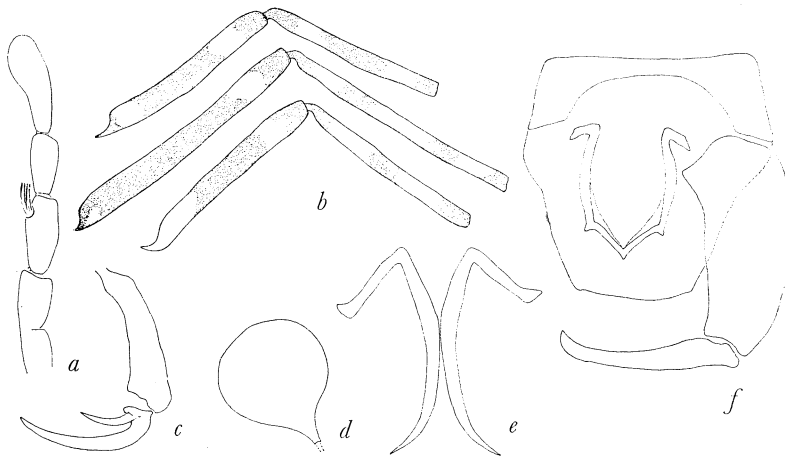


Fig. 17. *A. marginalis*. a, palpus; b, femora and tibiae; c, claws; d, spermatheca; e, ♂ parameres; f, ♂ genitalia.

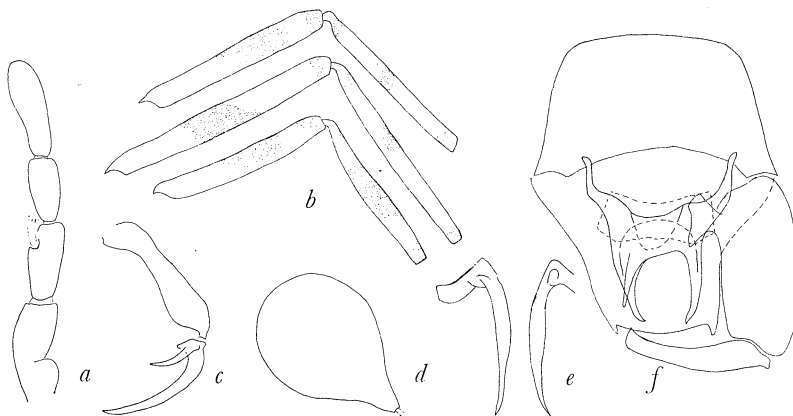


Fig. 18. *A. maculosipennis*. a, palpus; b, femora and tibiae; c, claws; d, spermatheca; e, ♂ parameres; f, ♂ genitalia.

Discussion: The wing markings of this species are very similar to those of *maculosipennis* Tok. and *pseudomarginalis* n. sp., but the ♀ of *marginalis* has a dark wing margin. The large, pear-shaped spermatheca and more strikingly pale banded legs will also identify *maculosipennis*, while *pseudomarginalis* and *maculosipennis* have only 1 median dark band on the mid tibia. The ♂ genitalia of *pseudomarginalis* are very similar but lack the caudolateral points on the aedeagus.

18. *Alluaudomyia maculosipennis* Tokunaga Figs. 18, 46.

Alluaudomyia maculosipennis Tok., 1940, *Tenthredo* 3: 181 (Caroline Is.; fig. wing, ♂ genitalia).—Okada, 1942, *Trans. Nat. Hist. Soc. Formosa* 32: 316 (Taiwan).—Tok. & Mur., 1959, *Ins. Micronesia* 12: 353 (Palau & Yap Is.).

♀. Length of wing 1.21 (1.08–1.47, n=6) mm. Head yellow, clypeus, palpi, and antennae except for bases of segments 3–10 brownish; eyes nearly contiguous, base. Antenna with flagellomeres in proportion of 13–10–10–10–11–11–12–13–15–15–14–12–17, antennal ratio 0.82 (0.80–0.84, n=3); flagellomeres of proximal series progressively more slender and distally tapered toward distal portion of series. Palpal segments (fig. 18a) in proportion of 6–10–10–9–13; segment 3 with very small round distal pit. Mandible usually with 15 teeth. Thorax yellowish brown; scutum with numerous dark brown punctures and a prominent pair of sublateral dark brown vittae; pleuron with a dark brown band above bases of coxae; scutellum and postscutellum dark brown, scutellum with extreme ends and narrow mid section pale. Legs (fig. 18b) yellowish white, with distinct dark brown rings; trochanters brown, all femora with broad median and narrow subapical dark bands; all tibiae with narrow subbasal, broad (fore) or narrow (mid and hind) median bands, and narrow apices brown; apices of all basitarsi brown; hind tarsal ratio 2.2 (2.1–2.6, n=6); claws (fig. 18c) very unequal, the longer nearly as long as tarsomere 5, slightly shorter on hind leg. Wing (fig. 46) with many small, irregular-shaped, dark gray spots as figured; costa extending to 0.73 (0.66–0.86, n=6) of total length; halter whitish. Abdomen whitish; 1 elongate, pear-shaped spermatheca (fig. 18d), measuring 0.090 mm×0.064 mm.

♂. Similar to ♀, with usual sexual differences, wing spots much reduced. Genitalia (fig. 18 e, f) with sternum 9 elongate, as long as basistyle, caudal margin only slightly excavated; tergum 9 with distinct but small moderately separated apicolateral processes. Basistyle short; dististyle nearly straight, with stout blunt tip. Aedeagus heavily sclerotized, basal arch stout, distal portion with a broadly separated lateral pair of processes and a ventrally bent median lobe, the 3 subequal in length and thickness. Parameres each with stout basal arm, the distal portion a slightly curved, slender blade with sharp, simple tip.

DISTRIBUTION: Caroline Is., Taiwan, Philippines to Malaya.

SPECIMENS EXAMINED: 65 ♂♂, 69 ♀♀. **INDONESIA**: West Java, Bogor (Adiwinata).

MALAYA: Pahang, Kuantan (Traub); Perlis, Kangar Rest House (Traub); Selangor, Kuala Lumpur (Hubert, Traub).

PHILIPPINES: Mindanao, Cotobato Prov., Pikit (Werner).

THAILAND: Ayudhaya (Manop); Bangkok (Scanlon); Chiang Mai (Maa, Notananda, Scanlon); Choburi (Scanlon); Khon Kaen (Manop); Loei (Manop); Nakhon Phanom (Manop); Nakhon Prathom (Manop); Nong Khai (Manop); Rachaburi (Manop); Sakon Nakhon (Manop); Samuth Prakan (Manop); Thonburi (Manop); Udonthani (Scanlon).

VIET NAM: DiLinh (Djiring) (Quate).

Discussion: Very readily recognized by the peculiar ♂ aedeagus. The extensive wing markings with 2 dark spots in the mediocubital fork, wing with a dark streak across the base of the anal cell but without marginal streaks on the distal portion of the wing, are also characteristic.

19. *Alluaudomyia pseudomarginalis* Wirth and Delfinado, n. sp. Figs. 19, 47.

Alluaudomyia formosana Okada: Tokunaga (misident.), 1962, Sci. Repts. Kyoto Prof. Univ. Agr. 14: 51 (♂, Ryuku Is., fig. genitalia).

♀. Length of wing 1.08 (1.0–1.23, n=3) mm. Head pale brownish except extreme bases of proximal antennal segments; eyes contiguous a short way, bare. Antenna with flagellomeres in proportion of 10–9–9–9–9–10–10–10–13–13–13–12–17, antennal ratio 0.91 (0.88–0.94, n=3); proximal flagellomeres elongate and tapering. Palpal segments (fig. 19a) in proportion of 5–8–10–11–14, 3rd segment very short with small round distal sensory pit. Mandible with 15 teeth. Thorax yellowish, scutum with numerous small brown dots. Legs (fig. 19b) yellowish with faint pale brown bands; trochanters dark; fore and hind femora with median dark brown band, mid femur brown on most of proximal 1/2; narrow dark rings on each side of pale knees on all femora and tibiae; broad median dark band on mid tibia, narrow median dark band on hind tibia, 2 dark bands on mid portion of mid tibia; narrow apices of all tibiae dark brown; hind basitarsus brownish; hind tarsal ratio 2.1 (2.0–2.2, n=3); tarsal claws (fig. 19c) unequal, long and slender, but short claw very much reduced on hind leg. Wing (fig. 47) with costa extending to 0.64 of total length; with many small blackish dots as figured, slightly infuscated along veins; small dark spots at ends of veins at wing margin, 2 spots in mid portion of mediocubital fork, but the usual dark streak at base of anal cell absent; halter pale. Abdomen pale; 1 spermatheca (fig. 19d) short and broad, tapering to slender neck, measuring 0.065 mm long × 0.054 mm broad.

♂. Similar to ♀ with usual sexual differences, wing spots much reduced in extent and variable in number. Genitalia (fig. 19 e, f) nearly identical with those of *marginalis*, but aedeagus longer with higher basal arch which lacks caudolateral points on shoulders, and parameres slightly shorter and stouter.

DISTRIBUTION: Malaya, North Borneo, Philippines, Ryukyu Is., Thailand.

Types: Holotype ♀, Clark Air Base, Angeles, Luzon, Philippines, 15. X. 1957, I. Balatbat, light trap (Type no. 67246, USNM). Allotype, ♂, same data except 22. IV. 1957. Paratypes, 11 ♂♂, 13 ♀♀, as follows. MALAYA: Pahang, Kuala Singgora, Maran, 22. II. 1959, R. H. Wharton, light trap, 1 ♂; Selangor, Kuala Lumpur, II–III. 1955, H. Barnett, light trap, 2 ♀♀; Kuala Lumpur, VII. 1958, R. Traub, light trap, 2 ♂♂; Selangor, Subang Forest Res., Traub, light trap, 1 ♂. NORTH BORNEO: Labuan I., IX–X. 1948, D. H. Colless, light trap, 5 ♂♂, 1 ♀; Ranau, 13. XII. 1958, T. C. Maa, at light, 1 ♂; Tawau, Kalabakan R., 9–18. XI. 1958, Maa, 1 ♂; Tambunan, IX. 1949, Colless, at light, 1 ♀. PHILIPPINES: Clark Air Base, same data as type, except dates IX and X, 2 ♀♀; Mindanao, Cotobato Pr., Pikit, 16. XII. 1946, F. Werner, light trap, 3 ♀♀. THAILAND: Khon Kaen Prov., Ban Phai Dist., 28–30. V. 1959, 1 ♀; Loei Prov., Meung Dist., 1–5. VI. 1959, 1 ♀; Nong Khai Prov., Meung Dist., 10–14. VI. 1959, 1 ♂; Saraburi Prov., Prabuddhabat, 29. XII. 1958, 1 ♀; all collected by R. Manop in light trap.

Discussion: Very closely related to *marginalis* n. sp., with very similar ♂ genitalia except for the differences noted in the aedeagus and parameres, but the wing markings and dark leg bands are much more restricted. Tokunaga's description and figures of the ♂ fit the present material very closely and do not at all closely resemble *formosana*, which has much darker legs with narrow pale bands, and greatly reduced wing spots.

20. *Alluaudomyia thurmanorum* Wirth and Delfinado, n. sp. Figs. 20, 48.

♀. Length of wing 0.81 (0.78–0.83, n=6) mm. Head brownish; eyes nearly contiguous, bare. Antenna with flagellomeres in proportion of 9–7–7–7–8–8–9–9–11–12–12–10–14, antennal ratio 0.93 (0.89–0.96, n=6); flagellomeres relatively short and slightly tapering. Palpal segments (fig. 20a) in proportion of 4–6–8–7–11, 3rd segment with a very small round distal pit bearing a very long hyaline sensilla. Mandible with 11 teeth. Thorax yellowish, with brown punctures and mottling on scutum; scutellum yellowish, with 4 hairs; postscutellum brownish; pleuron with transverse brown band. Legs (fig. 20b) pale yellowish; knees pale with adjacent narrow dark rings on femora and tibiae; femora with dark area on mid portion, faint on fore and mid legs, darker and oblique and lying at distal 1/3 on hind femur; tibiae each with narrow apex dark brown, fore and mid tibiae with mid portions broadly dark; tarsi pale; hind tarsal ratio 2.0 (1.87–2.33; n=6); claws (fig. 20c) long and slender, unequal on all legs. Wing (fig. 48) with costa extending to 0.47 (0.45–0.48, n=6) of wing length; hairs sparse; 9 small dark spots, 1 conspicuous spot over r-m crossvein; 1 larger spot at end of costa, extending in cell R5 over halfway to vein M1; 4 spots in distal portions of cells R5, M1, M2 and M4; a spot near base of vein M2, and 1 near apex of anal vein, and a faint, irregular area near basal arculus; halter pale. Abdomen yellowish; 1 subspherical spermatheca (fig. 20d) with tapering entrance to duct, overall measuring 0.058 mm × 0.043 mm.

♂. Similar to ♀ with usual sexual differences; thorax more brownish mottled; wing spots fainter, the distal spots in cells M2 and M4 tending to obsolescence. Genitalia (fig. 20 e, f) short and compact; sternum 9 short with shallow caudomedian excavation, the caudal membrane spiculate; tergum 9 short but tapering to very elongate, slender, slightly flaring, apicolateral processes. Basistyle stout; dististyle slender and curved. Aedeagus with basal arch high and not very broad at base, the basal arms moderately stout and only slightly bent; mid portion with a short, broad, caudally truncated shoulder, bearing distally a median, slender, ventrally bent, capitate tip. Parameres each with slender, curving lateral arm, mid portion moderately long and only slightly swollen and nearly straight; ending distally in a bluntly rounded, peg-like tip.

DISTRIBUTION: Java, Malaya, Thailand.

Types: Holotype ♂, allotype ♀, Thailand, Loei Prov., Tah Li Dist., 8–9.VI.1959, R. Manop, light trap (Type no. 67247, USNM). Paratypes, 4 ♂♂, 7 ♀♀, as follows. INDONESIA: West Java, Bogor, 28.XI.1959, R. T. Adiwinata, light trap, 1 ♂, 1 ♀. MALAYA: Selangor, Kuala Lumpur, VII.1958, R. Traub, light trap, 1 ♂. THAILAND: same data as types, 1 ♀; Chiang Mai, IV–V.1958, V. Notananda, light trap, 2 ♀♀; Nakhon Prathom, 18. XII. 1958, Manop, light trap, 1 ♀; Nong Khai Prov., Meung Dist., 10–14. VI. 1959, Manop, light trap, 2 ♂♂, 2 ♀♀.

Discussion: Named for Ernestine B. Thurman and (the late) Deed C. Thurman in hon-

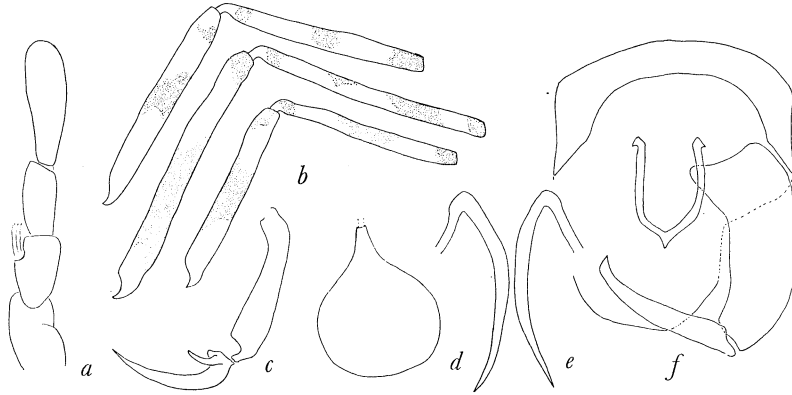


Fig. 19. *Alluaudomyia pseudomarginalis*. a, palpus; b, femora and tibiae; c, claws; d, spermatheca; e, ♂ parameres; f, ♂ genitalia.

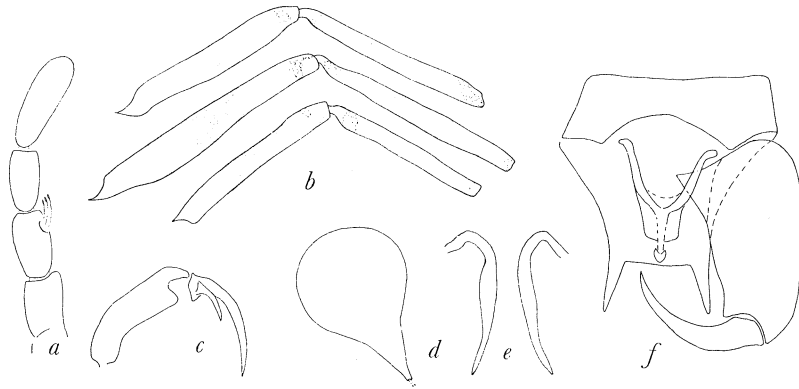


Fig. 20. *A. thurmanorum*. a, palpus; b, femora and tibiae; c, claws; d, spermatheca; e, ♂ parameres; f, ♂ genitalia.

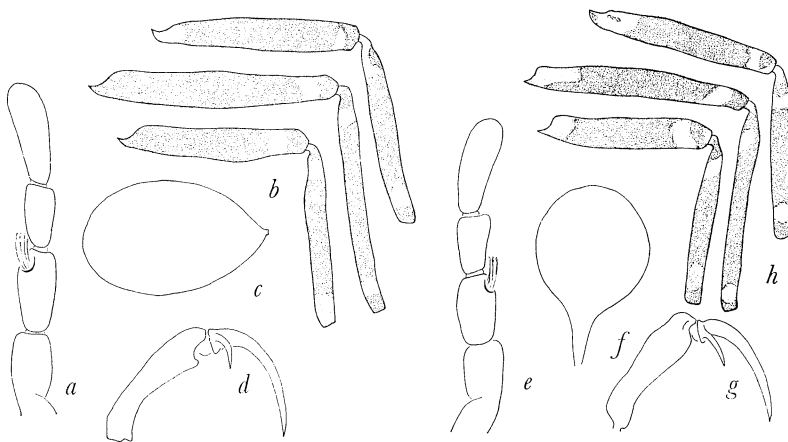


Fig. 21. *A. magna*. a, palpus; b, femora and tibiae; c, spermatheca; d, claws. *A. formosana*. e, palpus; f, spermatheca; g, claws; h, femora and tibiae.

or of their work on Thai mosquitoes and malaria and in appreciation of Mrs Thurman's help in collecting material for this study. *A. thurmanorum* can be recognized by its extensively pale banded legs and 9-spotted wing, as well as by the characteristic ♂ genitalia.

21. *Alluaudomyia tripartita* Okada Figs. 15 c-f, 49.

Alluaudomyia sagaensis var. *tripartita* Ok., 1942, Trans. Nat. Hist. Soc. Formosa 32: 316 (♂; Taiwan; fig. genitalia).

♀. Length of wing 0.88 mm. Head yellowish brown; eyes contiguous a short distance, bare. Antenna with flagellomeres in proportion of 9-7-7-7-8-8-8-9-11-12-12-12-14, antennal ratio 0.97; flagellomeres relatively short and slightly tapering. Palpal segments (fig. 15f) in proportion of 4-6-7-7-10, segment 3 very short with very small round sensory area near apex bearing long hyaline sensilla. Mandible with 12 teeth. Thorax yellowish with faint brown dots and mottling, pleuron with a transverse brown band; scutellum yellowish with 4 hairs; postscutellum dark brown. Legs (fig. 15d) yellowish white with brown bands and rings; narrow brown rings on each side of the narrowly pale knees; femora broadly pale at bases, with narrow brown ring at distal 1/3 and narrow subapical pale ring; tibiae yellowish white in mid portions with narrow apices dark brown, fore and hind tibiae with 1 dark band in mid portion, mid tibia with 2 dark bands in mid portion; tarsi pale; hind tarsal ratio 1.6; claws (fig. 15e) slender, very unequal on all legs, the short claw nearly vestigial on hind leg. Wing (fig. 49) very hairy; costa extending to 0.53 of wing length; 12 extensive dark spots as figured; 1 spot proximad of r-m crossvein with a smaller spot just caudad and a similar spot just distad; 1 at end of costa very broad and extending caudad nearly to vein M1; 4 spots near apices of cells R5, M1, M2, and M4, 1 spot near end of anal vein, 1 near base of vein M2, 1 near basal arculus, 1 at base of anal cell; in addition all veins with dark streaks and anal cell with a narrow dark streak near caudal margin; halter pale. Abdomen yellowish; 1 spermatheca (fig. 15c), with top portion broader than long, tapering to duct and measuring overall 0.058 mm × 0.050 mm.

♂. Not studied. As described by Okada (1942), with very elongate genitalia; dististyle hook-shaped; tergum 9 elongate with flaring apicolateral processes similar to those of *huberti* n. sp.; aedeagus with high, rounded basal arch and slender, tripartite distal stem; parameres with nearly straight, blunt, distal portion.

DISTRIBUTION: Taiwan.

SPECIMENS EXAMINED. TAIWAN: Chao-Chow, Kaoh-siung, IX.1959, S. M. K. Hu, light trap, 1 ♀.

Discussion: Specimens of *sagaensis* Tokunaga from Midoro Pond, Kyoto, Japan in the U. S. Natl. Mus. differ notably in their larger size, darker color, hind tibia with only 1 dark band in mid portion, more elongate antennae, large elongate oval spermatheca, and in the ♂ genitalia (fig. 16 c, d). The latter are shorter than in *tripartita*; aedeagus with short, stout, basal arch, the caudomesal portion transverse and bearing a pair of sharp caudal processes on the corners, the distal stem slender with tip bearing 3 slender points, 1 turned ventrad, the others laterad; parameres each with very stout mid portion, bearing apically 2 moderately elongate, heavily sclerotized processes, the lateral one slenderer and not quite as long as the slightly flattened inner one.

22. *Alluaudomyia magna* Wirth and Delfinado, n. sp. Figs. 21a-d, 54

♀. Length of wing 1.31 (1.28–1.32, n=3) mm. Head brown; eyes contiguous, bare. Antenna with flagellomeres in proportion of 12–10–10–11–11–12–12–12–17–17–18–17–23, antennal ratio 1.03; flagellomeres slender and slightly tapering. Palpal segments (fig. 21a) in proportion of 7–11–11–9–13, segment 3 with small, irregularly rounded sensory area on distal 1/3. Mandible with 15 teeth. Thorax dark brown with yellowish mottling; scutellum yellowish brown, with 4 hairs. Legs (fig. 21b) dark brown; femora with narrow subapical, tibiae with narrow subbasal, and mid and hind tibiae with narrow subapical, pale rings; tarsi pale, 5th tarsomere and hind basitarsus brownish; hind tarsal ratio 2.7 (2.6–2.8, n=3); claws (fig. 21d) unequal on all legs, long and slender. Wing (fig. 54) with costa very long, extending to 0.80 of total length; 9 conspicuous dark spots; the 2 proximad of r-m crossvein and at end of costa larger; the others located near base of vein M2, near tip of anal vein, and subapically in cells R5, M1, M2, M4, and anal cell; faint dark streaks also along the length of the veins; halter infuscated. Abdomen dark brown, the last segment whitish; 1 elongate oval spermatheca (fig. 21e), without tapering neck, very large, measuring 0.154 mm long × 0.093 mm broad. ♂. Unknown.

DISTRIBUTION: Thailand.

Types: Holotype ♀, Thailand, Udonthani Prov., Meung Dist., 17–20.VI.1959, R. Manop, light trap (Type no. 67248, USNM). Paratypes, 3 ♀♀, all collected in Thailand by Manop with light trap: Udonthani Prov., Pen Dist., 23–24.VI.1959, 1 ♀; Udonthani Prov., Nong Ham Dist., 21–22.VI.1959, 1 ♀; Loei Prov., Thai Li Dist., 8–9.VI.1959, 1 ♀.

Discussion: Distinguished by its large size and very dark color, including legs, by the wing pattern, and by the very large elongate oval spermatheca.

23. *Alluaudomyia formosana* Okada Figs. 21e-h, 50

Alluaudomyia maculipennis (Carter, Ingram & Macfie) var. *formosana* Okada, 1942, Trans. Nat. Hist. Soc. Formosa 32: 317 (♀; Taiwan; fig. habitus, palpus, antenna, spermatheca).

♀. Length of wing 0.92 (0.85–1.04, n=5) mm. Head pale brown; eyes nearly contiguous, bare. Antenna with flagellomeres in proportion of 10–7–7–8–8–9–9–11–12–13–12–17, antennal ratio 0.97 (0.92–1.0, n=5); flagellomeres moderately slender, slightly tapering, not as slender as usual in the genus. Palpal segments (fig. 21e) in proportion of 5–7–7–6–10, segment 3 with small, round, sensory area. Mandible with 15 teeth. Thorax dark brown with yellowish mottling; scutellum paler. Legs (fig. 21h) brownish; knee spots dark brown with narrow pale rings on each side, femora slightly paler at base, tibiae with fainter subapical narrow pale rings; tarsi pale except fore and hind basitarsi brownish; hind tarsal ratio 2.5 (2.25–2.75, n=5); claws (fig. 21g) very unequal on all legs, long and slender. Wing (fig. 50) with costa extending to 0.52 (0.48–0.56, n=5) of total length; membrane whitish; 2 small conspicuous black spots, 1 proximad of r-m crossvein, the other at end of costa; 5 much less prominent small blackish spots, 1 near base of vein M2, the others near apices of cells R5, M1, M2, and M4; halter slightly infuscated. Abdomen pale brownish; 1 subspherical spermatheca (fig. 21f) with very long, slender, tapering neck, measuring overall 0.083 mm × 0.061 mm. ♂. Unknown.

DISTRIBUTION: Malaya, Taiwan, Thailand.

SPECIMENS EXAMINED: 33 ♀♀; redescribed from a ♀ from Prabuddhabat, Saraburi Prov., Thailand. MALAYA: Selangor, Kuala Lumpur (Barnett, Hubert).

THAILAND: Bangkok, Cholburi (Scanlon); Khon Kaen, Nakhon Phanom, Nakhon Ratchasima, Nonthaburi, Pechaburi, Samuth Prakan, and Saraburi Provinces (Manop).

Discussion: The West African species *maculipennis* (Carter, Ingram & Macfie) and *pseudomaculipennis* (Cart., Ingr. & Macf.), likewise known only from ♀♀, differ mainly in the absence of the dark spot in cell M4 of the wing. In the present material the shape of the spermatheca differs from the pear-shaped form illustrated by us for *pseudomaculipennis*, the regularly tapering form drawn for *maculipennis*, and the more oval form drawn by Okada for *formosana*. The ♂ described as *formosana* by Tokunaga was misdetermined and belongs to the species here described as *pseudomarginalis* n. sp.

THE ANNULATA GROUP

This is a group of essentially Oriental species with many narrow dark rings and punctations on the legs and small dark punctures on the wings. The wing pattern does not vary from the basic plan of 2 large dark anterior spots, 1 proximad of r-m crossvein and other at end of costa, and 7 posterior spots on the veins; 4 subapically on veins M1, M2, M3+4, and Cul, 1 near base of vein M2, 1 at point of mediocubital fork, and the other near end of anal vein. There are small brown punctations scattered along the length of the radius, and frequently on the distal portion of the wing around the bases of the macrotrichia. Antenna annulate with apices of flagellomeres pale, as well as the usual narrow pale bases of flagellomeres 4-10. Claws unequal. A single spermatheca present, without diverticulum. Male genitalia with elaborate specific variations, but frequently a mesal lobe at the base of the basistyle.

There is 1 known New Guinea species, *tokunagai* NEW NAME, for *splendida* Tok. [1963: 216; preocc. by *splendida* (Winnertz) 1852], in addition to the 7 strictly Oriental species described below as new: *annulata*, *annulipes*, *bifurcata*, *griffithi*, *parafurcata*, *punctulata*, and *subannulata*.

24. *Alluaudomyia bifurcata* Wirth and Delfinado, n. sp. Figs. 22, 51.

♀. Length of wing 1.02 mm. Head brown, antennal segments pale on broad apices; eyes narrowly separated, bare. Antenna with flagellomeres in proportion of 12-10-11-11-12-12-13-13-17-18-18-18-22, antennal ratio 1.0; flagellomeres slender and distally tapering. Palpal segments (fig. 22a) in proportion of 5-8-9-6-10, segment 3 with elongate hyaline sensilla borne in a shallow distal concavity. Mandible with 12-15 teeth. Thorax yellowish brown with irregular dark brown mottling and punctures, scutellum yellowish with brown mid portion, bearing 2 hairs; pleuron with transverse dark brown band. Legs (fig. 22b) yellowish with many narrow dark brown rings and spots; coxae and trochanters brownish. On fore leg: femur with base slightly brownish, with narrow bands at midlength and at apex brown, and a very narrow, subapical brown ring; tibia with bands at extreme base and apex, and with 4 narrow, equally separated incomplete rings in mid portion, brown; basitarsus and tarsomeres 4 and 5 brownish. Mid leg: femur yellowish on proximal 2/3, with only 4 faint narrow incomplete brown rings on this portion, distal 1/3 dark brown with slight indication of 2 narrow pale rings; tibia with proximal 1/3 and narrow apex dark brown, also with 4 narrow brown rings along distal portion; basitarsus infuscated.

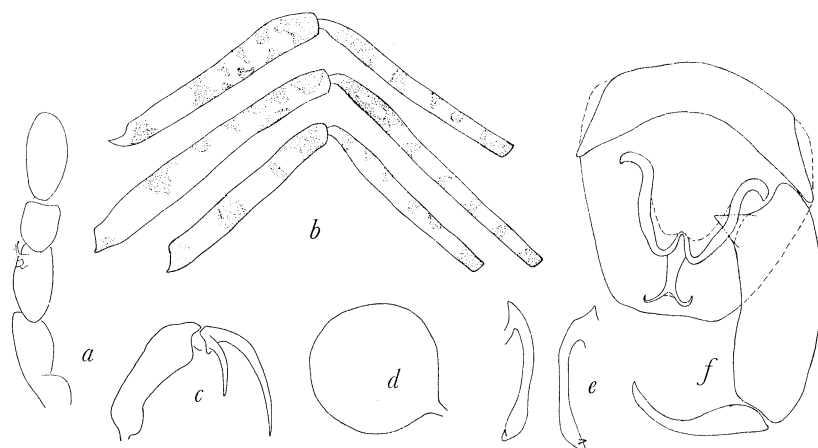


Fig. 22. *Alluaudomyia bifurcata*. a, palpus; b, femora and tibiae; c, claws; d, spermatheca; e, ♂ parameres; f, ♂ genitalia.

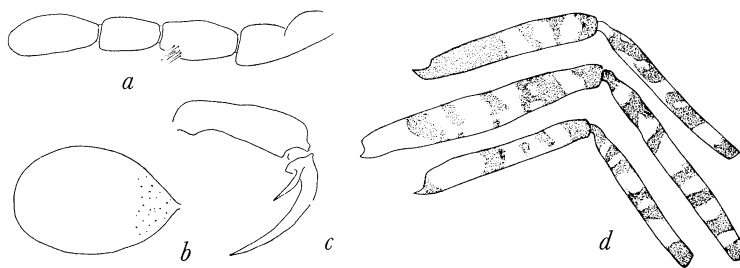


Fig. 23. *A. griffithi*. a, palpus; b, spermatheca; c, claws; d, femora and tibiae.

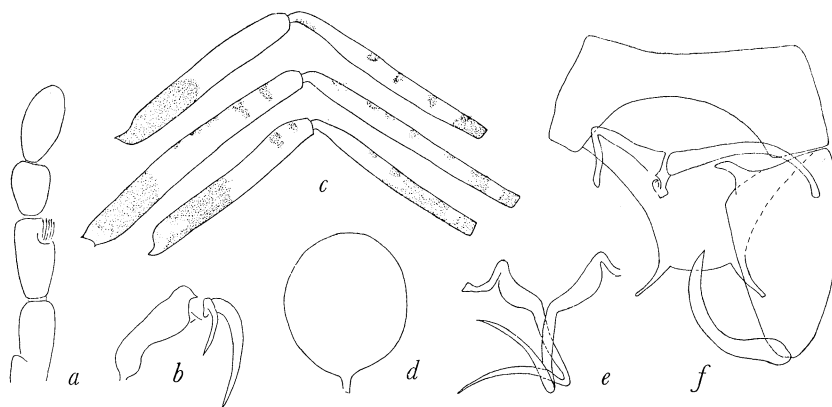


Fig. 24. *A. subannulata*. a, palpus; b, femora and tibiae; c, claws; d, spermatheca; e, ♂ parameres; f, ♂ genitalia.

ed on narrow base and apex. Hind leg: Femur with brown ring at base, broad subbasal pale band, mid portion pale with 3 incomplete dark rings, and brown on distal 1/4 with a partial pale ring; tibia with a partially broken brown band on proximal 1/4, narrow apex brown, and 3 narrow brown rings in mid portion; basitarsus, tarsomere 4 and base of 5 brown. Hind tarsal ratio 3.3; claws (fig. 22c) unequal on all legs, extremely long and slender on fore and mid legs. Wing (fig. 51) narrow; costa extending to 0.63 of total length; membrane whitish, slightly infuscated along veins and around wing margin; large conspicuous brown spots proximad of r-m crossvein and at end of costa, the 2nd spot extended caudad partway into cell R5; 7 smaller, prominent grayish spots on veins; small brown dots scattered along length of radius; halter knob slightly infuscated. Abdomen brownish, the tip whitish; 1 subspherical spermatheca (fig. 22d), with a short slender sclerotized neck, measuring 0.094 mm × 0.079 mm.

♂. Similar to ♀ with usual sexual differences. Genitalia (fig. 22 e, f) short and broad; sternum 9 narrow with broad, shallow caudomedian excavation, caudal membrane spiculate; tergum 9 short and caudally truncated without apicolateral processes. Basistyle moderately stout; dististyle slender, straight near base, curving distad; aedeagus with high basal arch, basal arms stout and curved, forming a ventral channel or lips on midline; caudal stem slender with apex deeply bifurcate into 2 long slender lateral processes. Parameres each with stout, curved basal arm, midportion slender and nearly straight, slightly swollen distally to blunt point with a small subapical ventral spine near tip.

DISTRIBUTION: Malaya, Thailand.

Types: Holotype ♂, Malaya, Perak, Pulau Pangkor, 1.IV.1959, R. Traub, light trap (Type no. 67249, USNM). Allotype ♀, Malaya, Selangor, Kuala Lumpur, VII.1958, Traub, light trap. Paratypes, 1♂, 2♀♀, as follows. MALAYA: 2♀♀, same data as allotype. THAILAND: 1♂, Sakon Nakhon Prov., Meung Dist., 25-27.VI.1959, R. Manop, light trap.

Discussion: This species can be recognized by the pale bases of the femora and by the characteristic ♂ genitalia.

25. *Alluaudomyia griffithi* Wirth and Delfinado, n. sp. Figs. 23, 55.

♀. Length of wing 1.0 mm. Head pale brown, apices of flagellomeres whitish; eyes slightly separated, bare. Antenna with flagellomeres in proportion of 15-10-10-11-11-12-12-12-16-16-16-15-20, antennal ratio 0.89; flagellomeres moderately slender, tapering. Palpal segments (fig. 23a) in proportion of 5-8-10-7-11, segment 3 with small, semi-depressed sensory area near tip. Mandible with 18 teeth. Thorax yellowish brown, with darker brown mottling; scutellum with 4 hairs. Legs (fig. 23d) yellowish, with narrow brown rings except on hind femur where proximal 1/2 is brown; coxae and trochanters brown. Fore leg: femur with narrow brown band at midlength and at apex, with 2 narrow, incomplete brown rings on distal portion; tibia with narrow base and apex brown, with 4 narrow brown rings. Mid leg: femur with 5 narrow brown rings along length; tibia with 7 brown rings including narrowly brown base and apex. Hind leg: femur brown on proximal 1/2, distal 1/2 with 3 narrow brown rings; tibia with 6 partially fused brown rings and narrow apex brown. Basitarsi brown at base and apex on fore and mid legs, entirely on hind leg; hind tarsal ratio 2.2; claws (fig. 23c) unequal on all legs, very long and slender on fore and mid legs. Wing (fig. 55) with costa extending to 0.60 of total length; membrane whitish, obscurely darkened along veins and on punctures at bases of macrotrichia on dis-

tal portion of wing; 2 large anterior spots and 7 round posterior spots located on veins, plus 8 small brown punctures along radius; halter infuscated. Abdomen pale; 1 elongate oval spermatheca (fig. 23b), partially collapsed and not measured, but relatively large; and tapering to short slender neck. ♂. Unknown.

DISTRIBUTION: Thailand.

Type: Holotype ♀, Thailand, Khon Kaen Prov., Choon Pae Dist., 25-27.V.1959, R. Manop, light trap (Type no. 67250, USNM).

Discussion: Distinguished from closely related *bifurcata* n. sp. by the femoral banding and the shape of the spermatheca. We dedicate this species with pleasure to Dr Melvin E. Griffith who arranged for the important Thai collections which have yielded so many new ceratopogonids.

26. *Alluaudomyia subannulata* Wirth and Delfinado, n. sp. Figs. 24, 56.

♀. Length of wing 1.0 mm. Head brownish, apices of flagellomeres whitish; eyes narrowly separated, bare. Antenna with flagellomeres in proportion of 16-14-14-14-14-14-14-19-19-19-20-27, antennal ratio 0.75; flagellomeres very slender, tapering. Palpal segments (fig. 24a) in proportion of 4-7-10-7-10, segment 3 with moderately large, slightly depressed round sensory area. Mandible with 13 teeth. Thorax pale yellow dorsally, without markings, lower 1/2 of pleuron contrasting brown; scutellum with 2 hairs. Legs (fig. 24b) yellowish white; coxa and trochanters brown; femora brown on proximal 1/2 of fore leg, proximal 1/3 on mid and hind pairs, distally pale except for 2 very faint pale brown spots on fore leg and a row of 5 on mid leg; tibiae of fore and mid legs with an obscurely subdivided brown band covering distal 1/3, narrow apex dark on hind leg, fore tibia with 2 proximal brown spots, mid and hind tibiae each with 5 similar spots; all basitarsi brownish; hind tarsal ratio 2.7; claws (fig. 24c) unequal, long and slender on all legs. Wing (fig. 56) with costa extending to 0.64 of total length; membrane milky white; 2 anterior and 7 posterior dark spots arranged as in *annulata*, but very small, the ones proximad of r-m crossvein and end of costa especially faint, only 4 brown punctures along radius; halter pale. Abdomen yellowish; 1 subspherical spermatheca (fig. 24d), with short, very slender, sclerotized neck; measuring overall 0.096 mm × 0.078 mm.

♂: Similar to ♀ with usual sexual differences; halter knob slightly infuscated. Genitalia (fig. 24 e, f) broad; sternum 9 with deep caudomedian excavation, caudal membrane spiculate; tergum 9 short, somewhat tapering with very long, slender, flaring, apicolateral processes. Basistyle moderately stout; dististyle slender and curving. Aedeagus with basal arch extremely broad and flat, transverse basal arms extremely slender and only slightly curved; distomedian stem very short and slender, with a small, ventrally bent rounded tip. Parameres each with short basal arm, mid portion moderately stout and abruptly bent midway, extending caudad distal to the bend, then abruptly bent ventrad with bent distal portion semidetached and narrowed to long pointed tip.

DISTRIBUTION: Malaya.

Types: Holotype ♂, Malaya, Pahang, Kuala Singgora, 18.VII.1958, R. H. Wharton, light trap (Type no. 67251, USNM). Allotype ♀, Malaya, Selangor, Kuala Lumpur, VIII.1958, R. Traub, light trap. Paratypes, 1♂, 1♀, as follows. MALAYA: Selangor, Kuala Lumpur, 12.III.1955, H. Barnett, light trap, 1♀; Pahang, Pahang Tua, Pekan, 6.IX.1961, Whar-

ton, light trap, 1♂.

Discussion: This species is paler than any other of the Annulata Group, with unmarked scutum and very obscurely ringed legs.

27. *Alluaudomyia annulipes* Wirth and Delfinado, n. sp. Figs. 25, 57.

♀. Length of wing 1.30 mm. Nearly identical with *annulata* n. sp. but mandible with 20 teeth and spermatheca (fig. 25d) broader, more regularly oval, measuring 0.122 mm long × 0.083 mm broad, and punctate anteriorly.

♂. Similar to ♀ with usual sexual differences. Genitalia (fig. 25 e, f) long and narrow; sternum 9 moderately long, without caudomedian excavation, the caudal membrane spiculate; tergum 9 elongate with subparallel sides distally and slender apicolateral processes. Basistyle long and slender, without mesal lobe; dististyle slender, curved, with slight hook-like bend at midlength. Aedeagus with rather narrow, rounded, basal arch, the basal arms short and curved, rather stout; distomedian stem very elongate, slender, slightly tapering, at extreme tip with small forked tip bent ventrad. Parameres each with short basal arm, mid portion moderately stout, slightly bent, with blunt rounded tip bearing a short, spinose appendage.

DISTRIBUTION: Malaya, Thailand.

Types: Holotype ♂, allotype ♀, Thailand, Songkla (seaside), 14.IV.1960, light trap (Type no. 67252, USNM). Paratypes, 4 ♂♂, 1 ♀, as follows. THAILAND: 1 ♂, same data as types. MALAYA: Kuala Singgora, 18.VII.1958, R. H. Wharton, light trap, 2 ♂♂, 1 ♀; Selangor, Kuala Lumpur, I.1960, light trap, 1 ♂.

Discussion: Nearly identical with *annulata* n. sp. but is distinguished by the more broadly oval spermathecae and very elongate ♂ genitalia.

28. *Alluaudomyia annulata* Wirth and Delfinado, n. sp. Figs. 26, 58.

♀. Length of wing 1.14 mm. Head pale brown, apices of flagellomeres whitish, eyes narrowly separated, bare. Antenna with flagellomeres in proportion of 14-12-12-13-14-14-14-15-18-18-19-19-22, antennal ratio 0.91; flagellomeres very slender, tapering. Palpal segments (fig. 26a) in proportion of 5-7-10-8-13, segment 3 with a small round shallow apical pit. Mandible with 14 teeth. Thorax yellowish, scutum with brown mottling anteriorly and punctures caudad; scutellum with 4 hairs; pleuron yellow on upper 1/2, brown on lower 1/2. Legs (fig. 26b) yellowish, coxae and trochanters brown; femora brownish on proximal 1/3 distally with narrow brown rings, 3 on fore leg, 4 each on mid and hind legs; tibiae with narrow subbasal and apical brown bands, fore tibia with 3 narrow proximal broken brown rings and broader subapical broken brown band; hind tibia with 5 brown spots, the 2 distal ones forming a partial brown band; fore and mid basitarsi brown at base and apex, hind basitarsus entirely brown; hind tarsal ratio 2.4; claws (fig. 26c) unequal, long and slender on all legs. Wing (fig. 58) slender, costa extending to 0.64 of total length; membrane milky white, with infuscation along veins and in punctures around some of the distal macrotrichia; 2 large anterior dark spots, one proximad of r-m cross-vein and 1 over end of costa, the latter extending halfway across cell R5; 7 small gray spots posteriorly, 4 subapically on veins M1, M2, M3+4 and Cu1, 1 subbasally on vein M2, 1 at point of mediocubital fork, and 1 near end of anal vein; 6 small brown punc-

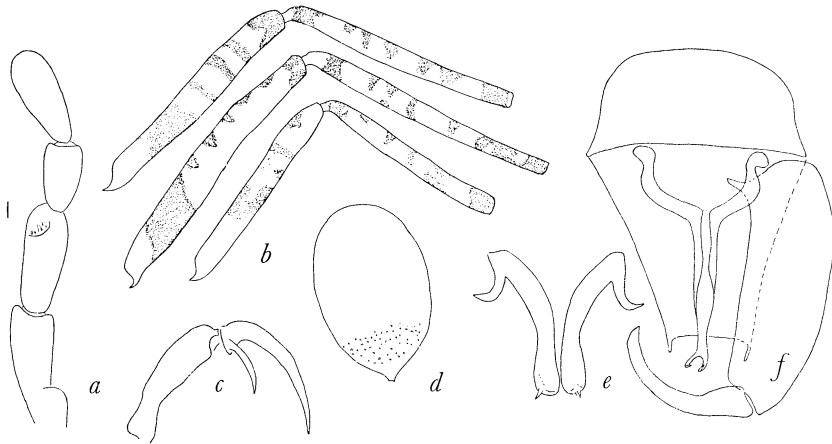


Fig. 25. *Alluaudomyia annulipes*. a, palpus; b, femora and tibiae; c, claws; d, spermatheca; e, ♂ parameres; f, ♂ genitalia.

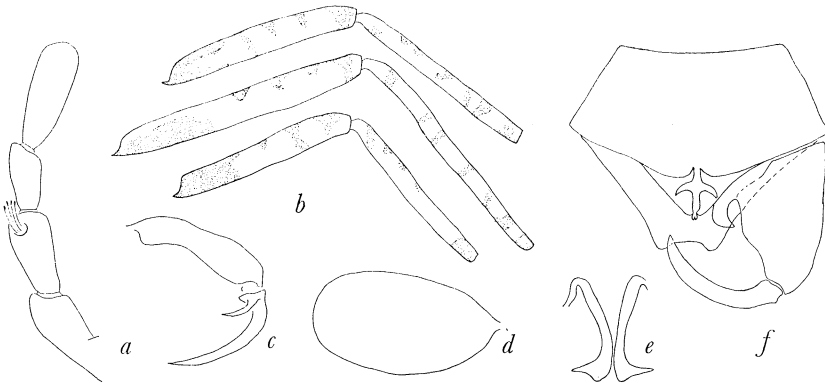


Fig. 26. *A. annulata*. a, palpus; b, femora and tibiae; c, claws; d, spermatheca; e, ♂ parameres; f, ♂ genitalia.

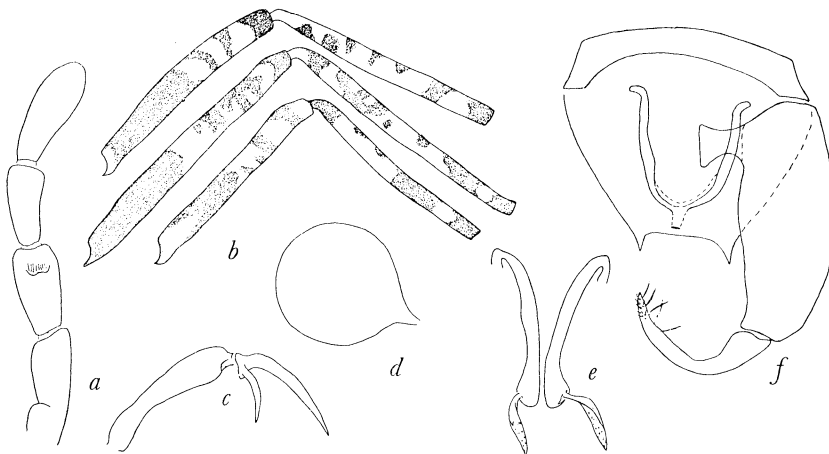


Fig. 27. *A. punctulata*. a, palpus; b, femora and tibiae; c, claws; d, spermatheca; e, ♂ parameres; f, ♂ genitalia.

tures also scattered along length of radius; halter infuscated. Abdomen whitish; 1 spermatheca (fig. 26d), irregularly elongate oval, slightly tapering to duct, large, measuring 0.122 mm long \times 0.68 mm broad, with hyaline dots on proximal end.

♂. Similar to ♀ with usual sexual differences, only 1 brown puncture on radius, midway between dark spots over r-m and end of costa. Genitalia (fig. 26 e, f) short and broad; sternum 9 long, fused caudad with base of aedeagus; tergum 9 short and tapered, caudal margin with apicolateral processes stout and developed in 2 closely approximated, rounded lobes. Basistyle stout, especially at base, with a long, thumb-like lobe extending caudomesad from anteromesal corner behind tip of paramere; dististyle slender, curving hook-like. Aedeagus with very low, broad basal arch more or less continuous with caudal margin of sternum 9, with a slender, fleur-de-lis-like, sclerotized distomedian process supporting a pubescent, low-conical membrane. Parameres each with short basal arm, mid portion slender, straight basally, then curved slightly and expanded in a knob-like tip bearing a slender, ventrolateral, beak-like process.

DISTRIBUTION: Malaya, Thailand.

Types: Holotype ♂, Malaya, Negri Sembilan, Telok Pelandok, Port Dickson, 18. VII. 1958, R. Traub, light trap (Type no. 67253, USNM). Allotype ♀, Malaya, Selangor, Kuala Lumpur, VII.1958, Traub, light trap. Paratypes, 1♂, 3♀♀, as follows. MALAYA: 3♀♀, same data as allotype, but I, V.1959. THAILAND: Cholburi, Bangphra, X.1963, J. E. Scanlon, light trap, 1♂.

Discussion: Readily distinguished from others of the Annulata Group by the dark bases of the femora, yellow brown-punctate scutum with contrasting brown lower pleuron, elongate sac-like spermatheca, and the remarkable, complicated, ♂ genitalia.

29. *Alluaudomyia punctulata* Wirth and Delfinado, n. sp. Figs. 27, 52.

♀. Length of wing 1.50 mm. Head brownish, antenna with apices of all flagellomeres and narrow bases of 4-10 pale; eyes narrowly separated, bare. Antenna with flagellomeres in proportion of 20-15-16-16-16-17-17-17-22-22-22-22-30, antennal ratio 0.88, flagellomeres very long and slender, tapering. Palpal segments (fig. 27a) in proportion of 6-9-12-9-15, segment 3 with a small round sensory area distally. Mandible with 15 teeth. Thorax yellowish, scutum with prominent, coarse dark brown mottling and punctures; scutellum brownish in middle, with 4 hairs; pleuron dark brown on lower 1/2. Legs (fig. 27b) yellowish, coxae and trochanters dark brown; femora dark brown on proximal 1/2, with narrow brown distal rings, 3-4 on fore and hind legs, 5-6 on mid leg; fore tibia brown on distal 1/2 with narrow subapical pale ring, with 3 proximal brown rings; mid and hind tibiae with 7 narrow brown rings, the proximal ones incomplete; basitarsi brownish; hind tarsal ratio 4.0; claws (fig. 27c) unequal, long and slender on all legs. Wing (fig. 52) narrow, costa extending to 0.70 of total length; membrane milky white, numerous small gray punctures at base of macrotrichia; the usual 2 anterior and 7 posterior conspicuous dark spots, radius with 11 small brown punctures; halter infuscated. Abdomen yellowish, 1 sub-spherical spermatheca (fig. 27d) with short tapering neck, measuring overall 0.080 mm long \times 0.063 mm broad.

♂. Similar to ♀ with usual sexual differences. Genitalia (fig. 27 e, f) short and compact; sternum 9 short with very shallow caudomedian excavation, caudal membrane not spi-

culate; tergum 9 short and rounded with very small apicolateral processes. Basistyle moderately stout; dististyle slender and hook-like, bearing mesally a remarkable long flattened hair and several fine distal hairs. Aedeagus with narrow, very high basal arch, the basal arms long and curved; distomedian process short and moderately stout with blunt, ventrally bent tip. Parameres each with long slender basal arm, main portion long and slender, slightly curved, slightly knobbed distally and bearing a distolateral, semidetached, long, slender, microspinose appendage.

DISTRIBUTION: Malaya.

Types: Holotype ♂, Malaya, Pahang, Kuantan-Pekan Road, swamp forest, 3.IV.1957, R. H. Wharton, light trap (Type no. 67254, USNM). Allotype ♀, Malaya, Kuala Lumpur, VII.1958, R. Traub, light trap. Paratypes, 5 ♂♂, 3 ♀♀, as follows. MALAYA: 1 ♀, same data as allotype, except 12.III.1955, H. Barnett, light trap; Pahang, Kuala Singgora, 18.VII.1958, Wharton, light trap, 2 ♂♂; Pahang, Tasek Bera, 11.X.1961, Wharton, light trap, 3 ♂♂, 2 ♀♀.

Discussion: This species is distinguished from the others of the Annulata Group by the extensively punctate wings, the dark bases of the femora, mottled thorax and characteristic ♂ genitalia with modified hairs on the dististyle.

30. *Alluaudomyia parafurcata* Wirth and Delfinado, n. sp. Figs. 28, 53.

♀. Length of wing 0.91 mm. Head brownish, antenna with apices of all flagellomeres and narrow bases of 4-10 pale; eyes bare. Antenna with flagellomeres in proportion of 17-10-10-11-11-12-13-13-15-15-16-17-21, antennal ratio 0.86; flagellomeres slender, tapering. Palpal segments (fig. 28a) in proportion of 4-6-8-5-8, very short, segment 3 with a round distal sensory area. Thorax yellowish brown with dark brown mottling; scutellum with 2 hairs; lower pleuron dark brown. Legs (fig. 28b) brown with narrow pale rings; 2 pale rings on distal 1/2 of each fore and hind femur, 3 on distal 1/2 of mid femur; 3 pale rings on fore and hind tibiae, 5 on mid tibia; tarsi pale except basitarsi brownish;

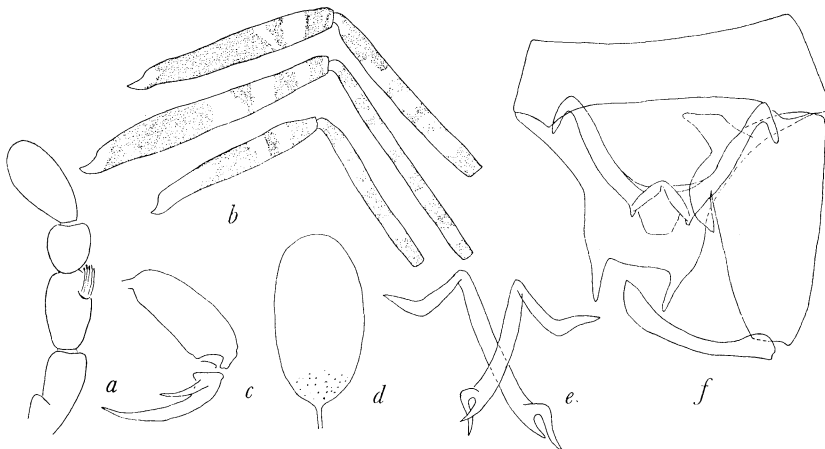
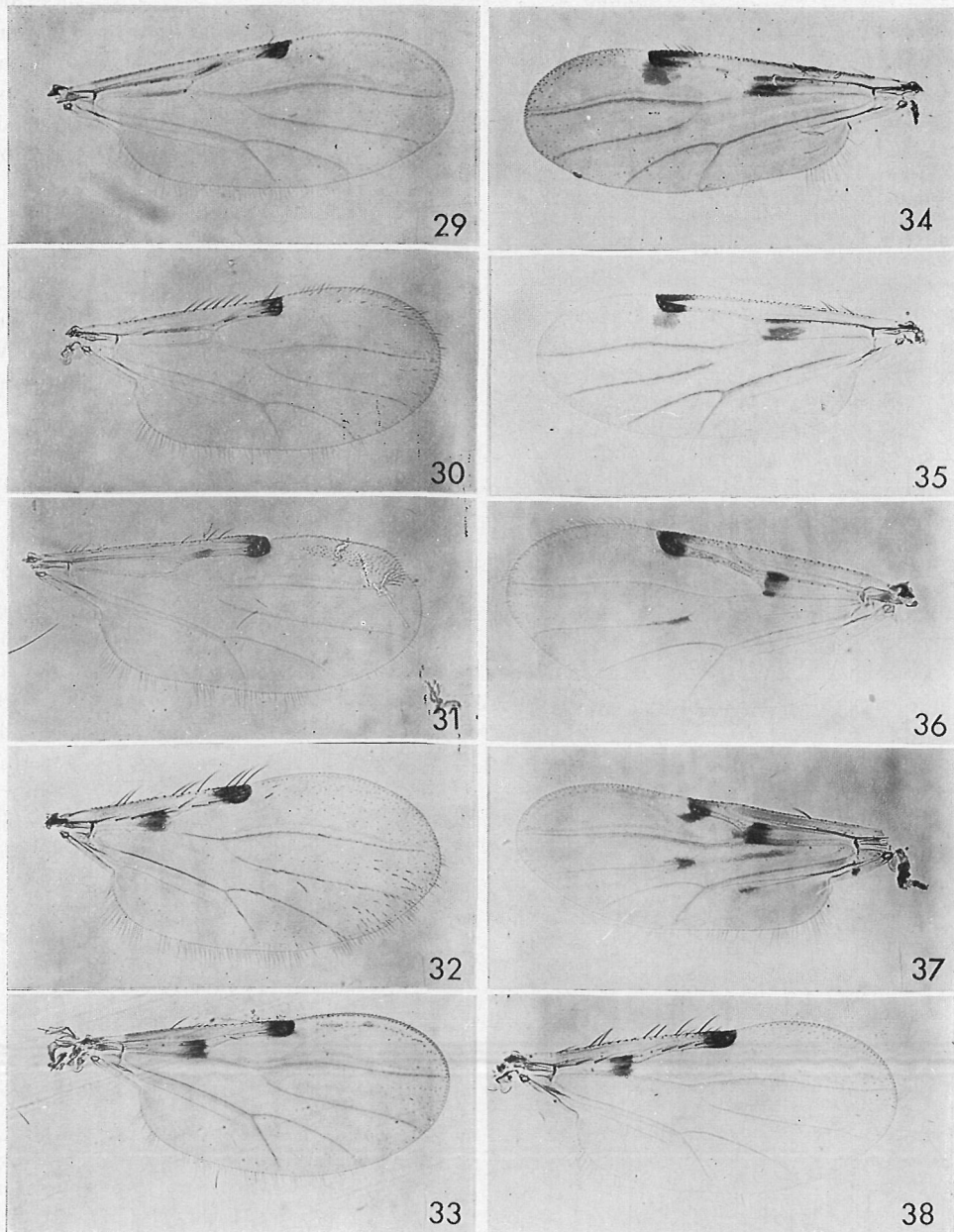
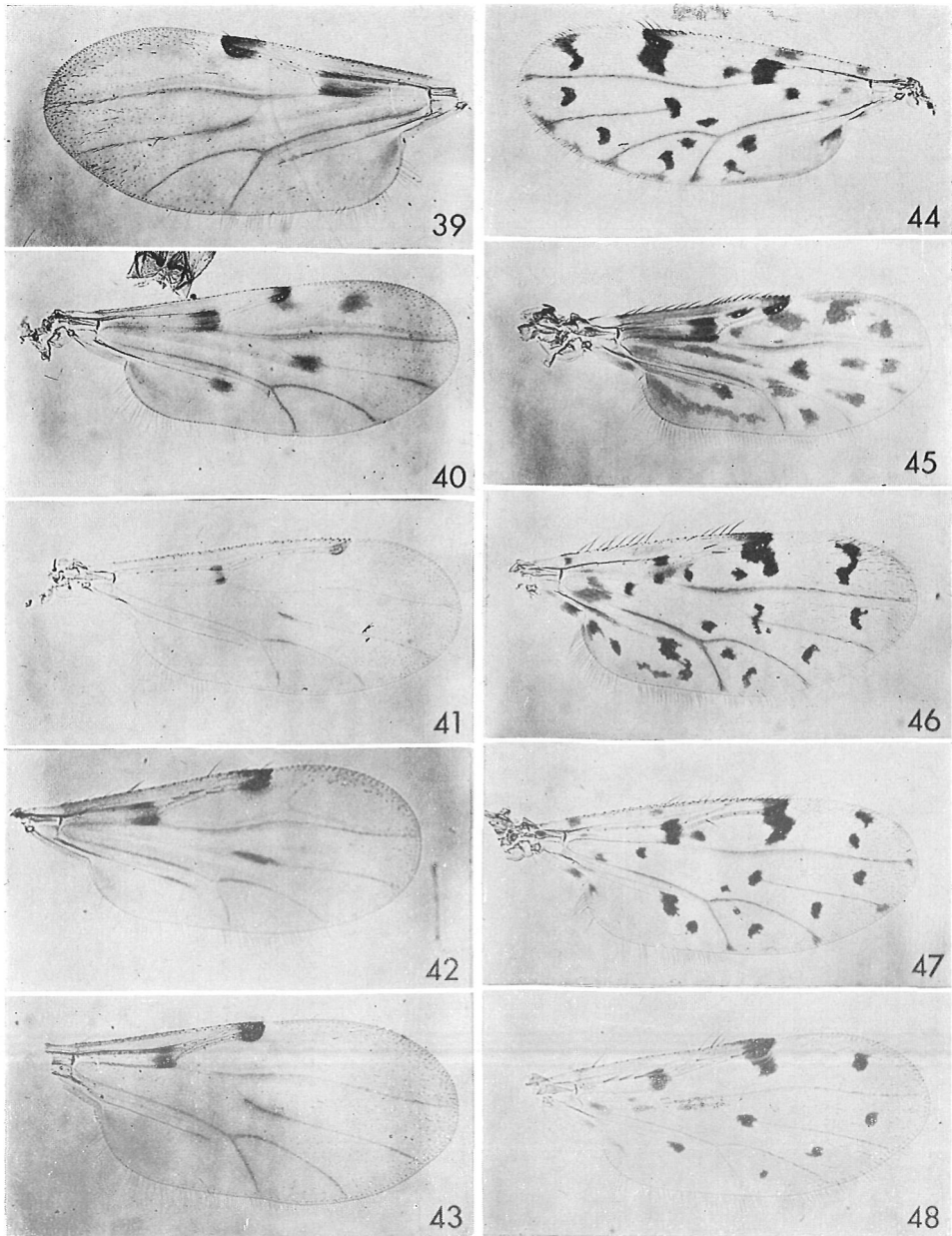


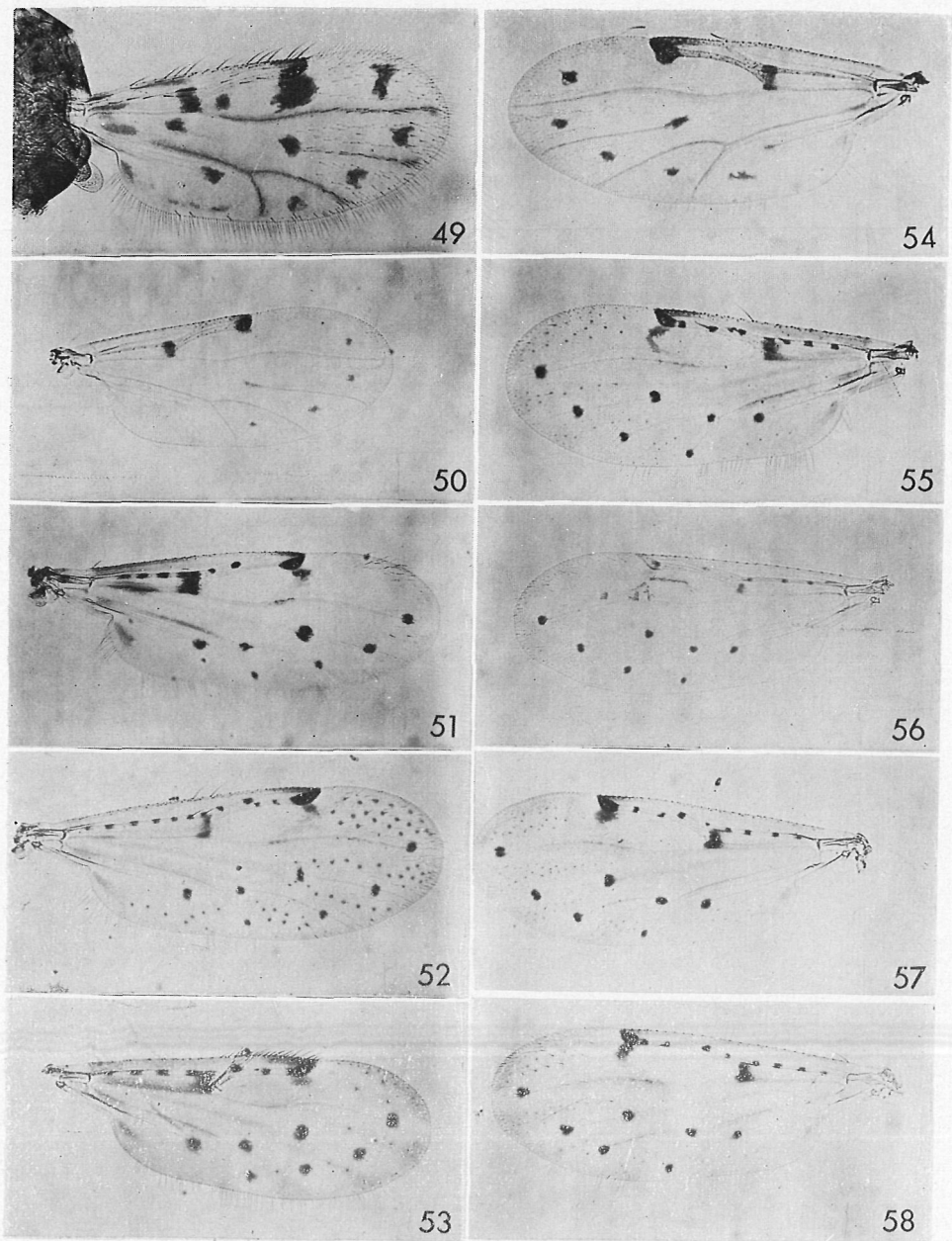
Fig. 28. *Alluaudomyia parafurcata*. a, palpus; b, femora and tibiae; c, claws; d, spermatheca; e, ♂ parameres; f, ♂ genitalia.



Figs. 29-38. Wing photographs of *Alluaudomyia* species. 29, *fuscipes*; 30, *abdominalis*; 31, *brevis*; 32, *adunca*; 33, *angulata*; 34, *fuscipennis*; 35, *inaequalis*; 36, *xanthocoma*; 37, *sternalis* (♂); 38, *spinosipes*.



Figs. 39-48. Wing photographs of *Alluaudomyia* species. 39, *quiquenebulosa* (♀); 40, *quiquenebulosa* (♂); 41, *albigena*; 42, *infuscata*; 43, *huberti*; 44, *marginalis*; 45, *maculosissima*; 46, *maculosipennis*; 47, *pseudomarginalis*; 48, *thurmanorum*.



Figs. 49-58. Wing photographs of *Alluaudomyia* species. 49, *tripartita*; 50, *formosana*; 51, *bifurcata*; 52, *punctulata*; 53, *parafurcata*; 54, *magna*; 55, *griffithi*; 56, *subannulata*; 57, *annulipes*; 58, *annulata*

hind tarsal ratio 3.3; claws (fig. 28c) not very long and slender, only slightly unequal on fore and mid legs, very unequal on hind leg. Wing (fig. 53) narrow, costa extending to 0.64 of total length; membrane grayish, a few small dark punctures at bases of macrotrichia on distal portion; the usual 2 anterior and 7 posterior, conspicuous dark spots, but more extensive than usual, 5 dark brown punctures on radius; halter strongly infuscated. Abdomen brownish, paler distally; 1 elongate oval spermatheca (fig. 28d) with a very slender, elongate sclerotized neck, measuring 0.126 mm × 0.066 mm without the neck, which is 0.025 mm long; small hyaline perforations on proximal portion.

♂. Similar to ♀ with usual sexual differences. Genitalia (fig. 28 e, f) short and compact; sternum 9 with scarcely apparent caudomedian excavation; tergum 9 short, narrowed distad with long, pointed, apicolateral processes. Basistyle stout with a short, distomesally directed basal lobe; dististyle slender and curving. Aedeagus with well developed basal arch, basal arms stout and nearly straight; median portion expanded caudally in 2 submedian points, forming a distomedian channel directed ventrad; dorsad of channel with a short, blunt, distomedian point. Parameres each with long slender basal arm, main portion moderately slender and slightly curved, distally divided into a claw-like fork, with a short, straight mesal process and a longer bent lateral one.

DISTRIBUTION: Malaya.

Types: Holotype ♂, Malaya, Pahang, Lamir, Pekan, 5.IX.1961, R. H. Wharton, light trap (Type no. 67256, USNM). Allotype ♀, Malaya, Johore, Kahang, Kluang, 7-9.I.1961, A. A. Hubert, light trap.

Discussion: This small species has darker legs and wings than most of the Annulata Group, and the thorax is also dark. The very elongate spermatheca and peculiarly forked ♂ parameres are also distinctive.

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APPENDIX

Check list of the *Alluaudomyia* of the world, with type localities

- abonnenci Clastrier, 1958a: 233 (Senegal)
- abdominalis Wirth & Delfinado, n. sp. (Malaya)
- adunca W. & Delf., n. sp. (Thailand)
- albigena W. & Delf., n. sp. (Thailand)
- albopicta (Ingram & Macfie), 1922-244 (Gold Coast; *Thysanognathus*)
- angulata W. & Delf., n. sp. (Malaya)
- annulata W. & Delf., n. sp. (Malaya)
- annulipes W. & Delf., n. sp. (Thailand)
- astera Tokunaga 1963-222 (Solomon Is.)
- aterivena Tok., 1940a-154 (Japan)
- bella (Coquillett), 1902-87 (U. S. A.) (*Ceratopogon*)
- bertrandi Harant & Cellier, 1949-10 (France)
- bifasciata Tok., 1963-220 (New Britain)
- bifurcata W. & Delf., n. sp. (Malaya)
- bimaculata Clastrier & W., 1961-228 (Nigeria)
- bimater de Meillon & Hardy, 1953-25 (South Africa)
- bipunctata Tok. & Mur., 1959-356 (Caroline Is.)
- brandti Tok., 1963-223 (New Guinea)
- brevicosta Clastr., 1960-261 (Rep. Congo)
- brevis W. & Delf., n. sp. (Malaya)
- claudia de Meillon, 1942-92 (S. Rhodesia)
- congolensis de M., 1939-9 (Belgian Congo)
- dekeyseri Clastr., 1958b-487 (Senegal)
- demeilloni Clastr., & W., 1961-223 (Nigeria)
- (*downesi* Wirth, 1952a-433 (Virginia), synonym of *parva* W.)
- fimbriatinervis Clastr., 1958a-230 (Senegal)
- footei Wirth, 1952a-428 (Florida)
- formosana Okada, 1942-317 (Formosa)(as *maculipennis* var.)
- fragilicornis Clastr., 1958b-489 (Senegal)

- fuscipennis* W. & Delf., n. sp. (Thailand)
fuscipes W. & Delf., n. sp. (Malaya)
gloriosa Kieffer, 1925b-422 (Austria)
griffithi W. & Delf., n. sp. (Thailand)
hirsutipennis Clastr., 1960-267 (Rep. Congo)
huberti W. & Delf., n. sp. (Malaya)
hygropetrica Vaillant, 1954-228 (France)
immaculata Tok., 1963-219 (New Guinea)
imparunguis Kief., 1913b-12 (East Africa)
inaequalis W. & Delf., n. sp. (Thailand)
infuscata W. & Delf., n. sp. (Malaya)
insulana Tok. & Mur., 1959-358 (Caroline Is.)
insulicola Tok. & Mur., 1959-361 (Caroline Is.)
jimmensis Tok., 1963-229 (New Guinea)
limosa Clastr., 1961-432 (France)
macclurei W. & Delf., n. sp. (Malaya)
maculipennis (Carter, Ingram & Macfie), 1921-316 (Gold Coast) (*Prionognathus*)
maculithorax (Cart. Ingr. & Macf.), 1921-319 (Gold Coast) (*Prionognathus*)
maculosa de M., 1936-172 (Zululand)
maculosipennis Tok., 1940b-181 (Caroline Is.)
maculosissima W. & Delf., n. sp. (Java)
magna W. & Delf. n. sp. (Thailand)
marginalis W. & Delf., n. sp. (Malaya)
marmorata (Cart. Ingr. & Macf.), 1921-312 (Gold Coast) (*Prionognathus*)
marmorea Clastr., 1960-258 (Rep. Congo)
mcmillani Clastr. & W., 1961-236 (Nigeria)
megaparamera Williams, 1956-327 (Michigan)
melanosticta (Ingr. & Macf.), 1922-248 (Gold Coast) (*Thysanognathus*)
monopunctata Tok. & Mur., 1959-354 (Caroline Is.)
monosticta (Ingr. & Macf.) 1923-60 (Zanzibar) (*Thysanognathus*)
natalensis de M., 1939-9 (Zululand)
needhami Thomsen, 1935-287 (New York)
nilogenes (Kief.), 1925a-262 (Egypt) (*Thysanognathus*)
novaguineana Tok., 1963-227 (New Guinea) (also as *novaguineae*)
papuae Tok., 1963-217 (New Britain)
parafurcata W. & Delf., n. sp. (Malaya)
paraspina W., 1952a-429 (Georgia)
parva W., 1952a-431 (Florida)
petersi Tok., 1963-228 (New Guinea)
platipyga Tok., 1963-221 (New Guinea)
(*poeyi* (Garrett), 1925-9 (British Columbia) (*Isoecata*), synonym of *bella* (Coquillett))
polyommata Macf., 1947-76 (Egyptian Sudan)
pseudomaculipennis (Cart., Ingr. & Macf.), 1921-318 (Gold Coast) (*Prionognathus*)
pseudomaculithorax Clastr., 1958a-225 (Senegal)
pseudomarginalis W. & Delf., n. sp. (Philippines)
punctulata W. & Delf., n. sp. (Malaya)

- quadripunctata (Geotghebuer), 1934-288 (Russia)
 quinquenebulosa W. & Delf., n. sp. (Malaya)
 quinquepunctata Tok., 1940c-256 (Japan)
 sagaensis Tok., 1940c-257 (Japan)
 senta de M., 1936-175 (Zululand)
 shogakii Tok., 1960-74 (Japan)
 similiforceps Clastr., 1960-265 (Rep. Congo)
 smeei Tok., 1963-230 (New Britain)
 sordidipennis Clastr. & W., 1961-234 (Gambia)
 spinosipes Tok., 1962-206 (Okinawa)
 (*splendida* Tok., 1963-216 (New Britain) (preocc. Winnertz 1852) syn. of *tokunagai* W. & Delf.)
 splendida (Winnertz), 1852-47 (Europe) (*Ceratopogon*)
 sternalis W. & Delf., n. sp. (Thailand)
 stictipennis W., 1952b-197 (California)
 subannulata W. & Delf., n. sp. (Malaya)
 tauffliebi Clastr., 1960-263 (Rep. Congo)
 tenuistylata Tok., 1959-296 (New Guinea)
 thurmanorum W. & Delf., n. sp. (Thailand)
 tokunagai W. & Delf., new name for *splendida* Tokunaga
 transvaalensis de M., 1947-119 (Transvaal)
 tripartita Ok., 1942-316 (Formosa) (as *sagaensis* var.)
 undecimpunctata Tok., 1940c-257 (Japan) (as *undecimpunctata*, sic)
 vicina Clastr., 1960-260 (Rep. Congo)
 vudu de M. & Har., 1954-65 (Cameroons)
 wansoni de M., 1939-9 (Belgian Congo)
 wirthi Williams, 1956-328 (Michigan)
 xanthocoma (Kief.), 1913a-182 (India) (*Culicoides*)

Index to the Oriental *Alluaudomyia*

- | | | |
|---------------------------|-----------------------------|--------------------------------|
| abdominalis n. sp.—p. 606 | fuscipes n. sp.—p. 606 | parafurcata n. sp.—p. 641 |
| adunca n. sp.—p. 609 | griffithi n. sp.—p. 635 | pseudomarginalis n. sp.—p. 628 |
| albigena n. sp.—p. 619 | huberti n. sp.—p. 622 | punctulata n. sp.—p. 639 |
| angulata n. sp.—p. 611 | inaequalis n. sp.—p. 613 | quinquenebulosa n. sp.—p. 619 |
| annulata n. sp.—p. 637 | infusata n. sp.—p. 620 | spinosipes Tok.—p. 615 |
| annulipes n. sp.—p. 637 | macclurei n. sp.—p. 622 | sternalis n. sp.—p. 617 |
| bifurcata n. sp.—p. 633 | maculosipennis Tok.—p. 627 | subannulata n. sp.—p. 636 |
| brevis n. sp.—p. 608 | maculosissima n. sp.—p. 624 | thurmanorum n. sp.—p. 629 |
| formosana Okada—p. 632 | magna n. sp.—p. 632 | tripartita Okada—p. 631 |
| fuscipennis n. sp.—p. 612 | marginalis n. sp.—p. 625 | xanthocoma (Kief.)—p. 616 |