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THE SYRPHIDAE OF THE MALAY PENINSULA.

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(Plate III & IV and twelve text-figures).

The Hover-flies, Flower-flies or Syrphus-flies are always well represented in collections of Diptera owing to their conspicuousness and relative abundance in such places as are usually visited by collectors. While most of them prefer bright sunshine a few are to be found only in shaded places. The habits of the larvae are very diverse: some live in the nests of ants, others in the nests of bees and wasps; some are predaceous upon Aphids, or plant lice, while still others live in rotting wood, under the bark of living trees or in decaying vegetable matter or manure. In comparison to the large number of described species very little is known of the immature stages and few larvae have been described.

In view of the scattered nature of the literature dealing with the *Syrphidae* of the Malay Peninsula, it is believed that a monographic revision of the family will prove of some value to students of the family who may have an opportunity of studying specimens from this region. The policy followed has been to draw up descriptions of each species received in order that more accurate comparisons may be obtained between the various forms. Where specimens do not agree with published descriptions (these sometimes meagre) they are presumed to be new, rather than variants of known forms.

It was originally intended to figure most of the species, illustrating their salient characters and colour pattern, but the receipt of a second large collection made the work so voluminous as to preclude its completion within a year or more at the very least. Mr. G. S. Walley has been good enough to assist in the preparation of drawings showing the colour pattern of several species, while Mr. J. J. De Gryse has prepared the coloured figures. It is hoped that an opportunity will later be offered to present illustrations of most of the new species herein described.

The greatest thanks are due to Mr. Herbert C. Robinson, late Director of Museums, F.M.S., for the privilege of examining the material belonging to the *Syrphidae*, as represented in the Federated Malay States Museums; and also to Mr. H. M. Pendlebury, Systematic Entomologist, F.M.S. Museums, whose acumen as a collector has resulted in most of the captures of the specimens examined. Others who have contributed to the collection are given credit following the descriptions of the species.

Although this paper is principally concerned with *Syrphidae* obtained in the Malay Peninsula between the years 1921 and 1925, it deals also with a few from Java, secured at Tjibodas and on the Papandajan by Messrs. Robinson and Pendlebury.

Subfamilies of the Syrphidae.

Owing to the uncertainty which must result by using subfamilies as primary divisions in keys to the genera, the latter are keyed out under one head. Most of the subfamilies intergrade and specimens are often found which can only be placed in a subfamily arbitrarily. The position of the anterior cross-vein is certainly not of sufficient value to warrant its use in establishing subfamilies. While the subfamilies *Cheilosinae* and *Xylotinae* are here recognized there is really no distinction between the two, and foreign elements are found in both: *Ferdinandea* I consider very close to *Cheilosia*, notwithstanding the position of the anterior cross-vein.

The subfamilies of the world, given here, will be found to differ markedly from those recognized by Verrall and Brunetti.

Table of Subfamilies.

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| 1. Each femur at the base with a conspicuous patch of tiny black spinules - - - | <i>Eristalinae.</i> |
| Femora without such patch of spinules - - - | 2. |
| 2. Anterior cross-vein rather rectangular, terminating before the middle of the discal cell - | 3. |
| Anterior cross-vein oblique, terminating at or beyond the middle of the discal cell - | 7. |
| 3. Humeri bare, without pile (rarely with pile behind in one subgenus of <i>Baccha</i>) - - | <i>Syrphinae.</i> |
| Humeri pilose on practically the whole surface - - | 4. |
| 4. Hind coxae with hair behind, at least on the inner half; antennae elongate, the third joint usually over twice as long as wide - - - | 5. |
| Hind coxae bare behind; third antennal joint usually not over one and one-half as long as wide; if long, the arista apical. | 6. |

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| 5. Antennae porrect; face convex, not produced downwards - | <i>Microdontinae.</i> |
| Antennae drooping; face more or less tuberculate or concave and produced downwards or forwards - - - | <i>Volucellinae.</i> |
| 6. Third antennal joint very large, orbicular, thick; abdomen concave below; genitalia entirely hidden from dorsal view (America) - - - | <i>Nausigasterinae.</i> |
| Third antennal joint smaller or elongate; abdomen not strongly concave below, the genitalia usually largely visible from above - - - | <i>Cheilosinae.</i> |
| 7. Arista terminal; face not with abundant pile - - - | <i>Ceriodinae.</i> |
| Arista dorsal or the face with rather abundant pile - - | 8. |
| 8. Arista plumose - - - | <i>Sericomyinae.</i> |
| Arista bare or pubescent - - | 9. |
| 9. Apical cross-vein recurrent, usually with a stump of vein at the angle - - - | <i>Eumerinae.</i> |
| Apical cross-vein oblique, at most very slightly recurrent at apex - - - | 10. |
| 10. Marginal cell closed and petiolate | <i>Milesinae.</i> |
| Marginal cell open - - - | <i>Xylotinae.</i> |

It will be found that the arrangement of genera and subfamilies is quite different from that usually followed. This system has been followed because it permits of a more or less lineal arrangement of by far the largest position of the genera, the aberrant genera being placed at the beginning of the family. The exact relationships of some of the subfamilies are difficult to determine, most of them appearing to have branched off at the middle of some subfamily. The position of the *Ceriodinae* is very doubtful and this group (not represented) may be placed either first or last in the family. Whether the *Eristalinae* have any close affinities with the remaining subfamilies may be questioned, although it is much easier to connect them with the *Xylotinae* than it is to associate the *Ceriodinae* with any of the other groups. My opinion is that the last mentioned subfamily is more closely allied to *Microdontinae* than to any other subfamily.

The genera marked * are not represented in the collection.

Synopsis of Genera:

1. Anterior cross-vein terminating well before the middle of the discal cell - - - 2.
- Anterior cross-vein joining the fourth vein at or beyond the middle of the discal cell, usually oblique - - - 41.
2. (1) Arista apical - - - 3.
- Arista dorsal - - - 4.
3. (2) Thickly pilose species, eyes pilose - - - *Callicera* Meigen.
- Thinly pilose species; eyes bare; abdomen slender - * *Pelecocera* Meig.
4. (2) Humeri pilose, at least on posterior part - - - 5.
- Humeri entirely bare - - - 25.
5. (4) Face concave or the oral margin strongly produced forward; arista never plumose - - - 6.
- Face tuberculate, evenly convex or strongly produced downwards - - - 9.
6. (5) Epistoma produced forwards into a long snout; abdomen robust - - - *Rhingia* Scop.
- Epistoma not unusually produced; abdomen slender - - - 7.
7. (6) Third antennal joint orbicular, rather large, rarely oval; arista longer than antenna - - - * *Sphegina* Meig.
- Third antennal joint elongate oval - - - 8.
8. (7) Face everywhere more prominent than the antennal base - - - * *Rhinobaccha* de Meij.
- Face concave and less prominent at some point than the antennal base - * *Neoascia* Willist.

9. (5) Marginal cell closed; arista plumose; posterior coxae with hair behind - - - *Volucella* Geoff.
- Marginal cell open - - - 10.
10. (9) Arista plumose - - - 11.
- Arista bare or very short pubescent - - - 14.
11. (10) Face wholly black or with small yellow spot on sides below; face with strongly differentiated lateral margins reaching practically to the antennae (subgenus *Endoasiomyia* Big.) - - - *Cheilisia* Meig.
- Face yellow, often with black median stripe, the facial side margins obsolete above - - - 12.
12. (11) Posterior coxae bare behind; apical cross-vein rather parallel with the wing margin - - - 13.
- Posterior coxae hairy behind; apical cross-vein almost at right angled to fourth vein - - - *Graptomyza* Wied.
13. (12) Abdomen rather flattened; face very broad and with very low broad tubercle and dense pile - - - *Pararctophila* H.-B.
- Abdomen very evidently arched; face with long, low, nasiform tubercle - * *Arctophila* and * *Sericomyia*.
14. (10) First antennal joint usually much elongated; antennae very long and porrect; face never tuberculate; apical cross-vein rectangular or more or less recurrent - - - 15.
- First antennal joint never greatly elongated, the antennae drooping and shorter than the face; apical cross-vein recurrent only when the third antennal joint is short - - - 17.

15. (14) Front or sides of the face with strong, transverse wrinkles - - - * *Orthoneura* Macq.
- Front and face not with such wrinkles - - - 16.
16. (15) Abdomen spatulate; posterior coxae bare behind - - - ** *Mixogaster* Macq.
- Abdomen not basally constricted, or if so the coxae are hairy behind - - - *Microdon* Meigen.
17. (14) Front or sides of face with transverse wrinkles - - - * *Chrysogaster* Meig.
* *Orthoneura* Macq.
- Front and sides of face without transverse wrinkles - - - 18.
18. (17) Abdomen spatulate; humeri hairy on less than posterior third (*Allobaccha* subgenus nov.) - - - *Baccha* Fabr.
- Abdomen not usually spatulate; if so the humeri more than two-thirds hairy - - - 19.
19. (18) Face wholly black in ground colour; abdomen rarely fasciate, if so the fasciae small, interrupted and limited to second and third segments - - - 20.
- Face not wholly black; abdomen very long, narrowed sub-basally, with conspicuous yellow markings and some of the segmental apices pale - - - *Spheginobaccha* de Meij.
20. (19) Face conspicuously tuberculate - - - 21.
- Face retreating, the oral tip may be produced - - - 22.
21. (20) Eyes bare (Sec *Cheilostia*) - - - *Cartosyrphus* Big.
Eyes pilose - - - *Cheilostia* Meigen.
- ** *Paramixogaster* probably comes here. The coxae may, however, be hairy behind.

22. (20) Oral margin moderately produced - - - * *Psilota* Meigen.
- Oral margin scarcely produced; face usually more or less gently convex in the middle - - - 23.
23. (22) Face moderately widened below - - - * *Pipiza* Meigen.
- Face a little narrower below than at the antennae - - - * *Pipizella* Rond.
24. Omitted.
25. (4) Abdomen more or less spatulate, the second segment at least cylindrical for most of its length - - - *Baccha* Fabr.
- Abdomen not spatulate, not conspicuously narrowed towards the base - - - 26.
26. (25) Face and scutellum wholly black - - - 27.
- Face or scutellum, or both, largely pale in ground colour - - - 29.
27. (26) In the ♂ the anterior tarsi or tibiae, or both, more or less strongly broadened - - - * *Platychirus* St. F. et S.
- Anterior tarsi or tibiae not flattened - - - 28.
28. (27) Abdomen broad, elliptical, flat - - - *Xanthandrus* Verr.
- Abdomen narrow, with almost parallel sides - - - *Melanostoma* Schin.
29. (26) Antennae very long, porrect; wasp-like species - - - * *Chrysotoxum* Meig.
- Antennae shorter, not porrect, if elongate, not wasp-like in appearance - - - 30.
30. (29) Sides of mesonotum bright yellow in ground colour - - - 31.
- Sides of mesonotum at most obscurely yellowish - - - 33.

31. (30) Face strongly produced forwards and with a well-marked long, nasiform tubercle - *Sphaerophoria* St. F. et Serv.
- Face only slightly produced; if moderately produced without a distinct tubercle - - - 32.
32. (31) Abdomen elongate, shining black and yellowish or orange - - - *Ischiodon* Sack.
- Abdomen usually broad, very largely opaque black and yellowish or reddish - - - *Syrphus* Fabr.
33. (30) Eyes conspicuously hairy 34.
Eyes bare - - - 37.
34. (33) Abdomen and thorax with long, abundant pile, the face produced strongly downwards - - - * *Eriozona* Schin.
- Not with both these characters - - - 35.
35. (34) Quite small species, the abdomen normally drooping - - - *Paragus* Latr.
- Larger, 7 mm., or more, the abdomen never drooping - - - 36.
36. (35) Abdomen not margined, the sides curled under - - - * *Ischyrosyrphus* Big.
- Abdomen with raised lateral margins - - - 37.
37. (36) Abdomen with pale fasciae or spots - - - *Syrphus* Fabr.
- Abdomen with basal half black, apical half reddish - - - *Malayana* gen. n.
38. (33) Wings clear, entirely without microscopic hairs - - - * *Scaeva* Fabr.
- Wings villous on most of surface - - - 39.
39. (38) Oral opening linear; abdomen always broader than thorax and unusually flat; always shining - - - *Asarkina* Macq.

- Oral opening oval; abdomen very largely opaque 40.
40. (39) Abdomen very broad and flat, with very broad, usually greenish tinged bands - - - * *Didea* Macq.
- Abdomen not much wider than thorax, often quite narrow and not margined, always less rounded at apex - - - *Syrphus* Fabr.
41. (1) Antennae with a terminal style - - - * *Ceroides* Rond.
- Antennae with dorsal arista 42.
42. (41) Third longitudinal vein deeply looped into the apical cell; each femur at base below with a patch of appressed small black spinules - - - 50.
- Third vein at most moderately curved, the patches of spinules never present at bases of femora - - - 43.
43. (42) Marginal cell closed - - - *Milesia* Latr.
Marginal cell open - - - 44.
44. (43) Apical cross-vein strongly recurrent - - - *Eumerus* Meigen.
- Apical cross-vein at most weakly recurrent just at its apex - - - 45.
45. (44) Face produced downwards and forwards into a long sharp snout - - - * *Lycastris* Walk.
- Face not produced snout-like, if produced downwards it is obtuse and obscurely tuberculate - - - 46.
46. (45) With very long and abundant pile (Bumble-bee-like flies) - - - *Criorhina* Meigen.
- Pile short or of moderate length, not nearly concealing the ground colour - - - 47.

47. (46) Mesonotum with bright yellowish pollinose spots in addition to those on the humeri - - - * *Temnostoma* St. Farg. et Serv.
 Mesonotum not with yellowish pollinose spots except sometimes on humeri and notopleura 48.
48. (47) Pile abundant and moderately long - - - * *Brachypalpus* Macq.
 Pile short and usually inconspicuous - - - 49.
49. (48) Face rather carinate; oral margin not strongly produced; posterior femora very greatly enlarged - - * *Syrilla* St. Farg. et Serv.
 Face concave, the oral margin very conspicuous (except a few species with subcarinate face from America) - - - *Xylota* Meigen.
50. (42) Marginal cell open - - - 51.
 Marginal cell closed - - - 54.
51. (50) Posterior femora with angular projection below before the apex - - - * *Merodon* Meigen.
 Posterior femora normal - - - 52.
52. (51) The anterior cross-vein ends far beyond the middle of the discal cell - - *** *Azpeytia* Walker.
 The anterior cross-vein ends but little beyond the middle of the discal cell 53.
53. (52) Mesonotum with alternate black and yellow or grey vittae - - - *Mesembrius* Scop.
 Mesonotum never with complete pale pollinose vittae - - - *Mallota* Meigen.
54. (50) Loop of third vein diagonally placed - - - * *Korinchia* Edw.
 Loop of third vein normal 55.

55. (54) Posterior femora with a strong, triangular sub-apical tooth below near apex - - - - *Dolichomerus* Macq.
 Hind femora without such tooth - - - - 56.
56. (55) Eyes with numerous roundish brown spots, many of them often confluent *Lathyrrophthalmus* Mik.
 Eyes with stripes or unicolorous - - - - 57.
57. (56) Eyes with vertical stripes *Eristaloides* Rond.
 Eyes unicolorous or at least not vittate - - - 58.
58. (57) Eyes pilose - - - - *Eristalis* Latr.
 Eyes bare - - - - 59.
59. (58) Mesonotum decidedly broader than long - - *Megaspis* Macq.
 Mesonotum hardly as broad as long - - - 60.
60. (59) Mesonotum almost bare, bright metallic blue - *Axona* Walk.
 Mesonotum with abundant, moderately long pile - *Eristalis* Latr.

*** Not seen. I have followed Brunetti in placing it here. It appears to belong to the *Xylotinae*, near *Criorhina*.

Genus *Microdon* Meigen.

Eyes bare or sparsely short pilose. Antennae elongate, porrect; face convex, usually with the upper portion flattened, not produced downwards or forwards; anterior cross-vein before the middle of the discal cell; apical and discal cells of wings rectangular apically or bulbous posteriorly and the cross-veins recurrent; scutellum of variable shape, often armed with short stout spines; abdomen with four segments in ♂, five in ♀, usually robust, rarely constricted basally. Legs moderately robust. Humeri hairy; posterior coxae hairy behind. Genotype: *M. mutabilis* Linne.

The species belonging to this genus live, in the immature stages, in the nests of ants. It is not definitely known whether or not they prey upon the immature stages of the ants but it is generally believed that they are scavengers. This belief is probably only partly correct as ants have frequently been observed attacking the larvae of *Microdon* which appear to be well protected and ignore such

treatment at the "mouths" of their unwilling hosts. The larvae or pupae have more than once been described as molluscs. They are readily recognized by their elongate-oval shape and strongly convex upper surface, the legs being very rudimentary.

The adult flies cannot well be confused with other members of the family. They resemble many of the *Stratiomyidae* in form, and also some bees, especially while in the living state. Most of the species "buzz" rather loudly while flying. The five species and one variety contained in the collection may be distinguished by the following synopsis:

Table of species.

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| 1. Scutellum with spines | - - - | 2. |
| Scutellum without spines although the apical corners may be somewhat prominent | - - - | 4. |
| 2. Wings blackish and brownish in front and apically; or greyish spines of the scutellum distinctly closer together than the length of the scutellum which is about as long as wide | - - - | 3. |
| Wings pale, yellowish in front; scutellum twice as wide as long, its apex gently concave between the spines which are situated on the corners | - - - | <i>grandis</i> sp. n. |
| 3. Wings greyish with brown anterior cross-vein; abdomen with intermediate segments yellow, the third with black spot on either side | - - - | <i>trimacula</i> sp. n. |
| Wings blackish and brownish in front and apically; abdomen wholly bronzy blackish | - - - | <i>robinsoni</i> sp. n. |
| 4. Colour metallic bluish | - - - | <i>sumatranus</i> Wulp? |
| Colour blackish or partly reddish | - - - | 5. |
| 5. Abdomen not, or but little reddish on the sides | - - - | <i>auroscutatus</i> sp. n. |
| Second and third abdominal segments red | - - - | <i>auroscutatus</i> var. <i>variventris</i> var. n. |

Microdon auroscutatus sp. n.

Face bright brassy pilose; scutellum with bright brassy, almost golden, appressed pile; legs almost all reddish; wings cinereous or lightly brownish, somewhat darkened in front; abdomen black.

Length, 9 to 11 mm. *Male*. Face green, densely punctured, very densely brassy-yellow pilose; in profile almost perpendicular on more than the upper half, the lower half rather strongly convex-retreating. Face convex laterally, with narrow, but distinct, orbital depression on the upper half. The sides of the face are slightly converging above, the constriction continuing on to the front to just above the bare, polished black, rather quadrate antennal prominence, where there is a distinct, but shallow, slightly arched transverse depression, above which the eyes diverge slightly. Before the depression the pile is directed downwards, above it it is inclined upwards, so that it appears brassy from frontal view. The ocellar triangle is equilateral and, while convex, is not prominent; ocelli red. From the vertex to well in front of the ocelli is a broad fascia of black pile, which usually almost reaches the depression owing to a small, detached patch in front of it. The occiput is slightly swollen and is wide behind the eyes; covered with closely appressed brassy-yellow pile, which, however, becomes paler and more erect below. The ocelli are situated only a little before the posterior corners of the eyes. First antennal joint red on the basal half or three-fourths, as long as the two following combined, not pilose; second and third joints black, the second slightly over one-third as long as the third; third with nearly parallel sides, its apex obtuse, sometimes slightly broadened in the middle. Arista situated near the upper margin of the third joint on the outer side, rather slender, not reaching to the tip of the third joint.

Thorax black, the mesonotum bordered with brassy-yellow pile, and in addition, there is a narrow, complete fascia across the suture and a narrow median vitta, the pile elsewhere black and short; the anterior brassy fascia is rather broad. The pile on the pleura is black, but there is a broad fascia of brassy pile running over the meso- and sternopleura. The scutellum is so densely covered with almost golden pile as to hide the ground colour; its apex is almost evenly convex and without points.

Legs reddish, the coxae black and clothed with very conspicuous, silvery-white appressed pile; subapical tarsal joints more or less infuscated. The pile on the legs is best described as brassy whitish, except on the upper surface of the tibiae, where it is pure white.

Wings cinereous to fairly brownish, darker on the anterior half, especially apically. Apical cross-vein recurrent, almost straight after the bend, ending opposite the tip of the second vein. Discal cross-vein slightly sinuous, at most slightly recurrent, its apex usually slightly curved towards the tip of the wing. Squamae whitish, with yellow border and extremely short, fine white fringe. Halteres yellow.

Abdomen greasy blackish. First segment very short, its anterior corners prominent, the concavity at the side almost angular but not extending onto the dorsum. Second segment short, about three times as long as the first, its posterior margin almost evenly transverse, but there is a very shallow concavity on either side. The third segment is about two and a half times as long as the second in its middle, its sides quite three times as long as the middle of the second; the fourth is not quite as long as the second and third together. The first segment is broadly brassy-yellow pilose on each side of the middle, the pale pile not reaching the sides. Practically all of the second segment bears brassy pile when viewed from certain angles, but from dorsal view, it is limited to the posterior border. There is an oblique, oval patch of pile extending forward from the posterior angles of the third segment and contiguous with a large triangle on the anterior angles of the fourth and there is also a smaller, triangular brassy patch on the basal angles of the third segment. The fourth segment bears a large, more or less oval, brassy pilose area on either side resting on the apex, these broadly separated from each other by the middle line. In general the pile elsewhere appears blackish, but in the proper lights is actually reddish.

Female. Differs only sexually. There is no constriction of the front, which, while somewhat narrowed above, is not greatly narrower than the face and there is no frontal depression. The pile is similar on the head and thorax. The pale pilose areas on the abdomen are more whitish and the dark areas bear some really black pile and in many places it is more difficult to locate reddish hairs. The arrangement of the pile scarcely differs. The fifth segment is less than half as long as the fourth and bears smaller, but similarly shaped, apical pale pilose patches as those found in the male, the fourth segment lacking the middle patches, but having lateral ones as on the third segment of the male.

Described from the following specimens: ♂, Pahang, F.M.S., Kuala Tahan, 300 ft., Nov. 24, 1921; 3 ♀, Pahang, Kuala Teku, 500 ft., Dec. 5 and 6, 1921; ♀, Peninsular Siam, Nakon Sri Tamarat, Khao Ram, 300 to 750 ft., Feb. 22, 1922, all collected by H. M. Pendlebury.

Microdon auroscutatus var. *variventris* var. n.

Agrees with the typical specimens except that the second and third abdominal segments are red in colour. The single female bears the same data as the male of *auroscutatus* but was taken on the previous day, Nov. 24, 1921.

Microdon robinsoni sp. n.

Scutellum with spines; wings brown in front, the apical third blackish; second abdominal segment widest; tibiae and tarsi white pilose on superior surface.

Length, 14 mm. *Female.* Face and front blue green, densely punctured, brassy-yellow pilose, the face retreating, almost straight above, strongly convex on the lower fourth; laterally convex, with a wide lateral depression which is widest above and narrowed to a point at the lower fourth. The jowls are convexly swollen and there is a shallow but wide emargination before them. The rather small antennal prominence is polished black, the ocellar tubercle similar, carried beyond the posterior reddish ocelli so as to be more oval than triangular, but not carried to the vertex as a swelling. The sides of the face and front are parallel, the front slightly narrower than the face. The brassy-yellow pile of the front is mostly directed upwards, that at the vertex directed slightly forwards and the pile immediately above the antennae is directed slightly downwards. Occiput swollen above the eyes, broad above the upper angles, so that the distance from the vertex to the posterior ocelli is practically the same as from the ocelli to the antennal prominence although the posterior ocelli are practically in line with the posterior angles of the eyes. The occiput is whitish pollinose, except above, clothed with brassy-yellow pile above and whitish pile on the lower two-thirds. First antennal joint compressed, as long as the face and almost as long as the last two joints combined, its colour reddish or brownish-red, with abundant short black pile on its upper and lower edges. The last two joints are black, the third rather brownish pollinose, the second not quite one-third as long as the first, scarcely wider; third joint about three-fourths as long as the first, about four times as long as wide, gently convex below, almost straight above, its obtuse apex very slightly curved upwards. The short, slender arista is borne subbasally on the outer side of the third joint near the middle.

Thorax and scutellum rather dull black, densely punctured. Pile on the mesonotum brassy-yellow, a narrow middle vitta, a transverse, rectangular spot immediately before the suture on either side, and a broad vitta behind the suture on either side, black-haired. The scutellum is armed with a strong spine on either side of the almost transverse apex, the margin obtusely rounded outside these points, the pile brassy, but longer, more abundant and rather whitish about the spines.

Legs brownish, about the basal half of the tibiae more reddish, the appressed pile is silvery-white, but on the basal, ventral half of the anterior four femora, apical half of the posterior tibiae on the ventral surface and all the tarsal pads, bright tawny; rather more yellow inside the anterior four tibiae apically; only conspicuously long and black behind the middle femora.

Wings brownish in front of the fourth vein to beyond the anterior cross-vein, thence deep brown to the apex and

spreading back almost to the fifth vein, the posterior third of the second basal cell also quite brownish. The apex of the apical cell is oblique, the apical cross-vein slightly recurrent and ending before the apex of the second vein, the discal cross-vein slightly sinuous. Squamae whitish, with yellow border and fringe. Halteres yellow.

Abdomen shining black, over twice as long as the thorax and much wider near the base, tapering from the apex of the second segment. The anterior corners of the first segment are prominent as there is a rather sharp concavity lying mostly before the middle, the posterior margin of the segment being arched towards the apex, which, from dorsal view, is a little beyond the apex of the scutellum. The second segment is transverse posteriorly, strongly convex on the sides, widest about its middle, the middle line only half as long as the side of the segment. The third segment is nearly four times as long as the middle of the second and is slightly longer laterally; the fourth is nearly as long as the third, the fifth not half as long as the fourth. The pile is brassy reddish, but white pile extends narrowly inwards along the base of the third and further and more conspicuously so along the base of the fourth; apical half of the fifth segment black pilose. Without magnification the abdomen appears rather greenish-black except at the tip.

♀, Peninsular Siam, Nakon Sri Tamarat, Khao Luang, 2000 ft., March 19, 1922, collected by H. M. Pendlebury.

Microdon trimaecula sp. n.

Allied to *M. apiformis* Brun., but readily distinguished by the pale brownish or ferruginous-yellow legs, the wholly pale tibiae, lateral yellow facial orbits and the strong suture separating the first two abdominal segments.

Length, 11 mm. *Male*. Head brownish-black, the moderately wide facial orbits reddish, the pile brassy-yellow, subappressed on the face. In profile the face is almost wholly moderately convex but almost perpendicular on the upper fifth; front at lower third less than one-fourth the head width, widening behind and in front, the depression broad, arched slightly forward and fairly deep; ocellar triangle slightly wider than long, situated twice its width in front of the vertex. Occiput and cheeks greyish pollinose. Antennae with the first joint brownish-red, apex and lower edge darker, second luteous, third brown, with greyish pollen, its base narrowly reddish; first and third joints of equal length, the third curved somewhat upwards, the apex acute above, obliquely convex, the sides parallel; arista reddish, robust, a little tapering, reaching to the apex of the third antennal joint.

Mesonotum bronzed brownish, the broad lateral margins, pleura and scutellum, dirty luteous, the pleura with more or less distinct brownish areas, the pectus

brownish. Pile brassy-yellow, subappressed and fairly long on the dorsum; hypopleura with brown pubescence. Scutellum strongly emarginate between the strong, pilose spines, its pile rather long.

Legs reddish, the femora sometimes brownish-red, nowhere black except the usual area at the fracture of the tibiae. Tarsi a little darker than the tibiae. Pile of legs all brassy-yellow.

Wings greyish, with slight luteous tinge, the anterior cross-vein conspicuously clouded with brown. Venation as in *auroscutatus*. Squamae white, with yellow border and short yellow fringe. Halteres reddish-yellow.

First abdominal segment brown, the apex yellowish; second wholly translucent yellowish, the third reddish, with a large, subquadrate brownish-black spot on either side, moderately separated from the lateral margins and completely filling out the lateral depression; fourth segment wholly brownish-black, a little bronzed, the lateral margins reddish on the anterior two-thirds. Lateral depressions on the second segment large, and fairly deep, especially impressed laterally. The first two segments, entire lateral margins, a wide, broadly interrupted fascia on the third segment and the apical third of the fourth, rather brassy yellow pilose, the pile elsewhere, short, appressed, black, a few black hairs on the median line of the second segment, the pile on this segment mainly rising from tiny tubercles. Second and third segments of almost equal length, the fourth as long as the two preceding combined, the abdomen tapering slightly from the apex of the second segment to the obtuse brownish genitalia.

Described from two ♂, Perak, Batang Padang, Tapah-Pahang Road, (12th mile), Sept. 10, 1923, and Jor Camp, March 10, 1924, both collected by H. M. Pendlebury.

Microdon sumatranus Van der Wulp?

Microdon sumatranus Van der Wulp, Diptera, Sumatra Exped., IV, 29, 1881.

Bright metallic blue, the abdomen more or less cyanaceous; wings brownish; apical and discal cross-veins strongly recurrent.

Length, about 11 mm. *Female*. Head bright metallic blue, whitish pilose, the face with parallel sides, the front very slightly narrowed towards the upper fourth, thence slightly widened to the posterior angles of the eyes. In profile the face is slightly prominent, very slightly convex, the lower fourth more strongly convex and retreating, the oral angles small and prominent, the jowls not visible below the eyes. There is scarcely a trace of a narrow, lateral facial depression. The small antennal prominence is tipped with reddish and there are a few black hairs immediately above

it. The ocellar triangle is but little swollen and of moderate size, slightly longer than wide and situated a little more than its own length before the posterior angles of the eyes. The occiput is not swollen above but is rounded off, the inside and along the orbits below silvery-white pollinose. Antennae black, the third joint with brownish pollen; first joint compressed, black pilose above and below, about as long as the front and almost as long as the apical two joints combined; second joint nearly one-third as long as the first, black pilose; third joint over twice as long as the second, widest at its apical third, thence almost straight to its blunt tip which is compressed and slightly upturned, the upper margin of the joint almost straight. The wholly thick, blackish arista is situated near the upper edge of the third antennal joint and does not reach to its apex.

Thorax bright metallic blue, yellowish-white pilose. Scutellum slightly emarginate apically, due to a swelling on either side; without spines.

Legs black, the tibiae yellowish, with preapical black bands, that on the hind ones broad; pile white, long behind and beneath the anterior four femora and in front and beneath the hind ones, long and silvery on the tibiae above, the tarsal pads yellow, the posterior tarsi with some black pile behind.

Wings brownish, paler behind towards the base; apical cross-vein strongly recurrent and ending before the apex of the second vein; discal cross-vein recurrent, its distal half almost straight and transverse. Squamae white, with short white fringe. Halteres yellow.

Abdomen cyaneous, the first two segments bright metallic blue. The first segment is wholly hidden by the scutellum except laterally, where there is a deep, broad depression extending across its middle, leaving the sides deeply concave. The second segment is convex on its sides and is widest apically. The third segment is as long as the lateral length of the second, the fourth nearly two and a half times as long as the third, its posterior margin oblique, as it is longer laterally; fifth nearly as long as the fourth. The anterior margin of the second segment is straight, the hind margin slightly oblique from the middle. On the posterior margin of the second to fourth segment is an incomplete fascia of whitish pile, that on the second and third narrowly interrupted and running entirely along the margin, that on the fourth continuing on the same line as the posterior margin at the sides so that it extends on to the disc of the segment and almost reaches to the middle, its inner ends moderately broadly separated. The fifth segment has a broad, similarly pilose vitta on either side of the middle line, not quite reaching the base of the segment, joined posteriorly with the broadly pale pilose lateral

margins, the lateral margins of the third and fourth segments also pale pilose, the pile elsewhere black. On the first two segments, except as mentioned, the pile does not form distinct fasciae, as it is erect, although wholly pale. On the pale pilose fasciae the ground colour is bright metallic blue, not cyaneous.

A ♀, Selangor, F.M.S., Kuala Lumpur, Oct., 1922, collected by H. M. Pendlebury, appears to be this species.

Microdon grandis sp. n. (Pl. IV, Fig. 6.)

Robust, the scutellum twice as wide as long, with strong spines at the corners; eyes short pilose.

Length, 14 mm. *Male*. Face about one-third head width; in profile slightly retreating, more strongly so above, below convex retreating, without orbital depressions, laterally convex. Front strongly constricted two-fifths the distance above the antennae where there is a broad, deep depression which extends shallowly almost to the base of the antennae. Pile of the head black, except along the narrow facial orbits where it is fulvous. Ocelli situated half-way between the vertex and frontal depression, their triangle distinctly longer than wide; occipital bump very prominent. Whole head black, with an aeneous or bronze reflection. Antennae black, the first joint elongate, the second not quite one-third the length of the first, the third joint missing.

Mesonotum blackish with metallic green reflections and four purplish vittae, the median two narrow, the outer ones wide, their limits not clearly distinct in most views. Pleura bronzy brownish, largely polished. Scutellum black, with greenish-bronze reflection. Pile black, stiff, sub-erect; a triangle above the base of the wings and the lateral and posterior margins of the scutellum fulvous pilose. Scutellar spines with reddish pile. Punctures of thorax and abdomen coarse.

Legs black, clothed with black pile, the tarsal pads more brownish. Tarsi widened and rather short.

Wings strongly tinged with luteous, somewhat paler behind. Venation as shown in the figure.

Abdomen greenish-black, the colour appearing somewhat brownish because of the appressed, bright fulvous pile; sides and broad apex of the fourth segment orange red, the genitalia of the same colour. Sides of the first segment and narrow lateral margins of the second, black pilose.

Described from a single male collected at Perak, F.M.S., Jor Camp, 2000 ft. August 21, 1922, by E. Seimund.

The specimen is not in perfect condition but it does not appear to be damaged in so far as structure and colour are concerned. The thorax has been somewhat broken. It is difficult to describe the colours of the specimen as it appears somewhat greasy, although this is not the case. I am not

sure that most of the specimens are not more metallic than the one described. The only allied species known to me is *M. fulgens* Wied., found in North and South America. The structure of the scutellum is the same in both species, as are practically all the structural characters, but there is a marked difference in the colour of the pile and also of the integument.

- Genus *Volucella* Geoffroy.

Apical cross-vein recurrent; anterior cross-vein before middle of discal cell; marginal cell always open; face produced downwards or forwards or both, tuberculate or at least usually somewhat convex on lower part, concave above; third antennal joint elongate; arista long plumose; abdomen robust. Posterior coxae hairy behind. Genotype: *V. pellucens* Fabr.

The larvae of *Volucella* have various habits: they may feed in the stems of fleshy plants such as cacti or in more woody plants or in manure while some live in the nests of bees and wasps. It is probable that all the species are scavengers in the immature stages. I am not aware of any records of healthy plants being attacked. The adults are found commonly on melliferous flowers and undoubtedly are valuable as pollinators.

The generic diagnosis given above will serve readily to separate the species of *Volucella* from all genera except a few species of *Phalacromyia* (strictly American), but as the latter genus has from one to three depressed, often strongly concave scutellar areas it is easily separated. The original separation of the genera on the open marginal cell of *Phalacromyia* will not hold. Five species and one variety of *Volucella* are represented in the collection.

Table of species.

- | | | |
|------------------------------------------------------------------------------------|-------|----------------------------|
| 1. The petiole of the marginal cell reaches the costa before the apex of that cell | - - - | 2. |
| The petiole reaches the costa beyond the apex of the marginal cell | - - - | 3. |
| 2. Mesonotum wholly pale reddish | - | <i>trifasciata</i> Wied. |
| Mesonotum almost all blackish | - | <i>surda</i> sp. n. |
| 3. Mesonotum all pale reddish | - | <i>rotundata</i> Edwards. |
| Mesonotum chiefly blackish | - | 4. |
| 4. Second abdominal segment practically all pale yellowish | - | <i>pellucens</i> Fabr. |
| Second abdominal segment chiefly dull black (See appendix, p. 321 .) | - - - | <i>xanthopygata</i> sp. n. |

Volucella trifasciata Wiedemann. (Fig. 7, and Pl. IV, Fig. 8.)
Auss. Zweifl., ii, 196, 1830.

Petiole of the marginal cell joining the costa before the end of the cell, slightly oblique; thorax wholly brownish-yellow; scutellum with flattened area; a row of bristles before the scutellum; abdomen black, with three yellow fasciae.

Length, 18 to 19 mm. *Female*. Head pale yellowish, the occiput densely greyish pollinose; a stripe above the oral margin and a lateral facial stripe darker; front with a reddish tinge. In profile the upper third of the face is hollowed to the anterior level of the eyes, the lower edge of this portion oblique, the tip of the low, broad tubercle and the whole of the face below it more prominent than the antennal tubercle, the tip of the oral angles being on a plane with it, the face scarcely retreating below the tubercle, produced downwards as an acute cone, the lower oral margin gently concave. The facial concavity and narrow side margins are densely pale yellow pollinose, the facial slopes with fine, whitish, appressed pubescence, the lower part of the face on the anterior surface, black-haired. Front narrow, slightly diverging below, with a depression on either side which encloses a more brownish area between it and the orbital margin; narrow supra-antennal margin yellow. Ocellar triangle small, the ocelli yellowish, the anterior one slightly remote. The frontal pile is all yellowish. Occiput yellowish-grey pollinose, each fine white hair rising from a brown puncture. Eyes with short yellow pile on upper two-thirds, the facets only slightly enlarged. Antennae yellow, the third joint brownish apically, sub-reniform, the lower edge convex, the upper excised beyond the middle and narrower on the apical third, hardly twice as long as wide. Arista yellow, brownish on the apical half, the plumes brown, the upper ones one-third longer than the lower.

Mesonotum and scutellum ferruginous yellow, the pleura and pectus rather pale yellow with a thin covering of yellowish-white pollen, the pile yellow but becoming almost white on the lower half of the pleura. Thorax with black bristles as follows: two on the hind margin of the mesopleura, three or four before the outer end of the suture, three supra-alar, three on post-alar calli, eight or ten before the scutellum and two or three on the scutellum at either side. Each hair on the thorax and scutellum rises from a small brown spot or tubercle. Scutellum with a large, flattened, densely-punctured, transverse oval area before the apex, which leaves the narrow base and broad sides polished. On the lower margin of the scutellum is a row of strong yellow hairs which turn upwards at their base and there is a row of much finer hairs, also upwardly-directed, on the posterior margin of the depressed area.

Legs reddish-yellow, the tibiae and tarsi ferruginous, except the bases of the former, the hind femora also darker below on the basal three-fourths.

Wings hyaline, yellowish before the third vein and narrowly along all the veins, with a more brownish median cloud in front; the apex beyond the cross-veins and the apex of the anal cell, the veins broadly, beyond the middle of the first posterior cell, greyish-brown, and somewhat darker in front.

Abdomen chiefly black, the first segment wholly yellow. Second segment with the basal third or slightly more, the narrow apex, more broadly so in the middle and the sides entirely, translucent yellow; the black fascia thus left is a little undulating, being concave on each side in front, subtriangularly slightly produced forwards at either side in front and the lateral border is oblique so that the yellow forms a triangle along the margin. The basal third of the third segment is translucent yellow, less widely so in the middle where the black is produced slightly forward as broad triangle, and along the sides the yellow is produced triangularly to the apical third of the segment. The base of the fourth segment is broadly reddish, more or less obscurely so, however, the fascia more or less obscurely interrupted by a broad triangular projection of the black. Abdominal pile chiefly reddish-yellow; on the first black fascia except on the lateral sixth, obliquely cut off in front so that the yellow pile extends to the lateral fourth, a similar area on the third segment, a large, almost equilateral triangle on the apex of the fourth segment which reaches almost or quite to the base, and the whole of the fifth segment clothed with short, black pile, the last two segments with some longer, more erect black hairs, the apex of the fourth with some scattered yellow hairs intermixed with the black. First three ventral segments translucent yellow, with a median brown vitta, the second and third each with an oblique, almond-shaped black spot on either side, those on the second with the narrow inner ends not reaching the median line, those on the third doing so broadly, the two following segments black, with narrow yellow bases.

The description is from two ♀♀, Perak, Jor Camp, 2000 ft., August 20 and 29, 1922, collected by E. Seimund and 2 ♀♀ same locality, 1800 ft., June 4 and 5, 1923, collected by H. M. Pendlebury.

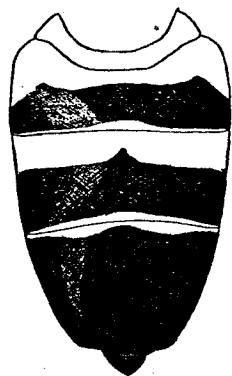


Fig. 7. Abdomen of *V. trifasciata* Wied.

Volucella trifasciata var. *aeropila* var. n.

In this form the second and third yellowish abdominal fasciae are very much reduced or entirely wanting while the third segment is wholly golden reddish pilose except for a very narrow median vitta, the fourth having the usual very well-marked V-shaped black pilose area. The wing markings are darker; otherwise there is little difference.

Described from 2 ♀♀, Pahang, "Cameron's Highlands," No. 4 Camp, 4800 ft., June 19 and 22, 1923, collected by H. M. Pendlebury.

This may prove to be a distinct species, but in the absence of males of *trifasciata* and this form it is not possible to decide. The ♂ genitalia are very distinctive in most of the species of the genus and an examination of this organ will be necessary in order to decide the relationships of the above forms.

Volucella surda sp. n. (Pl. IV, fig. 9).

Petiole of the marginal cell very short, situated just before the apex of the cell, transverse; front with an opalescent blue reflection; scutellum yellow, with a large, brown, transverse, finely punctate spot, each hair outside the spot rising from a small, brown puncture; mesonotum with a row of bristles immediately in front of the scutellum.

Length, 20 mm. *Female*. Face and cheeks translucent yellowish-red, the facial concavity and side margins densely yellowish-white pollinose, the slopes of the face thinly covered with similar pollen. In profile the upper third of the face is deeply concave and on a level with the front margin of the eyes, the tubercle rising, abruptly, broad, roundish, scarcely more prominent than the lower third of the face which is almost perpendicular and is on a plane with the apex of the antennal prominence; oral border gently concave, the oral angles acute and almost as far forward as the oral tip; the middle of the face on the lower two-thirds is clothed with appressed, short, black pile, the slopes with scarcely discernible fine whitish hairs. A rectangle on the front immediately above the antennae is brownish-red, the front elsewhere with a strong, opalescent blue reflection. Front narrow, its sides slightly divergent below, on either side with a deep groove which runs into the orbit below the ocelli at its upper end and joins the orbit at the anterior fifth or sixth below; pile all fine, yellow, moderately long but not very abundant. Ocelli red, their triangle small, equilateral. Occiput densely greyish pollinose, with almost white pile, that above short, becoming a little longer below. Eyes with enlarged facets on more than the upper half and clothed with short, not conspicuous pale pile on this portion, bare below. Antennae yellowish-red, the third joint sub-reniform, narrowest apically, excised slightly beyond the middle above, not twice as long as broad. Arista yellowish, with black plumes, those below slightly the shorter.

Mesonotum bright metallic blue, the side margins broadly brownish-yellow and this colour extends as a narrow line along the suture; pleura yellow, the mesopleura chiefly, a more or less distinct spot below it and a spot on the lower part of the hypopleura brown or blackish, the whole thorax yellow pilose, the hairs on the pale portions each rising from a small brownish tubercle. The black bristles are arranged as follows: two or three on the mesopleura before the root of the wings, three or four before the outer end of the suture, three supra-alar, four post-alar and ten or twelve more or less reddish ones before the scutellum. Scutellum translucent reddish-yellow, with a transverse, brown spot covering practically all the disc and leaving the narrow apex and base and broad sides, pale; with a preapical flat area; pile all yellowish, sparse, one or two long bristles at either side, but there is an apical row of long, upwardly-curved, rather numerous hairs, between which and the brown area there are no hairs, but the apical margin of the brown area bears a row of finer, shorter ones; brown area densely, finely punctured; elsewhere each hair rises from a small brownish tubercle, but these are not numerous.

Legs yellowish-red, the hind femora picuous brownish on the basal two-thirds except the immediate base, their tibiae with the median third reddish-brown, the last one or two tarsal joints brownish.

Wings yellowish before the third vein, the subcostal cell, stigma, and an apical spot, brownish; a brownish cloud extends back from the stigma and the apical cross-veins and apex of the anal cells are brownish, the remaining veins slightly clouded with yellowish. Squamae whitish, the upper lobe somewhat fuscous, with orange-yellow border and fringe. Halteres pale orange-yellow.

Abdomen chiefly steel-black. First abdominal segment orange-yellow, with a small, transverse brown spot on either side. Second segment with the broad base and almost equally broad side margins except at the apex, pale translucent yellow, the rather narrow apex orange-yellow, the anterior pale fascia interrupted in the middle by a narrow line of black. The reddish-yellow base of the third segment is similar in shape to that on the second but is only half as wide, being only slightly wider than the pale apex of the preceding segment and the apex of the third segment is narrowly, obscurely, orange; fourth segment with small, orange, anterior angles. Pile chiefly yellowish-orange, rather golden, short, abundant, subappressed, the black pilose areas as follows: the steel-blue portion of the second segment on more than the middle half, obliquely expanding to the lateral sixth behind; an anteriorly convex lunule before the middle of the third segment on either side, the broad middle line of the fourth segment, and

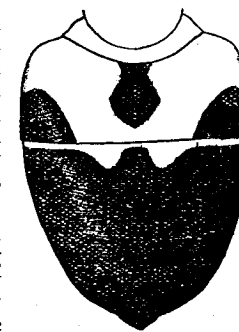
the cylindrical fifth segment except the narrow lateral and apical borders. The second segment has a slender yellow pilose vitta on the middle line. Venter black, except the incisures.

Described from a ♀ Peninsular Siam, Nakon Sri Tamarat, Khao Luang, 2000 ft., March 20, 1922, collected by H. M. Pendlebury.

Volucella rotundata Edwards. (Fig. 10).

Volucella rotundata Edwards, Journ. Federated Malay States Mus., VIII, pt. 3, 38, 1919.

Petiole of the costal cell joining the costa well beyond the apex of the cell; scutellum reddish-yellow, obliquely flattened before the apex; a row of bristles before the scutellum; wings with median frontal and apical dark areas; first two abdominal segments chiefly yellowish, the following segments black.



Length, 16 to 18 mm. *Male*. Head, except the occiput, shining yellowish-red, the facial concavity and narrow side margins yellow pollinose. The upper third of the face is a little retreating, the upper edge of the tubercle slightly

Fig. 10. Abdomen of *V. rotundata* Edw.

oblique, the latter of moderate size, sloping to the tip of the oral margin which is on a plane with the tip of the antennal prominence; oral angles acute. The pile of the face is black on the middle of the produced portion, yellow on the slopes, although the colours are somewhat variable in extent. There is a polished, more reddish triangle immediately above the base of the antennae. Frontal triangle small, slightly wider than long, clothed with short white pile. Vertical triangle one and one-half times as long as wide, its sides straight, its pile yellow, the tips of the hairs darkened. The eyes touch for a distance equal to three times the length of the vertical triangle and bear fairly long, bright yellow pile on the upper half where the facets are enlarged. Antennae reddish; third joint slightly over twice as long as wide, its lower edge convex, the upper edge hollowed beyond the middle, the apex rounded. Arista reddish-yellow, brown apically, with nearly equal brown plumes above and below.

Mesonotum and upper half of the pleura pale brownish yellow, the lower half of the pleura and pectus brownish, the yellow pile moderately abundant. Scutellum concolorous with mesonotum, with an oval, preapical flattened area which is more densely and finely punctate and bears shorter yellow pile than elsewhere on scutellum. Fine

black bristles of thorax arranged as follows: two or three beneath the base of the wing, three before the hind margin of the mesopleura, three before the outer end of the suture, four on the postalar calli, eight to ten before the scutellum and four or five on either side of the scutellum.

Legs reddish, the femora piceous on the basal half, the front ones on the basal third or less. Middle and hind tibiae with broad, darker bands beyond the middle, the posterior one very broad; apical two tarsal joints brownish or blackish. Pile of legs almost all black or brown, short, appressed, longer and more erect on the femora. Posterior tibiae slightly curved.

Wings almost hyaline, with a very large, brown oblique spot at the middle and a cinereous-fuscous, dilute spot at the apex in front, the veins in its vicinity also clouded; veins at base of wing clouded with luteous. Squamae yellow, with yellow fringe; halteres yellowish white.

First abdominal segment pale yellow, its sides narrowly more or less brownish. Second segment translucent pale yellow, appearing darker because of the black hair; in the middle with a subtriangular blackish spot, the base of the triangle resting on the base of the segment is usually more or less cut off, the four sides thus formed all being straight: the spot thus formed resembles a shallow pan in shape, its base resting on the base of the segment, its widest edge situated at the apical third; in addition the narrow side of the segment, except the broad base, is steely black. The narrow base of the third segment, sometimes expanded as a broad, obtuse triangle on either side of the middle line, is of the same colour as the preceding segment, the abdomen elsewhere steely black. Pile abundant, all short, black except on the first and base of the second segment, where it is slightly longer, erect and finer and there are some long hairs on the fourth segment apically and a few more or less scattered over the whole segment. There may also be a more or less linear, longer or shorter, basal pale spot on this segment laterally, but it is obscure. Venter black, the second segment except the sides, and a large, apically convex basal area on the third segment, translucent yellowish; pile on pale area yellowish, elsewhere black. Genitalia small, not normally visible from above.

Female. Front rather ferruginous or rusty-yellow, clothed with tawny pile. In one specimen the black of the second segment forms a broad, preapical cross-band.

Redescribed from 2 ♂♂, Perak, Jor Camp, 2000 ft., Aug., 19 and 29, 1922, collected by E. Seimund; ♀, Perak, Batang Padang, Jor Camp, 1800 ft., June 6, 1923; ♀, Pahang, Lubok Tamang, 3500 ft., June 10, 1923, both collected by H. M. Pendlebury.

The wholly black-haired posterior abdominal segments precludes the possibility of this being a variety of *trifasciata*. The median wing cloud is also much darker and more clearly defined.

Volucella pellucens Fabricius.

Petiole of the marginal cell ending beyond the apex of the cell; scutellum without flattened area; a row of bristles before the scutellum; abdomen black, the second segment almost all whitish-yellow. (The description is from European specimens as the example from our region is not in perfect condition.)

Length, 14 to 18 mm. *Male.* Face and front yellow or orange-yellow, the former pale yellowish pollinose on the depression, black pilose except on the sides below. Cheeks and narrow oral margin (to the oral angles) brown or black. In profile the face is deeply concave on the upper two-fifths, the concavity rather angular, the tubercle, which is large, prominent, rounded, rises obliquely on its upper edge, which is gently convex, below the tubercle the face is perpendicular, the tip of the tubercle on a plane with the apex of the antennal prominence; cheeks wide; oral margin concave in front, oral angles sharply rounded. Antennal prominence slightly oblique above, still rather horizontal, the triangle small, wider than long, produced as a sharp point between the eyes; wholly black pilose. Vertical triangle brownish across the ocellar region, yellow in front and behind, long and acute, the eyes touching only for a distance equal to its length; ocellar triangle with the sides almost equal; pile black. Occiput opaque black, broadly greyish along the orbits below, clothed with short black pile above and pale yellowish pile which becomes longer, below. Eyes brown pilose, the larger facets hardly differentiated. Antennae reddish; third joint twice as long as wide, slightly wider basally, its apex rounded, not excised above. Arista reddish, brown on the apical half, the plumes black, the upper ones one-third longer than the lower.

Mesonotum black with a strong metallic blue tinge, the humeri yellow, the margins behind the suture reddish; pleura black with an obscure reddish area in front and another beneath the wings; scutellum dull reddish, sometimes with a steel-blue tinge basally. Thoracic pile wholly black, the black bristles arranged as follows: some weakly differentiated ones below the root of the wing; four or five on the hind edge of the mesopleura, the dorsal of which are longer, four lateral presutural, three supra-alar, four on post-alar calli, six or eight before the scutellum and five on each side of the scutellum. Legs wholly deep-black, the knees very narrowly pale yellow.

Wings cinereous hyaline, yellowish along the veins before the middle; at the middle with a brown cloud which extends faintly along the sixth vein; beyond the middle

yellowish-brown or brown before the third vein, more evident around the apex of the marginal cell, and the apical cross-veins are faintly clouded with brownish. Squamae brownish-yellow, with fulvous border and fringe. Halteres brownish, the knob yellow or white.

Abdomen steely-black, the first segment often reddish-brown, the second pale yellow or almost white, except for a brown or blackish middle line which may be incomplete and narrow, or quite wide, and reaching both the base and apex. The broad hind margin of the second segment and the following segments are wholly black pilose, the base of the abdomen with shorter, fine, almost white pile. Second, and most of the third, ventral segments, almost white and clothed with pale pile, the venter elsewhere coloured as dorsally, and with black pile.

Female. Face wholly yellow pilose; front reddish yellow, with black pile; lateral grooves enclosing only a narrow strip, the front narrow, diverging below; eyes practically bare.

The scutellum and the sides of the thorax wholly, yellowish-red, the pile of the mesonotum chiefly yellow, but there are black hairs intermixed and these predominate towards the sides behind the suture. There are twelve bristles on the scutellum and eight to ten before it. There is rarely a pale brownish median vitta on the second abdominal segment.

In either sex there may be a few long black hairs on the base of the second segment laterally and the first segment may sometimes be blackish haired except at the sides.

There is a ♂ in the collection from Selangor, F.M.S., Kuala Lumpur, (from the Agricultural Dept. Collection), date and collector unknown.

Volucella xanthopygata sp. n.

Petiole of the costal cell joining the costa beyond the apex of the cell; scutellum convex, without depression; mesonotum with a row of fine bristles before the scutellum; wings yellowish; abdomen black, with two pairs of reddish yellow triangles, the second pair united on the middle line.

Length, 16 mm., wing 13 mm. *Male.* Face, cheeks and frontal triangle yellowish-red, the latter with a shining, supra-antennal brown arch. In profile the upper two-fifths of the face is slightly retreating, the large obtuse, rather rectangular tubercle rising abruptly at the lower edge of the concavity, the lower edge of the tubercle sloping, the lower part of the face slightly retreating, but still more prominent than the antennal tubercle. More than the lower half of the face is shining, the upper portion and side margins densely yellow pollinose, the pile short, sub-appressed, yellow, the tubercle with black hair. Frontal triangle

small, oblique, gently convex, with short, black pile and densely ochreous pollinose. Vertical triangle small, brownish, its anterior angle acute; somewhat prominent, clothed with moderately long black pile. Occiput black, yellow pollinose and pilose. Eyes touching for twice the length of the vertical triangle, short black pilose, the hairs becoming obsolete below, the upper third with enlarged facets. Antennae reddish, third joint two and one-half times as long as wide, not excised above. Arista with brownish plumes of almost equal length above and below.

Mesonotum opaque black, the middle line broadly brownish pollinose, the humeri and mesopleura with similar pollen, the ground colour perhaps also more brownish on these parts. Pile of the thorax fairly long, black, but with scattered yellow hairs intermixed, these predominating on the mesopleura. Scutellum dull black with the apical half translucent brownish, convex, just a slight preapical flattening, the pile black, but very short and yellow on the flattened area, the sides with three or four pairs of black bristles; there are two bristles on the hind margin of the mesopleura, several bristly hairs below the root of the wings, two presutural, four prealar and three or four postalar black bristles, and the pile on the sides of the mesonotum is longer.

Coxae, trochanters and femora, black or brown, the bases of the hind femora, their apical third, and the apical fourth of the front four, reddish, the legs elsewhere reddish-yellow. The pile on the femora is black, except on the pale apex of the posterior ones; on the hind tibiae and tarsi, yellow. Hind femora slender, their tibiae slightly curved.

Wings luteous, the subcostal cell and stigma brown, the posterior of the wing becoming somewhat paler.

First abdominal segment pale dirty yellowish in the middle, the lateral fourth black. Second segment wholly opaque black except the narrow, obscurely-reddish base. Third segment opaque black, with a large, reddish, triangular spot on either side at the base, the spot broadly separated from the posterior margin at its side, its posterior edge slightly convex, its inner end narrowly rounded: each spot reaches hardly one-third the distance across the segment, but there is some thin reddish pollen extending broadly across the base and it may be quite evident in some lights; the narrow posterior margin, except on the median third, and the narrow lateral margin, also reddish. Fourth segment with much larger basal triangles, which practically reach the whole length of the segment just at the sides and are only narrowly separated from each other, the dark colour more brownish, but the red colour appears diffuse owing to the overlying pollen on the anterior part of the segment. Genitalia brownish-red. The pile on the first abdominal segment is rather whitish; on the two following,

except on the reddish triangles, black, elsewhere rather tawny, wholly short and appressed. Venter black, with yellowish-white incisures.

♂, Java, Ongop Ongop, June 1916, collected by H. C. Robinson.

Genus *Graptomyza* Wiedemann.

Allied to *Volucella* but the marginal cell is broadly open and the spurious vein is absent. From all the genera of the *Syrphinae* and *Cheilosinae* it is readily distinguished by the presence of long hairs on the posterior surface of the hind coxae. The antennae are elongate, the arista normally plumose; the apical and discal cross-veins rectangular or somewhat recurrent, the anterior cross-vein situated before the basal third of the discal cell; legs fairly robust; abdomen oval, strongly convex; thorax and scutellum with bristles. Genotype: *G. ventralis* Wied.

The abundance of the arista plumosity has been used by various authors to separate the species but this character appears to be of little value. The hairs are easily broken off and quite frequently scarcely any remain in species with the arista normally well feathered. The genus is found in tropical and subtropical regions in all parts of the world except America.

Table of species.

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|----------------------------------------------------|-------|---------------------------|
| 1. Anterior four femora black | - | <i>seimundi</i> sp. n. |
| Anterior four femora wholly reddish or yellowish | - - - | 2. |
| 2. Posterior femora black or brown on apical third | - - - | <i>brevirostris</i> Wied. |
| Posterior femora wholly rusty yellowish | - - - | <i>ventralis</i> Wied. |

Graptomyza ventralis Wiedemann.

Auss. Zweifl., ii, 207, 1830.

Length, 9 mm. *Female*. Lateral third or slightly less of the face, widened and broadly united immediately below the antennae, hardly the lower third of the front and the cheeks except a large spot below the eyes, rusty yellowish, the face and cheeks separated by a black stripe, the median facial vitta and the parts of the head not mentioned above, deep black. In profile at least half the face lies below the lower edge of the eyes, the lower part sharply conical, a little produced anteriorly, a large, low tubercle on the lower third, the upper portion gently concave. A large, conspicuous sub-triangular depression on either side of the front above the yellow region, the front concave in profile with the upper fourth, however, almost horizontal. Pile of head sparse, longish, pale yellow, on the face limited to the median vitta below the tubercle, the side margins with short hairs. Front

as wide as one eye, a little widened below. Ocellar triangle small, its sides almost equal. Eyes sparsely short, pale pilose. Antennae ferruginous reddish, the third joint more brown and greyish pruinose, three and a half times as long as wide, somewhat tapering, gently convex below; arista slender, thickened just at the base, longer than the third antennal joint, with sparse, long, black plume.

Thorax deep shining black, the mesonotum with metallic watery bluish reflection; yellow markings as follows: about the lateral fifth of the dorsum (except a broad marginal vitta reaching from the posterior end of the humeri to the anterior edge of the posterior calli, its width twice that of the yellow vitta), a rectangular spot inside the humeri and contiguous with them, whole of the prothorax, posterior half of mesopleura and a large transverse spot below it. Pile of thorax yellow, not very abundant, moderately long, the mesonotum with a median, broad, black-haired vitta, and another wide one on the lateral portion of the black discal area as well as the black lateral vitta and the anterior upper portion of the mesopleura. Bristles of the thorax rather slender, black, yellow on the mesopleura and some of the prescutellars towards the middle; prescutellar row broadly interrupted in the middle. Scutellum pale yellow, with a brown depression occupying two-thirds of its disc and leaving the broad base and narrow margin pale; coarse black pile and black bristles limited to the margin, the sides with some yellow hairs basally.

Coxae, femora and posterior four tarsi reddish or rusty yellow, the tibiae and anterior tarsi more ferruginous. Pile of coxae and femora yellow, elsewhere, brownish.

Wings pale brownish-yellow, the spurious vein represented by an angulation of the membrane.

Abdomen shining black, with rusty yellowish areas as follows: first segment except a large sub-lateral spot; narrow base of second and a very broad sublateral vitta which extends almost to the apex of the fourth segment and expanded on the bases of the third and fourth segments as fasciae which are strongly arched and extend on to the preceding segment so that in the middle the bases of the third and fourth segments are wholly black; the orange fascia is rather strongly produced forward in the middle of the third segment, slightly so on the second, while the fourth bears a wide median vitta broadly separated from the base and apex. Posterior corners of the fourth segment produced as a strong triangle, the apex strongly convex and completely concealing the wholly black fifth segment. Abdominal pile yellow on the base, broad lateral margins and all the yellow markings except the median vitta on the fourth segment, otherwise blackish.

A single ♀, Perak, Batang Padang, Jor Camp, 1800 ft., May 31, 1923, collected by H. M. Pendlebury.

This appears to be *ventralis* Wied. and agrees quite well with the description although it is impossible to be certain without material from the type locality. Brunetti has described what he calls a variety of *ventralis* under the name *nigripes* but I think it must be a distinct species, because the abdominal fasciae, as shown in his figure (Fauna Brit. India, iii, pl. III, f. 17), are on the bases of the segments and do not extend on to the preceding segments, the femora are largely black, etc. Brunetti states that the hind tibiae are pale haired in *ventralis* but Wiedemann does not mention this in his description and it is not the case in the specimen described above. The fourth abdominal segment of Wiedemann's species is armed as described above, but Brunetti does not mention this in his description of the variety, but it is evidently so, although, here again, the figure does not show it.

Graptomyza brevirostris Wiedemann.

Auss. Zweifl., ii, 209, 1830.

Length, 7 mm. *Female*. Head pale yellow; a moderately wide median facial vitta, a vitta on the anterior edge of the cheeks, a large rectangle above the antennae, produced in the middle as a broad vitta reaching the vertex, and the occiput, black. Face short, less than one-third lying below the eyes, gently evenly produced to the apex of the tubercle, thence shortly retreating to the oral margin. Face and front slightly widened from the vertex to the lower border of the eyes, the front with the lateral areas very large, semicircular, not depressed, but moderately well marked off on their edge; front gently concave. Pile of head yellow, on the face limited to the lower two-fifths and the short haired side margins; occipital cilia and hairs on the dark facial vitta, black, the facial vitta reaching the base of the antennae. Front as wide as one eye. Eyes with short, pale pile. Ocellar triangle a little longer than wide, small, the ocelli small and yellow. Antennae ferruginous; third joint broadly brown above, its sides almost parallel, hardly four times as long as wide, its apex subtruncate, a little oblique and slightly curved upwards. Arista slender, yellowish, becoming black at apex; normally with sparse, rather short plume.

Thorax deep black, the mesonotum with strong watery bluish reflection the pale yellow markings distributed as follows: entire broad margin of the dorsum except the median third in front and an elongate spot between the suture and posterior calli on the immediate margin and much wider than the yellow stripe opposite, the black of the disc also projects somewhat backwards at the corners; a large yellow spot above the anterior coxae and a large triangle covering most of the mesopleura. Pile yellowish,

but wholly black on the black portions of the disc; bristles also all black, the prescutellars long but very weak. Scutellum entirely blackish, with a deep concavity occupying almost the whole disc, coarsely punctured and chiefly brown. Pile and bristles all black, limited to the margin.

Coxae blackish; femora (except about the apical two-fifths of the posterior pair) and the anterior four tibiae, pale yellow, the tarsi reddish-yellow, the posterior ones more orange; posterior tibiae wholly, and apex of their femora, blackish; pile of legs pale except on the black portions where it is black.

Wings slightly tinged with greyish; stigma broadly brown at base, brownish-yellow beyond; three more or less evident brownish-yellow fasciae as follows: one in the marginal cell behind the base of the stigma, one extending from the tip of the stigma through the marginal, submarginal and apical cells and one originating just before the tip of the second vein and hardly reaching the third vein. Squamae whitish, with pale yellow border and fringe. Halteres yellow.

First abdominal segment reddish-yellow; second similar basally, on the apical half with a black fascia which is produced forward in the middle and also at the lateral third as broad rounded triangles, its outer end cut off obliquely so that it is fairly widely separated from the lateral margin; narrow apex of second segment rusty-yellow on median half. Third segment with the broad sides and almost the apical half black, the black broadly produced forward to the base in the middle and less broadly so at the submedian third, outside of which is an orange vitta which is decidedly wider than the black lateral stripe. The black lateral vitta of the third segment continues along the fourth and is united with the black posterior margin of that segment; fourth segment rusty-orange with three broad, posteriorly tapering black vittae all narrowly separated from the anterior margin and posterior black fascia. On the third segment there is a large, median apical reddish triangle which reaches forward almost to the middle of the segment. Fourth segment simple. Pile yellow except on the discal black areas, where it is black.

A single ♀, Selangor, Kuala Lumpur, March 24, 1923, collected by H. M. Pendlebury.

Graptomyza seimundi sp. n.

Length, about 10 mm. *Female*. Face strongly produced downwards as an acute cone, about half lying below the eyes, the lower portion very little produced and quite perpendicular below the short, broad, low tubercle; ground colour yellow except a broad median blackish stripe which is broadly separated from the antennal base; a rather narrow stripe separating the cheeks and the oral tips, brownish;

checks yellow, jowls blackish. Pile of face, checks frontal depressions and occiput, yellow. Front with the yellow colour encroaching a little from the face, forming a narrow triangle below the lower sixth of the front and level of the antennae. Front shining black, with watery blue reflection, the middle line broadly raised, the depressions large and very well marked, concave; upper part of front black pilose; front hardly four-fifths as wide as one eye, but widened behind the ocelli which are large and form a small equilateral triangle. Eyes with sparse, fairly long yellow pile. Occiput black. Antennae ferruginous, rather dull; third joint somewhat tapering, three times as long as wide; arista yellow with broad black apex, the black plume fairly dense and rather long.

Mesonotum metallic blackish-blue with watery opalescence, the pile chiefly yellow, with coarser black hairs intermixed on the disc where they may predominate in part, the entire margin very broadly reddish except the broad middle line in front; a projection from the posterior corners of the black reaches half way to the scutellum. Humeri, propleura and a spot above the anterior coxae, pale yellow; upper half of pleura rusty reddish except a spot reaching almost to the humeri on the anterior half of the mesopleura, the lower portion of the pleura black. Bristles of the thorax all black; fairly strong, the prescutellar row hair-like and not strongly differentiated from the long black hair on the posterior part of the mesonotum. Scutellum rusty reddish, with moderately large, more brownish depression which is densely long pubescent; four strong marginal bristles and several long black marginal hairs.

Legs black, only the knees dark reddish; pile wholly black.

Wings tinged with yellow except posteriorly, strongly so basally, where the veins are also yellow; wings decidedly broader than usual. Spurious vein obsolete.

Abdomen deep black; first segment wholly rusty reddish. Second segment with a very large sublateral subtriangular ferruginous spot which broadly reaches both the anterior and posterior margins and is rounded inwardly; this is continued along the third segment as a narrow tapering vitta which becomes obsolete before reaching the apex; the incisure between the second and third segments is broadly ferruginous. First and second segments separated by a series of very large coarse punctures along the incisure. Apical corners of fourth segment strongly produced as angular spur, the middle also produced obliquely triangularly upward. Pile black, but on the base, very broad lateral margins and the fourth segment except the broad apex, yellow. Fifth segment apparently wholly wanting as such.

Described from a single ♀, Perak, Jor Camp, 2000 ft., Aug. 25, 1923, collected by E. Seimund, after whom the species is named.

Subfamily MILESINAE.

Genus *Milesia* Latr.

Anterior cross-vein beyond the middle of the discal cell; third vein slightly dipped into apical cell; marginal cell closed and petiolate; hind femora with a small tooth below near the apex. Genotype: *M. splendidus* Rossi.

The above characters sufficiently define the genus. The *Xylotinae* have the marginal cell open, while in the *Eristalinae* the third vein is strongly looped into the apical cell. The genus is an aberrant one and apparently shows no distinct relationship to other members of the family. The subfamily *Milesinae* has usually been used in the sense that it includes the *Xylotinae*, but the latter group is best considered separately.

Table of Species.

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|---------------------------------------------------------------------------------------------------------------------------|---------|---------------------------|
| 1. Face black in ground colour; mesonotum dull ochreous pollinose | - - - - | <i>balteata</i> Kert. |
| Face yellow or orange in ground colour | - - - - | 2. |
| 2. A yellow pollinose fascia immediately before the scutellum | - | 3. |
| No prescutellar fascia | - - | 4. |
| 3. Second and third abdominal segments each with two pale fasciae, the first one dull yellow, the second metallic reddish | - | <i>pendleburyi</i> sp. n. |
| All the yellow fasciae interrupted in the middle; only one on second and third segments | - | <i>conspicua</i> sp. n. |
| 4. Pile of at least one pair of tibiae many times longer than the tibial thickness | - - - - | 6. |
| Pile of tibiae nowhere longer (usually shorter) than the width of the tibiae, always appressed on the sides | - - | 5. |
| 5. Humeri and posterior calli whitish | - - - - | <i>tenuiformis</i> sp. n. |
| Humeri black, posterior calli at most brownish-red | - - | <i>callida</i> sp. n. |
| 6. The long, dense tibial fringes are yellow or brownish-yellow | - | <i>gigas</i> Macq. |

The tibial fringes are brown,
much longer and denser - *excelda* sp. n.

Milesia tenuiformis sp. n. (Pl. III, Fig. 2).

Face with median black stripe on lower half; abdomen unusually slender, bearing three pairs of narrowly separated, subtriangular spots on bases of second to fourth segments; wings brown in front; mesonotum with six pale yellow spots, the black scutellum with yellow border.

Length, 16 to 17.5 mm., of wings, 12 mm. *Male*. Face, cheeks, frontal triangle, vertical triangle in front of the ocelli and the occiput behind the mouth, pale yellow; face with a median, dorsally tapering, black stripe, the front with a long black triangle above the antennae, a stripe on the cheeks and the head, other than as mentioned, black or brownish black. Face with whitish pollen and with short whitish pile on more than the upper half, in profile, strongly retreating above, the lower third slightly produced but not prominent. Front shining, with very little short, fine pile. Vertical triangle with sparse blackish pile; eyes touching for more than the distance between the anterior and posterior ocelli. Occiput with yellowish pollen which becomes greyish or whitish below. Antennae shining brownish, the first joint darker at base and apex; third joint pale pollinose, one and one-half times as long as wide, somewhat tapering, more cut off above. Arista reddish yellow.

Mesonotum blue-black, with three slightly bronzed vittae; humeri, a subtriangular, longitudinal spot behind the outer ends of the suture, and the posterior calli, pale yellow; a pair of widely separated, moderately wide, dirty brownish-yellow pollinose vittae on the anterior two-thirds, the steel-blue dividing vitta interrupted in the middle by a slender bronze one, and a broader bronze vitta lies just outside the pollinose vitta. Pile of mesonotum brownish, extremely short, yellow on the pale spots. Pleura and pectus chiefly pale yellowish; a broad blackish band on the front of the meso- and sternopleura, not extending entirely across the pectus but united with the black mesonotum, a shorter, broad, band beneath the base of the wings and an oblique band on the lower margin behind extending between the last two pairs of legs and a triangle between the hind coxae, black. The pectus is dirty yellowish. Pile on pleura and pectus whitish, a little longer than on the mesonotum. Scutellum metallic blue, the margin, except at the base, broadly pale yellowish, the thinned margin very evident; pile pale, not conspicuous. Immediately above the wings there is a row of short, brownish hairs.

Coxae yellow, the hind ones brown in front and behind. Anterior femora yellow with a black dash on the basal half below and another on more than the apical half above; conspicuously flattened and normally broadened, their tibiae whitish-yellow, the tarsi black with the apex of the

last joint and base of the claws whitish-yellow. Middle femora reddish-yellow with an almost complete black stripe below which unites subapically with a black streak on the apical two-thirds above, their tibiae and tarsi coloured like the front ones. Hind femora mostly black; a broad stripe on the basal half below, the base above, the broad postero-ventral portion and the apical fourth below, dull reddish or dirty yellowish, the femora only slightly swollen, the spine rather sharp, yellow. Hind tibiae yellow on the apical third or less, elsewhere blackish with an obscure reddish cast, their tarsi black. The pile of the legs is all pale except on the tarsi and black portion of the hind tibiae; it is only a little longer on the posterior side of the middle tibiae and there are a few long hairs behind the posterior ones.

Wings blackish in front of the third vein, this colour spreading into the first posterior cell, the wing elsewhere faintly tinged with brown, the first basal cell wholly clear hyaline.

Abdomen dull black, metallic blue and yellow. The first segment is black with metallic blue anterior corners, the sides, extending inwardly in front, yellow. Second segment with the narrow, incomplete base and a triangle occupying the basal two-fifths, narrowly separating large yellow spots whose hind margins are oblique, dull black; immediately behind the pale triangles is a broad, slightly arched, metallic blue band, behind which the segment is dull black, the opaque area being about as wide in the middle as the preceding blue one; the yellow triangles are produced narrowly along the sides almost to the apex of the segment. The third segment is very similarly marked but the orange yellow spots are much smaller, their posterior margin slightly concave and they occupy only half the length of the segment at the sides, the posterior margin of the yellow fascia somewhat arched. Fourth segment with similar but narrower spots than on the third, occupying only one-fourth the length of the segment at the sides, their hind margin less arched and the opaque black hardly extends behind the posterior margin of the pale fascia, the segment behind being metallic blue except the narrow, obscure lateral and posterior margins.

Female. Front rather narrow, widening somewhat below, yellow in front of the ocelli, with a median, narrow shining blackish stripe which tapers out above so that it does not reach the ocelli. Antennae more reddish.

Legs more slender and perhaps slightly more extensively pale.

Abdominal pale bands similar, but there is an additional broad, subapical interrupted reddish-yellow fascia on the fourth segment, narrowly separated from the posterior and lateral margins and interrupted by about the width of the

basal fascia on the same segment, the inner ends of the spots rounded and more cut off in front. The blue fasciae on the abdomen are less arched, that on the third segment much wider, especially in the middle; fifth segment entirely metallic blue.

Described from ♂, Selangor, F.M.S., Kuala Lumpur, Sept. 10, 1922; ♀, Pahang, Kuala Tahan, 300 ft., Nov. 25, 1921, both collected by H. M. Pendlebury.

In general appearance this species resembles some *Spilomyiae*. The abdomen is unusually slender and in the ♂ is constricted at the apex of the second segment, but only slightly narrowed in the ♀. The metallic blue bands are very distinct even without magnification and have a "watery" lustre.

Milesia conspicua sp. n.

Face reddish-yellow; cheeks black before the jowls; mesonotum with two longitudinal, posteriorly abbreviated vittae which are not joined to the yellow sutural spots; abdomen with three pairs of reddish-yellow interrupted fasciae and the apical half of the fourth segment dull brownish ochre.

Length, about 20 mm., of wings 17 mm. *Male*. Face orange-yellow, gently concave, the lower part only slightly prominent, but the face is wholly rather prominent, the median stripe shining, elsewhere with brassy-yellow pollen, the fine, sparse pile whitish, shorter on the side margins. Cheeks shining black, the jowls again orange-yellow. Front reddish, except for the upper side of the antennal prominence, densely yellow pollinose and clothed with long, fine yellow pile. Vertical triangle long, black, golden-yellow pollinose in front of the ocelli, its pile reddish in front, broadly black across the middle, yellow at the vertex. The eyes touch for a distance greater than that between the anterior and posterior ocelli. Occiput black, behind the mouth, reddish-yellow; along the orbits densely reddish-yellow and yellow pollinose, the pile yellow. Antennae ferruginous, the third joint with a whitish sheen, elliptical; arista slender, concolorous.

Mesonotum subopaque black, the anterior margin (broadly interrupted in the middle), the inner end emitting a moderately broad vitta to the apical fourth, a moderately broad subapical fascia and a subtriangular spot just behind the outer end of the suture, golden-yellow; pile mostly yellow but on the black areas behind the sutures chiefly black or brown. Pleura slightly shining black: an area just above the anterior coxae, an oval spot on the mesopleura, a subrectangular one below it, reddish-yellow with a dense covering of yellow pollen; pile all reddish-yellow. Scutellum black, its apex reddish-yellow, its disc with short black hairs, its thinned margin narrow.

Legs reddish; middle femora with a basal streak below, the hind ones except towards the apex and on the apical half below, the basal two-thirds of the hind tibiae on the outside, the whole of the anterior tarsi and the last two or three joints of the posterior four, blackish or brown. Anterior femora only moderately flattened, the middle ones slightly so, the posterior ones not much swollen, scarcely curved. Anterior tibiae slightly curved, the hind ones only a little more so. Pile of the legs yellow except on the dorsal surface of the basal two-thirds of the hind tibiae; the pile forms a long fringe on the posterior surface of the posterior four tibiae and there are several long hairs behind the middle basitarsi. Spur on hind femora moderately robust, rather obtuse, densely pilose, the pile beneath the femora long.

Wings pale brownish, darker in front of the third vein. Squamae whitish, with pale yellow border and fringe. Halteres slender, yellow.

Abdomen opaque black, the first segment shining. Second segment on the basal half with a broad, broadly interrupted, clear yellow fascia, its outer ends curved a little forward, narrowly separated from the base of the segment except at the sides, interrupted by about half the width of the fascia, the inner ends of the spots truncate, with rounded corners; fascia hardly half as wide as the length of the segment; on the lateral sixth immediately before the apex is a small reddish-yellow triangle. Third segment with a subbasal, narrowly interrupted orange fascia, occupying about one-seventh the length of the segment, the inner ends rounded, slightly widened at the sides but not reaching the anterior margin; on the subapical sixth is a pair of reddish triangles, their inner ends connected (or obscurely so) by a narrow, shining black fascia. Fourth segment with similar subbasal fascia but it is slightly oblique and wider laterally; apical half of the segment, except the narrow margin, brownish-yellow. Abdominal pile black, on the first segment whitish, on the first yellow spots and the whole side margins yellow; long and black on the apex of the fourth segment; mostly long, sparse, yellow on the venter.

♂, Pahang, F.M.S., Gunong Tahan, Tangga Duablas, 5700 ft., Dec. 13, 1922, 3♂, Pahang, "Cameron's Highlands," Rhododendron Hill, 5200 ft., June 19 and 21, 1923, all collected by H. M. Pendlebury.

Milesia pendleburyi sp. n. (Pl. III, Fig. 1).

Mesonotum with three moderately narrow yellow pollinose fasciae, the anterior two broadly interrupted in the middle; abdomen with three orange-yellow and three metallic reddish bands.

Length, 23 mm. *Male*. Face, frontal triangle and posterior half of cheeks, pale waxy-yellow, covered with

shining whitish-yellow pollen, the anterior half of the cheeks, vertical triangle and occiput, black in ground colour, the black of the cheeks with similar pollen to face, that of the occiput greyish-yellow, the occiput pale yellow pilose, becoming darker yellow above; vertical triangle densely greyish-yellow pollinose in front of the ocelli which form an equilateral triangle, the anterior point of which rests on the middle of the vertical triangle which tapers to a fairly sharp point, the eyes contiguous for a distance slightly greater than the length of the ocellar triangle. Vertical triangle subnitid behind, mostly black pilose, a few pale hairs in front. Frontal triangle above, and sides of face on upper half, with sparse, pale yellow hairs. Face rather shallowly concave, the oral margin almost as prominent as the frontal prominence. Antennae ferruginous, paler apically, the hairs on the first two joints yellow; third joint clongate oval, the sides subparallel on the basal two-thirds; second joint normal; arista long, slender, bare, yellow on more than the basal half, the remainder brown.

Thorax rather dull black with three yellow pollinose bands encircling it transversely except on the pectus, the first on the anterior margin, the second on the suture running over the mesopleura, the third on the posterior margin, interrupted by the squamae but continued below them, the squamae appearing to form part of the band, the first two fasciae rather broadly, truncately interrupted on the middle of the mesonotum. The humeri mostly, the prothorax below them and a broad vitta on the meso- and sterno-pleura, yellow in ground colour, the posterior calli more reddish. Pile of mesonotum brown, fairly long, not abundant; on the pale areas, yellowish and finer and similar on the pleura except beneath the wing. Scutellum shining black, with rather narrow, compressed yellow border, the sparse pile black; ventral fringe yellow.

Legs: femora and tarsi rusty reddish, the latter becoming brown apically; tibiae whitish-yellow, the hind ones a little darker; anterior femora with the ventral depression broad and beset with small black spinules some of which arise from tiny tubercles; pile on anterior femora yellowish, but fuscous on the basal two-thirds of the anterior surface, on the middle femora brown with yellow hair on the posterior surface except apically; on the hind femora yellow on the anterior and antero-dorsal surfaces, elsewhere black. Pile on anterior four tibiae pale yellow, forming a dense fringe behind the middle ones and with a few long hairs in front; posterior tibiae pale pilose on the anterior surface and apical ventral fourth, behind and on both lower edges with abundant long black hairs. Tarsi wholly yellow haired. Fore femora moderately broadened, of the usual shape; posterior femora moderately enlarged, slightly arcuate, the black-haired yellow spine rather strong;

posterior tibiae gently arcuate, ending in an obtuse angle below.

Wings greyish hyaline, the posterior border more greyish, the base and anterior margin in front of the spurious vein rather amber-coloured; beyond the apex of the first basal cell, brownish, except that the marginal cell is greyish. Squamae white, with yellow border and brownish fringe. Halteres yellow.

Abdomen, in general, opaque black, the entire margin narrowly rusty reddish; first segment metallic bluish, the narrow anterior margin and small lateral spot reddish yellow; second, third and fourth segments with opaque yellow to orange fasciae subbasally, the two former with post-medial fasciae, the fourth with the apical half, metallic rusty reddish, as shown in the figure. Pile on the first segment, the yellow fasciae and bases of the segments, fine, erect, yellow, on the remainder of the second and third segments short, erect, black, on the posterior portion of the fourth, longer, coarser, chiefly black, with yellow hairs intermixed, and almost wholly appressed; on the sides of the third and fourth segments the dense yellow pile forms a long, downward-curving fringe, the hairs of which are as long as half the width of the abdomen and there are some black hairs intermixed on the apical portion of the third segment. The genitalia bears erect, long, crinkly black hairs with yellow ones intermixed.

Described from a single ♂, Perak, Batang Padang, Jor Camp, 1500 ft., May 19, 1923, collected by H. M. Pendlebury.

This species differs from the remainder in the collection by having a small patch of yellow pile beneath the posterior spiracle.

Milesia callida sp. n. (Pl. III, fig. 5.)

Abdomen with three narrow, bright yellow or orange fasciae, the first very narrowly interrupted; wings dark grey, blackish apically, with a broad yellowish stripe extending from the base to the apical fifth immediately behind the costal cell.

Length, 26 mm. *Male*. Face rusty reddish in ground colour, yellow pollinose except on the middle line; cheeks, and frontal triangle from the level of the lower edge of the antennae, black, the latter yellow pollinose except a broad stripe above which does not quite reach the upper angle; cheeks greyish pollinose except on the broad oral margin. In profile the face is deeply concave, the oral margin fairly strongly produced, the concavity lowest at the lower third of the face; lower slopes of antennal prominence with long, sparse, yellow pile; frontal triangle bare. Eyes touching for a distance equal to one and a half times the length of the ocellar triangle which is a little longer than wide and situated at the middle of the very long, moderately acute

vertical triangle, the sides of which are parallel behind the ocelli, its black ground covered by dense golden pollen except on the broad middle line behind the ocelli. (The head is somewhat "gummed" behind and I am not able to decide definitely the extent of pollen on the vertical triangle behind the ocelli; it may be wholly pollinose). Pile of vertical triangle brassy-yellow. Occiput yellow pollinose and brassy-yellow pilose, the immediate orbits more greyish. Antennae ferruginous, the third joint broadly yellow on the base below, twice as long as wide, obliquely-rounded apically, the sides subparallel; second joint longer than wide, black haired; arista elongate, slender, reddish.

Thorax dull black. The mesonotum is gummed on the anterior part: behind it has a pair of dull yellowish pollinose vittae rising inside the calli and probably reaching the anterior margin, where they are slightly convergent; sides ferruginous behind the base of the wings; posterior slope brownish grey pollinose. Pile short, erect, black; the sides, in front of the scutellum and the broad middle line, reddish-yellow pilose, the dorsum before the suture also probably mostly pale pilose; pleura wholly fine pale pilose, and mostly covered with more or less dense yellowish-grey pollen.

Legs: femora ferruginous reddish, the bases darker in front and behind; tibiae rusty reddish, including the first two joints of the hind tarsi except their apices, the tarsi otherwise black. Pile on femora, under side of posterior tarsi and upper surface of the tarsi, black, elsewhere golden yellow, the anterior tibiae pale brassy-yellow haired behind when viewed from base. Legs rather slender, the femora not greatly thickened; spur of posterior femur fairly large and black pilose.

Wings blackish-grey, darker apically, with a yellow stripe lying between the first and fourth longitudinal veins and reaching to the apex of the first basal cell except that behind the spurious vein there is a clear hyaline streak, while the yellow again fills out the whole of the second basal cell. Lower lobe of squamae orange, with reddish-brown fringe, the upper lobe brown, with short black fringe. Halteres orange.

Abdomen shining bluish-black, the following opaque black markings not reaching the sides: basal half of the second, slightly more than half of the third and basal fourth (less in the middle) of the fourth segment, each segment with a subbasal orange fascia, that on the second segment more yellow, equal in width to about one-third the opaque black part, very narrowly interrupted in the middle, scarcely arched anteriorly, each spot very slightly concave in front towards the outer end; fascia on third segment entire, of about the same width as the preceding but a little widened

at the sides so that it appears very gently arched; the fascia on the fourth segment is a little more broadened laterally and subinterrupted. Abdominal pile short, black; on second segment before the yellow fascia, on all the yellow fasciae, the entire side margins and the fourth segment behind the opaque area, fulvous, or rather golden-yellow in some views. The opaque black of the fourth segment is not more than half as wide as the pale fascia and altogether, not wider, (the basal pale fascia included) than the orange fascia; all the pale fasciae opaque.

Described from a single ♂, Singapore Island, Bukit Payang, 'beluka,' 500 ft., Feb. 26, 1923, collected by H. C. Abraham.

Milesia balteata Kertesz.

Milesia balteata Kertesz, Termes. Fuzet., xxiv, 414, 1901.

Abdomen with a broad pale yellow fascia on the second segment and a narrow one on the third; mesonotum clay-yellow pollinose; face black; middle tibiae not with brush of hairs.

Length, 25 mm., wing, 20 mm. *Female*. Head black in ground colour except a narrow triangle extending from the orbit towards the apex of the antennal prominence and an area behind the oral opening. Face rather deeply, evenly concave, the oral margin as prominent as the base of the antennae, but little produced below the lower eye margin. The whole face is thinly greyish-white pollinose, the broad oral margin bare; pile long and sparse above, below on the side margins, short, white. Front with moderately long, not abundant, black pile, the orbits rather broadly yellowish pollinose, becoming narrowly so above. Front not wide, slightly narrowing to the vertex. Occiput wholly greyish white pollinose, clothed with fine white pile, the jowls similar, the upper half of the former with black, coarser hairs. Antennae blackish, with greyish pollen and black appressed hairs, the third joint trapezoidal; arista slender, bright yellow.

Mesonotum and scutellum dark in ground colour but wholly clay-yellow pollinose, with the ground colour showing through faintly as obscure vittae in some views. Pleura covered with greyish-white pollen except an anterior and posterior shining brownish-black fascia. The pile is short, yellowish, moderately abundant, slightly longer on scutellum and pleura; a few black hairs on the sternopleura posteriorly. Beneath the wings is a rather broad, elongate rectangular yellow band, its posterior margin vague.

Legs black, the narrow apices of the femora, the middle ones with a streak behind on the apical half, broad base of the front, whole of the middle and narrow base of the hind tibiae, and base of first joint of middle tarsi, yellow,

the anterior femora with an obscure reddish streak behind. Anterior femora not much flattened, slightly tapering, clothed with black pile which is longer behind. Middle femora black pilose, posteriorly, towards the apex and on the upper anterior surface, with yellow pile, the hairs behind long. Hind femora wholly short black pilose except a few long hairs below, scarcely arcuate, moderately swollen, the spur black and clothed with black hairs. Anterior tibiae and tarsi all black pilose except for the bright yellow pubescence beneath; middle tibiae with short, almost whitish pile but a few scattered black hairs, their tarsi all black haired. Posterior tibiae with conspicuously long, dense black hair, that on the innerside appressed, the base and apex only with shorter hair, their tarsi black pilose.

Wings slightly infuscated, brownish-yellow in front, becoming brownish apically so as to form a brownish cloud before the apex of the apical cell. Squamae yellowish white, with yellowish fringe; halteres yellow.

Abdomen deep blackish-blue, the first segment greenish black, basal half of the second segment (except the very narrow base), pale yellow; third segment with a narrow, entire, fascia separated from the base by hardly its own width. Abdominal pile all rather short, fairly coarse, except that it is fine and yellowish in front of the hind margin of the first yellow fascia; longer laterally.

Redescribed from a single ♀, Peninsular Siam, Nakon Sri Tamarat, Khao Luang, 2000 ft., March 25, 1922, collected by H. M. Pendlebury.

Readily recognized by the rather sharply concave black face, wholly pollinose thorax and the abdominal fasciae.

Milesia excelda sp. n. (Pl. III, fig. 3.)

Extremely large; head wholly reddish-yellow, the eyes brown; brownish, the base of the second abdominal segment with a narrow, entire, whitish fascia, the third with a very narrow yellow one; middle and hind tibiae with dense lateral brushes of long brown hairs.

Length, 35 to 45 mm., wing about 27 mm. *Male*. Head reddish-yellow; antennal prominence triangular, the face retreating on the upper half, perpendicular below, moderately produced below the eyes; cheeks a little darker than the face; face, frontal and anterior half of the vertical triangles, yellow pollinose, the former with short yellow pile on the side margins which becomes longer on the sides above, the front with short, sparse yellow pile along the orbits, the hairs becoming longer above. Vertical triangle long, acute, the eyes touching for a distance equal to that between the ocelli; vertical triangle and occiput yellow pilose, the latter and the vertex yellow pollinose; inner portions of the occiput brownish. Antennae reddish-

yellow, the third joint elongate oval, narrowing slightly apically. Arista twice as long as antenna, slender, but little tapering.

Mesonotum rather slaty-coloured; a broad, geminate vitta on the middle, brownish; humeri, transverse suture, lateral margin above the wings, base of posterior calli, a large, transverse rectangular spot in front of the scutellum and the thinned apex of the latter, brownish-red. Pile of the mesonotum fine, short, yellow, not abundant; above the wings and on the posterior calli, brownish. Scutellum with fairly long, crinkly, not coarse, brown hairs between which are some shorter, pale ones; pleura with chiefly blackish or rich brown pile, the convex portion of the mesopleura with more reddish hairs, the metapleura with short, fine, brownish-red pubescence. A broad fascia before the root of the wings greyish pollinose.

Anterior femora slaty; in front, behind and apically, reddish, clothed with brownish-black pile, that behind long and dense, beneath with numerous black, short setulae; in shape, greatly broadened, somewhat concave below, widest basally, gradually tapering, the base rounded off. Anterior tibiae and tarsi black, the former reddish basally and in front on the apical half; postero-dorsal surface silvery or brassy in some lights and pale pilose, the posterior surface with long yellow and brown hairs, the front surface, narrowly, but broadening to the apex, with short tawny pile, all the other pile brownish-black; the front tibiae are remarkably arcuate and also curve somewhat forward apically; the tarsi are, perhaps, more brownish-red than black, but the upper surface is largely pure black and the hair is practically all reddish. Middle femora slaty, only reddish apically, the pile all longer than on the front ones, brownish, their tibiae coloured as the front ones but on the anterior surface there is a dense, long brush of reddish-brown hairs, and a slightly longer brush behind and there may be some reddish hairs intermixed but the tips of the hairs are darker; they are not so strongly arcuate as the front ones; middle tarsi deep reddish except the apical joint. Hind femora strongly arcuate, greatly enlarged, not flattened as are the anterior four, only the narrow apex reddish; pile not very long except below, where it is dense and forms a broad longitudinal tuft, the spur very long and also curved, with blackish pile, its apex reddish. Hind tibiae reddish yellow at base and apex, its anterior and posterior surfaces with long brushes as on the middle ones, but the hairs are longer, reddish-brown and less dense on the anterior surface; rather strongly arcuate, the curve near the middle. Hind tarsi reddish, the last two joints somewhat brownish above.

Wings with a brownish streak in the middle extending from the base to the apex of the spurious vein, more luteous in front, pale luteous behind and apically. Squamae

whitish, with brown border and reddish-brown fringe. Halteres whitish-yellow, slender, the knob small.

Abdomen somewhat slaty, but everywhere with a more or less distinct brownish or reddish tinge and on the last two segments this colour predominates and there is a pair of obscure, large, subrectangular, narrowly separated orange spots occupying the apical half of the fourth segment but nowhere reaching the margins; in some lights these are very distinct and quite orange-coloured, in others obscure. The second segment bears a subbasal, slightly arcuate, whitish, translucent fascia which is slightly widened laterally. The thread-like subbasal fascia on the third segment is yellow and hardly reaches the side margins, although the more reddish sides may connect it with them, and it is almost straight, although slightly more widely separated from the base of the segments and a little broadened laterally.

Described from: ♂, Peninsular Siam, Nakon Sri Tamarat, Khao Rani, 1200 to 3000 ft., March 13, 1922; ♂, Selangor, Kuala Lumpur, Gombak Valley, Oct. 18, 1921, collected by H. M. Pendlebury.

Distinguished from *M. gigas* Macq. which it closely resembles by the much longer brush of hairs on both sides of the middle tibiae, etc.

Milesia gigas Macquart.

Milesia gigas Macquart, Hist. Nat. Dipt., i, 533, 1834.

There is a single ♂ labelled Pahang, "Cameron's Highlands," near No. 4 Camp, 5000 ft., June 16, 1923 (H. M. Pendlebury), which I refer here. *M. gigas* is a variable species in regard to colour. The chief differences between the specimen before me and *excelsa* are as follows:

Length, 25 mm. *Male*. Cheeks ferruginous on anterior half, with some indication of a brown stripe. Vertical triangle broadly black pilose above. Thorax dull ferruginous, with indefinite darker, posteriorly broadened median stripe, the scutellum concolorous. Pile of thorax a little longer, more irregular in length, the hairs above the wings and on the posterior calli finer, not spinulose.

Legs ferruginous, the femora black beneath, the pile dirty yellowish the spinules beneath the front femora black and there are a few black hairs apically on the anterior four femora; fringes of the middle tibiae much less dense, not strong on the anterior surface; on the posterior tibiae also a great deal weaker, the pile rather ferruginous, with yellowish reflection; the spur on the posterior femora is much shorter, being much less than the width of the femur.

Wings with the basal three-fourths brownish-amber on the anterior half, the apical fourth brown, elsewhere grey (this is exactly the reverse in *excelsa* where the base is darker than the apex). Squamae greyish, with brownish tinge and brownish-yellow fringe; halteres ferruginous.

Abdomen ferruginous with the pale bands somewhat wider, the first two segments brownish ferruginous, the apical segments with reddish tinge, so that the fascia on the third segment is not very distinct. The abdominal pile is much more extensively pale, the lateral fringe brownish-yellow.

Subfamily EUMERINAE.

This subfamily cannot well be confused with any other and the single genus is strikingly distinct. *Eumerus* has usually been placed near *Syrilla* in the *Xylotinae* but the recurrent apical cross-vein, together with other characters are so distinctive that it should undoubtedly be considered as a subfamily. The recurrent cross-vein also occurs in *Chrysogaster*, of the *Cheilosinae*, and would seem to indicate some relationship between the two genera and this might well be the case: I do not believe the position of the cross-vein is fully reliable in determining relationships of genera. All of the *Volucellinae* possess the recurrent apical cross-vein and one species of *Microdon* has a very close approximation to it, but the hind coxae in these two subfamilies are pilose. The larval structure is more typical of the phytophagous *Syrphinae* type, also found in the *Cheilosinae* and this would further indicate the wide separation from the *Xylotinae*.

Genus *Eumerus* Meigen.

Anterior cross-vein beyond the middle of the discal cell; apical cross-vein strongly recurrent, usually subangulate; marginal cell open; face gently concave, straight, never tuberculate below although the oral margin may be somewhat produced forward and it may be more or less convex below the antennae; legs variable, the hind femora always stronger than the others, often very greatly swollen; usually small, rather robust species, most of which bear pollinose lunules on the abdomen. Genotype: *E. strigatus* Fallen.

Many of the species of *Eumerus* are very closely related to each other and difficult to separate, apparently insignificant characters often being used to separate them but as such are quite constant they may be safely relied upon.

Table of Species.

- | | |
|---------------------------------------------------------------------------------------------------------------------------|--------------|
| 1. Scutellum unicolorous blackish or metallic | - - - - - 2. |
| Scutellum wholly or partly red or yellow | - - - - - 4. |
| 2. Second abdominal segment with a pair of clear yellow spots; hind tarsi with at least three joints yellowish or whitish | - 3. |

- Second abdominal segment with greyish pollinose spots; hind tarsi wholly brownish - - *insistens* sp. n.
3. Spots on second abdominal segment fairly narrow, lying mostly beyond the middle; ocellar triangle but little longer than wide; posterior tarsi pale pilose - - - *deceptor* sp. n.
- Spots on second abdominal segment large, broad, occupying most of the length of the segment; ocellar triangle decidedly longer than wide; apical two joints of hind tarsi black pilose and appearing darker than the two preceding - - - *aurifrons* Wied.
4. Scutellum reddish; wings brownish, with pale posterior margin *trepidus* sp. n.
- Scutellum with the apex moderately broadly pale yellow - *marginatus* Grims.

Eumerus aurifrons Wiedemann.

Eumerus aurifrons Wied. Anal. Ent., 32, 1824.

E. splendens Wied. has been placed as a synonym by authors but I cannot accept this disposition. I have not seen a specimen which agrees with the description of *splendens* but the two descriptions as given by Wiedemann show differences which are undoubtedly specific in this genus.

Length, 5 to 7 mm. *Female*. Head steely-black. Face thinly grey pollinose, the broad middle line and the sides, broadly above, tapering to the narrow orbits below, thickly so, the pollen extending between the orbits and antennae to the upper edge of the latter and extending obliquely upwards to the orbits and not, or extremely narrowly, connected with the broadly contiguous frontal triangles which are situated about the lower fourth of the front and are wider than their length along the orbits, the orbits also moderately broadly grey pollinose behind the ocelli; occiput wholly so except the orbits behind the upper portion of the eyes. Ocellar triangle quite evidently longer than wide, the anterior ocellus a little behind the middle of the front; front moderately narrow, the upper third with parallel sides, thence gradually slightly diverging to the face, the sides of which are parallel. Face almost straight, very slightly retreating, the oral margin but little prominent. Pile of head pale yellowish, that on the eyes quite short, abundant, brassy, the front broadly black pilose across the ocelli. Antennae red, the third joint narrowly brown above, silvery

pollinose, fairly large, convex in the middle below, rather cut off beyond the arista above and convex; arista brown, the base broadly reddish.

Thorax blackish-blue, with a pair of very broadly separated, rather narrow grey pollinose vittae reaching to the posterior third or slightly beyond, slightly convexly approximated behind the suture, and broadly joined along the anterior slopes to the grey pollinose humeri. Pleura grey pollinose in front of the wings. Pile of mesonotum short, fine, pale brassy-yellow, that on the pleura and scutellum longer and slightly paler. Scutellum with the margin broadly thinned on the apical two-thirds, the setiferous tubercles small, the punctures at the base of the flange and regular.

Legs black; broad apices of the femora, (hind ones more narrowly obscurely reddish), anterior four tibiae and tarsi, basal third of hind tibiae, and their tarsi, except the basal three-fourths of the first joint, reddish-yellow, the anterior four tibiae each with a blackish streak on the postero-dorsal surface, the hind tarsi slightly darker on the apical two joints. Pile of the legs yellowish-white, except as follows: black on the anterior-apical two-fifths of the hind femora, the black portion of their tibiae and the two apical tarsal joints. Hind femora slightly incrassate, their apical two-fifths with strong, apically oblique spines on either side below; hind tibiae becoming fairly stout on apical two-thirds, their basitarsi gently incrassate.

Wings greyish hyaline, with a slight cinereous cloud towards the apex in front. Squamae whitish, with yellowish border and whitish fringe. Halteres yellow.

Abdomen blackish-blue, with a pair of large, oblique, pale yellow spots on the second segment and a pair of pollinose lunules on each of the following, the ground colour beneath them usually yellow. The spots on the second segment approach each other most closely on their sharply rounded posterior inner corners, are hardly one and three-fourths as long as wide (appear much less), the outer end much more sharply rounded than the rather truncate inner end and they are usually gently concave in front although they vary slightly in this respect. The white pollinose lunules on the third segment are situated in conspicuous depressions slightly larger than themselves, moderately oblique and arcuate, their inner ends rather obtuse, very slightly broadened and reaching a little in front of the middle of the segment. Lunules on the fourth segment more oblique, a little more curved, widest laterally, more widely separated in the middle, their depression less evident. All the pale spots are broadly separated from the lateral margins. Abdominal pile yellowish-white in front of the first pale spots, on the broad lateral margins and on the pale spots, elsewhere black and slightly coarser.

The collection contains a single ♀, Selangor, F.M.S., Kuala Lumpur, June 28, 1921, collected by H. M. Pendlebury.

Eumerus deceptor sp. n.

Abdomen with two (or three) pairs of yellow spots; posterior tarsi wholly pale pilose; antennae reddish.

Length, 9.5 mm. *Female*. Head black, with bronze tinge; face thinly greyish pruinose, the sides, broadly above, tapering to the narrow orbits below, with brassy greyish pollen. Lower half of the front greyish pollinose, except a large, subcordate area above the antennae which is rather narrowly joined along the middle line to the narrow shining upper portion, the orbits again moderately narrowly pollinose behind the ocelli; frontal pollen with a yellowish tinge in some lights. Ocellar triangle slightly longer than wide, anterior ocellus situated a little behind the middle of the front which is moderately narrow, the sides of the upper third parallel, thence gradually widening to the oral margin, although the face has almost parallel sides. Occiput with yellowish-grey pollen. Pile of head pale brassy yellowish (more pale straw colour on the eyes), fairly abundant and moderately long. Face gently concave, the oral margin moderately prominent. Antennae red, third joint brownish on the upper margin, sericeous pollinose, of only moderate size, the lower edge almost straight, the upper gently convex and somewhat cut off beyond the brown arista which has a red base and tapers evenly to the apex.

Mesonotum bronze-black, the broad sides aeneous; with two widely separated, moderately broad, greyish-yellow pollinose vittae reaching to behind the suture and broadly connected along the frontal slopes with similar pollen covering humeri. Pile brassy-yellow, fairly abundant, fine and moderately long. Pleura black, densely grey pollinose in front of the wings, the pile pale yellow. Scutellum aeneous, about as long as wide, with a broad thinned margin except on the basal fourth, the margin bearing about sixteen strong tuberculate teeth, the surface of the thinned margin with large punctures, especially at the base; pile brassy-yellow.

Legs reddish-yellow, black as follows: coxae and trochanters, basal half of the anterior, three-fifths of the middle and the hind femora except the apex, the hind basitarsi except the broad apex; hind tibiae with a broad, diffuse, brown band. Pile of the legs brassy-yellow, paler on the tibiae and almost whitish on the tarsi. Hind femora somewhat incrassate, with strong apically oblique spines on apical third of both lower edges. Hind tibiae rather stout, their basitarsi slightly swollen.

Wings tinged with yellowish and with a light fuscous cloud near the apex. Angle of apical cell with long stump

of vein. Squamae and halteres pale yellow, the former with yellow border and fringe.

Abdomen shining black, the second and third segments each with a pair of slightly oblique, gently lunulate orange yellow spots on the posterior half, the concavity of the lunules in front, the spots widely separated from each other and very slightly narrowed to the outer obtuse end and broadly separated from the lateral margin. Lunules on the fourth segment more curved, narrower inwardly, densely yellow pollinose (the ground colour appears to be orange), also situated on the posterior half of the segment. Pile yellow at the base, on broad lateral margins and on pale spots, elsewhere, black, the pale pile very fine. Sternites brown, the membrane orange.

Male. A ♂ received after the ♀ had been described, differs as follows: the frontal triangle is broadly joined to the vertical triangle about half-way between the vertex and antennae, the two triangles being separated by a black line. Both, except a large V at the vertex, are densely greyish pollinose, the frontal triangle abundantly clothed with pure white hair, the vertical triangle with yellow, while the hair on the eyes is very dense and quite pallidly yellowish; ocellar triangle distinctly longer than wide. Antennae wholly pale yellow, the basal sixth of the otherwise black arista of the same colour.

Thorax with a rather slender median line of grey pollen on the anterior half but it does not extend over the anterior slopes. The pile is a little longer and the teeth on the scutellum not quite as robust. Posterior tarsi only a little brown towards the base. Wings tinged with yellowish, greyish apically and with the tip more clearly browned.

The abdominal pile is wholly pale and there is no trace of grey lunules on the fourth segment, those on the third segment being slightly larger than in the ♀.

Described from: ♀, Selangor-Pahang border, Ginting Sempak, October 20, 1921 and ♂, Perak, Batang Padang, Jor Camp, 1800 ft., June 16, 1923, both collected by H. M. Pendlebury.

This species is very distinct from *aurifrons* as the pile is wholly longer, more abundant and coarser and it is a more elongate species. The much narrower, less oblique lunules on the second abdominal segment will at once distinguish it and the posterior tarsi bear no black pile, unless there is a little towards the base of the first joint on the anterior side. The scutellum is also longer and dentate which at once distinguishes the species from both *aurifrons* Wd. and *nicobarensis* Schiner.

Eumerus insistsens sp. n.

Antennae red; all tibiae at least half black; abdomen with three pairs of grey lunules.

Length, 7 mm. *Female*. Head steely-black, the face rather thinly grey pollinose, the pollen somewhat condensed laterally; lower two-fifths of front with similar pollen which is broadly connected along the orbits with that of the face but leaves a large bare area above the antennae; beneath the frontal pollen there are about six moderately conspicuous, slightly oblique transverse ridges on either side. Sides of front rather parallel, gently diverging below and slightly widened opposite the ocelli, in front of which it is a little wider than behind them. Occiput yellowish-grey pollinose, but almost bare near the upper corners of the eyes, which bear short, sparse, cinereous pile, the pile of the head cinereous-yellow, except a broad, black band over the ocelli. Ocellar triangle equilateral, occupying the upper fourth of the front, the orbits not pollinose behind them. Antennae reddish the third joint margined with fuscous beyond the arista above, the first joint brown, the second largely so; third joint one and a half as long as wide, the greatest width beyond the middle, the lower edge straight, the oblique upper apical section gently convex. Arista brown with reddish base. Face rather strongly retreating, the oral margin but little produced.

Mesonotum blue-black, with a pair of broadly separated, moderately distinct, greyish pollinose vittae on the anterior two-thirds, broadly connected on the anterior slopes with the greyish pollinose humeri. Pleura aeneous in front of the wings and thinly greyish pollinose, elsewhere shining black. Scutellum concolorous with mesonotum, with a fairly broad thinned margin on the apical fourth, which bears rather conspicuous setigerous tubercles. Pile of the thorax cinereous-yellow, not long, paler in colour on the pleura.

Legs bluish-black; apices of femora, basal third and narrow apex of the anterior, basal half and apex of the middle and basal third of hind tibiae, and the anterior four tarsi, reddish-yellow. Posterior femora moderately incrasate, widest at the middle, with four or five rather slender, apically-inclined spines on either side of the lower apical fourth; hind tibiae moderately swollen on the black portion, their tarsi considerably flattened and broadened but tapering to the apex.

Wings luteous hyaline, darker anteriorly. Squamae pale yellow, with darker border and fringe, the halteres yellow.

Abdomen shining black, with three pairs of oblique grey pollinose lunules situated on the posterior half of their respective segments, their inner ends nearer the anterior margin, the first two pairs of lunules but little curved, all obtuse at both ends, except that the third pair is more curved forward anteriorly and narrowed and extend slightly past the middle of the segment, all moderately separated in the

middle and widely so from the lateral margins and also situated in slight depressions. Pile black; before the first pair of spots, on the broad lateral margins and on the pale spots, white, fine and more erect.

Described from an unique ♀, Malacca-Johore border, Lubok Kedondong, N. W. of Mt. Ophir, 'Lalang and beluka,' 200 ft., Nov. 1920, collected by H. C. Abraham.

Eumerus marginatus Grimshaw.

Eumerus marginatus Grims., Fauna Hawaiensis, iii, 82, 1902.

Antennae black; scutellum with the broad thinned margin yellow; thorax with slender greyish vittae and sutural fasciae; robust species.

There are two female specimens in the collection, one minus head, the other without abdomen, which do not differ in the least from specimens from Hawaii, the type locality. The description is from Hawaiian specimens.

Length, 8 to 9 mm. *Male*. Aeneous. Face, frontal triangle and occiput silvery grey pollinose, the latter with yellow pollen behind the upper part of the eyes and on the vertex, the vertical triangle with similar pollen before the ocelli. Face, front and most of the occiput with white pile, that on the latter quite fine, becoming yellow on the upper part, that on the frontal triangle appressed, the vertical triangle with a black pilose band across the ocelli. Face retreating, with a large low swelling above, the oral region scarcely prominent. Frontal triangle wider than long, the eyes touching for a distance slightly greater than its length, the facets enlarged around the contiguous portion. Vertical triangle two and a half times as long as wide, the sides parallel behind the anterior ocellus, the angle not acute; ocellar triangle decidedly longer than wide. Occiput prominent above. Antennae black; third joint one and a quarter times as long as wide, its upper edge oblique on the apical fourth and but little convex, the apex not acute; arista brown with the thickened base reddish.

Thorax with a pair of widely separated, slender grey pollinose vittae reaching almost to the scutellum, the anterior margin broadly, a short obscure median vitta on the anterior slopes, the humeri and broad lateral margins before the suture, a narrow fascia along the suture to the vittae, the pleura before the wings and a triangle beneath the wings, grey pollinose. Pile brassy-yellow, but becoming white on the lower part of the pleura. Scutellum rather rectangular, much broader than long, the corners sharply rounded, the apex gently convex, the apical fourth thinned and pale yellow, with elongate, deep punctures leaving regularly placed ridges across the flange, the apex of which bears very shallow, short emarginations.

Coxae brown, their apices more or less and the trochanters, brownish-red; femora aeneous black, their

apices yellow; posterior tibiae and tarsi black except the basal third of the former, the intermediate joints of their tarsi sometimes reddish; anterior four tibiae and tarsi yellow the former with the subapical two thirds blackish or brownish. Pile of legs yellow but almost whitish and more conspicuous on the tibiae and tarsi. Hind femora strongly incrassate, the apical two-fifths slightly produced below on the anterior side as a narrow plate and bearing stout spines, the posterior edge with the spines rising from a slight ridge; posterior tibiae considerably swollen on the apical two-thirds; hind tarsi slender.

Wings with a faint luteous tinge on the basal two-thirds in front. Squamae white, the border, fringe and halteres yellow.

Disc of abdomen strongly bronzed and coarsely punctured, adorned with three pairs of narrowly separated grey pollinose lunules, the first pair on the second segment, oblique, more widely separated, rising near the base of the segment and running towards the posterior angles, situated on the anterior slope of a deep depression which has its origin in a large, deep median basal concavity, the lunules narrowest inwardly, where they are rather acute, slightly widening to their obtuse outer ends, gently arcuate. Lunules on third segment situated on the posterior half except their inner ends which curve forward a little, of almost equal width but broadly constricted on their lateral fifth and joining at the sides moderately narrow triangles which reach along the margin to the base of the segment and beneath which the ground colour is usually largely reddish, the inner ends of the lunules very narrowly separated and obtuse, covering the whole of the depression. Lunules of the fourth segment strongly oblique, sinuate, rising at the basal sixth and extending in a double curve to the posterior third at the sides where they join the broadly grey pollinose lateral margin which reaches from the apical third to the base, although it may be more or less obscure basally. Pile brassy-yellow; black on the disc behind the first pair of spots except on the pale markings and on the fourth segment beyond the lunules but there are stouter black hairs intermixed with the yellow on this segment. Genitalia large, black pilose.

Female. Front grey pollinose before the ocelli, only a small oval supra-antennal spot and the obscure median line bare or nearly so, the orbits broadly pollinose behind the ocelli, the pollen rather yellow on the upper half of the front, the pile yellow on the upper two-thirds but broadly black across the ocelli; ocellar triangle as in the ♂. Sides of front scarcely diverging to the lower fifth, thence moderately so to the face. Ocelli the length of the ocellar line in front of the hind margin of the eyes. Third antennal joint greyish

yellow pollinose, rather rectangular, wider than long a little longer below, the apex gently convex. Eyes sparsely short yellow pubescent. Otherwise as in ♂.

Malayan records: 2 ♀, Malacca-Johore border, Lubok Kedondong, N. W. of Mt. Ophir, 'Lalang and beluka,' 200 ft., Nov., 1920, collected by H. C. Abraham.

Eumérus trepidus sp. n. (Pl. IV, fig. 11.)

Third antennal joint twice as long as wide, rather acute below; scutellum very large, transverse, reddish; abdomen somewhat tapering, with three pairs of grey pollinose lunules; apical cross-vein sinuous, recurved apically.

Length, 14 mm. *Male.* Face rather strongly evenly retreating, the small, triangular oral tip prominent, in colour wholly black but densely covered with silvery-white pollen, with rather long, moderately coarse, not abundant black pile but there are some short brassy-yellow hairs intermixed and these predominate on the narrow checks. Frontal triangle somewhat swollen, with a large, not very conspicuous, rounded tubercle above and a smaller, more sharp one immediately above the front margin of the antennal prominence which is narrowly obscure reddish, the front elsewhere shining black, the sides very broadly silvery white pollinose, the pile similar to that on face. Eyes touching for a distance equal to that between the anterior apex of the vertical triangle and the posterior ocelli. Vertical triangle long, with almost parallel sides, moderately acute in front, dull blackish but more shining and rather coarsely punctured behind the ocelli, the pile black except along the orbits; ocellar triangle twice as long as wide, the posterior ocelli separated by about the width of one ocellus. Occiput not wide, whitish pollinose, with rather short, pale yellowish pile, the cilia black, short. Eyes with moderately abundant long yellowish pile. Antennae black, the first joint reddish except apically, the third dull, with a slight whitish bloom, longer than the first two combined, twice as long as wide, moderately pointed below, with a suboval, flattened apical area on the outer side, the upper margin convex, the lower almost straight. Arista longer than the antennae, rather stout as it scarcely tapers, brownish black, the base broadly reddish.

Mesonotum steel-blue or slightly slaty, with a moderately broad, apically tapering middle line, a vitta on either side, separated from the median vitta by about the average width of the former, the side margins broadly, the whole middle of the mesonotum on the posterior fourth and a narrow fascia reaching inwards along the suture, moderately densely whitish pollinose, strongly visible from posterior view but rather faint from some angles; pile fairly abundant, not long, subappressed, mostly black but yellowish in front and on the sides and mostly appearing pale in some

lights. Pleura bluish-black in front of the wings, thinly covered with whitish pollen and clothed with almost white pile, behind the root of the wings shining brownish, not pilose. Scutellum reddish, three times as wide as long, its apex only a little convex the sides obtusely rounded, the apex strongly thinned, the thinned margin with coarse, deep basal punctures, the immediate apex with small tubercles from each of which a hair rises; disc finely, sparsely punctured, subnitid, with fine yellow pile, the margins with longer black pile; ventral fringe subobsolete apically.

Femora and hind tibiae bluish-black, the narrow apices of the former and broad bases of all the tibiae, yellow; anterior four tibiae and their tarsi, brownish. Pile chiefly yellow, the apical two tarsal joints, narrow dorsal surface of posterior four tibiae (on the middle ones a single row of hairs), and almost the apical half of the hind femora, (more than half above, less than half in front), black pilose. The lower apical third of the hind femora is flattened and a little produced on both sides and bears on the front surface about eight small tubercles from each of which a short, sharp, tooth-like spine rises (those on the posterior surface are not visible in the type). Hind femora moderately swollen, their tibiae slightly curved.

Wings decidedly brownish, the apex and posterior portion paler: there is also a large, somewhat paler area beyond the middle and a small, almost hyaline, longitudinal spot before the loop of the third vein. Squamae almost white, with brownish border and fringe. Halteres pale yellow.

Abdomen shining black, very conspicuously punctured, with three pairs of greyish pollinose lunules which almost unite in the middle line: the first two pairs rise toward the hind margin laterally and extend slightly obliquely towards the middle line, their inner ends more strongly curving forward so that they are about the middle of the segment and they are somewhat enlarged inwardly. The third pair lies on the basal half of the segment, rising at the sides, slightly oblique, the inner ends curving forward so that they reach about to the basal fourth. All the lunules are borne in rather deep depressions, those on the second segment uniting and reaching the base of the segment so that there is a shallow median basal trough; bases of segments also somewhat sunken. First segment very short, much narrower than the second, the anterior corners of which are rather angular, the second segment perhaps slightly shorter than the third, fourth one and a half as long as third, its apex obtuse, rounded, its sides strongly convex, so that the genitalia are hidden from a lateral view. Pile of the abdomen yellow basally, on the sunken areas, and practically all the broad side margins, elsewhere blackish or brown. Venter grey pollinose, the fourth sternite deeply excised in

the middle, its basal half carinate; genital appendages yellowish; pile yellow, black on the fourth segment.

Described from a single ♂, Peninsular Siam, Nakon Sri Tamarat, Khao Luang, 2000 ft., March 19, 1922, collected by H. M. Pendlebury.

Subfamily SYRPHINAE.

Genus *Syrphus* Fabricius.

Characterized by the usually yellowish face, and scutellum and the presence of yellow fasciae on the abdomen, these latter sometimes interrupted so as to form spots, the abdomen not unusually flat and broad, the sides margined or unmargined, cubital vein usually at most gently undulated, the front not inflated, the anterior cross-vein before the basal third of the discal cell, legs slender, abdomen never pedicellate. The humeri are bare, the occiput strongly concave. Genotype, *S. ribesii* L.

There are several closely allied genera: *Didea* has the abdomen strongly margined but much flattened and the third longitudinal vein strongly undulated; *Scaeva* also has the margin raised, the cubital vein strongly curved, but the front is very much swollen in both sexes and the wings practically without villi; *Xanthogramma* usually has the abdomen margined, but it is also somewhat more flattened and unusually deep black with very conspicuous pale yellowish markings, the sides of the mesonotum and pleura with sharply defined pale yellow spots, (in the group centring around *S. maculipleura* Brun. this latter character is present but the abdomen is quite differently marked from *Xanthogramma*); *Eriozona* bears quite long pile while *Asarkina* has a much flattened abdomen with shiny orange bands and scale-like hairs on the occiput. Several other related genera will be distinguished by the key to genera. *Olbiosyrphus* Mik, I regard as merely a segregate of *Syrphus*, the species placed therein being readily connected by intergrading forms.

There are two well defined groups of *Syrphus*, both probably deserving recognition: those with the abdomen margined (*Syrphus*) and those without the margin, the sides being curved under and quite acute (*Epistrophe* Walk.) *Syrphus* might well be further divided, the genus retaining only those species with the lower lobe of the squamae pilose above and *Dideoides* Brun., for those with this organ bare. However, the matter is much too complicated for full discussion here. I believe that the adoption of this suggestion would greatly simplify the determination of species, but the material before me, from all parts of the world, indicates that nothing can be gained by going further and that attempts further to divide the group will prove very confusing, new genera being needed for any misfits in the

groups which are at best strictly artificial. For present purposes I am recognizing only the genus *Syrphus*.

Table of Species.

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| 1. Eyes pilose - - - - | 2. |
| Eyes bare - - - - | 3. |
| 2. Face wholly pale - - - | <i>chrysotoxoides</i>
sp. n. |
| Face with median dark vitta on lower half - - - - | <i>serarius</i> Wied. |
| 3. Sides of mesonotum sharply defined bright yellow on whole length - - - - | 4. |
| Mesonotum not bright yellow laterally, sometimes obscurely so, but the markings diffuse and pale pollinose - - - | 8. |
| 4. Face with median black vitta - | 6. |
| Face wholly pale - - - | 5. |
| 5. Posterior femora (♂) yellow on basal third; scutellum with narrow basal blackish fascia - | 5b. |
| Posterior femora (♂) wholly black; scutellar fascia not sharply defined, diffuse - | 5a. |
| 5a. Frontal triangle with orange to ferruginous triangle above the lunule; mesonotum opaque, bicolorous; bases of anterior femora normally broadly brown; frontal triangle bloated - - - - | <i>variscutatus</i> sp. n. |
| Frontal triangle wholly dull pale yellowish, not bloated, narrower and more acute above; mesonotum shining black; anterior four femora wholly orange - - - - | <i>difficilis</i> sp. n. |
| 5b. Only the apical fourth of the posterior femora black - | * <i>clarus</i> H.-B. |
| Apical half or more of posterior femora black - - - - | * <i>citrinum</i> Brun. |
| 6. Posterior femora wholly black - | 7. |
| Posterior femora yellowish on almost the basal half - | <i>robinsoni</i> sp. n. |

*Not seen from Malaya.

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| 7. Genital claspers bordered with a fringe of long, stiff yellowish hairs - - - - | <i>hervebazini</i> sp. n. |
| Genital claspers with normal, short sparse hairs - - - | <i>pendleburyi</i> sp. n. |
| 8. Lower lobe of squamae with long hairs above - - - | <i>fulvifacies</i> Brun. |
| Lower lobe of squamae short pubescent - - - - | 9. |
| 9. Mesonotum with two greyish vittae - - - - | 10. |
| Mesonotum without distinct greyish vittae, sometimes with three bronze vittae on slightly greyish ground - - - - | 11. |
| 10. Frontal triangle practically wholly yellow pilose; front of ♀ yellowish to cinereous pilose - - - - | <i>alternans</i> Macq. |
| Frontal triangle wholly long black pilose; front of ♀ wholly long black pilose - - - | 10a. |
| 10a. Third antennal joint about one and a quarter as long as wide (Europe) - - - - | <i>balteatus</i> DeG. |
| Third antennal joint one and three-quarters as long as wide - - - - | <i>nectarinus</i> Wied. |
| 11. Abdomen elongate, slender, with almost parallel sides - - | 12. |
| Abdomen oval or elliptical - | 15. |
| 12. Face with median black vitta - | 13. |
| Face wholly pale - - - - | 14. |
| 13. The yellow spots on the sides of the second abdominal segment reach forward to join the yellow on the sides of the first segment in their full width - | <i>deceptor</i> sp. n. |
| The yellow spots on the second segment are oblique in front and unite with the yellow of the first segment only very narrowly at the sides - - | <i>tenuiformis</i> |
| 14. All the very broad abdominal fasciae interrupted, the resultant spots on segments two and three longer than wide - | <i>malayensis</i> sp. n. |
| Second and third abdominal fasciae entire - - - - | <i>strigifrons</i> DeMeij. |

15. Second abdominal segment with the base pale on its whole width - *exul* sp. n.
 Second segment with the pale fascia well separated from the base except at the sides - *confrator* Wied.

Syrphus serarius Wied.

Syrphus serarius Wiedemann, Auss. Zweifl., ii, 128, 1830.

Allied to *griseocinctus* Brun. but the fascia on the second abdominal segment is less arched, practically entire, the following fasciae entire and broadened laterally, the legs much more extensively black and with more black hair. Eyes white pilose.

Length, 9.5 mm. *Female*. Face reddish-yellow, the oral margin rather broadly, checks and median facial vitta, reaching two-thirds to the antennae, shining black. Front shining black, its sides subparallel on upper third, thence widening to the face, across the middle with a broad greyish pollinose fascia, connected broadly along the orbits to the white facial pollen. Frontal pile black, rather long. Occiput black, greyish pollinose, the pile whitish, becoming yellowish above. Pile on face and cheeks long, white. Antennae black, third joint brown with large reddish basal spot below, twice as long as wide, more acute above, rather cylindrical; arista polished blackish brown, quite bare.

Thorax bluish aeneous, the pleura and sides of mesonotum in front densely greyish pollinose, the pile of the dorsum greyish-yellow, on the pleura and lateral margins, cinereous-white, long and fine. Posterior calli obscurely reddish, the scutellum dirty yellowish with rather sparse black hairs, the corners themselves, with white hairs, the white ventral fringe long, composed of crinkly hairs.

Legs brownish; apical half of the anterior four femora, basal third or more of the anterior four tibiae and an apical ring and about the basal third of the posterior tibiae, reddish. Long hair on the femora cinereous, the short hair and some long hairs near the apices, black, elsewhere on the legs, short and black.

Wings glassy hyaline, the stigma luteous; third vein almost straight. Squamae pure white, with yellow border and white fringe. Halteres reddish-yellow.

Abdomen subopaque black; first segment, entire lateral margins, broad apex of the fourth and whole of the fifth segment, shining bluish-black. Second segment with a transverse yellow fascia lying across the middle which is gently arched, as it is a little closer to the posterior margin at the sides, narrowly interrupted in the middle, the spots thus formed, with their front margin transverse, but still

very gently convex, strongly so at the sides, so that the spots are wider laterally; the fascia on the third segment is, in the middle, separated from the base by about half its width, and is, at this point, as wide as two-fifths the length of the segment, gently arched behind and widened in front so as to reach almost the base at its outer end; bands on third and fourth segments very similar, but a little narrower; none of the fasciae quite reach the lateral margins and all are densely covered with snow-white pollen. I think there are normally reddish transverse triangles on the base of the fifth segment. The pile is whitish on the first segment, the pale fasciae and lateral margins opposite and the basal angles of the fifth segment, elsewhere, black. Venter shining black, with very broadly grey pollinose incisures, the pile long, cinereous.

Described from a single ♀, Pahang, Lubok Tamang, 3500 ft., June 10, 1923, collected by H. M. Pendlebury.

The abdominal fasciae are wider than in *griseocinctus* Brun. and differently shaped. The antennae are not typical of *Syrphus* but rather like *Ischiodon* although the abdomen is elongate oval.

Syrphus chrysotoxoides sp. n.

Allied to *Syrphus torvus* O.S. but the squamae are bare above and the reddish abdominal fasciae are somewhat arched.

Length, 18.5 mm. *Female*. Face yellow, with a thin covering of yellow pollen, the middle more orange-coloured, shining; pile above and along the middle, black, elsewhere finer and yellowish. - In profile the face is retreating, the tubercle rather large, convex below, only slightly so above. Antennal prominence large, obtuse. Cheeks orange-yellow, thickly yellowish pollinose. Front narrow, the sides diverging somewhat towards the face, the colour rather dull black, becoming somewhat slaty about the ocelli, the side margins to well above the middle broadly yellow pollinose, leaving the middle opaque vitta about three-fifths the width of the front, the antennal prominence shining black with only the anterior edge of the W reddish; frontal pile all dense, short, black, slightly increasing in length anteriorly. Ocellar triangle slightly longer than wide. Occiput yellow pollinose, the pollen becoming more whitish below; vertex with black, upper portion with yellow, more than the lower half with whitish pile. Antennae black, the basal half of the first joint and the lower basal half of the third, reddish; third joint subtriangular, gently convex above and below, the apex rather acute; arista brownish, red, long, rather slender, evenly tapering to apex.

Mesonotum opaque black, the sides behind the humeri rather tawny, the side margins broadly rather tawny polli-

nose; pile on the dorsum short, tawny, longer on the sides and pleura. Scutellum dull translucent reddish, black pilose, the ventral fringe yellow.

Legs reddish, the hind femora ferruginous above, their tibiae black in front and on the apical fourth, the hind tarsi black, the anterior four with the last two or three joints brownish. Pile on the legs all yellow except on the upper surface of the hind femora, the hind tibiae externally and most of the tarsi, where it is, black. Hind tibiae slightly arcuate.

Wings strongly smoky yellow, the stigma luteous. Squamae yellowish with tawny border and fringe; halteres reddish-yellow. -

Abdomen opaque black, the first segment with the sides, anterior margin and middle, reddish. Second segment with a moderately broad basal fascia, the narrow apex (more broadly in the middle) and a broad, slightly arched fascia which lies mostly before the middle of the segment, reddish, the anterior black fascia linear in the middle, widened towards the sides but not reaching the lateral margins; the posterior black band is scarcely as wide as the reddish one, is of almost uniform width, extends over the lateral margins and is narrowly produced forward along the margins to cut off half the red band. On the third segment there is a moderately narrow basal fascia of black which is slightly widened laterally, its middle portion more or less reddish, but distinctly darker than the following reddish fascia which is also slightly widened laterally and slightly arched, its width equal to about one-fourth the length of the segment; the posterior margin of the segment is reddish and in the middle is rather broadly connected with the median reddish fascia; side margins of the segment wholly black. The fourth segment is similarly marked, but the reddish fascia is slightly closer to the anterior margin of the segment and is narrower in the middle but quite as wide laterally, so that it is slightly more arched; the apex of the segment is shining reddish and the posterior black fascia is decidedly broader than that on the preceding segment. Fifth segment with a long apical shining reddish triangle which reaches forward to the base of the segment; on either side an oblique laterally broad triangle, more narrowly separated from the base of the segment at the sides and narrowly separated from the median triangle at the base of the segment; this leaves the black in the form of triangles resting on the posterior angles of the segment.

Described from a ♀ from Peninsular Siam, Nakon Sri Tamarat, Khao Luang, 5800 ft., March 30, 1922, collected by H. M. Pendlebury.

Syrphus confrator Wiedemann.

Eyes bare; face brownish on middle line to upper end of tubercle; lower lobe of squamae not pilose; abdominal pale fasciae entire and extending over the side margins.

Length, 15 mm. *Male*. Face yellow, more reddish on the cheeks and jowls; the middle line, to the upper end of the tubercle, brownish; in profile moderately concave between antennae and tip of tubercle which is large, prominent, rather nasiform, its lower edge sloping, but gently concave, to the oral tip; pile whitish, rather abundant, black along the brown middle line; covered with yellowish white pollen except along the oral margin and on the facial stripe. Frontal triangle large, not swollen, long, black, the sides on the lower two-thirds yellowish red, this portion and the upper half, yellowish pollinose, the pile black; arms of the W reddish. Vertical triangle black, thinly greyish pollinose, one and a half times as long as wide, its pile black. Eyes touching for a distance equal to one and a half times the length of the vertical triangle, their facets enlarged on the upper half. Occiput greyish pollinose, the pile yellow above, whitish on the lower two-thirds, the occipital cilia not black. Antennae blackish, reddish below; third joint one and three quarters as long as wide, large, oval, somewhat tapering, more sharply rounded above; arista reddish, tapering, not very stout.

Mesonotum blackish, brassy aeneous, the humeri, posterior calli and the margin above the wings, reddish or translucent yellowish. Pleura greenish-black. Pile of thorax yellow, rather tawny on the lateral margins. Scutellum reddish-yellow, with rather abundant, fairly long black pile, the ventral fringe yellowish.

Basal third of the anterior four femora and the hind legs, blackish; basal half of the hind femora on the posterior side, their broad apices and the broad bases of their tibiae, and the remainder of the legs, reddish; middle three joints of the anterior four tarsi rather brownish. Pile of legs mostly yellowish; black apically behind the middle femora and on the posterior legs except the basal third of the femora.

Wings hyaline; stigma luteous. Squamae greyish white, with yellow border and fringe. Halteres yellow.

Abdomen opaque black; sides of first segment broadly reddish. Second segment with an entire, transverse median reddish band which is narrowed towards the middle, its posterior outer edges rounded off so that it is produced anteriorly to the base of the segment at the anterior angles. Third segment with a broad fascia lying a little before the middle, of almost uniform width, its outer corners curved forwards so as to reach the base just at the angles; it has

a small, short, median triangular projection behind. The fascia on the fourth segment is similar but is closer to the base of the segment and has a larger median triangle behind; the apex of the segment is also reddish and the fifth segment has a complete narrow reddish margin which expands on the anterior angles. The short pile is very fine, abundant, greyish-yellow on the first two segments, on the second fascia and sides of the third one; elsewhere shorter, coarser and black. On the second segment the posterior margin is broadly black pilose, expanded in the middle to reach the reddish fascia and the raised lateral margins are black haired except opposite the fascia. Venter reddish-yellow, with an elongate blackish longitudinal spot on each of the last two or three segments. Genitalia aeneous, with chiefly yellow pile.

There is a single ♀ in the collection taken by E. Seimund in Pahang, F.M.S., Sungei Bertam, 4800 ft., Sept. 4, 1922.

This species and the preceding, in the strict sense, belong to the genus *Dideoides* Brun. This genus cannot stand on the characters proposed by Brunetti, although it is quite valid if we limit the genus *Syrphus* to those species with the lower lobe of the squamae pilose. If that is done *Epistrophe* of Walker becomes the next available name, but this might easily be limited to those species without any trace of a raised abdominal margin.

Syrphus fulvifacies Brunetti.

Rec. Ind. Mus., viii, 161, 1913.

This species is very like the European *S. vitripennis* Meigen, but it is readily distinguished by the wholly black or brownish haired posterior tibiae and the presence of considerable black hair towards the apices of the femora together with the extensive black spinules on the posterior femora; in addition the front of the ♀ is less suddenly narrowed above and is darker and both sexes are distinctly larger than any specimens of *vitripennis* examined from both Europe and North America.

Length, 11 to 12 mm. *Male*. Face pale orange, except the tubercle, moderately thickly yellow pollinose, the fine pile yellowish in colour. Frontal triangle aeneous but thickly brownish-ochreous pollinose except the shining black supra-antennal spot, the sides below, to the level of the upper edge of the lunule, reddish; pile black. Vertical triangle rather dull black, brownish pollinose and black pilose, about one and a half times as long as wide, the ocelli situated well forward, their triangle longer than wide. Occiput grey pollinose, tinged with yellow above, the pile orange or bright yellow, the orbital cilia black. Cheeks dark, greyish pollinose. Antennae black, the third joint reddish on the lower third or less; arista ferruginous.

Thorax aeneous, lawny pilose, the pleura greyish pollinose and bearing yellow pile; notopleura yellowish-grey pollinose. Scutellum dull yellow, black pilose, the ventral fringe fuscous.

Legs reddish or orange; basal half of anterior four femora, hind legs except the broad femoral apex and basal fourth of the tibiae, and all the tarsi, except the basal joint of the middle pair, black. Pile of legs yellow, the femora with some black hair apically behind, the hind ones largely black haired above, their tibiae wholly so, but pale pubescent beneath. Bristles beneath middle tarsi black.

Abdomen opaque black, the narrow lateral margins and the apices of the fourth and fifth segments, shining. Second segment with a pair of large, subtriangular, inwardly rounded yellow spots, their outer end produced obliquely forward to the anterior angle, their anterior and posterior margins a little convex, the spots separated from each other by about half their width. Third segment with an entire, broad, gently undulated fascia; gently concave on either side of the middle in front, reaching forward to the anterior angles at the outer ends where it reaches the margin in about one-third its full width, the ends being oblique and concave posteriorly, the width of the band equal to more than one-third the length of the segment, the posterior median emargination very broad and gentle. Fourth segment with a similar fascia but it is a little nearer the base of the segment, not quite as wide and reaches the margin in not quite half its width. The fifth segment, apparently, is wholly black except that its broad apical margin, as well as that of the fourth, is red. Ventral segments with broad posterior fasciae, with median and marginal projections forward. Abdominal pile black, only yellow on the first and basal half of the second segment, the black pile extending along the margin of the former to the basal third.

Female. Front black, brownish yellow pollinose except on the upper third and supra-antennal area, immediately above which is an elongate spot covered with brown pollen; front gradually narrowing to the vertex, (longer and narrower than in *vitripennis*), black pilose; ocellar triangle equilateral.

Anterior four femora only black on basal third, with fewer black hairs. Spots on second abdominal segment narrower, more elongate and more rounded inwardly, rather elongate-oval. Following fasciae narrower and a little closer to the bases of the segments. Pile shorter throughout.

Redescribed from ♂ ♀ from West Java, Pranger Regency, Papandajan, 5500-7000 ft., April 23, 1923, collected by H. M. Pendlebury.

This is probably the species recorded from Java by de Meijere as *vitripennis*.

Syrphus pendleburyi sp. n.

Mesonotum greenish-grey on the disc, surrounded by opaque black, the lateral margins and border of the scutellum pale yellowish; face with median black stripe; eyes bare; abdomen with two entire and two interrupted yellow fasciae. In the sense erroneously adopted by authors, this species would belong to *Xanthogramma*, a genus which is abundantly distinct in general appearance, but difficult to define. I know of only four species of *Xanthogramma* in the strict sense. None of these occur in Asia.

Length, 9.5 mm. *Male*. Face and broad frontal orbits pale yellowish, the oral margin more orange, the broad median line, jowls, and a large spot above the antennae shining black. Face and cheeks with fine white pile, the upper angles and the front black pilose; sides of face white pollinose. Face rather puffed, in profile the whole middle part rather swollen, leaving a shallow concavity above, below the swelling strongly retreating to the oral margin but the oral tip itself is slightly produced. Front broad, swollen, its sides slightly convex, the upper portion of the black part yellow, of the pale part, yellowish pollinose. Vertical triangle but slightly longer than broad, metallic green in ground colour but rather densely brownish-yellow pollinose. The eyes touch for a distance almost equal to the length of this triangle. Occiput greyish-yellow pollinose, broadly silvery pollinose along the orbits except above, with whitish and pure white pile. Antennae small, brownish, the third joint reddish below, rectangularly oval, not twice as long as wide. Arista brown, tapering on the basal two-thirds.

Lateral margins of the mesonotum whitish-yellow, the ground colour elsewhere bright metallic blue, but almost wholly concealed. The disc, except behind, is peculiarly greenish-grey pollinose, bordered on either side by a broad opaque black vitta; on either side of the middle line, diverging behind, a moderately broad, dark vitta; posterior of the mesonotum without such sheen. Pile fairly long, not very abundant, mostly yellow. Pleura metallic blue, thinly pale pollinose, with yellowish-white spots as follows: a small one above the front coxae, posterior third of the mesopleura, a transverse, broad stripe on the upper part of the sternopleura and a broad, oblique fascia behind the root of the wing, the pile all pale yellow. Scutellum broadly bordered with dull yellowish-white, which leaves a large basal brownish triangle, which has an almost black middle, the pile all black, longer apically.

Posterior legs deep brown; anterior femora with the basal fourth or more brown and each with a brownish dash beyond the middle behind, and the tarsi brownish, the legs elsewhere yellowish-red although the tibiae are somewhat

darker on the median portion. Pile whitish; black on the tarsi, hind tibiae and apical half of all the femora.

Wings hyaline; stigma luteous. Squamae pallidly yellow, except outwardly, with brown border and fringe. Halteres yellow.

Abdomen opaque black; broad sides of the second segment, almost to the middle, from which point a broad, elongate arm extends obliquely inwardly to the lateral apical third of the segment, pale yellow; these arms are widened somewhat before their ends, are rounded apically and separated from each other by almost the length of one arm. Practically all the fascia on the third segment lies before the middle; it is concave on either side anteriorly and convex behind, broadly separated from the base of the segment but reaching forward to the anterior angles at the sides. The fascia on the fourth segment is quite similar but it is narrower in the middle and less convex towards the sides behind. Fifth segment with the base almost entirely, and a large, broad apical triangle which reaches forward almost to join the basal fascia, black, the segment elsewhere pale yellow. The abdominal pile is yellow on the base as far as the posterior edge of the yellow spots on the second segment, from thence, all black.

Described from a single ♂, Pahang, F.M.S., Gunong Tahan, Seat Point, 5460 ft., Dec. 21, 1922, collected by H. M. Pendlebury.

Syrphus hervebazini sp. n.

Allied to *pendleburyi* but readily distinguished from all the allied species by the fringe of long, stiff, yellow hairs on the genital claspers, more quadrate spots on the second abdominal segment and blackish stripe on the anterior four femora towards the ends.

Length, 10 to 11 mm. *Male*. Face orange-yellow or pale orange, with a broad median black stripe which is narrowed towards the oral margin; pile long, fine, pallidly yellow. Frontal triangle shining black, the broad orbits yellow, clothed with yellow pollen, the humular swelling rather prominent, the dark portion above it, brown pollinose; frontal triangle black pilose. Vertical triangle not twice as long as wide, the ground colour black, thinly covered with brownish pollen; anterior ocellus remote; pile black. Occiput black, black-haired above, the orbits brownish pollinose above, silvery-grey below, where the pile is short, abundant, scale-like, silvery-white. Checks wholly orange-white pilose. Antennae reddish-brown; third joint orange below, oval, one and a quarter as long as wide; arista black, not robust, longer than the antenna.

Mesonotum opaque black, the lateral margin broadly orange, the whole disc, except broad sublateral vittae and

posterior fascia, normally grey pollinose, with metallic greyish-green reflection, the pile entirely black except about the humeri; plicura and pectus aeneous, thinly greyish pollinose, with yellow markings as in *pendleburyi* but rather smaller. Scutellum with a broad basal triangle, reaching almost to the apex, opaque black or brown, the margin orange yellow, more widely so basally, the pile black.

Legs rusty yellow; posterior legs, all the tarsi entirely, bases of the anterior four femora and a broad preapical streak on apical half above, black. Pile black, a little coarse, of the usual length, the anterior four femora more or less pale pilose at the base.

Wings tinged with dark grey or fuscous, the third vein curved somewhat forward beyond the middle of the apical cell; stigma luteous brown. Squamae brown, whitish on outer third, with brown fringe except on outer corner. Halteres orange, with brown knob.

Abdomen opaque black, with two interrupted and two entire orange fasciae. Second segment with a large, subquadrate spot on either side reaching from the base to the apical third, the outer end separated from the lateral margin more widely behind, rarely reaching the side at the anterior angle, the spots separated from each other by a narrow, dark V, which is rarely only linear, narrowly to moderately separated. Third segment with a fascia lying chiefly before the middle, broadly separated from the anterior margin, its front edge slightly concave towards the outer ends in front, the band about one-third as wide as the length of the segment and sometimes with a shallow projection at each side in the middle. The fascia on the fourth segment is similar to that on the third, a little more noticeably concave in front and more widened, at the sides, narrower. Fifth segment with the base narrowly black, the pale fascia narrowly to widely interrupted, narrow in the middle, reaching the posterior angles at the sides. The pile is wholly black except on the sides of the first and basal lateral fourth of the second segment. Genitalia large, visible from above, the claspers broad, reddish, with fringe of long, stiff yellow hairs.

Described from four ♂♂ from Pahang, Cameron's Highlands, Rhododendron Hill, 5200 ft., June 14 and 18, 1923, collected by H. M. Pendlebury.

This fine species, which is distinct from any described species in the peculiar development of the genitalia is named in honour of my friend, Dr. Jacques Herve-Bazin whose excellent papers on Oriental Syrphidae are well known.

Syrphus robinsoni sp. n.

Allied to *pendleburyi* but readily distinguished by the posterior femora being reddish on the basal third, pile of

occiput black above, median abdominal fasciae arched towards the base of the abdomen, etc.

Length, 7.5 to 10 mm. *Male*. Face orange yellow, sometimes more or less orange below, with a broad shining blackish median vitta which narrows below and may or may not reach the oral margin and does not quite reach the antennae. Jowls black. Frontal triangle shining black, with the broad orbits yellow, the upper half, encroaching upon the black, dull yellow pollinose; often a more or less distinct brownish line reaching the upper angle. Back of mouth yellow; occiput black, grey pollinose, clothed with scale-like silvery pile except below, where it is normal, and on the upper fourth, where, as on the frontal and vertical triangles, it is rather dense and black in colour; face and cheeks with fine, pallidly-yellowish pile. Vertical triangle subopaque black, twice as long as wide, its sides straight; posterior ocelli not quite as far from the vertex as the length of the ocellar triangle. Antennae brown, second joint mostly reddish-brown, the third yellow below on basal portion, almost circular except for the upper basal part; arista brown, tapering, not longer than the antenna.

Thorax metallic black, the fairly broad lateral margins of the dorsum, a large spot above the anterior coxae, the posterior half or more of the mesopleura, a broad vitta below the wings and a broad arch running from the upper edge of the sternopleura to below the squamae, narrowest towards the front of the sternopleura, rather pale yellow, the immediate margin behind the humeri, dark. Pile of mesonotum black, rather long, on the pale portions, yellow, on the pleura, rather whitish; on disc of anterior half of the mesonotum the pile is rather rusty reddish-brown. Scutellum dull sulphur-yellow, with long black pile.

Wings slightly infuscated; stigma brownish-luteous; third longitudinal vein almost straight. Squamae brownish on inner half, the border wholly brown, the fringe rusty brownish. Halteres reddish-yellow or orange.

Legs reddish-yellow; posterior legs black, except the basal half of the femora; anterior four tarsi brownish. Femora with longish black hair, the anterior four with more or less yellowish hair basally, especially above; posterior tibiae subciliate with long black hair on the antero-dorsal surface and with long hair on the basal half behind. Their basitarsi also with long hair on the anterior surface; black hair on middle tibiae fairly long, on the front ones rather short, but longer than usual.

First abdominal segment yellow, the median half shining black; the abdomen opaque, with the apices of the third and following segments rather broadly shining, the apex of the fifth segment narrowly yellow; adorned with dull yellow as follows: a pair of transverse spots lying

slightly behind the middle of the second segment, their sides almost parallel (slightly widened laterally), their inner ends rounded, the outer reaching the side margins, where, however, they are orange and extend narrowly along the margin to the base. The third segment bears an entire fascia which is moderately arched, a little projecting forward in the middle, sharply notched behind, the sides subparallel, but sloping towards the sides in front so that the ends of the fascia just or not quite reach the margin at the posterior fourth, the anterior point of the band at the basal fifth of the segment. Fourth segment a replica of the third, the fascia slightly narrower. Spots of the second segment separated by about one-fourth the width of the segment their width equal to about one-fourth the length of the segment, the posterior black band about as wide as the spots. Fifth segment with a pair of rather orange, elongate oval spots, broadly separated from each other, almost reaching the base of the segment at their inner ends, and reaching obliquely to the posterior angle of the segment. Genitalia shining black. Abdominal pile fairly long, black, finer and yellow on the first segment, basal lateral fourth of the second and most of the pale ground on this segment, the pale fasciae almost bare.

Female. Front shining black, the sides fairly widely yellow almost to the ocelli (about the length of the ocellar triangle in front of the anterior one). Occipital pile yellow above, shorter; front black-haired. Antennae larger, the third joint one and a half as long as wide; almost twice as large as in the ♂.

Second abdominal segment with the spots only narrowly separated from each other in front, more so behind, and very slightly arched, the following fasciae more evenly arched and slightly wider, the spots on the fifth segment larger, broadly reaching the base of the segment. Pile shorter throughout.

The scutellum sometimes has just a touch of ferruginous in the disc in both sexes.

Described from 16 ♂ and 3 ♀ from Pahang: Cameron's Highlands, Rhododendron Hill, 5200 ft., taken by H. M. Pendlebury on the following dates in June: 7 ♂ 1 ♀, 18; 3 ♂, 14; ♂, 19; ♂ 20; 4 ♂ 21st, 1924 and 2 ♀ March 14, 1925.

This striking species which is named after Mr. H. C. Robinson, late Director of the Federated Malay States Museums, shows practically no variation and is readily recognized by the distinctly arched abdominal fasciae, pale scutellum, long haired tibiae, etc. It furnishes proof of the stability of the species in this group.

Syrphus variscutatus sp. n.

Length, 10 to 11.5 mm. *Male.* Face and cheeks sulphur-yellow, shining, the former somewhat "bloated"

in appearance, in profile, almost straight to the apex of the long, low, slightly differentiated tubercle, the tip of the oral margin a little prominent but much receding from the tip of the tubercle, the concavity between them short. Cheeks not wide, the buccal margin almost straight, just slightly convex below the eyes, the oral angles not prominent. Most of the pile of the face is black, fine, sparse, but below and on the cheeks it is whitish and less evident. Opposite the tubercle the face occupies half the width of the head, the sides being convergent above, but even at the antennae it is two-fifths as wide as the head. The frontal triangle is almost as long as the distance from its upper point to the vertex and also gives somewhat the impression of being bloated, although actually rather flattened, there being a gentle concavity in the middle. A large triangle above the antennae and a slender median line reaching to the upper angle is rather orange-coloured and quite dull, the remainder of the front dull sulphur yellow; the black pile is long and rather abundant but leaves a bare space above the antennae. Vertical triangle brownish-black, not wide, nearly twice as long as its width, the anterior ocellus remote and situated at the very front of the triangle, the short pile black. Occiput opaque black, yellow behind the mouth, the broad orbits greyish-white pollinose where exposed and silvery white pilose, but the pile above is black. First antennal joint yellow to reddish, the second brownish-red to shining brown, the third red below, brownish above, not twice as long as wide, oval, the apex obtuse; arista black, moderately robust, tapering.

Sides of the mesonotum broadly, a broad stripe below the humeri, more than the posterior half of the mesopleura, (except narrowly below) a broad, transverse stripe on the upper part of the sternopleura running over the middle of the hypopleura and covering the metapleura, opaque pale yellow. Disc of mesonotum of a peculiar dull metallic grey-blue or grey-green colour, with a pair of median, somewhat darker, broad vittae; a broad opaque blackish vitta separates the metallic colour on the disc from the pale yellow lateral margins and also extends across in front of the scutellum, but even this region is sometimes covered with the greyish colour, rarely with a slight brownish tinge. The pleurae, except as mentioned, are metallic blue but are covered with greyish-white pollen. The black pile of the mesonotum is fairly long, moderately abundant, but there is a narrow anterior fascia and the sides before the suture and the pleura wholly, are yellow haired. Scutellum opaque sulphur yellow, with a subtriangular blackish to bronzed basal triangle which may have its apical sides more or less concave and varies somewhat in size, rarely being almost wanting; scutellar pile black, the ventral fringe yellow;

and there is a rather conspicuous downwardly-directed tuft of black hairs at the basal angles.

Anterior four femora and tibiae yellow, the hind legs and all the tarsi brownish-black, the bases of the posterior femora broadly, more or less distinctly, reddish; in other specimens there is a broad, brown basal band on the anterior four femora and no indication of pale bases to the hind ones. Pile practically all black, somewhat long on the femora. Legs slender.

Wings somewhat blackish-brown or strongly cinereous tinged, the whole subcostal cell deep brown. Third vein moderately curved forward beyond the middle of the apical cell and ending a little before the apex of the wing; veins brown.

Abdomen opaque black, only the broad apex of the fourth segment sometimes subopaque; in rubbed specimens there is a metallic blue reflection showing through; adorned with four reddish or sulphur yellow fasciae, the first band interrupted, the others entire. The spots comprising the first band are broadly separated in the middle and reach forward on their outer end to the base of the second segment, this anterior production being narrow: posteriorly they are very slightly convex, very gently so in front, their inner ends more or less rounded, but more pointed posteriorly, their outer end cut off obliquely by the forward projection of the black area to the basal fifth of the segment. The first band is sulphur yellow, the following three usually more reddish-yellow. The first segment has usually a transverse yellow spot in front. The band on the second segment is from two-fifths to a half as wide as the length of the segment. The fascia on the third segment is broadly separated from the anterior margin and is biconvex behind, gently biconcave in front, as the middle and lateral portions are nearer the base of the segment, especially so laterally, where the bands extend over the side margins in about half their width; pale fascia almost or quite one third as wide as the length of the segment. The band on the fourth segment is similar but slightly narrower and a little closer to the base of the segment. The fascia on the fifth segment is very narrowly separated from the base and is wider laterally and it may be so extensive as to leave only a transverse, oval apical fascia of black. All the fasciae are opaque. The pile is yellow and fine on the first segment and first fascia, elsewhere rather coarse, black.

Female. A single specimen shows the following differences: face reddish-yellow, the front of the same colour except on the upper fourth where it is black, wholly shining; in the middle of the yellow portion is a long, shining black triangle, its narrow base resting just above the antennae, its apex not reaching the black of the upper

part. From lateral view the front is gently convex, swollen immediately above the antennae, strongly narrowed above; black pilose; face with fine white pile. Occiput above, and the vertex, bright yellow pollinose; occipital pile on upper third and the cilia, yellowish, elsewhere white, rather silvery. Third antennal joint slightly wider.

Mesonotum with shorter pile, the pale hairs whitish and a little more extensive. Hind coxae (as in ♂) situated on yellow ground. Hind femora yellow on basal half; anterior four tarsi much paler; wings paler.

All abdominal bands slightly narrower, reaching the side margins a little more widely, the pile shorter.

Described from nine males and two females from the following localities: ♂♂, Pahang, Gunong Tahan, Seat Point 5460 ft., Jan. 17, 1923; same locality, Padang 5500 ft., Jan. 26, 1923; same locality, 6000-7100 ft., Dec. 12 and 14, 1921; same locality, Gunong Kechau 6300 ft., Jan 23, 1923; Pahang, Cameron's Highlands, Gunong Berumban 6050 ft., June 17, 1923. ♀♀ same locality, Rhododendron Hill 5200 ft., June 15, 1923. Peninsular Siam, Nakon Sri Tamarat, Khao Luang 2000 ft., March 29, 1922, all collected by H. M. Pendlebury.

Syrphus difficilis sp. n.

This species is near *variscutatus*, and also allied to *gedehanus* de Meijere. I am not absolutely certain that it is distinct from the latter although the mesonotum does not display the pale pollen on the disc. It is possible that this has been obscured, although the specimens appear to be perfect. If any of the species described here is the same as *gedehanus* it is almost certain to be *difficilis*. In the following description the species is compared with *variscutatus*.

Length, about 10 mm. *Male.* Head subtranslucent yellowish, the occiput behind the eyes and the vertical triangle, blackish-green, the latter thinly ochreous pollinose, thickly so behind the ocelli, the posterior orbits silvery-greyish pollinose, becoming white on the cheeks and narrow facial orbits, the front wholly with opaque yellow pollen, only the lunule shining and slightly infuscated. Frontal triangle with long, not abundant, black pile to the level of the antennae; pile of vertical triangle black, on the vertex and upper third of the posterior orbits, yellow, the orbits elsewhere silvery yellowish pilose, the face and cheeks with fine white pile. Hairs on posterior orbits inclined to be squamose. Facial profile as in *variscutatus*, the sides of the face distinctly diverging below, the tubercle a little more pronounced. Antennae similar.

Thorax with similar yellow markings, the disc wholly dark and apparently entirely lacking the peculiar metallic

colouring and pollen, although there are black pilose sub-lateral vittae and the apical third is similarly clothed; there are no black hairs on the yellow ground above the root of the wing. The scutellum bears a shining deep black triangle which leaves only the broad margin pale honey yellow.

The legs and abdomen appear to be similar, but the markings on the latter are not clearly discernible owing to slight discoloration. The genital claspers are much more hairy.

Female. Very distinct. The front is opaque, black only behind the ocelli and along the very narrow orbits on the upper half, elsewhere rather dull orange. There is no trace of a dark frontal triangle. Pleura wholly yellow on upper two-thirds; scutellum without the triangle and without a dark basal fascia. Posterior femora yellow on approximately the basal half. Otherwise scarcely differing from *variscutatus*.

Described from 2 ♂, 1 ♀ from Pahang. ♂, Cameron's Highlands No. 4. Camp, 4800 ft., Oct. 14, 1923; ♂ ♀, same locality, "Rhododendron Hill," 5200 ft., June 21, 1923, all collected by H. M. Pendlebury.

There may be some doubt about the above sexes belonging together but I think the absence of black fasciae on the pleura is only sexual.

Syrphus citrinum Brunetti.

Xanthogramma citrinum Brunetti, Fauna Brit. India, 95, Pl. II, f. 20, 1923.

Olbiosyrphus citrinum H.-B., Bull. Soc. Ent. Fr., 290, 1924.

This species is very similar to *variscutatus* but the hair of the occiput is wholly yellow above, although a few of the ciliae are brown, and the posterior femora of the ♂ are yellow on the basal third; the scutellum has a very sharply defined narrow basal black fascia separated from the sides and its disc is very slightly tinged with brown as in some specimens of *variscutatus*. The narrow black base of the scutellum readily distinguishes the ♀.

Length, 10 to 11 mm. *Male.* Differs from *variscutatus* as follows: head similar, the pile of the upper portion of the occiput shorter and yellow in colour.

Disc of mesonotum with slightly olivaceous or grey colour, not at all metallic, the prescutellar deep black fascia about as wide as the sublateral vittae, the greyish disc chiefly yellow haired, but there are a few scattered black hairs which become more abundant behind; pale side margins without any black hairs except on the posterior calli. In neither specimen does the brownish scutellar spot connect with the basal black fascia.

Posterior legs with the basal third of the femora yellow.

Abdominal fasciae rather similar, but the second and third bands are almost straight on their anterior edge, not at all concave, slightly notched in the middle; behind the bands have a small median notch and the band on the third segment is gradually narrowed to the lateral margin which it reaches in more than half its full width, while the band on the fourth segment is widened to the side on about the lateral fifth; on the fifth segment the base is moderately widely black, followed by an interrupted, laterally wider, reddish-yellow fascia. In all the specimens of *variscutatus* this fascia is entire.

Female. The frontal dark triangle is ferruginous reddish except on its brown, narrow, upper third, and is very broadly separated from the opaque black upper portion which extends well in front of the ocellar triangle and narrowly along the orbits half way to the antennae. The pleurae are wholly pale although there is a brownish stain on the mesopleura in front. The posterior legs have the basal three-fourths of the femora yellow, elsewhere black. First pale abdominal band basal (on second segment), extremely narrowly interrupted; following bands absolutely straight on anterior edge, not notched in front or behind, of the same general shape as in the ♂. Fascia on fifth segment narrowly interrupted.

Described from three specimens from Pahang: 2 ♂ ♀, Cameron's Highlands, "Rhododendron Hill", 5200 ft., June 22, (♀, 19th), 1923, all collected by H. M. Pendlebury.

The female differs from allied forms in having the pale fascia on the second segment of the abdomen basal and scarcely interrupted. The narrow base of the scutellum is even darker than in the ♂.

Syrphus exul sp. n.

Face with broad median black vitta; eyes bare; abdomen moderately broad, subopaque black, with four orange fasciae, the first one occupying the first and base of the second segment, the second on the middle of the second segment, the others on the bases of the two following segments.

Length, 14 mm. *Male.* Face and cheeks reddish-yellow, the former with the median third shining black, the sides whitish pollinose, the pile yellow but black on the upper angles and on the front. In profile the face is moderately concave between the antennae and the large, broadly nasal-form tubercle, below which it is retreating to the slightly prominent oral tip which is much less prominent than the frontal swelling. Front black, rather prominent, shining immediately above the antennae, brassy-yellow pollinose along the orbits, the middle with less abundant darker

pollen. Vertical triangle about twice as long as wide, the elongate ocellar triangle situated well forward. The eyes touch for a distance equal to less than the length of the vertical triangle. Occiput black, densely greyish pollinose, with black hairs on the upper fourth, yellow to about the middle and the lower half with white pile; vertical triangle with black hairs, a few yellow ones intermixed. Antennae black; third joint elongate oval, hardly one and a half times as long as wide; arista black, thickened on basal half.

Thorax aeneous, the lateral margins of the dorsum behind the suture broadly obscure reddish, the pleura greyish pollinose. Scutellum translucent reddish, clothed with black pile except the entire narrow margins, that on the thorax tawny. Mesonotum with five moderately distinct bronze vittae.

Legs reddish; basal two-thirds of the anterior four femora, the hind legs and all the tarsi, blackish; base of the hind femora and narrow knees, reddish; anterior four tibiae with more or less distinct brownish band beyond the middle. Pile of legs black except on the anterior four tibiae and tarsi, where it is yellow.

Wings tinged with luteous; third vein quite straight. Squamae greyish-yellow with orange border and bright brownish-yellow fringe. Halteres reddish-yellow.

Abdomen subopaque black; first segment reddish, with a large, distinct, darker spot towards the sides, forming with the base of the second segment a broad, pale fascia which is rather greyish pollinose and connects broadly along the sides with the fascia on the middle of the second segment; this latter fascia is narrowly interrupted in the middle (probably sometimes entire?) and is rather narrow. On the base of the third segment is a straight, distinctly narrower fascia and on the fourth segment a still slightly narrower one but this latter is very slightly undulated and the apex of the segment is also reddish. The abdominal pile is yellow almost to the apex of the second segment and quite long; beyond this, except for the wholly pale-haired side margins and a few hairs on the base of the third segment the pile is shorter and black. Genitalia black, with black pile.

Female. Front and face gradually widened from vertex to middle of face, the sides thence almost parallel; at the vertex equal to one-third the width of one eye; large supra-antennal area shining black, the upper two-fifths rather dulled; across about two-fifths of the front, immediately above the supra-antennal area, yellowish brownish pollinose, the orbits on the lower three-fifths rather widely yellow pollinose. Frontal pile wholly and that of the posterior orbits above, black.

The mesonotum is bluish aeneous, with five very distinct bronze vittae, the median one narrowest. The first abdominal segment bears a large black triangle towards each side which fills out most of the segment and the basal half of the second segment is wholly reddish-yellow except a small median black basal triangle.

Described from three specimens from Pahang: Gunong Tahan, Seat Point, 5460 ft., Feb. 2, 1923; "Cameron's Highlands", Rhododendron Hill, 5200 ft., June 20 and 21, 1923, all collected by H. M. Pendlebury.

This species is allied to *quinquivittatus* Brun., but is readily distinguished by having the basal third of the anterior four femora black, narrower abdominal fasciae etc.

Syrphus viridaureus Wiedemann.

Syrphus viridaureus Wied., Anal. Ent., 35, 1828.

Syrphus alternans Macq., Dipt. Exot., ii (2), 89, 1842.

Allied to *S. balteatus* DeG. but the venter is yellow, with black fasciae, the abdomen, especially the second segment, much more extensively pale, etc.

Length, 8.5 mm. *Female.* Face translucent yellow, densely white pollinose except on the tubercle and lower oral margin, its pile fine, white; in profile, somewhat retreating, its tubercle prominent, occupying a little more than the sub-lower third of the face, retreating below the tubercle to the oral tip. Front broadly shining yellow above the antennae, with an oval brownish spot above the base of each, the sides whitish pollinose; upper three-fourths metallic blue, but the ground colour concealed, except sometimes a fairly wide or narrow, elongate triangle which reaches to the anterior ocellus, by dull yellowish pollen, the ocellar region less thickly pollinose; pile cinereous to pale yellow at least on the lower half except the median line and always yellow at the vertex, nowhere abundant, very short in the region of the ocelli. The front is much longer than the face and is strongly narrowed above where it is only one-third as wide as at the antennae. Occiput grey pollinose, the orbits above with yellow pollen and pale yellow pile, but most of the pile is silvery-white. Knees white pollinose. Antennae yellow; third joint more or less brownish above, oval, a little more cut off below, so that it is rather sharply rounded at the upper apex; arista reddish brownish apically.

Mesonotum with the sides broadly translucent yellowish and densely greyish-white pollinose, and even when raised they are so shiny as to show their true colour only under careful observation; the middle line is broadly shining black but is thinly covered with greyish-white pollen; on either side of it is a broad, greyish-white pollinose vitta, broad of which is another shining black vitta occupying all the space to the pale lateral margins but it is rather narrow

and margined with a narrow brownish-bronze vitta on either side; the posterior fourth of the mesonotum is more brassy-bronzed. The pleurae are metallic blue with the mesopleura, upper margin of the sternopleura, a roundish spot behind it and another in front of the halteres, yellow, the whole whitish pollinose. The fine pile of the thorax is all whitish, not very abundant. Scutellum yellow, with black pile, the base and ventral fringe yellow.

Legs reddish-yellow, the hind tarsi becoming brownish apically, the posterior tibiae slightly darker in the region of the apical third. The fine hair is all yellow except on the upper apical half of the hind femora, their tibiae almost entirely and their tarsi on the upper surface where the hair is black, but the tibiae may be yellow-haired ventrally.

Wings hyaline; stigma brownish-grey. Squamae white, with white fringe. Halteres yellow.

Abdomen reddish-yellow, black as follows: more than the median half of the first segment; a triangle (its point resting on the base) or rectangular spot, reaching to the basal third of the second segment, its posterior corners extended as long, slender arms to the lateral fifth and the broad apex of the second segment, expanded narrowly along the margin to the middle; third segment with the broad apex and a slender, very gently arched fascia on the basal third, sometimes narrowly interrupted on the middle line; fourth segment similar but with a narrower dark apex. The black is opaque as follows: the arms of the triangle on the second segment, about the anterior fourth of the black apical fasciae, elsewhere with a bluish or aeneous reflection. The fifth and following segments are apparently all reddish. The black pile is short, appressed; except on the first broad fascia, the pile is yellowish on the first two segments and also on the longitudinal lateral angles of the two following segments. The black fasciae vary considerably in width from almost wanting to quite wide and the anterior ones on the segments may or may not be interrupted.

Male. Frontal triangle densely yellow pollinose except a narrow steel-blue vitta above the lunule; wholly clothed with rather short yellow pile.

The following specimens are in the collection: ♀, Malay Peninsula, Selangor, Kuala Lumpur, (on bamboo hedge), June 15, 1924, and a ♂, June 6, 1924; ♀, Selangor-Pahang border, Ginting Sempak, Oct. 12, 1921; ♀, (without abdomen), Kuala Lumpur, Aug. 13, 1922; 2♂, West Java, Preanger Regency, Papandajan, 5500-6000 ft., April 22, 1923, 2♂, Pahang, "Cameron's Highlands," 5100 ft., March 12, 1925, all collected by H. M. Pendlebury.

I do not agree with de Meijere and Brunetti in placing *nectarinus* and *viridaureus* as at most varieties of *balteatus*,

but believe that there are several closely related species and that biological studies will prove this to be the case.

Syrphus nectarinus Wiedemann.

A single ♂, West Java, Preanger Regency, Papandajan, 5600-6000 ft., April 23, 1923, may be this species. It has the frontal and vertical triangles black pilose and the median half of the posterior femora brown; the median shining vitta of the mesonotum is wider and divided by a slender grey pollinose median line.

Syrphus balteatus De Geer has the front long black pilose in both sexes, the genital claspers narrower than in the Asiatic species, the front wider in the ♀, frontal triangle longer in the ♂; third antennal joint shorter in both sexes and many other differences.

The correct identity of the species I have described above must be considered very doubtful. There are evidently several species belonging to this group but large series together with a study of the immature stages are necessary before actual progress can be made in determining the specific limits. This can be done only in the field, and the larvae are undoubtedly plentiful. Fetid females deposit eggs fairly readily when Aphid colonies are provided.

Syrphus deceptor sp. n.

Abdomen narrow, with almost parallel sides; first segment, except in the middle, and the basal two-thirds of the second except the middle line, reddish-yellow; beyond, with three similarly coloured, slightly arched, entire fasciae; face with a complete black median stripe.

Length, 10.5 mm. wing, 10 mm. *Male.* Face yellow, with pale yellow pollen, the oral margin narrowly, and the black or brown middle facial stripe, shining; jowls reddish yellow, somewhat brownish in front. In profile the face is perpendicular, gently concave between the antennae and the tip of the long, low, nasiform tubercle, below it, shortly concave, the oral tip one-third as prominent as the tubercle. Frontal triangle with a shining black arch above the antennae, elsewhere brownish-yellow pollinose. Pile of the face yellow, that on the front black. Vertical triangle narrow, slightly over twice as long as wide, black-haired, black in ground colour and clothed with thin ochreous pollen. Eyes contiguous for a greater distance than the length of the vertical triangle. Occiput greyish pollinose, clothed with white pile, the orbital cilia black. Antennae reddish, the third joint brown on the upper half, twice as long as wide, tapering, its apex obtusely rounded; arista reddish, not stout, tapering.

Mesonotum deep greenish-black, rather thinly covered with ochre brown pollen; a large lateral triangle before the

suture, the mesopleura, except in front, and the upper margin of the sternopleura rather golden yellow pollinose, the ground colour reddish beneath the pollen; broad margins above and behind the roots of the wings rather bronzed reddish. Pleura moderately densely ochreous pollinose, the pollen on the posterior part more yellow or whitish. Pile on thorax all pale yellow or almost whitish, rather long but fine and not abundant. Scutellum yellow, with sparse, long, black pile, the ventral fringe long and yellow in colour.

Anterior four legs, except the middle coxae, reddish yellow, the middle femora sometimes brownish basally on the under side. Hind legs brownish, the bases and apices of the femora, coxae and trochanters, reddish. Pile of the legs mostly yellow; on the posterior apical half of the anterior four femora and apical half of the hind ones, (long on the anterior four posteriorly and on the hind ones anteriorly) and the posterior tibiae, with brownish-black pile, that on the antero-dorsal surface of the tibiae rather ciliate and longer.

Wings distinctly infuscated, darker anteriorly; stigma yellowish-brown. Squamae pale yellowish, with yellow border and fringe. Halteres yellow.

Abdomen bluish-black, overlaid with brownish pollen so that it appears brownish-black, subopaque. First segment and large, basal subrectangular spots on the second segment on either side, reddish-yellow: the spots reach the apical fourth on the sides and are oblique posteriorly, the middle line is broadly black to the base of the abdomen and may be slightly widened in front. Second and third segments each with a subbasal, slightly arched, wide reddish fascia, which is more widely separated from the base towards the sides but expanded just at the sides so that it is as close to the base at the margin as at the middle; that on the third segment averages half as wide as the length of the segment, the following one being somewhat narrower. Apex of the fourth segment reddish, except at the sides, the fifth with reddish triangles in the basal angles, its apex somewhat reddish. Pile, before the first black band (except on the black part of the first segment), on the yellow fascia on the third segment and on the lateral margin of the fascia on the fourth, long, not abundant, rather fine, yellow: elsewhere, black and shorter but longer on the sides.

♂, Pahang, F.M.S., Gunong Kechau, 6300 ft., Jan. 23, 1923; 2♂, Pahang, Gunong Tahan, 6500 ft., Dec. 12, 1921, ♂, same locality, Padang Luas, 4900 ft., Dec. 31, 1922, all collected by H. M. Pendlebury.

Readily distinguished from the following species by the chiefly yellow first abdominal segment, partly yellow or reddish thorax and entire black facial stripe.

Syrphus strigifrons de Meijere.

Syrphus cincitellus var. *strigifrons* de Meij., Tijds. voor Ent., lvi, 158, 1914.

Described as a variety of *cincitellus* Zett. but quite distinct, the black on the second abdominal segment not expanding at the base, the face less sharp and with no trace of brownish vitta on the tubercle, which is more oval etc. Eyes bare.

Length, about 14 mm. *Male*. Face reddish-yellow or orange, densely reddish-yellow pollinose, except the oval tubercle which is less prominent than the antennal base; frontal triangle concolorous, with a large squarish or pentagonal shining black spot above the antennae. Vertical triangle one and a half as long as wide, the ocelli situated the length of their triangle before the vertex, greenish-black in ground colour, thinly brown pollinose and black pilose. Occiput silvery greyish pollinose, more yellowish above, the pile yellow above, pale yellow elsewhere, but with white reflection. Cheeks orange, the pile white. Antennae orange, brownish above; third joint elongate oval, one and three-quarters as long as wide, slightly tapering; arista brownish-red, microscopically pubescent.

Mesonotum greenish-black, with brassy reflection, thinly clothed with brownish pollen, the broad margins before the suture reddish with covering of thick yellow pollen, the posterior calli reddish. Mesopleura, except the anterior border, the propleura, except the posterior margin, a fascia extending in an arch along the upper surface of the sternopleura to beneath the outer corner of the squamae (more or less interrupted at the sutures) and the scutellum, reddish, the pleura yellow pollinose. Pile of mesonotum rather fuscous, fairly long, not abundant, on the sides tawny and more abundant, on the pleura, yellow, the scutellum with long sparse black pile, the lower fringe long and yellow.

Coxae and legs orange, the median half of the posterior femora and their tibiae and tarsi, brown or black, the apical third of the hind femora also sometimes brown so that only the basal fourth is orange. Pile all yellow except that it is black on the posterior legs beyond the middle of the femora.

Wings strongly infuscated and still darker in front, especially apically. Squamae, their fringe, and the halteres, yellow.

Abdomen opaque black with dull orange markings as follows: first segment shining orange except on the narrow middle or sometimes the apex on the median two-thirds; second segment wholly pale except the apical third and fairly broad median vitta, the black posterior fascia gently arched in front. Third segment with a broad, gently arched

sub-basal fascia which has the posterior margin straight and a little oblique on either side, the fascia occupying almost half the segment and extending over the side margins; fourth segment similar, but the fascia almost touches the base in the middle and the apex is fairly broadly red, the apical fascia broadly separated from the lateral margins; fifth segment on the base with a pair of subtriangular reddish spots which occupy half the segment at the sides and are separated from each other by about half their greatest width and in addition the apex of the segment is broadly obscure reddish. Genitalia bronze-black, covered with brownish-red pollen. Pile fine and yellow on the basal yellow portions and the margins opposite the yellow fasciae, elsewhere coarser, fairly long and black.

De Meijere described the first segment as black only in the middle, but the species is variable in this respect.

Two ♂, Pahang, "Cameron's Highlands", Rhododendron Hill, 5200 ft., June 20, 1923, collected by H. M. Pendlebury.

Syrphus deceptor has an entire black facial stripe, while *S. cinctellus* has a bare median (not pollinose above and below the tubercle) vitta.

Syrphus tenuiformis sp. n.

Face with a median black stripe not reaching the antennae; abdomen slender, with four yellowish-red fasciae, the first very broad and interrupted, the remainder entire; anterior and posterior coxae reddish.

Length, 10 mm. *Male*. Face pale yellow, the cheeks more reddish, the former densely pale yellow pollinose, the middle line shining black, but not reaching to the base of the antennae; in profile, slightly retreating, with a conspicuous, nasiform tubercle lying mostly below the middle, gently concave above, shortly concave below the tubercle, the oral tip a little produced. Frontal triangle aeneous, with a shining black area above the antennae, elsewhere clothed with rusty reddish pollen; frontal pile all black, that on the face yellowish, except on the upper angles. The shining black supra-antennal region encloses a scutiform, raised, polished area which has a large puncture above, on either side of which is a wide groove which leaves the margin of the shining area rather conspicuously prominent. Vertical triangle aeneous, covered with moderately abundant rusty pollen and clothed with black pile; narrow, almost twice as long as wide. The eyes touch for a distance equal to one and a half times the length of the vertical triangle. Occiput grey pollinose, yellow pilose. Antennae reddish, the third joint brown above, broadly so apically, elongate oval; arista brown, reddish just at the base, fairly stout, tapering.

Thorax deep greenish-black, the mesonotum thinly ochraceous pollinose, the sides before the suture broadly and the mesopleura densely pollinose, so that the ground colour, which is not reddish, is not visible. There is a large, transverse rectangle just before the scutellum, less evidently pollinose. Pleura more thickly pollinose than the dorsum, the pollen rather pale yellow or even whitish on the posterior part. The pile on the thorax is sparse, fine, white, but it may be somewhat yellowish tinged on the disc. Scutellum rather dull reddish, yellow pollinose, clothed with long, sparse, black pile, the ventral fringe long and yellow.

Anterior four legs, and the hind legs on the base of the femora, reddish, the hind legs and middle coxae, black, the anterior four femora more or less reddish brown basally on their anterior surface, their tibiae rather ferruginous just beyond the middle. Pile of the legs chiefly yellow; anterior four femora with long black hairs on the apical half behind the hind ones on the whole apical half. Posterior tibiae with a row of short, ciliate black hairs on the antero-dorsal surface.

Wings somewhat infuscated; stigma brown, long, acute. Squamae pale yellow, with yellow border and fringe. Halteres yellow.

Abdomen subopaque black; with reddish markings. First segment rather brassy-black, the angles broadly, the sides narrowly, reddish. Sides of the second segment on the anterior two-thirds, reaching broadly towards the middle line, the resultant spots with their anterior and posterior sides oblique, their inner end broadly rounded, a little more cut off in front, broadly separated from each other. The middle portion of the second segment, in front, is somewhat brassy. Third segment with a broad, subbasal, slightly arched reddish fascia which occupies about one-third the length of the segment and is slightly wider laterally. Fourth segment with a similar band, but it reaches the base of the segment in the middle and is slightly narrower, the apex of the segment also reddish except laterally. The fifth segment bears a reddish, subtriangular spot on the basal angles which is continuous with the red on the apex of the preceding segment and forms the fourth fascia. Abdominal pile yellow on the base and on the pale fasciae, black on the black areas behind the first large yellow spots and on the fifth segment and genitalia, long on the sides of the abdomen.

♂, Pahang, F.M.S., Gunong Tahan, 6500 to 7100 ft. Dec. 14, 1921, and a ♂, Dec. 15, 1921, collected by H. M. Pendlebury.

The specimens were possibly taken in company with the preceding species and resemble it rather closely. It is distinguished quite readily by the facial stripe not reaching

the antennae, the absence of reddish ground colour on the mesopleura and the black base of the second abdominal segments.

Syrphus malayensis sp. n.

The sides of the abdomen are parallel, the pale spots much as in the ♂ of *Melanostoma scalare*.

Length, 10.5 to 11.5 mm. *Male*. Face reddish-yellow, sometimes with ferruginous tinge, the cheeks below and the tubercle, shining, elsewhere densely orange pollinose, the oral margin as prominent as the antennal base, the tubercle long, low, nasiform, a gentle concavity between its tip and the antennal prominence, the black pile fine. Frontal triangle black, densely brownish ochreous pollinose except the shining brownish lunular spot, the pile long, black, not very abundant. Vertical triangle dull brownish black, the ocellar triangle a little longer than wide, placed its own length in front of the vertex; vertical triangle almost twice as long as wide, its sides straight. Occiput black, greyish pollinose, the occipital cilia black, the pile elsewhere yellowish. Cheeks reddish or a little infuscated, with grey pollen and short, sparse, yellow pile. Antennae orange, the upper third of the third joint brown beyond the base of the arista which is black and sparsely microscopically pubescent.

Thorax shining greenish-black, fairly thickly covered with brownish pollen, the pile on the dorsum long, fairly abundant, black, the sides before the suture broadly densely yellow pollinose and pilose, the ground colour beneath apparently reddish and the yellow pollen continues down over the mesopleura on to the sternopleura, the ground colour beneath possibly reddish, the pleura elsewhere with thinner greyish tinged pollen, the pile yellow. Scutellum reddish, with sparse, long black pile, the ventral fringe long and yellow.

Legs, including the anterior and posterior coxae, reddish, the posterior tibiae and tarsi blackish or brown, their femora with a very broad, never very dark, brownish band at the middle, but this often wanting. Pile blackish except that the bases of the anterior four femora may bear yellow hairs.

Wings yellowish hyaline with the broad costal region dark brown, this colour spreading backwards apically. Squamae and fringe rather tawny or deep orange, the rather long orange halteres with somewhat ferruginous knob.

Abdomen: first and second segments orange, with almost the median third, expanding behind to form a narrow, outwardly tapering fascia, opaque black. Third segment similar, but the median vitta is narrower and more gradually dilated behind so as to leave the inner margin of

the orange spots convex posteriorly and the apical opaque fascia is much wider, (rarely the spots are more rectangular and in all cases about the apical fifth of the segment is black, increasing in width to the middle, from about the lateral fifth); sometimes the spots are parallel on their inner basal half, thence oblique to the lateral posterior fifth. The spots on the fourth segment are subject to the same variation, but they are shorter and always oblique posteriorly as they extend obliquely to the lateral margin which they reach at about the apical third of the segment, (they are usually slightly longer than wide, while the spots on the preceding segments are very much longer than wide). The fifth segment is practically wholly shining black, but in one specimen there is a broad, medianly narrowed and interrupted, obscure reddish basal fascia and this is probably the normal condition. The pale markings are opaque, the black not wholly opaque; the broad apex of the fourth segment and whole lateral margin shining. The black usually extends somewhat forward along the lateral margin but never distinctly so. The pile is black on the black markings and posteriorly from the base of the fourth segment (except the basal half of the margins of this segment), elsewhere, fine and yellow, the black pile on the disc, appressed. Genitalia black, with black hair.

Described from four ♂♂ from Pahang, "Cameron's Highlands", Rhododendron Hill, 5200 ft., June 14, 15 and 20, 1923, and 1 ♂, "Cameron's Highlands", Gunong Berumban (summit) 6050 ft., March 14, 1924, all collected by H. M. Pendlebury.

This species has the general superficial appearance of a *Platycheirus*, especially those species related to *P. perpallidus* Verr., notably *P. quadratus* Say, of North America. The dark costa is very striking and should facilitate identification. I know of no other species which could possibly be confused with it.

Genus *Malayomyia* gen. n.

Allied to *Syrphus* but distinguished as follows: basal half of abdomen opaque black, apical half orange red, the pile concolorous with the integument, the abdomen elongate oval, moderately convex, the pile long, erect, abundant. Differs from *Eriozona* in the much longer, strongly margined abdomen, shape of face, etc. Genotype, *M. pretiosa* sp. n. (Pl. III, fig. 4, and text figure 12).

Except for the convex abdomen the habitus of the genus is the same as *Syrphus*, the abdomen lacking pale fasciae.

Malayomyia pretiosa sp. n. (Fig. 12; Plate III, fig. 4).

Length, 15 to 16 mm. Eyes tawny pilose, becoming paler below. Face orange, except on the median stripe, tawny pollinose, the profile as in fig. 12, the tubercle long, broadly nasiform, the face quite swollen, with abundant yellow pile. Frontal triangle strongly produced, oblique, not inflated, black pilose, yellow pollinose except in front. Vertical triangle over two and a half times as long as wide, acute, the ocelli placed more than the length of their triangle before the vertex, the ground colour black, with a thin covering of brownish pollen. Occiput black, densely yellowish to grey pollinose, wholly yellow pilose. Cheeks and lower third of occiput orange, with pale pile. Antennae red, the first two joints with rather abundant black hairs; arista red.

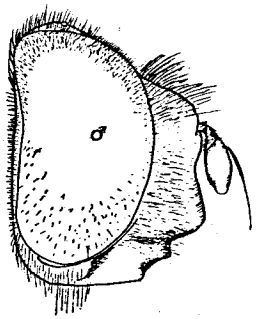


Fig. 12. Head of *M. pretiosa* sp. n.

Thorax dull aeneous black, the pleura with yellowish-brown pollen; mesonotum with a pair of moderately separated, posteriorly diverging darker stripes on the anterior half in the middle and another slender vitta on the anterior two-thirds about half way between the middle and sides; pile black, the lateral margins and mesopleura with rather tawny pile, the disc in front with a few pale hairs intermixed. Scutellum rusty reddish, with long black pile, the ventral fringe also black and strong.

Legs rusty reddish, the basal third of the anterior four and half of the posterior femora black; the colour of the pile follows the ground colour except that the black pile is a little more extensive behind the femora.

Wings amber coloured, rather brownish in front, apically paler behind. Squamae brownish, the lower lobe with broad orange border and rather orange-brown fringe, the fringe on the upper lobe brown.

Abdomen with the first, second and basal third to half of the third segment, opaque black, the moderately wide apex of the second, the lateral margin behind the middle of the second and whole terminal portion of the abdomen, rusty reddish, the pile tawny, except on the second segment, where it is particularly abundant, strong, black; a few black hairs also on the base of the third segment in the middle and some pale hairs on the margin of the second behind. Abdomen very strongly margined.

Described from two specimens from Pahang. "Cameron's Highlands", Rhododendron Hill, 5200 ft., June 19, 1923, collected by H. M. Pendlebury.

Genus *Asarkina* Macquart.

Asarkina of authors.

Differs from *Syrphus* in the broader much more flattened abdomen and the presence of squamose hairs on the occiput. Oral margin usually oblique and much elongated, the face always prominent below; usually there is a collar of long hairs extending across the mesonotum immediately behind the humeri. Genotype: *A. rostratum* Wiedemann. (Africa).

This genus cannot be separated from *Syrphus* and allies by any single character but the habitus is very distinctive. There is no character occurring in *Asarkina* that does not find a counterpart in *Syrphus*, yet the insects of the respective genera are exceptionally distinct in appearance.

The genus, which is well represented in the collection, is a difficult one and the specific limits are not well understood. Bezzi considers most of the species of the *ericetorum*-group as varieties, but I believe that they are quite distinct and that a study of the immature stages will prove them so. Certainly the forms before me are sufficiently constant to be considered good species.

Table of Species.

- | | | |
|--------------------------------------------------------------------------------------------------------------------|---|----------------------|
| 1. Wings largely black or brown, with the balance hyaline | - | 2. |
| Wings more or less evenly infuscated or hyaline | - | 3. |
| 2. Wings with a pale (usually hyaline) subbasal fascia; pile on mesopleura and squamal fringe distinctly yellowish | - | <i>aegrota</i> Fabr. |
| Wings without a pale subbasal fascia; pile on mesopleura pure silvery-white; squamae with white fringe | - | <i>pura</i> sp. n. |
| 3. Face without a median black stripe | - | 4. |
| Face with a median black stripe, or the tubercle black | - | 6. |
| 4. Frontal triangle and lower part of front of ♀ yellow pilose | - | 5. |
| Frontal triangle and front black pilose | - | 8. |

5. Third antennal joint oval, laterally compressed; black abdominal fasciae more than one-third as wide as length of third segment; apical half of posterior femora and their tibiae wholly, brown - - - *laticornis* sp. n.
- Third antennal joint not compressed, tapering; black abdominal fasciae not one-fourth as wide as length of third abdominal segment; posterior femora wholly reddish, their tibiae scarcely darker - - - *salviae* Fabr.
6. Cheeks wholly orange coloured before the jowls, the median facial vitta not reaching the oral margin. - - - *incompleta* sp. n.
- Cheeks wholly or more than half black before the jowls, the median facial vitta reaching the oral margin - - - 7.
7. All the femora broadly blackish subbasally; pile on disc of mesonotum black - - - *nigripes* sp. n.
- Femora all orange basally; pile of thorax wholly tawny - - - *biroi* Bezzi.
8. First abdominal segment wholly orange except the incisure - *consequens* Walk.
- First abdominal segment black beneath the scutellum, the sides orange - - - *consequens* var. *exilis* var. n.

Asarkina aegrota Fabricius.

Wings brownish on more than the basal half, usually with a broad, rarely a narrow, subbasal hyaline or yellowish fascia.

Length, 11 to 14 mm. *Male*. Face yellowish, densely whitish pollinose; the cheeks, except behind, broad oral margin and almost the median third of the face, not reaching the base of the antennae, shining black, the cheeks and lower part of the face chiefly pollinose, the middle line of the face broadly bordered with metallic blue. In profile the face is a little receding, convex immediately below the antennae, shallowly concave between the antennae and the tip of the rather nasiform tubercle, the short space between the tubercle and the oral tip almost perpendicular, the tip of the tubercle on a plane with the apex of the antennal

prominence. Facial pile all white, not long, rather abundant. Frontal triangle metallic blue, the orbits narrowly pale yellowish pollinose, the arms of the supra-antennal W more or less reddish; pile black, rather abundant, not long. Vertical triangle over three times as long as wide, its sides parallel behind the posterior ocelli which are situated before the middle, the anterior ocellus remote; the ground colour is black, thinly covered with brown pollen, the pile short, black. The eyes touch for a distance equal to twice the length of the ocellar triangle, but are only closely contiguous in the middle. Occiput greyish-white pollinose, bluish above; with yellow pile above, and pale yellowish scale-like hairs on the margin on the lower three-fourths and white scale-like hairs between the margin and the orbits. Antennae reddish, brownish above, the third joint brown above and on almost the apical half, suboval, more pointed on the apical half, one and a half times as long as wide; arista brownish, slightly stout, tapering from just beyond its base.

Mesonotum bluish-black, moderately shining, towards the sides aeneous, the lateral margin more or less distinctly diffusely reddish; pile black, the frontal fringe long, yellow, the whole dorsum margined with yellow pile. Pleura blue in ground colour, white pollinose before the wings except in front, the pile white. Scutellum translucent reddish yellow, with short black pile, the ventral fringe black and directed obliquely downward.

Anterior four legs reddish-yellow, their coxae, trochanters, basal fourth of the anterior femora, basal third of the middle ones (extending to the middle below) and the hind legs entirely, brown or black, the anterior four tarsi becoming black on the last two or three joints. Pile of the legs chiefly black, the anterior femora in front and the anterior four tibiae, with short, appressed, yellow pile, the middle tibiae with short, black bristles on the outer surface.

Wings brownish on nearly the basal two-thirds, the brown margin slightly oblique apically; across the basal third of the wings with a broad hyaline or yellowish fascia, the anal lobe always hyaline, the fascia rarely narrower.

First abdominal segment brown, its sides yellow. Basal two-thirds or slightly more of the second segment, except a broad median vitta which expands slightly in front and lateral triangles reaching forward to the basal third, pale yellow, the segment elsewhere opaque brown or black. Not quite the basal half of the second segment is yellow; there is a slight median projection of the black on the middle line and the pale fascia is narrower at the sides. Basal fascia of the fourth segment narrowest in the middle, slightly increasing in width to the sides where it is slightly more than one-third as wide as the length of the segment, the

immediate apex of the segment reddish. Fifth segment slightly shining black, its apex and sides reddish, the basal lateral reddish triangles fairly large. Pile yellow from the base of the abdomen to the apex of the first yellow fascia, thence entirely black, longer and very dense on the sides.

Female. Front very narrow above, black, covered on the middle half with opaque yellowish-brown pollen, the lower fourth metallic blue with narrowly yellowish pollinose sides; ocelli situated well forward, pile all black. Pile on the mesonotum more extensively yellow on the whole margin. There are usually some yellow hairs on the abdominal margin opposite the fasciae on the third and fourth segments.

♂, Perak, F.M.S., Jor Camp, 2000 ft., Sept. 6, 1922, collected by E. Seimund; 2 ♀, Pahang, F.M.S., Kuala Tahan, 300 ft., Nov. 21, 1921, ♂, 3 ♀, Perak, Batang Padang, Jor Camp, 1500, 1800 ft., May 28, 29, 30, 1924, ♀ Pahang, Lubok Tamang, 3500 ft., June 10, 1923, all collected by H. M. Pendlebury.

Asarkina pura sp. n.

Wings brown on the basal two-thirds; antennae reddish; abdomen opaque black, with a faint brownish gloss, adorned with three broad reddish fasciae.

Length, 10.5 mm. *Female.* Face yellow, the median fourth, not quite reaching the base of the antennae, brownish black, the cheeks also black before the jowls; face, except on the middle line, densely white pollinose; in profile gently rounded above, gently concave between the antennal prominence and tip of the tubercle below which it is shortly receding to the oral tip; apex of the tubercle on a plane with the apex of the antennal prominence. Front strongly narrowed above, the ocelli placed well forward, their swollen triangle continued back to the vertex, the area between this slight swelling and the orbits level, polished; lower fourth of the front shining brownish or blackish, the broad supra-antennal W brownish-red, the middle portion of the front densely pollinose: just above the shining portion is a large whitish triangle resting on the orbits, its lower edge transverse, but continued narrowly along the eyes to the face and between the whitish triangles is a brownish one the apex of which points towards the antennae while its upper margin is transverse and situated well before the ocelli but it is continued narrowly along the orbits to the middle of the ocellar triangle; upper portion of the front shining black; frontal pile all black. Occiput greyish-white pollinose on the greater part, thinly brownish pollinose above, clothed with wholly white or silvery-white pile. Antennae reddish yellow, the third joint broadly pale brownish on the upper surface beyond the arista, hardly twice as long as wide,

its lower margin almost straight, its upper convex, more truncate apically, so that its apex is more pointed towards the bottom; arista reddish, situated at the basal third on the outer dorsal surface, fairly stout, slightly tapering, not much longer than the third antennal joint.

Mesonotum deep shining black, the margins before the suture densely white pollinose, behind the suture rather reddish pollinose; the pile is almost all whitish, being black only on a large area above the root of the wing, but not conspicuous, although it is more abundant and longer on the sides. Pleura brownish-black, with white pile, densely white pollinose before the wings except in front. Scutellum reddish-yellow, with sparse, rather short, yellow and black hairs intermixed, the latter more abundant, the pile slightly longer apically.

Anterior four legs reddish-yellow, the bases of their femora more or less brownish, their tarsi becoming reddish brown. Posterior femora, except the narrow base and apex, their tibiae, except the obscure, broad base and apex, and the hind tarsi wholly, brownish, the femora reddish basally and apically, their tibiae obscurely so. Pile on the anterior four legs all pale, on the hind ones, all black.

Wings deep brown on the basal three-fifths or slightly more, hyaline apically. Squamae white, with white fringe; halteres bright yellow.

First abdominal segment brownish, its sides broadly reddish-yellow. Second segment with the basal two-thirds orange yellow, the opaque black apical fascia emitting a narrow triangle forward along the lateral margin to the middle of the segment and also a narrow, short, median triangle; at the base of the segment is a brownish, transverse, short oval spot. Basal three-fifths of the third segment orange, the hind margin of which is very slightly convex; almost the basal half of the fourth segment is orange, but the fascia is narrowed slightly in the middle and is not narrowed laterally, although there is a slight, sub-lateral constriction; it is nowhere quite half as wide as the middle of the segment. Apex of the fourth segment reddish; large basal triangles occupying just the whole length of the fifth segment at the sides, also reddish. Abdominal pile fine, yellowish, erect in front of the first black fascia, behind this sub-appressed, shorter, black, except that it is pale on the anterior half of the second and third pale fasciae just along the margins.

Described from a ♀, Selangor, Ampang, F.R., jungle 600 ft., Oct. 1920, collected by H. C. Abraham.

This may prove to be only a variety of *A. aegrota* Fabr. but the differences between the two species are quite sufficient to warrant separation of the two forms. The

species related to *Syrphus* are very often more easily distinguished in the larval than in the adult stage.

Asarkina salviae Fabr. (Fig. 13).

Syrphus salviae Fabr. Ent. Syst. IV, 306.

Face and frontal triangle wholly yellow pilose; abdomen wholly reddish except the narrow segmental apices and slender median vitta on the first two segments; legs orange, the hind tarsi brown.

Length, 12 mm. *Male*. Face and front orange, the sides of the former very broadly thinly whitish pollinose and with a bluish opalescence. In profile the face is almost perpendicular on the upper fourth, still, slightly produced, the lower half gently convex but almost perpendicular, the tubercle, which is most prominent at the middle of the face, is slightly convex on its upper surface. The lower mouth edge is strongly oblique so that its anterior edge is situated at about the lower fifth of the eyes. The face is rather pinched, the lower three fourths being obscurely carinate. Frontal triangle longer than broad, acute above, yellow pollinose except broadly above the antennae; without a black spot. Vertical triangle practically three times as long as wide, bronze black, the ocellar triangle situated on its anterior half; pile very short, black. Occiput silvery-yellow or whitish pollinose, the scale-like hairs yellow, becoming white on the lower half. Cheeks green behind the middle of the eyes. Antennae reddish, the third joint obscure brown on the upper surface, subcordate, its upper margin flattened. Arista brown, as long as the last two antennal joints.

Mesonotum greenish-black, its lateral margins rather broadly orange, its pile short, longer laterally, tawny. Pleura blackish, thinly covered with yellowish pollen; mesopleura and a contiguous area below the wings, orange, the pile tawny. Scutellum orange, with similarly coloured pile but the hairs on the apical third are stouter, longer and black in colour.

Anterior four tarsi brownish-blue, the hind ones and the remainder of the legs, except the brown posterior tarsi, orange. The posterior tibiae are very conspicuously black pilose on the antero-dorsal surface and less so on the dorsal surface, their tarsi also black haired, the legs otherwise with yellow hair,

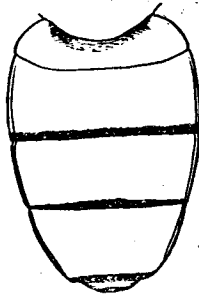


Fig. 13. Abdomen of *A. salviae* Fabr.

Wings tinged with luteous, this colour fading out posteriorly. The third vein is slightly curved into the apical cell about its middle, thence rather strongly carried forward so that the cell is twice as wide subapically as at its base. Squamae and halteres orange, the fringe of the former of the same colour.

Abdomen orange, the apices of the second to fifth segments narrowly black, the first two segments with a narrow median vitta. The pile is almost all black beyond the first black fascia, orange basally; all the hairs hanging downwards on the side margins are also orange. Genitalia black, yellow pollinose, not large.

Female. The lower fifth of the front is orange, the rest greenish-black, the sides evidently rather broadly yellow pollinose; its width at the vertex is about one-fourth that at the antennae. The first two abdominal segments lack the median dark vitta.

♂, Selangor, F.M.S., Kuala Lumpur, July 24, 1921; ♀, same locality, June 9, 1922, collected by H. M. Pendlebury; ♂, Amboina, (F. Muir).

Asarkina consequens Walker. (Fig. 14).

Syrphus consequens Walk., Journ. Proc. Lin. Soc. Lond., i, 18, 1857, (Singapore).

Lower half of face rather prominent; frontal triangle black with yellow pollen, swollen and polished below, posterior tibiae and tarsi wholly, the apex of their femora broadly, black; coxae all yellow.

Length, 11 to 16 mm. *Male*. Middle of face and cheeks shining orange, the sides of the face white pollinose, the pile fine, white. In profile the face is perpendicular or very gently concave immediately below the antennae, concave on almost the upper half, the broad, roundly-nasiform tubercle most prominent below the middle of the face, shortly, sharply concave below the tubercle; lower edge of the cheeks rather strongly oblique but not quite straight, the anterior mouth-edge level with the lower fifth of the eye. Jowls, and sometimes the posterior half of the cheeks, greenish-black, covered with white pollen. Frontal triangle swollen in front, polished black, only the arms of the W and

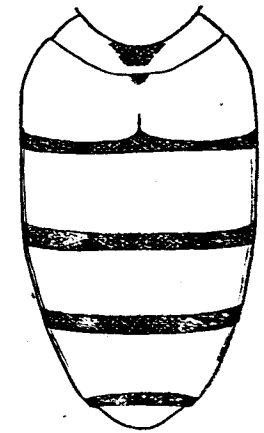


Fig. 14. Abdomen of *A. consequens* Walk.

small orbital triangles below, reddish; except the swelling, thickly yellow pollinose, the pile black. Vertical triangle over twice as long as wide, shining black, with short black pile. Occiput silvery-white pollinose, the pile on its upper third or less, yellow, elsewhere silvery-white. Antennae reddish, the third joint black on the upper third, almost twice as long as wide, sub-cordate, its upper margin more flattened, its apex more sharply rounded above. Arista brown, as long as the antenna, microscopically pubescent on the thickened basal third.

Mesonotum shining black, the side margins broadly reddish; pleura chiefly reddish, blackish in front, behind, and bordering the pectus; pile of the thorax tawny, except sometimes some black hairs on either side of the mesonotum bordering the root of the wings. Scutellum translucent reddish-yellow, clothed with black pile except at the base.

Legs, including the coxae, reddish, the apices of the posterior femora, posterior tibiae and their tarsi, black, the two subapical joints of the anterior four tarsi tinged with fuscous. Apical half of the posterior femora, their tibiae entirely and all the tarsi, except the foot pads, black-haired, the legs elsewhere with reddish-yellow pile.

Wings tinged with brownish or luteous, which fades out somewhat posteriorly; stigma fuscous to luteous. Third longitudinal vein gently undulated. Squamae and halteres reddish-yellow, the former with tawny fringe.

Abdomen reddish-yellow to orange, with four black fasciae, each of which is successively narrower than the preceding, situated on the posterior margins of the segments. First segment reddish, the incisure between this and the following segment usually very narrowly black. Each black fascia occupies almost the posterior third of the segment and that on the second segment emits a small anterior triangle along the middle line and there is usually a faint median vitta on this segment. The abdomen is black pilose on and beyond the first black fascia and the pile is so dense at the sides that the yellow colour does not appear to extend quite to the margins; base of abdomen pale tawny pilose but the black pile extends forward along the sides of the second segment to the basal fourth. Genitalia reddish.

Female. Front very shining deep black, the sides, on a little more than the lower half, densely yellow pollinose; supra-antennal area with watery bluish opalescence, the pile black except on the yellow pollen where it is yellow. Front very narrow on the upper fifth, thence widening to the antennae where it is hardly as wide as one eye; ocellar triangle fairly small, slightly longer than wide, situated about three times its own length in front of the posterior corners of the eyes. Fifth abdominal segment black, with

a large, dull reddish triangle in each basal corner which are broadly separated from each other in the middle.

Redescribed from the following specimens: 2 ♂, Perak, F.M.S., Jor Camp, 2000 ft., August 21 and 27, 1922, collected by E. Scimund; 6 ♂ 1 ♀, same locality 1800-2500 ft., June 1, 2, 3, 4, 1923, collected by H. M. Pendlebury, ♂, Perak, Batu Tegoh, Taiping, Dec. 24, 1923, collected by M. R. Henderson; ♂, Pahang, F.M.S., Wray's Hill, Jungle, 500-1200 ft., Nov. 25, 1922; ♂, Pahang, K. Teku, 500 ft., Dec. 3, 1921; collected by H. M. Pendlebury.

Asarkina consequens var. *exilis* var. n.

Differs from the typical form only in having the first abdominal segment for the whole distance beneath the scutellum, a moderately narrow median vitta on the second abdominal segment and slightly wider abdominal black fasciae.

Described from an unique ♂, Perak, Batang Padang, Jor Camp, 1800 ft., June 6, 1923, collected by H. M. Pendlebury.

Asarkina laticornis sp. n. (Fig. 15).

Face retreating; front with brown spot; posterior legs black from the middle of the femora; black abdominal fasciae half as wide as the yellow bands, the first yellow band interrupted.

Length, 12 mm. *Male.* Face and frontal triangle yellow, the former yellow pollinose except on the small, oval tubercle which is slightly less rounded below. Face retreating in profile, the tip of the oral margin not quite as prominent as the eyes opposite the antennae, gently convex immediately below the antennae, thence concave to the tubercle, below which it is very gently concave-retreating. Frontal triangle long, rather acute above, yellow pollinose except on the swollen area above the antennae which bears an elongate blackish spot on the middle line. Pile of the frontal triangle black, except along the orbits, where it is tawny; on the face, pale yellow. Vertical triangle three times as long as wide, acute in front, its ground colour greenish-black, thinly clothed with yellowish pollen, its pile black but there are a few pale hairs at the vertex and in

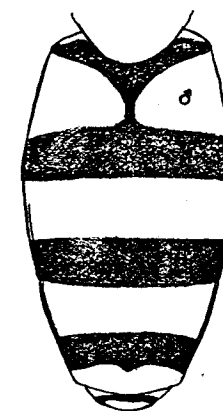


Fig. 15. Abdomen of *A. laticornis* sp. n.

front. Occiput yellowish-grey pollinose, its pile yellowish above, whitish below. Cheeks wholly yellow. Antennae reddish, the third joint brown above and apically, the brown colour occupying the upper apical half; third joint obtusely oval, not quite one and a half times as long as wide. Arista brown, rather slender, longer than the antenna.

Mesonotum bright blackish-green, a large spot laterally before the suture and the posterior calli, reddish; pile tawny. Pleura concolorous with the mesonotum, the mesopleura chiefly, a broad spot on the upper margin of the sternopleura, a large roundish one above the middle coxae and a smaller, roundish one below the root of the wings, reddish yellow, more or less opalescent, the pleura thinly yellow pollinose, their pile reddish-yellow. Scutellum translucent yellow, clothed with black pile.

Front coxae yellow, the posterior four chiefly brown; legs reddish-yellow, the hind pair black from the middle of the femora. Pile of the legs yellow; on the posterior tibiae and tarsi black, on their femora mixed with black on the apical half.

Wings slightly tinged with luteous, the stigma slightly darker. The third longitudinal vein is almost straight and has no conspicuous dip into the apical cell. Squamae yellow, with slightly more reddish margin and yellow fringe; halteres yellow, their knobs slightly infuscated.

Abdomen reddish-yellow; first segment black, except a lateral spot; apical third of second segment and a narrow median vitta, somewhat widened in front, opaque black. Third segment with slightly more than the apical third opaque black. The fourth segment has the basal half reddish-yellow, followed by a subopaque black fascia which is concave posteriorly on either side of a median black triangle, the sides of the black slightly widened, leaving the rather broad yellow hind margin widest on either side of the middle. The basal two-thirds of the fifth segment is shining black except for small reddish triangles in the basal angles. The pile is black on all the black areas except the first segment, and entirely so from the middle of the third segment, including the hairs hanging down along the sides, the basal pile yellow. The ventral black fasciae coincide with the upper ones but all are narrowed towards the middle line.

Described from a single male collected by H. M. Pendlebury: Peninsular Siam, Nakon Sri Tamarat, Khao Luang, 5800 ft., March 30, 1922.

Asarkina nigripes sp. n.

Length, 14 mm. *Male*. Head deep black, the sides of the face with a small, obscure reddish spot near the middle;

face yellow pollinose, but on the sides below, the cheeks and occiput, silvery greyish, the broad tubercular area (reaching the oral margin in its full width), the broad oral margin behind the oral angles as far as the jowls and the transverse, supra-antennal area, bare, shining, the latter somewhat metallic. Pile of head black; whitish on the cheeks and lower half of the occiput, yellow on the upper half of the latter. Upper fifth of the face almost perpendicular, the following fifth a little less prominent, concave, the lower half strongly produced forward as a large tubercle which is broadly slightly flattened on either side above. Frontal triangle large, scarcely convex, not swollen in front, clothed with cinnamon-brown pollen which diffuses with yellow towards the face. Eyes touching for an unusually short distance, scarcely greater than the length of the vertical triangle, which is thinly brownish pollinose, a little more than twice as long as wide, the slightly elongate ocellar triangle situated on its anterior portion. Antennae dull reddish with the third joint black except the lower half of the base, the basal joints more or less broadly infuscated above. Arista black, very noticeably pubescent, quite stout on its basal three-fourths.

Mesonotum greenish-black, with three obscure, broad, bronzed vittae, the lateral margins broadly reddish-yellow; pile black, tawny on the sides. Pleura blue-black, the mesopleura on the upper third behind, with a small reddish spot; pleura densely yellow pollinose, the broad border, except above, thinly so; pile bright yellow. Scutellum translucent yellowish, rather dulled by pollen, wholly black pilose.

Front coxae greenish, with reddish apices and clothed with grey pollen; posterior four coxae reddish, the middle ones with large, greenish basal spot in front; trochanters and narrow bases of the femora (the hind ones more broadly) reddish; anterior four legs dull reddish, the sub-basal third of their femora blackish, their tarsi wholly black, the middle tibiae with sub-apical fourth or more ferruginous; posterior legs black; pile of legs wholly black.

Wings cinereous; stigma brown; third vein subangulately carried forward on apical portion. Squamae reddish yellow, with similarly coloured fringe. Halteres orange.

First abdominal segment brown with the broad sides reddish yellow; second segment reddish-yellow with the apical third (measured in the middle), dull black, a fairly broad median vitta which spreads out along the base of the segment, of the same colour. Third, fourth and fifth segments dull black, each with a reddish-yellow orange fascia which is one-fourth wider than the following black fascia and is moderately separated from the base of the segment (less so in the middle); all the fasciae except the last a

little narrowed towards the sides and a little concave in the middle behind. Pile black; yellow from the middle of the second segment to the base of the abdomen.

Described from a single ♂, Pahang, Cameron's Highlands, Tanah Rata, 4,800 ft., Jan. 24, 1924, collected by M. R. Henderson.

Asarkina biroi Bezzi.

Asarcina Biroi Bezzi., Ann. Mus. Hung., VI., 502, 1908.

Length, 13 to 15 mm. *Male*. More than the median third of the face, the cheeks and the front, black; sides of face (usually extending to the oral margin), reddish with dense whitish or pale yellow pollen; the large roundish tubercle bears a broad, shallow concavity on either side above, leaving the middle rather keel-shaped, and from its upper edge to the oral margin there is no pollen, the pollen in the middle above being always dull yellowish; pile of face yellowish, a few black hairs along the black middle stripe. (Two of the specimens do not show the depressions on the facial tubercle but are evidently this species). Frontal triangle with a semicircular, bare, rather bronzed swollen area immediately above the antennae, elsewhere brownish yellow pollinose and bearing long black pile, the triangle about as long as wide. Vertical triangle about three times as long as wide, narrow but not very acute in front, the ocellar triangle longer than wide and occupying the sub-anterior third; surface lightly brown pollinose, the black pile limited to the middle line. Occiput yellowish pollinose and pilose above, elsewhere silvery-grey with silvery-white squamose hairs. Antennae reddish, the third joint broadly brown above, moderately tapering, about equal in length to the first two joints combined; arista brown, microscopically pubescent; a little thickened on the basal half, thence tapering. Oral margin strongly oblique.

Thorax aeneous; broad lateral margins of the dorsum, scutellum, mesopleura largely, a spot on the sternopleura and more or less of the hypopleura, reddish; pile wholly tawny except on the scutellum where it is black, the base rather narrowly yellow haired except in the middle.

Legs reddish, the apical half of the posterior femora more ferruginous, the remainder of the posterior legs brown or blackish; all the tarsi black. Pile of the legs black, the femora more or less broadly pale haired basally, the anterior tibiae with blackish and yellow hairs intermixed.

Wings fairly strongly tinged with yellowish-brown, more luteous in front and on the basal two-thirds; third vein carried forward on the apical two-thirds of the apical cell, the point at which the widening commences rather angulate, not rounded. Squamae and their fringe, orange. Halteres orange with infuscated knob.

Abdomen pale orange; first segment immediately beneath the scutellum, the incisure between the first two segments and a posterior fascia on the apices of the second to fourth segments, black, the black fasciae equal in width to about two-fifths the length of the third segment; black fascia on the second segment produced as a fine median vitta to the base of the segment, the outer ends of the fascia rounded in front and not reaching the lateral margins. Fifth segment with about the apical fourth black; bases of third to fifth segments narrowly black, the basal black lines more or less narrowed in the middle. Abdominal pile short, appressed, black from the apex of the abdomen to the base of the black fascia on the second abdominal segment and also on the small posterior angles of this segment elsewhere yellow and quite fine.

Female. Front wholly black in ground colour, the lower half yellow pollinose along the orbits, elsewhere in front of the ocelli (except the large supra-antennal area and a narrow median vitta) with brown pollen. Frontal pile black except along the orbits below, very short behind the ocelli which are situated about three times the length of their moderately elongate triangle in front of the posterior angles of the eyes. Fifth abdominal segment reddish, with a broad, incomplete shining black apical fascia.

Two males (mentioned previously) show the following variation: they lack the depression on the facial tubercle; one has the femora wholly reddish and practically all pale pilose while the other has the femora deep brown on the apical half; one has the black spot extending across beneath the scutellum; both have the wings cinereous and the base of the scutellum more broadly pale pilose. Notwithstanding this variation I believe they are conspecific with the others.

Redescribed from: ♂, Pahang, Lubok Tamang, 3500 ft., June 12, 1923; 2♂, same locality June 23, 1923; Jor-Lubok Tamang 3500 ft., Oct. 11, 1923; ♀, "Cameron's Highlands" Tanah Rata 4800 ft., March 15th 1925; ♀, Selangor, Kuala Lumpur, Gombak Valley, Oct. 12, 1921, all collected by H. M. Pendlebury.

Allied to *biroi* but readily distinguished as the pale abdominal fasciae are narrowly separated from the lateral margins, except sometimes in front in the female.

Length, 12 to 17 mm. *Male*. Differs from *biroi* as follows: cheeks wholly orange in front of the jowls, the oral margin also orange beneath the facial tubercle; face black pilose; frontal triangle but little swollen in front; antennae brownish-red; arista thickened on basal three-fifths.

Posterior femora and broad base of their tibiae, reddish; anterior four tarsi reddish, becoming brown apically. Wings

strongly infumated, the bend in the fourth vein more rounded, not angular.

Asarkina incompleta sp. n. (Fig. 16).

Abdominal pale fasciae narrower, the second to fourth gently undulated, being gently concave on either side in front, convex behind and narrowly cut off from the lateral margin; first abdominal segment brown beneath the scutellum; second with moderately narrow median vitta; fourth with the apical black fascia strongly projecting forward in the middle, the sides of the segment narrowly black.

Female. Agrees in general with the δ but the lateral margin opposite the pale fasciae is more brown than black and this colour does not quite reach the base of the segments; sixth segment orange, with an apical black fascia. Front as in *biroi* but the pale pollen along the orbits much narrower and the shining black median vitta wanting, the whole middle area brownish pollinose; frontal pile wholly black. Abdominal fasciae less undulated, almost straight.

Described from two specimens; δ , Pahang, Lubok Tamang, Gunong Terbakar, 4500 ft., June 4, 1923; φ , West Java, Preanger Regency, Papandajan, 5500 to 7000 ft., April 23, 1923, both collected by H. M. Pendlebury.

Genus *Sphaerophoria* St. Fargeau et Serville.

Differs from *Syrphus* as follows: thorax with strongly differentiated yellow side margins and pleural spots; face strongly produced below, at least slightly tuberculate; abdomen more slender than the thorax, not margined, with parallel sides or at most the sides are gently convex in the female; legs slender, simple; male genitalia large, globose. Genotype: *Musca scripta* Linne.

Sphaerophoria, in the male, is an easily recognized genus because of the large genitalia, but the females are less easily differentiated from allied genera, but the prominent face will serve to distinguish them. There are, however, some species of *Allograpta* (which is, perhaps, not separable from *Syrphus*) which closely resemble *Sphaerophoria* and are difficult to place. The males of *Allograpta* all have small genitalia. *Ischiodon* has a much less prominent face and larger, more elongate, tapering third antennal segment, this organ being short oval in *Sphaerophoria*.

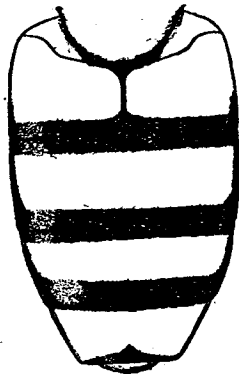


Fig. 16. Abdomen of *A. incompleta* sp. n.

Paragus pseudoropalus Miller, described from New Zealand, is one of several species of *Sphaerophoria* in which the genitalia of the male is small, and *Syrphus javanus* Wiedemann, of which I have examined the types, is best considered in the same light, although the face is less prominent than usual in the genus and its disposal in *Allograpta* might be more acceptable. *S. javanus* is certainly not referable to the genus *Xanthogramma* which must be limited to three or four Palaearctic and one Nearctic species.

Table of Species.

- | | |
|----------------------------------------------------------------------------------------|--------------------------------------------|
| 1. Posterior tibiae wholly black, or black with a broad yellowish median band | - - - 2. |
| Posterior tibiae yellow on at least the basal half or yellow with brownish median band | - - - 3. |
| 2. Posterior tibiae wholly black | - <i>nigrotibialis</i> sp. n. |
| Posterior tibiae black with almost the median third yellowish | - <i>javana</i> Wied. |
| 3. Posterior trochanter with a stout process | - - - See <i>Ischiodon</i> Sack. (p. 243). |

Posterior trochanters without such process. (There are no species belonging to this section in the collection although several probably occur.)

Sphaerophoria nigrotibialis sp. n.

Length, 8 mm. *Female*. Face, cheeks and sides of the front almost up to the anterior ocellus, orange or reddish yellow, the median facial stripe and the front bluish black. Occiput densely greyish-yellow pollinose; pile on the front short, black, on the upper third of the occiput, yellowish, on the remainder of the occiput, silvery white, on the face and cheeks fine, white. Antennae orange, third joint brownish above; arista rather brownish with paler basal third.

Mesonotum shining deep black, the side margins broadly yellow, the pile cinereous or yellowish laterally and in front, black elsewhere and also on the dull yellow scutellum. Pleura yellow as follows: prothorax, most of the mesopleura, a wide vitta running from the anterior edge of the sternopleura backwards and curving around to the corners of the scutellum, a small, contiguous spot above the hind coxae and an area immediately below the base of the wings; elsewhere black and thinly covered with greyish pollen. The pile on the pleura is yellow, the ventral scutellar fringe black.

Coxae and legs yellow, the hind legs black except on the basal three-fifths of the femora; there is a small brownish spot on the outer base of the middle coxae. The hind legs bear black pile on the black areas and there are black hairs behind the apical third of the middle femora and the whole posterior surface of their tibiae.

Wings hyaline, the stigma pale luteous. Squamae and halteres yellow, the former brownish towards the thorax and with brownish fringe.

Abdomen shining black, adorned with four dull yellowish fasciae which are bordered anteriorly and posteriorly with rather broad opaque black fasciae. First segment pale yellow, except the very narrow apex. The pale fasciae on the second to fourth segments are moderately arched, the hind one more so, and the two posterior ones are somewhat narrowed at the sides; they are also successively nearer the anterior margins of the segments in the middle and all extend over the side margins. The fascia on the fifth segment is broadly interrupted in the middle: it is in the form of a longitudinal rectangle on either side of the middle line the posterior outer half of which is produced obliquely to extend rather narrowly over the side margins behind the middle: this leaves an almost equilateral black triangle in the anterior angles, the inner end of which is rounded. The abdominal pile is yellow from the base to the posterior edge of the first yellow fascia and on the disc of the second one, elsewhere coarser, black.

Described from a single ♀, Pahang, F.M.S. Kuala Tahan, 300 ft., Nov. 28, 1921, collected by H. M. Pendlebury.

Sphaerophoria javana Wiedemann.

Syrphus javanus Wied., Anal. Ent., 34, 1824.

Length, 8 to 8.5 mm. *Female*. Differs from *nigrotibialis* as follows: the yellow lateral frontal margins are slightly narrower and do not reach quite as high; third antennal joint brown with a large orange triangle on the basal lower half reaching to the apical third.

Thorax similar but the black pile a little more extensive, that on the scutellum being more abundant and somewhat shorter.

Legs yellowish, including the front and hind coxae, the middle coxae, slightly more than the apical third of the hind femora, the basal third and apex of their tibiae and the hind tarsi, brown, the anterior tarsi somewhat brownish except basally. Middle femora black-haired on the posterior apical half, their tibiae with a few black hairs towards the apex but not on the posterior surface; hind legs black-haired, the femora with pale hairs on the basal half except below.

Squamae brown, somewhat paler on the outer part, their fringe brown. Halteres yellow.

Abdominal fasciae slightly narrower, that on the fifth segment of quite different shape as it is composed of two confluent spots on either side: an elongate apically-rounded spot reaching back to the apical third on either side of the middle line and a slightly curved one of uniform width extending from the middle of the first one to the lateral margin behind the middle. The pile is black, with that on the first segment and sides of the second, including large basal triangles, yellow.

The collection contains a ♀ from Pahang, F.M.S. Kuala Tahan, 300 ft., Nov. 21, 1921, collected by H. M. Pendlebury.

Genus *Ischiodon* Sack.

Similar to *Sphaerophoria* but the hind trochanters are armed with a moderately strong, rather blunt process and the species are a little more robust. Type: *I. scutellaris* Fabr. Only one other species, *I. aegyptus* Wied., is known. It occurs in Africa and Southern Europe.

Ischiodon scutellaris Fabricius.

Scaeva scutellaris Fabr., Syst. Antl., 252, 1805.

Length, 8 to 9 mm. *Male*. Face and front yellow, the former except in the middle, the latter along the orbits, pale yellowish pollinose. Pile of head whitish, blackish on the vertical triangle, yellow on the occiput above and on the frontal triangle. Eyes touching for a distance equal to about twice the length of the ocellar triangle; vertical triangle twice as long as wide, fairly large, black with grey pollen behind the ocelli. Occiput rather yellow pollinose, but it becomes more grey below. Antennae reddish: third joint over twice as long as wide, rather cylindrical, strongly narrowed on apical part; arista reddish.

Thorax aeneous or greenish-black, sometimes more or less brassy, the broad sides of the mesonotum, most of the mesopleura and a large contiguous spot on the sternopleura, yellow; pleura pale pollinose. Pile wholly yellow, longer on pleura and scutellum.

Legs reddish-yellow, coxae blackish, except the broad apex of the anterior ones; posterior femora black on the subapical fourth, their tibiae with a brownish median band; last three joints of the hind tarsi and the intermediate three of the anterior four tarsi, brownish. Pile of the legs yellow except on the black femoral band where it is blackish.

Wings hyaline. Squamae and halteres yellowish, the former with yellow fringe.

Abdomen somewhat variable as the dark colour ranges towards the apex or on the apical half from black to ferruginous; adorned with three pale yellow, broad fasciae, the

first of which, situated on the second segment, is moderately interrupted in the middle, the inner ends of the resultant pale spots rounded, but sharper towards the front; second fascia narrowly separated from the base of the third segment in the middle, more broadly so laterally, shallowly excised posteriorly, its width equal to almost two-thirds the length of the segment. Fascia on fourth segment similar in shape but slightly wider and largely touching the base of the segment, the narrow yellow apex of the third adding to the width of the fascia. First segment shining bluish; abdomen opaque with the narrow sides and apices of each segment shining; second and usually the third segments black, the remainder usually rusty brownish to ferruginous, the third segment rarely of this colour. Genitalia of moderate size. Abdominal pile all short, yellowish.

The collection contains a ♂, Malay Peninsula, no data, from the collection of the Agricultural Department; and a ♂, Singapore Isd., Mandai, Jan. 4, 1923, collected by H. C. Abraham.

Genus *Baccha* Fabricius.

Anterior cross-vein before the middle of the discal cell, rectangular; eyes large; face usually partly yellow, tuberculate; abdomen spatulate or with parallel sides; legs simple; humeri bare or pilose on about the posterior half or less. If the sides of the abdomen are parallel the face is usually marked with yellow, thus distinguishing the genus from *Melanostoma*; or the scutellum is partly pale. Type: *B. elegans* Fabr.

Owing to the great diversity of appearance *Baccha* is a difficult genus to define closely. From genera of the subfamily *Cheilosinae* with petiolate abdomen it is separated by the tuberculate face, the others having the face concave. Most of the Oriental species I have seen belong to the subgenus *Allobaccha* (subgen. n.), only a few species belonging to *Baccha* s.s. The subgenus *Ocyptamus* Macq. is peculiar to America while *Allobaccha* does not occur there. *Ocyptamus* has been frequently treated as a distinct genus but there are too many intermediate forms to define sharply two genera and such a course must therefore result in a great deal of confusion. *Allobaccha* is more easily separated.

Table of Subgenera of *Baccha*.

- | | | |
|-------------------------------------------------------------|---|------------------------|
| 1. Abdomen broad, its sides normally parallel; rather short | - | <i>Ocyptamus</i> Macq. |
| Abdomen more or less strongly spatulate | - | 2. |

- | | | |
|--------------------------------------------------------|---|------------------------------|
| 2. Humeri bare, entirely without hairs | - | <i>Baccha</i> Fabr. |
| Humeri with a row of hairs behind or almost half hairy | - | <i>Allobaccha</i> subgen. n. |

Table of Species.

- | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------|
| 1. Scutellum wholly or partly red or yellow, at least margined with such apically | - | 2. |
| Scutellum entirely dark | - | 4. |
| 2. Scutellum yellow, with a transverse blackish spot lying almost wholly beyond the middle; wings with the costal border and large, sharply defined median fascia dark brown (<i>circumcincla</i> Wulp?) | - | <i>dispar</i> Walker. |
| Scutellum wholly yellow, or somewhat browned at the base, especially laterally; wings almost wholly brown, lacking the median brown fascia | - | 3. |
| 3. Wings brownish with somewhat paler base; chiefly black species | - | <i>virtuosa</i> sp. n. |
| Wings with costa and apical spot narrowly brown; chiefly reddish-yellow species (no Malayan specimens) | - | <i>rubella</i> Wulp. |
| 4. First segment of the posterior tarsi brown | - | 5. |
| First segment of the posterior tarsi reddish or yellowish | - | 6. |
| 5. Cross-veins clouded; wings pale amber, with broad apical brown spot | - | <i>cronis</i> sp. n. |
| Wings almost uniformly brown; with paler base and darker apical spot | - | <i>varipes</i> sp. n. |
| 6. Humeri hairy behind | - | 7. |
| Humeri wholly bare; yellowish brown cloud of wings fading to grey apically | - | <i>nigricoxa</i> sp. n. |
| 7. Frontal prominence without violaceous spot on the side; (not seen, exact position not known) | - | <i>fallax</i> Austen. |
| Frontal prominence with violaceous lunule on either side; (this is only visible from certain views) | - | 8. |

8. Margin of squamae of ♂ ♀
 brownish - - - - *porphyra* sp. n.
 Squamae wholly white, including
 the fringe - - - - *pulchrifrons*
 Austen.

Note.—It will be impossible accurately to place most of the described species in this genus until they have been checked over with attention to the following points: position of ocellar triangle, hairiness of humeri, presence of "collar," colour of squamae, presence of squamal fringe, presence of scutellar fringe and long abdominal pile. These characters are much more reliable than the colour of the wings and presence or absence of abdominal markings in dealing with certain groups of Oriental species.

Subgenus *Baccha* Fabr.

Baccha virtuosa sp. n.

Wings dark brown, the base very little paler; scutellum orange, with indefinite brownish basal stripe on sides; face wholly orange; abdomen very long and slender.

Length, 14 mm. *Male.* Face, cheeks, back of mouth and frontal lunula orange, the face and cheeks densely yellowish-white pollinose except a stripe running from the antennae to the lower edge of the tubercle and a broad triangle on the cheeks along the mouth edge face a little retreating, the tubercle large, oval, prominent, the oral tip a little produced. Face, cheeks, and occiput, white pilose, the latter with yellow pile on the upper fourth. Frontal triangle black, mostly covered with ochreous pollen, black pilose, the lunula flat and rather strongly produced. Ocellar triangle four times as long as wide, its sides parallel behind the middle of the elongate ocellar triangle, in front tapering to an acute point, the ocellar triangle situated more than twice its own length from the vertex, the ocelli small, the posterior ones narrowly separated from each other, the brown pile situated on a median line. Vertical triangle a little shining, brown pollinose behind, the pollen spreading somewhat on to the occiput. Antennae orange, the third joint mostly with a faint brownish tinge, semicircular, a little longer than wide; arista short, brown, with narrow reddish base.

Thorax: mesonotum black, with rather thick covering of brownish pollen which obscures the ground colour but little; notopleura, mesopleura and a large spot on the upper part of the sternopleura, densely golden yellow pollinose and dirty yellowish in ground colour, the pleura elsewhere rather aeneous with rather abundant greyish pollen. Pile of dorsum fuscous, on the sides in front of the suture, yellowish, the strong anterior row of hairs behind the humeri also rather yellowish. Humeri wholly bare. Posterior calli brownish. Scutellum reddish-yellow, the base a little darker,

the sides at the base narrowly, more or less, brown. There are not more than half a dozen long pale hairs on the scutellum which entirely lacks the ventral fringe and is yellowish pollinose.

Legs orange; posterior femora, except basal fourth and apical fifth, their tibiae on the apical two-thirds and the basal fourth or more of their basitarsi, black. The hair of the legs is concolorous with the integument.

Wings rather dark brownish, the basal fifth somewhat paler; allula a little widened apically, as wide as the costal and subcostal cells opposite, its posterior edge straight, its colour yellowish hyaline. Squamae and fringe pale yellow; halteres reddish-yellow.

Abdomen brownish-black. First segment reddish yellow with the base, except on the broad sides, ferruginous or brown. Second segment with an elongate, subtriangular yellow spot on either side (separated from each other by somewhat less than the width of one spot), either oblique on its narrowed posterior edge or carried along the side of the segment to the apical two-fifths where it unites with an elongate, subrectangular reddish spot which reaches to the posterior fifth and is separated from the opposite one by a broad median vitta. Commencing at the basal fifth of the third segment is a yellow or reddish band which is a little wider in the middle than one-fifth the length of the segment and is carried obliquely to the sides which it reaches a little before the apical third. The position and shape of this spot varies somewhat, as in one specimen it occupies the median third of the segment and its front margin is carried a little forwards at the side. (The positions given are by measurement). The fourth segment has a broad reddish fascia on the apical half of the basal third, the fascia narrowed and broadly interrupted in the middle and narrowly separated from the lateral margins, or it may be represented by only two oval reddish spots. The pile, except the long hairs on the first segment, and a few hairs on the basal half of the second at the extreme sides, is appressed, black, fairly long and coarse. There are no erect, outstanding hairs on the sides of the basal segments.

Described from two ♂♂, Pahang, "Cameron's Highlands", Rhododendron Hill, 5200 ft., June 18 and 19, 1923, collected by H. M. Pendlebury.

This species is peculiar in lacking the scutellar fringe, the long abdominal pile, etc. The humeri are wholly bare so it ranks as a true *Baccha* but it is readily distinguished from the remaining species belonging to this subgenus by lacking the long lateral hairs on the abdomen.

I do not think that this is *Baccha nubilipennis* Aust., although it appears to be closely allied. It apparently differs

as follows: the metapleura is yellow pollinose (not silvery); the abdominal pile is not "very short", but rather long; the first abdominal segment is mostly reddish or yellow, not "black, with edging of yellow in ♀"; the basal yellow fascia on the second abdominal segment is wholly interrupted (not notched behind); the fourth segment in both specimens bears at least distinct reddish or yellow spots (not wholly black); the darker portions of the legs are black rather than "brown" although the edges of the black areas are brown. Major Austen does not mention the vestiture of the scutellum, which he states is "polished dark brown on the disc, more or less yellowish, semi-translucent on the margin." These differences are sufficiently great to be considered specific.

Baccha eronis sp. n.

Allied to *B. maculata* Walker from which it differs in having the base of the second abdominal segment broadly reddish, darker wings the apical spot being much broader and strongly developed while the discal cell is more acute at the apex.

Length, 11 mm. *Male*. Head blue-black, cheeks reddish on the anterior two-thirds; face greyish-yellow pollinose, the rather large tubercle bare; pile of face, lower half of front and on occiput, yellow, on the upper half of the frontal triangle and the vertical triangle, brown, the occipital cilia black. Frontal triangle elongate, acute above, the orbits narrowly yellow pollinose; in profile the frontal triangle is oblique, a little convex, not strongly produced. Vertical triangle short, acute, the ocelli situated only the length of their own triangle from the vertex, the triangle a little longer than wide. Antennae orange; arista slender, brown.

Thorax and scutellum aeneous blackish; humeri, root of wings and an elongate spot on the mesopleura, yellow, the latter yellow pollinose, the pleura elsewhere with thin brownish pollen. Posterior calli brown. Pile yellowish and quite sparse on the pleura and scutellum, fuscous on the mesonotum. Humeri bare, the "collar" wanting; scutellum without ventral fringe.

Legs, including the front coxae, orange; apical half of the posterior femora, except the apex, apical two-thirds of posterior tibiae and the apical four joints of their tarsi, blackish; apex of posterior tibiae and their basitarsi, ferruginous. Femora without pile, the middle ones with a row of long, widely spaced cilia on their posterior surface; tibiae moderately thinly haired, the posterior ones with short, appressed black hair on the black portion.

Wings strongly tinged with yellowish-grey, the cross-veins at the middle of the wing clouded with brown, the stigma brownish, with dark brown base, the apex of the

wing with a broad, brown costal spot beginning half way between the apices of the first and second veins and extending a little behind the tip of the third vein, the brown encroaching upon the apical cell in front. Wings without allulæ, the pallidly yellowish squamae with yellow margin, but lacking any fringe. Halteres orange.

Abdomen slightly shining black, with obscure violet reflection; first segment aeneous, with obscurely reddish apex; second with hardly the basal fifth (not more than one-sixth in the middle) reddish, the third with the basal seventh, (slightly more laterally) orange, the fourth with the basal third bright orange. The second and third segments are of exactly the same length, each as long as the fourth and fifth combined, both very slender, but the third more enlarged apically, the fourth the widest. The long hairs on the first segment and the pile on the lateral third of the orange spot on the fourth segment, yellow, the pile elsewhere blackish. The usual long isolated hairs are present on the intermediate segments.

A single ♂, Pahang, Lubok Tamang, 3500 ft., June 11, 1923, collected by H. M. Pendlebury.

It seems unlikely that this is the same as *maculata* Walk. as the colour of the abdomen is quite different and I have noted other differences in the foregoing. It is a true *Baccha* but peculiar in lacking any fringe on the squamae.

Brunetti is in error when he states (Fauna Brit. India, p. 120) that Walker gave the length of his *B. maculata* as "8 lines." Walker's measurements were: "Length of the body 5 lines, of the wings 8 lines."

Baccha nigricoxa sp. n.

Allied to *nigricosta* Brun. Wholly black except antennae and legs.

Length, 9.5 to 10.5 mm. *Male*. Head blue black; sides of face, cheeks, and occiput, greyish pollinose, the face but little retreating, the tubercle large, obtusely nasiform; pile of face cinereous, of the frontal triangle, fuscous or yellowish-brown, of the occiput, wholly whitish, the vertical triangle with black pile. Frontal triangle rather large, moderately prominent in front, narrowly grey pollinose above, with aeneous reflections. Vertical triangle a little raised in front, obtuse, the anterior ocellus situated at its anterior angle, the ocellar triangle narrow and much longer than wide, wholly situated in front of the middle of the vertical triangle which is strongly widened behind. Antennae orange, the first two joints brownish-red; arista short, thickened and orange on the basal third, black apically, microscopically pubescent basally.

Thorax, scutellum and first abdominal segment aeneous; mesonotum with fairly long pile of a cinereous to fuscous

colour and usually some deep brown hairs intermixed, especially on the anterior half, the "collar" fairly well marked but not outstanding; notopleura and broad fascia on the pleura before the wings, greyish-yellow pollinose, the pleura elsewhere less thickly pollinose and with rather cinereous pile, the sides of the mesonotum sometimes with obscurely fawny pile. Pile of scutellum long, yellowish, the ventral fringe long, oblique, not sharply defined.

Legs orange; front coxae black or brown; posterior femora with broad brownish band on apical fourth, the apical fifth of their tibiae and the apical tarsal joints ferruginous. Pile of legs normal, yellowish, the posterior femora with considerable brownish hair.

Basal third of the wings hyaline; the middle yellowish brown, fading to grey apically, the long stigma and moderately wide apical spot, brown. Allulae elongate, wider apically, their posterior edge straight. Squamae yellow, with yellow fringe. Halteres orange.

Abdomen shining; broad apex of second, apical third or more of the third and basal two-thirds or more of the fourth segments, subopaque or opaque and rather brownish, except that the whole, rather broad lateral margin is shining. The pile is long and fine, wholly pale on the base as far as the opaque portion of the third segment, but on the immediate disc of the second and base of the third segments and the rest of the abdomen, brown, or black, appressed, shorter and coarser.

Described from four ♂♂ from Pahang, "Cameron's Highlands", Rhododendron Hill, June 16, 20 and 22, 1923, all collected by H. M. Pendlebury.

This species apparently comes closest to *B. umbrosa* Brun. but the abdomen in that species is described as wholly short white pilose; *B. nigricosta* Brun. has the posterior tarsi "blackish" so it is quite distinct.

Baccha dispar Walker.

Scutellum yellow, with a brownish subapical, incomplete fascia; wings with costal border and broad median fascia brown.

It is possible that *B. circumcineta* de Meij. is the same.

Length, 12 to 13 mm. *Female*. Face and anterior three-fifths of the cheeks shining yellow; median facial stripe, a squarish spot above the antennae, front on and behind the ocellar triangle, and the occiput, blackish-blue. Middle of the face quite prominent, very gently concave above the tubercle, receding below it; oral margin strongly oblique. Front moderately narrow, with almost parallel sides on the upper fifth, widening below until it is two and a half times as wide at the antennae; the ground colour is

evidently black but about the median two-thirds is so densely yellowish pollinose as to obscure it. Ocellar triangle situated well forward, slightly longer than wide. Occiput greyish-yellow pollinose. Pile of head yellowish, not conspicuous on face and front. Antennae orange, the third joint about one and a quarter times as long as wide, broadly oval; arista yellow on basal half, brown apically, the basal fourth thickened.

Thorax slightly shining black, the humeri and broad lateral margin before the suture, the mesopleura, a large, triangular, contiguous spot below, and a broad oblique band below the squamae, yellow, the lateral margin of the dorsum behind the suture yellowish-brown. Pile short, sparse, appressed on the dorsum, brassy-yellow; on the lateral margins and pleura, paler, longer, erect. Scutellum yellow, with a transverse, subapical blackish spot, its pile short, yellow.

Legs yellow; coxae brown with yellow tips; apical two-thirds of the posterior femora, apical three-fifths of their tibiae and the first joint of their tarsi except the apex, brown; the indistinct hairs yellowish.

Wings subhyaline, a broad costal border, reaching to the apex and a broad, almost rectangular median fascia, brown. Squamae yellow, with darker border and yellow fringe. Halteres yellowish brown.

Abdomen shining brownish, the apical third of the third segment perhaps subopaque. First segment and base of the second at the sides, a sharply arched median fascia on the third segment, a broad basal fascia on the fourth, broadly triangularly excised in the middle behind, its outer edge oblique and somewhat produced posteriorly, yellow or orange; fasciae separated from the side margins; incisure between second and third segments more or less reddish. Abdominal pile black; yellow on first segment. Second segment cylindrical, slender, almost as long as the two following combined.

There is a single female, Selangor, F.M.S., Kuala Lumpur, Oct. 31, 1922, collected by H. M. Pendlebury, in the collection.

Subgenus *Allobaccha* subgen. n.

Baccha rubella Wulp.

This species probably occurs in Malaya but I have not seen specimens. It is included in the table in order to assist in identification should the species be found. *B. rubella* is to be considered the type of the subgenus *Allobaccha*.

Baccha varipes sp. n.

Black or blackish except the antennae and most of the legs; wings brown with paler base. Allied to *B. umbrosa* Brunetti.

Length, 10 mm. *Male*. Head black; occiput, except the upper orbits and the face broadly on the sides, greyish-white pollinose, the frontal triangle narrowly yellow pollinose along the orbits on the upper half. In profile the face is moderately concave above the large, low tubercle which lies chiefly below the middle, and shortly concave between it and the oral tip. Frontal triangle slightly swollen, bronze coloured except below. Pile on the head brownish except on the lower two-thirds of the occiput where it is whitish and longer. Vertical triangle twice as long as wide, shorter than the frontal, the eyes touching for a distance almost equal to the length of the frontal triangle. Antennae reddish; first joint brown, the third broadly oval, one and a quarter times as long as wide. Arista brown, the swollen basal fourth reddish. Eye facets enlarged on upper half. Oral margin strongly oblique.

Thorax aeneous, the notopleura and mesopleura rather tawny pollinose; lower part of pleura and scutellum with rather bluish tinge. Pile of mesonotum short, blackish, but broadly reddish on the lateral margins before the suture and more or less across the front margin, the pile on the pleura rather tawny.

Coxae black, the posterior four trochanters brownish. Legs reddish; apical third or more of the hind femora except the apex, apical two-thirds of their tibiae and the whole of their tarsi, brownish, appearing paler in some lights. Pile black, not conspicuous on the anterior legs, long behind the middle femora; anterior four tibiae almost bare; anterior tarsi chiefly yellow haired, but some long black hairs behind. Anterior tibiae short, the hind pairs each successively a little longer.

Wings dark brownish, paler basally, with a subrectangular costal cloud between the apex of the stigma and the tip of the third vein. Squamae brownish, with brown fringe. Halteres yellow, their stems tinged with brown.

Abdomen shining black, the first segment with a watery greenish tinge; second opaque black on the broad apex, the third on about the apical half, the fourth subopaque on more than the apical half, more broadly so in the middle, as it leaves the basal metallic shining portion in the form of two broadly contiguous triangles. Fifth segment wholly bronze-black. Pile wholly black, rather long but not abundant.

Described from a single ♂, Pahang, F.M.S., Gunong Tahan, Sebat Point, 5460 ft., Dec. 21, 1922, collected by H. M. Pendlebury.

This species differs from *nigricosta* Brunetti in the absence of pale abdominal markings and from *umbrosa* Brunetti in the darker, more evenly coloured wings, black pilose abdomen, etc.

Baccha pulchrifrons Austen.

Scutellum shining black; median third of the face steel blue; wings lightly clouded with brown in the middle, with dark apical costal spot.

Length, 11 mm. *Male*. Face yellow, the median third narrowed somewhat to the oral margin and spreading over the upper sixth, frontal and vertical triangles, occiput and cheeks behind, steel blue in ground colour, the upper two-fifths of the frontal triangle densely yellowish pollinose, the occiput with greyish, the face with white pollen except on the median line. In profile the face is gently concave above, the tubercle large and more prominent than the antennal tubercle, below the tubercle shortly concave to the moderately prominent oral tip, yet the face is slightly receding. Antennal tubercle large, roundish, reaching practically to the orbits and occupying all the shining portion of the frontal triangle; on either side with a lunate violet spot. Vertical triangle not pollinose. Pile of the head whitish except on the upper part of the occiput where it is yellowish; that on the vertical triangle arranged in a median vitta, the shining portions of the face and front destitute of pile. Vertical triangle twice as long as wide, slightly prominent; antennae orange.

Thorax and scutellum steel blue, the humeri, notopleura and mesopleura yellow, the posterior calli brownish. Pleura thinly grey pollinose. Pile of thorax yellow, brighter and shorter on the disc.

Legs yellowish; more than basal half of the anterior and practically all of the posterior four coxae, brown; a broad, preapical band on the hind femora and their last three tarsal joints, brown or brownish, the apical third of the hind tibiae somewhat darkened and a faint indication of a similar band at the basal third.

Wings hyaline or nearly so, with a moderately conspicuous yellowish-brown cloud originating before the middle of the wing and fading out towards the apical fourth and posteriorly, yet distinctly reaching to the hind margin along the fifth and sixth veins; costal region rather narrowly brownish, the rather narrow apical brown spot not quite reaching the stigma. Squamae yellowish-white, with white fringe. Halteres yellow.

First abdominal segment and broad base of the second, except in the middle, clear yellow, the remainder of the abdomen shining black with reddish markings; third segment opaque or almost so on the apical half. Second segment cylindrical, a little widened at the apex, with a more or less distinct, small, longitudinal oval spot on either side of the apical third. Third segment with a large spot on either side near the middle, its anterior edge rounded and cut off obliquely at the side, the posterior edge oblique, inner edge gently convex so that a broadly interrupted arched fascia is formed, the concavity behind, the spots occupying about one-third the length of the segment and not reaching the side margins. The spots on the fourth segment are basal, similar in shape except that there is a broad production backward at their inner end, this arm reaching back as far as the outer corner and rounded apically. Abdominal pile white in front of the middle of the third segment, but on the disc of these and the whole of the apical segments it is shorter, mostly appressed, black.

One ♂, Selangor, F.M.S., Kuala Lumpur, Oct. 31, 1922, collected by H. M. Pendlebury.

I am not positive that this is *pulchrifrons* although it agrees very well with the description. There are a number of very closely allied species in the East, and it is not possible to be certain of the identity of isolated specimens without recourse to the types. Austen described the pile on the mesonotum as golden yellow, but it could hardly be termed that in the specimen before me.

Baccha porphyra sp. n.

Scutellum and middle of face shining black; wings wholly infuscated but the basal cells somewhat paler; apical costal spot large.

Length, 11 mm. *Male*. Head black is ground colour, the vertical triangle steely, a violaceous lunate spot on either side of the antennal prominence; sides of the face, widening below, and the cheeks before the jowls, reddish-yellow, the latter with a brown spot resting on the orbits at the middle; face, except the broad median vitta, whitish pollinose, the front with more greyish pollen above, but there is a spot of yellow in the middle below the angle; occiput greyish pollinose. Head mostly white pilose, the hairs on the upper part of the occiput and vertical triangle yellow or even fuscous in some lights. Antennal tubercle roundish, not quite reaching the orbits, with a quite evident, broad, supra-antennal depression. Vertical triangle twice as long as wide, slightly prominent, the pile not reaching the sides. Antennae orange, the arista brown on the apical half, very short plumose basally.

Thorax and scutellum shining black, the humeri rarely brownish, notopleura usually brownish, rarely yellowish, mesopleura usually brownish, rarely yellow on the upper posterior part, these two regions greyish to golden pollinose, the pleura thinly grey pollinose. Pile yellow, shorter on the disc of the mesonotum.

Coxae black, the legs reddish-yellow, the apical third of both the femora and tibiae of the hind legs and the last four joints of their tarsi, black or brown.

Wings luteous brownish, the basal third somewhat paler, the costal spot at apex moderately large, deep brown. Squamae greyish-white, with similarly coloured fringe. Halteres yellow.

Abdomen shining black, the apical third of the third segment subopaque; first segment, and broad base of the second except in the middle, reddish-yellow (in the second specimen only the base of the first segment is obscurely yellowish) the second segment with a broad, entire reddish band at the apical third (absent in two); third with a pair of moderately separated, subtriangular spots near the middle, their inner corners rather obtuse, their anterior and posterior edges oblique, the posterior edge much more strongly so except towards the inner end, where it is shortly transverse. Spots on the base of the fourth segment in the form of transverse rectangles with the outer third produced posteriorly and rounded apically. These last two fasciae do not reach the side margins. (In two the fascia on the third segment is considerably wider, occupying, towards the middle, about one-fourth the segment's length, while in one it occupies less than one-fifth). Pile white before the middle of the third segment, long; on the disc of the second and third segments and on the abdomen beyond the middle of the third segment, black, subappressed or appressed, and quite short.

Female. Front very narrow, the sides parallel above, diverging from well in front of the ocelli which are situated more than twice the length of their triangle in front of the vertex, the anterior ocellus remote; front with a long, longitudinal grey pollinose spot on either side, broadly separated from each other in the middle and situated hardly half-way between the ocelli and antennae.

Humeri, notopleura and large oval spot on the mesopleura, reddish-yellow.

Base of abdomen shining reddish; second segment with the pale fascia situated at the apical third before which the colour is reddish-brown, gradually fading into the broadly reddish base. Third segment strongly widened to the apex,

where it is twice as wide as in the δ ; on the subbasal fourth with an oblique, posteriorly-pointed, spot which is broadened and rounded in front and has a short posterior projection on its inner side, the lateral apex of the spot just inside the margin a little behind the middle, its anterior margin rather diffuse. Fourth segment slightly narrowed posteriorly, with a pair of basal spots which are very similar in shape to those of the third, but they are a little narrower and touch the base except on their outer third, while the inner end projects backwards forming broadly separated, moderately wide, orange, vittae, which continue over the fifth segment, the latter bearing a broad lateral orange triangle reaching their whole length on the sides and confluent behind with the median vitta, the remaining segments (the ovipositor) wholly reddish. The pile is everywhere shorter than in the δ .

Described from 5 δ δ , Pahang, Wray's Camp, 3300 ft., Dec. 8, 10 and 11 and 1 φ , Dec. 8, 1921, all collected by H. M. Pendlebury.

Were it not for the violaceous lunule on the sides of the antennal prominence I should not hesitate to place the above specimens as *fallax* Austen, but as that was one of the characters pointed out by Major Austen as distinguishing it from *pulchrifrons* Austen, it seems probable that the individuals before me are entirely distinct from the two species mentioned.

Genus *Melanostoma* Schiner.

Eyes bare; face and thorax black in ground colour, the former usually tuberculate; humeri not pilose; anterior cross-vein before basal third of discal cell; abdomen narrower than thorax in δ , seldom slightly wider in φ , the side margins thin; anterior legs simple in both sexes. Genotype: *M. melinum* L.

Melanostoma is separated from *Platychirus* only on sexual characters, the latter having the anterior tibiae or tarsi or both dilated, sometimes remarkably so. Were it not for the fact that it does not seem suitable to place those species with simple fore legs in *Platychirus* I should unhesitatingly consider *Melanostoma* as no more than a subgenus. The females of many of the species can only be placed in their proper genera through familiarity with the species.

Table of Species.

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|-----------------------------|------|------------------------|
| 1. Face without tubercle | - - | <i>univittatum</i> Wd. |
| Face distinctly tuberculate | - 2. | |

- | | | |
|------------------------------------------------------------------------------------------------------------|---------|-------------------------------|
| 2. Second to fourth segments each with broad uninterrupted reddish fascia | - - - - | <i>quadrifasciatum</i> sp. n. |
| These segments with interrupted fasciae or spots or immaculate. | 3. | |
| 3. Posterior tibiae and tarsi wholly black; spot on fourth abdominal segment quadrangular (δ only) | - - - - | <i>gedehensis</i> de Meij. |
| Posterior tibiae broadly pale at both ends | - - - - | <i>orientale</i> Wied. |

Melanostoma univittatum Wiedemann.

Syrphus univittatus Wied., Anal. Entom., 36, 1824.

Readily distinguished from all other species by the absence of distinct facial tubercle. Abdomen of δ reddish, with slender median vitta and narrow apical segmental margins black, of φ , with three pairs of large, longitudinal spots on second to fourth segments and an entire basal red fascia on the fifth segment.

Length, 5 to 6.5 mm. *Female*. Face and front rather narrow, the former barely one-third the head-width, gradually narrowed from the cheeks to vertex, the face only slightly so. Face slightly retreating, very gently convex below the middle, the oral margin very slightly prominent. Face almost all densely yellowish pollinose, the black ground, however, quite visible. Front greyish pollinose; a large roundish area above the antennae, more or less of the middle part above and the vertex, bare. Occiput yellowish grey pollinose. Pile of the head mostly pale yellowish but a wide band across the ocelli, the black supra-antennal area and the orbital cilia black pilose. Antennae reddish.

Thorax black, the mesonotum more or less bronzed or brassy, its sides and the pleura densely greyish-yellow pollinose; scutellum greenish-black; pile wholly pale yellowish.

Legs reddish, with whitish pile. Wings tinged with yellowish. Squamae tinged with yellowish, with yellow fringe. Halteres yellow.

Abdomen subopaque black, the first and fifth segments, apices of the others and the lateral margins, shining. Second segment with a pair of large, oval oblique spots which reach the lateral margin very broadly in front and the anterior margin rather narrowly; the two following segments each with a pair of moderately separated, roundly triangular, reddish spots, their bases resting on the base of the segment, their posterior end rounded, their anterior outer end produced broadly to the lateral margin. Basal third of the fifth segment reddish, the black produced almost half way

to the base in the middle; sixth segment reddish basally, but the black in the middle reaches the base of the segment. Abdominal pile black, subappressed, on the black portions except at the base; elsewhere yellow, rather long basally.

A single ♀, Peninsular Siam, Nakon Sri Tamarat, Khao Kao, 300 ft., Feb. 21, 1922, collected by H. M. Pendlebury, is in the collection.

Melanostoma orientale Wiedemann.

Syrphus orientalis Wied., Anal. Entom., 36, 1824.

Length, 5 to 7 mm. *Female*. Head shining bluish black; face, except the fairly large, low, roundish tubercle, yellowish-grey pollinose; cheeks in large part less thickly pollinose; occiput very densely grey pollinose; front with a broad, narrowly-interrupted, or entire fascia across the lower third and the narrow orbits below, yellowish-grey pollinose. Face very slightly retreating, the oral margin a little produced. Front about half as wide above as at the antennae; ocellar triangle large, its sides equal, placed a little before the corners of the eyes. Pile of head pale yellowish, on the front, black. Antennae orange, the third joint broadly brown above and apically, obtusely elongate oval, one and a half times as long as wide; arista thickened on basal half, quite strongly microscopically pubescent, brown, with a reddish base.

Thorax and scutellum bluish-black; pleura and sides of dorsum in front of the wings, densely yellowish-grey pollinose; wing roots surrounded by reddish. Pile yellow, paler on the pleura.

Legs reddish; posterior femora with preapical fourth brown, their tibiae brown, except the broad base and apex, their tarsi brownish with the first joint largely reddish on the apical half or more. Pile yellow; chiefly black on the posterior tibiae and tarsi.

Wings hyaline; stigma luteous. Squamae white, with brownish border and yellowish fringe. Halteres yellow.

Abdomen more or less subopaque, the base, lateral margins, fifth segment wholly and the apices of the third and fourth, shining. Base of third segment with a very broadly interrupted reddish fascia, one-third the width of the segment, somewhat narrowed towards the sides. Fourth segment similarly marked. Fifth with a rather narrow reddish triangle reaching inwardly along the base. Pile black, rather short, appressed; on the base of the abdomen and on the reddish fasciae, yellow.

A single ♀, Pahang, "Cameron's Highlands", Rhododendron Hill, June 14, 1923, collected by H. M. Pendlebury.

Melanostoma gedehensis de Meijere.

Allied to *orientale* Wd. but differs in the absence of orange spots on the second and fifth abdominal segments and the spots on the fourth segment being quite quadrate, the posterior legs black except the bases of the femora, etc.

Length, 6.5 mm. *Male*. Head bluish-black, wholly covered, except the small rounded tubercle, oral tip, supra-antennal spot and vertical triangle, with dense greyish pollen, the vertical triangle thinly brownish-yellow pollinose. Face slightly retreating, with a fairly large tubercle on the lower third, the oral tip also prominent; pile fine, sparse, whitish. Frontal triangle more or less brassy, black pilose, the supra-antennal swelling reaching half way to the upper angle. Eyes bare, touching for a distance equal to the length of the vertical triangle which is acute in front, one and a half times as long as wide and black pilose. Occipital cilia short, brownish-yellow, the pile pale yellow. Antennae black; third joint reddish below on basal three-quarters. Arista brownish-red, thickened on basal half, with very obscure pubescence.

Thorax and scutellum deep greenish-black, with a slight brassy reflection; the pleura wholly covered with moderately thick greyish pollen; the dorsal pile rather brownish-red, long, the pile of the pleura pale brassy-yellow.

Legs: posterior pair black except the trochanters and base of the femora; anterior four femora brown on basal half or more, their apices reddish; tibiae all reddish with about the middle half brownish; tarsi reddish-brown, the basitarsi of the middle legs orange. Pile of legs black except on the femora, where it is yellowish except towards the ends.

Wings conspicuously brownish tinged, the long, large stigma, brown. Squamae strongly tinged with brown, with brown border and brownish-yellow fringe. Halteres yellow.

Abdomen dull black, the first segment and lateral margins, except opposite the pale spots on the fourth segment, and the whole of the fifth segment, shining bronze-black. Third segment with a pair of large, orange, basal spots reaching a little more than half way to the apex, broadly rounded behind, separated from each other by almost the width of one spot and narrowly separated from the lateral margin, although they may appear to reach it on their anterior half. Fourth segment with a pair of quadrate, orange, spots which hardly reach the middle, less widely separated from each other than the preceding pair and reaching the lateral margin in their full width. Pile short, fine, yellow; on the opaque black areas, black; longer laterally and basally. Genitalia aeneous, short black pilose.

Described from a single ♂, West Java, Preanger Regency, Papandajan, 5000-7000 ft., April 23, 1923, collected by H. M. Pendlebury.

This cannot be a submelanic form of *orientale* Wd. as might be indicated by the legs, because the abdominal spots on the third segment are larger, instead of being reduced and quite differently shaped. It is more closely allied to some nearctic species than to any of those I have seen from Europe and abundantly distinct from *melinum*, *scalare*, etc. De Meijere described this as a variety of *quadrinotata* but it is probably a distinct species.

Melanostoma quadrifasciatum sp. n.

Readily recognized because each abdominal segment except the first bears a broad, basal, uninterrupted orange band, the first band broadly separated from the lateral margins.

Length 8 mm. *Female*. Wholly shining black. Face, antennae, frontal orbits, below, and a broad fascia across the lower third of the front, ochreous pollinose, the large roundish tubercle and small oral tip, bare. Pile of face, cheeks and occiput, yellow, on the front, except the pollinose areas, black. Sides of the ocellar triangle equal. Antennae orange, the third joint narrowly black above, over one and a half times as long as wide, the apex obtusely rounded; arista bare, reddish, thickened on almost the basal half. Face a little retreating; cheeks and occiput brownish-yellow pollinose.

Pleura brownish-yellow pollinose, the thorax wholly clothed with moderately abundant yellow pile; scutellum almost as long as wide.

Legs rusty reddish; subapical two-thirds of the posterior tibiae, blackish, the posterior femora with a broad, subapical ferruginous band.

Wings tinged with luteous, more brownish apically; stigma brownish-yellow. Squamae whitish, with yellow border and fringe. Halteres orange, with fuscous knob.

Abdomen with four orange fasciae, all of them entire and all but the first reaching the lateral margins. Abdomen decidedly wider than the thorax. First fascia situated on the base of the second segment, wider in the middle than one-third the length of the segment, its posterior margin a little convex, slightly narrowed towards its rounded ends which are broadly separated from the lateral margins. Fascia on third segment widest near the middle, where it occupies slightly over one-third the length of the segment, gradually narrowed to the sides which it reaches in one-half its greatest width; deeply, broadly notched behind in the middle. Band on fourth segment similar to that on third. Fascia on fifth segment widest sublaterally, slightly narrowed to the middle. Abdominal pile black, appressed; pale on the first segment and large lateral triangle on the second.

Described from a single ♀, Perak, Batang Padang, Jor Camp, 1800 ft., June 4, 1923, collected by H. M. Pendlebury.

Genus *Xanthandrus* Verrall.

This genus is difficult to define clearly as it bears almost all the characters of *Melanostoma* although with a quite different facies as the abdomen is elliptical, slightly wider than the thorax, quite flat and bears quite striking orange markings which are usually more extensive in the male than in the female, although this is not the case with *X. bucephalus* Wied. found in the Neotropical region. Genotype; *X. comtus* Harris.

Table of Species.

1. Third antennal joint over twice as long as wide, tapering on apical part; basal two-fifths of the wing much paler than apical portion - - - - *callidus* sp. n.

Third antennal joint not one and a half times as long as wide, obtusely rounded at apex; wings but little infuscated and not strikingly paler on basal portion - - - - *brevicornis* sp. n.

Xanthandrus callidus sp. n. (Fig. 17).

Wings brownish beyond the basal third, pale brownish basally; abdomen opaque black, the entire margin acneous; second segment with a wide basal orange band, the third with a narrower almost interrupted band. Very much like *Pyrophaena rosarum* in markings, but much more robust.

Length, 11 to 12 mm. *Male*. Face and cheeks metallic blue, moderately covered with whitish pollen, the middle of the face less thickly so, the tubercle shining. Face rather strongly retreating, slightly convex above, the tubercle conspicuous, roundish, not large, situated below the middle of the face, the oral tip slightly produced; sides of face parallel. Frontal triangle bright brassy, the supra-antennal W polished black with more or less reddish outer arms; above the W a swollen area divided by a longitudinal sulcus which leaves each side of the swelling shaped like a powder horn, their small ends curving around the arms of the W; above this, in the middle, is a triangular, rather dull, purplish-bronze spot, while the upper angle is broadly opaque black; sides of antennal prominence metallic blue. The frontal pile is limited to the orbits and is fairly long, black, that on the face short, fine, white, the middle of the face and the cheeks bare. The eyes touch for a distance almost equal to the length of the frontal triangle. Vertical triangle about twice as long as wide,

narrow; anterior ocellus remote; pile short, black. Occiput hidden from dorsal view, metallic blue, on the sides and below, white pollinose, chiefly silvery-white pilose, but above with yellow pile and black orbital cilia. First two antennal joints shining black, the third brownish, more or less obscurely reddish basally, dull, appearing somewhat bloated, two and a half times as long as wide, widest subbasally, thence slightly tapering to the obtusely rounded apex; second joint decidedly shorter than the first. Arista brownish-red with a brown tip, rather fine, tapering.

Thorax aeneous, the mesonotum more bronzed on the disc; clothed with rather short, fairly abundant, dull tawny pile, the scutellum with many, much longer hairs, the pleura with more yellowish pile, their colour inclined to be somewhat metallic bluish. Scutellum rather large, its margin with a row of very small, closely appressed tubercles, each of which bears a long hair, the tubercles only visible from certain views.

Legs deep black, the apices of the front and middle femora and broad bases of their tibiae, (the front ones rather obscurely), yellowish. Pile all black. Legs slender, the hind basitarsi slightly incrassate.

Wings brownish, somewhat paler on the basal third and posteriorly, stigma long, brown. Squamae translucent whitish with pale orange border and fringe. Halteres pale orange.

Abdomen opaque black, the first segment and narrow side margins of the two following strongly brassy, the sides of the fourth and broad apex, and the whole of the fifth segment, shining black. Basal three-fifths of the third segment orange, the band about half cut in two in the middle behind, its outer ends broadly separated from the side margins, its posterior margin convex on either side, the posterior corners rounded. Fourth segment with a similarly shaped fascia but it is only half as wide. The pale yellowish pile is very short, sparse, only conspicuous on the sides, where it is fairly long.

Described from 8 ♂♂, one from Peninsular Siam, Nakon Sri Tamarat, Khao Luang, 5800

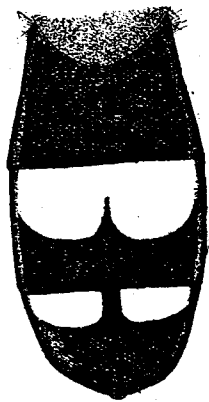


Fig. 17. Abdomen of *X. callidus* sp. n. ft., March 30, 1922;

the others from Pahang, 2 ♂ Gunong Tahan, Padang, 5500 ft., Dec. 12 and 13, 1921, 6 ♂, "Cameron's Highlands", Rhododendron Hill, June 19, 1923, all collected by H. M. Pendlebury.

Xanthandrus brevicornis sp. n.

Length, 9.5 mm. *Male*. Extremely like *callidus* but differs as follows: third antennal segment hardly one and a half times as long as wide, laterally compressed, not subcylindrical and not tapering apically, but obtusely rounded; the antennae reach but little beyond the base of the tubercle, not to its apex. Wings tinged with yellowish brown, a little darker in front, the basal two-fifths not quite as dark. Anterior four femora on the broad apices and the basal third of their tibiae, clear reddish. The notch in the reddish band on the third abdominal segment is broader and a little deeper and the spots on the fourth segment are more semi-circular, being much less transverse.

A single ♂, Pahang, "Cameron's Highlands," Rhododendron Hill, 5200 ft., June 20, 1923, collected by H. M. Pendlebury.

Subfamily CHEILOSINAE.

Genus *Spheginobaccha* de Meij.

Face perpendicular, with a large, low tubercle below; antennae large; occiput convex above; humeri elongate, pilose; spurious vein connected at apex by a stump of vein to the fourth vein just before the apex of the fifth vein; abdomen elongate, narrow, scarcely spatulate. Genotype: *S. macropoda* Bigot.

In some respects this genus presents the facies of *Baccha* but is readily distinguished by the elongate, wholly pilose humeri, convex occiput, large antennae, etc. It seems to be somewhat related to *Eumerus*, but this may be entirely superficial. There can be no doubt but that it belongs in the *Cheilosinae*.

Spheginobaccha macropoda Bigot.

Sphegina macropoda Bigot, Ann. Soc. Ent. Fr., (6), iii, 331, 1883.
Baccha robusta Brunetti, Rec. Ind. Mus. II, 50, 1908.

Abdomen elongate, slender, slightly spatulate, with three pairs of yellow spots and yellow segmental apices; antennae reddish, third joint large, orbicular, the arista situated near the middle; first joint of hind tarsi as long as remaining joints, somewhat thick.

Length, 9 to 11 mm. *Female*. Head black in ground colour. Face very slightly retreating, with a round, moderately large, not prominent, tubercle on the lower fifth;

covered with brassy greyish-yellow pollen, the sparse pile yellowish. Cheeks narrow, metallic blue. Sides of face slightly converging below. Sides of front parallel on upper half, the lower half diverging, but not wide; slightly before the middle with a yellowish pollinose crossband which widens laterally and continues narrowly along the orbits to join the facial pollen; elsewhere shining bluish-black, with conspicuous punctures, the middle more or less polished, the ocelli situated at the upper third, their triangle small, equilateral, the front rather swollen above the middle, with a broad, shallow depression beneath the pollen; immediately above the antennae is a broad, shallow lobe overhanging the antennal pit, at the base of which is a small, round tubercle. The not abundant frontal pile is short, longer and coarser above, black. Occiput broad above, on either side in front of the humeri, with a deep sinus; it is wholly pollinose in some lights, the pollen above the sinus being ochre yellow, that below with a yellowish tinge, but with a silvery-white reflection in most views; pile short, blackish just along the eyes above, and longer and more yellowish above the sinus, fine and more whitish below. Antennae reddish, third joint narrowly brownish above; second joint very short, third orbicular, a little flattened on upper apical part, rather large, its arista situated externally near the middle of the upper margin, brownish, not thickened, of equal width throughout.

Humeri, posterior calli and the scutellum, translucent dirty yellowish. Mesonotum with the whole margin, except in front, broadly aeneous, with more or less bluish tinge in some lights and more or less densely bright or reddish yellow pollinose, especially noticeable before the suture; the whole disc opaque, with a pair of broadly separated, slightly tapering, median yellow pollinose vittae which reach the similarly coloured pollen behind, the black stripe separating them with a very slender pale median line; the three dark vittae are finely transversely wrinkled and have a bronze-green appearance in some lights. Scutellum with the base narrowly and the sides more or less, brownish. Pile of thorax extremely short, yellowish, but there are a few longer hairs before the roots of the wings and on the margin of the scutellum. Pleura metallic blue, with a broad, transverse silvery-white pollinose band in the middle, the pronotum with a row of rather long yellow hairs above the front coxae, the pleura elsewhere without hairs.

Coxae and posterior four trochanters bluish, thinly pollinose, almost without pile, but with conspicuous black hairs apically on the former. Femora yellowish-red, the anterior four on apical portion above, the middle ones more extensively so, and almost the apical two-thirds of the hind ones, pitchy black; slightly more than the basal half of the tibiae are yellow and the apex of the anterior ones is narrowly brownish-red, the tibiae elsewhere and the tarsi

wholly, black. Pile of legs black, short, appressed. Middle femora on lower apical third of front and hind surfaces, with several small black spines, the hind femora with longer, more oblique spines on the apical half; femora strong, but not incrassate. Hind tibiae very slightly curved, thickened on the apical half, with a rather strong lateral compression about the apical fifth. Hind tarsi nearly as long as their tibiae, the first joint somewhat swollen, almost half as long as its tibia; anterior tibiae scarcely more than half as long as the hind ones, their tarsi unusually short, not longer than the first joint of the hind ones. Middle tibiae four-fifths as long as the hind ones.

Wings large, brownish-yellow, paler posteriorly and apically. There is a short stump of vein projecting into the first posterior cell from a point a little before the junction of the fifth vein with the fourth and this stump connects with the apex of the spurious vein.

Abdomen narrower than the thorax on more than the basal half, the apex broadened so that it may be slightly wider than the thorax. First segment slightly shining black, its narrow margin, more widely so just at the sides, reddish yellow. Second segment reddish-yellow, with a large, opaque, almost entire apical triangle which emits a broad middle line forward to the base, the median line broadening so that at the base it occupies almost half the width of the segment, the immediate apex of the segment pale orange. Sometimes the black at the apex of the second segment reaches the side margins broadly while in other specimens the yellow extends along the sides and joins the yellow of the following segment. Third segment subopaque black, the apex narrowly, and a pair of subbasal, subtriangular spots, orange yellow, the hind margin of the spots oblique, the length of their outer edge not quite as great as the width of the spot, the inner ends broadly rounded, broadly separated from each other. The fourth segment bears a pair of almost similar spots but they are silvery-grey pollinose and the ground colour is not wholly orange; the apical half of the fourth and following segments is metallic bluish-black and each has a narrow yellowish apical border. Pile short, appressed, yellow on the first segment, yellow spots and metallic areas; black on the opaque areas.

Male. Differs from ♀ as follows: eyes situated on the front by a little more than the width of the ocellar triangle which is a little longer than wide, rather large and situated at the posterior two-fifths of the front; eyes most closely approximated at the anterior two-fifths of the front, the orbital margins below rather narrowly greyish brassy yellow pollinose, the pollen forming a rather broad fascia immediately below the approximation of the eyes.

Fourth abdominal segment broadly reddish-yellow apically, the fifth entirely wanting as such (extremely small and hidden). Genitalia fairly large, orange, the appendages brown.

Described from: 2 ♀♀, Selangor, Kuala Lumpur, Aug. 12 and 21; ♂♀, same locality, April 25, 1923; and ♀, Perak, Batang Padang, Jor Camp, 1800 ft., May 30, 1923, all collected by H. M. Pendlebury.

Genus *Cheilosia* Meigen.

Anterior cross-vein at or before the basal third of the discal cell, rectangular; wholly dark, the face or body rarely marked with yellow. The genus is distinguished from all others by the quite striking, wide facial side margins which extend from the facial pits to, or almost to, the antennae, a character rarely conspicuous in allied genera. The genotype is *C. flavipes* Meig.

The well-marked facial side margins are always more strongly defined in *Cheilosia* and *Cartosyrphus* than in any other genera, except, perhaps, *Ferdinandea*, but this genus has the anterior cross-vein ending beyond the middle of the discal cell. Nevertheless, I consider it closely allied to *Cheilosia*. I have used the original spelling for the name of this genus, in accordance with the rules of nomenclature.

Endoiasimyia Bigot, with *indiana* Big. as genotype I consider to be a synonym of *Cheilosia*, although it may form a subgenus. In 1922 Shannon (Ins. insc. Mens., x, 127), recognized the genus *Cartosyrphus* and erected two subgenera. The genera and subgenera may be distinguished as follows.

- | | | |
|-----------------------------------------------------------------------|---|--------------------------|
| 1. Eyes hairy, antennal pits separated (Genus <i>Cheilosia</i>) | - | 2. |
| Eyes quite bare; antennal pits confluent (Genus <i>Cartosyrphus</i>) | - | 4. |
| 2. Sides of face without long hairs | - | subgenus |
| | | <i>Cheilosia</i> Meig. |
| Sides of face with long hairs | - | 3. |
| 3. Arista bare or pubescent | - | subgenus |
| | | <i>Chilomyia</i> Shann. |
| Arista long plumose | - | subgenus |
| | | <i>Endoiasimyia</i> Big. |
| 4. Arista bare or pubescent | - | subgenus |
| | | <i>Cartosyrphus</i> Big. |
| Arista long plumose | - | subgenus |
| | | <i>Hiatomyia</i> Shann. |

The table of species given below includes Indian as well as Malayan species, but I am unable to place two of those described by Bigot. I think both belong to the subgenus *Endoiasimyia*, and *acuticornis* sp. n. and *apicalis* Brun. also belong in this section; *tendens* sp. n. is a *Cheilosia* in the strict sense.

Table of Species.*

- | | | | |
|---------------------------------------------------|---|---|----------------------------|
| 1. Arista long plumose | - | - | 3. |
| Arista pubescent or bare | - | - | 2. |
| 2. Thickly pilose species (more or less bee-like) | - | - | - |
| | | | <i>himalayensis</i> Brun. |
| Pile not unusually long and abundant | - | - | 4. |
| 3. Sides of face with black hair in both sexes | - | - | - |
| | | | <i>acuticornis</i> sp. n. |
| Sides of face with "yellowish grey hair" | - | - | - |
| | | | <i>apicalis</i> Brun. |
| 4. Abdomen shining plumbeous, with black fasciae | - | - | - |
| | | | <i>plumbiventris</i> Brun. |
| Abdomen with at most a plumbeous tinge | - | - | 5. |
| 5. Third abdominal segment wholly black pilose | - | - | - |
| | | | <i>hirticincta</i> Brun. |
| Abdomen wholly pale pilose | - | - | 6. |
| 6. Mesonotum wholly black pilose | - | - | - |
| | | | <i>tendens</i> sp. n. |
| Mesonotum brownish-yellow pilose | - | - | - |
| | | | <i>nigroaenea</i> Brun. |

Cheilosia acuticornis sp. n.

Black, only the antennae and portions of the legs reddish; facial slopes with black pile; third antennal joint subtriangular; sides of mesonotum and apex of scutellum, with black bristles.

Length, 8.5 mm., of wings the same. *Male*. Face greenish-black, covered, except the tubercle, with appressed, fine, white tomentum; the slopes with moderately abundant, fairly long, fuscous pile, the side margins with short, not conspicuous white pile; in profile, with a rather large

**C. pilipes* Big., is not included. Brunetti places it in *Cheilosia*, but the original description does not warrant the assumption that the wings are broadly brown apically. Bigot says: "ailes un peu jaunâtres, nervures et base d'un fauve pale." The species cannot be recognized from the description.

obtusely-rounded tubercle which lies mostly below the middle of the face, above which it is moderately deeply concave, the concavity below the tubercle deeper, shorter, the oral tip only moderately produced, the apex of the tubercle on a plane with the antennal prominence. Front rather strongly separated from the face, somewhat swollen, with a conspicuous median longitudinal groove, the colour black, wholly thinly whitish pollinose, the pollen condensed along the eyes and on the groove. Frontal and vertical triangles black pilose. The eyes touch for a distance equal to more than twice the length of the vertical triangle, which is black, rather small. Occiput opaque black, narrowly evident above, on the lower two-thirds, silvery whitish, the pile black above, whitish below. Eyes clothed with moderately abundant whitish pile. Antennal pits separated, reddish. Antennae reddish, third joint rather ferruginous on the upper part apically. Arista brownish-red, the long hairs forming the plume, black.

Mesonotum moderately shining deep black; on the middle of the front half with a pair of posteriorly slightly diverging, greyish pollinose longitudinal vittae, and on either side, but little evident before the transverse suture, a moderately wide, similar vitta, but it is not quite as evident from most views. The pile is mostly dull tawny, but the submedian black stripes and most of the posterior part, bears black hairs, the pleura bear almost white, abundant pile; scutellum with rather reddish-yellow, short pile, with longer black hairs on the disc, the pile on the margins more whitish; sides of the mesonotum, except in front, with black bristles, the scutellum with about eighth. The margins of the mesonotum, the pleura and scutellum are more greenish in colour, the pleura covered with greyish-yellow pollen. The scutellum is about three-fifths as long as its greatest width and is less obtuse than usual.

Femora all blackish, their apices yellow; tibiae yellow, each with a brownish band, those on the front four beyond the middle and about one-fifth as wide as the length of the tibiae, those on the hind tibiae occupy about one-third their length and lie mostly beyond the middle. Tarsi brownish, the two basal joints of the front four paler. All the pile on the legs is pallidly yellowish or white, not very abundant, only the broad apices of the hind femora with sparse, mostly appressed, black hairs and a few erect, stouter ones below.

Wings moderately infuscated, paler posteriorly. Squamae whitish, with brown border and brownish fringe; halteres pale yellowish.

Abdomen subopaque black, with metallic blue reflection in some lights, the side margins and apex aeneous. Pile on sides long, conspicuous, yellowish, the black pile on the

disc shorter, not reaching the side margins, although approaching them on the apices of the second and third segments; the broad base of the fourth segment is black pilose; the pale pile extends inwardly as large basal triangles on the second and third segments. Venter with greyish yellowish pollen and pallidly yellowish pile. Genitalia rather small, pale-haired, thinly greyish-yellow pollinose.

In the type δ the wings are tinged with brownish on the apical third.

Female. Facial knob a little smaller and more regular, the concavity above regular; antennae a little larger. Front at vertex one-fifth the head-width widening until at the antennae it is about one-third the head-width, long, the orbits rather broadly yellowish-white pollinose on the lower part, across the broad depression with considerable brownish-yellow pollen which extends down the broad median depression almost to the lunule, where it spreads out broadly along the border of the lunule and also borders the sericeous orbits facial spot on its upper side. Pile black. Pile of eyes short, more whitish.

Pile everywhere shorter than in the δ , the bristles of the thorax and scutellum therefore very conspicuous. Abdomen subopaque, with the lateral margins more widely shining aeneous, the pale pile erect, covering all the shining areas and including the whole of the fifth segment. Pile elsewhere, short, sparse, appressed, black. Apical third of wings quite blackish on more than anterior half.

Described from the following specimens: δ , Selangor Pahang border, Ginting Sempak, Oct. 18, 1821; δ ♀, Pahang, Lubok Tamang, 3500 ft., March 4, 1924, collected by H. M. Pendlebury. Another specimen from "Cameron's Highlands, No. 4. Camp, 4800 ft., June 18, 1923, is probably different. It is larger, has the apical wing marking much more conspicuous than in the other males, the thorax more shining brassy with more tawny pollen and the squamae are wholly brown. Until further specimens are secured it is unwise to describe the species.

Cheilosia tendens sp. n.

Length, 7.5 mm. *Male*. Blue-black. Facial swelling very large, bulbous, occupying more than half the face, moderately shortly concave above, shortly and deeply concave below, the oral margin a little more prominent than the antennal projection; on the lower slopes of the tubercle and the face below except the oral tip, brownish-yellow pollinose, the prominence shining, leaving only the narrow orbits pollinose, the orbital sericeous spot depressed; facial slopes with long cinereous to brownish pile. Frontal triangle short, a little swollen, the depressed line deep above,

the upper angle narrowly opaque; pile all black. Vertical triangle small, the sides equal, pile all black. Occiput yellowish-grey pollinose and pilose, the occipital cilia black. Cheeks brownish-yellow pollinose and pale yellowish pilose. Eyes with fairly short yellowish pile which becomes rather brown above, but appears almost white in some views. Antennae ferruginous brown, the third reddish at base below, broadly oval, fairly large; arista long, brown, tapering, short pubescent.

Mesonotum with traces of four aeneous vittae as in *acuticornis*, in some lights thinly brownish pollinose, wholly black pilose, without bristles. The pleura are thinly brown pollinose, the pile brown above, becoming cinereous towards the pectus. Scutellum concolorous with thorax, black pilose, only the long ventral fringe greyish-yellow.

Legs black; narrow apices of anterior four femora and basal fourth of posterior tibiae, reddish; basal two-fifths of the anterior tibiae and more than the basal third of the middle ones, yellow. Pile of legs black; on the posterior femora whitish except for a few hairs apically, on the middle pair less extensively yellowish.

Wings cinereous hyaline; stigma pale luteous. Squamae brownish, with brown border and fringe. Halteres brown, with reddish-brown stem.

Abdomen opaque black with the sides of the second segment and subquadrate spot on basal two-thirds of the third and fourth, metallic bluish, the broad apex of the fourth with more or less blue reflection. Pile sparse, long basally, apically and laterally, shorter on the disc.

Two males, Pahang, Lubok Tamang, 3500 ft., March 4 and 5, 1924, collected by H. M. Pendlebury.

Genus *Ferdinandea* Rondani.

This genus is one of the most easily recognized in the family owing to the presence of bristles on the thorax and scutellum together with the position of the anterior cross-vein, which is oblique and joins the fourth vein at the middle of the discal cell. The head is similar to that of *Cheilosia*, the facial side margins being equally as well marked in most of the species, while the general habitus is the same.

Verrall has placed the genus in the *Milesinae*, while Shannon includes it in the *Xylotinae*. It undoubtedly belongs in the *Cheilosinae* notwithstanding the position of the anterior cross-vein, a character of really little value in separating these subfamilies and I doubt if the two groups can remain as such.

In the genus *Ferdinandea* (*Chrysochlamys*) there are but eight described species distributed as follows: Nearctic,

4; Palaearctic, 3; Japan (Palaearctic?) 1. An additional species is represented in the collection.

Ferdinandea maculipennis sp. n.

Length, 12 mm. *Male*. Rather robust. Face brownish red, the broad median stripe and cheeks black, the whole densely brassy-yellow pollinose, the pollen on the middle of the face decidedly rust coloured and the black front is similarly clothed except a transverse spot immediately above the base of the antennae. Frontal triangle a little convex, bearing long black pile. Vertical triangle one and a half times as long as wide, black, with abundant brownish pollen and black pile, the anterior ocellus remote; occipital cilia black. Pile of cheeks, occiput, facial margins and lower slopes of the frontal prominence, brassy-yellow. Occiput black in ground colour, yellowish-grey pollinose. Antennae ferruginous; third joint subcircular, a little longer than wide, the long, slender arista brown, microscopically pubescent.

Mesonotum rather cupreous, but when seen from behind densely brownish-grey pollinose with a narrow median and broad sublateral darker more bronzed stripes, but even these are pollinose in some views. Pleura in front of the wings with a broad fascia of brownish-grey pollen, elsewhere more blackish. Pile of mesonotum black, fairly coarse, with pale hairs intermixed in the middle anteriorly; the lateral margins and pleura yellow pilose. Bristles all strong; four equally spaced prescutellars in addition to the lateral and pleural ones. Scutellum brownish-red, black haired, the ventral fringe yellow, the margin with five pairs of strong bristles.

Femora black, with reddish apices; tibiae reddish, the anterior four each with a large brown spot behind, the posterior pair brownish red on the apical half, with brownish anterior surface except at the base; tarsi reddish, becoming brown at apices, the posterior ones darker. Pile of femora tawny, on the upper surface and whole of the broad apex, black, the middle pair apically with six or seven long closely placed bristles in a longitudinal row on the posterior surface; tibiae and tarsi black pilose, the posterior tibiae with tawny pile behind and beneath.

Wings pale amber coloured basally except behind, the apical two-fifths brownish-grey, with a large, subtriangular brown spot reaching back from the stigma to the fourth vein and surrounding the anterior cross-vein, Squamae yellowish-brown, with yellow border and golden yellow fringe. Halteres yellow with brownish knob.

Basal two and a third abdominal segments aeneous, the remainder of the abdomen deep shining bronze-black; the

whole aeneous portion, expanding at the sides to cover the whole length, and the narrow base of the fourth segment, except in the middle, expanding a little towards the sides, bright orange-yellow pilose, the pile elsewhere black, coarse and fairly long.

Described from a single ♂, Pahang, "Cameron's Highlands," Gunong Berumban, (summit) 6050 ft., March 14, 1924, collected by H. M. Pendlebury.

Genus *Callicera* Panzer.

This genus cannot well be confused with any other as it is at once distinguished by the presence of long pile on the upper surface of the lower lobe of the squamae and terminal arista or style. The third antennal joint is elongate, tapering, somewhat laterally compressed and bears a long apical style which is thickened on the basal fourth; anterior cross-vein near the basal fourth of the discal cell and the whole insect clothed with fairly long and abundant pile, even on the face and eyes.

Of the genera with terminal style or arista *Ceriodes* bears a stout, tapering style and the face is never more than sparsely short pilose, usually almost perpendicular, the eyes apparently bare; *Pelecocera* is a genus of small flies having the third antennal joint produced above into a point and bearing a densely pubescent thick arista, while *Merapioidus* has the third joint produced upwards into a long conical point which bears the arista. The following tabulation shows the relationships:

- | | | |
|-----------------------------------------------------------------------------------------------------------------------------|----|--------------------------|
| 1. Anterior cross-vein beyond or near the middle of the discal cell | 2. | |
| Anterior cross-vein at or before the basal third of the discal cell | 3. | |
| 2. Third antennal joint cylindrical, tapering, with terminal style (wasp-like flies) (<i>Ceriodinae</i>) | | <i>Ceriodes</i> Rond. |
| Third antennal joint large, transverse, produced upwards and forwards into a point bearing the arista. (<i>Xylotinae</i>) | | <i>Merapioidus</i> Big. |
| 3. Eyes pilose (<i>Cheilosinae</i>) | | <i>Callicera</i> Panz. |
| Eyes bare; slender, thinly pilose species (<i>Cheilosinae</i>) | | <i>Pelecocera</i> Meigen |

The three species recorded as occurring in India and Malaya may be distinguished by the accompanying key.

Table of Species.

1. Shining facial vitta very narrow, the pollen and pile extensive - *sackeni* Verr.
Shining facial vitta broad - - 2.
2. Third abdominal segment yellow pilose; apical half of anterior four femora orange-red - - *doleschalli* Verr.
Third abdominal segment black pilose except the sides; anterior four femora with only the apical sixth reddish - - *pendleburyi* sp. n.

Callicera pendleburyi sp. n. (Fig. 18.)

Appears to be most nearly allied to *Callicera doleschalli* Verrall, from Burmah, from which it differs by possessing a black pilose third abdominal segment and black femora, only the apices being reddish.

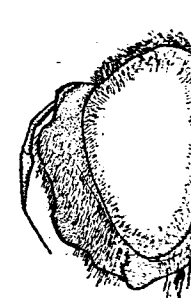


Fig. 18. Head of *C. pendleburyi* sp. n. Length, 12 to 12.5 mm. *Male*. Face and front shining bluish-black, the former greyish-white pollinose except a broad median vitta which expands above and leaves the whole callus shining and emits a more or less broad triangle downwards towards the sides of the face, half-way or less to the cheeks; the frontal orbits are rather narrowly dark brown pollinose; upper portion of the occiput rather opaque black, the aeneous, equilateral vertical triangles with rusty brownish pollen, the occiput below, silvery greyish pollinose. Face, cheeks and posterior orbits, except the upper fourth, white pilose, the occiput above, the lateral shining facial triangle, frontal and vertical triangles, black pilose. Eyes with dense, long, brown, pile which becomes rather tawny below. Facial profile as in the figure. First antennal joint reddish the two following brown or black, with ferruginous yellow pollen in some views, the arista ferruginous beyond the swollen reddish base.

Thorax aeneous, rather dulled by brownish. Pile on about the anterior third of the mesonotum tawny, elsewhere black. Anterior half of pleura more or less densely yellowish grey pollinose, with abundant yellowish pile and more or less metallic blue reflection. Scutellum blackish with erect black pile, the broad posterior margin with very dense pale

yellowish hair which spreads out fan-like to form a very conspicuous border, some of the hairs erect, the ground colour beneath them more bluish and lightly pale pollinose. There is a large patch of shorter, brown pile beneath the root of the wing.

Femora black, with reddish apices; anterior four tibiae reddish, the anterior pair more or less darkened behind in the middle; posterior tibiae and most of the basal joint of all the tarsi, dull reddish; tibiae sometimes more brownish except at apices. Pile of femora yellow; anterior pair with some black hairs behind apically, the middle pair usually almost wholly short black pilose on anterior and upper surfaces and with black hairs below towards the apices; posterior pair with only some short black hairs apically. Tibiae and tarsi with black hair, the anterior pair with yellowish pubescence on the antero-ventral surface. Tarsi brownish-black.

Wings hyaline, pale brownish to beyond the cross-veins, except behind, the colour gradually fading out. Squamae chocolate brown, with brown fringe and long brown hairs on the upper surface of the lower lobe. Halteres yellow.

Abdomen opaque black or rather brownish, (*i.e.* blackish beneath the black, brownish beneath the pale pile), the sides of the first segment with more or less blue reflection, the lateral margins on the basal three-fourths of the second and third segments shining; a metallic blue reflection is visible to a slight degree beneath the dark pollen. Abdominal pile long, abundant, yellow on the sides of the first and basal half of the second, the entire lateral abdominal margins and whole of the fifth segment; on the apical half of the second and whole of the third segments long and black; on the basal half of the second segment it is shorter and less abundant, but the black pile becomes longer towards the sides and posteriorly and is quite long laterally against the pale pile; first segment not pilose in the middle. Genitalia with black pile. Venter greyish pollinose on aeneous ground, wholly yellow pilose. In some cases the pile on the base of the abdomen may be almost white.

Described from 4 ♂♂ from Pahang, "Cameron's Highlands"; ♂, Rhododendron Hill, 5200 ft., June 20, 1923; 3 ♂, Gunong Berumban, (summit) 6050 ft., March 14 and June 17, 1923, and 1 ♂, same locality, 5100 ft., March 12, 1925, all collected by H. M. Pendlebury.

Genus *Rhingia* Scopoli.

Anterior cross-vein at or before basal third of discal cell; humeri pilose; epistoma produced as a long porrect nized by these characters. Genotype: *R. rostrata* L. The snout; posterior coxae not hairy behind. Readily recognized single species in the collection appears to be undescribed.

Rhingia chaetosa sp. n. (Pl. IV, fig. 19).

Abdomen with three incomplete reddish fasciae; elsewhere, except the first segment, shining blackish.

Length, 11 mm. *Female*. Face shining reddish, cheeks aeneous, the narrow oral margin and a stripe on more than the apical half of the snout, black. Antennal tubercle reddish; front with parallel sides, greenish-black, thinly covered with yellowish pollen, the orbits more thickly so; pile black. Occiput aeneous, yellow pollinose, short yellow pilose below, above with black pile, the hairs at the vertex long. Antennae ferruginous reddish; third joint elongate cordate; arista brown, very short plumose.

Mesonotum aeneous, thinly covered with brownish yellow pollen, the side margins broadly and a pair of submedian, posteriorly diverging, rather broad vittae, thickly so. Pleura more brownish-black, chiefly covered with brownish-yellow pollen, the side margins broadly and a pair of submedian, marginal darker stripe on either side. Pile yellow, except on a vitta above the wings, the bristles black, arranged as follows: on the posterior edge of the mesopleura, two on the notopleura, on the posterior calli and on the margin of the scutellum, where there are eight or ten.

Legs reddish-yellow, the following portions blackish brown: basal half of the anterior four femora, basal two-thirds of the hind ones, a broad band situated mostly beyond the middle of the hind tibiae and the tarsi, except the basal joint of the anterior four; anterior four tibiae in the middle, and their basitarsi, rather ferruginous.

Wings rather yellowish, more brownish-yellow apically. Squamae greyish-white, with yellow border and fringe; halteres yellow, with ferruginous knobs.

Abdomen shining blackish, the first segment yellow with a reddish-brown spot on either side. Second to fourth segments each with a reddish fascia which does not reach the lateral margin, the last two widened behind in the middle, the first narrowest in the middle, all concave towards the sides in front, the outer end curving forward almost to the base of the segment, the bands broadly separated from the base, except that the anterior band appears to almost reach the base broadly towards the sides. Fifth segment wholly black. Pile pale basally and on the whole lateral margin; elsewhere black, but there are a few yellow hairs intermixed on the posterior angles of the fourth segment.

Described from a single ♀: Pahang, F.M.S., Gunong Tahan, Padang, 5500 ft., Dec. 17, 1921, collected by H. M. Pendlebury.

Subfamily XYLOTINAE.

Genus *Xylota* Meigen.

Anterior cross-vein oblique, ending beyond the middle of the discal cell; third longitudinal vein straight or almost so, the apical cross-vein curved and joining the third vein well before the costa; face short, concave, the oral margin prominent; abdomen with short pile; posterior femora moderately to very strongly thickened, often armed with spines beneath.

There are six species in the collection, only one of which agrees with any published description.

Table of Species.

- | | | |
|------------------------------------------------------------------------------------------------------------------------------------|-------|---------------------------|
| 1. Tibiae wholly testaceous; femora chalybeous | - - - | * <i>conformis</i> Walk. |
| Hind tibiae, at least, broadly black or brown | - - - | 2. |
| 2. All the femora red except the broad apex of the posterior pair | - - - | <i>brunettii</i> sp. n. |
| At least one pair of femora more broadly black or brown | - - - | 3. |
| 3. Anterior four femora wholly reddish | - - - | <i>annulata</i> Brun. |
| Anterior femora broadly or wholly blackish | - - - | 4. |
| 4. Basal half or more of front four femora reddish; middle tibiae wholly pale | - - - | <i>doris</i> sp. n. |
| Anterior four femora black, with the apex reddish** | - - - | 5. |
| 5. Middle tibiae wholly yellow; posterior surface of apical half median tuft of subappressed bristly hairs on anterior surface | - - - | <i>pendleburyi</i> sp. n. |
| Middle tibiae over half brown or black; posterior femora of ♂ without tuft of bristles on anterior surface | - - - | 6. |
| 6. Middle tibiae with the pile on the posterior surface of apical half decidedly longer than the thickness of the tibia, and erect | - - - | ** <i>spinipes</i> sp. n. |
| Middle tibiae with their hair wholly short and appressed | - - - | <i>petulans</i> sp. n. |

*Not seen.

***X. spinipes* sp. n. is teneral, and while the legs appear as though they should be very largely black or brown they are almost wholly pale in the type.

Xylota brunettii sp. n.

Length, 10 mm. *Female*. Face yellowish-brown, the lower part of the cheeks and a large, indefinite spot on the sides of the face below, waxy-yellow, the face, cheeks and occiput sericeous greyish pollinose. Front shining bronze brown, the median third densely greyish-yellow pollinose, the short, fine pile pale yellowish. Pile of occiput brownish yellow above, silvery-white below. Antennae brown; third joint elongate oval; arista reddish, with the apical half brown.

Mesonotum brownish-bronze, not much shining, clothed with very short black hairs, the submedian vittae yellowish pilose, narrowed behind, aeneous. Humeri, notopleura and pleura pale yellowish pilose and greyish pollinose, the pleura brownish-yellow in ground colour with a black triangle covering the anterior corners of the meso- and sternopleura and another spot beneath the halteres; a brownish spot above the middle coxae. Scutellum with fairly wide margin which is a little paler than the disc and bears yellowish pile, the disc with short black hairs.

Legs reddish, the anterior four tibiae and tarsi more yellowish, appearing almost whitish in some views owing to the white pile; apical two joints of the front tarsi, apical seventh of the posterior femora and the whole of their tibiae and tarsi, blackish, the tibiae with a broad, incomplete obscure reddish band in the middle. Pile of legs pale, on the dark portions brownish; posterior tibiae with abundant, short fine hairs beneath. Posterior femora greatly swollen, strongly narrowed at the base and apex; beneath, on the apical half, with three irregular rows of short black spines and outside of these seven or eight longer spines on both the anterior and posterior ventral edges, and a small spine on the antero-ventral edge near the basal third.

Wings greyish-hyaline, the stigma luteous. Squamae whitish, with pale yellow border and fringe; halteres pale yellow.

First abdominal segment with lateral and anterior margins pale yellow, elsewhere brown. Second and third segments opaque black, the sides rather broadly yellow, the yellow forming large, inwardly rounded triangles which lie mostly before the middle of the segment, the second pair not quite reaching the posterior margin of the second segment at the sides. Fourth segment greenish-black, with a broad, basal, incomplete opaque fascia, the segment convex, but flattened on almost the apical third; fifth segment small, wholly shining black. Abdominal pile short and black on the opaque areas; yellow on the base and yellow spots; white on the two terminal segments.

Described from a single ♀, Pahang, Lubok Tamang, at light, 3,500 ft., June 7, 1923, collected by H. M. Pendlebury.

This species is very readily recognized by the colour of the legs. The specimen is rather teneral and it is difficult to judge accurately the true colour, but I believe the above description will apply well to mature specimens, although the wings may be much darker than stated. I take great pleasure in naming this species after my friend, Mr. E. Brunetti, who has so well characterized the Indian Syrphidae.

Xylota annulata Brunetti.

Rec. Ind. Mus., ix, 270, Pl. XIV, figs. 11 and 15, 1913.

Brunetti states that the fourth segment is wholly aeneous, the fifth wholly red. There are only four abdominal segments visible as such in the males of this sub-family, so it is evident that he meant the apical third of the fourth segment which is strongly marked off from the convex basal portion. Assuming this to be so I have no hesitation in assigning the specimen described below to *annulata*, the differences between this specimen and those described by Brunetti (2♂ 1♀), being not any greater than is to be expected, the sides of the fourth segment being broadly dark reddish and the band on the posterior femur a little wider.

Length, 11 mm. Face and anterior half of cheeks yellow; upper third of face and remainder of head, black; face rather silvery, occiput grey, pollinose. Frontal triangle shining, the upper angle and the anterior portion of the vertical triangle, yellow pollinose and wholly without pile; posterior three-fifths of the vertical triangle thinly brownish pollinose and bearing short fuscous pile, the large ocellar triangle occupying about the anterior two-thirds of the posterior three-fifths of the vertical triangle, the sides of the triangle quite straight, so as to form a true V. Occiput yellow pilose above, silvery below. Antennae shining brownish, the third joint densely brownish-yellow pollinose, elongate oval, tapering, one and three-quarter times as long as wide. Arista ferruginous, the apical half black, slender, quite bare.

Thorax black; pleura greyish pollinose; mesonotum bronzed except the aeneous vittae which lie beneath the entire golden yellow pilose vittae which are very broadly separated from each other, taper behind and are narrowly connected along the posterior margin by similar, longer pile to the golden yellow pile on the posterior calli, the humeri and pleura with pale yellow or whitish pile, the former yellow in ground colour, the mesopleura with an elongate oval yellow spot behind on the upper three-fifths. Pile of mesonotum and scutellum otherwise short and black, on the

sides of the scutellum towards the base rather long, on the margin short and yellow. Scutellum with rather narrow impressed margin.

Legs orange; apical joints of anterior four tarsi brownish; posterior tarsi wholly, their tibiae except the narrow, dorsal reddish surface, the apex of their femora and a broad median band, black, the median band much wider above, where it leaves the basal and subapical fourth orange. (In Brunetti's figure it lies almost wholly on the basal half). Posterior femora strongly incrassate, ridged and very shortly spinose on the apical third below and bearing five or six stout spines on the anterior and posterior surfaces outside the ridges. Pile of legs pale, black only on the apex of the posterior femora and anterior, ventral and basal two-thirds of the posterior surface of the hind tibiae. (The femora are not nearly as much enlarged as in many American species and there can be no question about this being a true *Xylota* although Brunetti appears to have been a little doubtful).

Wings tinged with luteous greyish, quite dark on the apical fourth; stigma yellowish-brown. Squamae white, with yellow border and fringe. Halteres orange.

Abdomen orange; second segment with an incomplete fairly broad basal fascia, a broad median vitta and the apical third, strongly narrowed to the sides, which it narrowly reaches, opaque black; third segment with the narrow, incomplete base, a narrow median vitta which commences to expand at the middle of the segment and runs from thence to a point well inside the posterior angles, opaque black; fourth segment aeneous except the broad lateral margins and posterior third. Abdominal pile short, appressed and black on the opaque areas, elsewhere pale yellow, longer and generally erect.

Description from a single ♂, Perak, Batang Padang, Jor Camp, 1800 ft., May 31, 1923, collected by H. M. Pendlebury.

Xylota pendleburyi sp. n.

Thorax brassy-yellow, vittate; second and third abdominal segments more than half reddish; spines of hind femora forming a somewhat angulate plate.

Length, 12 mm. *Male*. Head black or brownish; except the vertical triangle and the apex of the frontal triangle, silvery-grey pruinose. Pile of head yellowish. Vertical triangle elongate, the ocelli situated slightly before the middle. Eyes contiguous for a shorter distance than the length of the frontal triangle, the facets enlarged dorso-frontally. Antennae brownish-yellow, the third joint

broadly reddish basally, one and three-quarter times as long as wide, the apex rounded; arista brownish-red.

Mesonotum bronzy, with a pair of widely separated brassy vittae which spread out before the scutellum and emit a second short, sharp vitta forward from the inner edge of the calli. The pile is yellowish before the suture and on all the brassy parts, elsewhere blackish. Pleura greenish-black, grey pollinose, with a spot beneath and behind the humeri and beneath the wings, less thickly so, the pile all whitish. Scutellum brassy, with strong apical groove, its pile whitish.

Posterior trochanters with long, slender spur. Legs black, with the following portions reddish-yellow: extreme apices of all the femora, all of the anterior four and the basal third of the hind tibiae, first four joints of the anterior four and the hind tarsi, except the basal four-fifths of the first and the whole of the apical joint of the latter, the base of the tibiae rather whitish. Pile of the legs pale yellowish, with slight brassy tinge; on the lower posterior edge of the anterior tibiae and basitarsi and on the posterior and anterior lower edges of the middle tibiae and basitarsi, it is unusually long and fine and also quite long beneath the middle half of the hind femora; about the middle of the posterior femora is a strong tuft of black hairs. Hind femora moderately incrassate, laterally compressed on the apical half; on the apical third with eight setigerous tubercles on the anterior surface which tend to form an irregular, rather angular, plate; and about five behind which are much less conspicuous. Hind tibiae strongly arcuate. Trochanters more or less brownish-red.

Wings strongly tinged with fuscous yellow. Squamae whitish, with yellow border and fringe. Halteres orange.

Abdomen with the first and apical segments aeneous, the first segment quite large and more or less sericeous pollinose. Second segment reddish, with the very narrow apex and a faint narrow median vitta, rusty brownish. Third segment reddish, with the apical third or more, in the form of a semicircle, dull brownish, the red reaching almost to the apex at the sides. Fourth segment with reddish translucent appearance in some lights, wholly shining, the genitalia almost all rather reddish. Abdominal pile whitish: a median vitta on the second and third segments, narrow apex of the second, the dark portion of the third and an obscurely limited region on the basal two thirds of the fourth, with blackish pile.

Described from a single ♂, Pahang, F.M.S., Kuala Tahan, 300 ft., Nov. 21, 1921, collected by H. M. Pendlebury,

Xylota doris sp. n.

Abdomen with four orange spots; mesonotum not distinctly vittate.

Length, 10.5 mm. *Female*. Face pale yellow, the upper third, cheeks and remainder of head, deep black. Face, cheeks and occiput silvery greyish pollinose; median third of front yellow pollinose and finely white pilose, the upper portion with coarser black pile which is shorter than the pale; front quite narrow above. Occiput with yellow hair above, silvery-white below. Antennae black, third joint brown, oval, the arista brown, with paler base, slender, elongate.

Thorax and scutellum aeneous, the humeri and pleura grey pollinose. Pile of mesonotum short, tawny, on the posterior third, except that the broad sides extending broadly and obliquely to the suture and above the wings, and a roundish spot sublaterally between the humeri and suture are short black pilose. Pleural pile almost white. Scutellum black pilose, the margin with yellow pile, narrowly compressed.

Posterior legs black, the basal fifth of the femora orange; anterior four legs orange, with paler tibiae, the apical two tarsal joints and the apical fourth of the front femora and apical third of the middle pair, except the immediate apex, black. Pile of the legs yellow, black on the black portions of the tarsi, on the posterior tibiae and broad apex of the posterior femora above, wholly short on the tibiae. Posterior femora strongly swollen, with low, spinose ridges on the apical third below and five strong spines on either side outside the ridges.

Wings strongly tinged with greyish and still greyer on the apical fourth; stigma yellowish-brown. Squamae white, with yellow border and brown fringe. Halteres orange.

Abdomen with the first, fourth and fifth segments aeneous, the lateral margins and subrectangular spots on the second and third segments, orange, these segments opaque black, the pale areas shining; the spots on the second segment are broadly separated in the middle, the inner ones with rounded corners the outer ends widened, the spots lying mostly before the middle of the segment, their width on the inner half equal to about one-third the length of the segment. Spots on the third segment wider, their anterior edge almost straight, the posterior a little oblique, their inner posterior corner more rounded off, the spots less widely separated from each other than the preceding ones

and almost entirely before the middle of the segment. Abdominal pile short, black on the opaque areas, elsewhere reddish-yellow.

Described from an unique ♀, Pahang, "Cameron's Highlands," Gunung Berumban, 4000-4500 ft., March 16, 1924, collected by H. M. Pendlebury.

Xylota petulans sp. n.

Wholly black except parts of the legs; vittae on mesonotum moderately distinct; wings fuscous on apical half.

Length, 12 mm. *Female*. Head black, the back of the mouth and supra-antennal margin reddish; face, occiput and median third of the front, sericeous pollinose but the moderately broad median frontal vitta is only thinly so. Front narrow, with parallel sides on the upper half, thence slightly diverging to the lower fourth from whence it diverges fairly strongly. Antennal prominence strong. Pile of head yellowish-white, short and sparse on the front. Antennae black, the third joint brownish, with the base broadly obscure reddish, twice as long as wide, elongate oval; arista brown, its basal fifth swollen and reddish in colour.

Mesonotum cupreous bronzed, with a pair of widely separated brassy vittae which reach the whole length but are narrowed behind. Pile pale brassy yellowish; the cupreous areas chiefly, and the side margins behind the suture, bear shorter, black pile, that on the sides coarser. Pleura black, grey pollinose, an area behind and below the humeri and below the wings, less thickly so, the pile all whitish. Scutellum aeneous, with strong apical groove and yellowish pile.

Legs black, almost the basal third of all the tibiae and the first three joints of the anterior four tarsi, pale yellow. Pile of the legs rather fuzzy, very short, quite conspicuous, the tibiae largely or wholly black pilose on the ventral surface. Hind femora slightly incrassate; on the apical third below with five or six setigerous tubercles on anterior and posterior surface.

Wings rather yellowish, with the apical third fuscous. Squamae whitish, with pale brown border and fringe. Halteres orange.

Abdomen blue-black, slightly shining; second segment with the apical fourth, produced forward to the base on the middle line, opaque black. Third segment with an apical triangle reaching almost to the lateral margins and two-thirds the distance to the base of the segment, also opaque black. The two apical segments are slightly bronzed in

some lights. The short pile is black, but on the metallic areas of the first three segments and large rounded lateral triangles on the fourth, it is white.

Male. Differs as follows: frontal triangle shining black, narrowly yellowish or brownish pollinose above. Sides of the vertical triangle parallel to opposite the anterior ocellus, thence concavely moderately acute, the almost equilateral ocellar triangle in the middle of the vertical triangle which is thinly yellowish-brown pollinose in front of the ocelli; except along the orbits, yellow pilose; no black hairs on the head.

Mesonotum best described as bronzed with a broad, geminate, posteriorly-abbreviated median cupreous vitta and a broad sublateral one of the same colour. Pile of the dorsum very short, reddish-yellow, elsewhere on the thorax, almost white. Viewed from behind a posteriorly abbreviated yellow pilose vitta is very conspicuous between the cupreous vittae but it is not at all evident from anterior view. Spines beneath the posterior femora more extensive, the posterior trochanters with a moderately long spur.

Abdomen opaque brownish-black; first segment wholly aeneous, abdomen otherwise shining black as follows: entire lateral margins, fourth segment except the broad base; second segment except the broad apex, which is produced to the middle as a triangle and continued fairly broadly to the base where it again expands more or less to form all dull fascia; on the third segment the opaque areas are similar but the shining spots are shorter; the shining spots on the second and third segments are more or less evidently metallic reddish, especially in the middle, probably reddish in teneral.

Described from the following specimens: ♀, Selangor-Pahang border, Ginting Sempak, Oct. 13, 1921; 3 ♂, Perak, Batang Padang, Jor Camp, 1800 ft., May 30 and June 5, 1923; ♂, Pahang, "Cameron's Highlands," No. 4. Camp, 4800 ft., March 12, 1924; ♀, Sungai Ringlet, 3500 ft., March 10, 1925, all collected by H. M. Pendlebury.

Xylota spinipes sp. n.

Thorax rather weakly bivittate; abdomen apparently wholly dark; spines of hind femora reaching nearly to the base.

Length, 12 mm. *Male*. Face, cheeks, and lower portion of the front brownish-yellow; frontal triangle brown, the occiput largely similar, the vertical triangle steely-blue. A large, rectangular supra-antennal area and the vertical triangle, shining, the head elsewhere greyish pruinose. The eyes touch for a distance equal to the length of the frontal triangle and only the facets in front are enlarged. Ocelli

situated about the middle of the elongate vertical triangle. Antennae reddish-brown; third joint one and three-quarter times as long as wide, the apex rounded. Arista reddish yellow. Pile of head whitish except on the vertical triangle, where it is brassy-yellow.

Mesonotum greenish-black, the anterior margin broadly brownish-yellow; a pair of broadly separated brassy-yellow pilose vittae which are obscure posteriorly, and the side margins with similar pile, so that in some views there appear to be three broad, dark vittae on which behind the suture, the pile is more or less brownish, although the apparent differences in colour is largely due to the arrangement of the pile. The pleura are almost all brownish-yellow and chiefly greyish pruinose, their pile whitish with a brassy tinge. Scutellum rather aeneous, with strong apical groove and yellow pile.

Anterior four coxae brown, the hind ones brownish yellow except the posterior outer edge, the trochanters of the opposite colours. Anterior four femora brownish yellowish, with the apex obliquely brown, the apical third below and less than one-fourth above being of this colour; the hind ones are rather similar, but the colours are darker, being rather blackish and yellowish brown. Anterior four tibiae and tarsi yellow, the apical tarsal joint a little darkened; basal fourth of hind tibiae and their tarsi yellowish, although the first joint is chiefly, and the last one or two joints, at least above, brownish. Pile of the legs all pale brassy-yellow except that it is black on the apical tarsal joints. Hind femora moderately incrassate: bearing on the anterior and posterior surfaces below, about ten setigerous tubercles, the spines on the anterior edge quite strong, the apical five rather evenly placed, the others reaching unevenly to the basal sixth; femora only slightly laterally compressed towards the apex. Hind tibiae moderately strongly arcuate. Hind trochanters with a strong, brown, acute, spur.

Wings lightly tinged with cinereous yellow, the stigma luteous. Squamae whitish, with yellow border and fringe. Halteres yellow.

Abdomen aeneous, the broad apex and narrow median vitta on the second, apical two-fifths and median vitta of the third and immediate base of the fourth segments, opaque black, the ground colour on the second and third segments possibly with a slight brownish tinge, or even reddish in some specimens. The pile is black on the opaque portions and on the fourth segment except the broad lateral margins, elsewhere, including the genitalia, yellowish.

Described from a single ♂, Peninsular Siam, Nakon Sri Tamarat, Khao Luang, 3000 ft., March 25, 1922, collected by H. M. Pendlebury.

The specimen is somewhat teneral and it is very difficult to judge the colour correctly. The colours should therefore be considered only approximately.

Note: There is great sexual dimorphism between the sexes of *Xylota* in many cases, the females often lacking the bright markings found in the male and also being without the armament of the legs in many cases, and always lacking the trochantral spur on the hind legs. It is therefore possible that the opposite sex of one or more of the above species has been described.

Criorhina sp. n.

A single female belonging to an undescribed species is in such poor condition that I hesitate to name it.

The ocellar triangle is equilateral, first two antennal joints more or less reddish the third chiefly black, arista missing. Face strongly produced below the eyes, conical the tubercle small; face and front yellow pollinose except a median vitta running over both, shining black. Mesonotum evidently all long tawny pilose except a narrow fascia before the scutellum; scutellum and pleura except a broad anterior band on the latter, black pilose. Legs black, the knees reddish, evidently all black pilose but the front legs missing. Veins luteous, only brown towards apex of wing, apical cell rather strongly upturned at apex. Abdomen black pilose to the middle of the third segment, beyond with yellow pile, the venter wholly black haired.

The specimen bears the label "Malay Penin., no data. ex. Coll. Ag. Dept."

It is to be hoped that a perfect specimen may be found so that an accurate description can be given.

Subfamily SERICOMYINAE.

The genera *Sericomyia*, *Arctophila*, *Pararctophila* and *Condidia* form a natural group and are fully entitled to subfamily rank. They possess the general characters of the *Xylotinae* but the arista is long plumose and the male genitalia is peculiar in having one clasper very small while the other is long and slender, a character not found in any other genera known to me.

Genus *Pararctophila* Herve-Bazin.

This genus differs from *Sericomyia* and *Condidia*, the latter known only from North America, by the absence of pale spots or fasciae on the abdomen, and from *Arctophila* by the much thinner or flatter head and much less convex abdomen. The species are more robust than those of *Sericomyia* but this is not generally the case, and the species described below is more slender, the sides of the abdomen being more parallel and the abdomen less strongly arched.

The recognition of four genera is open to question. It is true that the species of *Arctophila* and *Pararctophila* are generally more hairy than those of the other genera but there are intergrading forms. *Condidea* is separated from *Sericomyia* because of the undulated third vein and the presence of very large roundish spots on the second abdominal segment. The diagnosis of Coquillett is very misleading, while Schiner's diagnosis of *Arctophila* will have to be modified to include those species of *Sericomyia*-like form.

Pararctophila malayana sp. n. (Pl. IV, fig. 20).

Abdomen opaque brownish-red; face translucent dull yellowish, yellow pollinose except on the tubercle; third antennal joint reddish.

Length, 15 to 16 mm. *Male*. Face and frontal triangle reddish-yellow, densely coated, except a small margin above the antennae and the middle facial line, with yellow pollen; tubercle and oral tip rather ferruginous. Face very wide below; produced downwards below the eyes as an obtuse cone, so that almost half the face lies below the lower of the eyes; in profile there is a rather flat depression below the antennae below which about one-third of the face is produced to about the same plane as the antennal prominence, the lower fifth of the face on a plane with the upper depression and slightly retreating, the oral angles obtuse. Middle of face broadly bare, elsewhere with moderately long yellow pile, the frontal triangle similarly pilose. Frontal triangle small, slightly wider than long. The eyes touch for a distance equal to about half the length of the frontal triangle; the vertical triangle is about as long as the frontal triangle, one and a half times as long as wide, velvety reddish brown in colour, with rather tawny pile. Occiput narrowly visible from above, widening slightly below, yellow pollinose, and pilose, the pile above being more fulvous. First two antennal joints polished ferruginous, the third dull, rather reddish, almost rectangular, hardly one and a half times as long as wide; arista yellowish, becoming black at the apex, the plumes long, black but a few at the base below are yellowish.

Mesonotum somewhat shining brownish olivaceous, with five slender, more brown vittae which unite on the posterior fourth; humeri and pleura below them, sides of the mesonotum rather broadly, and the scutellum, more or less rusty yellowish. The whole thorax is clothed with abundant, tawny pile which is long on the margins of the mesonotum, pleura and scutellum and the latter bears a few black hairs on the disc. The pleura are deep brownish in colour, chiefly covered with yellowish-grey pollen.

Legs brownish reddish-yellow; tarsi apically, hind femora except the immediate base and apex, more brownish, shining, the anterior femora somewhat darkened above. Hind femora rather strongly swollen and somewhat arcuate, with a conspicuous subapical swelling below; hind tibiae slightly arcuate, widest just after the base and on the basal three-fifths, their apex somewhat tapering, their length about two thirds that of their femora. Posterior basitarsi almost as long as their tibiae, the whole tarsus as long as the hind femur.

Wings almost hyaline, the anterior third greyish-yellow, this colour condensed in the middle of the wing; most of the veins narrowly clouded with luteous.

Abdomen opaque, usually mostly dull brownish-red (brick red), the second and third incisures brown. The first segment wholly, and most of the second, usually much paler; sometimes there is a slender brown median vitta on the second segment. The colour of the abdomen varies a little in intensity and may be somewhat paler or darker than described. Pile long basally, on the sides and apically, almost all tawny, the narrow apex of the second and base of the third segment with short black pile.

Described from four males: 2♂, Pahang, F.M.S., Gunung Tahan, 6,500 ft., Dec. 14, 1921; ♂, same locality, Dec. 15; ♂, same locality, 7,186 ft., Dec. 13, 1921 and 2♂, Pahang, "Cameron's Highland," Tanah Rata, March 14, 1925, all collected by H. M. Pendlebury.

Subfamily ERISTALINAE.

Genus *Mallota* Meigen.

Allied to *Helophilus* from which it is distinguished by the usually more robust form and absence of pale vittae on the mesonotum. The species are usually densely pilose, but some are almost bare and superficially resemble *Eristalis* and *Merodon*. From *Eristalis* the open marginal cell will at once distinguish the species, while *Merodon* is characterized by a triangular production of the posterior femora near the apex. The genotype is *Mallota fusiformis* Fabr.

Table of Species.

- | | | |
|-------------------------------------------------------------------------------|-----------|------------------------|
| 1. Tibiae wholly reddish and wholly pale pilose | - - - - - | 2. |
| Tibiae partly black or brown or at least one pair more than half black pilose | - - - - - | 3. |
| 2. Wholly fulvous pilose species | - | <i>fulvula</i> sp. n. |
| Largely black pilose | - - - | <i>maculata</i> sp. n. |

3. Pale fasciae on third and fourth abdominal segments situated at the base - - - 4.
 Pale fasciae situated near the middle of the segments - - *crystaloides* sp. n.
 4. Posterior tibiae ciliate with dense black pile - - - *orientalis* Wied.
 Posterior tibiae wholly pale pilose, not ciliate - - - *sufficiens* sp. n.

Mallota fulvula sp. n.

Length, about 20 mm. *Female*. Entirely fulvous or reddish-orange pilose, the pile long and dense. Face black, densely greyish pollinose except the middle line, broad oral margin and the cheeks in front of the jowls; the latter with a subtriangular reddish spot below the eye. In profile the face is moderately concave above, with a large, rounded, not prominent tubercle below the middle, the short perpendicular space between the tubercle and the oral tip more prominent than the lowest part of the upper concavity, the tubercle much less prominent than the conical antennal prominence. The shining portions of the face are not pollinose. Front narrow above, black, mostly covered with greyish pollen which becomes brownish towards the ocelli and the upper side of the antennal prominence is more brownish in colour and without pollen, its apex narrowly yellowish. Occiput greyish pollinose, the orbits narrowly without pile, the fine orbital cilia long and black. Antennae shining brownish, the third joint dull brown, with a whitish bloom, elliptical, broader than long, its apex obliquely transverse, the corners rounded. Arista slender, reddish, thickest on basal half. Eyes with short pile.

Mesonotum opaque, the sides broadly shining greyish green-black, the disc greyish pollinose with a narrow, submedian geminate and narrow sublateral vittae opaque black, the latter contiguous with the shining margin. Pleura black, densely greyish pollinose. Scutellum reddish-yellow.

Legs ferruginous red, the femora black on the basal half, the pile all tawny, forming a ventral and dorsal fringe on the hind tibiae. Hind femora slightly thickened, slightly compressed, their tibiae compressed and slightly arcuate.

Wings broadly yellowish-brown along the veins and beyond the middle on the anterior part, the apex more greyish. Marginal cell narrowly open. Lower lobe of the squamae reddish, with reddish fringe, the upper lobe brownish, with brown fringe. Halteres ferruginous, with reddish stem.

Abdomen chiefly metallic greyish, the second segment with a narrow, incomplete basal, and wide, almost complete, median band, the two very broadly joined in the middle (almost one-fourth the segment), opaque black. Third segment with a broad opaque black fascia beyond the middle, which widens laterally where it occupies more than half the segment. Fourth segment with only transverse rectangles on the posterior corners shining black, the fifth segment aeneous. The pile on the whole insect largely obscures the ground colour.

Described from a single ♀, Pahang, F.M.S., Sungai Bertam, 4800 ft., Sept. 4, 1922, native collector.

Mallota maculata sp. n.

Scutellum yellow pilose; an elongate rectangular area on the front of the mesonotum, apex of the abdomen and the tibiae, fulvous pilose, the pile elsewhere black, except on the apical third of the hind femora.

Length, 20 mm. *Female*. Median facial stripe and cheeks shining black, the face elsewhere yellow pollinose and clothed with long black pile; in profile concave above, with a low, large, rounded, tubercle lying mostly below the middle, shortly perpendicular below the tubercle; produced below the eyes as a short, obtuse cone. Front opaque black, the antennal prominence wholly shining, its apex very narrowly reddish, the orbits opposite narrowly opaque black or brown; front with almost parallel sides above, widened anteriorly from slightly above the middle, its pile fairly long, all black. Occiput brownish pollinose, the immediate orbits, except above, silvery-white, the pile black.

Mesonotum opaque or subopaque black, with a rectangular brownish-red pollinose, longitudinally-placed rectangle in front, reaching back quite to the roots of the wings and clothed with fulvous pile, the pile elsewhere and on the pleura, black, on the reddish-yellow scutellum, yellow. Pleura lightly greyish pollinose.

Basal half, or slightly more, of the femora, black, the legs elsewhere reddish; anterior four femora wholly, the hind ones on the black portion, black pilose; the pile elsewhere on the legs fulvous. Hind femora somewhat compressed, with longer pile above and below, the hind tibiae compressed, gently arcuate, slightly curved backwards towards their apex, with much longer pile above and below.

Wings brownish, the middle of the cells and posterior border clearer, in some parts, almost hyaline. Marginal cell widely open. Squamae brown, with brown fringe.

Abdomen opaque black, the first segment grey pollinose, the fourth and fifth with orange pollen and fulvous pile;

each of these segments with a broad, postmedian shining fascia, the second and third segments with considerable brownish pollen in front towards the sides; first segment yellow pilose, the two following entirely black pilose except a small patch of tawny pile on the anterior angles of each.

Described by an unique ♀, Peninsular Siam, Nakon Sri Tamarat, Khao Luang, 5800 ft., March 24, 1922, collected by H. M. Pendlebury.

The specimen is not in the best of condition, the abdominal venter having been destroyed by pests. It is a very conspicuous, easily recognized species because of the strongly contrasting colour of the long, dense pile.

Mallota orientalis Wiedemann. (Fig. 21).

Eristalis orientalis Wied., Anal. Ent., 38, 1828.

Thorax in front, yellow pilose laterally; scutellum yellow and yellow-haired; sides of second abdominal segment with orange yellow spot, the two following segments each with a greyish-yellow pollinose fascia on the base.

Length, 15 mm. *Female*. Sides of the face broadly yellow in ground colour, the middle stripe and a small spot on the cheeks, shining black, the face elsewhere densely white pollinose; in profile moderately retreating, the under side of the antennal prominence rather strongly so, with a small, not conspicuous, nasiform tubercle. Pile long, sub-appressed, white. Front rather narrow the sides converging above, shining black, the sides to above the middle, whitish pollinose; the lower two-thirds in the middle except a large shining supra-antennal spot, with moderately abundant yellowish-brown pollen. The pile is black, but there is a whitish band across the middle and along the orbits below. Occiput grey pollinose, the orbits above broadly shining, the pile black above, elsewhere silvery-white. Antennae shining black, the third joint dulled by yellowish-grey pollen, decidedly longer than wide, its upper apical margin convexly oblique, bearing numerous small sensory pits and a large oval one. Arista bare, brownish-red, over twice as long as third antennal joint, rather slender. Eyes bearing uniformly short brownish-red pile.

Mesonotum before the suture, whitish-grey pollinose, the humeri opaque brown, behind the suture, opaque black; the side margins and a broad, preapical fascia, the outer ends of which are produced forward to the suture, shining. Pile before the suture, on the pleura and scutellum, yellow, elsewhere black, but yellow on the posterior calli. Scutellum yellow in ground colour.

Legs black; narrow apices of the femora, basal half of the anterior four tibiae and the first two or three joints of their tarsi, brownish-yellow, the colours diffuse. Pile yellow as follows: on anterior four femora and tibiae, and on the hind femora except the apical half below and apical fifth above; elsewhere black, the hind femora on the under side apically with a few long black hairs and much condensed pile, their tibiae with longer pile above and below. Posterior femora somewhat swollen, subangulate below towards the apex, gently convex above, their tibiae slightly arcuate and broadened.

Wings somewhat infuscated on the apical half (beyond the origin of the third vein) the furcation of this vein broadly darker, elsewhere hyaline.

Abdomen mostly shining black; second segment on either side with a large yellow triangle which is widely separated from the hind margin but reaches the anterior margin broadly and perhaps extends slightly on to the greyish pollinose first segment. In front of the pale triangles is an opaque black triangle; behind, on either side, an elongate, opaque black spot which is narrowly separated from the yellow triangle and lateral margin. On the outer side of the yellow spot is a rather large, subquadrate area densely covered with orange pile; elsewhere the pile is appressed, short, black, so that the inner portion of the yellow spot is not very distinct. The basal fourth of the third segment is densely yellowish-grey pollinose, behind which is a narrow opaque black fascia and there is a small yellow spot under the outer end of the greyish pollinose fascia; fourth segment similar, the opaque black fascia slightly wider in the middle. Pile on the pale pollinose fasciae and on the sides of the third and fourth segments erect, yellow, elsewhere black.



Fig. 21. Abdomen of ♀ *M. orientalis* Wied. side of the yellow spot is a rather large, subquadrate area densely covered with orange pile; elsewhere the pile is appressed, short, black, so that the inner portion of the yellow spot is not very distinct. The basal fourth of the third segment is densely yellowish-grey pollinose, behind which is a narrow opaque black fascia and there is a small yellow spot under the outer end of the greyish pollinose fascia; fourth segment similar, the opaque black fascia slightly wider in the middle. Pile on the pale pollinose fasciae and on the sides of the third and fourth segments erect, yellow, elsewhere black.

A single ♀, Perak, F.M.S., Jor Camp, 2000 ft., Aug. 25, 1922, collected by E. Scimund.

The species described by Brunetti in Fauna Brit. Ind. as *E. orientalis* is not the same as the above, but a closely allied species.

Mallota sufficiens sp. n.

Closely allied to *orientalis* Wied. but readily distinguished by the wholly yellow-haired, non-ciliate posterior tibiae, absence of spot on wings, etc. Eyes pilose.

Length, 13.5 mm. *Female*. Head densely dull yellowish pollinose, the posterior orbits silvery, the occiput more greyish; a narrow, incomplete facial vitta, a large subrectangular spot above the antennae, the upper fifth of the front and the posterior orbits above, shining black; front with wide brownish pollinose vitta in the middle above the shining supra-antennal area. Pile of head pale yellow, on the black areas (except the facial vitta) and the middle of the front, black. Face very slightly receding, with scarcely a trace of swelling, the antennal protuberance moderately produced. Front at antennae not quite a quarter the width of the head and only half this width at the vertex; ocellar triangle wider than long, situated slightly before the angle of the eyes. Antennae black; third joint greyish-brown pollinose, broadly oval; arista slender, bare, brown. Pile of eyes becoming black above.

Thorax yellowish-grey pollinose except behind the suture above and immediately below the squamae; mesonotum behind the suture opaque black, with black pile, the pile elsewhere on the thorax, yellow. Scutellum pale yellow. Posterior calli with a few pale hairs externally.

Legs black; apices of front four femora, basal three quarters of the front tibiae, whole of middle tibiae, basal third of the posterior pair, and the first joint of the middle tarsi, reddish-yellow, the anterior tibiae rather brownish apically. Pile of the legs yellow; black as follows: on the black tarsal joints and most of the apex of the posterior femora. Femora all thinly grey pollinose, the hind pair moderately swollen, tapering apically, not arcuate; posterior tibiae gently arcuate, slightly compressed, not ciliate.

Wings cinereous hyaline; stigmal spot transverse; marginal cell moderately open; loop of the third vein deep, rather sharply rounded. Squamae and fringe yellow, the upper lobe infuscated and with a brown border and fringe. Halteres reddish-yellow.

First abdominal segment yellow, with an indistinct black spot towards the sides, the whole yellow pollinose. Second segment with a narrow basal fascia (broadly separated from the lateral margins), a very broad median vitta and the broad posterior margin, opaque black, elsewhere reddish with a thick covering of yellow pollen. Basal third or slightly more of the third segment reddish, with yellow pollen, the remainder opaque black. Fourth segment with the basal fourth pale and with a broad, preapical shining black fascia, the segment elsewhere opaque black. Fifth segment with broad, basal grey pollinose fascia. Abdominal pile yellowish on the pale areas, the grey pollinose fasciae and the lateral margins except the second segment where the narrow base is pale-haired because there

is a lateral black pilose triangle extending forward along the margin from the black fascia, the black pile fairly coarse.

A ♀, Pahang, Lubok Tamang, 3500 ft., March 5, 1924, collected by H. M. Pendlebury and another, Selangor, Kuala Lumpur, "ex. Coll. Agr. Dept."

Mallota eristoloides sp. n.

Eyes pilose; face partly yellow, the tubercle large; abdomen not broad, tapering, yellow fasciate, not densely pilose.

Length, 13 mm. *Male*. Face with a large, transverse tubercle lying mostly below the middle, above which is a rather deeply, even concavity, below the tubercle perpendicular and more prominent than the upper concavity. Checks, oral margin narrowly, except the tip, almost the lateral fourth of the face and a narrow band below the antennae, yellow; a stripe on the front edge of the cheeks, and the remainder of the face, black. Face yellowish pollinose except a shining spot on the upper slope of the tubercle, the pollen dense on the sides and below the antennae. The pile on the face and sides of the frontal triangle is white, rather sparse, long; on the middle of the frontal triangle, more abundant, black. Frontal triangle black in ground colour, densely yellowish pollinose, the pollen becoming brownish towards the front of the triangle which is narrowly shining; a narrow brownish-yellow arch immediately above the antennae, with a deep fovea in the middle; above the arch, a small, roundish swelling, bearing a minute tubercle. Eyes touching for a distance almost equal to the length of the vertical triangle; abundantly short white pilose. Vertical triangle not twice as long as wide, its sides evenly converging anteriorly to form an acute point, the anterior ocellus remote; the triangle is lightly yellowish pollinose except along the orbits behind. The occiput is black with yellowish pollen above, greyish-white below; pile long, yellowish above, shorter, white, below, the occipital cilia black; pile of vertical triangle black.

Antennae brownish-yellow, the third joint dulled by whitish pollen, one and a half times as long as wide, suboval, the upper side more convex, the apex rounded. Arista dull reddish-yellow, brownish at apex, rather slender, wholly tapering, much longer than the antennae.

Humeri, anterior supra-coxal piece and the posterior calli, reddish-yellow, densely brownish-yellow pollinose. Mesonotum black but wholly rather thinly covered with brownish pollen so that it is nowhere decidedly shining and there appears to be a broad lateral stripe before the suture, a broad median area reaching the suture and a narrow fascia along the suture with more greyish pollen. Pile of mesonotum mostly pale yellowish, rather short, but there are numerous slightly longer, somewhat stouter black hairs

intermixed and in some views these seem to predominate. Pleura black, moderately whitish pollinose; a small spot on the mesopleura just before the wings, the broad upper border of the sternopleura and a broad stripe extending from the base of the hind coxae to the hypopleura, waxy yellowish and covered with yellow pollen. Pile of pleura yellow, rather long, only a few black hairs on the upper part of the mesopleura. Scutellum translucent waxy-yellow, yellow pilose with a broad band of stouter black hairs across the middle.

Anterior four femora reddish-yellow but almost all blackish on upper and lower surfaces except at the apex. Hind femora reddish, with a large, shining black area on more than the apical half above, the area expanded so as to occupy most of the femora on the middle half in front and extending slightly over the postero-dorsal line. Tibiae diffusely reddish-yellow and brownish-red, the apical half or less blackish, a premedian band brownish, sometimes obscure. Tarsi mostly brownish or slaty-black, the first two joints of the anterior four and middle two of the hind ones, paler. Pile on anterior femora and tibiae pallidly yellowish, very fine, not long except on base of femora; on the upper surface it is short, black, except at the base. Middle femora and tibiae pale pilose, that behind the femora long, while beneath them, on either side it is stouter, rather bristly and black except basally; the middle tibiae bear numerous stouter black hairs on the ventral surface and two short, parallel, subcontiguous apical spines. Posterior femora mostly clothed with short, coarse, black pile which is condensed and longer below; above, broadly on the base in front and behind, yellowish, the apex however, broadly black-haired; in addition to the black hair below there are two rows of long, fine bristles, some of which may be yellowish, a row on either side. Hind tibiae wholly black pilose, the hair longer dorsally and ventrally. Hind femora considerably thickened, somewhat compressed, their tibiae compressed and moderately arcuate.

Wings hyaline the stigma faintly yellow, its base brown; marginal cell moderately open; anal cell much widened.

Abdomen with seven pale fasciae, the first segment forming the first, each of the following with a median and apical one. First segment wholly reddish, thinly white pollinose. Second segment with the narrow base on two-thirds the segmental width, expanded as a median triangle, and a sinuous band beyond the middle, black, across the middle is a gently bisinuate, reddish-yellow fascia, before which the colour is brownish-yellow and the colour is also similar behind the postmedian black fascia, the apex of the segment yellow, white pollinose. Base of third segment narrowly yellow on the lateral third, the yellow tapering towards the middle; median yellow fascia almost straight,

lying slightly before the middle of the segment, not reaching the lateral margins, its width not equal to a third of the length of the segment; the fascia before and behind it are broad, rather dull black, the narrow apex of the segment yellow, white pollinose. Fourth segment with the narrow lateral margin and the posterior border dull reddish-yellow, the reddish fascia situated before the middle, somewhat arched, the middle lying nearer the base of the segment, separated from the lateral margin, the black ground before the fascia, opaque, that behind it, somewhat shining. Genitalia rather large, brownish reddish. Abdominal pile short, yellow on the side margins and on all the segments in front of the anterior border of the second black fascia, behind these fasciae it is all black, shorter and coarser. The abdomen is widest at the middle of the second segment, thence tapers to the apex of the third, from which point the sides are subparallel to the apex.

An unique ♂, Peninsular Siam, Nakon Sri Tamarat, Khao Luang, 5800 ft., March 29, 1922, collected by H. M. Pendlebury.

While this species bears very little superficial resemblance to the others in the collection owing to the short pile it is quite typical in other characters. Several of the American species have short pile but it is always more abundant than in the present species, which is not as conspicuously pilose as *Eristalis lenax* L.; nor most of the species of that genus. Owing to the deceptive appearance of the insect I am not prepared to state definitely that it is undescribed, but I have searched through all the descriptions of allied genera and can find nothing to fit the specimen. It is, however, possible that a name for it will be found under some other genus, as many of the older authors were inclined to place things according to appearances in many instances, without due regard for structural characters.

Genus *Mesembrius* Rondani.

This genus is readily separated from *Helophilus* by the carinate face, the presence of globuliferous hairs on the posterior basitarsi and the narrow stigmal spot. It differs from *Eristalis* in having the marginal cell open and from *Mallota* by the vittate thorax and more slender form. It is the only genus known to me with the globuliferous hairs on the tarsi.

Mesembrius is practically limited to the Ethiopian and Oriental regions (only one species occurring in Europe) while *Helophilus* does not occur, so far as I am aware, in these regions. The two species in the collection are separable as follows:

Middle tibiae wholly yellow; length	
19 mm.	<i>gigas</i> sp. n.
Middle tibiae with the apical third	
black; length 14 mm.	<i>bengalensis</i> Wied.

Mesembrius gigas sp. n.

Posterior tibiae bearing a long apical spur; face with shining black median vitta; first abdominal pale band sub-interrupted or only very narrowly so; pale spots on fifth abdominal segment very small; median pale stripes on the mesonotum broadly united behind.

Length, 19 mm. *Female*. Face yellow in ground colour, a moderately wide median vitta and the cheeks, black, the former normally largely shining, the face elsewhere densely yellowish-white pollinose and clothed, except below, with moderately abundant, fairly long, yellowish white pile but on either side of the median stripe there are shorter black hairs. In profile the face is almost perpendicular, with a low long median swelling, the antennal tubercle moderately prominent. Front narrow, the sides converging above and almost parallel on the upper fourth or more; the ground colour is concealed, except on the large antennal prominence, by ochreous pollen which is, however, less abundant above and the sparse, not long, pile is wholly black; only the narrow front margin of the lunular W is reddish. Occiput orange pollinose on the upper third or less, elsewhere rather silvery, the pile orange above, whitish below; only a few black orbital cilia and these well removed laterally from the posterior angles of the eyes. Antennae brownish reddish, the third joint reddish-brown, as long as wide, suboval, its upper edge a rather truncate; arista reddish, with brownish tip.

Mesonotum opaque black, with steel blue reflections in some lights, adorned with four orange vittae, which are two-thirds as wide as the median black one (the lateral ones are practically as wide as the median), the median pair broadly joined before the scutellum and narrowly connected to the lateral ones; in front the median pale stripes are broadened on the outer side but seem hardly to join the lateral ones. Pile of mesonotum short, dense, orange coloured. Pleura pale yellow pollinose except a broad anterior and narrow posterior fascia, the pale yellowish pile longer than that on the dorsum. Scutellum reddish-yellow, the base narrowly brown, the pile short, dense, orange coloured.

Legs shining black, the anterior four femora thinly yellowish-grey pollinose, the apices of all the femora narrowly, the middle tibiae, except a brownish anterior stripe on the apical half, the front tibiae on the basal third and behind and the base of the middle basitarsi, yellowish or reddish. Posterior femora above, except at apex, middle and front four beneath and behind, yellow pilose, elsewhere black-haired; posterior tibiae except the base, the anterior four beneath and in front and all the tarsi, black pilose, the pile elsewhere yellow. Posterior femora more than usually

incrassate, their tibiae only two-thirds their length and terminating in a long, acute spur on the inner side.

Wings almost hyaline, only slightly tinged with yellow in front. Squamae large, yellow, but so densely orange pubescent as to appear orange, with orange border and fringe. Halteres bright yellow.

First abdominal segment black, beneath the scutellum densely reddish-yellow pollinose, elsewhere with greyish pollen. Second segment chiefly dull orange, the moderately narrow base for three quarters the width of the segment, the apical fourth and a very slender, interrupted, median vitta, black, the posterior border of the segment except laterally and more broadly in the middle, steel blue. A little more than the basal half of the third segment (a little less in the middle), its outer end almost cut off from the margins by a posterior black triangle, dull orange, followed by a narrow opaque black fascia which broadens laterally almost or quite to reach the posterior angles, the balance of the segment steel blue. The dull orange fascia on the base of the fourth segment is composed wholly of pollen, its width is only a quarter the length of the segment in the middle but it increases to a third the length laterally and hardly reaches the lateral margins even in front; contiguous to this behind is a moderately wide opaque brown fascia, the abdomen behind this all steel blue except that there may be a small yellow pollinose spot within the anterior angles of the fifth segment at the very base. The lateral margins of the abdomen are densely pale brassy-yellow pilose except just at the apex and the pile on all the yellow and opaque areas is yellow while on the shining areas it is coarser, black, very dense laterally and almost reaching the margins on the second and third segments. The venter is steely-black, with white pile.

A single ♀, Malacca—Johore border, Lubok Kedondong, N. W. of Mt. Ophir, 'alang and beluka,' 200 ft., Nov. 1920, collected by H. C. Abraham.

This is an unusually large and remarkable species, the spur on the posterior tibiae and the unusually large spines on the front of the mesonotum serving at once to distinguish it.

Mesembrius bengalensis Wiedemann.

Eristalis bengalensis Wiedemann, Zool. Mag., i, 3, 1819.

Face wholly pollinose, front opaque except immediately above the antennae; first and fourth pale abdominal fasciae interrupted, the median two entire; legs black, the basal third of the tibiae and first joint of the middle tarsi, yellow.

Length, 10 to 12 mm. *Female*. Face yellow in ground colour, a moderately broad median vitta and the cheeks,

black, the whole densely white pollinose and covered, except the broad oral margin, with fairly long, fine, white pile. Face in profile, slightly retreating with a faint indication of a swelling below the middle, and the immediate oral tip is also slightly prominent, the latter narrowly shining brownish. Front black in ground colour, only the lunular W brownish-yellow, densely yellowish pollinose, more brownish in the middle and above, but becoming opaque black on the ocellar triangle and along the orbits above, the narrow median line yellow. The front is narrow, a little widened below, the upper third with almost parallel sides and with black pile, the lower two-thirds yellowish pilose; above the antennae is a shining black spot in the shape of half an oval. Occiput golden yellow pollinose on upper fourth and with black pile, elsewhere almost silvery-white pollinose and white pilose; it is clearly hollowed where it projects over the thorax and is fairly prominent. Antennae pitchy, the third joint rather dull black, with slight whitish bloom, trapezoidal, longer below, rather large; arista brownish reddish, bare.

Mesonotum opaque black but there is a slight bluish tinge and there appears a slender, deeper coloured median vitta; adorned with four bright yellow vittae, the middle ones more broadly separated from each other than from the laterals and not quite as wide, but they expand before the scutellum and almost or very narrowly meet each other and are narrowly connected with the lateral stripes along the front edge of the posterior calli; in front they are joined to the lateral stripes along the anterior slopes. The pile is yellow except on the black vittae behind the suture, the lateral yellow vittae behind the root of the wing and on the posterior calli, where it is short and brownish. Pleura and coxae moderately densely greyish-white pollinose, only a broad fascia in front almost destitute of pollen as well as an arca beneath the scutellum, the pile almost white and longer than that on the dorsum. Scutellum yellow, the base narrowly black, the pile black on the disc, yellow on the margin.

Legs black, with thin yellowish pollen, the narrow apices of the femora, basal third (only fifth of the posterior) of the tibiae and the middle basitarsi yellow or reddish yellow, the second joint of the middle tarsi and the immediate base of the front tarsi more or less reddish. Pile of the anterior four femora, posterior tibiae, all the tarsi and the apex of the posterior femora, black; beneath and behind the anterior four femora and on most of the posterior pair, moderately long, yellow, anterior four tibiae largely short black haired, the latter with yellow hair exteriorly. Posterior femora moderately swollen, with a subapical, elongate-oval shining black spot on the anterior surface.

Wings somewhat infuscated; apically and posteriorly, almost hyaline. Squamae pale yellow, with yellow border and fringe. Halteres pale yellow.

First abdominal segment broadly yellow on the sides, elsewhere blackish but chiefly covered with rather whitish pollen, although the pollen becomes more yellowish towards the sides behind. Second segment chiefly dull yellow: there is a narrow black basal fascia extending about three-fifths across the segment and moderately widely connected with the black apical sixth; the apical fascia is a little wider in the middle, slightly tapering laterally and almost reaching the lateral margins, the posterior margin shining, but largely covered with thin ochreous pollen, especially noticeable on the middle portion and with more or less metallic blue reflection, the black forming the median vitta and anterior fascia, opaque, the inner arms of the yellow marks obtusely rounded. More than the basal half of the third segment is reddish-yellow, the black posterior portion widest in the middle, slightly tapering to the sides, its immediate anterior margin opaque black, the middle part largely ochreous pollinose, the apex broadly deep black. The fourth segment is coloured almost as the third but the pale band is narrower in proportion and is more narrowed in the middle. Fifth segment rather dull brownish, with a moderately large, hemispherical yellow pollinose spot on either side at the base, these spots less widely separated from the lateral margins than from each other. Abdominal pile moderately short, yellow; on the black posterior segmental fasciae and a little before the second and third ones, and the dark triangles on the sides of the second segment, black, the apical segment and the sides of the fourth segment wholly yellow haired. Fourth and fifth ventral segments shining brownish or blackish, the venter elsewhere pale yellowish and with white pile.

Male. Frontal triangle wholly pale brassy-yellow pollinose, the eyes contiguous for a distance not greater than the length of the ocellar triangle which is large, its sides nearly equal and occupying about the preupper fourth of the vertical triangle which is long and narrow, acute on the anterior half, where it is reddish-brown pollinose and wholly clothed with black pile; frontal triangle wholly pallidly yellow pilose. Antennae smaller.

Middle femora quite large, with a very stout, preapical angular projection behind, the apex narrow and of about normal size. (This at once distinguishes the ♂ from other species).

Third and fourth abdominal segments narrower as in all males, the pale fasciae therefore appearing much wider and leaving broad, apical blackish triangles.

The description is from two specimens: ♀, Selangor, Kuala Lumpur, Nov. 26, 1924, ♂, Java W., Preanger Regency, Tjiseroean, 4200 ft., April 24, 1923, both collected by H. M. Pendlebury.

Genus *Eristalis* Latreille.

Eyes of male contiguous, partly or wholly pilose; thorax distinctly longer than wide, often densely pilose, the pile always long, not reduced to setulae; wings with the marginal cell closed, the third vein deeply looped into the first posterior or apical cell, legs simple, never armed with teeth or angular projections. Genotype: *Musca tenax* Linne.

Eristalis forms the central group of a large number of genera, one section of which is characterized by the open marginal cell, the remaining genera being only weakly differentiated from *Eristalis*.

The larvae of the subfamily (*Merodon* excepted) are of the rat-tailed type and live for the most part in decomposing vegetation or manure, especially well liquified substances. Species of *Mallota* are found mostly in rotting wood or tree injuries from which sap is exuding, while, as far as is known, the larvae of *Merodon* live in healthy or injured bulbs.

Table of Species.

- | | | |
|--------------------------------------------------------------------------------------------------------------------------------|-------|---------------------------|
| 1. Scutellum wholly translucent reddish; eyes pilose | - - - | <i>simplicipes</i> sp. n. |
| Scutellum with at least the basal half black; eyes bare | - - - | 2. |
| 2. Reddish or metallic fascia on base of third segment narrowly entire in the middle or scarcely interrupted | - - - | 3. |
| Fasciae on second and third segments both broadly interrupted by opaque black | - - - | <i>perakensis</i> sp. n. |
| 3. The opaque black on the base of the second segment reaches the lateral margins; plumosity of arista very short | - - - | <i>niger</i> Wied. |
| The opaque black is rather broadly separated from the lateral margin; plumes of arista three times as long as arista thickness | - - - | <i>purus</i> sp. n. |

Eristalis simplicipes sp. n. (Fig. 22).

Eyes pilose; arista with long whitish rays; thorax thinly yellowish pollinose before the suture, the pollen only con-

spicuous immediately before it; abdomen with three interrupted reddish-yellow fasciae; scutellum reddish yellow; first joint of all the tarsi yellowish.

Length, 12 to 15.5 mm. *Male*. Middle third of face, broad oral margin and cheeks, black in ground colour, but thinly covered with yellowish-white pollen, so that only a dash over the tubercle and narrow oral margin remain shining, the face elsewhere reddish-yellow, with dense, almost white pollen; in profile, gently receding, the tubercle rather robust but not very prominent, obtusely nasiform, the pile pale yellow except on the median black stripe, where it is black. Frontal triangle shining black, densely covered with brownish-yellow pollen which gradually fuses in colour with that on the face, but it leaves a large shining spot above the antennae, the apex of the antennal prominence reddish, the frontal pile all black; there is a large, not prominent, rounded tubercle above the antennae. Eyes actually touching for a distance equal to the length of the frontal triangle, the vertical triangle not large, rather broad, the anterior apex very acute. Occiput rather dull black, greyish pollinose, the pollen becoming silvery-white on the lower two-thirds of the orbits where the fine pile is also white, the pile above black and coarser. Antennae rather dull brownish, the first joint shining, the third longer than the first two combined, not quite twice as long as wide, slightly narrowing towards the rounded apex; arista reddish yellow, brown apically, the plumes long and almost white.

Mesonotum rather dull black, the posterior fourth subshining and presenting a greyish sheen; before the suture with a narrow, transverse, dull ochre or brownish-yellow fascia, before which it is covered with similarly coloured pollen, which forms, in some lights, a slightly darker fascia on the anterior slopes; lateral margins behind the suture, broadly shining. Pleura clothed with greyish pollen, that on the metapleura almost silvery-white. Scutellum orange, slightly paler apically. Pile of thorax bright yellow, only the disc of the scutellum with black hair, none of the pile long, only a few hairs on the scutellum being longer than the rest, the pile on the sides of the mesonotum tawny.

Legs shining black; apices of four anterior femora, broad base of the hind ones, basal third of the posterior, two-thirds of the middle and half of the anterior tibiae, yellow or reddish-yellow. First joint of the anterior tarsi except the diffusely brownish apex, obscure base of the second joint, posterior basitarsi, except the apical fifth and almost half of the following joint, first two joints and base of third, except their brownish apices, yellowish. Pile of the legs chiefly yellow; anterior four femora except the bases, more broadly below and above, the middle ones except behind, the hind ones on more than the apical half

except above, where it is only on the apical third, and the the hind tibiae, except the yellow portion, with black pile. Apical three tarsal joints with black pile, all the pale joints with black bristles on antero and posteroventral surfaces. Posterior femora not widened, of almost equal width throughout, their tibiae a little flattened, slightly curved.

Wings with a brownish cloud in the middle on the anterior half, usually almost hyaline, but sometimes considerably luteous, the outer and posterior borders broadly hyaline.

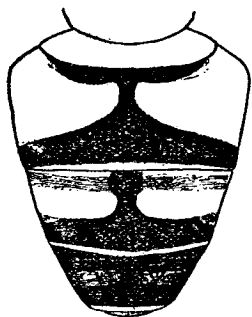


Fig. 22. Abdomen of ♂. *E. simplicitipes* sp. n.

First abdominal segment almost white, only the portion behind the angles reddish-yellow, the very narrow apex sometimes blackish. Second segment chiefly dull yellowish red: there is an incomplete basal fascia, a narrow median line which broadens slightly behind and a broad apical fascia which is well separated from the lateral margins, (and from the apex by a slender apical yellowish-white fascia) brown, or in part black, the black usually only evident on the middle half of the basal fascia and middle line, but sometimes largely on the posterior fascia and the brown may almost grade into the pale ground colour. The narrow base of the third segment is creamy-white, its apex narrowly sulphur-yellow, the apical half brownish-black, a broader median line black, the rather narrow, more or less obscure, incomplete, subbasal fascia brownish; the dull brownish-yellow fascia is therefore broadly interrupted and reaches the side margins on the anterior half where it joins the orange ground of the preceding segment. The fourth segment bears a more broadly interrupted basal fascia which occupies about the anterior third of the segment and is even duller than the preceding one and it does not quite reach the lateral margins, the narrow apex sulphur-yellow, the sides of the segment broadly shining metallic bluish-black, this colour extending rather broadly across the segment immediately behind the pale fascia. Genitalia shining black. Abdominal pile moderately short, erect, fairly abundant: on the first segment, basal corners of the second, anterior corners of the two following segments and genitalia, yellow, elsewhere black.

Female. Lower fourth of front reddish-brown pollinose (the pollen extends slightly above the shining supra-antennal area), the remainder of the front opaque black,

although in some views there is a large, oblique, brownish pollinose spot reaching almost to the middle of the front. Front a little more than half as wide above as at the antennae where it is considerably narrower than one eye and it is wholly clothed with black pile; upper fourth of occiput black pilose.

Very narrow base of the second and following abdominal segments snow-white pollinose on a reddish ground, the apices of all but the fourth segment narrowly bright orange, otherwise no pale abdominal markings except on the second segment where there is a narrowly interrupted fascia as in the ♂ but it is not widened laterally although produced broadly along the margin to the base of the segment. Across the middle of the third and fourth segments is a narrow shining fascia and the fifth segment is shining black except the basal third.

Described from six specimens: ♂, Pahang, Gunong Tahan, (summit) 7186 ft., Jan. 22, 1923; ♂, Pahang, Gunong Gedong, 6400 ft., Dec. 24, 1922; 3 ♂, Pahang, "Cameron's Highlands," Rhododendron Hill, 5200 ft., June 10, 1923; ♀, Pahang, Lubok Tamang, 3500 ft., June 10, 1923, all collected by H. M. Pendlebury.

Eristalis niger Wiedemann.

Eristalis niger Wiedemann, Anal. Ent., 38, 1824.

Front wholly black pilose, with a rounded tubercle above the antennae; facial tubercle prominent; abdomen opaque black, with interrupted cupreous fasciae, the femora black except the narrow apices. Eyes bare.

Length, 10 to 14 mm. *Female.* Face densely greyish white pollinose, the middle line broadly shining black, somewhat expanded on either side of the tubercle; cheeks shining in the middle, the oral margin narrowly so, the fine pile white. The large, obtuse tubercle is as prominent as the antennal base, between the two, rather deeply concave, below the tubercle gently concave to the oral tip, still more prominent than the lowest part of the upper concavity. Lower edge of tubercle about level with lower edge of eyes. Front rather narrow above, its lower third somewhat swollen and bearing in the middle a rather large, sub-cordate tubercle; between the lower swollen area and the anterior ocellus the ground colour is opaque black, the upper part again shining black; immediately below the opaque of the front is a fairly large, elongate orbital white pollinose spot and across the lower edge of the opaque there appears to be some indefinite yellowish pollen; in some lights there appears to be a slender orbital white stripe connecting the white frontal pollen with that on the lower slopes of the antennal prominence; the anterior margin of the rounded W is reddish and above this

is a small polished area above each antenna. Ocelli placed as far in front of the posterior angles of the eyes as the distance between the posterior ocelli. Occiput grey pollinose except above, more silvery along the orbits, the pile white on the lower three-fourths, black above. Antennae entirely black; third joint oval, one and a half times as long as wide, more rounded above. Arista slender, three-fourths as long as the front, shortly sparse plumose on the basal third.

Mesonotum opaque black on a steel-blue ground; a rather narrow greyish pollinose fascia extends across immediately before the suture, but towards the middle it is inclined to become somewhat tawny; behind this pale fascia is an incomplete dark one and there is another resting against the scutellum, the intervening space exhibiting the ground colour quite markedly in some lights, but thinly covered with greyish pollen which also extends broadly along the sides to join the grey fascia. Pleura steel-blue, grey pollinose except a large spot below the wings and the propleura; pile whitish, but rather tawny on the non-pollinose spots. Scutellum opaque black with a broad steel-blue margin. Pile of mesonotum rather brassy-yellow and black intermixed, the black predominating behind the suture; on the scutellum the black predominates on the disc, the pale on the border.

Coxae greyish pollinose, their apices brownish; femora black, their apices narrowly reddish; basal half or slightly less of the tibiae, whitish-yellow, the apical half brownish; tarsi black. Posterior femora rather slender, their tibiae scarcely curved.

Wings greyish hyaline, in mature specimens with a brownish cloud beyond the middle extending outwardly to the apical fourth and backward more or less clearly to the fourth longitudinal vein. Squamae tinged with yellow, with pale yellow border and fringe; halteres orange yellow.

Abdomen opaque black, the first segment clothed with rather dense, outwardly-directed brassy pile, which makes it appear paler, its sides opaque. Second segment with a pair of very large transverse rectangular cupreous or bronze spots which are widely separated from each other, their outer end slightly widened, the narrow lateral margin behind the spots also bronzed; width of spots equal to about half the length of the segment. Third segment with the basal half bronzed or cupreous, the band triangularly excised in the middle, gradually widened to the sides to occupy two-thirds the length of the segment; on the median half of the posterior margin with a large transverse similarly coloured triangle. Fourth segment with the basal third at the middle, two-thirds at the sides, and an apical triangle

which reaches forward almost to the middle of the segment and nearly to the lateral margins, bronzed, the fifth segment bronzed except a basal arch, the convexity of which rests on the base of the segment. Pile chiefly yellow: on the segments behind the opaque fascia and the base of the fifth segment, shorter, black.

One of the specimens had not fully developed and the colours are reddish on the abdomen and thorax instead of metallic.

♀, Peninsular Siam, Nakon Sri Tamarat, Khao Ram, 750-1200 ft., Feb. 23, 1922; ♀, same locality, 1500-2000 ft., Feb. 28, 1922 (teneral), ♀, Perak, Batang Padang, Jor Camp, 1800 ft., March 10, 1924, all collected by H. M. Pendlebury.

Eristalis purus sp. n. (Fig. 23).

Similar to *niger*, but distinguished as follows.

Length, 11 mm. *Female*. Face and front wider, the latter with the sides almost evenly diverging from the posterior angles of the eyes to the antennae, the antennal prominence not so strong, wider, the supra-antennal tubercle a little less prominent; ocellar triangle broader than long, not equilateral. Face slightly shorter the tubercle less prominent. Aristal plumes three times as long as the greatest thickness of the arista.

Pile of the thorax longer, yellow, black only on the anterior slopes and some much shorter hairs intermixed above the wings. Middle tibiae brownish on the apical third; first joint of middle tarsi yellowish. Wings without a cloud, tinged with yellowish, especially basally.



Fig. 23. Abdomen of ♀, *E. purus* sp. n.

First abdominal segment obscurely reddish towards the sides behind the second brownish-red with the broad apex brown, the still broader median vitta opaque black, the narrow base of the segment black except at the sides; on the disc the colour is brownish-yellow, but this probably varies. Apical segments with the shining areas aeneous, the fascia on the third segment entire, although narrowed to half its lateral width in the middle, the base of the segment narrowly subopaque except on the median fourth. In other respects as in *niger*.

Described from an unique ♀, Selangor-Pahang border, Ginting Sempak, Oct. 15, 1921, collected by H. M. Pendlebury.

Eristalis perakensis sp. n.

Allied to *niger*: it differs as follows.

Arista bare. The facial tubercle is more truncate and not as prominent as the antennal base and there is an almost angular concavity below it. There is only a very narrow silvery orbital spot at the junction of the opaque and shining areas above the antennae and the vertex is also opaque.

The ground colour of the thorax is bluish-black and the pile on the mesonotum is black except on the sides before the suture; pleural pile rather brassy-yellow. Wings brownish, slightly paler on the basal third.

The spots on the second and third abdominal segments are red, narrowly separated from the lateral margin and broadly separated from each other, their inner posterior margins rounded, the second pair of spots more widely separated from each other than the first. The first segment lacks the appressed yellow pile but is thinly brownish-yellow pollinose; the very narrow lateral margins of the abdomen are bronzed but there is a very narrow vitta separating them from the reddish spots. The apex of the third segment is less widely bronzed, the following segments not different. The pile is pale on the first segment and the red spots, elsewhere black, including the margins.

Described from a single ♀, Perak, F.M.S., Jor Camp, 2000 ft., August 27, 1922, collected by E. Scimund.

These last three species are very deceptive in appearance and one might be inclined to consider them as varieties of one species were it not for the very striking differences found by careful examination. While *purus* most closely resembles *niger* superficially it is easily distinguished by the broader front and much broader ocellar triangle, while the opaque vitta separating the reddish spots from the shining lateral margin and opaque vertex will at once distinguish *perakensis*.

Genus *Axona* Walker.

Differs from *Eristalis* in the differently shaped face and the apex of the scutellum being shallowly concave. Genotype: *A. chalcopyga* Wd.

Brunetti has placed a species with the marginal cell open in *Axona* and uses this character in his generic diagnosis. As he had evidently not seen *chalcopyga* he was not aware that the marginal cell is closed and petiolate and his diagnosis is therefore erroneous. There seems to be only one species which appears to be rather rare.

Axona chalcopyga Wiedemann.

Eristalis chalcopygus Wied., Aus. Zweifl., ii, 178, 1830.

Length, 20 to 21 mm. *Male*. Metallic or purplish-blue, the lateral third of the third segment, its narrow apex and the whole of the fourth reddish-orange. Middle of face and oral margin shining, the greyish pollen extending in a straight line from the orbits above to the oral angles, very slightly widened just at its upper end, the cheeks with a shining median triangle connected with the oral margin. In profile the upper third of the face is deeply concave, the median third forms a fairly prominent tubercle, while the lower portion is almost perpendicular, but quite prominent; no pile. Frontal triangle shining the narrow orbits yellowish pollinose; rather small somewhat convex, the rather narrow orbits with moderately long blackish pile. Eyes contiguous for a distance equal to the length of the face, the ocellar triangle small, slightly longer than wide, occupying practically all the vertical triangle. Occiput not visible from the sides above, greyish pollinose, the immediate orbits on the lower three-fourths rather silvery, and lacking the rather conspicuous silvery-white pile which occurs behind the margins. Cheeks bare. Antennae blackish, the third joint narrowly reddish at the base, wider than long, and longer below, rather rectangular; arista brownish, bare, elongate, not robust.

Thorax longer than wide, the margins and suture thinly greyish-yellow pollinose, the pile black on the dorsum, but there are fine, pale shorter hairs laterally and the pleura are practically all pale haired. Scutellum rather evenly convex on its margin, with a shallow apical concavity and a small basal swelling on either side, the pile all black and very short.

Legs steely, the tarsi blackish, their pile wholly black and simply arranged, the legs quite simple.

Wings blackish-brown in front, this colour reaching rather rectangularly back over the anterior cross-vein, thence following the fourth vein to the apex of the first basal cell where it extends along its apex and occupies the anterior third and basal third of the anal cell; middle of first basal cell hyaline. Squamae brown, with yellowish fringe. Halteres yellow.

First abdominal segment short whitish pilose, the pile elsewhere short and black. The orange colour on the third segment is in the form of large triangles which reach the anterior margins at the sides where they occupy the whole length of the segment and approach each other more closely at the apical fourth of the segment although they are rather narrowly joined along the posterior margin. Genitalia small, reddish. Sternites all blue.

Female. Front narrowest opposite the anterior ocellus, gently diverging before and behind, hardly a quarter the head-width at the antennae; only about a sixth at the narrowest point; a broad, deep depression across the lower fifth leaves the convexity above the antennae rather prominent; ocellar triangle swollen and continued back to the vertex, the extremely short, sparse frontal pile white, that of the vertex and upper part of the occiput black.

Immediate base of the scutellum with pale hairs. The brown of the wings extends as an almost even, very gently convex line from the apex of the third vein to the apex of the alular base.

The red of the abdomen is limited to the narrow apex of the third and the whole of the following segments.

There is a single, somewhat crushed ♂ from Selangor, Sungai Tengah, Sabak Bernam, Oct. 26, 1921, collected by E. Seimund.

Owing to the fact that the head and thorax of the ♂ are crushed to a certain extent there might be a slight error in the description of these parts. The ♀ described above is evidently the same species although there is a striking difference in the shape of the brown portion of the wings. The ♀ is from British North Borneo.

Genus *Megaspis* Macquart.

Differs from *Eristalis* in the thorax being slightly wider than long; face and front somewhat bloated, the antennae reposing more or less in the facial concavity. Genotype: *M. chrysopygus* Wd.

The collection contains four species but all the Oriental species probably occur in Malaya and those known to me may be separated by the table of species.

The name *Phytomyia* Guerin, has also been used for this genus but its use is open to question. Even though it should be permanently adopted the name *Megaspis* could be retained for the genotype named above as it is not actually congeneric with the remainder of the species but might well be recognized as a distinct genus on the presence of the facial depressions and small tubercles. None of the other species possess the striking facial depressions.

Table of Species.

- | | | |
|----------------------------------------------------------------|-----------|----|
| 1. Mesonotum unicolorous or almost so | - - - - - | 2. |
| Mesonotum with one or more fasciae of reddish or yellow pollen | - - - - - | 3. |

- | | | |
|-------------------------------------------------------------------------------------------|-----------|-----------------------------|
| 2. Second abdominal segment more than half orange yellow | - - - - - | <i>zonatus</i> Fabr. |
| Abdomen black the apical one or two segments with long golden pile | - - - - - | <i>chrysopygus</i> Wd. |
| 3. Mesonotum wholly black behind the suture, largely orange pollinose before it | - - - - - | 4. |
| Mesonotum with prescutellar yellow pollinose fascia | - - - - - | 5. |
| 4. Wings obliquely black on the anterior half | - - - - - | <i>aesymnus</i> Walk. |
| Wings with basal and median blackish spot on anterior half | - - - - - | <i>zonatus</i> Fabr. |
| 5. Arista bare; face wholly yellow; front partly yellow pollinose | - - - - - | <i>errans</i> Fabr. |
| Arista plumose; face practically all, front wholly, black; front with silvery pollen only | - - - - - | <i>argyrocephalus</i> Macq. |

Megaspis chrysopygus Wiedemann.

Eristalis chrysopygus Wied., Zool. Mag., i, 3, 1819.

Thorax and abdomen black, the apical one or two segments with golden pile.

Length, 15 to 17 mm. *Male.* Black, the supra-antennal area reddish, the tarsi chiefly orange. Face swollen below, the upper third strongly concave as it is almost level with the eyes; on either side of the concavity below and extending along the sides of the tubercle is a broad, rather deep depression; middle of tubercular area polished and more prominent, especially below, except on the middle of the depression, narrow median line, oral margin and front of the cheeks the face is covered with small tubercles; the depression and front are thinly greyish-white pollinose: there is a triangular silvery spot opposite the upper end of the depression which is narrowly connected along the orbits with a larger one on the front of the cheeks and there is a narrow orbital line of similar pollen on the lower half of the frontal triangle. The pile on the face is short, pale yellowish, that on the frontal triangle similar except on the upper half, where it is black. Frontal triangle longer than wide, the shining area acutely rounded above, broad, reaching three-fourths the distance to the upper angle, with a rather distinct median impressed line and variously interrupted transverse rugae and with a large, round, deep puncture near the upper end, the pile very short and sparse.

Eyes contiguous for a distance equal to the length of the face. Vertical triangle a little swollen, small, very acute in front, brown pollinose and black pilose. Occiput hidden on upper fourth as the eyes are rounded down behind, elsewhere silvery pollinose, the orbits with an acute edge and lacking pile, the pile elsewhere short, yellowish, that on the cheeks black. Antennae brown, third joint rather rectangular, with obtusely rounded apex, one and a half times as long as wide; arista brownish, with long pale plumes.

Thorax and scutellum subnitid, the humeri and a spot immediately before the outer end of the suture shining; elsewhere densely covered with minute setigerous tubercles, the hairs very short except on the lateral margin and pleura, wholly black. Scutellum large, broad, with preapical groove.

Legs black, the hind femora slightly widened, their tibiae scarcely arcuate, flattened, wider in the middle than the femora. Tarsi reddish-yellow, the anterior ones brownish-red to brownish. Pile of the legs black except on the posterior four tarsi where it is yellow: the anterior four femora bear a wide vitta of longish, dense black pile on their whole length behind, the hind ones with longer hairs above and below and condensed hair on the apical fourth of the lower surface on anterior and posterior edges, their tibiae densely ciliate on upper and lower surfaces.

Wings blackish to apex of the first vein except behind, this colour extending a little beyond the apex of the basal cells and leaving the apex of the anal cell hyaline; there is a hyaline spot extending forward between the anterior cross-vein and one-third the distance to the first basal cross-vein, thus leaving a black stripe over the anterior cross-vein, the wings hyaline apically. Squamae and fringe brown, halteres yellow.

Abdomen moderately shining, the apices of the second and third segments with tiny tubercles and the third and fourth with dense, fairly long, golden pile, the basal ones with very short black hairs except that they are somewhat longer on the sides.

Female. Front about a quarter the head-width above, hardly a third the head-width at the antennae, the sides diverging on a little more than the lower half, scarcely so on the upper part. Supra-antennal area rather rounded, without median impression and with strong, irregular rugae; above this with slight median and orbital depressions; the whole front bears small tubercles and these tend to form ridges below the frontal depressions below which the pile is whitish, black above, very short; front subopaque, the ocellar triangle more shining, a little longer than wide; occiput margined above, narrowest at upper third of eyes,

Abdomen shining, with a large part of the disc of the second and third segments, except on the broad middle, more or less depressed and covered with opaque powder which is joined together well before the segmental apices, the apices of the second and third segments also with the tiny tubercles; the depressed areas on the fourth segment are probably not opaque but the pile hides them; fourth segment densely golden pilose, the fifth thinly so.

The collection contains a ♀, Pahang, F.M.S., Gunong Tahan, Wray's Camp, 3300 ft., Nov., 1920, native collector. The description of the ♂ is from an Indian specimen.

Megaspis aesymnus Walker.

Eristalis aesymnus Walker, List Dipt. Brit. Mus., iii, 630, 1849.

Thorax deep dull orange before the suture, the basal three-quarters of the second abdominal segment similar; wings brown on anterior half except apically.

Length, 12 to 14 mm. *Male.* Face brownish in ground colour, the greyish white, (almost silvery) pollen entirely concealing it except on the long, rather broad, flat tubercle, a slender stripe beneath it, the narrow oral margin and a transverse spot along the oral angles. The space below the tubercle and the upper concavity, which is shorter than the tubercle, on the same plane, the tubercle on a plane with the frontal prominence; face and lower half of front white pilose, becoming stained with yellow on the front. Frontal triangle moderately swollen, its lower two-thirds only slightly oblique, the sides of this lower portion yellowish pollinose, the middle shining pitchy-brown, irregularly, strongly roughened, the upper third or more slightly more opaque brownish-black; pile on upper and median portions black, sparse on the latter. The eyes touch for a distance almost equal to the length of the frontal triangle. Vertical triangle rather dull, finely punctured, black, its sides almost equal, its pile very short, fine, brownish-black. Occiput silvery white pollinose, except above, where it is less thickly, more yellowish or brownish-yellow pollinose, the fine, short pile silvery-white, more yellow above, the fine orbital cilia black. Cheeks and lower fifth of face without pile. Antennae small, pitchy brownish, the third joint obtusely oval; arista yellowish, its basal half with long white rays.

Mesonotum before the suture, extending slightly behind it laterally, densely dull orange pollinose, the ground colour yellowish-red; similar pollen extends down over the pleura, especially before the wings, over half way to the coxae, but it becomes paler below and on the remainder of the pleura it becomes yellowish or even greyish-white. The pile on the yellow portion of the mesonotum is very short, dense, yellow, on the pleura, except a black-haired triangle immediately below the base of the wings, longer, yellow; on the

sides of the mesonotum, bright orange. Behind the suture the mesonotum is opaque black, but there is a broad, shining bluish-black band occupying the subapical fourth of this portion, and the sides are broadly brownish and would appear quite markedly so but for the dense, short, rather coarse, black pile which covers the entire dorsum behind the suture. There are a few cinnamon coloured hairs just on the outer side of the posterior calli in front, and before the middle of the scutellum in the depression. The scutellum is two and a half times as wide as long, its end rather evenly convex, its colour blackish-brown with similar pile to that on the posterior mesonotum, but on the edge is a single row of moderately long, fine yellowish hairs.

Legs brownish-black, just the tips of the femora, the basal fifth or less of the anterior four tibiae, the first three joints of the middle and first joint of the anterior tarsi, yellow or reddish-yellow. Pile of legs mostly black, the base of the middle tibiae with some silvery-white hairs above, the basal third of the hind femora yellow pilose; the hair on the under side of hind femora on both anterior and posterior edges, long, condensed apically, also longer and more abundant on the upper surface apically; on the hind tibiae it is condensed and moderately long on both the dorsal and ventral surfaces, on the anterior four femora longer and condensed behind.

Wings broadly smoky-brown in front, so that the posterior margin is almost evenly broadly hyaline, the smoky colour only extending to the apex of the marginal cell. Squamae brownish, with darker border and fringe; halteres yellow.

First abdominal segment shining brownish, its sides broadly yellow. Second segment opaque orange, the apical fifth, increasing to almost a quarter in the middle, opaque black, but the immediate apex on the median two-thirds, moderately broadly so in the middle, shining black. Third segment opaque black, the apex slightly more widely shining, the lateral margins moderately broadly shining for their whole length; with a moderately narrow basal subopaque orange fascia, which becomes very narrow in the middle, and does not reach the side margins. The fourth segment is similar, but the apex is still more broadly and completely shining, the orange fascia slightly narrower. Pile on all the yellow portions, more than the basal half of the fourth and all of the fifth segment, yellow, and there are yellow hairs intermixed on the black pilose lateral margins; the pile is short dorsally, longer laterally and apically. Venter pale yellowish, the last two segments mostly rather brownish, the pile all pale.

Redescribed from a single ♂, Selangor, Kuala Lumpur, Nov. 22, 1922, collected by H. M. Pendlebury.

Megaspis errans Fabricius.

Syrphus errans Fabr., Mantis. Ins., ii, 337, 1787.

Length, 13 to 15 mm. *Male*. Head honey-yellow except the vertical triangle and part of the occiput, the entire posterior orbits pale, the whole of the pale portion except a large spot on the cheeks and the large, suborbicular supra-antennal area, whitish pollinose, the posterior orbits silvery; frontal triangle with yellowish pollen. Pile of face rather whitish, fairly abundant; of the front, yellow, of vertical triangle and the row between the eyes, black and strong. Vertical triangle rather small, a little prominent, brown pollinose before the ocelli; occiput brownish-red pollinose above. Antennae small, orange, the basal joints tinged with brownish; arista bare, long, reddish-yellow.

Mesonotum dark in ground colour, evidently more or less paler laterally especially behind, but so densely covered with greyish-yellow pollen as almost to conceal the ground colour the broad middle in front of the suture is more greyish while the suture is almost white and behind the suture is a broad, incomplete darker fascia (broadly separated from the posterior margin and sides by quite pale pollen), which is, however, more or less distinctly broadly interrupted two or three times by somewhat paler pollen, but this depends upon the angle at which the insect is viewed. The pile is rather short but very abundant, wholly yellowish except that there may sometimes be considerable black hair on the dark fascia: (in poorly preserved specimens the dark fascia may be quite blackish). About the upper half of the pleura pale in ground colour the remainder blackish, but, like the dorsum, the whole is densely yellowish-grey pollinose and yellowish pilose. Scutellum ferruginous brownish, darker basally, densely rather short black pilose, each hair rising from a blackish puncture; the margin with very long pale pile, the base with a narrow band of rusty brownish hairs except in the middle.

Legs black; basal three-fifths of the posterior femora, sometimes a broad, incomplete basal band on the middle pair, and the apices of all the femora, reddish; basal half of front and hind tibiae and basal two-thirds, more or less, of the middle pair, pale yellow and clothed with white hair; yellowish portions of the femora yellowish pilose, the pile on the legs elsewhere black. Basal joint of middle tarsi reddish.

Wings rather strongly fuscous except on apical third or less where they are quite hyaline and also paler posteriorly. Squamae yellowish basally, moderately infuscated on apical half or more, the border and dense fringe dark yellow; upper lobe brown, with dark brown fringe. Halteres reddish, with the knob rusty.

First two abdominal segments translucent reddish yellow, the second with a broad brownish apical fascia which is gradually widened in the middle, where it reaches the basal fifth of the segment (this fascia is actually but little darker than the rest of the segment except on its anterior half, the colour being largely due to black pile.) Third segment with a large, subapical brown triangle which almost reaches the base and is broadly separated from the lateral margins: the colour in front of it rusty-yellow, with strong brassy reflection, on the sides and posterior margin more ferruginous and less metallic; the triangle is opaque reddish brown to brown, with a large, broadly oval median longitudinal spot, more or less distinctly connected with the shining anterior and posterior portions of the segment. Fourth segment similarly marked to the third except that the opaque portion of the triangle is reduced to a small, obliquely placed triangle on either side, the apex more broadly shining and the median convexity scarcely evident. Apex of third segment broadly black pilose, the pile elsewhere yellow.

Two specimens: ♂, Java W., Preanger Regency, Tjisoeroepan, 4200 ft., at light, April 24, 1923, collected by H. M. Pendlebury; ♂ from the Agricultural Department collection labelled: Pahang, Pekan, June, 1917.

Megaspis zonatus Fabricius.

Length, 13 to 15 mm. *Male*. Head brownish or yellowish-brown; face, frontal triangle below, and the cheeks, grey pollinose. Frontal triangle above the shining, coarsely punctured elongate-oval supra-antennal area, brownish pollinose; posterior orbits silvery except above, where they are brownish pollinose; occiput and vertical triangle black, the latter fairly large, not raised, more or less brownish pollinose in front of the ocelli and black pilose. Ocellar triangle rather large, situated well forward. Occiput yellow pilose above, white on the lower three-fourths; cheeks and face pale greyish pilose, the frontal triangle with luteous pile, the row of hairs between the eyes, black. Cheeks with small shining triangle in their middle below. Antennae small, black, the first two joints brownish-yellow; arista yellow, long white plumose on the basal three-fourths.

Mesonotum rather opaque black, the broad anterior margin cinnamon brown pollinose, the humeri and lateral margins in front of the posterior calli, reddish or yellow in ground colour and greyish-yellow pollinose, this pollen extending more or less towards the middle before the suture. Pile on disc brassy-yellow, but largely intermixed with stouter, shorter black hairs behind the suture (these are not readily seen and are best observed from lateral view); posterior calli chiefly black-haired, the lateral margins and mesopleura with tawny pile. Pleura brownish or black,

often with more or less evident, rather extensive, brownish yellow areas, but densely clothed with yellowish-grey pollen and yellow pile. Scutellum chestnut brownish, each black hair rising from a black puncture, the margin with longer pale pile. A strongly impressed preapical line.

Legs black; basal third of the front, basal half of the middle and broad base of the posterior tibiae, pale yellow and chiefly white pilose; posterior four tarsi reddish, the apical two joints and more or less of the first joint of the posterior pair, brownish. Pile on basal half of posterior femora and the pale tarsal joints, yellowish, the posterior femora on the postero and anteroventral surfaces broadly covered with scattered black hairs of varying lengths. Posterior tibiae ciliate pilose dorsally and ventrally.

Wings hyaline posteriorly and apically, in the middle with a more or less extensive deep brown spot, the base of the wing broadly similarly coloured, the region between and surrounding these spots varying from less deeply brown to almost hyaline. Squamae deep brown, the lower lobe with rather greyish base, the fringe deep brown and very dense. Halteres reddish-yellow.

First abdominal segment reddish-yellow, rather brownish beneath the scutellum. Second segment reddish-yellow, with the apical fourth, narrowing somewhat towards the sides, varying from pale brownish to black. Third segment brownish to black, with a pair of very broadly separated reddish-yellow basal triangles which reach about half the length of the segment at the sides. Fourth segment similarly marked to third. Third segment with a broad, subopaque fascia across the middle, not reaching the sides and with a large, longitudinal, broadly oval, shining area in the middle; fourth with an opaque spot on either side, placed obliquely. Each segment bears numerous peculiar small tubercles along the posterior margin. Black portion of second segment, except the narrow lateral margin, black pilose, the pile elsewhere yellow, quite thick, but not long.

Female. Lower two-thirds of the front brownish yellow pollinose and cinereous-yellow pilose; upper third subopaque black and black pilose. Front twice as long as the face, convex, fairly strongly narrowed above, where it is half as wide as at the antennae. Head black in ground colour.

Abdomen more reddish, the apical third of the second segment black; fifth segment entirely black.

Four ♂♂ and two ♀♀ from Java W., 2♂, Preanger Regency, Tjisoeroepan, 4200 ft., at light, April 24, 1923; 2♂, ♀, same locality, Papandajan, 5500 to 6000 ft., April 22, 1923, all collected by H. M. Pendlebury, and ♀, Sjibodas, May, 1916, collected by H. C. Robinson.

Genus *Lathyrophthalmus* Mik.

Thorax usually vittate; eyes usually with roundish darker spots which are often more or less confluent; usually hairy above. Otherwise as in *Eristalis*.

This genus, which is an artificial one, is represented in Africa and Asia, only a few species being found elsewhere. Of the thirteen species recorded from the Oriental Region two are represented in the collection.

Table of Species.

Spots on third abdominal segment somewhat oblique, widest inwardly; all the femora brown except their apices	- - -	<i>obliquus</i> Wied.
Spots not oblique, widest laterally; femora yellow, or with brownish apices	- - -	<i>arvorum</i> Fabr.

Lathyrophthalmus obliquus Wiedemann.

Eristalis obliquus Wiedemann, Anal. Ent., 38, 1828.

There is a single, reared, ♀ which I do not describe as such a description would be misleading. The spots on the eyes are not developed, as is usual with teneral. The characters given above will distinguish this species from most of those likely to occur in the region. The ♂ is unknown to me and I have not a perfect ♀.

A ♀, labelled "Selangor, F.M.S., Kuala Lumpur, (bred from dung), July, 1907, Ex. Agric. Dept.

Lathyrophthalmus arvorum Fabricius.

Syrphus arvorum Fabr., Mant. Ins., 335, 1787.

Length, 12 to 14 mm. *Male*. Face, frontal triangle, cheeks and lower fifth of the occiput yellow; front yellow pollinose, the head elsewhere with greyish-white pollen; face retreating, with a small, oval, prominent, less thickly pollinose tubercle, above which it is rather deeply concave, almost perpendicular below. Frontal triangle gently convex, with a faint tubercle in the middle, longer than wide, a small supra-antennal arch shining. Vertical triangle small, black, yellow pollinose in front. Eyes contiguous for a distance equal to the length of the face, the facets enlarged on the upper half, the pile blackish, fairly long, the lower half bare. Pile of head whitish, on the frontal and vertical triangles, black. Antennae yellow, third joint obtusely oval, one and three quarter times as long as wide; arista brownish-yellow, bare.

Thorax yellow; pectus and four dorsal vittae black, yellowish pollinose except the moderately wide blackish

vittae, the median two of which are often more or less ferruginous on the apical fourth and are slightly more widely separated from the scutellum than the posteriorly attenuated lateral ones; the median vittae are united on the anterior slopes and approach each other closely behind, the middle line being narrowed at both ends. Scutellum translucent reddish-yellow. Thorax with fairly abundant yellow pile, the scutellum black pilose except on the margin.

Legs reddish, the hind femora brownish apically above, their tibiae brownish on the apical third and on their dorsal surface except the broad base, their tarsi tinged with brownish apically. Legs yellow pilose, the apical half of the anterior tibiae, apical fourth of the middle, apical fourth of the hind femora below, one-sixth above, the hind tibiae, except the broad base and the basal half of the anterior and posterior surfaces, black haired. Hind femora a little flattened and slightly enlarged, their tibiae a little widened.

Wings hyaline or with faint yellowish tinge. Squamae rather whitish, with yellowish border and fringe. Halteres yellow.

Abdomen somewhat variable: the first two segments yellow, the second with the broad posterior margin, except at the sides, blackish or brownish, this colour produced forward in the middle as a broad triangle to almost the basal fourth. Third segment black or brown, with an obscurely or distinctly interrupted reddish fascia formed of an elongate basal triangle on either side, which occupies about three quarters of the segment laterally, its inner end acutely rounded; sometimes a black triangle extends forward along the lateral margin to the basal fourth, the posterior margin of each triangle is yellowish pollinose. Fourth segment shining brownish-red, with an opaque brownish, incomplete, fascia on the apical third which is rather narrowly connected in the middle with the base of the segment, in front of the opaque fascia is an incomplete, narrowly interrupted, gently arched yellow pollinose fascia, the inner ends of the spots rather rounded, and before them, except laterally, the colour is opaque ferruginous or brown; this basal dark fascia is very narrow or almost obsolete on the broad middle of the segment. Genitalia blackish; apices of second and third abdominal segments shining, elsewhere, except for the lateral margins, opaque. Pile yellow, except on the sides and apex of the second abdominal segment.

Female. Front convex in profile, a little over a fifth of the head-width above, slightly more than a quarter at the antennae; densely yellow pollinose, the pollen along the orbits paler, becoming brown in the middle above; about the ocellar triangle but lightly pollinose. Eyes with shorter, less abundant pile, the spots more or less confluent above.

Second abdominal segment with the broad, incomplete base, brownish, the apical third blackish, the pale fascia equal to half the length of the segment at the sides, narrowed in the middle to hardly one third the length. Third segment with a gently arched, subbasal, greyish-yellow pollinose fascia which is gently widened to the sides where it is a third the length of the segment, the sides of the segment more or less reddish. Fourth segment similar to third, the fascia more yellow and less narrowed in the middle; fifth segment with a pair of slightly arcuate, subbasal ochreous pollinose spots, their inner ends rounded, the outer rectangular, obliquely placed. Apex of each segment shining black. Pile black on the black portions of the second to fourth segments, except on the sides.

The description is made largely from Hawaiian specimens. The collection contains the following: ♀, Selangor, F.M.S., Kuala Lumpur, (Museum window), Aug. 23, 1922; ♀, Pahang, F.M.S., Gunong Tahan, Padang, 5500 ft., Dec. 27, 1922; ♀, Selangor, Kuala Lumpur, Sept., 8, 1922, all collected by H. M. Pendlebury.

Genus *Eristaloides* Rondani.

Differs from *Eristalis* by the presence of much darker brown stripes on the eyes. In the only Oriental species known to me there are five dark brown stripes and four reddish-brown ones. The eyes are rather densely short black pilose although the pile is pale below.

Eristaloides paria Bigot.

Eristalomyia paria Bigot, Ann. Soc. Ent. Fr., p. 218, 1880.

Length, 12 mm. *Female*. Head black in ground colour, almost wholly densely pollinose. Pollen of face and cheeks yellowish-grey, the tubercle, a broad stripe on the middle of the face on either side and a spot on the cheeks in front and behind, bare, or practically so; front below, with a yellow pollinose triangle situated immediately above the supra-antennal bare spot, elsewhere, black pollinose; occiput above with brownish-yellow pollen, elsewhere, grey. Pile of face and occiput pale yellowish or almost white, on the front, eyes and vertex, black. Ocellar triangle large, wider than long, resting on a line drawn between the posterior angles of the eyes. Antennae brown the lower third of the third joint reddish; arista ferruginous, scarcely pubescent.

Thorax densely greyish-yellow pollinose, the mesonotum with four very broad dull olivaceous black vittae which are much wider than the pale ones, the median pair more widely separated from the posterior margin than the outer ones which taper from near their anterior end. Pile fine, wholly yellowish, abundant and moderately long.

Scutellum translucent reddish, black pilose except on the broad margin and narrow base.

Legs black; apices of the femora, broad base of the posterior and almost the whole of the anterior four tibiae (their broad apices are brownish) and the first one or two joints of the posterior four tarsi, yellowish; anterior tarsi brown. Pile of legs yellow, on the apices of the posterior femora, the whole of their tibiae and the dark tarsal joints, black; fairly long and abundant beneath the posterior tibiae.

Wings hyaline, more or less strongly tinged with yellow or pale brown on the apical two-thirds in front. Squamae slightly to strongly infuscated, with darker border and brownish-yellow fringe. Halteres yellow.

Abdomen opaque black, the lateral margins and increasingly wider segmental apices, shining. First segment greyish-yellow pollinose, broadly red laterally. Second segment with a moderately broad pale yellow pollinose fascia which is very gently concave in front on either side, gently convex behind and carried a little backwards; at the middle it lies entirely on the anterior half of the segment; the ground colour beneath is reddish and this colour spreads broadly forward to the base at the sides. Third segment with a subbasal pollinose fascia which reaches the anterior corners of the segment and is most widely separated from the base of the segment before its outer ends while it approaches the base broadly in the middle, the ground colour reddish beneath the yellow pollen. Fourth segment similarly marked but the fascia is a little more arched and does not reach towards the base laterally. Fifth segment with similar marking to fourth, but no pale ground colour. The pollinose fasciae are all broadly separated from the lateral margins, but the red colour reaches the margins on the second and third segments. Abdominal pile pale yellow on the base, on all the pale fasciae and bases of the segments and on the entire lateral margins, elsewhere black.

Two ♀♀, West Java, Preanger Regency, Papandajan, 5500-7000 ft., April 23, 1923, collected by H. M. Pendlebury; Pahang, Fraser's Hill, 4000 ft., Aug. 29, 1923, collected by M. R. Henderson.

Genus *Dolichomerus* Macquart.

This genus differs from *Phytomyia* in the hind femora bearing a strong subapical tooth. Genotype: *D. crassus* Fabr.

Dolichomerus crassus Fabricius.

Syrphus crassus Fabr., Mant. Ins., ii, 334, 1787.

Femora reddish, their apices black; posterior tibiae reddish with black apex; middle tibiae over half white, the

anterior half yellow, the bases of each on the outer side densely white pubescent; each abdominal segment bears three large, gently convex areas; general colour deep shining black.

Length, about 15 mm. *Female*. Face black, rather shining, conspicuously punctured except in the infra-antennal depression and the broad oral margin; immediately below the antennae with some greyish-white pollen. In profile the face is concave on the upper third, the lower part gently convex, the tubercle long, not very conspicuous although it is attenuated by a broad depression on either side of its upper three-fifths, its surface polished below the tubercle retreating to the oral tip which is not as prominent as the depth of the upper concavity. The cheeks are shining black, with a small, yellow pollinose triangle below the eye. Facial pile short, yellowish-white, subappressed. Front rather wide, its sides almost parallel on the upper half, in profile almost evenly convex but there is a shallow, poorly marked arch just above the lower fourth, the ground coarsely punctured, black; before the arch all the pile is directed forwards; behind, directed backwards, sordid whitish with some tawny hairs above, that on the ocellar triangle black and erect. At the lower fifth of the front is an oval, shining swelling with a large puncture near its middle. When viewed without magnification the front and face appear greyish-white. Occiput black, the orbits, except above, silvery pollinose; pile black above, pale below, absent near the orbits. Antennae black, third joint quadrately oval, hardly one and a half times as long as wide; first joint very small; arista luteous, its apical fourth brown, the plumes on the basal three fourths long, fine, white. Eyes bare.

Thorax black, rather dull, more shining laterally, the pile of the notum extremely short, black, the ground densely, finely punctured. Pleura with longer black pile, that on the upper portion more condensed, the metapleura with sordid pile in some lights. Scutellum large, transverse, with a strongly differentiated thin margin, its pile inconspicuous.

Coxae and trochanters black. Femora reddish, their apices black, their bases sometimes very narrowly obscurely so. Apical third of the tibiae black, the bases of the anterior and posterior ones reddish, the middle ones reddish, the anterior four silvery-white on the dorsal side of the pale areas when viewed from their base, the basal fifth of the hind ones similarly clothed. Tarsi black, the middle basitarsi reddish except the apex. Posterior femora compressed, not large, with a large triangular projection on the antero-ventral edge before the apex: the basal part of the projection bears a sharp, narrow triangle, beyond which are a number of short black spines; hind tibiae compressed and

arcuate, excised on the anterior surface for the reception of the femoral spur and also bearing a curved fovea slightly beyond their middle. The pile on the pale portions of the tibiae is white, elsewhere on the legs black; short except as follows: posterior tibiae densely ciliate on their ventral surface.

Wings hyaline apically, black on more than the basal half along the costa to the apex of the second vein, the apical margin of the black sharply defined, curving around from the apex of the first vein, just beyond the posterior basal cell and through the widest part of the anal cell. There is also a wide, black line along the anterior cross-vein connected with the black of the base along the third vein. Squamae brownish, with brown fringe. Halteres fuscous, with yellow stem.

Abdomen shining black; first segment opaque black. On the base of each, and extending over three quarters the length of the second to fourth segments is an orbicular or slightly oval, gently convex, area; on the third and fourth segments on either side of the median convexity is a transversely suboval basal, similarly convex area, which is separated from the lateral margin by a conspicuous fovea; each of these raised areas is surrounded by opaque black; on the second segment there is no distinct lateral convexity but there is a shining area slightly larger than the other convex ones and of almost similar shape, bounded anteriorly and exteriorly by linear whitish pubescence; inside each of the lateral convexities at the base of each segment is a group of scale-like yellowish-white hairs; beyond the apical third of the second segment the abdomen is fringed with moderately long whitish hairs, a short region of black ones on the middle of the second segment. The dorsum bears scarcely noticeable black pile. Fifth segment small, with longer, sparse black and pale pile.

A single ♀, Pahang, F.M.S., River Tembeling, Nov. 19, 1921, collected by H. M. Pendlebury.

APPENDIX.

The two following species which were not represented in the main collections, have come to hand after the completion of the manuscript.

Volucella bombylans var. *malayana* var. n.

This variety agrees well with *V. bombylans plumata* DeG. from which it differs chiefly in having the abdomen wholly clothed with tawny or reddish-yellow pile. It is distinguished from the species included in the table on page 160, by the long dense pile on the thorax and abdomen.

Length, 16 mm. *Male*. Face reddish-yellow, the cheeks and oral margin shining black; in profile the upper two-fifths of the face is moderately concave, the lower portion perpendicular with an elongate prominent tubercle immediately below the concavity; face strongly produced downwards as a sharp cone. Pile on the face, frontal triangle and lower edge of the eyes, yellow, elsewhere, black. Frontal triangle small, brownish. Vertical triangle brownish, longer than wide, acute in front, the eyes only touching for a distance equal to half the length of the frontal triangle. Ocellar triangle slightly wider than long. First antennal segment brown, the others missing.

Mesonotum shining black; lateral margins and scutellum translucent reddish-yellow, the mesonotum on the borders and the scutellum wholly, clothed with long yellow pile, the thorax elsewhere with long black pile.

Legs black, the extreme apices of the anterior four femora and the broad bases of their tibiae, brownish-red; pile wholly black.

Wings pale cinereous, with a rather rectangular brownish cloud in the middle in front and a much smaller cloud running over the apex of the marginal cell. Squamae and fringe brown, the former with greyish or whitish base. Halteres reddish, the knobs blackish.

Abdomen shining black, the second segment yellowish except a large subrectangular median spot which widens towards the base in front and does not quite reach the apex of the segment. The third segment bears a large, suboval spot on either side towards the base, the spots very widely separated from each other and dull rusty reddish or castaneous in colour. Abdominal pile wholly tawny, very long.

Described from a single, slightly damaged ♂ from Malay Peninsula, ex Agricultural Department collection.

Paragus serratus Fabricius.

Mulio serratus Fabr., Syst. Antl., 186, 1805.

Readily distinguished from other South Oriental species by the transverse, very strongly dentate scutellum.

Length, 4 to 5.5 mm. *Female*. Head black, slightly more than the lateral third of the face pale yellowish to slightly above the antennae, the oral margin black; sides of front white pubescent on lower half, the pollen enlarged as triangles at the middle, but not forming a continuous transverse band. Front rather narrow above, not twice as wide at antennae as at vertex, the sides practically parallel on the upper fourth. The equilateral ocellar triangle is situated at the upper fifth of the front. Pile of head short, white; black on the upper half of the front. Pile of the eyes arranged in three broad, irregular vertical rows, which are more or less

joined in places. First antennal segment longer than the second, the third one and three quarters the length of the first and second combined, tapering on the apical third; arista situated at basal third of third segment and hardly reaching beyond its apex. Antennae reaching to the lowest fourth of the face.

Thorax shining black, conspicuously punctured, more or less bronzed, clothed with fine white pile, but on the disc of the mesonotum the hairs are chiefly black and inconspicuous; in front with a rather broad band of greyish pollen which is interrupted in the middle, the mesopleura similarly covered and with longer pile than elsewhere. Scutellum about three times as wide as long, transverse, the apex gently convex and furnished with ten to twelve strong teeth. Hair of scutellum sparse, yellow, stronger than on mesonotum.

Anterior four legs yellow, with hardly the basal half of the femora black, their broad apices and the basal half of their tibiae, whitish. Posterior femora black with the apical fifth whitish, the basal two-fifths of their tibiae also whitish, the remainder of the tibiae and the tarsi, brown.

Wings luteous on the basal half or more, the apex cinereous. Squamae and halteres white.

Abdomen variable, black, marked with yellow; coarsely punctured and tuberculate, the segments fused, the incisures feebly marked. First segment and broad sides of the second, except the apex, black, the second elsewhere, except a transverse preapical median spot, yellow or orange. Second segment with a rather narrow, very narrowly interrupted, yellow basal fascia which curves backwards at the sides and is chiefly covered with very pale yellow pollen. Fourth and fifth segments with similar basal fasciae but they do not curve away from the base of the segments laterally, are more widely interrupted in the middle and on the fifth segment appearing as an inverted U owing to the shape of the segment, this segment also with a well-marked apical flange. The abdominal pile is whitish but each segment, except the first and last, bears a more or less entire, incomplete fascia of short dark hair, situated chiefly behind the middle of the segment.

A single ♀, Selangor, Kuala Lumpur, F.M.S., Nov. 12, 1924, collected by H. M. Pendlebury. Widely distributed in the East and not uncommon in Africa.

EXPLANATION OF FIGURES.

ON PLATE III.

- Fig. 1. *Milesia pendleburyi* sp. n.
 " 2. *Milesia tenuiformis* sp. n.
 " 3. *Milesia excelda* sp. n.
 " 4. *Malayomyia pretiosa* sp. n.
 " 5. *Milesia callida* sp. n.

(Mis-spelt *callies* on plate.)

ON PLATE IV.

- Fig. 6. *Microdon grandis* sp. n. wing.
- " 8. *Volucella trifasciata*, Wied., profile of head.
- " 9. *Volucella surda* sp. n., profile of head.
- " 11. *Eumerus trepidus* sp. n., wing.
- " 19. *Rhingia chaetosa* sp. n., head in profile.
- " 20. *Pararctophila malayana* sp. n., head in profile.

IN TEXT.

- " 7. *Volucella trifasciata*, Wied., abdomen, p. 162.
- " 10. *Volucella rotundata*, Edw., abdomen, p. 165.
- " 12. *Malayomyia pretiosa* sp. n., profile of head, p. 226.
- " 13. *Asarkina salviae*, Fabr., abdomen. (From specimen in Wiedemann Collection), p. 232.
- " 14. *Asarkina consequens*, Walk., abdomen, p. 233.
- " 15. *Asarkina laticornis* sp. n., abdomen, p. 235.
- " 16. *Asarkina incompleta* sp. n., abdomen, p. 240.
- " 17. *Xanthandrus callidus* sp. n., abdomen of ♂, p. 262.
- " 18. *Callicera pendleburyi* sp. n., head in profile, p. 273.
- " 21. *Mallota orientalis*, Wied., abdomen of ♀, p. 291.
- " 22. *Eristalis simplicipes* sp. n., abdomen of ♂, p. 302.
- " 23. *Eristalis purus* sp. n., abdomen of ♀, p. 305.

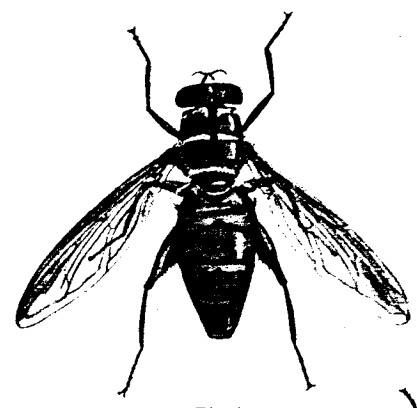


Fig. 1.
Malesia pendleburyi sp. n.

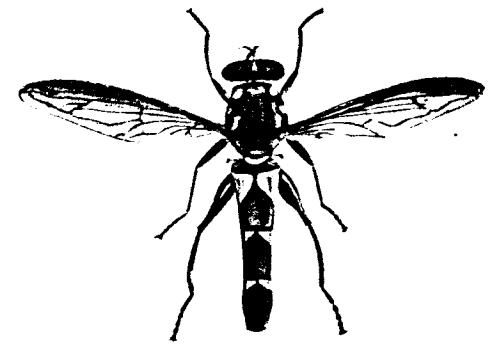


Fig. 2.
Malesia tenuiformis ♂.

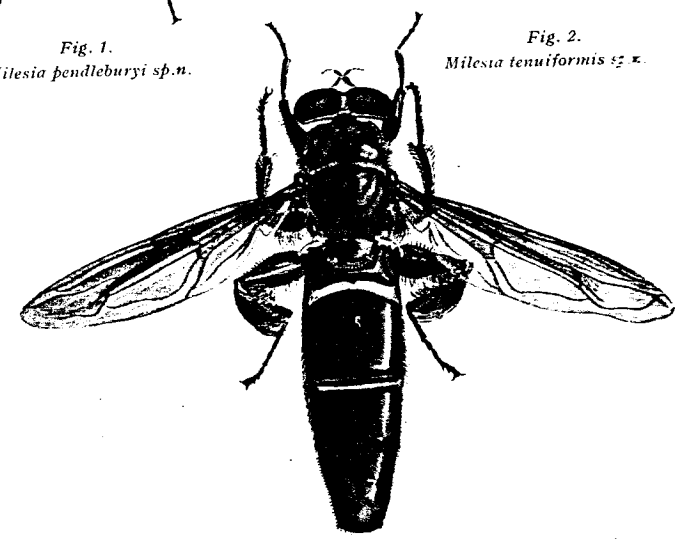


Fig. 3.
Malesia excelsa sp. n.

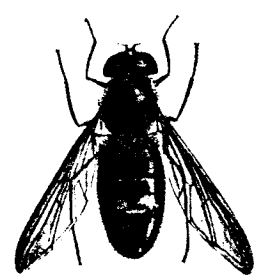


Fig. 4.
Malayomyia pretiosa sp. n.

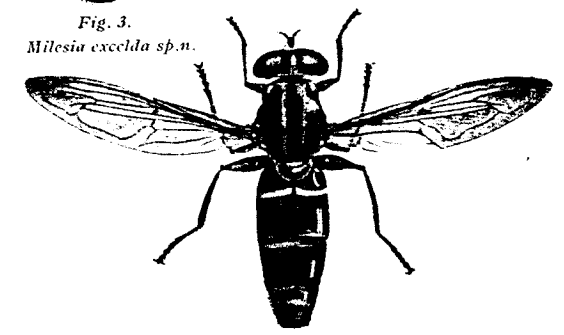


Fig. 5.
Malesia callis ♂.

J. J. de Grise, del.

Scaborne, Ltd London.



Fig. 6

Microdon grandis sp. n., wing.

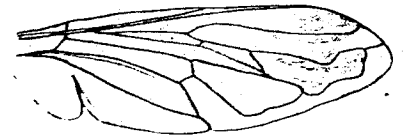


Fig 11

Eumerus trepidus sp. n., wing.

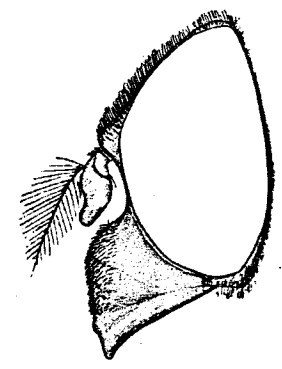


Fig. 8

Volucella trifasciata, Wied.,
profile of head.

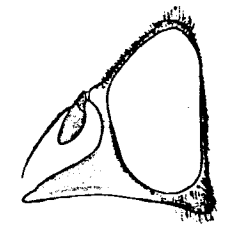


Fig 19

Rhingia chaetosa sp. n.,
head in profile.

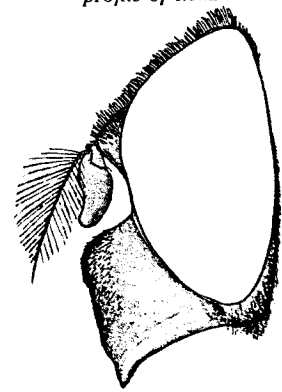


Fig. 9

Volucella surda sp. n.,
profile of head.

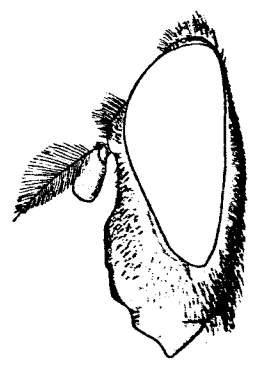


Fig 20

Pararectophila malayana sp. n.,
head in profile.