

## Taxonomic Notes on *Atrichops* (Diptera, Athericidae)

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### Abstract

This paper describes 2 new species of the genus *Atrichops*, i. e. *fulvithorax* from the Yaeyama Islands of Japan (Iriomote-jima) and *stuckenbergi* from Kenya. It also contains some notes on 4 species, i. e. *chotei*, *lucens*, *metatarsalis* and *s-fuscum*, of which *lucens* is newly relegated to *Atrichops*. Also included are 2 undetermined species which are very similar to *fulvithorax* and *s-fuscum*.

### Introduction

This paper is an addition to my revision of the genus *Atrichops* (NAGATOMI, 1979b). Two new species, *fulvithorax* and *stuckenbergi*, are described from the South-West Islands (Iriomote-jima) and Kenya and some notes are given to *chotei*, *lucens*, *metatarsalis* and *s-fuscum*, of which *lucens* is found to be a true *Atrichops*. Two undetermined species are also recorded from Sarawak and the Philippines.

Thus, a total of 11 named species of *Atrichops* are now known from the world and they are distributed as follows: 7 from the Oriental region, to which 2 unnamed species may be added, 1 from Europe [i. e. *crassipes* (MEIGEN, 1820)], 2 from Japan [*morimotoi* (NAGATOMI, 1953) and *fontinalis* (NAGATOMI, 1958)] and 1 from Africa (Kenya) [*stuckenbergi* sp. n.].

### Key to species of *Atrichops* known from the Oriental region

1. Mesonotum, scutellum and hind femur yellowish brown..... 2
- Mesonotum (usually except humeral callus) and scutellum dark brown to black or darkened in contrast with humeral callus..... 4
- 2(1). In ♂ (at least in *fulvithorax*; ♂ unknown in sp. 1), difference in size between upper and lower facets less conspicuous and upper facets smaller than in *chotei* (because it is difficult to express numerically, both species are needed simultaneously for comparison); in ♀, upper front more or less pollinose..... 3
- In ♂, difference in size between upper and lower facets more conspicuous and upper facets larger than in *fulvithorax*; in ♀, upper front without pollen and

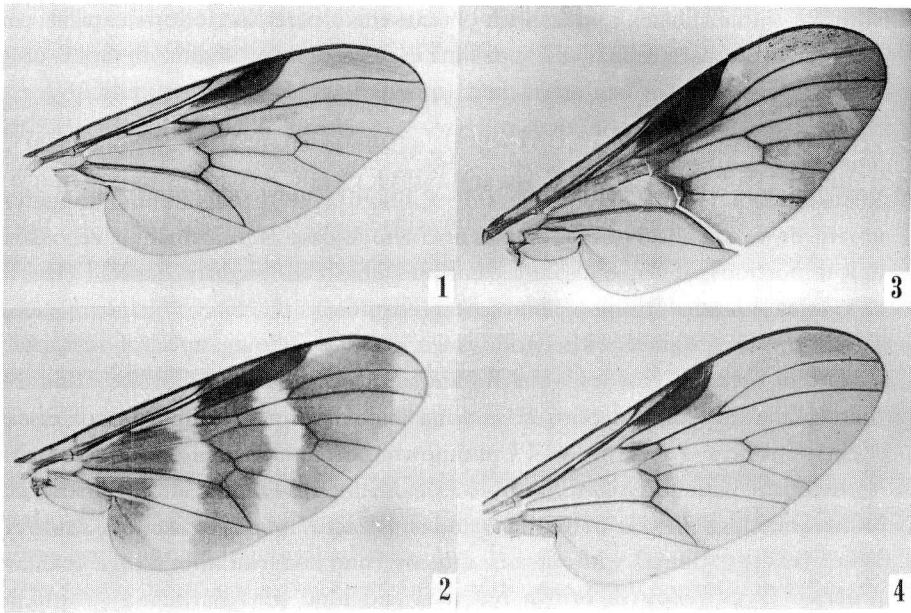
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- entirely shining black; wing with 3 darkened parts as follows: apical part of wing (whose margin may be indistinct), a band from stigma to apex of discal cell (this band may be interrupted or paler at 1st posterior cell) and a band from stigma to apex of anal cell (see Fig. 1A in NAGATOMI, 1979b) (South Thailand and Sarawak). . . . . *chotei* NAGATOMI, 1979
- 3 (2). Wing (except stigma) almost evenly suffused with brown and darkened parts absent or very indistinct [sometimes area above base of vein R<sub>4</sub> and veins forming apical portions of 1st and 2nd basal and anal cells slightly darker] (see Fig. 1) (Yaeyama Islands [Iriomote-jima], near Formosa). . . . . *fulvithorax* sp. n.
- Wing (besides stigma) with dark brown parts as follows: apex of subcostal cell, a spot just above base of vein R<sub>4</sub> and a band from apex of 1st basal cell to that of anal cell; apical portion of wing and a region around apex of discal cell slightly infuscated (see Fig. 4) (♂ unknown) (Sarawak) [this species may possibly be identical with *fulvithorax*]. . . . . sp. 1
- 4 (1). Wing (besides stigma) spotted or banded. . . . . 5
- Wing (except stigma) without any spot or band; sclerite above fore coxa with 2 processes; legs yellowish brown but tarsi and hind tibia darkened (♂ unknown) (South Thailand). . . . . *chakratongi* NAGATOMI, 1979
- 5 (4). Wing with a characteristic s-shaped darkened band (see Fig. 1B in NAGATOMI, 1979b). . . . . 6
- Wing not as above. . . . . 7
- 6 (5). In ♂, upper facets conspicuously larger than lower facets and number of upper facets along front margin 17 or so (♀ unknown) (Philippines). . . . . sp. 2
- Difference in size between upper and lower facets in ♂ not conspicuous and number of upper facets along front margin 30-40 (Philippines, Burma and India) . . . . . *s-fuscum* (FREY, 1954)
- 7 (5). Wing with 3 well-defined dark brown bands and wing apex distinctly pale. . . . 8
- In wing, stigma, area above stigma, a band from base of stigma to apex of anal cell and a band from apex of stigma to apex of discal cell darkened; apical portion of wing more or less infuscated; coxa and femur dark brown to black (♂ unknown) (Java). . . . . *lucens* (de MEIJERE, 1911)
- 8 (7). Legs dark brown but fore tarsus reddish brown and bases of mid and hind femora whitish (after original description) (♀ unknown) (Viet Nam). . . . .
- . . . . . *coomani* (SÉGUY, 1946)
- Legs dark brown but fore coxa, fore and mid femora and tibiae, and base of hind femur yellowish brown; sclerite above fore coxa with 2 processes; ♂ hind basitarsus swollen (Burma). . . . . *metatarsalis* (BRUNETTI, 1909)

### Notes on some characters with taxonomic value

*Process on sclerite above fore coxa (and behind propleura).* A knob-like process is present on the sclerite between fore coxa and anterior spiracle. As mentioned by NAGATOMI (1979b), the process is often absent or short and indistinct in *s-fuscum*. There are 2 processes in *chakratongi* and *metatarsalis* (see Figs. 2A, B in NAGATOMI,



Figs. 1-4. Wing. 1. *Atrichops fulvithorax*, male. 2. *A. metatarsalis*, male.  
3. *A. stuckenbergi*, female. 4. *A.* sp. 1, female.

1979b and Fig. 9 in this paper). Of 2 processes, the posterior one may sometimes become short or wide or may be confused with the sclerite in *metatarsalis*.

*Male hind basitarsus.* The male hind basitarsus is swollen in *crassipes* and *metatarsalis* but may not be very conspicuous at least in the latter in comparison with other species (Figs. 5-8).

*Male cercus.* The male genitalia of *Atrichops*-species are very similar to one another and may not afford useful distinguishing characteristics. But the posterior margin of cercus has a deep concavity in *chotei* (Fig. 3B in NAGATOMI, 1979b), while it is almost straight or has a shallow concavity in *fontinalis*, *fulvithorax*, *metatarsalis*, *morimotoi* and *s-fuscum* (Figs. 5D and 6D in NAGATOMI, 1979a and Figs. 12, 15 and 17 in this paper).

### *Atrichops chotei* NAGATOMI

*Atrichops chotei* NAGATOMI, 1979, Kontyû 47: 285. Type-locality: near Songkhla, South Thailand.

There are 1♂, 2♀♀ from Sarawak which probably belong to *chotei* known from Thailand. The specimens of Sarawak differ from those of Thailand in the following points: palpus and proboscis dark brown rather than yellowish brown; abdominal terga 4-5 (sometimes 3-5 in ♀) wholly dark brown. But the differences above may not be significant in separating species.

The important characters of *chotei*, which are common to the specimens of Thailand and Sarawak, are as follows: thorax (including mesonotum and scutellum) entirely yellowish brown; wing with darkened parts as shown in Fig. 1A of NAGATOMI (1979b);

in ♂ upper facets conspicuously large; in ♀ front except lower part shining black and without any pollen; in ♂ (as well as ♀) hind basitarsus not swollen, and narrower than hind tibia.

Length: in 1 ♂, body 4.1 mm, wing 4.2 and fore basitarsus 1.3; in 2 ♀♀, body 3.9-4.4, wing 4.9-5.1, and fore basitarsus 1.4-1.5.

Distribution. Sarawak (new record) and South Thailand.

Specimens examined: 1 ♂, 2 ♀♀, 1st Div., Semongoh For. Res., 1 25'N 110 17'E, 15-19. xi. 1976, P. S. CRANSTON (deposited in British Museum, Natural History).

### *Atrichops fulvithorax* sp. n.

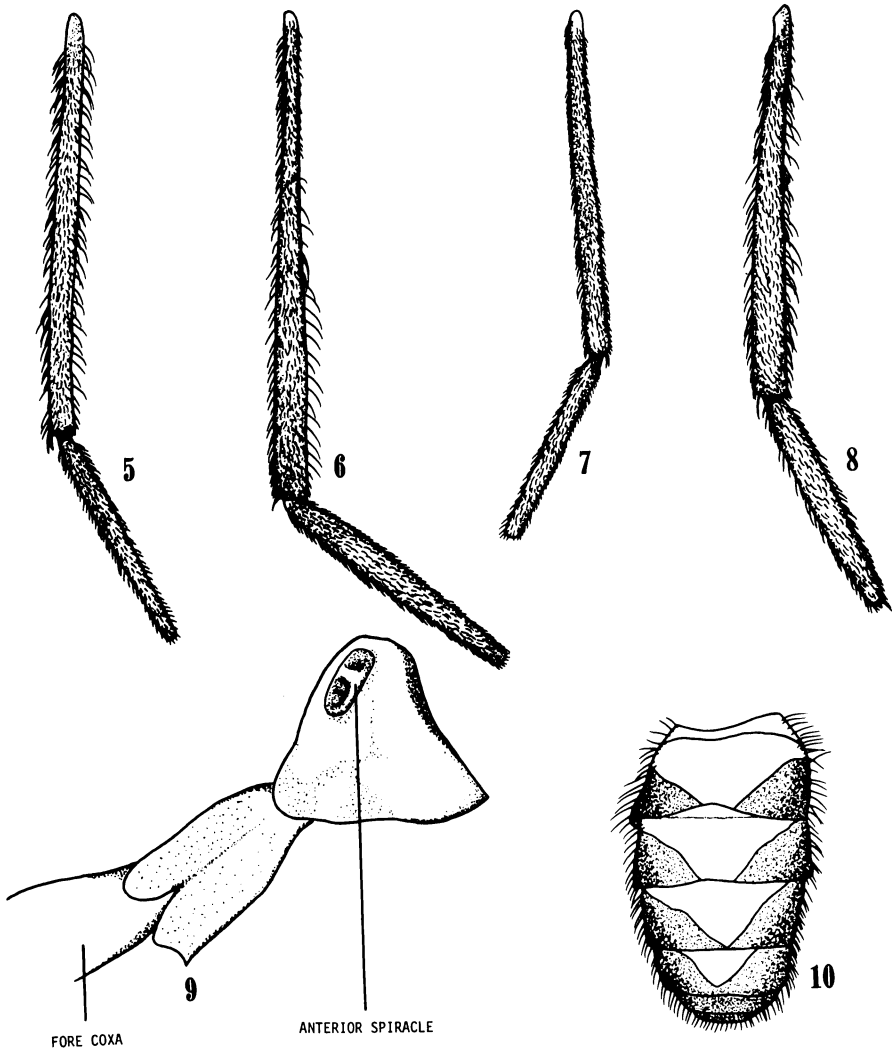
(Figs. 1, 5, 11-12)

This species is very similar to *chotei* of Thailand and Sarawak but may be distinguished from the latter in the following points: wing membrane is almost evenly suffused with brown and darkened parts are absent or very indistinct (in *chotei* darkened apical part of wing and bands below stigma are distinct or more distinct); in ♂, the difference in size between upper and lower facets less conspicuous and upper facets smaller than in *chotei*; in ♀, upper front with pollen (in *chotei*, without pollen and entirely shining black); in ♂ cercus, concavity along posterior margin shallow (in *chotei*, deep).

At least some of the differences above seem to be significant.

Male. Head: dark brown and whitish gray pollinose; antenna except arista often brown rather than dark brown; hairs on head black; difference in size of facets conspicuous (but less conspicuous than in *chotei*); combined lengths of 5 largest facets 0.3 times distance from antenna to median ocellus and 0.9-1.2 times length of ocellar triangle (in *chotei* 0.3-0.4 and 1.1-1.4 times respectively); number of upper facets along front margin 19-20 (or so) as in *chotei*; contiguous portion of eyes 0.8-1.4 times as long as ocellar triangle; width of one eye on a mid-line from a direct frontal view 0.9-1.0 times distance from antenna to median ocellus, 1.9-2.3 times width of front just above antenna, and 1.2-1.3 times width of face at lowest portion from a direct frontal view; ocellar triangle 0.9-1.2 times as wide as long; space between antennae 0.1-0.2 times width of ocellar triangle; distance from proboscis to antenna 0.7-0.9 times that from antenna to median ocellus; width of facial swelling 1.2-1.6 times its length, 0.6-0.8 times width of face at top portion of facial swelling, and 2.2-3.4 times width of side of face on a mid-line; mid-upper face 0.6-1.0 times as long as facial swelling; palpus 0.7-0.9 times as long as face; when measured along mid-inner surface (except for segment 3 measured at the longest part near ventral margin), relative lengths of antennal segments 1-3, 53 (43-67): 100: 95 (86-117) and their relative widths 104 (86-150): 123 (100-167): 185 (171-200); arista (including thin apical part) 2.8-3.2 times as long as rest of antenna (from base to arista along inner surface); proboscis measured along ventral surface 1.3-1.7 times as long as face (=distance from proboscis to antenna); structural characters are based on 10 specimens.

Thorax: yellowish brown; hairs on thorax black; sclerite, just behind propleura and just above fore coxa, with 1 short and blunt process; halter with stem yellowish



Figs. 5-8. Hind tibia and basitarsus, lateral view. 5. *Atrichops fulvithorax*, male. 6. *A. metatarsalis*, male. 7. *A. metatarsalis*, female. 8. *A. s-fuscum* (from Philippines), male. It must be noted that the dorsal surface is at right side in Figs. 5-6, 8 and at left side in Fig. 7.

Fig. 9. *Atrichops metatarsalis*, male. Two processes on the sclerite between fore coxa and anterior spiracle.

Fig. 10. *Atrichops stuckenbergi*, female. Abdomen, dorsal view.

brown and knob dark brown.

Legs (Fig. 5): coxa and femur yellowish brown and tibia and tarsus brown to dark brown; often tibia almost concolorous with femur; hairs on legs black; relative lengths of segments (excluding coxa and trochanter) of fore leg 81 (77-84): 125 (120-131): 100: 48 (45-52): 32 (29-35): 17 (14-18): 12 (10-14), of mid leg 82 (79-87): 124 (120-130): 81

(76-85): 29(26-33): 14(13-16): 6(6-7): 9(8-11), of hind leg 124(117-131): 145(139-152): 83(78-87): 31(29-33): 16(14-18): 7(6-7): 10(9-11) and in hind leg viewed from the side relative widths of femur, tibia and tarsal segments 1-3, 14(12-16): 10(9-10): 7(6-8): 5(4-6): 4(3-5) (tarsal segment 1, 0.1, segment 2, 0.1-0.2, and segment 3, 0.2-0.3 times as wide as long) (based on 10 specimens).

Wing (Fig. 1): membrane wholly tinged with brown to dark brown; stigma distinctly darker; sometimes area above base of vein  $R_4$  and veins forming apical portions of 1st and 2nd basal and anal cells slightly darker.

Abdomen: dark brown but sterna 1-3, anterior borders of terga 1-4 (or 1-5), middle of tergum 1 and often anterior portion of sternum 4 yellowish brown (yellowish brown borders of terga 2-5 may not be visible depending on condition of specimen); hairs on abdomen black.

Genitalia (Figs. 11-12): at posterior margin of cercus, concavity is shallow.

Length: body 3.9-5.1 mm; wing 3.7-4.9; fore basitarsus 1.0-1.4.

Female. Similar to ♂ except as follows: Head: whitish gray pollen more distinct on face and area above antenna; width of front just above antenna 0.7-0.8 times that at median ocellus which is 1.9-2.4 times width of ocellar triangle; width of one eye on a mid-line from a direct frontal view 0.9-1.2 times distance from antenna to median ocellus, 1.4-1.8 times width of front just above antenna, and 1.3-1.6 times width of face at lowest portion from a direct frontal view; antennae almost contiguous to each other; distance from proboscis to antenna 0.9-1.0 times that from antenna to median ocellus; structure of face differing from that of ♂ as shown in generic diagnosis (see NAGATOMI, 1979b); palpus 0.8-1.1 times as long as distance from proboscis to antenna; relative lengths of antennal segments 1-3, 53(43-75): 100: 90(86-114) and their relative widths 100(86-114): 111(100-125): 184(163-200); arista 2.8-3.4 times as long as rest of antenna (as in ♂); proboscis measured along ventral surface 1.3-1.7 times as long as face (as in ♂); structural characters are based on 10 specimens.

Legs: relative lengths of segments of fore leg 89(85-92): 127(121-136): 100: 47(43-49): 33(30-37): 18(16-20): 14(13-15), of mid leg 95(89-100): 130(123-136): 79(76-82): 27(23-28): 14(13-15): 7(6-8): 11(9-12), of hind leg 129(121-133): 152(143-162): 83(79-90): 28(26-31): 15(13-17): 7(6-8): 11(10-13) and in hind leg viewed from the side relative widths of femur, tibia, and tarsal segments 1-3, 17(16-18): 10(9-11): 7(5-8): 5(4-6): 4(4-5) (tarsal segment 1, 0.07-0.09, segment 2, 0.1-0.2, segment 3, 0.25-0.3 times as wide as long respectively) (based on 10 specimens).

Abdomen: in the specimens whose stomachs have no blood-meals, tergum 1, anterior part of tergum 2 and mid-anterior parts of terga 3-4 yellowish brown or sometimes dorsum wholly dark brown.

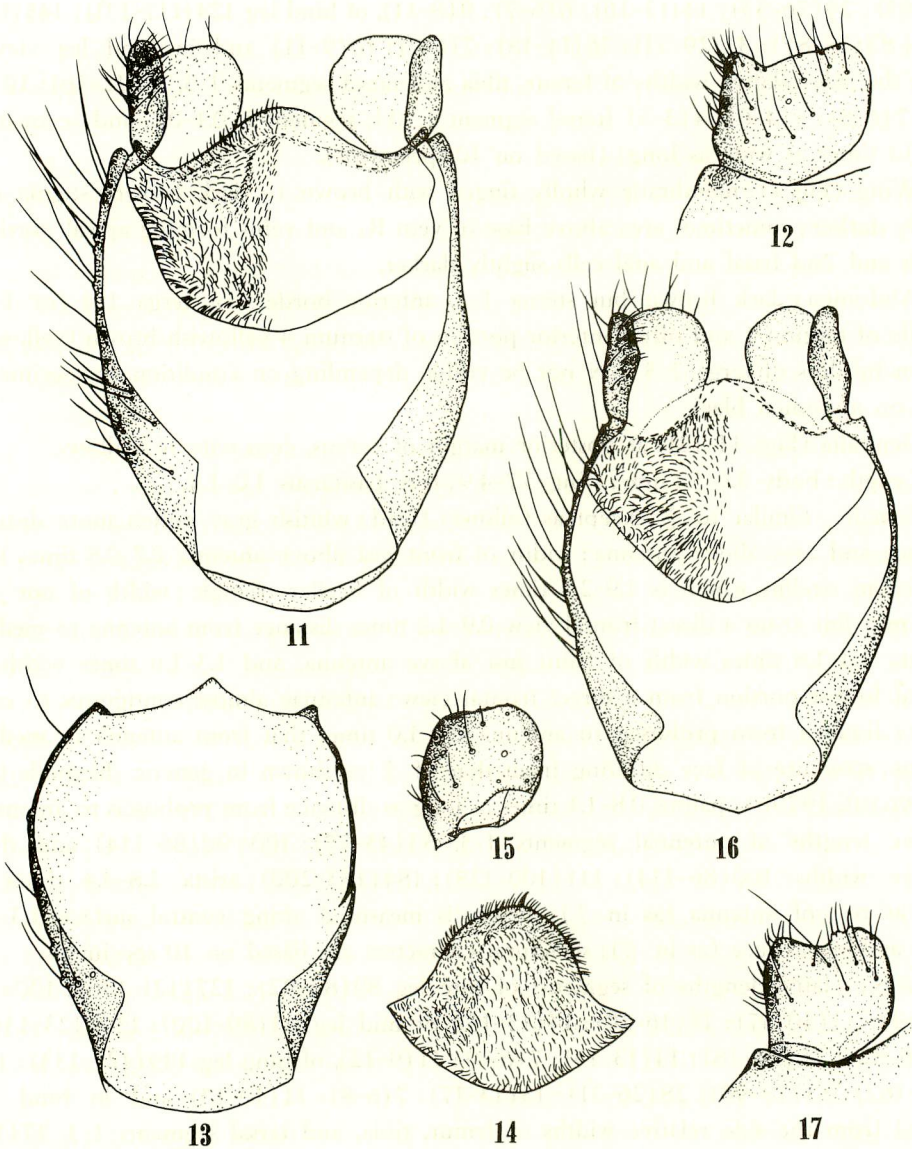
Length: body 3.5-5.1 mm; wing 3.5-5.3; fore basitarsus 1.0-1.4.

Distribution. South-West Islands, Japan [Yaeyama Islands (Iriomote-jima)].

Holotype: ♂, 17. v. 1981, Komi, Iriomote-jima, A. NAGATOMI.

Paratypes (124♂♂, 130♀♀): 16♂♂, 18♀♀, 20. vii. 1980, Komi, Iriomote-jima, A. NAGATOMI; 30♂♂, 29♀♀, 21. vii. 1980, Komi, Iriomote-jima, A. NAGATOMI; 19♂♂, 48♀♀, same data as holotype; 57♂♂, 35♀♀, 21. v. 1981, Komi, Iriomote-jima, A. NAGATOMI; 2♂♂, 1. v. 1982, Komi, Iriomote-jima, A. NAGATOMI.





Figs. 11-17. Tergum 9, sternum 10 and cerci, male. 11-12. *Atrichops fulvithorax*. 13-15. *A. metatarsalis*. 16-17. *A. s-fuscum* (from Philippines). 11, 13-14, 16. Tergum 9, sternum 10 and cerci, ventral view (13: tergum 9; 14: sternum 10). 12, 15, 17. Cercus, dorsal view.

Holotype in Kagoshima University (Kagoshima) temporarily and paratypes in U.S. National Museum (Washington, D.C.), British Museum (Natural History) (London), and Natal Museum (Pietermaritzburg, South Africa).

*Atrichops lucens* (de MEIJERE) comb. n.

*Atherix lucens* de MEIJERE, 1911, Tijdschr. Ent. 54: 294. Type-locality: Gunung Ungaran, Java.

I have seen the type (♀) of this species in the Instituut voor Taxonomische Zoölogie, Amsterdam and found it to be an *Atrichops*.

This species is similar to *morimotoi* of Japan but may be distinguished from the latter in the following respects: the darkened apical band of wing may not be so distinct and may not be connected with median band at 4th posterior cell; the coxa and femur almost wholly dark brown to black. Some more profound differences may be found when a more detailed comparison is made between these 2 species.

A note of the type of *lucens* is given below.

Female. Head: dark brown to black; face and area above antenna whitish gray pollinose; antenna except arista yellowish brown; upper part of front, ocellar triangle, vertex, occiput (except cerebrale), cheek, palpus, proboscis and antennal segments 1-2 with black hairs which are longer on front.

Thorax: dark brown to black, humeral callus, propleura and areas around anterior and posterior spiracles yellowish brown; sclerite above fore coxa with 1 process; mesenotum, scutellum, propleura, anterior part of metapleura with black hairs; mesonotum may be covered with whitish gray pollen (which may have been rubbed off in the type-specimen before I saw it); halter with stem yellowish brown and knob dark brown.

Legs: dark brown to black; in fore and mid legs, tibiae and basal portions of basitarsi somewhat paler (this may be true of hind leg); hairs on coxa and femur black.

Wing: stigma, area above stigma, a band from base of stigma to apex of anal cell and a band from apex of stigma to apex of discal cell (or bases of 2nd and 3rd posterior cells) darkened; apical portion of wing may be somewhat infuscated.

Abdomen: wholly dark brown to black in specimen before me (this may be due to the coaguration of blood-meal in stomach); above and below clothed with black hairs.

Length: "Körperlänge ca. 4.5 mm; Flügellänge 5 mm" (after original description).

Male. Unknown.

Distribution. Java.

Specimen examined: 1 ♀ (type), "Goenoeng Oengaran, Java, Dec. 1909, E. JACOBSON" (so labeled in the type).

*Atrichops metatarsalis* (BRUNETTI)

(Figs. 2, 6-7, 9, 13-15)

*Atherix metatarsalis* BRUNETTI, 1909, Rec. Indian Mus. 2: 422. Type-locality: Dawna Hills (2000-3000 ft.), Burma.

This species is characterized by the following: wing with 3 broad dark brown



bands, but areas at apex of wing and just beyond apex of  $R_{2+3}$  distinctly pale; sclerite above fore coxa (and behind propleura) with 2 processes; mesonotum and scutellum largely dark brown to black; fore coxa and fore and mid femora yellowish brown; ♂ hind basitarsus swollen.

Male. Head: dark brown to black and whitish gray pollinose; antenna except arista yellowish brown; hairs on head and its appendages black but those on lower occiput pale; difference in size between upper and lower facets not conspicuous; structural characters almost fit the description of *fulvithorax*; in 2 specimens measured, combined lengths of 5 largest facets  $1/6$  (0.17 times or so) as long as distance from antenna to median ocellus and 0.7-0.8 times length of ocellar triangle; number of upper facets along front margin (between median ocellus and antenna) 38 or so; distance from proboscis to antenna 0.6-0.7 times that from antenna to median ocellus; palpus 1.1 times as long as face; when measured along mid-inner surface (except for segment 3 measured at the longest part near ventral margin), relative lengths of antennal segments 1-3, 43 (43): 100: 86 (86) and their relative widths 93 (86-100): 114 (114): 171 (171); proboscis measured along ventral surface 1.7-1.8 times as long as face (=distance from proboscis to antenna).

Thorax (Fig. 9): mesonotum and scutellum dark brown to black and shining; humeral and posterior calli, a large area behind humeral callus and a line along transverse suture yellowish brown; propleura and area between anterior spiracle and fore coxa are yellowish brown and meta- and upper part of pteropleura may be so, but pleura otherwise are dark brown; pleura whitish gray pollinose; hairs on mesonotum and scutellum black and those on pleura pale; sclerite, just behind propleura and just above fore coxa, with 2 short and blunt processes; halter with stem yellowish brown and knob dark brown to black.

Legs (Fig. 6): dark brown but fore coxa, fore and mid femora and tibiae, and base of hind femur yellowish brown; mid and hind coxae may partly be and basal portion of mid basitarsus may be yellowish brown; hairs on legs black; relative lengths of segments (excluding coxa and trochanter) of fore leg 87 (84-88): 147 (145-148): 100: 55 (54-56): 35 (33-36): 19 (18-20): 9 (9), of mid leg 84 (82-86): 136 (132-139): 85 (78-89): 28 (26-30): 13 (12-14): 6 (6-7): 9 (9-10), of hind leg 134 (132-137): 171 (169-174): 88 (84-91): 32 (30-35): 15 (14-16): 7 (7): 10 (9-10) and in hind leg viewed from the side relative widths of femur, tibia and tarsal segments 1-3, 8 (7-8): 6 (6-7): 6 (5-6): 3 (3-4): 2 (2-3) (tarsal segment 1, 0.12-0.13, segment 2, 0.17-0.20, segment 3, 0.25-0.31 times as wide as long respectively) (based on 3 specimens).

Wing (Fig. 2): membrane strongly tinged with dark brown but with 3 pale bands as follows: apex of wing occupying the distal portions of 1st and 2nd submarginal and 1st posterior cells; median band below stigma extending to petiole of anal cell; basal band from before stigma to axillary; besides these 3 bands, base of wing and a spot just beyond stigma (in 1st submarginal cell) also pale.

Abdomen: dark brown to black but sterna 1-3, tergum 1 and anterior borders of terga 2-4 (or 2-5) yellowish brown (in terga 2-4, yellowish brown parts are usually visible only at middle); often tergum 1 and sternum 1 darkened; hairs on abdomen black but those on sterna 1-3 pale.

Genitalia (Figs. 13-15): posterior margin of cercus almost straight.

Length: body 4.4-4.9 mm; wing 4.2-4.5; fore basitarsus 1.25-1.4.

Female (here described for the first time). Similar to ♂ except as follows: Head: front more or less pollinose, and as usual pollen on area above antenna more distinct as well as face; structural characters almost fit the description of *fulvithorax*; in 4 specimens measured, width of front just above antenna 0.8-0.9 times that at median ocellus; width of one eye on a mid-line from a direct frontal view 0.8-0.9 times distance from antenna to median ocellus, 1.3-1.4 times width of front just above antenna, and 1.1-1.4 times width of face at lowest portion from a direct frontal view; relative lengths of antennal segments 1-3, 63 (50-67): 100: 102 (88-117) and their relative widths 106 (88-117): 125 (100-133): 203 (175-233); proboscis measured along ventral surface 1.7-1.8 times as long as face.

Legs (Fig. 7): hind coxa wholly or largely yellowish brown (this may often be so in ♂); relative lengths of segments of fore leg 105 (100-113): 153 (146-166): 100: 54 (51-56): 39 (37-41): 22 (21-23): 12 (11-13), of mid leg 111 (105-121): 160 (149-171): 87 (82-92): 30 (26-35): 16 (15-18): 8 (7-9): 12 (11-13), of hind leg 155 (146-168): 187 (174-203): 97 (88-105): 33 (29-35): 17 (15-19): 9 (7-10): 13 (12-13) and in hind leg viewed from the side relative widths of femur, tibia and tarsal segments 1-3, 19 (18-21): 12 (10-13): 9 (8-11): 6 (6-7): 5 (5-6) (tarsal segment 1, 0.07-0.11, segment 2, 0.18-0.25, segment 3, 0.27-0.41 times as wide as long respectively) (based on 7 specimens).

Abdomen: yellowish brown borders of terga 3-4 usually not seen.

Length: body 3.4-4.2 mm; wing 4.0-4.6; fore basitarsus 0.85-1.05.

Distribution. Burma.

Specimens examined: 9 ♀♀, Pwekawk-waterfall, Maymyo, 12. iii. 1980, N. KASHIWAI; 4 ♂♂, 3 ♀♀, Pwekawk-waterfall, Maymyo, 16. iii. 1981, N. KASHIWAI.

### *Atrichops s-fuscum* (FREY)

(Figs. 8, 16-17)

*Atherix s-fuscum* FREY, 1954, Notul. Ent. 34: 10. Type-locality: Surigao, Mindanao, Philippines.

There is a single ♂ specimen from the Philippines, which is very similar to *s-fuscum* and treated in this paper as sp. 2. The difference between these 2 species is shown in the couplet 6 of the key.

There are 2 ♂♂, 1 ♀ from S. India and 1 ♂ from Burma before me and here determined as *s-fuscum*. In both sexes, the relative lengths of each femur and tibia to fore basitarsus are longer in the specimens from India and Burma than in those from the Philippines (=true *s-fuscum*). But more material is necessary to determine whether or not the difference is of specific or subspecific value.

Male (here described for the first time). Head: dark brown and whitish gray pollinose; antenna except arista yellowish brown; hairs on head and its appendages black but those on lower occiput (except cheek) pale; difference in size between upper



and lower facets not conspicuous; structural characters almost fit the description of *fulvithorax*, but in 3 specimens from the Philippines, combined lengths of 5 largest facets 1/5-1/6 distance from antenna to median ocellus and 0.7-1.0 times length of ocellar triangle; number of upper facets along front margin (from median ocellus to antenna) was 31-38; contiguous portion of eyes 0.0-2.0 times as long as ocellar triangle; width of one eye on a mid-line from a direct frontal view 2.1-2.4 times width of front just above antennae; ocellar triangle 0.8-1.0 times as wide as long; space between antennae 0.0-0.3 times width of ocellar triangle; when measured along mid-inner surface (except for segment 3 measured at the longest part near ventral margin), relative lengths of antennal segments 1-3, 59 (43-67): 100: 100 (100) and their relative widths 111 (100-117): 127 (114-133): 195 (186-200); no significant difference is found in structural characters between the 3 specimens from the Philippines and the 2 from India and Burma.

Thorax: dark brown to black (often brown rather than dark brown, probably due to fading); in specimens from India and Burma, area between anterior spiracle and fore coxa very distinctly whitish gray pollinose (this may be so in all of the better preserved specimens); hairs on thorax black but those on pro- and often metapleura pale; halter with stem yellowish brown and knob dark brown to black.

Legs (Fig. 8): in the specimens from India (which are better preserved), legs dark brown to black but fore femur except apex, base of hind femur, fore and mid tibiae except bases yellowish brown; in the specimen from Burma basal portion of fore coxa, fore femur except apex, base of hind femur, whole surfaces of fore and mid tibiae, fore and mid basitarsi except apices yellowish brown; in the specimens from Philippines, paler or darkened parts not necessarily definite due to fading but mid femur sometimes yellowish brown; hairs on legs black; in 3 specimens from the Philippines, (a) relative lengths of segments (excluding coxa and trochanter) of fore leg 79 (77-80): 124 (121-126): 100: 52 (47-56): 37 (32-40): 21 (20-21): 13 (12-13), (b) of mid leg 81 (81-82): 115 (113-116): 73 (72-75): 25 (25-26): 13 (13-14): 6 (5-6): 9 (8-9), (c) of hind leg 123 (117-126): 134 (132-136): 76 (74-77): 28 (27-28): 13 (13-14): 6 (6): 9 (8-10) and in hind leg viewed from the side (d) relative widths of femur, tibia and tarsal segments 1-3, 13 (13-14): 13 (11-14): 10 (9-10): 6 (6): 4 (4) (tarsal segment 1, 0.12-0.14, segment 2, 0.20-0.23, segment 3, 0.29-0.33 times as wide as long); in the 3 specimens from India and Burma, (a) mentioned above 92 (88-98): 138 (134-143): 100: 52 (50-54): 37 (36-38): 19 (18-22): 11 (10-12), (b) 92 (88-96): 133 (130-137): 84 (80-86): 29 (26-31): 14 (13-16): 6 (5-7): 9 (9-10), (c) 145 (139-150): 168 (166-173): 91 (89-92): 32 (30-35): 15 (14-16): 7 (5-8): 9 (8-10), (d) 17 (14-18): 12 (11-13): 10 (9-11): 5 (5-6): 4 (4) (tarsal segment 1, 0.10-0.12, segment 2, 0.15-0.20, segment 3, 0.25 times as wide as long).

Wing: membrane strongly tinged with dark brown but with following 6 pale parts: (1) apical portion of wing, (2) a band from 1st submarginal cell beyond stigma to 3rd posterior cell, narrower posteriorly, (3) a band from 1st submarginal cell near base (or from discal cell) to 5th posterior cell, wider posteriorly, (4) a band from 1st basal cell to axillary, wider posteriorly, (5) basal portion of marginal cell, (6) base of wing; dark brown part forming a characteristic S or Z-band; pale or dark brown bands varies somewhat in extent with individual.

Abdomen: dark brown to black; sterna 1-2 (or 1-3), anterior part of tergum 2

(or 2-3) and whole or partial surface of tergum 1 yellowish brown; hairs on abdomen black.

Genitalia (Figs. 16-17): at posterior margin of cercus, concavity is shallow.

Length: 3 ♂♂ from the Philippines: body 4.0-4.3 mm, wing 4.0-4.4, and fore basitarsus 1.2-1.3; 3 ♂♂ from India and Burma: body 4.7-5.0, wing 4.6-5.1, and fore basitarsus 1.2-1.4.

Female. Similar to ♂ except as follows: Head: as usual, pollen on face and area above antenna more distinct (front more or less pollinose, as well as occiput); structural characters almost fit the description of *fulvithorax*.

Thorax: pronotum, propleura and humeri yellowish brown (this may be often so in ♂).

Legs: base of mid femur and in the specimen from India hind coxa yellowish brown (these may be so in ♂); in 1 specimen from the Philippines (Mountain Prov., Abatan, Buguias 60 km S of Bontoc, 1800-2000 m), all femora wholly yellowish brown (this may be so in ♂); in the specimen from India pile on coxae and femora of fore and mid legs partly pale; in 2 specimens from the Philippines (a) relative lengths of segments of fore leg 90(88-91): 123(122-123): 100: 52(51-53): 41(39-43): 22(21-23): 16(15-16), (b) of mid leg 96(92-100): 124(120-128): 71(67-75): 23(22-23): 13(12-14): 6(6): 11(10-11), (c) of hind leg 136(129-142): 148(141-154): 74(73-75): 25(24-26): 13(12-14): 7(6-7): 12(12) and in hind leg viewed from the side (d) relative widths of femur, tibia and tarsal segments 1-3, 18(17-18): 11(10-12): 8(6-9): 5(4-5): 5(4-5) (tarsal segment 1, 0.08-0.11, segment 2, 0.17-0.20, segment 3, 0.33-0.38 times as wide as long): in the 1 specimen from India, (a) mentioned above 114-150-100-52-43-26-17, (b) 124-155-88-31-17-7-12, (c) 167-188-95-33-19-10-14, (d) 21-12-7-5-5 (tarsal segment 1, 0.08, segment 2, 0.14, segment 3, 0.25 times as wide as long).

Abdomen: wholly dark brown to black; sterna 1-2 and tergum 1 may have a yellowish brown tinge; in the specimen from India pile on sterna 1-3 and terga 1-3 pale.

Length: 2 ♀♀ from the Philippines: body 4.2-4.7 mm, wing 4.8-6.3, and fore basitarsus 1.2-1.4; 1 ♀ from India: body 4.6, wing 5.1, and fore basitarsus 1.05.

Distribution. Philippines, South India and Burma.

Specimens examined (7 ♂♂, 4 ♀♀): *Philippines*: 3 ♂♂, 2 ♀♀, Minalwang, 1050-1200 m, Misamis Or., 24. iii. -9. iv. 1961, H. TORREVILLAS; 1 ♂, Mt. Isarog, Pili 600 m, Camarines Sur, Luzon, 7. iv. 1965, H. M. TORREVILLAS; 1 ♀, Abatan, Buguias 60 km S of Bontoc, 1800-2000 m, Mountain Prov., 27. iv. 1964, H. M. TORREVILLAS. *South India*: 2 ♂♂, 1 ♀, Mudigere area, c. 900 m, Karnataka, 2-10. xi. 1977, Zool. Mus. Copenhagen Exp. *Burma*: 1 ♂, Pwekawk-waterfall, Maymyo, 16. iii. 1981, N. KASHIWAL.

### *Atrichops stuckenbergi* sp. n.

(Figs. 3, 10)

This species (♀) is very similar to *fontinalis* (♀) of Japan but may be distinguished from the latter in the following points: pleura and large area between humeral callus and transverse suture yellowish brown (in *fontinalis* dark brown); in abdominal terga



2-4, postero-lateral parts dark brown (in *fontinalis* mid-lateral spots on terga 2-3 dark brown); in 1st submarginal cell, darkened part below stigma much larger than in *fontinalis*; antennal segment 3 dark brown (in *fontinalis* yellowish brown); front wider than in *fontinalis*. At least some of the differences above seem to be significant.

Female. Head: dark brown to black and whitish gray pollinose especially on face and area above antenna; lateral patch on upper front velvety black; antennal segments 1-2, palpal segment 1 and ventral base of proboscis yellowish brown (or largely so); hairs on head and its appendages black but those on lower occiput pale; structural characters almost fit the description of *fulvithorax*, but in 2 specimens measured, width of front just above antenna 0.8-0.9 times that at median ocellus which is 2.4-2.7 times width of ocellar triangle; width of one eye on a mid-line from a direct frontal view 1.2-1.3 times (in *fulvithorax* 1.4-1.8; in *fontinalis* 1.3-1.6) width of front just above antenna; when measured along mid-inner surface (except for segment 3 measured at the longest part near ventral margin), relative lengths of antennal segments 1-3, 50 (40-60): 100: 80(80) and their relative widths 95(90-100): 105(100-110): 140(140); palpus 1.1-1.3 times as long as distance from proboscis to antenna; proboscis measured along ventral surface 1.8-1.9 times as long as face.

Thorax: yellowish brown; mesonotum (except humeral- and posterior calli and areas around them) dark brown (area before transverse suture largely yellowish brown); thorax more or less whitish gray pollinose; hairs on mesonotum and scutellum black, but those on pleura pale; sclerite, just behind propleura and just above fore coxa, with 1 short and blunt process; halter with stem yellowish brown and knob dark brown.

Legs: yellowish brown but tarsi and hind tibia dark brown; hairs on legs black; relative lengths of segments (excluding coxa and trochanter) of fore leg 108(106-109): 154(152-155): 100:57(56-58): 47(44-49): 27(26-28): 20(19-20), of mid leg 114(113-114): 164(160-168): 98(96-100): 33(32-34): 19(18-19): 9(8-10): 12(11-12), of hind leg 171(170-172): 199(196-202): 103(100-106): 37(36-38): 19(18-19): 10(9-10): 14(13-14) and in hind leg viewed from the side relative widths of femur, tibia and tarsal segments 1-3, 22(21-22): 12(11-12): 9(8-10): 6(6): 6(5-6) (tarsal segment 1, 0.08-0.10, segment 2, 0.15-0.17, segment 3, 0.25-0.33 times as wide as long) (based on 2 specimens).

Wing (Fig. 3): membrane faintly tinged with brown, with following dark brown parts: stigma, areas above and below stigma, and a band along veins forming apices of 1st and 2nd basal, and anal cells; apical portion of wing more or less darkened.

Abdomen (Fig. 10): yellowish brown, with following dark brown parts: segments 6-7 and in terga 2-5 postero-lateral spots which extend or nearly extend to anterior margins of terga; sterna 1-2 may have a dark brown tinge; hairs on abdomen black but those on sterna 1-5 chiefly pale.

Length: body 4.9-5.1 mm; wing 6.2-6.5; fore basitarsus 1.25-1.3.

Male. Unknown.

Distribution. Africa (Kenya).

Holotype: ♀, Naro Moru, Country Life Lodge, Kenya, 25. xii. 1969, M. E. IRWIN and E. S. ROSS.

Paratype: 1 ♀, same data as type.

Holotype and paratype are deposited in California Academy of Sciences, San Francisco.

This species is dedicated to Dr. B. R. STUCKENBERG (Natal Museum, Pietermaritzburg, South Africa) who erected the family Athericidae.

### *Atrichops* sp. 1

(Fig. 4)

There are 2 ♀♀ from Sarawak which are very similar to or may possibly belong to *fulvithorax* from the Yaeyama Islands (Iriomote-jima near Formosa), but differ from the latter by the darkened part of wing distinct.

They are also similar to *chotei* but are distinguished from the latter by the upper front of ♀ more or less pollinose (in *chotei*, without any pollen).

It is necessary to examine more material in order to determine whether or not the specimens represent a new species or belong to *fulvithorax*.

Female. Head: dark brown but antenna except arista, palpus and basal portion of proboscis yellowish brown; lower portion of face may be brown; head whitish gray pollinose especially on face and area above antenna (i. e. front more or less whitish gray pollinose, besides area above antenna); hairs on head and its appendages black; lateral patch on upper front velvety black; structural characters almost fit the description of *fulvithorax*; in 2 specimens measured, width of one eye on a mid-line from a direct frontal view 1.3 times width of front just above antenna, which is 0.7-0.8 times distance from antenna to median ocellus.

Thorax: yellowish brown; scutellum may have a dark brown tinge in certain lights; hairs on mesonotum and scutellum black but those on pleura pale (hairs on metapleura may be intermixed with a few black ones); sclerite, just behind propleura and just above fore coxa, with 1 short and blunt process; halter with stem yellowish brown and knob dark brown.

Legs: yellowish brown, but tarsi (except basal portions of fore and mid tarsi) and hind tibia darkened; hairs on legs black; relative lengths of segments (excluding coxa and trochanter) of fore leg 83-119-100-46-37-19-15, of mid leg 93-120-70-22-13-6-9, of hind leg 120-137-74-24-13-7-9 and in hind leg viewed from the side relative widths of femur, tibia and tarsal segments 1-3, 17-8-6-5-5 (tarsal segment 1, 0.09, segment 2, 0.19, segment 3, 0.36 times as wide as long) (N=1).

Wing (Fig. 4): membrane faintly tinged with brown, with the following dark brown parts: stigma, apex of subcostal cell, a spot just above base of vein R<sub>4</sub> (this spot connects with stigma), and a band from apex of 1st basal cell to that of anal cell; apical portion of wing and a region around apex of discal cell slightly infuscated.

Abdomen: abdomen is dark brown, but antero-median parts on terga 2-4 or 2-5 may be yellowish brown [more material should be examined in order to elucidate the coloration and markings of abdomen]; hairs on abdomen black.

Length: body 4.4 mm, wing 4.7, and fore basitarsus 1.35 (N=1).

Male. Unknown.

Distribution. Sarawak.

Specimens examined: 2 ♀, R. Kapah trib., of R. Tinjar, 25. ix. 1932, B. M. HOBBY and A. W. MOORE (Oxford Univ. Exp.).

### *Atrichops* sp. 2

There is 1 ♂ from the Philippines which is very similar to *s-fuscum* but is probably different specifically from the latter by the upper facets conspicuously large. It remains unnamed until more material is available.

Male. Similar to *s-fuscum* except as follows: Head: difference in size between upper and lower facets conspicuous; combined lengths of 5 largest facets 0.4 times distance from antenna to median ocellus and 1.3 times length of ocellar triangle; the number of upper facets along front margin was 17.

Legs: relative lengths of segments (excluding coxa and trochanter) of fore leg 80-116-100-49-31-16-11, of mid leg 82-114-71-22-12-6-8, of hind leg 124-137-73-27-12-6-8 and in hind leg viewed from the side relative widths of femur, tibia and tarsal segments 1-3, 14-10-8-6-4 (tarsal segment 1, 0.11, segment 2, 0.23, and segment 3, 0.33 times as wide as long).

Length: body 3.8 mm; wing 4.0; fore basitarsus 1.2.

Female. Unknown.

Distribution. Philippines.

Specimen examined: 1 ♂, Atugan Riv., 1800 m, Bukidnon, Mindanao, 23. iv. 1968, D. E. HARDY.

### Acknowledgements

Sincere thanks are expressed to Dr. Paul H. ARNAUD, Jr. (California Academy of Sciences, San Francisco), Dr. W. A. STEFFAN and Mr. N. L. EVENHUIS (Bishop Museum, Honolulu), Professor Emeritus D. Elmo HARDY (University of Hawaii, Honolulu), Mr. K. G. V. SMITH, Mr. B. H. COGAN, and Dr. P. S. CRANSTON (British Museum (Natural History), London), Dr. Leif LYNEBORG (Zoologisk Museum, Copenhagen), Dr. T. van LEEUWEN (Instituut voor Taxonomische Zoölogie, Amsterdam), Professor T. SAIGUSA (Kyushu University, Fukuoka), Mr. N. KASHIWAI (Tokyo), and Dr. K. KUSIGEMATI (Kagoshima University, Kagoshima) for the loan or gift of material or their generous help in various ways. The drawings were made by Miss Yoshiko IKESHIMA (Kagoshima University) to whom I am much indebted.

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