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AND

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DIPTERA FROM NEPAL

ASILIDAE

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British Museum (Natural History)

SYRPHIDAE

BY

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British Museum (Natural History)

AND

SIMULIIDAE

BY

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Medical Research Council c/o British Museum (Natural History)

Pp. 237-294 ; 12 *Text-figures*

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TRUSTEES OF
THE BRITISH MUSEUM (NATURAL HISTORY)

Issued 4 September 1964

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DIPTERA FROM NEPAL

SYRPHIDAE

By R. L. COE

SYNOPSIS

The material studied comprises twenty-two genera and sixty-two species, of which eleven are described as new. Some existing species are discussed and where necessary redescribed, and keys are included to certain genera.

INTRODUCTION

THE bulk of the material dealt with in this paper was collected by the author while a member of the British Museum (Natural History) East Nepal Expedition 1961-62. Also included is other B.M. (N.H.) material from South-East Asia and two collections from the same region submitted for identification by Drs. F. Kuhlhorn and F. Keiser, of the Zoologisches Sammlung des Bayerischen Staates, Munich, Germany and the Naturhistorisches Museum, Basel, Switzerland respectively.

As entomologist with the British Museum expedition, I was working in the field from late September to early February, a period when most of the wild plants were in seed and failed to attract Syrphidae. Moreover, cold winds and frequent frosts had by late November decimated the insect population except in sufficiently sheltered places. In the high damp evergreen oak forest above our base camp at Sangu, frost and frozen snow had by that time restricted successful collecting to barely an hour around midday when the overhead sun raised the temperature along the narrow exposed track sufficiently for the insects to take flight from their obscure hiding places. During this brief spell of activity in the high forest Syrphidae were occasionally taken throughout the winter months at altitudes up to nearly 10,000 feet.

Near our base camp at around 6,200 feet a cultivated Composite (*Guizotia abyssinica* Cassini), from the yellow blooms of which the natives extract an oil, survived the nightly frosts of late December in a field facing south and sheltered by high evergreen shrubs from the north and east. Some interesting Syrphidae were attracted to the flowers. In early December the blooms of the same plant afforded good collecting on the Tumlingtar plateau in the Arun Valley at an altitude of about 2,000 feet. With wild blooms almost absent this cultivated plant was extremely useful for collecting Syrphidae and other insects, Hymenoptera in particular.

Of the species dealt with in this paper, fifty-one were collected in East Nepal, and an analysis of their distribution reveals some facts of interest. Only nine occur in the Palaearctic Region ; twenty-seven occur in the territories extending

southward through Burma and Thailand as far as Sumatra and Java ; three occur still further south, i.e., in Northern Australia ; and three occur in the Ethiopian Region.

However, of the twenty-two genera taken in East Nepal, twenty occur in the Palaearctic Region ; one (*Megaspis*) occurs in the Ethiopian Region ; and one (*Lycastris*) is peculiar to the Oriental Region.

In the following text, collectors' names are given when the material was taken other than by the author.

Subfamily SYRPHINAE

Paragus tibialis tibialis (Fallén)

Pipiza tibialis Fallén, 1817 : 60.

Paragus tibialis (Fallén) Meigen, 1822 : 183.

EAST NEPAL : Taplejung District, Sangu, c. 6,200 ft., from mixed vegetation by stream in gully, ix-x.1961, 1 ♂, 1 ♀.

The typical form of this species with its entirely black abdomen is cosmopolitan in its distribution.

Paragus tibialis rufiventris Brunetti

Paragus tibialis rufiventris Brunetti, 1913 : 157.

EAST NEPAL : Taplejung District, Sangu, c. 6,200 ft., from mixed vegetation from stream in gully, ix-x.1961, 7 ♂ ; also from blooms of *Guizotia abyssinica* Cassini, 16-29.x.1961, 2 ♂ ; above Sangu, c. 6,500 ft., from evergreen scrub, 5-13.x.1961, 1 ♂. Taplejung District, Dobhan, c. 4,000 ft., from cut rice steppes above River Maewa, 28.i.1962 2 ♂.

This form of *tibialis* occurs in INDIA and CEYLON.

The following *Paragus* species all belong to the sharply differentiated group with very deeply serrated scutellum, bearing a marginal row of conspicuous teeth, as defined by Stuckenberg (1954 : 409).

Paragus crenulatus crenulatus Thomson

Paragus crenulatus crenulatus Thomson, 1869 : 503.

EAST NEPAL : Arun Valley, Tumlingtar plateau, c. 2,000 ft., from blooms of *Guizotia abyssinica* Cassini, 10-16.xii.1961, 1 ♂.

Typical *crenulatus* is widespread in the Oriental Region.

Through the kindness of Dr. Kjellander, of Stockholm, I was enabled to compare my single example of the typical form of this species with the sole existing specimen in Thomson's collection at the Naturhistoriska Riksmuseum. They agree in all respects, thus confirming Stuckenberg's interpretation of Thomson's description.

Paragus crenulatus Thomson, dark form

Paragus crenulatus Thomson ; dark form, descr. Stuckenberg, 1954 : 412.

EAST NEPAL : Arun Valley, Tumlingtar, c. 2,000 ft., from blooms of *Guizotia abyssinica* Cassini, 10-16.xii.1961, 3 ♂, 2 ♀ ; Taplejung District, Dobhan, c. 4,000 ft., from cut rice steppes above River Maewa, 28.i.1962, 2 ♂, 2 ♀.

This material agrees with Stuckenberg's description of three specimens from Calcutta, in which the body is dark, the mesonotal pile white, and the mesonotal stripes complete and silvery. Also, the thorax is more coarsely punctate than in the typical form, and has dull violaceous and a few cupreous reflections. As Stuckenberg remarks there is considerable variation within the species, which could probably be divided into several subspecies if more material became available.

Paragus yerburiensis Stuckenberg

Paragus yerburiensis Stuckenberg, 1954 : 415.

EAST NEPAL : Arun Valley, Tumlingtar plateau, c. 2,000 ft., from blooms of *Guizotia abyssinica* Cassini, 10-16.xii.1961, 3 ♂, 1 ♀.

Described from INDIA and CEYLON.

Paragus auratus Stuckenberg

Paragus auratus Stuckenberg, 1954 : 418.

EAST NEPAL : Arun Valley, Tumlingtar plateau, c. 2,000 ft., from blooms of *Guizotia abyssinica* Cassini, 10-16.xii.1961, 6 ♂, 1 ♀.

Described from INDIA, CEYLON and AFRICA.

Baccha maculata Walker

Baccha maculata Walker, 1852 : 223.

EAST NEPAL : Taplejung District, Sangu, c. 6,200 ft., from mixed vegetation by stream in gully, ix-x.1961, 2 ♂.

Described from NORTH INDIA.

Baccha* sp. near *maculata Walker

EAST NEPAL : Taplejung District, above Sangu, c. 6,300 ft., from old mixed forest, 25-28.x.1961, 1 ♀.

This specimen is close to *maculata*, differing from the single female example of the latter in the Brit. Mus. (Nat. Hist.) in the following respects :—frons and facial knob less prominent, side dusting on frons more evenly broad ; thorax, scutellum and pleurae shining black, not steely blue as in *maculata* ; tergites with the pale basal markings on 3-5 more restricted and pale yellowish.

***Platycheirus albimanus* (Fabricius)**

Syrphus albimanus Fabricius, 1781 : 434.

Platycheirus albimanus (Fabricius) Verrall, 1901 : 280.

EAST NEPAL : Khumbu, Thangpoche, c. 13,000 ft., 10.vii.1962, 2 ♀ (*G. Ebert, H. Falkner*). In Zoologisches Sammlung des Bayerischen Staates.

Common in EUROPE and stated to occur in the Nearctic Region.

***Platycheirus manicatus* Meigen var. *himalayensis* Brunetti**

Platycheirus manicatus Meigen var. *himalayensis* Brunetti, 1915 : 209.

EAST NEPAL : Khumbu, Thangpoche, c. 13,000 ft., 10.vii.1962, series ♂, ♀ (*G. Ebert, H. Falkner*). In Zoologisches Sammlung des Bayerischen Staates.

Described from 3 ♂ from Garhwal, West Himalayas (Zoological Survey, Calcutta).

Differs principally in ♂ from the typical European form of *manicatus* by having the front tarsi more conspicuously dilated.

***Melanostoma univittatum* (Wiedemann)**

Syrphus univittatus Wiedemann, 1824 : 36.

Melanostoma univittatum (Wiedemann) Brunetti, 1915 : 208.

EAST NEPAL : Arun Valley, below Tumlingtar, River Sabhaya, c. 1,800 ft., on sandy shore, 30.xii.1961, 1 ♀.

Widely distributed in Oriental and Australian Regions.

***Melanostoma orientale* (Wiedemann)**

Syrphus orientalis Wiedemann, 1824 : 36.

Melanostoma orientale (Wiedemann) de Meijere, 1908 : 312.

EAST NEPAL : Taplejung District, Sangu, 6,200 ft., from blooms of *Guizotia abyssinica*, Cassini 10-16.xii.1961, 1 ♂, 3 ♀ ; also from mixed vegetation by stream in gully, ix.1961-i.1962, 2 ♂, 1 ♀ ; and from blooms of wild cherry, 15-18.xi.1961, 2 ♂, 1 ♀ ; Taplejung District, Dobhan, from mixed vegetation by stream in deep gully, c. 3,500 ft., i-ii.1962, 1 ♀.

Widely distributed in Oriental Region.

***Sphaerophoria indiana* Bigot**

Sphaerophoria indiana Bigot, 1884 : 99.

EAST NEPAL : Taplejung District, Sangu, c. 6,200 ft., from blooms of *Guizotia abyssinica* Cassini, 16-29.x.1961, 2 ♂ ; also from mixed vegetation by stream in gully, ix-x.1961, 1 ♂, 1 ♀ ; Arun Valley, Tumlingtar plateau, c. 2,000 ft., from blooms of *Guizotia abyssinica* Cassini, 10.xii.1961, 2 ♂, 3 ♀.

Occurs in INDIA, CEYLON and CHINA.

Syrphus torvus Osten-Sacken

Syrphus torvus Osten-Sacken, 1875 : 139.

EAST NEPAL : Taplejung District, Sangu, c. 6,200 ft., from damp evergreen oak forest, 2-26.xi.1961, 1 ♂ ; also, c. 6,200 ft., from blooms of *Guizotia abyssinica* Cassini, 10-16.xii.1961, 1 ♀ ; from blooms of wild cherry, 15-18.xi.1961, 1 ♀ ; and from foliage at edge of mixed forest, 17.xi.1961, 1 ♀.

Frequent in EUROPE and INDIA.

My Nepalese material agrees with the series of European *torvus* in the Brit. Mus. (Nat. Hist.), except that in both sexes the dust on frons is golden instead of grey. However, a single ♀ from Sweden agrees with my series in this respect. Osten-Sacken described his *torvus* from North America, but I have seen no material from that sub-continent that agrees with the species as now understood, and it is possible that there are two species confused here.

Syrphus pellucidipennis sp. n.

(Text-figs. 1-2)

FEMALE. Length (exclusive of antennae), 15.5 mm.; wing-length, 14.5 mm. Eyes rather narrowly separated at vertex, the space between them steadily increasing from shortly above front ocellus to their lowest extremity ; eye-hairs dense, yellowish, rather short above, longer below. Vertex shining blackish olive, scarcely dusted, with short black hairs. Frons shining olive, with dense wide golden dusting at sides ; lunula shining blackish olive. Face (Text-fig. 2) broad, broader than the maximum width of an eye, very shortly descending below eye-level, moderately hollowed beneath antennae and with moderately produced central prominence ; yellow, with rather sparse pale golden dusting except on the shining, more orange, central prominence. Antennae greyish black, the first segment slightly shining, second and third dull ; first and second subequal in length, third about as long as first two together, rather narrow, tapering towards tip. Arista rather short, reddish, slightly darkened towards tip.

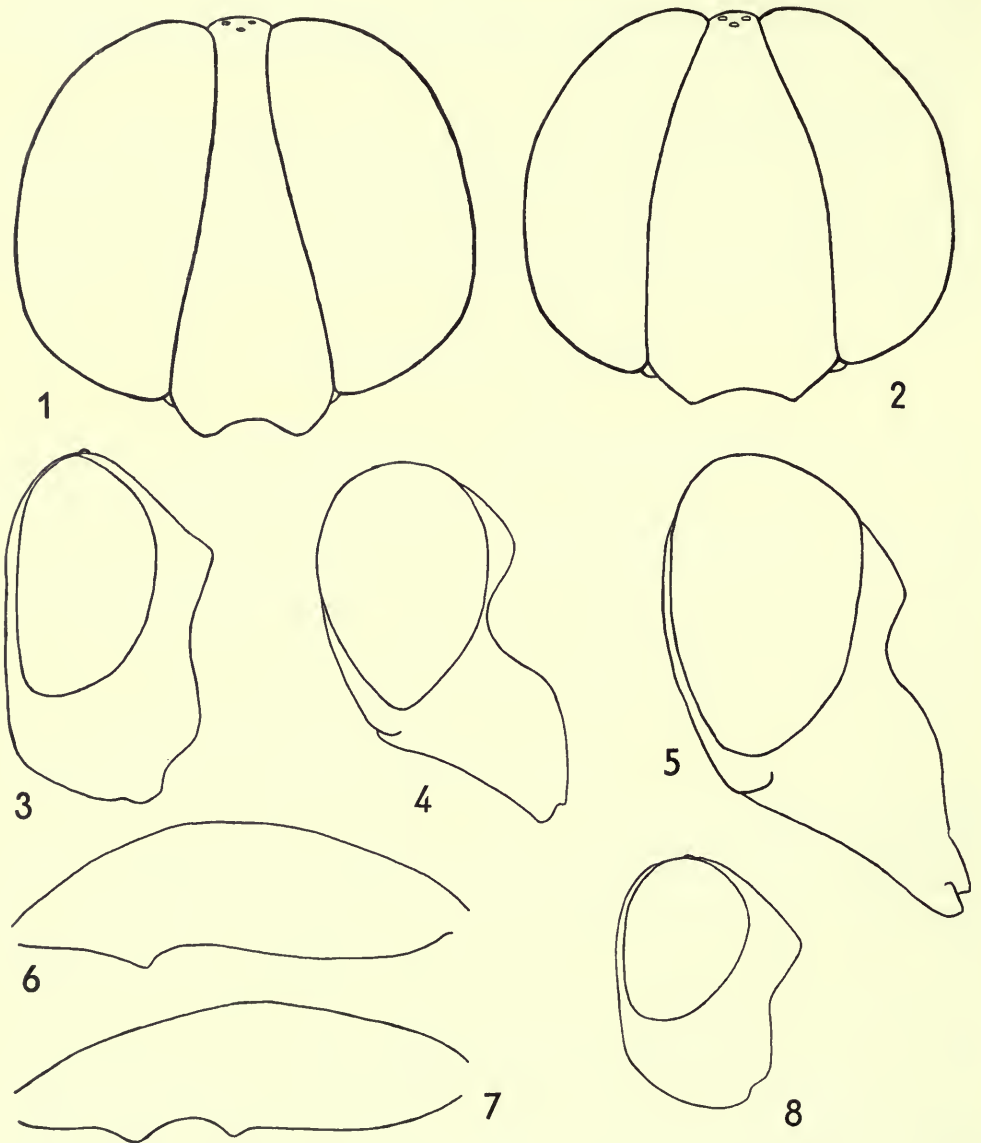
Thorax greyish green, scarcely shining, becoming orange at sides, clothed with mainly rather short yellow hairs on disc and with longer light orange hairs at sides ; scutellum yellowish orange, slightly shining, with rather long fine intermixed yellow and black hairs. Pleurae mainly greyish green, extensively dulled by dense pale golden dusting and with moderately dense rather long light orange hairs.

Abdomen with first tergite and extreme base of second moderately shining grey ; remainder of second tergite black, dull towards base, shining towards tip, with a pair of narrow, widely divided yellow fasciae halfway along tergite, these not extending over side-margins ; third tergite black, similarly dull towards base, shining towards tip, with a tiny isolated reddish yellow spot at middle towards base and a slight trace of reddish at middle of hind-margin ; fourth tergite black, similarly dull towards base, shining towards tip, with a much more extensive reddish marking spreading across hind-margin and extending forward for a short distance at median line, thus appearing narrowly triangular ; fifth tergite with an almost equilaterally triangular reddish marking extending forward from hind-margin. Sternites mainly blackish.

Four anterior femora narrowly blackish at base, hind pair with more than basal half blackish, all tibiae yellowish, four anterior tarsi yellowish, hind pair darkened dorsally. Leg-hairs mainly following ground colour on the two anterior pairs, but on the hind pair the short black femoral hairs are continued over the yellow apical half, and the tibiae have numerous short black hairs for their entire length, these becoming conspicuous and close-set along the apical half.

Squamae yellowish, fringed with long golden hairs. Halteres yellowish. Wings pellucid apart from the light yellowish brown stigma.

Holotype ♀. EAST NEPAL: Taplejung District, damp evergreen oak forest above Sangu, c. 9,200 ft., 2-26.xi.1961. Brit. Mus. (Nat. Hist.).



FIGS. 1-8. 1, 2, heads of ♀ *Syrphus* from in front. (1) *chrysotoxoides* Curran. (2) *pellucidipennis* sp. n. 3-5, 8, heads in profile. (3) *Ferdinandea longifacies* sp. n. (4) *Volucella flavoscutellata* Sack. (5) *V. varipila* sp. n. (8) *F. isabella* Hull. 6, 7, hind femora of ♂ *Pseudovolucella*, base to right, externo-lateral view. (6) *fasciata* Curran, (7) *hingstoni* sp. n.

The single example of this large, handsome species was taken resting on a fern leaf warmed by the sun's rays. Apart from the very restricted yellow markings on the abdominal tergites, its dull green thorax and hairy eyes would lead one at first glance to consider it a close ally of *torvus* Osten-Sacken (q.v.) of the *ribesii-vitripennis* group of the genus. However, the lower lobe of the squama is devoid on the disc of the numerous long yellow hairs characterizing that group, microscopic pile only being present.

Curran (1928 : 201) described a *Syrphus chrysotoxoides* from a single ♀ taken in Siam, and this example shares with my new species the combination of characters mentioned above. Curran's type specimen of *chrysotoxoides* is in the Brit. Mus. (Nat. Hist.), and is gummed to a card and in very poor condition. From certain omissions of detail in Curran's description it seems probable that he described it in its present state. Although sharing the characters detailed, *chrysotoxoides* differs from my new species in many respects. The face (Text-fig. 1) of *chrysotoxoides* is considerably narrower, at its maximum width being less than the maximum width of an eye ; antennae extensively reddish ; wings evenly smoky yellow ; all tergites extensively yellow ; sternites mainly yellowish ; and all femora entirely clear reddish orange.

Syrphus brunettii Hervé-Bazin

Syrphus brunettii Hervé-Bazin (pro *albostriatus* Brunetti nec Fallén), 1923 : 290.

Syrphus albostriatus Brunetti nec Fallén, 1923 : 72.

EAST NEPAL : Sangu, c. 6,200 ft., from mixed vegetation in deep gully, ii.1962, 2 ♂ ; from damp evergreen oak forest above Sangu, c. 8,500 ft., 2-26.xi.1961, 1 ♀.

The above material that I took in East Nepal and one ♂ and two ♀ in the Brit. Mus. (Nat. Hist.) from North East India agree with Brunetti's description of his supposed *albostriatus* Fallén, as amended to *brunettii* by Hervé-Bazin, except that Brunetti states that the eyes in the male are " absolutely contiguous for only a short distance ". Actually, both *albostriatus* and the material that I now identify as *brunettii* have the eyes touching for a considerable distance in the male. Unfortunately I have been unable to check the type series of *brunettii* at the Zoological Survey in Calcutta, but I am satisfied that Brunetti's statement is a *lapsus calami*. Further, had Brunetti's examples of the male truly had the eyes touching for only a short distance, Hervé-Bazin would surely have drawn attention to this further distinction from the true *albostriatus* when renaming the series.

Syrphus serarius Wiedemann

Syrphus serarius Wiedemann, 1830 : 128.

EAST NEPAL : Taplejung District, Sangu, c. 6,200 ft., from mixed vegetation by stream in gully, x.1961-i.1962, 1 ♂, 5 ♀.

Occurs widely in Oriental Region.

In this species the markings on the tergites vary a great deal, also in the female the frontal dust-spots may be present or absent and while the latter are usually grey they are yellowish in one of my Nepalese examples.

Syrphus ? nitens Zetterstedt var.

Syrphus nitens Zetterstedt (typical), 1843 : 712.

EAST NEPAL : Taplejung District, Sangu, c. 6,200 ft., from blooms of *Guizotia abyssinica* Cassini, 10-16.xii.1961, 1 ♂.

This single male example of a *Syrphus* of the *luniger* group agrees with the uncommon *nitens* in having the third and fourth tergites with the yellow bands not, or scarcely, broader than the black cross-band separating them, and than the black cross-band bounding the front margin of the third tergite and the hind margin of the second tergite. The yellow bands of the third and fourth tergites are, however, narrowly divided into lunules instead of being entire and the central prominence of the face is rather broadly darkened. Otherwise it agrees quite closely with typical male *nitens*.

Occurs widely in EUROPE (typical form).

Syrphus balteatus (Degeer)

Musca balteata Degeer, 1776 : 116.

Syrphus balteatus (Degeer) de Meijere, 1908 : 297.

EAST NEPAL : Taplejung District, Sangu, c. 6,200 ft., from mixed vegetation by stream in gully, ix-x.1961, 1 ♀ ; also, between Sangu and Tamrang, c. 5,200 ft., from mixed shrubs in deep gorge, x-xi.1961, 2 ♂, 3 ♀. South of Katmandu, Rapti Tal, c. 980 ft., 23-27.iii.1962, 2 ♀, (*G. Ebert, H. Falkner*). The latter two examples are in the Zoologisches Sammlung des Bayerischen Staates.

Common and widespread in Palaearctic, Ethiopian, Oriental and Australian Regions.

Syrphus balteatus (Degeer) var.

EAST NEPAL : Taplejung District, between Sangu and Tamrang, c. 5,200 ft., x-xi.1961, 1 ♂ ; also Sangu, c. 6,200 ft., from mixed vegetation by stream in gully, xi.1961-i.1962, 1 ♂, 2 ♀ ; and from blooms of *Guizotia abyssinica* Cassini, 10-16.xii.1961, 1 ♂.

This is a curious variety in which the broad yellow bands on tergites, and frequently the narrow yellow bands also, are rather widely divided by a greyish black longitudinal stripe. In the field this difference in the markings is very noticeable. A ♂ and a ♀ in the Brit. Mus. (Nat. Hist.) from North-east India and Hong Kong respectively exhibit this same variation from typical *balteatus*.

Syrphus cinctellus (Zetterstedt)

Scaeva cinctella Zetterstedt, 1843 : 742.

Syrphus cinctellus (Zetterstedt) Verrall, 1901 : 392.

EAST NEPAL : Taplejung District, below Sangu, c. 6,000 ft., from edge of small mixed wood, 4.xi.1961, 1 ♂. East of Katmandu, Dudh Kosi Tal, 10,350 ft., 24.vii.1962, 1 ♀ (*G. Ebert, H. Falkner*). Latter example in Zoologisches Sammlung des Bayerischen Staates.

Common in Palaearctic Region. Also recorded from NORTH INDIA.

Syrphus fulvifacies Brunetti

Syrphus fulvifacies Brunetti, 1913 : 161 (♀).

Syrphus fulvifacies Brunetti ; Brunetti, 1923 : 89 (♂).

EAST NEPAL : Taplejung District, Sangu, c. 6,200 ft., from blooms of *Guizotia abyssinica* Cassini, 10-16.xii.1961, 1 ♀ ; also from mixed vegetation by stream in gully, xi.1961-i.1962, 1 ♂ ; above Sangu, c. 7,000 ft., on old stone wall, 7.i.1962, 1 ♀ ; and from leaves of shrubs on sunny ridge, 14.i.1962, 1 ♂, 1 ♀.

This small, distinct species was described by Brunetti (1913 : 161) from a single ♀ taken at Rotung in N.E. India on 26.ix.1918, and now in the Zoological Survey at Calcutta. Later (1923 : 89) he described the ♀ from a specimen taken at Kashmir in June, 1901. Brunetti does not state in which collection the latter example was deposited. It is certainly not in the Brit. Mus. (Nat. Hist.).

Curiously enough, while Brunetti named the species *fulvifacies* from its entirely clear yellow face ("wholly bright golden-orange" is his description) he separated it in his key to *Syrphus* species from *latifasciatus* Macquart by its having the "facial bump dark", correctly quoting *latifasciatus* as having the "facial bump pale yellow". The five examples of *fulvifacies* that I collected in Nepal all have the face entirely clear yellow and agree with Brunetti's description of that species.

In Brunetti's key mentioned above, the two species (*fulvifacies* and *latifasciatus*) run to couplet 16, and that section may be replaced by :—

- 16 Thorax glittering black or greenish black. Second and third tergites with the yellow bands broad, occupying more than half length of tergite. Frontal lunule pale yellow, concolorous with remainder of frons and the face . *latifasciatus* Macquart
 — Thorax dull pale green. Second and third tergites with the yellow bands narrow, occupying not more than half length of tergite and usually less. Frontal lunule intensely black, shining, with small median orange area anteriorly

fulvifacies Brunetti

Finally, although Brunetti records a ♀ *latifasciatus* (1923 : 87) from Simla, I have not seen an Oriental example of that species. Brunetti states that there is no doubt whatever of his identification being correct.

For the above emendation of Brunetti's key I have compared my Nepalese series of *fulvifacies* with the European material of *latifasciatus* in the Brit. Mus. (Nat. Hist.).

Syrphus confrater Wiedemann

Syrphus confrater Wiedemann, 1830 : 120.

EAST NEPAL : Taplejung District, above Sangu, on old stone wall, c. 7,000 ft., 7.i.1962, 1 ♂ ; Sangu, from mixed vegetation by stream in gully, c. 6,200 ft., xi.1961-i.1962, 3 ♀ ; and from blooms of *Guizotia abyssinica* Cassini, 10-16.xii.1962, 1 ♂. South of Katmandu, Rapti Tal, Hitora, c. 980 ft., 23-27.iii.1962, 1 ♀ (*G. Ebert, H. Falkner*). In Zoologisches Sammlung des Bayerischen Staates.

Distributed throughout Oriental Region.

Syrphus albipilus sp. n.

FEMALE. Length (exclusive of antennae), 9.5 mm.; wing-length, 8 mm. Eyes rather broadly separated at vertex, the space between them parallel-sided until shortly below front

ocellus, then steadily widening until just below level of antennae, after which the sides become parallel or even slightly convergent down to their lowest extremity ; eye-hairs dense, whitish, mainly rather long. Occiput dull greyish below, glittering pale bluish above, fringed with long, abundant, thickened hairs, which are whitish except towards vertex, where they become pale yellow. Vertex shining blue-black with purplish reflections, clothed with short dark hairs. Frons shining steely blue-black with a rather narrow cross-band of grey dusting following the line of a shallow median transverse depression and continued down against the eyes to the level of the antennae ; lunula shining orange anteriorly ; hairs on frons of medium length, whitish. Face narrow, shallow, almost evenly wide, flattish in profile, hardly hollowed under antennae and with a very slightly protruding shining black central prominence ; pale yellowish, sparsely white-dusted towards sides, with long whitish hairs. Antennae dull dark greyish, third segment rather long and narrow, tapering somewhat after middle, more than twice as long as first and second segments together ; arista short, blackish.

Thorax shining black with bluish reflections, clothed with rather long abundant whitish hairs. Scutellum yellow, moderately shining, with rather long hairs, which are mainly whitish interspersed with scanty blackish ones, but with some much longer black hairs apically ; fringed subapically with rather long fine whitish hairs. Pleurae silvery grey, extensively whitish dusted, the undusted parts moderately shining ; clothed with long whitish hairs.

Abdomen with first tergite light blue-green, shining except at sides, where it is white-dusted ; second tergite slightly shining black with just beyond middle a pair of shining light orange fasciae, which widen towards sides, occupying about one-third length of tergite on disc and about one-half laterally, these fasciae not quite reaching side-margins, the light grey area between the two suggesting that a complete band is sometimes present ; third tergite quite brightly shining all over, more than anterior two-thirds occupied by a straight orange band, which does not quite reach side-margins, remainder black ; fourth tergite similarly shining all over with an anterior orange band which widens towards sides, occupying about one-third length of tergite on disc and about one-half laterally, not quite reaching side-margins ; this band has a pair of narrow, well separated whitish grey fasciae imposed along its posterior margin, these not nearly reaching side-margins, remainder of tergite black ; fifth tergite shining steely blue-black. All tergites clothed with whitish hairs, moderately long on disc of first and second tergites, much longer at sides, succeeding tergites short haired. Sternites shining, pale yellow, black-banded with long whitish hairs.

Legs with coxae and trochanters grey ; four anterior femora black on about basal half, otherwise pale orange, with long white hairs posteriorly, hind pair completely black, with long white hairs anteriorly ; front tibiae pale orange with trace of a dark ring just after middle, mid pair similar but the darkened area is nearer to tip, hind pair more brownish orange, broadly darkened around middle ; tarsi completely darkened, except the hind metatarsi, which are rather lighter.

Wings pellucid, stigma very pale yellowish brown. Squamae whitish grey, fringed with long whitish hairs. Halteres with light orange stem and lemon yellow knob.

Holotype ♀. EAST NEPAL, Arun Valley, Tumlingtar plateau, on blooms of *Guizotia abyssinica* Cassini, c. 2,000 ft., 10-16.xii.1961. Brit. Mus. (Nat. Hist.).

This small species is clearly allied to the Ethiopian *adligatus* Wiedemann. Both belong to a group characterised by :- the abundant, long and thickened occipital hairs ; the flattish yellow face with slightly shining black central prominence ; abundantly hairy eyes in both sexes ; entirely black or dark grey antennae with short arista ; tergites 2-4 with orange or grey bands, entire or divided. Also in this group are *serarius* Wiedemann (Oriental Region) and *claripennis* Loew (Ethiopian Region). The group can be divided into those species that have the orange band on the third tergite about twice as wide, at least on disc, as that on the fourth tergite

(*adligatus*, *albipilus*), and those in which the bands on the third and fourth (and usually the second) tergites are subequal in width (*serarius*, *claripennis*). In the former subgroup there is apparently a tendency for the coloration of these bands to be predominantly orange, and in the latter subgroup predominantly grey.

Although *adligatus* ♀ closely resembles *albipilus* ♀ it may be clearly separated by the following characters :— thorax dull greenish grey anteriorly, with a pair of closely approximated greyish median stripes (most clearly seen from behind) ; the yellowish subcostal cell with a conspicuous dark brown rectangular patch below the tip of subcostal vein ; the greyish white dusting across the frons broad.

Asarcina ericetorum (Fabricius)

Syrphus ericetorum Fabricius, 1781 : 425.

Asarcina ericetorum (Fabricius) Brunetti, 1915 : 210.

EAST NEPAL : Taplejung District, Sangu, c. 6,200 ft., from mixed vegetation by stream in gully, ix-x.1961, 1 ♂ ; and by rocky stream, 7-16.x.1961, 1 ♀.

This species with its numerous named varieties is common and widespread in the Ethiopian, Oriental and Australian Regions.

Asarcina aegrota (Fabricius)

Eristalis aegrota Fabricius, 1805 : 243.

Asarcina aegrota (Fabricius) Brunetti, 1915 : 210.

EAST NEPAL : 7.viii.1962, 1 ♂ (no other data), (G. Ebert, H. Falkner). In Zoologisches Sammlung des Bayerischen Staates.

Common throughout the Oriental Region. Recorded from NORTH AUSTRALIA.

Xanthogramma (Ischiodon) scutellaris (Fabricius)

Scaeva scutellaris Fabricius, 1805 : 252.

Ischiodon scutellaris (Fabricius) Sack, 1913 : 5.

Xanthogramma (Ischiodon) scutellaris (Fabricius) Hull, 1949 : 290.

EAST NEPAL : Taplejung District, Dobhan, from cut rice fields above River Maewa, c. 4,000 ft., 28.i.1962, 1 ♀.

Widespread in India and elsewhere in the Oriental Region.

Subfamily CHRYSOTOXINAE

Chrysotoxum baphyrus Walker

Chrysotoxum baphyrus Walker, 1849 : 542.

EAST NEPAL : Arun Valley, Tumlingtar plateau, c. 2,000 ft., from blooms of *Guizotia abyssinica* Cassini, 10-16.xii.1961, 1 ♂.

Distributed through INDIA. Also recorded from CEYLON and VIETNAM.

Subfamily CHEILOSIINAE

Rhingia binotata Brunetti

Rhingia binotata Brunetti, 1908 : 59 (♂).

Rhingia binotata Brunetti ; Brunetti, 1913 : 166 (♀).

EAST NEPAL : Taplejung District, Sangu, c. 6,200 ft., from blooms of wild cherry, 15-18.xi.1961, 1 ♂ ; also c. 6,000 ft., from edge of small mixed wood, 4.xi.1961, 1 ♂ ; and c. 5,500 ft., from river bank below Tamrang Bridge, x-xi.1961, 1 ♂.

Recorded from NORTH INDIA and CEYLON.

Rhingia laticincta Brunetti

Rhingia laticincta Brunetti, 1908 : 58.

EAST NEPAL : Taplejung District, damp evergreen oak forest above Sangu, c. 8,500 ft., 2-26.xi.1961, 3 ♀ ; and edge of small mixed wood below Sangu, c. 6,000 ft., 4.xi.1961, 1 ♀.

Recorded from NORTH INDIA.

Cheilosia nigroaenea Brunetti

Cheilosia nigroaenea Brunetti, 1915 : 204.

EAST NEPAL : Khumbu, Khumdzung, c. 12,700 ft., 15.vi.1962, 1 ♀ ; and Dudh Kosi Tal, 10,350 ft., 24.vii.1962, 1 ♀ (*G. Ebert, H. Falkner*). In Zoologisches Sammlung des Bayerischen Staates.

Recorded from NORTH INDIA.

Ferdinandea longifacies sp. n.

(Text-fig. 3)

MALE. Length (exclusive of antennae), 12 mm. ; wing-length, 11 mm. Eyes in contact for somewhat more than length of vertex : eye-hairs rather long, pale yellow. Vertex small, narrow, light brown-dusted, with long, forwardly curved black hairs. Frons yellow, wide, rather prominent, densely yellowish white-dusted towards sides, with moderately long black hairs except on the shining orange, well-formed lunula. Face (Text-fig. 3) broad, descending, with deep jowls, only slightly concave immediately below antennae, moderately produced ; eye-margins very wide against middle and lower part of face, pale golden dusted ; face with similar dusting immediately below antennae and as rather broad lateral stripes extending down from eye-margins to upper mouth-edge, otherwise shining yellow ; lower part with rather numerous short black hairs at sides, otherwise bare. Antennae with first two segments short, second distinctly longer than first, both reddish brown ; third segment short, roundish, similarly reddish brown, sometimes narrowly darkened above and at tip ; arista long, blackish.

Thorax dark olive brown to blackish, moderately shining, with four rather broad longitudinal grey or yellowish grey stripes, the inner pair straight, the outer pair forming two crescents, one anterior of, and the other posterior of, the transverse suture ; clothed with short brown and yellowish hairs, mainly anteriorly, and longer evenly disposed black hairs ; scutellum pale yellow, dullish, with rather short black hairs, evenly disposed except along anterior margin where they are replaced by short yellow hairs ; some scattered long black hairs are also present. Pleurae densely grey-dusted, with mainly long golden yellow hairs and some scattered black hairs.

Abdomen with tergites evenly shining brownish black, second and third with blackish cross-bands visible from behind ; the latter are clear of the posterior margins, rather broad, and reach practically to the side-margins ; tergites clothed with rufous hairs, short and sometimes paler on disc, long at and towards sides, on most of fifth tergite and on the dull, greyish black-dusted pregenital segment. Sternites shining glassy grey-black, with long yellow or rufous hairs.

Coxae and trochanters blackish, heavily grey-dusted. Four anterior femora with slightly more than basal half black, otherwise reddish yellow, hind pair with the dark area rather more extensive. Tibiae orange-yellow, apart from a broad sometimes incomplete blackish ring on front pair just after middle ; middle tibiae sometimes have at least a trace of such a ring. Four anterior tarsi reddish yellow apart from the darkened last two segments, hind pair so apart from the darkened terminal segment. Hairs on femora mixed black and yellowish, long behind and below on two anterior pairs, long in front and below on hind pair ; those on two anterior pairs of tibiae and tarsi mixed short yellow and black, those on hind tibiae and tarsi almost entirely short yellow.

Wings with greyish membrane, stigma brownish yellow, surrounding area and base of wing more or less yellowish, discal and basal cross-veins more or less distinctly clouded. Squamae whitish grey with long golden fringes. Halteres with greyish or light brownish stem and dark brown knob.

FEMALE. Eyes rather narrowly separated. Otherwise resembling male.

Holotype ♂. EAST NEPAL, Taplejung District, from damp evergreen oak forest above Sangu, c. 9,200 ft., 2-26.xi.1961.

Paratypes. 1 ♀ with same data as holotype ; 4 ♂ with same data as holotype, except altitude 8,500 ft. N.E. INDIA : Naini Hills, 7-8,000 ft., 23.v.1927, 2 ♂, (*R. C. Jermy*) ; Mishmi Hills, Delai Valley, Talon, c. 4,840 ft., 25.xi.1936, 1 ♀, (*M. Steele*).

All the above material is in Brit. Mus. (Nat. Hist.).

It is worthy of note that all my series of male paratypes were taken resting on a stony forest path during the brief period when the sun had attained the meridian and its rays reached the spot through a gap in the foliage overhead. The male holotype was captured under similar conditions higher up in the forest, where in the shade away from the path the single female taken was flying slowly round the base of a young oak tree which had sappy exudations low down on the trunk. Two of the European representatives of the genus, *cuprea* Scopoli and *ruficornis* Fabricius, pass their larval stage in sap exuding from such wounds in various trees.

The following key will suffice to distinguish the six species of *Ferdinandea* now known from the Orient.

- | | | |
|---|--|--|
| 1 | Tergites almost entirely reddish brown, not metallic ; wings without a trace of clouding ; legs entirely yellowish ; length (exclusive of antennae), 12 mm. ; wing-length 11 mm. | <i>montana</i> Hull (India) |
| - | Tergites metallic, not at all reddish brown | 2 |
| 2 | All femora black except at actual tip (i.e., much less than apical third yellow) | 3 |
| - | All femora with at least apical third yellow or yellowish brown ; no cloud extending down from stigma | 4 |
| 3 | Wing with a strong brown cloud extending down from stigma over discal cross-vein ; length (exclusive of antennae), 12 mm. ; wing-length, 11 mm. | <i>maculipennis</i> Curran ♂ type only, ♀ unknown (Malaya) |

- Wing with no cloud extending down from stigma ; length (exclusive of antennae), 11 mm.; wing-length, 10 mm. . *sumatrensis* de Meijere ♂ type only (not seen), ♀ unknown (Sumatra)
- 4 Second and third tergites black-haired on the purplish black cross-bands ; jowls shallow, not extending much below lowest extremity of eye (i.e., for a distance far less than one-third of depth of eye) ; length 13 mm.
formosana Shiraki ♂ type only, ♀ unknown (Formosa)
- Tergites entirely yellow- or rufous-haired ; jowls deep, extending far below lowest extremity of eye (i.e., for a distance exceeding one-third of depth of eye) 5
- 5 Coxae and trochanters somewhat brownish, four anterior femora brownish at base only, legs otherwise yellow ; face (Text-fig. 8) squat ; tergites gleaming aeneous black, second and third with no trace of posterior dullish black cross-bands ; length (exclusive of antennae), 11 mm.; wing-length, 10 mm.
isabella Hull ♀ type only, ♂ unknown (Kashmir)
- Legs much more extensively darkened ; face noticeably long, produced downward ; tergites shining brownish black, second and third with posterior dullish black cross-bands visible at least from behind ; length, 11-13 mm.; wing-length, 10-12 mm.
longifacies sp. n. (Nepal and N.E. India)

Subfamily VOLUCELLINAE

Volucella varipila sp. n.

(Text-fig. 5)

MALE. Length (exclusive of antennae), 15.5 mm. : wing-length, 14 mm. Eyes in actual contact for less than length of frons ; eye-hairs long, dense, blackish brown. Vertex black, moderately shining, long white hairs behind, a few black hairs in front. Frons black, lightly brown-dusted, moderately shining, with short black hairs, which are mainly backwardly and outwardly inclined ; lunula shining black. Face (Text-fig. 5) broad, only slightly hollowed under antennae, then descending rather flatly well below eyes, central prominence hardly produced ; entirely black, moderately shining, with mainly adpressed short whitish hairs, these longer on upper part. Antennae with first and second segments short, first particularly so, both slightly shining blackish, third quite twice as long as deep, dull blackish grey ; arista fully three times as long as third antennal segment, brownish towards base, otherwise black, with long black plumes above, short, scanty ones below. Occiput inconspicuous, flattish, grey.

Thorax shining black, with long upright hairs, these mainly black, whitish on about posterior sixth ; scutellum clear lemon-yellow, moderately shining, with long whitish hairs and a row of numerous long black bristles along posterior margin. Pleurae shining black with traces of light brown dusting, long black-haired.

Tergites mainly shining black ; first grey-black, inconspicuous ; second shining black on disc, with a pair of large roughly triangular brownish yellow lateral fasciae which spread over the side-margins for entire length of tergite, hairs adpressed, whitish, longer towards sides ; third mainly shining black with a pair of rather large squarish, brownish yellow fasciae, these extending back from the front margin for the length of the tergite or nearly so, each fascia occupying about one-fifth width of tergite, which is long black-haired with some long rufous hairs posteriorly ; fourth shining black with long rufous hairs ; fifth segment moderately shining black, with long mixed rufous and black hairs. Sternites shining black, with long black hairs, a few rufous ones intermixed.

Legs black (in holotype the tibiae are obscurely brownish at base, but this is not usually so). Four anterior femora clothed for entire length with long black hairs ventrally and posteriorly, hind pair similarly clothed ventrally and anteriorly ; all tibiae with a posterior fringe of shortish

black hairs, some longer bristly hairs present at or just beyond middle ; hind pair moderately curved after middle and flattened on inner side for more than apical third ; tarsi with very short mainly black hairs.

Wings with veins more or less strongly tinged brown or black, tip of marginal and submarginal cells and adjoining veins clouded brownish, a similar cloud extending down from the small blackish stigma to lower basal cross-vein ; brown wing markings sometimes more extensive. Squamae grey, with rather long whitish fringes. Halteres brown-stemmed, with a black knob.

FEMALE. Resembling male, except in the following respects :— Eyes rather narrowly separated ; the partially shining black frons lightly grey-dusted behind, more heavily greyish brown-dusted in front, with a pair of moderately-sized light brownish markings close against eyes shortly after middle ; entire frons with longish white hairs, but these distinctly shorter than the vertical hairs ; third tergite with long rufous hairs, black ones only present narrowly at base.

Holotype ♂. EAST NEPAL : Khumbu, Khumdzung, c. 12,700 ft., 11.vii.1962, (G. Ebert, H. Falkner).

Paratypes. 2 ♂, 1 ♀ with same data as holotype, except dates extending from 15.vi–18.vii.1962. Foregoing material in Zoologisches Sammlung des Bayerischen Staates. N.W. INDIA : Kashmir, Killanmarg, 10,500 ft., 26.vii.1931, 1 ♂ (Fletcher coll.). Brit. Mus. (Nat. Hist.).

This new species of *Volucella* bears a strong resemblance to *flavoscutellata*, described by Sack (1928 : 107) from Kumaon in North India. Both species with their densely pilose bodies belong to the *bombylans* group of *Volucella*, as do *ruficauda* and *lividiventris*, both described by Brunetti (1923 : 152) from Sikkim, *taiwana*, described by Shiraki (1930 : 215) from Formosa, and *bombylans* var. *malayana* described by Curran (1928 : 321) from Malaya. Typical *bombylans* has apparently not been recorded from the Oriental Region. The following key will suffice to distinguish the Oriental species of *Volucella* dealt with above.

- | | | | |
|---|--|--|---|
| 1 | Face reddish yellow ; length, 16 mm. | <i>bombylans</i> Linnaeus var. <i>malayana</i> Curran | |
| | | ♂ type only (not seen), ♀ unknown | |
| – | Face black, or at most (<i>flavoscutellata</i>) dark reddish towards sides | | 2 |
| 2 | Third antennal segment orange yellow ; length 17 mm. | | |
| | | <i>taiwana</i> Shiraki ♂ type only (not seen), ♀ unknown | |
| – | Third antennal segment at least partially darkened | | 3 |
| 3 | Hair on disc of thorax grey ; length 15–16 mm. | <i>lividiventris</i> Brunetti (not seen) | |
| – | Hair on disc of thorax otherwise | | 4 |
| 4 | Face (Text-fig. 4) deeply concave under antennae, then jutting forward conspicuously (as in <i>bombylans</i>), black centrally, dark reddish towards sides ; length (exclusive of antennae), 13 mm. ; wing-length, 12 mm. | | |
| | | <i>flavoscutellata</i> Sack ♀ type only, ♂ unknown | |
| – | Face only moderately hollowed under antennae, then descending rather flatly, entirely black | | 5 |
| 5 | Third antennal segment scarcely one-and-a-half times as long as deep, reddish brown, with darker transverse band towards tip ; facial hairs mainly adpressed, blackish, longer on upper part, sometimes admixed with some brownish hairs ; thorax long rufous haired ; length (exclusive of antennae), 13–18 mm. ; wing-length 12–16.5 mm. | <i>ruficauda</i> Brunetti | |
| – | Third antennal segment quite twice as long as deep, entirely blackish grey ; facial hairs mainly adpressed, whitish, longer on upper part ; thorax with hairs long, mainly black, whitish only on about posterior one-sixth ; length (exclusive of antennae), 15–17 mm. ; wing-length 14–16 mm. | | |
| | | <i>varipila</i> sp. n. | |

Subfamily SERICOMYIINAE
Pseudovolucella hingstoni n. sp.
 (Text-fig. 7)

MALE. Length (exclusive of antennae), 15 mm. ; wing-length, 13.5 mm. Eyes in contact for less than one-sixth of distance from their anterior point of approximation to occiput. Frons very short, yellow-tomentose, with narrow central greyish line, long black hairs down middle, short reddish hairs at sides. Face flattish, descending well below eyes, yellow-tomentose except on the broad dull greyish antennal concavity, the shining reddish brown bare central prominence, and along the broad grey shining side-stripes. Eye-margins and sides of face with moderately long yellow hairs. Antennae with first and second segments shining black, third segment dark brown, somewhat reddish apically and below ; arista about twice length of third antennal segment, reddish, fringed with fine, close-set blackish hairs.

Thorax very slightly shining, greyish brown, with rather dense longish foxy red hairs, which become longer at sides and posteriorly. Scutellum rather duller greyish brown, becoming broadly yellowish orange along posterior margin with very long foxy red hairs dorsally and along posterior margin and rather close-set fringe of shortish curled yellow hairs below.

Abdomen blackish dorsally, with a narrow reddish orange slightly arched band on second, third and fourth tergites ; these tergites rather dull, fourth shining for rather more than apical half ; first and extreme base of second pale yellowish. The reddish orange band on second tergite at middle is equidistant from front and hind margins, sloping back to extend broadly over side-margins ; that on third tergite is more anteriorly placed throughout, likewise sloping back to extend broadly over side-margins ; that on fourth tergite is even more anteriorly placed on median line, sloping back without quite reaching side-margins ; tergites clothed on disc with rather short upright hairs, mainly following the ground-colour, and along sides with mainly yellow hairs, these becoming very long towards base of second tergite. Sternites orange, second, third and fourth broadly darkened along median line, all with long yellow hairs. Pregenital segment shining blackish brown, with long orange hairs.

Legs with all coxae and femora black, except latter rather broadly pale at tip, hind pair indistinctly so. Front tibiae darkened except broadly at base, front tarsi darkened. Mid tibiae and tarsi reddish yellow, except last three tarsal joints darkened. Hind tibiae very dark reddish, broadly black at middle, hind tarsi blackish. Hind femora (Text-fig. 7) greatly thickened (as is usual in males of this genus), only slightly convex above, and below with a blunt projection bearing about six long black bristly hairs just beyond middle and a second projection on apical third ; clothed anteriorly with long golden partly depressed hairs for about basal two-thirds, these becoming dorsal on about apical third.

Wings with greyish membrane ; stigma dark brownish, this colour extending downwards over anterior half of middle of wing to form a very distinct cloud. Squamae yellowish white with a fringe of long brownish black hairs. Halteres with pale orange stem and dark brown knob.

FEMALE. Length (exclusive of antennae), 14 mm. ; wing-length, 13 mm. Eyes broadly separated, the space between them widening almost from occiput down to their lowest extremity. Frons dark greyish brown on upper part with a rather broad yellow tomentose band just below middle, this band connected narrowly along eye-margins with the yellow facial tomentum, leaving a broad isolated chocolate-brown area reaching down to the orange and black lunula. Face with central prominence more shining than in ♂, and jowls slightly deeper.

Thoracic and scutellar hairs paler than in ♂.

Tergites with the reddish orange bands slightly deeper than in ♂, and that of fourth tergite extending broadly over side-margins as with two preceding tergites.

Hind femora only moderately and evenly thickened, not curved and without ventral projections ; rather evenly clothed with moderately long pale yellow hairs and with a ventral fringe of exceedingly long similarly coloured hairs extending along almost basal three-quarters, some of these quite twice as long as maximum depth of femora.

Holotype ♂. SIKKIM : Phadam Chen, 9,000 ft., 30.iii.1924 (*R. W. G. Hingston*). Everest Expedition.

Paratype. EAST NEPAL : Taplejung District, damp evergreen forest above Sangu, c. 9,200 ft., 26.xi.1961, 1 ♀.

Above material in Brit. Mus. (Nat. Hist.).

General characters conforming to the generic diagnosis of Shiraki (1930 : 39). Superficially resembling *fasciata* Curran (1931 : 369), the distinguishing characters are detailed in the following key to the seven species of *Pseudovolucella* now described from the Oriental Region.

- | | | |
|---|---|---|
| 1 | Second tergite with one or two reddish brown or reddish orange bands, interrupted or not | 2 |
| - | Second tergite without such bands | 5 |
| 2 | Second tergite with one such band | 3 |
| - | Second tergite with two such bands | 4 |
| 3 | Four anterior legs reddish yellow, apart from last two tarsal joints darkened. Length (exclusive of antennae), 13-14 mm.; wing-length 12-13 mm. ♂ hind femora (Text-fig. 6) very strongly convex above, and with a single projection below on apical third <i>fasciata</i> Curran (Borneo) | |
| - | All coxae and femora black, latter broadly pale at tip ; front tibiae darkened except broadly at base ; front tarsi entirely darkened ; length (exclusive of antennae), 14-15 mm.; wing-length, 13-13.5 mm. ♂ hind femora only slightly convex above and with a projection just beyond middle besides the one on apical third <i>hingstoni</i> sp. n. (Sikkim, Nepal) | |
| 4 | Hind femora strongly thickened ; arista with some forty dorsal bristles ; length, 14 mm. <i>apimima</i> Hull ♂ type only (not seen), ♀ unknown (Java) | |
| - | ♂ hind femora less strongly thickened. ♂ ♀ arista with some twenty-four bristles ; length, 13 mm. <i>mimica</i> Shiraki (not seen) (Formosa) | |
| 5 | Frons with yellowish pile ; tergites brownish orange ; length (exclusive of antennae), 14-15.5 mm.; wing-length, 13-14.5 mm. <i>malayana</i> Curran ♂ only, ♀ unknown (Malaya) | |
| - | Frons with black pile | 6 |
| 6 | Tergites brownish ; length, 14 mm.; wing-length, 12 mm. <i>apiformis</i> de Meijere ♂ type only (not seen), ♀ unknown (Sumatra) | |
| - | First tergite, and slightly more than basal half of second, brownish yellow, remaining tergites black ; length (exclusive of antennae), 14 mm.; wing-length, 13 mm. <i>ochracea</i> Hull ♂ type only, ♀ unknown (Burma) | |

Subfamily CERIOIDINAE

Ceria obscura Brunetti

Ceria obscura Brunetti, 1908 : 94.

EAST NEPAL : Bi Khola, c. 7,500-c. 8,850 ft., 13.v.1962, 1 ♂ (*G. Ebert, H. Falkner*). In Zoologisches Sammlung des Bayerischen Staates.

Described from SIKKIM. Type in Zoological Survey Museum, Calcutta. Series in Brit. Mus. (Nat. Hist.).

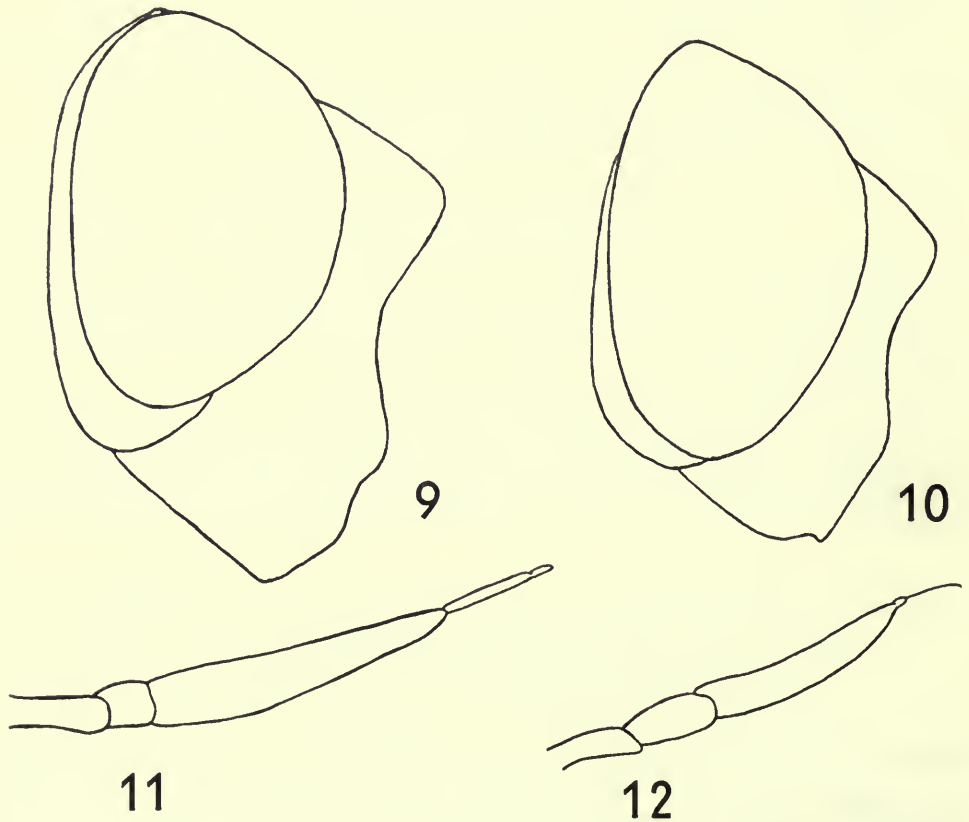
Subfamily ERISTALINAE

Eristalis himalayensis Brunetti

(Text-fig. 9)

Eristalis himalayensis Brunetti, 1908 : 70 (nom. nov. pro. *ursinus* Bigot, 1880 : 215, nec Jaenicke, 1867 : 401).

EAST NEPAL : Taplejung District, from damp evergreen oak forest above Sangu, c. 9,200 ft., 2-26.xi.1961, 2 ♂, 2 ♀; also from edge of mixed forest above Sangu, c. 6,500 ft., 17.x-i.xi.1961, 1 ♀; Sangu, c. 6,200 ft., from blooms of *Guizotia abyssinica* Cassini, 16-29.x.1961, 2 ♀; and from mixed vegetation by stream in gully, xi.1961-i.1962, 1 ♀. Brit. Mus. (Nat. Hist.). East of Katmandu, Dudh Kosi Tal, c. 980 ft., 24.vii.1962, 1 ♂ (*G. Ebert, H. Falkner*). In Zoologisches Sammlung des Bayerischen Staates.



FIGS. 9-12. 9, 10, heads of ♂ *Eristalis* in profile. (9) *himalayensis* Brunetti. (10) *brevifacies* sp. n. 11, 12, antennae of ♀ *Callicera*, interno-lateral view. (11) *robusta* sp. n. (12) *sumatrensis* de Meijere.

Occurs also in NORTHERN INDIA, KASHMIR, SIKKIM and BURMA.

The small group of Oriental representatives of the "plain-eyed" *Eristalis* to which *himalayensis* belongs is characterised by the contrasting paleness of the first abdominal tergite with the blackish succeeding tergites. Bigot's *albibasis* (1880 : 215), of which I have not seen the single ♀ described, is represented in the Brit. Mus. (Nat. Hist.) by a teneral ♂ of *himalayensis* in which the dark brown clouding of the wing is completely absent. Brunetti (1923 : 170) states that the sole example described by Bigot is in the Indian Museum (now the Zoological Survey of India), and bears the data :— "Simla, 7,000 ft., 16.v.1909 (Annandale)". He remarks that it bears a considerable resemblance to *himalayensis*, but is easily separated by the clear wings, greater depth of epistoma below the eyes, and by minor characters. I am inclined to believe that the type will be found to represent a teneral example of *himalayensis*. It cannot be *brevifacies* (described below), as in the latter a clear distinction from *himalayensis* (Text-fig. 9) exists in the lesser depth of epistoma below the eyes.

Eristalis brevifacies sp. n.

(Text-fig. 10)

MALE. Length (exclusive of antennae), 13–16 mm. ; wing-length, 11–13 mm. Eyes in contact for nearly twice length of vertex ; eye-hairs mainly dense and moderately long, dark brown above, pale yellow below, some of the latter very long and scattered towards ventral margin ; a central band of black hairs extends down from the vertex almost to the ventral margin. Vertex small, dull black, with long black hairs. Frons slightly bulbous, dulled by dense yellowish grey dusting except where the shining black ground-colour is exposed on the median line immediately above the shining orange lunule, long black haired. Face (Text-fig. 10) moderately hollowed beneath the antennae, then only slightly projecting, central knob inconspicuous ; descending only shortly below eye-level, lightly grey-dusted, with a short almost linear bare shining median stripe extending over the flattish part down to the lightly dusted, broadly shining central knob, clothed with moderately long pale yellow hairs which become longer at sides towards upper mouth edge and against the narrow whitish eye-margins. Antennae with first and second segments short, shining black, third hardly longer than first and second together, dull brownish black, narrowly red at base, at least on outer surface. Arista about twice the length of third antennal segment, moderately long plumose, light reddish brown.

Thorax black with bluish reflections, slightly shining on disc along approximately anterior quarter, moderately shining along remainder, finely and inconspicuously punctate, broadly greyish along line of suture, hair uniformly light tawny ; scutellum dull yellowish, with light tawny hairs. Pleurae dull grey, with long yellowish hairs.

Abdomen with first tergite entirely yellowish grey with long pale yellow hairs ; second tergite narrowly yellowish grey at base, otherwise moderately shining black with large yellowish side-spots extending from anterior margin to not far short of posterior margin, widest at middle where each occupies about a quarter of width of tergite, hairs following ground-colour, rather long ; third and fourth tergites moderately shining black, entirely covered with rather long black hairs, and both with a brightly shining black band just after middle. Sternites grey-green with long pale yellow hairs. Pregenital segment black, brightly shining, with sparse rather short black hairs.

Coxae and trochanters black, grey-dusted, yellow-haired. Hind femora only slightly thickened, black, narrowly yellow-tipped, two anterior pairs rather broadly yellow-tipped (less so behind) ; anterior pair with mainly black hairs ventrally, and posteriorly with an

abundant covering of black and yellow hairs, the latter mainly confined to base, all hairs becoming longer towards base and those placed postero-dorsally forming a fringe; mid pair similarly clothed, but ventrally there are some very long isolated yellow hairs on more than basal third; hind pair with a similar fringe to the anterior pairs, but it is placed antero-dorsally; ventrally, besides a row of very short black hairs along the apical half, there are some very long isolated mainly yellow hairs, placed principally in two rows, antero-ventral and postero-ventral. Four anterior tibiae yellow on basal half, blackish grey on apical half, front pair with mixed short black and pale yellow hairs, mid pair predominantly short pale-haired; hind tibiae laterally flattened, moderately curved, black except obscurely yellowish towards base, clothed with mainly short, predominantly black hairs. Front tarsi dark grey, mid pair yellow with last joint darkened, hind pair with metatarsus dark grey, reddish towards tip, second, third and fourth joints yellow, fifth darkened.

Wings with clear membrane, apart from a dark brownish clouding spreading down from the blackish stigma over anterior half of middle of wing. Squamae greyish brown, with moderately long pale yellow fringe. Halteres with yellowish stem and greyish knob.

FEMALE. Eyes broadly separated, the space between them widening almost from occiput down to their lowest extremity. Frons dull black with a cross-band of grey dusting about halfway between front ocellus and base of antennae, and a similar but indefinite area just above frontal lunule, hairs long, blackish. Third antennal segment larger than in ♂, quite one and a half times as long as first and second together (inside measurement). Otherwise resembling ♂.

Holotype ♂. EAST NEPAL: Taplejung District, between Sangu and Tamrang, from mixed shrubs in deep gorge, c. 5,200 ft., x-xi.1961. Brit. Mus. (Nat. Hist.).

Paratypes. N.E. INDIA: Assam, Nyukmadong, 6,600 ft., 1-6.viii.1961, 2 ♀ (*F. Schmid*). In Basel Museum Collection. Naini Hills, 7-8,000 ft., 11-14.v.1927, 3 ♂, 1 ♀ (collector unknown). N.W. INDIA, Kashmir, Gulmarg, 8,500 ft., summer 1913, 1 ♀ (*F. W. Thomson*). Brit. Mus. (Nat. Hist.).

Superficially resembling *himalayensis* (see above), but in both sexes clearly distinguished by the less descending face with much narrower, almost linear, bare shining black median stripe, four anterior femora fringed behind with mainly black, instead of entirely yellow, hairs, hind femora without the dense antero-ventral fringe of longish dark brown and black hairs which is present in *himalayensis*. The thorax is evenly and finely punctate, whereas in *himalayensis* it has numerous small dark punctations on disc, these finer on anterior half, noticeably coarse on a median shining grey area beyond middle. In ♂ the eyes touch for nearly twice the length of vertex in *brevifacies*, and in *himalayensis* for about length of vertex. Finally, *himalayensis* has a larger size range than *brevifacies*, varying from 15-18 mm. in length and from 13-15 mm. in wing-length.

Eristalis simplicipes Curran

Eristalis simplicipes Curran, 1928: 300.

EAST NEPAL: Taplejung District, Sangu, c. 6,200 ft., from blooms of *Guizotia abyssinica* Cassini, 16-29.x.1961, 1 ♀.

Curran described this handsome species from 5 ♂ and 1 ♀ taken by H. M. Pendlebury in Malaya. This series is in Brit. Mus. (Nat. Hist.). The single ♀ described by Curran and labelled "allotype" differs from his series of males in having no yellow or reddish yellow markings on the third, fourth and fifth tergites.

My ♀ example, however, agrees with the ♂ in this respect. It differs, on the other hand, from all of Curran's material in having the large yellow or reddish yellow paired markings on the second tergite almost wholly pale yellow-haired, only a restricted area at the sides being black-haired. In Curran's examples that tergite is wholly black-haired.

Eristalis cerealis Fabricius

Eristalis cerealis Fabricius, 1805 : 232.

EAST NEPAL : Taplejung District, above Sangu, c. 6,500 ft., 17.x-1.xi.1961, 3 ♂, 2 ♀ ; also Sangu, c. 6,200 ft., from blooms of *Guizotia abyssinica* Cassini, 16-29.x.1961, series ♂ ; from rotting fruits of Bhor tree on ground, 7-31.x.1961, 1 ♀ ; by rocky stream, 7-16.x.1961, 1 ♀ ; and from mixed vegetation by stream in gully, ix.1961-i.1962, series ♂ ♀. E. NEPAL : Arun Valley, Tumlingtar, plateau, c. 2,000 ft., from blooms of *Guizotia abyssinica* Cassini, 10-16.xii.1961, 1 ♂.

Examples in Brit. Mus. (Nat. Hist.) from CHINA, JAPAN, KASHMIR and INDIA.

Eristalis paria (Bigot)

Eristalomyia paria Bigot, 1880 : 218.

EAST NEPAL : Taplejung District, edge of mixed forest above Sangu, c. 6,500 ft., 17.x-1.xi.1961, 1 ♂ ; Sangu, 6,200 ft., from blooms of *Guizotia abyssinica* Cassini, 16-29.x.1961, 1 ♂ ; from mixed vegetation by stream in gully, ix-x.1961, 1 ♀ ; and by rocky stream, 7-16.x.1961, 1 ♀. In Brit. Mus. (Nat. Hist.).

EAST NEPAL : Katmandu, c. 4,580 ft., 16.iv.1962, 2 ♀ ; E. of Katmandu, Dudh Kosi Tal, c. 9,170 ft., 9.vi.1962, 1 ♀ ; Thodung, 10,120 ft., 1.vi.1962, 1 ♀ (*G. Ebert, H. Falkner*), in Zoologisches Sammlung des Bayerischen Staates.

Widespread in INDIA. Also recorded from JAVA and LAOS.

Eristalis ocularia Coquillett

Eristalis ocularius Coquillett, 1898 : 325.

Eristalis laetus Brunetti, 1923 : 165, nec Wiedemann, 1830 : 192.

EAST NEPAL : Taplejung District, Sangu, c. 6,200 ft., from blooms of *Guizotia abyssinica* Cassini, 16-29.x.1961, 2 ♀.

Described from JAPAN, this species is represented in the Brit. Mus. (Nat. Hist.) by an example from that country and by others from NORTH EAST INDIA and CHINA.

Eristalis arvorum (Fabricius)

Syrphus arvorum Fabricius, 1787 : 335.

Eristalis arvorum (Fabricius) de Meijere, 1908 : 247.

EAST NEPAL : Taplejung District, Sangu, c. 6,200 ft., from blooms of *Guizotia abyssinica* Cassini, 16-29.x.1961, 1 ♀ ; and Arun Valley, below Tumlingtar, River Sabhaya, west shore, c. 1,800 ft., resting on tent, 30.xii.1961, 1 ♀. In Brit. Mus. (Nat. Hist.).

EAST NEPAL : S. of Katmandu, Hitora, Rapti Tal, c. 980 ft., 23-27.iii.1962, 5 ♀ (*G. Ebert, H. Falkner*). In the Zoologisches Sammlung des Bayerischen Staates.

Widespread in Oriental Region, also recorded from CHINA, JAPAN and QUEENSLAND.

Eristalis obscuritarsis de Meijere

Eristalis obscuritarsis de Meijere, 1908 : 250.

EAST NEPAL : Taplejung District, Sangu, 6,200 ft., from blooms of *Guizotia abyssinica* Cassini, 16-29.x.1961, 2 ♂, 1 ♀.

Widespread in INDIA, also recorded from JAVA, SUMATRA and the PHILIPPINES.

Eristalis quadristriatus Macquart

Eristalis quadristriata Macquart, 1846 : 127.

EAST NEPAL : Taplejung District, Sangu, 6,200 ft., from blooms of *Guizotia abyssinica* Cassini, 16-29.x.1961, 5 ♂, 1 ♀.

Recorded from FORMOSA and the PHILIPPINES.

Represented in the Brit. Mus. (Nat. Hist.) collection by a single ♀ labelled "ex Bigot Coll. Pres. by G. H. Verrall. B.M. 1894-234". I am satisfied that my above series from Nepal is the same species. There is a dark spot at *both* extremities of the stigma in all the material, an unusual feature in the genus.

Eristalis tenax (Linnaeus)

Musca tenax Linnaeus, 1758 : 591.

Eristalis tenax (Linnaeus) Verrall, 1901 : 505.

EAST NEPAL : Taplejung District, from edge of mixed forest above Sangu, c. 6,200 ft., 17.x-1.xi.1961, 1 ♀; also on old stone wall above Sangu, c. 7,000 ft., 7.i.1962, 1 ♂, 1 ♀; Sangu, c. 6,200 ft., from blooms of *Guizotia abyssinica* Cassini, 16-29.x.1961, 1 ♀; and Arun Valley, Tumlingtar, plateau, c. 2,000 ft., from blooms as above, 10-16.xii.1961, 5 ♂, 1 ♀. In Brit. Mus. (Nat. Hist.).

EAST NEPAL : E. of Katmandu, Dudh Kosi Tal, Hitora, c. 3,500 ft., 24.vii.1962, 1 ♀. (*G. Ebert, H. Falkner*.) In the Zoologisches Sammlung des Bayerischen Staates.

E. tenax is common in most parts of the world.

Eristalis multifarius Walker

Eristalis multifarius Walker, 1852 : 248.

Eristalis circularis Curran, 1930 : 333. **Syn. n.**

Merodonoides minutus Hull, 1944 : 43. **Syn. n.**

EAST NEPAL : Taplejung District, Dobhan, from cut rice steppes above River Maewa, c. 4,000 ft., 28.i.1962, 1 ♀.

Recorded from INDIA, CEYLON and MALAYA.

Curran (1930 : 333) created the genus *Merodonoides* with *circularis* Curran (*idem*) as type-species, separating it from *Eristaloides* Rondani (1844 : 453) on the basis

of its bare eyes and considerably enlarged hind femora. Hull (1949 : 397) sank *Merodonoides*, *Eristaloides*, and a number of other so-called genera under *Eristalis*, considering their characters to be of only minor group value. I agree entirely with Hull's move in this matter.

I have examined the male holotype of *circularis* Curran, 1930, and find that it is identical with *multifarius* Walker and therefore becomes a synonym of the latter species. Hull (1949 : 397) gave *circularis* Curran as a synonym of *Helophilus singularis* Walker (1856 : 17), originally described as an *Eristalis*. Hull is incorrect here, as *singularis* is a true Helophilini with its widely open marginal cell. Hull's *Merodonoides minutus* (1944 : 43) (**syn. n.**) of which the male holotype is in the Brit. Mus. (Nat. Hist.) is only a pale variety of *multifarius*.

Megaspis zonata (Fabricius)

Syrphus zonatus Fabricius, 1787 : 337.

Megaspis zonatus (zonalis) (Fabricius) de Meijere, 1908 : 240.

EAST NEPAL : Taplejung District, Sangu, c. 6,200 ft., from blooms of *Guizotia abyssinica* Cassini, 16-29.x.1961, 4 ♂, 1 ♀ ; also from edge of mixed forest above Sangu, c. 6,500 ft., 17.x-i.xi.1961, 1 ♀ ; and Dobhan, east bank of River Tamur, c. 3,500 ft., from mixed vegetation by stream in deep gully, i-ii.1962, 2 ♂, 1 ♀.

Common throughout the Oriental Region, also recorded from CHINA and JAPAN.

Megaspis errans (Fabricius)

Syrphus errans Fabricius, 1787 : 337.

Megaspis errans (Fabricius) de Meijere, 1908 : 240.

EAST NEPAL : Taplejung District, Sangu, c. 6,200 ft., from blooms of *Guizotia abyssinica* Cassini, 16-29.x.1961, 1 ♂, 1 ♀ ; and Arun Valley, Tumlingtar, plateau c. 2,000 ft., from blooms as above, 8-25.xii.1961, 4 ♂, 4 ♀.

Common throughout the Oriental Region, also recorded from CHINA and JAPAN.

Subfamily XYLOTINAE

Xylota dimidiata Brunetti

Xylota dimidiata Brunetti, 1923 : 232.

EAST NEPAL : E. of Katmandu, Dudh Kosi Tal, c. 9,170 ft., 9.i.1962, 2 ♀ (*G. Ebert, H. Falkner*). In Zoologisches Sammlung des Bayerischen Staates.

This striking species with its brown cloud over the apical part of the wings and reddish legs was described from NORTH INDIA from a single ♀. The latter is in the Brit. Mus. (Nat. Hist.), together with a series of 5 ♂ and 3 ♀ collected in the Naini Hills, NORTH INDIA (*R. C. Jermyn*). Brunetti's type ♀ has the face almost entirely orange-yellow, but two of Jermyn's females have it entirely black, while his remaining one has the upper part black and the lower part orange-yellow. In the apparently undescribed male, the ground colour of the face from the front view is completely hidden by dense whitish dusting, but by tilting the specimen

backwards and viewing the face from beneath the latter is seen to be yellow on more than the lower two-thirds. The male differs principally from the female in the following respects :—Eyes touching briefly for a distance about equal to length of the vertical triangle ; frons, including frontal prominence but excluding the orange-yellow lunule, heavily white-dusted ; abdomen narrower, hour-glass shaped, i.e., second tergite narrowing to tip, third tergite narrowing to base.

Xylota makiana (Shiraki)

Zelima makiana Shiraki, 1930 : 65 (*Xylota*).

INDIA : Assam, Nyukmadong, 6,600–8,000 ft., 1–6.viii.1961, ♂ (*F. Schmid*). In Naturhistorisches Museum, Basel, Switzerland.

Described from 1 ♂ and 2 ♀ taken in FORMOSA, this species is characterized in the male by the extraordinarily long and handsome anterior and posterior fringes of pale yellow hairs on the mid tibiae. The present record is of considerable geographical interest.

Criorhina bomboides Hull

Criorhina bomboides Hull, 1944 : 37.

SIKKIM : Kecholperi, 5,900 ft., 9.iv.1959, 1 ♂ (*F. Schmid*). In Naturhistorisches Museum, Basel, Switzerland.

Described from a single male taken at Shillong in ASSAM. Schmid's specimen appears to be the second record of this species.

Criorhina crioarctos Hull

Criorhina crioarctos Hull, 1944 : 36.

Described from a single female taken in Burma in 1896 by Lt.-Col. Bingham. I describe below the hitherto unknown male.

MALE. Length (exclusive of antennae), 14 mm. ; wing-length, 13 mm. Eyes bare, narrowly dichoptic. Vertex dull brownish black, with rather sparse long black hairs behind and shorter greyish ones in front, all proclinate. Frons furrowed shortly after front ocellus, followed by a curious raised lunule, these parts brownish, remainder of frons and the short frontal prominence shining black, with the exception of the brownish lunula ; whole frons bare. Face moderately broad, slightly more descending than in female ; similarly almost straight in profile, but the mahogany-red colour restricted to sides, otherwise covered densely with yellowish grey dusting, apart from a narrow median streak of exposed blackish ground colour for almost entire length ; some longish grey hairs present close to eye-margins and on jowls, face otherwise bare. Antennae short, reddish brown, first segment slightly longer than second, third segment short, about twice as deep as long, angular above, rounded below ; arista fairly long, reddish brown.

Thorax with bronzy green slightly shining ground colour, a narrow median dull black stripe between a pair of similarly coloured much broader ones distinctly seen ; wholly covered with abundant rather long brownish black hair, which becomes longer towards sides and posteriorly. Scutellum bronzy green, slightly shining, with very long abundant brownish black hair. Pleurae with similar hair.

Abdomen with second tergite slightly shining bronzy green, a dense brush of long rufous hairs present laterally, otherwise with long brownish black hairs ; third tergite similarly coloured, with long brownish black hairs only ; fourth tergite shining blackish, with a pair of large dull pale yellow spots towards sides, a narrow brush of long rufous hairs present laterally, tergite otherwise with long brownish black hairs ; fifth segment moderately shining black with long grey-black hairs. Sternites shining brownish.

Legs brownish orange, except front tarsi with metatarsus darkened above and at tip and other four joints completely darkened, four remaining tarsi with last two joints darkened. Four anterior femora with long brownish black hair, becoming longer towards base, hind pair similarly clothed for rather more than basal half, then golden haired ; tibiae and tarsi mainly with short golden hairs. Hind femora somewhat thickened.

Wings with membrane strongly yellow-tinged, a brownish cloud present towards tip over about anterior half and a small isolated darker spot below it ; veins yellowish on more than basal two-thirds of wing, otherwise blackish. Squamae smoky grey with long brownish black fringes. Halteres with light yellowish brown stem and brownish black knob.

INDIA : Assam, Bondi La, 8,800 ft., 29.iv.1961, 1 ♂ (*F. Schmid*). In Naturhistorisches Museum, Basel, Switzerland.

Criorhina tripilosa sp. n.

FEMALE. Length (exclusive of antennae, but to tip of epistoma), 17 mm. ; wing-length, 15 mm. Eyes well separated, the space between them widening from level of front ocellus down to their lowest extremity, bare. Vertex shining black, with close-set blackish hairs anteriorly, and some scattered longer ones behind. Frons shining black, with a pair of small narrow pale yellowish brown dust-spots against eyes, frontal prominence and lunula clear orange-yellow, bare, the remainder of frons with close-set short brownish black hairs. Face moderately broad, considerably hollowed under antennae, then steadily jutting forward to upper mouth-edge ; descending obliquely well below lowest level of eyes, shining black, narrowly banded with greyish brown dusting immediately below base of antennae and with irregular greyish brown dusting against eye-margins down to jowlar margins ; central prominence small, oblong, clearly protruding. Antennae yellowish, first and second segments moderately long, first somewhat longer than second, third about one and a half times as deep as long, darkened above and at tip, arista missing. Occiput rather flattish, the grey ground colour totally obscured against eyes by heavy grey-brown dusting. Thorax shining black and practically undusted behind suture, anterior of this mainly obscured by yellowish grey dusting which on disc vaguely forms two pairs of stripes ; closely covered with short black hairs. Pleurae heavily dusted yellowish grey, with abundant long shaggy black hairs. Scutellum with ground colour obscured by yellowish grey dusting, slightly shining, densely covered with very long shaggy yellow hair.

Abdomen with second tergite with minute blackish hair-punctures, ground colour obscured by heavy pale greenish grey dusting, covered by long shaggy yellow hair except along the hind-margin where the dusting becomes darker and the covering hairs rufous ; third tergite with the shining greenish black ground colour exposed anteriorly towards sides and along a short narrow median stripe, otherwise dully shagreened on about anterior half and heavily covered with greenish grey dusting posteriorly ; some vague reddish markings can be traced towards sides and rather short rufous hairs cover the whole tergite ; fourth tergite similarly with the shining greenish black ground colour exposed anteriorly towards sides and along a more extended and broader median stripe, otherwise in the single female examined shagreened on the left of the tergite and heavily yellowish grey dusted with minute black hair-punctures on the right portion, the entire tergite covered with rather long rufous hairs ; fifth tergite similar to the fourth.

Legs with coxae dull grey-black, trochanters shining reddish ; four anterior femora shining black on more than basal half, then more or less obscurely streaked dark reddish and clear yellowish orange at tips, with mainly short blackish hairs beneath and longer more abundant similar hairs behind ; hind femora much thickened and slightly curved, similarly coloured to

the preceding pairs and abundantly and completely covered with mainly long blackish hairs which are obviously more closely set towards the apex. Four anterior tibiae reddish orange with dark streaks after middle, mainly short brown- and black-haired; hind tibiae thickened about middle, constricted and flattened on inner side on about apical third, reddish orange, darker along thickened part, where the mainly short brownish hairs are supplemented by longer black ones. Tarsi with first three joints orange, remaining two greyish black, all with very short mainly light brownish hair.

Wings with the greyish membrane extensively tinged brownish, particularly obviously so towards the fore-margin; from the dark brown stigma a similarly coloured cloud spreads downward to almost reach discal cross-vein, and the subapical cell and upper basal cell each have a considerable whitish area. Squamae brownish grey, with a dense fringe of rather long golden hairs. Halteres brownish stalked with darker brown knob.

Holotype ♀. INDIA: Kumaon, Barasu, 5,000–6,000 ft., 5.v.1958 (*F. Schmid*). In Naturhistorisches Museum, Basel, Switzerland.

This handsome species appears to be related to *pallipilosa* Hull (1944: 34), described originally from a series of four males. Later Hull (1950: 610) described the female of *pallipilosa* from a single specimen. All the material described is in the Brit. Mus. Nat. Hist.) and bears the following data, "Kashmir: Gulmarg, 8,500 ft., summer 1913 (Lt.-Col. F. W. Thomson)". A striking sexual dimorphism in *pallipilosa* is that in the male the entire frons and the face apart from the sides is densely covered with pale brownish yellow extremely minute pubescence, whereas in the female the frons is partially shining black and the face is shining blackish brown or brown apart from a narrow band of greyish or pale yellowish dusting immediately under the base of the antennae. Described from the female only is the subspecies *bicolorata* Hull (1950: 610) of *pallipilosa* (which differs from the typical examples in the colour of the abdominal pile) and a third related species, *rubropilosa* Hull (1950: 608). These females all have the face shining black, blackish brown or brown, without dusting apart from the narrow band of greyish or pale yellowish dusting immediately under the base of the antennae.

The striking and clearly differentiated sequence of black, yellow and orange in the coloration of the body-pile of *tripilosa* contrasts most obviously with the predominantly grey body-pile of *pallipilosa* and its subspecies *bicolorata* and of *rubropilosa*, apart from the considerably more thickened hind femora of *tripilosa* with their very dense long black hairs.

(Note:—While it was hoped to include a specific key to the numerous species of Oriental *Criorhina* in the present paper, this has proved impracticable because less than half the described species are in the Brit. Mus. (Nat. Hist.), and of the others some cannot be made available for study, and many descriptions omit to mention characters that would be of vital importance in a key.)

Lycastris austeni Brunetti

Lycastris austeni Brunetti, 1923: 279.

Brunetti described this handsome species from a male and female taken in NORTH EAST INDIA, Darjeeling, 6,000 ft., 26.iii.1894, ♂; 7,000 ft., v.1894, ♀ (*C. T. Bingham*). Both examples are in the Brit. Mus. (Nat. Hist.).

The long shaggy body pubescence resembles that of *Volucella bombylans* Linnaeus, the yellowish hairs on the basal tergites being succeeded in turn by black and then reddish hairs. This species and *griseipennis* sp. n., described below, are much larger than the three other species known in the genus. The length (exclusive of snout and antennae) of *austeni* is 17 mm., and the wing-length 16 mm.

***Lycastris griseipennis* sp. n.**

MALE. Length (exclusive of snout and antennae), 16 mm.; wing-length, 15 mm. Superficially resembling *austeni*, but most obviously distinguished by the almost uniformly greyish wings with only slight clouding on cross-veins.

Eyes in contact for not more than the distance between their posterior point of approximation and the anterior ocellus. Snout projecting for about three times the length of frons, but this may be variable as in some other species of the genus. Both snout and frons are dark brown to blackish, shining, base and sides of the frons with some pale yellow dusting, and a continuous line of similar dusting extending narrowly along the extreme lateral margin of the frons and continuing broadly along the sides of the snout for practically its entire length. Antennae and arista brownish.

Thorax blackish brown, only slightly shining, with rather long dark reddish brown hairs, these more blackish towards the sides and on the reddish brown humeri. Scutellum with dark greenish ground colour, clothed with long shaggy yellowish hairs.

Abdominal tergites with similar ground-colour, second tergite with long shaggy sub-depressed yellowish hairs obscuring ground-colour and extending over basal part of third tergite. The hairs on apical part of latter and on fourth tergite and pre-genital segment are foxy red (in ♂ paratype these become dark grey on pre-genital segment).

Legs with coxae and trochanters black or dark brown; front and mid femora brownish red for about basal half, then pale yellow, fringed mainly with long brownish hairs, these being replaced by pale yellow hairs shortly after middle; hind femora moderately thickened, brownish red, broadly yellow-tipped, the long brownish fringe extending almost to tip, then replaced by pale yellow hairs; front tibiae pale yellowish, vaguely darkened at extreme tip, mid pair entirely pale yellowish, both pairs fringed for entire length with long pale yellow hairs; hind pair pale yellowish for almost basal half, then brownish red, the long pale yellow fringe of hairs on basal half admixed with brownish hairs on apical portion; front and hind tarsi entirely brownish black, with very short brown and black hairs; mid metatarsi pale yellow with extreme tip darkened, fringed mainly postero-ventrally with long pale yellowish hairs for about basal three-quarters, then with shorter dark brown hairs, which continue along remaining four tarsal segments, which are blackish.

Wings evenly greyish, with clouding on cross-veins. Squamae greyish with fringe of rather long yellow hairs. Halteres pale-stalked with brown or black knob.

Holotype ♂. NORTH EAST INDIA : Assam, Mishmi Hills, Delai Valley, Cha Che, 5,320 ft., 17.xi.1936 (*M. Steele*).

Paratype. 1 ♂ with same data as holotype.

The above material is in Brit. Mus. (Nat. Hist.).

The distinctive characters of this species are detailed in the key on p. 284.

***Lycastris albipes* Walker**

Lycastris albipes Walker, 1857 : 155.

Walker described *albipes* from a teneral female in the W. W. Saunders collection, its sole data being "India". Brunetti (1908 : 85) described as new *Lycastris*

flavohirta from two males taken by him at Darjeeling on 10-15.ix.1905 (Type) and on 25.ix.1906 (Paratype). Later (1923 : 279) he sank *flavohirta* as a synonym of *albipes*. His action in thus combining two such well defined species can be understood because he had at that time only Walker's teneral female type of *albipes* to compare with *flavohirta*.

Identical with *albipes* is *Lycastris (Xyphoheromyia) glossata* Bigot (1892 : 161), which is represented in the Brit. Mus. (Nat. Hist.) by the two male co-types from Sabatoo, INDIA. I describe below for the first time the true male of *albipes*, and necessarily redescribe the female, which Walker, as already stated, described from a teneral female.

MALE. Length (exclusive of snout and antennae), 11.5-14.5 mm. ; wing-length, 11-14 mm. Eyes in contact for not more than the distance between their posterior point of approximation and the anterior ocellus. Snout projecting for about three to three and a half times the length of frons. Both are dark brown to blackish, shining, base and sides of the frons with pale yellow dusting, which has a tendency to spread across middle towards base and continues broadly along the sides of the snout for more than its basal half. Vertex with long yellow hairs, these becoming longer behind. Antennae and arista pale brownish.

Mesonotum with shining greenish black ground colour, obscured by yellowish grey dusting and with a pair of closely applied dull greenish grey median longitudinal stripes clearly visible at least anteriorly ; clothed with rather abundant yellowish hairs, these moderately long on disc, longer towards sides and posteriorly. Scutellum clear yellowish with rather abundant long yellowish hairs.

Abdomen broadest at apex of second segment, then considerably narrowing to tip. Tergites shining greenish black, except first tergite pale basally and on disc, second and third more or less pale at extreme base ; hairs moderately abundant, rather long pale yellowish, longer at sides and forming an adpressed fringe along posterior margins of second, third and fourth tergites. Pre-genital segment shining brownish black with rather sparse and long brownish black hairs.

Legs with coxae and trochanters greenish black, more or less distinctly grey dusted ; front femora moderately thickened, ventrally with a rather triangular short blackish projection shortly before middle ; hind femora considerably swollen, obviously convex above ; front and mid pairs black for more than basal half, then yellow, hind pair almost all black, narrowly yellow only at extreme tip ; all femora with rather long, mainly yellowish white hairs. Front and mid tibiae pale lemon-yellow with fringe of whitish yellow hairs, these much longer on mid pair ; hind tibiae black for at least basal three-quarters, remainder reddish yellow, the whitish yellow hairs of varying lengths and variously directed. Front metatarsi clear yellow, more or less extensively brownish towards tip, remaining four segments brownish black ; mid tarsi mainly clear yellow, only two apical segments darkened ; hind tarsi entirely brownish black ; hairs on all tarsi mainly short, whitish yellow, only mid pair with rather longer similar hairs ventrally and posteriorly.

Wings greyish, with clouding on cross-veins and at tip. Squamae whitish grey, with fringe of long yellow hairs. Halteres pale-stalked with light brownish knob.

FEMALE. Length (exclusive of snout and antennae), 12-14 mm. ; wing-length, 11-13.5 mm. Resembling ♂ in general appearance, differing as follows. Eyes widely separated, becoming increasingly divergent from level of front ocellus to base of projecting portion of frons. The vertex and upper (flat) part of frons are greenish black, moderately shining centrally, heavily and broadly yellow-dusted below front ocellus and along sides of frons, also along a very narrow central strip which extends to base of projecting portion of frons, clothed with long yellow hairs, these becoming longer behind.

Abdomen very rotund, broadest at apex of second segment.

Legs with front femora simple, lacking the ventral projection that is present in ♂, hind femora not convex above.

INDIA : Simla, 7,000 ft., x.1945, 2 ♂, 2 ♀ (*T. Jermyn*) ; Sabatoo (ex Bigot coll.), 2 ♂ (co-types of *glossata*) ; ex W. W. Saunders coll., 1 ♀ (Type of *albipes*). In Brit. Mus. (Nat. Hist.).

Lycastris flavohirta Brunetti

Lycastris flavohirta Brunetti, 1908 : 85.

Brunetti described *flavohirta* from two males, and subsequently sank the species under *albipes* (see latter for details). My recent capture in East Nepal of a single female of *Lycastris* led me to study the genus, with the result that I find *flavohirta* to be an undoubtedly distinct species, of which my Nepalese specimen is the hitherto undescribed female. A redescription of the male and description of the female follows.

MALE. Length (exclusive of snout and antennae), 11–12 mm. ; wing-length, 10–11 mm. Eyes in approximation for not more than distance between hind ocelli and front ocellus. Snout projecting for about three to three and a half times the length of frons ; both are dark brown to blackish, shining, base and sides of the frons with pale yellow dusting, which tends to spread across middle towards base, and continues broadly along the sides of the snout for more than its basal half. Vertex with long brown hairs, becoming longer behind. Antennae with first and second segments blackish brown, third segment and arista reddish brown.

Mesonotum with shining greenish black ground colour, obscured by greyish white dusting, with a pair of closely applied dull greenish grey median longitudinal stripes, clearly visible at least anteriorly ; clothed with rather abundant greyish hairs, moderately long on disc, longer towards sides and posteriorly, sometimes admixed with darker hairs. Scutellum dark yellow to greenish, with long rather abundant greyish hairs, sometimes admixed with darker hairs.

Abdomen broadest at apex of second segment, then narrowing moderately to tip. First tergite grey at sides, shining black on disc ; second reddish orange apically, greenish black basally, this darkening sometimes spreading across tergite so that only a more or less narrow reddish orange strip remains along the posterior margin ; third and fourth tergites and pre-genital segment reddish orange or orange, the only darkening being a more or less distinct narrow black median longitudinal stripe on third tergite anteriorly ; hairs on tergites moderately abundant, rather long, pale yellowish, sometimes admixed with grey, longer at sides and forming an adpressed fringe along posterior margins of second, third and fourth tergites.

Legs with coxae and trochanters black or dark reddish brown, grey-dusted. All femora simple, only hind pair moderately thickened ; front pair mainly clear yellow, only slightly more than basal third black ; mid pair clear yellow on apical half, basal half black ; hind pair clear yellow on about apical third only, basal two-thirds black. Front and mid tibiae entirely clear yellow, hind pair darkened on apical third or less. All femora and tibiae fringed with long pale yellow hairs, these longer on mid and hind pairs. Front tarsi entirely brownish or blackish, mid pair clear yellow with last two segments darkened, hairs on all tarsi very short.

Wings greyish, with clouding on cross-veins and at tip. Squamae whitish grey, with fringe of long yellow hairs. Halteres entirely light brownish yellow.

FEMALE. Length (exclusive of snout and antennae), 12 mm. ; wing-length, 11.5 mm. Resembling male in general appearance, differing as follows. Eyes widely separated, becoming increasingly divergent from level of front ocellus to base of projecting portion of frons. Vertex rather heavily yellow-dusted from occiput to a point slightly below front ocellus. Frons rather narrowly pale yellow-dusted at sides and along a very narrow central strip which extends

to base of projecting portion of frons, clothed with long yellow hairs, these becoming longer behind, and admixed with black hairs above vertical triangle.

Abdomen rotund, but less so than in *albipes* ♀. Coloration of first tergite as in male, but second and third entirely greenish black, fourth and fifth clear orange-yellow, broadly greenish black laterally.

NORTH INDIA : Darjeeling, 7,000 ft., 11-15.ix.1905, 1 ♂ (Type) (*E. Brunetti*) ; Simla, 7,000 ft., x.1945, 3 ♂ (*T. Jermyn*) ; near Sureil, 18.x.1917, 2 ♂ (*N.A.* and *F.G.*). EAST NEPAL : Taplejung District, from damp evergreen oak forest above Sangu, c. 9,200 ft., resting on fern leaf in sun, 2-26.xi.1963, 1 ♀. In Brit. Mus. (Nat. Hist.).

Lycastris cornutus Enderlein

Lycastris cornutus Enderlein, 1911 : 136 (♀).

Lycastris cornutus Enderlein (Sack), 1913 : 7 (♂).

Enderlein described *cornutus* from a single female taken at Kosempo in SOUTH FORMOSA on 23.i.1908 (*H. Sauter*), and now in the Stettin Zoological Museum. In 1913 Sack described the male from a series of both sexes taken at Hoozan and Taihorinsho in FORMOSA by the same collector on an unspecified date. Brunetti (1923 : 279) queried the validity of *cornutus* as a result of examining a female in the Brit. Mus. (Nat. Hist.). This specimen bears the data :—"Formosa, Chip Chip, 09.ii, Sauter, presented by Dr. K. Kertesz, Budapest Museum". I have examined the specimen concerned and also a male from the same source, and find that they agree respectively with Enderlein's description of the female and Sack's subsequent description of the male of *cornutus*. The latter is certainly a good species, closely related to *flavohirta* Brunetti, from which my key characters clearly distinguish it.

So far as is known the genus *Lycastris* occurs only in the Oriental Region. The five species that I recognize in the present paper are keyed below.

- | | | |
|---|--|----------------------------|
| 1 | At least second tergite with ground colour hidden by long shaggy sub-depressed yellowish hairs | 2 |
| - | Ground colour clearly visible on all tergites, the mainly or entirely pale hairs shorter, scantier and at most sub-depressed on posterior margins | 3 |
| 2 | Wings intensely infuscated along at least anterior half, fading off towards tip and posteriorly | <i>austeni</i> Brunetti |
| - | Wings evenly greyish, with slight clouding on cross-veins | <i>griseipennis</i> sp. n. |
| 3 | Tergites 2-4 shining black, any pale markings restricted to extreme base and tip of tergites, and occasionally a small yellowish somewhat triangular area at basal corners of third tergite. Male front femora thickened, ventrally with a short blackish projection shortly before middle ; hind femora considerably swollen, convex above, pale at extreme tip, otherwise black. Female hind femora similarly coloured | <i>albipes</i> Walker |
| - | Tergites 2-4 otherwise coloured, brownish or greenish or a mixture of both. Male front femora simple ; hind femora scarcely swollen, not convex above, yellow for at least apical quarter. Female hind femora similarly coloured | 4 |
| 4 | Face strongly hollowed, concave, for short distance immediately under antennae ; legs with all femora fringed with long black hairs for basal half of front and mid pairs and basal three-quarters of hind pair ; hind tibiae black haired on about apical third, all tibiae otherwise with pale yellow fringe | <i>cornutus</i> Enderlein |

- Face descending, not obviously hollowed, for short distance immediately under antennae ; all femora and tibiae fringed with long pale yellow hairs, these somewhat shorter on front pair, black hairs practically confined to a short mid-ventral patch on hind femora *flavohirta* Brunetti

Subfamily CALLICERINAE

Callicera doleschalli Verrall

Callicera doleschalli Verrall, 1913 : 328.

Verrall described this rather inconspicuous species from a single male example taken by Lieut. E. Y. Watson in the North Chin Hills in BURMA, 5,000 ft., iii.1893. Its almost entirely reddish orange legs distinguish it from other Oriental species with the first antennal segment scarcely or not longer than the second. As Verrall mentions in his original description, the abdomen of the type is much spoilt by damp, and it is difficult to make out the colouring of the tergites. This apparently unique example of the species is in the Brit. Mus. (Nat. Hist.).

Callicera sumatrensis de Meijere

(Text-fig. 12)

Callicera sumatrensis de Meijere, 1919 : 26 (♀).

Callicera pendleburyi Curran, 1928 : 273. **Syn. n.**

De Meijere described this species from a single female taken at Suban Ajam in SUMATRA by Herrn. Edw. Jacobson in July, 1916. From the original description it appeared to me to be closely related to *pendleburyi* Curran, and at first I separated the two species in my key by the rather unsatisfactory character of the entire antennae being black in *sumatrensis* (as stated by de Meijere) and the first segment reddish in *pendleburyi*. Later, de Meijere's type female of *sumatrensis* was kindly lent to me by Dr. Willem N. Ellis from the collection in the Zoological Museum of the University of Amsterdam. Examination proved that the first antennal segment in this specimen is obviously reddish and not black as stated by de Meijere. Indeed, *sumatrensis* and *pendleburyi* are identical, and the latter becomes a synonym of the former.

Curran fully and accurately described *pendleburyi* from five males taken at Cameron's Highlands, Pahang, MALAYA, the full data of the material being as follows :—Rhododendron Hill, 5,200 ft., 20.vi.1923, 1 ♂ ; Gunong Berumban (summit), 6,050 ft., 14.iii. and 17.vi.1923, 3 ♂ ; same locality, 5,100 ft., 12.iii.1925, 1 ♂ (*H. M. Pendlebury*). In subsequent years Pendlebury collected many further examples (with one exception, males) from the same localities as before, and a single male from NORTH BORNEO. His material forms the entire series of forty-two specimens in the Brit. Mus. (Nat. Hist.). Curran was apparently unaware that a female existed in the B.M. material and did not describe that sex.

As de Meijere's description of the type female of *sumatrensis* was taken from a somewhat teneral and rubbed specimen and is not entirely accurate (as shown earlier) I give below the main features in which that sex differs from the male,

using for comparison the single female that I have found in the B.M. series of *pendleburyi*:—Antennae (Text-fig. 12) with segments proportionately longer; eyes widely separated, the space between them steadily widening from shortly below front ocellus to their lowest extremity, at least twice as widely separated at level of antennae as at level of front ocellus; eye-hairs shorter and all pale; thorax much more shining aeneous, less greenish black; tergites with shorter hairs; legs almost entirely pale haired. The data of the female examined is as follows:—"Cameron's Highlands, Pahang, 4,800 ft., 7.vi.1935".

It should be noted that in his description Curran gives the length of *pendleburyi* as 12–12.5 mm. This may be taken as an average body measurement, but among the long series of males subsequently taken by Pendlebury the range is from 10–13 mm. De Meijere gives the length of the holotype female of his *sumatrensis* as 9 mm., but actually it measures 10 mm.

Callicera robusta sp. n.

(Text-fig. 11)

This species is distinguished from other Oriental *Callicera* with the first antennal segment at least twice as long as second by, among other characters, the almost entirely clear reddish orange legs. It is also larger than the rest.

MALE. Length (exclusive of antennae), 15 mm.; wing-length, 13.5 mm. Eyes actually touching for a distance about equal to twice the length of vertex, clothed with rather short pale yellow hairs, which become light brown on the upper part, and with a vertical central band of dark brown hairs. Frons shining bluish black, with a narrow yellowish orange lunule at base of antennae, bare. Face shining bluish black, clothed with rather long yellowish hairs, except for a broad bare central strip which is widest at level of facial knob, eye-margins broadly pale yellow-dusted. Antennae with first two segments reddish orange, third black, very obscurely orange beneath on about basal half, first twice as long as second, third two-and-a-half times as long as first and second together; arista whitish with black base, about one-third as long as third segment.

Thorax dull bluish black, clothed with rather long yellowish hairs, these intermixed with dark brown hairs on about posterior third; scutellum dull bluish black with long upright dark brown hairs on disc and fringed with long yellow hairs.

First and second tergites moderately shining bluish black, third and fourth metallic bronzy green, abdomen entirely clothed with rather long yellowish hairs, no black hairs traceable on the partly denuded abdomen of the single male examined; sternites metallic bronzy green.

Legs, apart from coxae and trochanters, clear reddish orange; four anterior femora with longish hairs, mainly yellow and mainly brownish ventrally, posterior pair with mainly yellow hairs anteriorly, and rather sparse mixed black and yellow hairs ventrally.

Wings clear greyish, inclined to be yellowish tinged anteriorly, stigma yellowish. Squamae smoky grey, with long pale yellow fringes. Halteres with pale yellow stem and dark brown to blackish knob.

FEMALE. Agreeing with the male, apart from the following differences:—Antennae (Text-fig. 11) with segments proportionately longer, third segment conspicuously clear orange for about basal half; eyes widely separated, the space between them steadily increasing from shortly below front ocellus to their lowest extremity, about twice as widely separated at level of antennae as at level of front ocellus; eye-hairs only slightly shorter than in male, paler, but similarly becoming darker on the upper part, and with a vertical central band of darker hairs. Thorax

more shining aeneous black, less bluish black; scutellum similar; tergites with shorter and paler hairs; legs almost entirely pale-haired. Length (exclusive of antennae), 13-14.5 mm.; wing-length, 12-13 mm.

Holotype ♂. N.E. INDIA: Naini Hills, 7,000-8,000 ft., 13.v.1927 (*T. Jermyn*).

Paratypes. N.E. INDIA: Naini Hills, Kunj Khanak, 8,000 ft., 24-25.v.1927, 3 ♀ (*T. Jermyn*); 7,000-8,000 ft., 14-25.v.1927, 3 ♀ (*T. Jermyn*). In Brit. Mus. (Nat. Hist.).

The distinctive characters of this species are given in the key on p. 289.

Callicera nitens sp. n.

This species is distinguished from the other five Oriental *Callicera* dealt with in this paper by, among other characters, the glittering black appearance of the frons, scutellum and third and fourth tergites. The hairs of the eyes and body are exceptionally long for the sex in the single female described.

FEMALE. Length (exclusive of antennae), 13 mm.; wing-length, 12 mm. Eyes widely separated, the space between them steadily increasing from shortly below front ocellus to their lowest extremity, about twice as widely separated at level of antennae as at level of front ocellus; eye-hairs exceptionally long for a female, whitish below, light brownish on upper part, no obvious vertical central band of darker hairs. Frons, vertex and upper part of occiput glittering black, with noticeably long blackish hairs. Face with the blackish ground colour scarcely obscured by the thin evenly distributed pale yellow dusting, and with long yellowish white hairs. Antennae black, the basal segment shining, second and third dull; first twice as long as second, third about two-and-a-half times as long as first and second together (inner measurement); arista white, shortly black at the thickened base, more than half as long as third antennal segment.

Thorax glittering black, with long yellowish white hairs anteriorly, these mainly blackish posteriorly; scutellum glittering black, with long whitish hairs; pleurae greenish black, lightly dusted whitish, with very long thick whitish hairs.

Abdomen with first tergite dull grey, second similar but narrowly glittering black along posterior margin, third and fourth entirely glittering black; hairs on tergites long, becoming longer on succeeding tergites, yellowish white on first and basal half of second, tawny haired on apical half of second, third tawny-haired on disc, black-haired towards sides, fourth entirely tawny-haired. Sternites shining black, with long greyish hairs.

Coxae and trochanters black, legs otherwise uniformly reddish, except last three or four tarsal joints darkened and about apical half of hind metatarsi dorsally. Front femora with fringe of mixed black and yellowish white hairs behind and below, mid pair with posterior fringe of long whitish hairs and a few mixed black and whitish hairs towards base below, hind pair with a fringe of long whitish hairs anteriorly and below; tibiae with a fringe of short black hairs, posteriorly on the first and second pairs, anteriorly on the third.

Wings with greyish membrane, stigma dark brownish, a dark cloud extending broadly down from before base of stigma across middle of wing for about anterior half. Squamae greyish, with pale yellow fringe of moderate length. Halteres with light brown stalk and greyish knob.

Holotype ♀. EAST NEPAL: Taplejung District, damp evergreen oak forest above Sangu, c. 9,200 ft., 2-26.xi.1961. In the Brit. Mus. (Nat. Hist.).

The distinctive features are detailed in the key on p. 289.

Callicera sanguensis sp. n.

This species is characterized by the sharp contrast of the long grey thoracic hair and the foxy red hair of the tergites.

MALE. Length (exclusive of antennae), 12 mm.; wing-length, 11 mm. Eyes actually touching for a distance more than twice the length of vertex, clothed with rather long pale yellowish brown hairs, these becoming blackish on upper part and along a vertical central band of hairs. Frons shining purplish black, greenish at the base and down the sides, bare, lunule with no obvious yellow marking; face polished black, very slightly grey-dusted against the broad fawn eye-margins. Antennae dull black, except third segment reddish below for less than basal half; first segment twice as long as second, third about twice as long as first and second together (inner measurement); arista white, shortly black at the thickened base, nearly half as long as third antennal segment.

Thorax dull greenish black, uniformly clothed with long pale yellowish grey hairs; scutellum similarly coloured, but with noticeably long upright black hairs on disc and still longer pale hairs along posterior border and a fringe of short pale hairs submarginally; pleurae dull bronzy green, clothed with long thick greyish white hairs.

Abdomen with first tergite bronzy green, slightly shining, second tergite dull black, third slightly shining black and fourth more brightly so; tergites uniformly clothed with long upright foxy red hairs. Sternites slightly shining greyish brown, with long greyish yellow hairs.

Coxae and trochanters black; femora black, narrowly yellow-tipped; four anterior tibiae and tarsi light brownish; hind tibiae darkened on about apical fifth, otherwise light brownish; hind tarsi light brownish, darkened above. Four anterior femora with postero-ventral and posterior fringe of rather long light yellowish brown hairs, hind pair with an antero-dorsal and anterior fringe of similar hairs and some longer similarly coloured hairs scattered antero-ventrally and ventrally; four anterior tibiae with a posterior fringe of rather short light yellowish brown hairs, hind tibiae with a similar but anterior fringe.

Wings clear and transparent apart from the light yellow stigma. Squamae grey with a fringe of moderately long hairs, which are peculiar in appearing light golden brown from above and blackish from below. Halteres light brown, the knob partly darkened.

Holotype ♂. EAST NEPAL: Taplejung District, c. 6,200 ft., from mixed vegetation by stream in gully, x.1961-i.1962. British Museum East Nepal Expedition. In Brit. Mus. (Nat. Hist.).

The distinctive features are detailed in the key on p. 289.

Callicera sackeni Verrall

Callicera sackeni Verrall, 1913: 331.

Verrall described this species from a single male taken by Lieut. E. Y. Watson at Fort White in the North Chin Hills, BURMA, 7,000 ft., iv.1893. This sole representative of the species is in the Brit. Mus. (Nat. Hist.). Unfortunately, for many years this specimen has been a mere fragment, headless, legless, and almost wingless, and is quite unrecognizable. On examining a series of one male and six females placed with it over the name label of *sackeni* and comparing their characters with Verrall's description of the latter I found that they represent a distinct species, which I have described earlier in this paper as *robusta*. I will not repeat Verrall's excellent description of *sackeni*, which has already been transcribed word for word by Brunetti (1923: 306). It is clearly differentiated in the following key to the six Oriental species of *Callicera* that I now recognize.

- | | | |
|---|--|--|
| 1 | First antennal segment at least twice as long as second (inner measurement) | 2 |
| - | First antennal segment not nearly twice as long as second, usually subequal (inner measurement) | 4 |
| 2 | Legs, apart from coxae and trochanters, entirely clear reddish orange | robusta sp. n. |
| - | At least tarsi partly blackish | 3 |
| 3 | Frons, thorax, scutellum and third and fourth abdominal tergites glittering black | nitens sp. n. ♀ (♂ unknown) |
| - | Thorax and scutellum dull greenish black, second tergite dull black, third and fourth black, only moderately shining | sanguensis sp. n. ♂ (♀ unknown) |
| 4 | Femora mainly blackish | 5 |
| - | Femora reddish orange, only darkened at extreme base | doleschalli Verrall ♂ (♀ unknown) |
| 5 | Third antennal segment quite three times as long as first and second together (inner measurement) | sackeni Verrall ♂ (♀ unknown) |
| - | Third antennal segment only slightly longer than first and second together (inner measurement) | sumatrensis de Meijere |

Microdon bellus Brunetti

Microdon bellus Brunetti, 1923 : 315.

EAST NEPAL : Taplejung District, c. 6,500 ft., at edge of mixed forest above Sangu, resting on stone slab in sunshine, 17.x-1.xi.1961, 1 ♀.

Described from two females taken at Mussoorie, NORTHERN INDIA.

REFERENCES

- BIGOT, J. M. 1880. Diptères nouveaux ou peu connus, 21. *Ann. Soc. ent. Fr.* (5) **10** : 213-230.
 — 1884. Diptères nouveaux ou peu connus, 32. *Ann. Soc. ent. Fr.* (6) **4** : 73-116.
 — 1892. Nova Genera Dipterorum. *Wien. ent. Ztg.* **11** : 161-162.
 BRUNETTI, E. 1908. Notes on Oriental Diptera, with descriptions of new species, 1. *Rec. Indian Mus.* **2**, 1, no. 9 : 49-96.
 — 1913. Zoological results of the Abor Expedition, 1911-12. *Rec. Indian Mus.* **8**, 2, no. 11 : 149-190.
 — 1915. Notes on Oriental Syrphidae, with descriptions of new species, 2. *Rec. Indian Mus.* **11**, 3, no. 13 : 201-256.
 — 1923. *Fauna of British India*. Diptera, **3** (Pipunculidae, Syrphidae, Conopidae, Oestridae). xi + 424 pp. London.
 COQUILLET, D. W. 1898. Report on a collection of Japanese Diptera, presented to the U.S. National Museum by the Imperial University of Tokyo. *Proc. U.S. Nat. Mus.* **21** : 301-340.
 CURRAN, C. H. 1928. The Syrphidae of the Malay Peninsula. *Journ. F.M.S. Mus.* **14**, 2 : 141-324.
 — 1930. Additional records and descriptions of Syrphidae from the Malay Peninsula. *Journ. F.M.S. Mus.* **16** : 290-376.
 DEGEER, C. 1776. *Mém. pour servir à l'Hist. des Insectes*, **6** : 1-522.
 DE MEIJERE, J. C. H. 1908. Studien über südostasiatische Dipteren. Part 3. *Tidjschr. Ent.* **51** : 191-332.
 — 1919. Beitrag zur Kenntnis der Sumatranischen Dipteren. *Bijdr. Dierk.* **21** : 13-39.
 ENDERLEIN, G. 1911. Neue Gattungen und Arten aussereuropäischer Fliegen. *Stettin. ent. Ztg.* **72** : 135-209.
 FABRICIUS, J. C. 1781. *Species Insectorum*, **2** : 1-517.
 — 1787. *Mantissa Insectorum*, **2** : 1-382.
 — 1805. *Syst. Antliatorum* : 1-372.

- FALLÉN, C. F. 1817. *Diptera Sveciae*, Part 1 (Syrphidae) : 1-62.
- HERVÉ-BAZIN, J. 1923. Notes sur les Syrphides de l'Inde. *Ann. Soc. ent. Fr.* **92** : 289-299.
- HULL, F. M. 1944. Some flies of the family Syrphidae in the British Museum (Natural History). *Ann. Mag. nat. Hist.* (11) **11** : 21-61.
- 1949. The Morphology of the Genera of Syrphid flies. *Trans. zool. Soc. Lond.* **26** : 257-408.
- 1950. Studies upon Syrphid flies in the British Museum (Natural History). *Ann. Mag. nat. Hist.* (12) **3** : 603-624.
- LINNAEUS, C. 1758. *Syst. Nat.*, ed. **10**, 824 + iii pp.
- MACQUART, P. J. M. 1846. *Dipt. Exotiques*, suppl. **1**, 238 pp.
- MEIGEN, J. W. 1822. *Syst. Besch.* **3** : 1-416.
- OSTEN SACKEN, C. R. 1875. On the North American species of the genus *Syrphus* (in the narrowest sense). *Proc. Boston. Soc. nat. Hist.* **18** : 135-153.
- RONDANI, C. 1844. Ordinamento Sistematico dei Generi Italiani degli Insetti Ditteri. *Nuovi. Ann. Scienze Naturali* (2) **2** : 256-270, 443-459.
- SACK, P. 1913. H. Sauter's Formosa-Ausbeute. *Ent. Mitt.* **2**, 1 : 1-10.
- in RICHARDS, O. W. 1928. *Bombus* and *Volucella* in the Himalayas. *Ent. mon. Mag.* **64** : 107-108.
- SHIRAKI, T. 1930. Die Syrphiden des Japanischen Kaiserreiches. *Mem. Fac. Sci. Agric. Taihoku*, **1** : xx + 446 pp.
- STUCKENBERG, B. R. 1954. The *Paragus serratus* complex, with descriptions of new species. *Trans. R. ent. Soc. Lond.* **105** : 393-422.
- THOMSON, C. G. 1869. Diptera species novae descripsit. *Eugenies Resa*, pt. **12** : 443-614.
- VERRALL, G. H. 1901. *Syrphidae of Great Britain*. 691 pp.
- 1913. Descriptions of new species of the Syrphid genus *Callicera*. *Trans. ent. Soc. Lond.* **46** : 323-333.
- WALKER, F. 1852. *Insecta Saundersiana*, **3** : 157-252.
- 1856. Catalogue of the Dipterous Insects collected at Singapore and Malacca by Mr. A. R. Wallace, with descriptions of new species. *Jl. Linn. Soc. Lond. (Zool.)*, **1** : 4-39.
- 1857. Characters of undescribed Diptera in the collection of W. W. Saunders, Esq., F.R.S., etc. *Trans. ent. Soc. Lond. (N.S.)* **4** : 119-158.
- WIEDEMANN, C. R. G. 1824. *Analecta entomol.*, 60 pp.
- 1830. *Aussereurop. zweifl. Insekten*. **2** : xii + 684 pp.
- ZETTERSTEDT, J. W. 1843. *Diptera Scandinaviae*, **2** : 441-894.