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MISCELLANEA (pp. 317—320).

Synonymy in Corethrinae—*E. Brunetti*. Further notes on Indian *Phlebotomi*—*N. Annandale*.

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VII. NEW ORIENTAL NEMOCERA

By E. BRUNETTI.

In the present paper are described nearly fifty new species belonging to the first suborder of Diptera. Figures of some of them, especially wings of the somewhat closely allied species of *Rhyphus* and *Dixa*, will appear in my forthcoming volume on Nemocera (exclusive of Culicidae and Chironomidae) for the "Fauna of British India" series.

RHYPHIDAE.

No less than six species of *Rhyphus* from the East have come before me, including the only one previously recorded (*maculipennis*, Wulp); a European species, *punctatus*, F., about the identification of which there can be little doubt, and also a variety of the common European *fenestralis*, Scop.

All these forms are rather easily separated by the following characters:—

Table of species.

- | | | |
|----|--|--|
| A | Antennae conspicuously vari-coloured. | |
| B | Sub-apical clear spot in wing (at tip of 2nd longitudinal vein) elongated, and entirely clear | <i>maculipennis</i> , Wulp. |
| BB | The above spot nearly circular, and enclosing a distinct dark round spot | <i>pulchricornis</i> , sp. nov. |
| AA | Antennae wholly black. | |
| C | Thorax bluish ash-grey with chocolate-coloured stripes. | |
| D | Wing more deeply and extensively marked; distinct blackish spot at tip, whole distal margin more or less light blackish grey | <i>fenestralis</i> , Scop., var. nov. <i>indicus</i> . |
| DD | Wing much less deeply marked, and quite clear on distal portion, beyond the cross-veins; no apical spot whatever | <i>punctatus</i> , F. |
| CC | Thorax yellow, or brownish yellow, with reddish brown stripes. | |
| E | Costa darker, towards tip of wing showing distinctly a quite clear | |

square spot on costa, only descending to the 3rd longitudinal vein, with a smaller contiguous spot below; a distinct, narrow brown streak beyond outer cross-vein; distal part of wing below 3rd longitudinal, nearly clear, with posterior veins very lightly suffused *distinctus*, sp. nov.

EE Costa much lighter, showing towards tip of wing only one, much less clear, *oval* spot, always descending below 3rd longitudinal vein, without any second spot adjacent; no brown streak outside outer cross-vein; distal part of wing below 3rd longitudinal, very slightly darker grey, and this towards the margin only, the posterior veins not individually suffused *divisus*, sp. nov.

***Rhyphus maculipennis*, Wulp.**

A ♀ in the Indian Museum collection, dated 30-vii-10 (no locality given, but probably Assam), and one in my own collection from Peradeniya, Ceylon, xii-07, are almost certainly this species, although in the former specimen both the hind legs are missing. The wing agrees perfectly with Van der Wulp's plate. The antennae and abdomen in his type specimen were injured. Of the former, the first *three* (not *two*, as he says¹) joints are yellow, joints 4 to 8 yellow with brownish marks, or wholly brownish, 9, 10 quite black, 11, 12 yellowish white, 13 to 16 quite black, the 16th with a short white style. The abdominal two basal segments are mainly dirty yellow, with black posterior borders, the remainder being brownish yellow with broadly black borders; the apical segments wholly blackish. Belly similar. The palpi are black.

***Rhyphus pulchricornis*, mihi, sp. nov.**

♀ Base of Darjiling Himalayas. Long. $3\frac{1}{2}$ mm.

Head.—Frons, fully one-third width of head, reddish yellow, bare; vertex with a few hairs; ocellar triangle small, black, isolated; antennae long, 16-jointed, variegated, the joints mostly reddish yellow and black, with a short, white style and two or three bristles at apex. The antennal joints 1, 2, 3 are reddish yellow, 4, 5, quite black, 6, 7, 8, reddish yellow, 9, 10, black, 11, 12 brownish yellow, 13 to 16 black, the appearance of the antenna suggesting that it is liable to variation. Palpi bright reddish yellow, with a few bristles; proboscis very short, yellow.

¹ Quite possibly a variable character.

Thorax yellowish, with three wide, dark, soft reddish brown stripes. Sides yellow, with black streaks. Some bristles on the dorsum. Scutellum yellow, with a few bristles.

Abdomen brownish yellow, blackish towards tip, posterior borders of basal segments widely black. Belly apparently colorous.

Legs brownish yellow, minutely pubescent: tips of the femora, of the tibiae and of the tarsal joints blackish.

Wings pale grey: anterior border a little yellowish on basal half; posterior border pale blackish, slightly deeper at tip. A dark irregular band from the costa, reaching to the discal cell, and another, of about equal width, placed between the first and the infuscated wing tip. The clear space immediately adjoining the infuscated wing tip encloses a pale blackish oblong spot placed lengthwise on the costa. Outer side of the discal cell with a black suffusion, a black round spot in the 1st basal cell; posterior cross-vein and the anal vein narrowly black suffused. Halteres pale yellowish brown.

Described from a specimen in good condition in the Indian Museum collection, from Siliguri (18—20-vii-07).

N.B.—This species is very near Van der Wulp's *maculipennis*, but I believe it quite distinct, differing in the wing marks, and in the wholly yellowish hind femora, these joints in Wulp's species having a black ring in the middle. The palpi, too, in Wulp's species are blackish and the thorax is described as yellow with *black* stripes.

***Rhyphus fenestralis*, Scop., var. nov. *indicus*, mihi.**

♂ ♀ Himalayas and Assam. Long. 4-5 mm.

A number of specimens in the Indian Museum, from the Himalayas, show a difference from the usual form of this common European species, the difference being constant in all the specimens examined.

The apical spot in the wing is distinctly black, clearer cut, and of a different shape. In *fenestralis* (typical) it is brownish, and its inner sides form a right angle, and, at the edge of the wing, the spot extends distinctly below the 3rd longitudinal vein; whereas in *indicus*, it is quite black, the edge much more clearly cut, and the distal half of the spot does *not* extend below the 3rd longitudinal vein, although above this vein it reaches the wing tip as usual, so that the inner form of the spot is not a right angle, but irregular. Moreover, the abdomen is darker, especially in the ♀ in which sometimes the usual black bands extend over nearly all the abdomen. The abdomen in the ♂ is lighter than in the ♀, and shows traces of a dorsal line of elongated spots. In size, the variety is slightly larger, and all the examples have the brown ring on the hind femora, but though always present, it varies in intensity, and is darkest in the ♂.

From a careful comparison of the specimens with four ♀ ♀ from Austria, four ♀ ♀ taken by me in Wales, and a ♀ taken by Dr. Annandale in Mull, Scotland, 4—6-x-07 (all in the Indian Museum), I find no other difference from typical *fenestralis*. I have no European ♂ present to compare with, but in *indica* both sexes appear equally common.

This new form appears common in the Himalayas, the Indian Museum possessing it from Simla (7,000 ft.), 24-iv-07 and 10-v-09 [*Annandale*, common]; Matiana, Simla district (8,000 ft.), 28—30-iv-07 [*Annandale*]; Darjiling (7,000 ft.), 5—9-viii-09 [*Paiva*, common]; also from Ukhral, Manipur (6,400 ft.) [*Pettigrew*].

***Rhyphus punctatus*, F.**

Though I have no specimen to compare them with, I have little doubt that three ♀ ♀ in the Indian Museum represent this species, agreeing almost perfectly with Schiner's description. Two are from Kurseong, Darjiling (5,000 ft.), 10—26-ix-09 [*Lynch*], and the third from the same place taken on 9-ix-09 by Dr. Annandale.

***Rhyphus distinctus*, mihi, sp. nov.**

♂ ♀ Darjiling district. Long. 3-4 mm.

Head.—Eyes absolutely contiguous in ♂ from the conspicuously raised ocellar triangle, which occupies the whole vertex, almost to the base of the antennae. Under side of head blackish grey. Frons in ♀ one-fourth the width of the head, and, with vertex and face, whitish grey; under side of head somewhat yellowish. Antennae wholly black with a little short grey pubescence, tips of both scapal joints sometimes narrowly brownish yellow; palpi black. Back of head with some soft long hairs, proboscis yellowish.

Thorax brownish yellow; with three moderately broad, somewhat reddish brown stripes; the outer ones extending from just below the anterior margin, nearly to the posterior one. The middle stripe extends from the anterior margin nearly to the scutellum, tapering gradually; often narrowly divided in front: there is also a small unicolorous transverse mark just below each shoulder.

A dorso-central row of stiff hairs, gradually diminishing in length extends from the posterior margin forwards, thence curving towards and over the humeral swellings.

There is a lateral row of 6 or 7 long stiff hairs above each wing and some post-alar ones. Scutellum brownish yellow, with a broad median brown band, and the extreme edges brown: metanotum shining dark brown.

Abdomen dark reddish brown, with a moderate amount of soft short yellow hair; hind margins of segments more or less narrowly yellowish, sometimes the posterior corners of the segments also. Basal segment sometimes lighter coloured. Belly yellowish, more or less dark marked, genitalia inconspicuous.

Legs light brownish yellow; tarsi dark; extreme tips of posterior femora black. There is generally a more or less distinct broad irregular blackish band occupying about the middle third of the hind femora, and the hind tibiae are more or less blackish for some distance at both base and tips: legs minutely pubescent.

Wings very pale grey, with brownish markings. The cross-veins are rather deeply but narrowly brown, whilst moderately dark brownish markings occur as follows: a square mark in the middle of the upper basal cell; a brown well-defined streak from the middle of the costa, narrowing gradually, passing between the above-mentioned square mark, and the inner transverse vein, crossing the base of the discal cell and continuing narrowly along the 5th longitudinal vein: a broader, also well-defined stripe from the costa (narrowing hindwards) passing clear of the outer transverse vein, terminating at the upper fork of the lower branch of the 4th longitudinal.

The tip of the wing down to the 3rd longitudinal vein is brown, leaving in front of it a distinct square shaped, quite clear spot, touching the costa and contiguous to the previously described stripe. It may be described differently by saying the whole of the costa is brownish, deepening towards the tip, with a quite clear square spot placed just touching the tip of the 2nd longitudinal vein, extending from the costa to the 3rd longitudinal. The distal part of the wing from below the 3rd longitudinal down to a little beyond the lowest branch of the 4th, is light brownish grey leaving a clearer streak across the 1st, 2nd and 3rd posterior cells, just before their centres and almost below, but a little previous to, the clear square costal spot. Nearly below this latter spot, but a little beyond it, yet just touching it in the 1st posterior cell is a nearly upright, oblong quite clear spot, on the outer side of which the brown colour is distinctly deeper for a very small space. The 6th longitudinal vein is very narrowly and not deeply suffused. Halteres yellowish.

Described from a number of both sexes from Darjiling (7,000 ft.), taken by Mr. Paiva, 5—8-viii-09, and a ♀ taken by Dr. Annandale at Kurseong, 2,000 feet below Darjiling, 4-ix-09.

***Rhyphus divisus*, mihi, sp. nov.**

♂ ♀ Himalayas. Long. $3\frac{1}{2}$ —5 mm.

This species considerably resembles *distinctus* but differs in some minor characters, and very essentially in the wing markings. The row of stiff hairs behind the eyes and across the vertex is stronger. The basal abdominal segments in the ♂ are more yellowish on their posterior borders, and the middle line on the thoracic dorsum is very distinctly divided. The blackish band on the hind femora is confined to the ♂, whereas in *distinctus* it is sometimes present, though indistinctly, in the ♀. The wing markings are entirely different.

On a pale grey ground colour, the cross-veins are deeply but narrowly infuscated as is also the 5th longitudinal vein; the proximal two-thirds of the marginal cell is rather deeply blackish, with a slightly paler spot in a line with the outer cross-vein; the distal part of the wing is light blackish grey, much deeper at tip just above the 3rd longitudinal vein and a little below it, leaving a nearly clear oval spot touching the costa, at the tip of the 2nd longitudinal and extending downwards into the 1st posterior cell, a second, much fainter and more irregular clear spot occurs just beyond the outer cross-vein. The praefurca appears slightly obliterated about its middle. Halteres yellow.

Described from a good series of both sexes in the Indian Museum from the following localities:—

Darjiling (7,000 ft.), 5—12-viii-09 [*Jenkins* and *Paiva*, common]; Kurseong, 10—26-ix-09 [*Lynch*]; Gangtok, Sikkim State, 9-ix-09; also two pairs taken *in cop.*, Darjiling, 5-viii-09, and Gangtok, 8-ix-09. An apparently immature specimen from Phagu, Simla hills, 12-v-09 [*Annandale*].

A ♂ and two ♀ ♀ taken at Darjiling in company with the others have the thoracic markings almost obliterated, and the clear parts of the wing more extended; but they apparently belong to the same species.

N.B.—Of the three species (*fenestralis*, *distinctus* and *divisus*) taken by Mr. Paiva at Darjiling in August, 1909, he says that some were taken on windows and others along the roads of the town, where they were hovering in small swarms under the shade of the trees, but it would be impossible to say now whether all the species occurred in both habitats or not, as at the time of collecting, identification was impracticable.

DIXIDAE.

This family, like the Rhyphidae, contains but a single genus—, and this one, *Dixa*, has not previously been recorded from the East. Five species are here offered as new, as I am unable to identify any of them with such descriptions of Palaearctic species as are accessible to me.

DIXA, Meig.

Table of species.

- A Wing with more markings than a narrow transverse streak across the middle.
- B Wing tip not infuscated. Thoracic stripes dark brown, abdomen brown.
- C Wing nearly clear; only a few infuscated spots, mostly in basal and anal cells: no deeper black spots *montana*, sp. nov.
- CC Wing with several blackish streaks; and four rather deep black marks

- contiguous to and below the 1st longitudinal vein *maculipennis*, sp. nov.
- BB Wing tip distinctly infuscated for a little distance. Thoracic stripes brownish yellow; abdomen brownish yellow *ochrilineata*, sp. nov.
- AA Wing with only a narrow transverse streak across the middle. Thoracic stripes dark brown. Abdomen blackish.
- D The transverse streak on the wing extending over the posterior cross-vein *bistriata*, sp. nov.
- DD The transverse streak not continued over the cross-vein *bifasciata*, sp. nov.
- N.B.*—*D. bifasciata* is possibly the ♀ of *bistriata*.

***Dixa montana*, mihi, sp. nov.**

♂ ♀ Western Himalayas. Long. 2-3 mm.

Head.—Frons and back of head, lighter or darker, grey. Proboscis robust at base, pointed, moderately long, pubescent, brownish yellow; palpi dark brown. Antennae: 1st joint large, globular, yellowish brown, flagellum of apparently 12 joints, brownish yellow, closely pubescent, filamentous towards the tip, making it difficult to discover the exact number of joints.

Thorax.—Dorsum grey, sometimes a little yellowish, sometimes almost whitish. Three dark brown stripes, the median one, which is very narrowly divided more or less by a longitudinal pale stripe, runs from the anterior margin to beyond the middle, posterior to which it continues, much narrowed. The two outer stripes which are separated from the median one by a narrow space, begin some distance behind the shoulder and continue to the posterior margin of the dorsum; the space between them, posterior to the broad part of the median dark stripe, being light grey, traversed longitudinally by the attenuated continuation of the median stripe. A more or less indistinct transverse streak, or darker space, on the shoulders, brown or grey of a lighter or darker shade, sometimes with traces of a thin line connecting them. Scutellum yellow, metanotum brownish. Sides of thorax brownish or brownish grey, irregularly tinted.

Abdomen dark brown, with very sparse pale hairs. Genitalia in ♂ very small, yellowish, mainly concealed. The tips of (presumably) a pair of small claspers are visible. Ovipositor in ♀ small, with a reddish brown tip.

Legs pale brownish yellow. Tips of femora and tibiae, and the tarsi towards the tips, blackish; the hind tibiae being very distinctly though not greatly incrassated.

Wings pale grey; venation in accordance with the generic description. Three moderately small pale brown spots. The 1st

embraces the end of the praefurca, the base of the fork of the 2nd vein, and the anterior cross-vein: the 2nd spot is in the middle of the basal cell: the 3rd is placed across the middle of the 5th vein, thus falling in both the 2nd basal and the anal cells. A very pale grey, irregular, narrow but just distinctly perceptible streak joins the fork of the 2nd vein to the fork of the 4th. In addition there are some indistinct pale grey spots placed apparently irregularly in the basal half of the wing. Halteres yellowish.

Described from three ♂ ♂ and two ♀ ♀ in the Indian Museum collection, all captured by Dr. Annandale in the Simla district, with the following data: Simla (7,000 ft.), 10-v-09 (type ♂); Barogh (5,000 ft.), 10-v-10; Phagu (9,000 ft.), 11-v-09 (type ♀).

Types in Indian Museum.

NOTES.—This species must bear some resemblance to the common European *D. maculata*, Mg. Of the descriptions available to me that of this species is the only one in which the slight but very distinct incrassation of the hind tibiae is mentioned. Yet this character, although distinctly present in all five Oriental species treated of here, and apparently common to both sexes, has not, so far as I am aware, been described as generic, unless indeed, Macquart is referring to this peculiarity in his words “jambes terminées par deux pointes, peu distinctes.”

In the European species, *maculata*, the thorax is described as pale yellow, and there are stripes on the sides of the thorax, the base of the wing is yellowish, and lesser differences also are apparent between Meigen's species and the present one, which may be regarded as distinct.

Dixa maculipennis, mihi, sp. nov.

♂ ♀ Eastern and Western Himalayas. Long. 2-2½ mm.

Head.—Back of head, vertex and frons light grey. Proboscis yellowish, distinctly dark brown at base; palpi dark brown. Antennae with two very distinct basal (scapal) joints, the 1st circular, very short, the 2nd subglobular, both orange-yellow: flagellum of at least 14 joints, possibly one or two more, if such are shorter, as they are not at all easily counted.

Thorax rather bright yellowish. Three dark brown thoracic stripes as in the previous species; and on each shoulder a distinct but not sharply defined brownish, curved, transverse streak, connecting the tip of the median stripe with the tip of the outer stripe. Prothorax forming a sort of imperfect collar, swollen on each side into an elongate lobe, lying close to the thorax. Scutellum dark brown, with a broad yellow median indistinct stripe; metanotum dark brown. A small brown scutellar bridge with a narrow yellow upper margin, joins the scutellum on each side to the wing base.

Abdomen brownish, a small blackish mark towards each side on the posterior margins, the segments becoming blackish towards

the tip of the abdomen. Genitalia in ♂ black, a pair of claspers, large, conical, fleshy, the 1st joint of which is yellowish; the 2nd joint is also conical, smaller, apparently pointed at the tip. (The claspers are closed together so that exact vision is impossible.) Ovipositor blackish.

Legs pale yellowish; tips of femora and tibiae, and the tarsi towards the tips, narrowly black: hind tibiae slightly but distinctly incrassated at tips.

Wings.—Venation normal. Pale grey, costal cell unmarked, the brown spots beginning on the 1st longitudinal vein. Four distinct brown spots in a row, with fairly clearly cut sides, are placed in juxtaposition to this vein; the 1st small, rounded, near the base; the 2nd, larger, squarish, below the tip of the auxiliary vein, both these two spots limited posteriorly by the 4th vein. The 3rd spot is a streak, beginning beyond the origin of the 2nd vein, and ending on the 4th vein, proximad of the anterior cross-vein. The 4th spot is over the fork of the 2nd vein. Much lighter pale brownish grey small spots are placed, possibly irregularly over the rest of the wing. In the single specimen present they are situated as follows: Two in the 2nd basal cell, two in the anal cell, one in the axillary cell; one each in the marginal, submarginal, and the 1st posterior cells, all united more or less into a streak, placed towards the tip of the wing. Two each in the basal (one basal, one central) and 2nd submarginal cells, also in the 1st posterior cell; one each at the base of the 3rd, 4th, and 5th posterior cells. Halteres yellowish.

Described from one ♂ and one ♀, the ♂ from Darjiling, 29-v-10, taken by me, the ♀ from Matiana (8,000 ft.), Simla district, 28—30-iv-07 [*Annandale*].

Types in Indian Museum.

NOTE — Easily known by its marmorated wings.

***Dixa ochrilineata*, mihi, sp. nov.**

♀ Darjiling district. Long. 2 mm.

Head light yellow. Eyes separated by a frons one-third the width of the head. Proboscis yellowish, with rather well-developed terminal dark brown lips; palpi dark brown. Antennae: 1st scapal joint very short and indistinct, 2nd large, globular, yellow; flagellum of 14 to 16 joints (?), dark brown, extreme base of 1st, yellow.

Thorax distinctly gibbous, prominent in front, yellow. Three brownish yellow dorsal stripes, somewhat normally placed, the median one attaining the anterior margin, the outer ones distinctly curved towards and over the sides anteriorly. Some soft long hairs in the neighbourhood of the stripes and in front of the wings.

Scutellum and metanotum yellow, the former a little brown at the sides, the latter in the middle. Sides of thorax with a dark

brown lateral stripe on a level with and passing across the bases of the coxae.

Abdomen brownish yellow, a little darker towards the sides. Ovipositor small, inconspicuous, pale yellow.

Legs.—Coxae and femora pale brownish yellow, femora a little lighter near the tips, the tips themselves blackish brown ringed. Tibiae and tarsi brownish.

Wings.—Venation normal. Very pale grey, costal cell wholly unmarked. Tip of wing very pale blackish from beyond the fork of the 2nd vein, the shade extending posteriorly as far as the 2nd posterior cell, filling it. A dark brown streak from the 1st longitudinal vein, passing over the origin of the 3rd vein, the anterior cross-vein, then in diminished intensity to the hind margin of the wing by way of the posterior cross-vein and the last section of the 5th longitudinal vein. A very pale blackish spot in the 1st basal cell, near its tip, an elongate one in the basal part of the 2nd basal cell, turning down at its proximal end into the anal cell. Wings a little yellowish at the base. Halteres pale yellow.

Described from ♀ from Kurseong, 9-ix-09 [*Annandale*].

Type in Indian Museum.

***Dixa bistriata*, mihi, sp. nov.**

♂ Darjiling. Long. $2\frac{1}{2}$ mm.

Head.—Proboscis and palpi brownish yellow, the former brown at the tip. Antennae: 1st scapal joint very wide and short, saucer-like, 2nd normal, subglobular; flagellum of not less than 12 joints, closely pubescent: the whole antennae dark brown, except the pale yellow extreme base of the 1st flagellar joint.

Thorax pale yellowish. Three dark chocolate-brown stripes of normal pattern, the median one extended somewhat linearly in front just below the shoulders. The shoulders themselves with a very pale blackish streak.

Scutellum and metanotum dark brown, a narrow yellowish stripe in the middle of the former. Sides of thorax yellowish, with brown marks.

Abdomen blackish, with a little pale yellow pubescence. Genitalia of moderate size, consisting of a pair of dark brown claspers, of which the second joint is cylindrical, much thinner, yellow; apparently a small dorsal plate is present in addition to the moderately large ventral one.

Legs pale brownish yellow, tips of femora and tibiae narrowly black ringed; tarsi darker.

Wings practically clear, a blackish narrow irregular streak in the middle from the 1st longitudinal vein, over the cross-veins, continued in an attenuated form along the posterior cross-vein and the terminal section of the 5th longitudinal vein. A very pale blackish streak in the basal part of the anal cell. Halteres yellow.

Described from a single ♂ taken by myself at Darjiling, 29-v-10.

Type in Indian Museum.

***Dixa bifasciata*, mihi, sp. nov.**

♀. Western Himalayas. Long. nearly 3 mm.

Head.—The broad flat vertex light grey dusted, through which the dark ground colour can be seen. Proboscis yellowish brown, palpi long, concolorous. Antennae with its two scapal joints very distinct, dark brown; flagellum brown, except the pale yellow extreme base of the first joint.

Thorax pale yellowish. Three dark brown stripes of normal pattern, the outer ones continued much further forward than in the last species. Dorsum between the stripes greyish. Scutellum yellowish, metanotum dark brown. Sides of thorax yellowish, brown marked.

Abdomen blackish, with whitish pubescence; belly similar.

Legs pale yellowish, knees almost imperceptibly black, tarsi darker. Hind tibiae with the slight incrassation at the tip as usual, but yellowish.

Wings very pale grey, a rather dark brown narrow short streak in the centre over the cross-veins, not extending to the posterior cross-vein. A pale blackish streak filling the basal half of the anal cell. Halteres pale yellow.

Described from a single ♀ taken by Dr. Annandale at Phagu (9,000 ft.) in the Simla district. 12-v-09.

Type in Indian Museum.

NOTES.—This species is very near *bistriata*, and may possibly be identical with it. The differences lie in the respective lengths of the 1st scapal joint and in the lengths of the thoracic stripes; the femora and tips tips, black ringed in one species and practically all yellow in the other. The wing marks in the two species may be differentiated as follows: In *bifasciata* the central streak stops before or at the posterior cross-vein, this vein itself not being at all suffused, whilst in *bistriata* the suffusion is continued narrowly to the posterior margin. The basal pale streak in the anal cell is much more distinct in *bifasciata* than in *bistriata*. When placed side by side the two forms appear distinct, although the descriptions read so similar.

BIBIONIDAE.***PLECIOMYIA*, mihi, gen. nov.**

TYPE *Penthetria melanaspis*, Wied., Auss. Zweifl., i, 72 (1828)
Plecia melanaspis, auct.

Allied to *Plecia*, W., from which it differs by the 4th longitudinal vein rather broadly forking immediately at the point of contact with the anterior cross-vein.

The 3rd longitudinal vein forks almost immediately beyond the anterior cross-vein, the upper branch lying almost parallel to the lower one.

A third but lesser character is the presence of twelve joints to the antenna, two short normally shaped basal ones forming

the scape, a comparatively long first flagellar joint, followed by eight others of a flattened bead shape, with a moderately long, conical terminal joint. This is not entirely a conclusive character, as at least one other allied Oriental species (*Plecia fulvicollis*, F.) has twelve-jointed antennae, instead of ten- or eleven-jointed as in the other allied species belonging to this region.

***Pleciomyia melanaspis*, Wied.**

Even as early as 1828 Wiedemann recognised a generic difference between this species and the species of *Plecia*, by placing it in *Penthetria*. I have not seen any other species that can be referred to my new genus.

P. melanaspis is quite common apparently all along the Himalayas, the Indian Museum series representing Naini Tal, v-1893; Bhim Tal, 19—22-ix-06; Theog (Simla district), 27-iv-07; Kurseong, 9-ix-09; Siliguri, 18—20-vii-07 (both Darjiling district, hills and plains respectively). From the latter locality there is a ♂ and ♀ *in cop.* Also from Soondrijal and Katmandu (both Nepal), Sikkim and Mungphu in the E. Himalayas, and Sibsagar, Shillong, Margherita in Assam.

It is known from Siberia, China and Japan, and I found it common both at Darjiling, 21-ix to 2-x-08, and also at Hankow, China, 22—26-iv-06, but only sparingly at Mussoorie, 20-v-05.

PLECIA, Wied.

Table of species.

- A The 3rd longitudinal vein forks at some distance beyond the anterior cross-vein (nearly at half the length of its lower branch) and always distinctly beyond the fork of the 4th vein.
- B Whole thorax reddish yellow, including dorsum, sides, scutellum and metanotum. Antennae 12-jointed . *fulvicollis*, F.
- BB Dorsum of thorax and scutellum reddish yellow; the sides and metanotum black. Antennae 10-jointed *tergorata*, Rond.
- AA The 3rd longitudinal vein forks shortly beyond the anterior cross-vein (distinctly before one-third of the length of its lower branch), and approximately opposite the fork of the 4th vein; the upper branch lying almost parallel to the lower one, not almost erect as in Division A.
- C Not wholly black species. Dorsum of thorax reddish yellow. Antennae 11-jointed . . . *indica*, sp. nov.

CC Wholly black species.

D Legs wholly black. Long. 8—12 mm.

Antennae 11-jointed *atra*, sp. nov.

DD Legs mainly brownish. Long. 6-7 mm.

Antennae 10-jointed *obscura*, sp. nov.

Plecia fulvicollis, F.

P. subvarians, Wlk.

P. thoracica, Guer.

This species appears as common in the plains of the eastern tropics as *melanaspis*, Wied., is in the higher and more northern parts. The Indian Museum has it from many parts of India, Lower Burma, Assam, Java and Ceylon.

I have taken it myself at Jubbulpore, Meerut (both India), and in Java. It is known from many of the East Indian and Philippine Islands.

Through the kindness of Mr. E. F. Austen, who has examined the type ♂ and ♀ of *subvarians*, Wlk., in the British Museum, I am able definitely to allot this name synonymic rank, and from notes on *thoracica*, Guer., supplied by the same gentleman I have no hesitation, knowing the variability of *fulvicollis* from the large number of specimens examined from many parts of the East, in regarding Guerin's species as also identical.

Moreover, Van der Wulp's reference to *thoracica* is incorrect; it should be Belanger's *Voyage aux Indes Orientales* (1833).

Like many species in this family, it varies considerably in size, from 5½ to 7 mm., one specimen in the Indian Museum being barely 4 mm. long.

Plecia tergorata, Rond.

In the Indian Museum from Bhim Tal (4,500 ft.), 19—27-ix-06; Sukna (500 ft.), 1-vii-08 [both *Annandale*]; Darjiling, 6—9-viii-09 [*Paiva*]; Shan Hills, Upper Burma [*J. Coggin Brown*]. A pair in cop. from Bhim Tal, 27-ix-07.

It is also known from Burma, Borneo and Java.

N.B.—In spite of Rondani's remark that the wing is wholly black, without trace of yellow at the base, three or four of the above-mentioned specimens have the wings wholly yellowish brown, yet there can be little doubt of their identity with this species. In both *Pleciomyia melanaspis* and *Plecia fulvicollis* the wings are sometimes more brown than black. The scapal joints and first flagellar joint of the antennae are relatively longer than in either *melanaspis* or *fulvicollis*.

Plecia indica, mihi, sp. nov.

♀ Himalayas. Long. 6—9 mm.

Entire body black, with the exception of the dorsum and upper part of the thorax, above the ridge line about the insertion

of the wings. This part is wholly bright ferruginous red, and very minutely pubescent.

Wings blackish, darker on anterior border; stigma and halteres black. *Antennae* as in *atra*, but the first flagellar joint hardly longer than those immediately following.

Described from two ♂♂ and several ♀♀ in the Indian Museum from Darjiling, 2-x-08 [*Brunetti*]; Theog (Simla hills), 27-iv-07, and Kumaon, ix-1906 [both *Annandale*]; Soondrijal (Nepal), Kangra Valley (4,500 ft.) and Kimoli, 24-x-07. I also took it at Darjiling, 10—16-x-05.

***Plecia atra*, mihi, sp. nov.**

♀ Nepal and Western Himalayas. Long. 8—12 mm.

Entire body deep velvet-black, especially on the dorsum of the thorax. *Antennae* of eleven joints, the scapal two, subcylindrical, the 2nd being wider at the tip; the 1st flagellar joint is cup-shaped at its base; the following seven joints of equal size, of flattened bead shape, the last one, small, conical; the whole antenna straight and slightly pubescent.

Abdomen rough, minutely pubescent. Legs bare, pulvilli greyish white.

Wings blackish, anterior part much darker, stigma black; halteres greyish black. The 4th longitudinal vein not forked until some distance from the anterior cross-vein. Upper branch of the 3rd longitudinal vein long, almost parallel to the lower one, originating close to the anterior cross-vein.

Described from four ♀♀ in the Indian Museum from Kumaon (Bhim Tal, 4,500 ft.), 19—22-ix-06 [*Annandale*], and from Soondrijal, Nepal.

This is the only wholly black eastern species except my *obscura*, which is more dirty black in colour with a tendency to brown in the legs, besides being smaller in size.

***Plecia obscura*, mihi, sp. nov.**

♂ ♀ Western Himalayas. Long. 6-7 mm.

Wholly dirty black, minutely pubescent. Thorax, on dorsum and sides sometimes brownish (in one specimen). Femora dark mahogany-brown, remainder of legs blackish brown. *Antennae* rather stout, black, scapal joints equal in length, short; 1st flagellar joint longer than each scapal joint, slightly pinched in the middle; remaining seven joints subequal, normal (no obvious minute apical joint in one example, antennae incomplete in the other two).

Vertex in ♂ wholly occupied by the very large cup-shaped ocelli, which are placed, so to speak, on their sides with their bases united.

Genitalia in ♂: a pair of strong hairy claspers, two-jointed, the basal joint the longer and stronger, the 2nd joint ending

apparently in a single claw. In the ♀ the genital organ is narrow, cylindrical, short, ending in a pair of rather slender palp-like appendages.

Wings blackish brown, darker on anterior part: venation as in *indica*.

Described from two ♂♂ and one ♀ in my collection captured by me at Mussoorie, 24-v-05. Not in very good condition but the specific characters quite distinct enough to recognise as representing a good species.

BIBIO, Geoff.

Table of species.

- | | | |
|----|---|------------------------------------|
| A | Thorax partly or wholly reddish yellow or brownish yellow (at least the <i>dorsum wholly red</i> in all the species except <i>discalis</i> , in which it is black). | |
| B | Dorsum of thorax yellowish. | |
| C | Abdomen wholly reddish yellow | <i>hortulanoides</i> , ♀, sp. nov. |
| CC | Abdomen wholly black | <i>bicolor</i> , Wlk. |
| BB | Dorsum of thorax black | <i>discalis</i> , sp. nov. |
| AA | Thorax wholly black. | |
| D | Abdomen wholly reddish yellow | <i>abdominalis</i> , sp. nov. |
| DD | Abdomen wholly black. | |
| E | Larger species; at least 10 mm. long. Basal section of 3rd longitudinal vein usually much longer than the anterior cross-vein. | |
| F | Species 14 mm. long | <i>hortulanoides</i> , ♂, sp. nov. |
| FF | Species 10 to 12 mm. long | <i>obscuripennis</i> , Meij. |
| EE | Smaller species; at most 7 mm. long. Basal section of 3rd longitudinal vein barely, if any longer than the anterior cross-vein. | |
| G | Femora wholly bright reddish or yellowish. | |
| H | Femora yellowish, tibiae yellow | <i>johannis</i> , L. |
| HH | Femora reddish, tibiae and tarsi black | <i>rufifemur</i> , sp. nov. |
| GG | Femora wholly black or dark brown. | |
| I | Hind tibiae reddish yellow. Veins on posterior part of wing distinct to hind margin, but paler than those in anterior half | <i>fuscitibia</i> , sp. nov. |
| II | Hind tibiae dark brown or black. Veins uniformly distinct, or those on posterior half of wing paler, and either distinctly continued to the hind margin or abbreviated. | |

- J Veins on posterior half of wing, viewed from certain directions, as distinct as those on anterior half. Hind tibiae black *approximatus*, sp. nov.
- JJ Veins on posterior half of wing less distinct than those on anterior half.
- K Hind tibiae dark brown, lower branch of 4th vein and upper branch of 5th vein not reaching border of wing *defectus*, sp. nov.
- KK Hind tibiae black. All the veins attain the wing margin *proximus*, sp. nov.

N.B.—The above table is constructed for the sake of convenience only, and does not illustrate the affinities of the species. The order in which the descriptions are arranged is intended to represent their affinities. Schiner and others have adopted the relative lengths of the basal section of the 3rd longitudinal vein and the anterior cross-vein, as the preliminary distinction in separating the species, but in view of its decided variability in *obscuripennis* and the closely allied European *marci*, L., it seems safer to distinguish the species comprised in the present paper by their conspicuous differences of colour.

***Bibio hortulanoïdes*, mihi, sp. nov.**

♂ ♀ Darjiling district. Long. ♂ 14 mm., ♀ 11-12 mm.

Head.—In ♂ eyes closely contiguous from the vertex to immediately above the antennae, leaving a very small frontal triangle, the eyes with dense dark brown hair. Proboscis, palpi and antennae black with thick long dark brown hair, which is also long and thick behind the vertex. Vertical triangle conspicuously elevated bearing the three ocelli.

In the ♀ the frons is one-third the width of the head, shining black, with some black short hair, ocellar tubercle as in ♂. The other parts as in the ♂ but the hair is more blackish than brown, whilst the pubescence on the proboscis, palpi, under side of head and behind the eyes is yellowish.

Thorax.—In ♂, dorsum, scutellum and sides shining black, densely covered with blackish brown hair. In the ♀ the dorsum is bright brownish yellow (with microscopic concolorous pubescence), the colour very sharply delimited. The remainder of the thorax black, moderately shining, with short black hairs. Scutellum and scutellar ridge black; metanotum black.

Abdomen.—In ♂, shining black, wholly covered on all sides with thick blackish brown hair. The genital organs shining black, obtuse, bilobed. In the ♀, bright brownish yellow with short concolorous pubescence; belly similar. Genital organs inconspicuous.

Legs shining black, pubescent, spines on fore tibiae with a dull carmine tinge, pulvilli yellowish white.

Wings brownish in ♂ as in *obscuripennis*, Meij.; in ♀ very pale grey, conspicuously lighter than in the ♂, anterior border a little blackish in the ♂, but wholly deep black in the ♀. Stigma large, black. Halteres black.

Described from a ♂ and ♀ in bad condition in the Indian Museum (labelled simply "Ind."), which were returned by Bigot marked "*hortulanus* ♂ ♀ ?"; also a perfect ♀ obviously of the same species taken at Kurseong, 15-v-10.

Types in the Indian Museum.

NOTE.—This is either a large and well-marked variety of *hortulanus*, L., or distinct. The differences apparent are, the much greater size of the ♂, *hortulanus* being generally about 8 to 11 mm. in length; the brown, not whitish wings in the ♂, the yellowish hair in the ♀ on the under side of the head and behind the eyes, the hair in this position in *hortulanus* (♀) being black.

***Bibio obscuripennis*, Meij.**

This species was abundant at Darjiling during a few days before and after October 16th 1905, when I captured several pairs *in cop.* in addition to a good number of males and a lesser number of females. My identification of the species was confirmed by Herr Meijere.

Its chief distinction from *marci*, L., to which it bears a remarkably close resemblance, is the brown wings in the ♂. In *marci* they are nearly clear, with a whitish tinge. The basal section of the 3rd longitudinal vein in both species varies distinctly in its length relative to that of the anterior cross-vein, in some specimens being one and a quarter times as long, in others as much as nearly double, and it cannot be relied on exclusively as a specific character.

The species is represented in the Indian Museum by specimens from the following localities: Chitlong (Nepal); Darjiling, 16-x-05 [Brunetti]; 27-v-10 (6,000 ft.) [D'Abreu]; Kurseong, 23-iv-10 [D'Abreu]; Naini Tal, 28-ix-07; Matiana (Simla hills, 8,000 ft.), 28, 30-iv-07 [Annandale]; Chinese Frontier, N. W. Burma (4—5,000 ft.), xi-10 [C. W. Beebe].

***Bibio proximus*, mihi, sp. nov.**

♂. Darjiling. Long. 5 mm.

Head wholly black, clothed with black hairs, including dense pubescence on the eyes.

Thorax wholly black, dull, dorsum rather more shining anteriorly, pubescence black.

Abdomen black with black pubescence.

Legs black: hind femora barely incrassated posteriorly, distinctly less so than in *marci*; hind tibiae more incrassated towards

tips than in that species, giving a distinct clubbed appearance: hind metatarsus distinctly incrassated, the second joint of the tarsi two-thirds as long as the metatarsus. (In *marci*, the metatarsus is not at all incrassated, and is twice the length of the next joint.) Spines on fore tibiae carmine tipped.

Wings very pale grey, only the anterior veins dark, those on hind part of wing normally pale: 1st section of 3rd vein barely as long as anterior cross-vein (in *marci* it is always distinctly longer, often twice as long). Halteres black.

Described from a single ♂ from Darjiling taken November, 1910, by Mr. D'Abreu.

Type in Indian Museum.

NOTES.—This species is intermediate between *marci*, L., and *obscuripennis*, Meij. From the former it is distinguished by the black, not dark brown pubescence; the shortness of the basal part of the 3rd longitudinal vein, and the incrassation of the hind metatarsus. Minor differences are the lesser incrassation of the hind femora, the greater incrassation of the hind tibiae and the pale grey wings, as contrasted with the quite whitish wings of *marci*.

When placed by the side of a specimen of *marci*, these differences appear sufficiently distinctive.

From *obscuripennis*, Meij., it differs by its smaller size and clearer wings and in the structure of the hind metatarsus, which in Herr de Meijere's species is not distinctly incrassated and is twice the length of the following joint.

***Bibio abdominalis*, mihi, sp. nov.**

♂ ♀ Western Himalayas. Long. 7-8 mm.

Head wholly black; vertex very small, shining black, with small distinct ocellar triangle. Eyes (which are densely pubescent in the ♂ with very dark brown or nearly black hair), contiguous from vertex to antennae, the frontal triangle very small. Antennae and palpi wholly black, moderately pubescent.

Thorax shining black, closely pubescent; a fan-like bunch of hair in front of and another one below the root of the wing. Scutellum and metanotum shining black, the former with long soft black hairs on posterior margin, with a tendency to curl forwards; metanotum bare.

Abdomen shining black in ♂, with close long black pubescence; belly similar. Genital organs confined in a hard squarish segment-like case. In the ♀ the abdomen is normally wholly reddish yellow, with minute sparse black pubescence; belly similar. Genital organs apparently comprised in a flat elevation on the under side of the last abdominal segment.¹

¹ In the type ♂ and ♀, which still remain united, both abdomens are considerably stretched out, as though the insects in life had endeavoured to separate themselves, yet no extension of any part of the male genitalia can be seen. There

Legs shining black, anterior femora with dense black hair, hind pair with the hair much sparser: tibiae and tarsi moderately pubescent.

Wings dark grey in ♂, a little blackish in ♀, in both sexes somewhat iridescent in certain lights, costal cell and stigma brownish, veins dark brown. The basal section of the 3rd longitudinal vein is almost exactly equal to the anterior cross-vein. The 4th longitudinal vein forks immediately before the posterior cross-vein. Halteres blackish.

Described from a type ♂ and ♀ taken *in cop.* by Mr. A. D. Imms at Badrinath (10,200 ft.), Garhwal district, 27-v-10, also from one additional ♂ and three additional ♀♀ of the same date and locality, and a ♀ taken by Dr. Annandale at Phagu (Simla district, 9,000 ft.), 11-v-09.

Types in the Indian Museum (also most of the other specimens).

NOTES.—One of the three females referred to above has the abdomen blackish except towards the side, where the colour is sufficiently distinct to identify the specimen with certainty with this species.

This species is very like *B. marci*, L., the common Palaearctic and North American species, but in that species the ♀ abdomen is wholly black as in the ♂, so that in spite of the resemblance between the males, the specific difference between the two forms is indisputable.

***Bibio approximatus*, mihi, sp. nov.**

? = *venosus*, Meig., var.

♀ Darjiling district. Long. 5-6 mm.

Body wholly black, head much flattened, slightly pubescent. Dorsum of thorax with sparse short black hairs; a very small brownish yellow spot just below posterior corners of dorsum. Scutellum and metanotum black. Legs with terminal spines on fore tibiae reddish brown, apical spurs on posterior tibiae, brownish yellow. Hind metatarsi not at all thickened, nearly twice as long as the 2nd tarsal joint. Abdomen with very pale yellowish hairs. Ovipositor normal.

Wings pale yellowish grey, hardly darker on anterior part; veins pale brownish yellow, but clearly defined; those on hinder part of wing when viewed from certain directions appear almost as dark as the anterior veins. Stigma large, well defined, oval, black, a slight narrow blackish suffusion over base of 5th longitudinal vein. Basal portion of 3rd longitudinal vein almost exactly equal to the length of the anterior cross-vein. Halteres black, but basal half of stem yellowish.

is a small thick rounded organ between the two abdomen tips of the same red colour as the ♀ abdomen, but it is not obvious to which abdomen it really belongs.

Described from one ♀ from Kurseong, November, 1910, taken by Mr. D'Abreu.

Type in Indian Museum.

NOTE.—This species must bear a considerable resemblance at first sight to *Bibio venosus*, Meig., owing to the rather clear wings, the distinctness of the veins, and the similarity in size. Though the abdomen is given as only a little over 5 mm. in length, it is probably more in living specimens, as the single example examined appears to be shortened by shrinkage; otherwise the wings are abnormally long, their full expanse being 20 mm. The relative length of the hind metatarsus to the following joint is practically identical in both species, and it is quite possible the specimen before me really is a variety of *venosus*, Meig., bearing about the same relation to it as *obscuripennis* does to *marci*, the only suggested differences in my new species from *venosus* being the grey instead of clear wings, and the pale yellow instead of whitish colour of the abdominal pubescence.

***Bibio discalis*, mihi, sp. nov.**

♀ Western Himalayas. Long. $5\frac{1}{2}$ mm.

Head.—Frons over a third the width of the head, dull black with sparse short black hair. Ocellar triangle normal. Pale hairs behind the vertex. Antennae black, scape yellowish. Tip of proboscis yellowish and the 1st joint of the palpi also, the remainder black, all the organs with black pubescence.

Thorax.—Dorsum dull black, sharply delimited from the wholly yellowish remainder of the thorax. Prothorax considerably enlarged, conspicuously over the anterior corners of the dorsum. Scutellum yellowish, metanotum black. The whole thorax, with the scutellum with pale yellow hairs.

Abdomen black; pale yellow hairs on both dorsal and ventral sides, extreme tip and belly yellowish.

Legs yellowish, knees narrowly black; fore tibiae and tarsi (in one example) with a slight pale reddish brown tinge and the spurs carmine tipped; tips of tarsi brown.

Wings pale grey, anterior border no darker, stigma light brown, elongate. Halteres yellowish.

Described from two ♀ ♀ from Phagu, Simla district (9,000 ft.), 11-v-09, taken by Dr. Annandale.

Type in Indian Museum.

NOTE.—This species has considerable resemblance to *B. johannis* ♀, but the distinctly yellowish thorax with well-defined black dorsum at once distinguish it from the European species, in which the whole thorax is black or blackish brown.

***Bibio johannis*, L.**

Two males, taken by Dr. Annandale at Matiana, 28—30-iv-07, and another from Theog (9,000 ft.), 2-v-07 (both places, Simla district), certainly represent this well-known European species.

***Bibio rufifemur*, mihi, sp. nov.**

♀ Darjiling. Long. 6-7 mm.

Head black; antennae with a little blackish pubescence; some short grey hairs behind head. Ocelli close together on a small triangle on extreme vertex; frons wholly bare.

Thorax black, a little brownish grey hair on pleurae. Scutellum and metanotum shining black, former with a few short black hairs on hind margin.

Abdomen black, roughened, with black and brown hairs.

Legs.—Coxae shining black, with microscopic yellow pubescence, and a few longer hairs; tips reddish on outside. Femora bright orange-red, with sparse, very short, yellow hairs, tips black. Remainder of legs black, with short black or brown hairs, tips of tarsi joints narrowly yellowish brown.

Wings brownish grey, darker anteriorly; costal cell rather dark brown; stigma distinctly dark brown, rather small, elongated egg-shaped, not touching 3rd longitudinal vein. Veins on front half of wing brown, 4th, 5th and 6th veins brownish yellow: 4th vein forks rather widely at junction with posterior cross-vein and just beyond tip of 2nd vein. Halteres black.

Described from two ♀ ♀ in my collection, taken by me at Darjiling, 20-x-05.

***Bibio fuscitibia*, mihi, sp. nov.**

♂ Western Himalayas. Long. 5-6 mm.

Head black, with rather long and thick black hairs, mixed with some dark brown ones; antennae and palpi black, mouth greyish white.

Thorax and scutellum shining black, black haired.

Abdomen black, moderately shining, with blackish and dark brown hairs. Belly similar.

Legs normal; femora black with brown hairs; fore tibiae dark brown, ending in a light brown spine, posterior tibiae reddish brown, middle pair darker, black at tips, shortly setose; hind pair with softer hairs, darker towards tips; tarsi brown, darker at tips; hind metatarsus thickened, one-and-a-half times as long as next joint.

Wings nearly clear, stigma dark brown, moderately long, and distinct: 4th longitudinal vein forking exactly at junction with outer cross-vein, the branches not widely separated. Halteres black.

Described from a ♂ in the Indian Museum collection from Phakia, Kumaon district (10,700 ft.), taken by Mr. A. D. Imms, 3-vi-09.

N.B.—This species bears a considerable resemblance to the European *B. laniger*, Mg., but that species has greyish brown, thicker, woolly hair, and a comparison of specimens of the two species shows them to be quite distinct.

Bibio defectus, mihi, sp. nov.

♂ Darjiling. Long. $3\frac{1}{2}$ mm.

Head and appendages wholly black, very shortly pubescent.

Thorax shining black, with dark brown hairs; scutellum and sides black.

Abdomen black with brown hairs, greyish hairs at the tip and at the sides near the base.

Legs dark brown, hind femora nearly black, somewhat long, distinctly though not greatly clubbed, hind tibiae a little lighter, with darker streaks, also clubbed.

Wings pale brownish grey; stigma moderately large and distinct; 4th longitudinal vein forking distinctly proximad of the posterior cross-vein, the branches moderately diverging; lower branch of 4th and upper branch of 5th veins shortened, not reaching the wing-margin. Halteres black.

Described from a unique ♂ from Kurseong, taken 13-viii-09 [Paiva]; preserved in the Indian Museum.

NOTE.—This species comes in the group containing the European species *clavipes*, *varipes*, etc.

Dilophus graciosus, Big.*Redescription.*

♂ ♀ N. India; China. Long. ♂ 3 mm., ♀ $3\frac{1}{2}$ - $3\frac{3}{4}$ mm.

♂ Eyes rather bright reddish brown, some long whitish hairs below the head. Thorax shining, abdomen somewhat roughened; posterior margin of scutellum, and a scutellar ridge below it, connecting it with the metanotum, bright brownish yellow. The whole body with short sparse pale hairs. Legs reddish brown, with yellowish hairs (longest on the femora); coxae and tarsi tips darker. Wings (damaged) nearly clear, stigma dark brown, distinct but ill-defined; halteres black, rather large, stems yellow.

♀ Head black, shining, eyes long, antennae jet black. Thorax bright ferruginous, with a thin black dorsal line, which widens anteriorly and extends along the anterior borders of the thorax nearly to the shoulders.

Abdomen dull ferruginous, dorsum of segments blackish, the first two or three segments nearly wholly blackish on upper side. Belly ferruginous. Legs black, all the coxae, the fore femora wholly, middle femora wholly, except the tips, and the basal half of the hind femora, bright ferruginous. Wings uniformly yellowish grey, stigma large, clear cut, black.

Redescribed from specimens of both sexes in the Indian Museum including the type ♂ and ♀, which were taken *in cop.* by Major Sage in September 1890 at Dharamsala, Western Himalayas. The other specimens are from Amangarh, Bijnor District, United

Provinces, 24-ii-10; Kurseong, 24-vi-10; Theog (8,000 ft.), 2-v-07; Phagu (9,000 ft.), 11-v-09 [*Annandale*]; Kumaon district (5,700 ft.), July 1909 [*Imms*]; Darjiling, 21-iv-10 [*Beebe*].

A ♀ in the same collection from Yunnan, South China, almost certainly represents the same species.

Type ♂ and ♀ in Indian Museum.

***Scatopse brunnescens*, mihi, sp. nov.**

♀. Ceylon. Long. 2 mm.

Whole body and legs dark shining brown, slightly yellowish, tinged here and there with short whitish pubescence. Dorsum of abdomen nearly black, belly dark brownish yellow. Antennae with 2nd scapal joint a little longer than the 1st, followed by six flagellar short, wide, rounded joints, with a long (equally broad at its base), conical terminal joint; all the antenna with close greyish pubescence.

Wings with the two anterior distinct veins joined towards the base by a short cross-vein, the 1st of these veins ending before the middle of the costa, the 2nd ending some little distance before the tip of the wing, at the spot where the costal vein ends. Of the faint veins, the 1st is perfectly straight, ending some little distance below the tip of the wing, forked beyond its middle, the branch vein being anterior to the vein itself, the prong of the fork ending exactly at the wing tip. The next vein is slightly curved, attaining the wing-border faintly: the 3rd and 4th veins are short and distinct, both curved rather suddenly downwards towards their tips to the hind margin.

Described from one specimen from Peradeniya, 9-viii-10 [*Gravelly*].

Type in Indian Museum.

***Scatopse nigronitida*, mihi, sp. nov.**

♂ ♀ Western Himalayas. Long. 2-2½ mm.

Wholly shining black with minute black pubescence. Femora with a tinge of dark brown in certain lights. Wings clear; 4th vein originating immediately proximad of tip of 1st, the branches diverging gradually up to half their length, afterwards diverging widely. Upper branch of 5th nearly straight; lower branch, originating near base, almost at right angles, nearly straight. Halteres thick, brown.

Described from two pairs taken *in cop.*, an additional ♂ and 2 ♀ ♀ in the Indian Museum from Dharampur (5,000 ft., Simla hills), 14-v-08 [*Annandale*].

SIMULIIDAE.

SIMULIUM.

Table of species.

- | | | |
|----|--|--------------------------------|
| A | Thorax distinctly reddish brown, with short yellow hair | <i>rufithorax</i> , sp. nov. |
| AA | Thorax black; at most with a dull reddish brown tinge occasionally. | |
| B | Thorax with grey shoulder spots, and a wide greyish band on posterior margin | <i>griseus</i> , sp. nov. |
| BB | Thorax without either grey shoulder spots or posterior marginal band. | |
| C | Abdomen destitute of any sign of yellow hair. | |
| D | Hind metatarsus much incrassated, nearly as long and as large as the tibia ¹ | <i>metatarsalis</i> , sp. nov. |
| DD | Hind metatarsus not so conspicuously incrassated; distinctly less in size than the tibia. ¹ | |
| E | Antennae wholly black. Long. $2\frac{1}{2}$ mm | <i>griseifrons</i> , sp. nov. |
| EE | Antennae reddish yellow at base. Long. $1\frac{1}{2}$ mm. | <i>rufibasis</i> , sp. nov. |
| CC | Abdomen with short bright yellow hair, or with rather shaggy brownish yellow hair. | |
| F | Abdomen with normal, short, very bright yellow hair. | |
| G | Abdomen with at least the first two segments distinctly yellowish or brownish yellow, often several segments so coloured | <i>indicum</i> , Becher. |
| GG | Abdomen all black | <i>aureohirtum</i> , sp. nov. |
| FF | Abdomen with distinctly longer shaggy brownish yellow hair | <i>senilis</i> , sp. nov. |

Simulium rufithorax, mihi, sp. nov.

♂ ♀ Bombay; E. Himalayas. Long. 2 mm.

Head.—Eyes dull red, the upper facets in the ♂ very large, the lower ones small, sharply demarcated from each other, the eyes being absolutely contiguous from the extreme vertex to the antennae. In the ♀ the facets uniformly small, the frons dark grey, nearly blackish, covered with golden yellow hairs. Proboscis and palpi blackish, the former with well-developed labella at the

¹ Probably a sexual character, but no better one offers itself, and the two forms may possibly be the ♂ and ♀ of the same species.

tip, the latter with the last joint distinctly the largest. Antennae more or less reddish brown (in the type ♂, the scape and two basal flagellar joints reddish,¹ in one ♀ wholly red, in the other only slightly so at the base, in all cases with whitish pubescence over the whole flagellum). A row of whitish hairs behind the eyes encircling the back of the head.

Thorax wholly rather dull but obviously reddish brown on dorsum, covered with bright golden yellow hairs, sides of thorax wholly blackish grey. Scutellum reddish brown, metanotum dark grey.

Abdomen blackish, the posterior margins of the segments very narrowly whitish, dorsum with a few pale scattered hairs.

Legs.—Apparently normally the coxae and femora dull reddish brown or brownish yellow, the tibiae and tarsi blackish, but the brownish colour extends at least to the hind femora in one of the female specimens. Hind metatarsus much enlarged in both sexes, especially so in the ♂, in both sexes as long as or slightly longer than the rest of the tarsus and about two-thirds as long as the tibia.

Wings clear, venation normal. Halteres brownish or blackish.

Described from one ♂ from Kanara, Bombay, viii-07, and two ♀ ♀ from Karwar, Bombay, viii-07. Two ♀ ♀ in the Indian Museum are from Kurseong, 10—26-ix-09 [*Lynch*], and 7-ix-09 (type ♀) [*Annandale*].

Type ♂ in the Pusa collection, type ♀ in the Indian Museum.

Simulium grisescens, mihi, sp. nov.

♂ Darjiling district. Long. $1\frac{1}{2}$ mm.

Head set very close on the thorax. Eyes with conspicuously large facets on upper side; a moderately narrow face below the antennae, light grey. Antennae black, with rather thick short grey pubescence, scape brownish yellow. Proboscis blackish, yellowish at tip; palp black.

Thorax deep velvet-black, evidently originally covered with the short bright yellow hairs common to most of the Oriental species, shoulders broadly and squarely pale blue greyish dusted, the inner corner of the spot nearly rectangular; also a broad similarly coloured band on the posterior margin. This rather gives the appearance of the dorsum being of blue-grey ground-colour with a broad deep black transverse band occupying the major portion of the surface with a contiguous perpendicular broad stripe reaching to the anterior margin. Sides of thorax conspicuously blue-grey dusted; scutellum blackish, metanotum black.

Abdomen black, apparently with a little brownish yellow pubescence; 1st segment with blue-grey shimmer, the fan-shaped side hairs brownish yellow. Belly black.

¹ Under a strong light, the microscope reveals the whole antenna as dull reddish brown, though the flagellum appears mainly black to the naked eye.

Legs.—Fore coxae pale yellowish, posterior coxae blackish grey. Fore femora principally brownish yellow, a little blackish towards the tip: posterior femora blackish, the base shortly yellowish. Fore tibiae and tarsi shining black, the proportions of the joints as in *indicum*, but the *three* first tarsal joints are widened, although none of them to such an extent as in that species: 4th and 5th joints very narrow.

Middle tibiae black, narrowly yellowish at base, metatarsus yellowish, black at tip, rest of tarsus black, the joints narrowly yellowish at base. Hind tibiae considerably widened, black, very narrow at base, where it is a little yellowish; hind metatarsus much enlarged, basal half yellowish, the rest black: remainder of tarsus black, base of 2nd joint a little yellowish: hind metatarsus much longer than the rest of the tarsus and practically as long as the tibia. Both hind tibia and metatarsus with long hairs on the upper side.

Wings quite clear, venation normal, halteres bright yellow, large and thick.

Described from a unique type male in the Indian Museum from Kurseong, taken by Mr. Lynch, 10—26-ix-09.

NOTE.—This is a very distinct species, recognisable by the bluish grey dusted spots on the shoulder, the similarly coloured band on the posterior margin of the thoracic dorsum, and the first abdominal segment tinged with the same colour also. The third fore tarsal joint being widened is also a specific distinction, and noticeable when specimens of *grisescens* and *indicum* are placed side by side.

***Simulium metatarsalis*, mihi, sp. nov.**

♂ Darjiling district. Long. barely 2 mm.

Head very closely applied to the thorax. Eyes contiguous from vertex to antennae, upper facets very large. Proboscis and palpi black. Antennae black, with close greyish pubescence.

Thorax black; dorsum with close bright yellow hairs which appear reddish orange when viewed from certain directions. Scutellum black, with yellow hairs. Sides of thorax and metanotum black. Lower part of thorax anteriorly, grey dusted.

Abdomen wholly black with rather sparse black pubescence, no trace of gold hairs. Belly similar. The hairs towards the sides of the 1st segment light brownish.

Legs.—Fore coxae yellowish, posterior pairs blackish. Fore femora and tibiae dull yellowish, with golden yellow hair nearly as far as the tip of the latter, which with the whole tarsus, is black, the tarsus narrow, of equal width throughout. In spite of the gold hair the fore tibiae viewed from above appear whitish grey. Middle femora and tibiae slender, basal half of each yellowish, with some yellow hair, apical half black, as are the slender middle tarsi. Hind femora mainly black, slightly pale yellowish at base, tibiae much incrassated, basal half yellowish,

with gold-yellow hair, metatarsus much incrassated also. Nearly as large as the tibia. Relatively larger than in any other Oriental species, the basal half yellowish, rest of tarsus black. The hind tibiae and metatarsi with numerous long hairs on upper side.

Wings colourless, venation normal. Halteres brownish.

Described from a perfect unique ♂ from Kurseong, taken 28-iii-10, by Dr. Annandale.

Type in the Indian Museum.

NOTE.—From the general resemblance between the two species, it seems possible that *griseifrons* may be the ♀ of this species.

***Simulium griseifrons*, mihi, sp. nov.**

♀ Western Himalayas. Long. nearly $2\frac{1}{2}$ mm.

Head.—From between one-third and one-fourth the width of the head; grey dusted, without any vestige of gold hair; face convex, blackish. Proboscis and labella reddish brown, palpi black. Antennae wholly black. Back of head blackish grey (seen from above, whitish grey), with some black hairs, which form an irregular fringe behind the eyes.

Thorax (partly denuded) black, apparently covered with short golden yellow pubescence. Scutellum black, covered with gold pubescence and with a row of long soft black hairs on hind margin. Sides of thorax blackish.

Abdomen black, the extreme edge of each segment pale.

Legs.—Fore coxae dull brownish yellow, posterior coxae black. Femora brownish yellow, apical half black, the colour less pronounced and less extensive on the fore pair. Tibiae, basal two-thirds yellowish, apical third black; the outer sides of the tibiae, seen from above, appear whitish. Tarsi black, the anterior ones with metatarsus as long as the rest of the tarsus, but only slightly wider. Hind metatarsus considerably incrassated, distinctly longer than rest of tarsus, and with the basal half yellowish white.

Wings clear; venation in accordance with the generic characters. Halteres pale yellow.

Described from one ♀ from Kalighat, Kumaon (6,000 ft.), Western Himalayas, taken by Mr. A. D. Imms, 4-vi-10.

Type in Indian Museum.

NOTE.—Possibly the ♀ of *metatarsalis*. The only distinctive character between them seems to be the difference in the size of the hind metatarsus, and this is probably a sexual one.

***Simulium rufibasis*, mihi, sp. nov.**

♀ Darjiling district. Long. $1\frac{1}{2}$ mm.

Head.—Frons blackish grey without trace of gold hair, face light ash-grey. Proboscis and labella dull dark reddish brown; palpi black. Antennae black, basal two or three joints reddish yellow.

Thorax as in previous species, except that the scutellum is slightly reddish brown at the tip, and that (being denuded) no golden yellow hair is visible on its dorsum, though such is probably present in perfect specimens.

Abdomen wholly black, dull.

Legs.—Fore coxae yellowish, posterior coxae black: all trochanters brownish yellow. Femora black, but fore pair a little yellowish at the base. Fore tibiae whitish yellow, except a little blackish at the tip, posterior tibiae yellowish on basal half, blackish on apical half. Tarsi exactly as in the previous species.

Wings clear; venation normal. Halteres bright yellow.

Described from a single type ♀ in the Indian Museum, taken by Dr. Annandale at Kurseong, 18-vi-10.

Simulium indicum, Becher.

This species was described originally (Journ. Asiat. Soc. Bengal, liii, 199, pl. xiv) in 1884 from female specimens in the Indian Museum from Assam.

It appears to be fairly common and widely distributed along the Himalayas and into Assam, the Museum possessing specimens from Mussoorie (7,400 ft.), 19-x-09 [*Badley Scott*]; Simla (7,000 ft.), 14-iv-07 [*Annandale*]; Darjiling (7,000 ft.), 12-viii-09 [*Jenkins*]; Kurseong, 10—26-ix-09 [*Lynch*]; Sylhet, 18-iv-05 [*Hall*]; Khasi Hills, "Assam," 2-iii-05 [*Hall*]; and Jaunsa, Tons Valley [*C. G. Rogers*].

Of the ♂, which has apparently not previously been recorded, there are two specimens from the island of Bombay, 25-xi-09, one of which I propose as the new type of the species, the original type ♀ not being traceable.

Two other ♀ ♀ in the same collection appear to represent a variety with wholly black abdomen; they come from Darjiling, 10-viii-09 [*Paiva*], and Ukhral, Manipur (6,400 ft.) [*Pettigrew*].

The extent of the yellow on the abdomen is very variable, in the series of specimens examined.

In general appearance the species resemble *aureohirtum*, but differs in the following points:—

The frons is shining greyish white, the humeral calli are distinctly and rather broadly reddish brown, the colour varying in extent; the sides of the thorax are distinctly grey dusted (in one example there is a grey dusted band along the lateral margins of the dorsum); the antennae are always more or less reddish brown at the base. The two principal specific characters are, the yellow colour of, generally at least, the first two abdominal segments, and the fore metatarsi are distinctly incrassated as well as lengthened. The fore coxae are yellowish, the posterior ones blackish; the femora and tibiae are pale on the basal half, the remainder being black; the fore and hind tibiae are shining whitish yellow. Tarsi black, posterior metatarsi pale on basal half, more so on hinder pair. The fore metatarsus and hind metatarsus are both

lengthened and considerably incrassated; the golden yellow hair on the hind legs reaches to and covers the metatarsus; it is apparently sparser on the anterior legs.

***Simulium aureohirtum*, mihi, sp. nov.**

♂ ♀ Assam and Bombay. Long. 2-3 mm.

Head.—The large upper facets of the eye in the ♂ relatively smaller than in the other species, the eyes closely contiguous from vertex to antennae. Antennae dull reddish brown, varying to nearly black; sometimes scape and one or two basal flagellar joints pale also, the remainder blackish, occasionally the whole antennae brownish yellow. Frons nearly one-third of the head in ♀, blackish grey with rather thick bright yellow hair; face dark grey with a few yellow hairs. Proboscis and palpi blackish or dark brown.

Thorax blackish, occasionally with a little dull reddish brown tinge; with close bright yellow hair covering the whole of the dorsum. Shoulders sometimes reddish brown, the colour occasionally extending narrowly along the anterior margin of the thorax. The sides blackish grey, bare. Scutellum normally black, but sometimes reddish brown, always with close yellow hair. Metanotum blackish.

Abdomen blackish, with gold-yellow hair in some specimens the characteristic ridge on the first segment is pale on the hind margin; the usual fan-shaped row of yellow hairs towards each side on the first segment. Belly black.

Legs.—Normally, fore coxae brownish yellow or pale yellowish, posterior coxae black or blackish grey. Femora principally reddish brown or brownish yellow, with a broader or narrower apical band, this band generally wide on the posterior legs; often the fore femora wholly pale; sometimes the remaining femora also almost wholly so. Tibiae generally with basal half (or rather more) brownish yellow, the remainder black, sometimes wholly dark brown or brownish black; a slight whitish grey shimmer is visible in some specimens viewed from above. Tarsi blackish or dark brown, basal half of metatarsus normally pale, the extent of the colour varying considerably. Fore tarsi ♂ ♀ not widened, metatarsus barely as long as rest of tarsus, whole tarsus distinctly longer than tibia. Middle tarsi in both sexes about as long as the tibia, metatarsus equal to the remainder of the tarsus. Hind tarsi in ♂ considerably thickened, three-fourths as long as tibia, and distinctly longer than the rest of the tarsus, whole tarsus a little longer than tibia. Hind tarsus in ♀ of the same proportion as in the ♂ except being less thickened.

The coxae, femora, outer side of tibiae, and the under side of the hind metatarsus (the latter in ♂ only) bear golden yellow hair more or less prominently in ♂, more sparsely in ♀

Wings clear, venation normal. Halteres brownish or brownish yellow.

Described from two ♂♂ from Umling, Assam, iii-07 (including type ♂), and several ♀♀ from Kanara, Bombay, viii-07 (including type ♀), also two ♀♀ from Umling, iii-07, all in the Pusa collection. A ♀ with all the pubescence rubbed from the abdomen is probably this species. It is in the Indian Museum, from Kurseong, 6-ix-00.

Types in Pusa collection.

NOTES.—Although none of the specimens are in good condition, the specific characters as illustrated by the full series seem to be sufficiently distinctive from *indicum* to warrant the claim of the species to specific rank. The differences I perceive are, (i) the abdomen is wholly black, instead of yellowish at the base; (ii) the blackish grey, not whitish grey sides to the thorax; (iii) the barely widened fore tarsi in the ♀, compared with the conspicuously widened two first joints in *indicum*. The amount of bright yellow hair also appears greater in this species, especially on the legs.

***Simulium senilis*, mihi, sp. nov.**

♂ Western Himalayas. Long. 3 mm.

Head.—Eyes closely contiguous, the head applied very closely to the thorax. Proboscis, palpi, antennae and under side of head wholly black.

Thorax black, with short bright yellow hair. Sides black, with a little greyish reflection. Scutellum black, with bright yellow hair, metanotum black.

Abdomen black with moderately sparse but rather ragged yellowish or brownish yellow hairs which are distinctly longer than in any other Oriental species, and present an appearance of shagginess. The first segment has the characteristic (generic) ridge a little pale, with, towards each side, very long shaggy brownish yellow hair which reaches nearly to the middle of the abdomen.

Legs.—Fore coxae pale yellowish, posterior coxae blackish. All femora yellowish, a little darker at the tip, especially the hind pair. All tibiae dirty yellowish, a little darker towards the tip; both femora and tibiae with golden yellow hair, which is less obvious on the latter. Anterior tarsi black, narrow, not at all enlarged, metatarsus equal in length to the remainder of the tarsus, the whole tarsus about as long as the tibia. Hind metatarsus enlarged, two-thirds as long as the tibia, yellowish, the tip black, remainder of tarsus black with the bases of one or two of the joints a little yellowish.

Wings colourless, venation normal.

Described from a single ♂ in good condition in the Indian Museum taken by Dr. Annandale, 8-v-07, at Phagu (8,700 ft.), Simla district.

NOTE.—The length and somewhat shaggy appearance of the hair on the abdomen effectually distinguishes this species from other eastern ones.

PSYCHODIDAE.

Table of subfamilies.

The 7th longitudinal vein absent.¹ The 2nd longitudinal forks at, or only very little before, the middle of the wing. Prongs of upper branch always fork distad of middle of wing (in *P. malabaricus*, at the middle). Genitalia of the ♂ with three pairs of appendages; ovipositor in ♀ without horny scimitar-shaped pair of valves

PHLEBOTOMINAE.

N.B.—One genus only, *Phlebotomus* Rond., is Oriental.

The 7th longitudinal vein conspicuously present. The 2nd longitudinal forks quite near base of wing; always before the first fourth of the wing's length. Prongs of upper branch always fork proximad of middle of wing. Genitalia in the ♂ with two (*Psychoda* Latr., *Pericoma* Wlk.) or three (*Brunettia* Ann., *Parabrunettia* gen. nov.) pairs of appendages; ovipositor in ♀ consisting of a conspicuous horny scimitar-shaped projecting appendage, forming a pair of valves

PSYCHODINAE.

Since the publication by me, comparatively recently (Rec. Ind. Mus., ii, 369), of several new species of *Psychoda* and *Pericoma* from India, a considerable quantity of fresh material has accumulated at the Indian Museum, but it is to be regretted that the present notes and description do not in any way bring our knowledge of the Oriental, or even the Indian species up to date, as there still remains a residuum of small obscure specimens which I have been unable to deal with successfully. They may represent few species or a number of either described or of undescribed ones. Much further study is required on the limits of those already known before additional ones should be described. At present I am able to sink my *Pericoma appendiculata* definitely as the ♀ of *spinicornis*; and *P. bella* as a synonym of *margininotata*. No further specimens of *Psychoda distincta*, *albonotata* and *albonigra* have come before me, but good or fair series of *bengalensis*, *nigripennis*, and *vittata* have stamped these as good species. The first three species of *Psychoda* in my table

¹ In *Phlebotomus papatasi* an exceedingly short 7th longitudinal vein occurs at the base of the 6th running almost direct to the wing-margin. It is liable to be entirely overlooked but Grassi figures it, and it is found in *P. perturbans*, Meij.

(l. c., p. 370) are referred to a new genus, closely allied to the recently established *Brunettia*, Annandale, but of these species, no further specimens have been seen of *squamipennis* and *argenteopunctata*.

Four genera are recognised here in the Psychodinae, *Psychoda* and *Pericoma*, which never possess conspicuously scaled wings and conspicuous chaetae together in the same species;¹ and *Brunettia* and *Parabrunettia* (the latter, new) in which both scaled wings and tolerably or very conspicuous chaetae on the flagellar joints of the antennae are simultaneously present. I am still much in doubt, however, as to the limits of both these latter genera.

Eaton's genera are, to my thinking, untenable,² yet the group of species with thickly scaled, broad wings, generally with hairs closely covering the surface also, and with distinct chaetae on the flagellum, seems a well-defined one; all of these possess the venation of *Psychoda* except *superstes*, which, being the first species described, must remain typical of *Brunettia*.

At the present state of our knowledge it appears to me that it will eventually be found that the three genera *Psychoda*, *Pericoma* and *Parabrunettia* all possess some species with and some species without: (1) areas of conspicuous extent on the wings covered with scales; (2) hairs on the surface of the wings in addition to those on the veins; and (3) some species with the 2nd longitudinal vein forking before (proximad of) the origin of the 3rd longitudinal vein whilst other species have the fork beyond (distad of) the origin of the 3rd vein. None of these can by any means be regarded as generic characters, but serve very well as primary divisions of the species into groups.

The genital organs have not occupied much attention hitherto, but Dr. Annandale is engaged to some extent on their examination. In dried specimens their exact observation is always difficult.

The presence of the spiral chaetae (so conspicuously developed in *Brunettia superstes*) in *Psychoda distincta*, *Pericoma spinicornis* and *margininotata*, though much inferior in size, affords a further point on which to separate or substantiate species, but they must not be regarded as of more than specific value. Dr. Annandale has also discovered in *Psychoda bengalensis* and *nigripennis* a previously overlooked peculiarity in the shape of a pair of very small bifid chaetae on each joint (except the last) of the flagellum, having the appearance of two pairs of cow's horns. They may, quite possibly, be present in some other species, but require very minute examination, being almost transparent.

¹ "Conspicuous" is emphasized, as very small chaetae (differing only in size from those in *Parabrunettia*), are found by Dr. Annandale to be present in some species of *Pericoma*. They appear to be absent in most species of *Psychoda*.

² A number of genera in Psychodidae, created on variations of scales on the wings, seems wholly undesirable, as tending to reduce the family to the level of taxonomic absurdity at present happily to be found only in the Culicidae.

PSYCHODA and PERICOMA.

A closer study of the Indian species in these two genera (which represent the only Oriental ones available) results in several characters being found which were not made use of in my previous paper on this family.

Firstly there is the presence or absence of distinct scales on the wings—nearly always of some shade of brown, although sometimes appearing whitish or greyish when viewed from certain directions. These scales appear in only one species (*apicalis*) of *Psychoda*, but characterise several species in *Pericoma*, whilst in *Parabrunettia* they are present in some species on both the upper and lower surfaces of the wing, and in others on the lower surface only.

In referring to these scales, allusion is not made to a certain number of scale-like hairs or even true scales, few in number and irregularly placed, at the base of the wing, and which may be present in many species, possibly adventitiously; but only to cases where the scales are numerous, eminently conspicuous and arranged in regular rows, covering thickly the whole of such portion of the wing-surface as they may occupy.

The second character, which, like that of scales, is quite consistent in its occurrence or absence, is that of hairs, comparatively soft or at least less bristly than usual, closely covering the *surface* of the wing as well as the veins and arranged *longitudinally* or nearly so, so that they do not form the "criss-cross" pattern obvious in the case of all those species in which the hairs are confined to the veins. It is quite obvious at a glance to which category any wing belongs except in the densely scaled ones.

The third consistent character is the position at which the 2nd longitudinal vein forks (always near the base of the wing); whether before or after (proximad or distad of) the origin of the 3rd longitudinal vein.

Further characters appear less definite and should best be applied only to the separation of closely-allied species, being liable to occasional variation.

The three principal characters above specified can be used in both *Psychoda* and *Pericoma*.¹ Under *Brunettia* and *Parabrunettia* (two at present rather indefinitely characterised genera) are given some considerations relating, chiefly or wholly, to those species at present referred to them.

PSYCHODA, Latr.*Table of species.*

- A *Surface of wing either without scales, or*
(when such are present) limited to a

¹ Probably they will be found to apply equally well to at least *Parabrunettia* also, when this genus is more closely characterised and a larger number of its species better understood.

- few small tufts forming spots placed at the tips of the veins, on the margin of the wing or at the forking of the veins: never covering any appreciable extent of the wing-surface.¹ Sometimes a few, irregularly placed, at the base of the wings.
- B Wings with the *hairs on the veins only*, arranged in two divaricate depressed rows, one on each side, and generally overlapping those of the contiguous veins, presenting a "criss-cross" appearance to the whole wing. *No hairs whatever on the surface of the wing. No obvious scales*, except as forming the small spots.
- C Wing with *distinct black hair-spots* at the tips of many or all of the veins.
- D The 2nd longitudinal vein forks *very closely* proximad or distad of the base of the 3rd vein.
- E Fore metatarsi wholly white scaled . *geniculata*, sp. nov.
- EE Fore metatarsi never wholly white scaled (at the tip only in *albonigra*, and not at all in *bengalensis*).
- F Wings with thick black bushy hair on costa, with small spots (each composed of one or two white scales), placed along a considerable section of it, at apparently regular intervals. (The 2nd longitudinal vein forks immediately proximad of the base of the 3rd vein; the fork of the anterior branch of the 2nd vein opposite that of the 4th vein.) *albonigra*, Brun.
- FF Wings with only normally blackish grey hair; *scale-spots wholly absent*. The 2nd longitudinal vein forks barely distad of the base of the 3rd vein, practically simultaneously. The fork of the anterior branch of the 2nd vein a little distad of that of the 4th vein . . . *bengalensis*, Brun.
- DD The 2nd longitudinal vein forks *considerably* distad of the base of the 3rd vein.

¹ An apparent exception is *P. orbicularis*, in which scales are present on the basal portion of the *veins only*, but never on the *surface* of the wing, that is to say, *emanating* from the surface.

- G White scale-spots *absent* from tips of veins. Tips of tibiae and metatarsi not white scaled *distans*, sp. nov.
- GG White scale-spots *present* at tips of veins. Tips of tibiae and metatarsi with white scales *albopicta*, sp. nov.
- CC Wings without hair-spots at tips of veins.
- H Veins of wings *wholly without rows of distinct scales* on any part of their length, nor distally in the form of spots.
- I The 2nd longitudinal vein forks distad of the base of the 3rd vein. Hairs on veins uniformly blackish—no conspicuous lighter sections of hairs. The middle veins (2nd, 3rd and 4th) nearly straight or gently bisinuate.
- J Thorax with *blackish grey* hair. Anterior branch of 2nd longitudinal vein forking a little beyond the middle of the wing, the 4th forking *a little before the middle* *nigripennis*, Brun.
- JJ Thorax with *bright yellowish brown* hair. Anterior branch of 2nd vein forks as in *nigripennis*, but the 4th vein forks *near base of wing* *fulvohirta*, sp. nov.
- II The 2nd longitudinal vein forks proximad of the base of the 3rd vein. Hairs on veins mainly blackish but with a transverse band of light brown hairs, formed by a short row placed beyond the middle part of each vein, in the distal portion of the wing. The middle veins (2nd, 3rd, 4th) distinctly arcuate *vittata*, Brun.
- HH Veins of wings with *distinct scales* on the *basal fourth* of all of them *orbicularis*, sp. nov.
- BB Wing with the *surface closely covered with hairs* as well as the veins, the hairs placed much more longitudinally than in the species of B section, giving a longitudinal appearance to the pubescence instead of a criss-cross network.
- K Distinct spots at least near the margin of the wing, white or black or both, composed of small scales or stiff hairs.

- L The white spots on wing chiefly confined to the wing-border, or at forking of 2nd and 4th veins.
- M Anterior branch of 2nd longitudinal vein forks opposite fork of the 4th vein. *A few scales* near the base of the wing. The small white scaly hair-spots placed *at the tip* of each vein, wherever they occur . *albonotata*, Brun.
- MM Anterior branch of 2nd longitudinal vein forks a little proximad of the fork of the 4th vein. The white spots composed of white *hairs*, not scales, and placed *between* the tips of the veins, not at the tips . *distincta*, Brun.
- MMM Anterior branch of 2nd longitudinal vein forks near middle of wing, a little distad of the fork of the 4th vein. All three terminations of the 2nd, and that of the 3rd vein with a pair of small spots placed very closely together, composed of a few elongate yellow bristly hairs. Lower branch of 4th vein, and the 5th vein, at their tips with conspicuous black hair-spots. Tips of other veins with more or less inconspicuous black hair-spots, or a tendency thereto . *decora*, sp. nov.
- LL The white spots (20 or more) distributed irregularly along all the veins, giving the entire wing a spotted appearance . *maculipennis*, sp. nov.
- KK No distinct spots near or at the wing-margin. With or without two transverse narrow bands of grey scale-like hairs.
- N With such transverse bands . *transversa*, sp. nov.
- NN Wing wholly unmarked . *hirtipennis*, sp. nov.
- AA Surface of wing *wholly covered* with *closely-placed* imbricating dark scales . *apicalis*, sp. nov.

***Psychoda geniculata*, mihi, sp. nov.**

♀ Ceylon. Long. about $1\frac{1}{2}$ mm.

Very near *P. albonigra*, mihi.

A dark brown species with dark brown wings and conspicuous white spots on the legs. Wings with black and white spots near tips of veins.

Body clothed with thick blackish brown hair, with which is intermixed on the thorax, some fan-shaped tufts of whitish grey hair. White bristly, almost scale-like, hair on vertex and bristly black hair on frons and face. Antennae with very elongate flask-shaped joints, verticillate as in *P. bengalensis*; scape with milk-white elongate scales; chaetae present on flagellum, but small, curved, not S-shaped; pubescence of flagellum greyish white.

Legs with light brown scales and some bristly hairs. Knees narrowly but distinctly white, through the presence of a few snow-white small elongate scales. Tips of tibiae and of the metatarsi with a circlet of small elongate snow-white scales. Front metatarsi almost wholly white scaled. Some pale stiff bristles on the legs but apparently no actual isolated elongate scales as in *albonigra*.

Wings with hairs situated on the veins only, rich brown in colour, showing golden brown with violet iridescence in certain lights. No surface scales on the wings, the only ones present being the small ones forming the spots at the tips of the veins. Black bristly hair-spots at tips of practically all the veins; some white scaly hair-spots near tips of some of the veins, and a few on each of the two lower branches of the 2nd longitudinal vein and both branches of the 4th vein, all placed at a little before their tips. A larger white scaly hair-spot near the base of the costa, and some isolated erect white hairs placed irregularly here and there on the veins. The 2nd longitudinal vein forks immediately distad of the base of the 3rd vein, the upper branch of the former forking barely beyond the middle of the wing, and very little distad of the fork of the 4th vein.

Described from one ♀ in the Indian Museum from Peradeniya, Ceylon, taken by Mr. E. E. Green in October 1910.

It is in perfect condition and is a distinctly good species.

***Psychoda albonigra*, mihi.**

To the description of this species may be added, "knees with a very few small white scales; tips of the metatarsi with a circlet of white scales."

The type still remains the only known specimen.

***Psychoda bengalensis*, mihi.**

In the figure of the wing of this species, no auxiliary vein is shown, although it is, of course, distinctly present, extending at least to a point beyond the fork of the 2nd longitudinal vein.

Additional data.—Darjiling (5,000 ft.), 3—4-vii-08 [*Annandale*]; (7,000 ft.), 5—8-viii-09 [*Paiva*]; Kurseong, 24-iii-10; 25—26-vi-10 [*Annandale*]; Phagu (9,000 ft.), 11-v-09; Barogh (5,000 ft.), 10-v-10; Kasauli (6,300 ft.), 15-v-08; Dharampur (5,000 ft.), 13-v-08 (all four localities, Simla hills, taken by Dr. Annandale), Naini Tal (6—7,000 ft., Western Himalayas) [*Lloyd*]; Calcutta;

common vi, vii, viii [*Annandale* and others]; Dum Dum, near Calcutta, 29-vii-09 [*Lord*]; Madhupur, Bengal, 22-x-09 [*Paiva*]; Port Canning (Ganges delta), 6-xii-07 [*Annandale*]; Bangalore, Mysore State (3,000 ft.), 16-x-10; Trivandrum, 13-xi-08; Kulatupuzha (W base of Western Ghats, Travancore), 19-xi-08; Maddathorai, same district, 17-xi-08 (all three, South India, taken by Dr. Annandale); Peradeniya, Ceylon, 8-vi-10 [*Gravely*]; Moulmein, Lower Burma, 25-ii-08 [*Annandale*].

***Psychoda distans*, mihi, sp. nov.**

♀ South India. Long. barely 1 mm.

Body covered with dark brown hair, mixed here and there with grey, the ground colour of the thorax yellowish brown, with dark greyish hair. Legs brown, the tarsi a little lighter, no white tips to tibiae or metatarsi.

Wings with the two divaricate rows of hairs on the veins only. The 2nd longitudinal vein forks considerably distad of the base of the 3rd; the anterior branch forking just beyond one third of the wing, and nearly opposite the fork of the 4th vein.

A distinct and rather large black bristly hair-spot at the tip of each vein. No white scale- or hair-spots on the wing. A distinct though not conspicuous spot composed of black hairs, at the fork of the 2nd longitudinal vein and the fork of its anterior branch also.

Described from a single ♀ in the Indian Museum from Maddathorai, Travancore State, South India, taken by Dr. Annandale, 16-xi-08.

N.B.—The genital organs are not easily seen but the specimen appears to be a ♀

***Psychoda albopicta*, mihi, sp. nov.**

♀ Bengal. Long. $1\frac{3}{4}$ mm.

Very near *P. distans*, but differing from that species, by very distinct though small white scale-spots at the tips of most of the veins, including the 3rd vein. A conspicuous bunch of black scaly hairs at the fork of the anterior branch of the 2nd longitudinal vein, and the fork of the 4th vein. Some of the black hair-spots at the tips of the veins are much less distinct than in *distans*.

Fringe of wing dark brown on costa, lighter brown on posterior margin, the whole appearing golden brown in certain lights. The hairs on the wing are brown, darker towards the base.

The *body* is dark, with brownish yellow hair, which is darker brown on the thoracic dorsum, and almost yellow in places. Antennae brown, flagellar joints flask-shaped with long necks, the verticillate hairs widely expanded. Long sinuous chaetae

distinctly present. The tips of the tibiae and of the metatarsi with a narrow circlet of white scales; the legs moderately dark brown.

Described from a single type ♀ in the Pusa collection, taken at Pusa, Bengal, 8-i-08.

***Psychoda nigripennis*, mihi.**

Several specimens recently acquired by the Indian Museum through the generosity of Mr. C. W. Beebe, are in all probability this species, taken by that gentleman ten miles south of Kuching, Sarawak, Borneo, 25-vi-10.

Being mounted on microscopic slides their absolute identification is impossible, in the absence of any previous examination.

Additional data respecting this species—Darjiling, 3-vii-08 [*Annandale*]; 8—11-viii-09 [*Paiva*]; Kurseong, 23—25-vi-08 [*Annandale*]; Simla, 9-v-09, and Phagu (Simla district, 9,000 ft.), 11-v-09 [*Annandale*]; Calcutta, common in June, July, August; 24-ii-10, hatched from partially dried freshwater sponge from edge of a garden pond; Kichha, Naini Tal (plains), 4-iv-09 [*Hodgart*]; and the following localities from South India, collected by Dr. Annandale: Trivandrum, 13-xi-08; Shasthancotta, near Quilon, 7-xi-08, "at light;" Maddathorai, 16—18-xi-08; Tenmalai, 22-xi-08; Nedumangad near Trivandrum, 14-xi-08; Ernakulam (Cochin), 4-xi-08.

***Psychoda fulvohirta*, mihi, sp. nov.**

♀ Darjiling district. Long. $1\frac{1}{2}$ mm.

Body covered with blackish grey hair, with the exception of the thorax where the hair is conspicuously *bright yellowish brown*, that of the alulae being more yellow. Antennae as in *nigripennis*. Legs blackish, without any ornamentation.

Wings with the appearance of those of *nigripennis*. The 2nd longitudinal vein forks distinctly distad of the base of the 3rd vein, and its anterior branch forks a little beyond the middle of the wing very considerably beyond the fork of the 4th vein, which occurs towards its base. The 3rd vein is gently bisinuate.

The hairs on the wings are blackish grey, those towards the base being blacker, and those of the posterior marginal fringe somewhat greyish.

Described from two ♀ ♀ from Darjiling (7,000 ft.), 7-viii-09, type [*Paiva*]; and Kurseong, 26-vi-10 [*Annandale*]; both in the Indian Museum.

N.B.—The bright yellowish brown colour of the hair on the thorax makes this species easily distinguishable from all others except those specimens of *margininotata* with similarly coloured hair, but from that species the wholly unmarked wing and unornamented tarsi will readily separate it.

***Psychoda vittata*, mihi.**

A ♂ has been taken by Dr. Annandale at Maddathorai, Travancore, South India, 18-xi-08. This sex was not previously known, but the genital organs appear normally generic in character. The wings in this species are distinctly lanceolate, the fringe of the wings is darker on the section contiguous to the brownish band of hairs, and also in the neighbourhood of the wing tip. A good specific character is the curved nature of the middle veins of the wing (2nd, 3rd and 4th, with their branches), which distinguish it to some extent from its nearest allies, *nigripennis* and *fulvohirta*.

Of the "further specimens" remarked by me after the original description of the species, as being in the Indian Museum, two are now destroyed, and the other two are certainly *vittata*.

Additional data.—Several specimens in the Indian Museum, 11—26-vii-08, and one, 16-xi-08, from Calcutta.

***Psychoda orbicularis*, mihi, sp. nov.**

♀ Bengal. Long. $\frac{3}{4}$ mm.

Very near *P. nigripennis*, but differing by the presence of distinct elongate brown scales on the basal fourth of all the veins. The wing is lanceolate in shape, the entire margin very distinct, whence its name, the costal fringe blackish, but appearing lighter if viewed from certain directions; the fringe of the posterior margin light greyish. The 2nd longitudinal vein forks distinctly distad of the base of the 3rd vein, the anterior branch forking immediately before the middle. The 4th vein forks distinctly before one-third of the wing.

The body is covered with brown or brownish grey hair. The antennae as in *P. nigripennis*, with grey pubescence. The legs yellowish grey, with light greyish pubescence.

Described from a single ♀ in good condition from Pusa, 21-xii-08. In the Pusa collection.

***Psychoda albonotata*, mihi.**

It should be noted that the whole surface of the wing is hairy in this species, as in all the following species. Moreover there are some distinct shortly elongate *dark brown scales* over the base of the wing. The Sylhet specimen noted by me¹ is almost certainly this species and the few white scales on its abdomen were probably accidentally attached, not forming part at all of the insect's vestiture.

***Psychoda distincta*, mihi.**

In the original description of this species is an inaccuracy respecting the scales noted to occur on the basal half of the wing

¹ Rec. Ind. Mus., ii, 374.

In the type specimen (the only one now existing, as the one dated 1-1-05 has been accidentally destroyed) there is absolutely no trace of any such scales, either at the base of the wing or elsewhere on it, with the exception of the very small ones that compose the wing-margin spots.

The pinned specimen dated 30-1-05 is the type; the third specimen (which is mounted on a slide, and which shows the scales mentioned), not belonging to this species.

***Psychoda decora*, mihi, sp. nov.**

? South India. Long. 1 mm.

Body covered with blackish hair, the thorax covered with bright yellowish brown hair. Antennae with the pubescence rather closely compressed, as in *P. nigripennis*. Legs brown, normally scaled and pubescent.

Wings with dark brown and blackish hairs covering the surface as well as the veins. Two inconspicuous and incomplete narrow transverse lines passing across the wing similar in position to those in *P. transversa*, composed of light brown or yellowish brown hairs, placed in small sections. Two distinct black spots near the base of the wing, composed of stiff, erect long black thickened hairs, one spot on the base of the 2nd vein, just before the fork, and the other on the anterior branch just beyond the fork. The wing-fringe is greyish, with blacker sections here and there, the hair is also darker along the costa.

Described from one ♀ in the Indian Museum taken by Dr. Annandale at Tenmalai, Travancore State, South India, 22-xi-08.

***Psychoda maculipennis*, mihi, sp. nov.**

? ♂ Ceylon. Long. 1 mm.

Body with rich dark brown hair towards sides of dorsum, yellowish grey in middle and anteriorly, deep blackish brown on abdomen. Antennae with verticillate hairs thick and close, brownish, but showing greyish reflection. Palpi black with grey scales; grey scales on face, black bristly hair on frons; grey hair on vertex.

Legs brownish, with concolorous bristly hair and scales; tarsi with dirty grey scales.

Wings with surface as well as veins closely covered with dark brown hairs. Wing-border with a narrow fringe of black hairs, which is tolerably well defined from the longer greyish fringe around the whole margin. At numerous and apparently irregular intervals these short black hairs are replaced by white or greyish ones, and along most of the veins irregularly placed, and at the tips of most of the veins are very small spots composed of a few white hairs. These small white spots (to the extent of twenty or more) give the whole wing a spotted appearance that immediately distinguishes it from all other species.

Described from a single specimen, apparently a ♂, in good condition, from Peradeniya, Ceylon, taken 17-vi-10 by Mr. E. E. Green. In the Indian Museum.

***Psychoda transversa*, mihi, sp. nov.**

? ♀ Darjiling. Long. 1 mm.

Body covered with brownish grey or brownish yellow bristly hairs. Antennae as in *nigripennis*. Legs blackish with the tarsi showing a lighter shade in certain lights, the tips of the joints with small pale scales.

Wings densely covered with blackish hairs situated over the entire surface of the wings as well as on the veins.

No hair-spots nor scale-spots at the tips of any of the veins, but two narrow transverse bands composed of elongated, thickened (almost scale-like) greyish white hairs, the first placed just before the middle of the wing, the second just beyond three-fourths of the wing; both bands extending from the costa to the hind margin.

Described from a single specimen, which is apparently a ♀ (the genital organ not being clearly visible), in the Indian Museum, from Kurseong (4,700—5,000 ft.), 20-vi-10, taken by Dr. Annandale.

N.B.—The two conspicuous transverse bands of grey stiff hairs on the wings immediately distinguish this species from all other Oriental ones.

***Psychoda hirtipennis*, mihi, sp. nov.**

♀ Darjiling district; S. India; Bengal. Long. about 1½ mm.

Body brownish yellow, with yellowish brown or brownish grey hair varying both in shade and intensity. Antennae practically as in *P. nigripennis*. Legs with light brown scales, tarsi not obviously lighter, except when viewed in certain directions.

Wings lanceolate, the brown hairs covering the surface of the wing and placed mainly longitudinally, no regularly divaricate rows of hairs on the veins. Some erect bristly hairs on the basal fourth of the wing.

Described from several specimens in the Indian Museum presenting the following data: Kurseong, 5-ix-09; Bangalore, 15-x-10; Maddathorai, 18-xi-08; Trivandrum, 12—13-xi-08 (the last three places in South India, taken by Dr. Annandale); Calcutta, 27-xi-10.

N.B.—One example of the above series (from Maddathorai), varies more than the others by having browner legs, brighter brown hair on the thorax, and a tendency to patches of darker hairs on the wing, with light greyish reflections here and there. The specimen seems to come within the probable specific range of *hirtipennis*, which is certainly of variable nature.

***Psychoda apicalis*, mihi, sp. nov.**

? ♀ South India. Length of wing 2 mm.

Body with dark brown hair on the thorax, a little lighter here and there. The abdomen (subsequently lost) seems to have been covered with small elongate whitish scales, which, when viewed in certain lights, show prismatic colours. Antennae as in *P. nigripennis*, the pubescence very dense, lying rather close, so that the outline of the flagellum appears to have parallel sides. Legs closely covered with blackish scales; tips of tibiae and of metatarsi, with a row of white scales, of which there are a few on the tarsi.

Wings very lanceolate and narrow, wholly covered with closely placed, overlapping dark brown scales. It is difficult to see whether hairs are present on the actual surface of the wing or not, but apparently (and in all probability) they are present. Some are present on the veins.

The 2nd longitudinal vein forks considerably distad of the base of the 3rd vein; the anterior branch forking again distinctly beyond the middle of the wing, a good distance beyond the fork of the 4th vein, which occurs just before the middle of the wing.

Wing-border wholly unmarked, bearing a blackish brown fringe, darkest on the costa and at the base of the hind margin: a small arc of nearly snow-white hairs at the tip of the wing.

Described from a single ♀ (?) in the Indian Museum from Maddathurai, Travancore State, South India, 16-xi-08, taken by Dr. Annandale.

N.B.—Very distinct from all other species by the densely scaled wing, with snow-white fringe at the tip. The abdomen has been lost in mounting the specimen for the microscope, after the description was drawn up, but the length of the insect was overlooked. It is a small species, the wing measuring 2 mm. in length. The sex is not quite certain, but was noted originally as "probably ♀"

PERICOMA, Wlk.*Table of species.*

- A Wing with two rows of depressed scales on all the veins from the base to the middle where they gradually develop into bristly hairs *squaminervis*, sp. nov.
- AA Wing *without scales*, except small ones in the nature of tufts forming spots at the tips of the veins or at or near their forkings.
- B Wing *surface* completely covered with comparatively soft black hairs, in addition to those on the veins *annandalei*, Brun.
- BB Wing *surface wholly destitute of hairs* (except an isolated one or two near

the margin and a few at extreme base of wing). The hairs placed exclusively on the veins.

- C Lower branch of 4th longitudinal vein with a distinct appendix at its basal angle. (The 2nd longitudinal vein forks proximad of the base of the 3rd vein.) Antennae in ♂ with six prominent erect spines on the upper side of the 1st flagellar joint, which is considerably lengthened. (Antennae in ♀ without such spines, the 1st flagellar joint not abnormally lengthened.) *spinicornis*, Brun.
(*appendiculata*, Brun.)
- CC Lower branch of 4th longitudinal vein without such appendix at its basal angle. The 1st flagellar joint not abnormally lengthened in either sex, and always without the prominent spines.
- D Wing with small but distinct spots at the tips of many or all of the veins, composed of black or white hairs, scale-like hairs, or true scales, often a black and a white spot both present at the tip of the same vein.
- E A distinct section of the marginal fringe at the tip of the wing, composed wholly of white or whitish hairs.
- F Metatarsus normally black, except for an apical fringe of small white scales. Marginal fringe of wing with sections composed of grey or whitish grey hair. (The 2nd longitudinal vein forks proximad of the base of the 3rd vein.) *margininotata*, Brun.
(*bella*, Brun.)
- FF Metatarsus with at least the apical half covered with whitish scales.¹ Marginal fringe of wing with only one arc of whitish grey hair, which is apical. (The 2nd longitudinal vein forks proximad of the base of the 3rd vein.) *metatarsalis*, sp. nov.
- EE No distinct section of white hairs in the marginal fringe at the wing-tip.

¹ In two out of the three specimens present before me it is wholly covered with the whitish scales, except rather narrowly at the base.

- G Distinct bright yellow hairs in short sections on the veins, these sections so situated as to form an irregular transverse line from the costa to near the distal end of the posterior margin. Costa with very thick black bristly hair. (The 2nd longitudinal vein forks distad of the base of the 3rd vein.) *mixta*, sp. nov.
- GG No distinct sections of bright yellow hairs on the veins, any hairs of such colour being isolated and exceptional. Costa with only normally black or blackish hairs, with some sections of lighter coloured hairs.
- H Tarsi (apart from metatarsi) wholly white.
- I Metatarsi wholly white. The 2nd longitudinal vein forks proximad of origin of 3rd vein *lacteitarsis*, Brun.
- I Metatarsi black, with white scales at tips. The 2nd longitudinal vein forks distinctly distad of the origin of the 3rd vein *gilvipes*, Brun.
- HH Tarsi black: (apical third of fore metatarsi) and tips of posterior metatarsi with small white scales *proxima*, sp. nov.
- DD Wings without distinct hair- or scale-spots at tips of veins. Hairs on veins long enough to overlap those of the adjacent veins. No white scale-spots on wings.
- J Wings rather smaller than usual. The 2nd longitudinal vein forks (apparently) distad of the base of the 3rd vein *impunctata*, sp. nov.
- JJ Wings very large. The 2nd longitudinal vein forks immediately proximad of the base of the 3rd vein *unicolor*, sp. nov.

***Pericoma squaminervis*, mihi, sp. nov.**

? ♀ Darjiling district. Long. $1\frac{1}{2}$ mm.

Body covered with light brown and greyish hair; ground colour of thorax light brown, that of abdomen blackish. Antennae as in *Psychoda bengalensis*. Legs brownish grey, tarsi distinctly lighter, almost as pale as in *lacteitarsis* when viewed from certain directions.

Wings with a depressed row of elongate brown scales on each side of each vein, from the base to beyond the middle of the wing where they gradually become narrower until eventually, towards the margin of the wing, they are replaced by stiff hairs. They lie close together, although not always touching one another, and are long enough to overlap those emanating from the adjacent veins. A distinct spot of bristly black hairs at the tip of each vein, and apparently a slightly clearer spot in the wing immediately in front of the vein-tip.

Described from a single specimen (apparently a ♀) in the Indian Museum taken by Dr. Annandale at Kurseong, 4-viii-08.

N.B.—A very distinct species from all others, readily distinguished by the conspicuous, scaled veins.

***Pericoma spinicornis*, mihi.**

P. appendiculata, mihi.

As noted in the original descriptions these two forms represent the sexes of a single species. There can be no reasonable doubt about the point, although no actual pair has been found *in cop*. The number of spines on the first flagellar joint in the ♂ is six: the palpi consist of four subequal, oblongo-cylindrical joints.

The Indian Museum possesses a good series giving the following data: Darjiling (7,000 ft.), 26—28-v-10 and 2-x-08, common [*Brunetti*]; 8—11-viii-09 [*Jenkins*]; 6—10-viii-09 [*Paiva*]; Kurseong (5,000 ft.), 20—26-vi-10; 3—5-vii-08; 4—5-ix-09 [*Annandale*]; 10—26-ix-09 [*Lynch*]; Kurseong (4,700—5,000 ft.), 24-iii-10 [*Annandale* and *Gravelly*]; Siliguri, base of Darjiling hills, 18—20-vii-07 [*Hodgart*]; Simla, 11-v-08, 5-v-10, 10-v-09, on windows [*Annandale*]; Phagu (9,000 ft.), 11-v-09 [*Annandale*]; Naini Tal (6,000 ft.), 2-vi-09 [*Hodgart*].

***Pericoma annandalei*, mihi.**

Eight examples of this species have been acquired by the Indian Museum, captured by Dr. Annandale at Kurseong, 22—29-vi-10, where he found them running over *Caladium* leaves at dusk, in thick jungle.

***Pericoma margininotata*, mihi.**

P. bella, mihi.

Long. $1\frac{1}{2}$ — $1\frac{3}{4}$ mm.

From a good series of this species (with which must be included the form described as *bella*), recently acquired by the Indian Museum, it is possible to emend the original description. The species is very variable in its coloration.

The 2nd scapal joint is subglobular, a little more than half as long as the 1st, which is cylindrical, twice as long as its width. The flagellum is composed of either fifteen distinct joints, or of

fourteen joints with an apical style to the last one. The 4th palpal joint is the longest and thinnest.

At the tip of each vein, normally, is a black hair-spot and a small white scale-spot, the latter sometimes almost in the marginal fringe. The costal fringe comprises some short sections composed mainly of white or whitish hairs, including generally a section of some length just beyond the middle; whilst the wing-tip is always clothed with white hairs for some distance, there being also some few short patches of white hair in the fringe of the posterior margin.

An error has crept into the sentence (Rec. Ind. Mus., ii, 383) about the 3rd vein, which should read: "the 3rd vein originates in a right angle from the 2nd, just beyond where the latter forks; its basal portion very narrow, but quite distinct in wings denuded of vestiture; and there is a distinct appendix at the angle."

The study of a good series in the Indian Museum makes it clear that the black hair-patches on the wing are tolerably constant, especially those at the fork of the upper branch of the 2nd longitudinal vein, and at the fork of the 4th vein. The hairs at the wing-tip are generally wholly white, always mainly so.

The wing as described under the specific name *bella* in my previous paper on this family, may be regarded as the typical form; whilst the form described (*loc. cit.*) in the subsequent note is not at all uncommon.

The colour of the hair on the dorsum of the thorax varies from greyish white to rather bright reddish brown, all intermediate shades being represented in different individuals.

The tarsi are best described as variable; generally pale yellowish at base, darkening to dark brown at the tips; with long, irregularly placed bristly hairs, which are pale on the basal half of the tarsi and dark brown on the apical half, being concolorous with the ground colour of the limb. The rest of my description of the tarsi is correct, and may be supplemented by "the distance covered by the white apical scales at the tips of the basal joints of the tarsi, varies, especially on the 2nd tarsal joint, which is in some examples all white, the colour in all cases being that of the scales, as the ground colour of the whole tarsus is always black."

The Indian Museum has this species from Darjiling (7,000 ft.), 26-v-10 [*Brunetti*]; 11-viii-09 [*Dr. Jenkins*]; 5-8-viii-09 [*Paiva*]; Kurseong, 25-27-vi-10 [*Annandale*]; Simla, 25-iv-07, 11-v-08, 9-10-v-09 [*Annandale*]; Phagu (9,000 ft., Simla district), 11-15-v-09 [*Annandale*]; Pallode (20 miles N. E. of Trivandrum, South India), 15-xi-08 [*Annandale*].

***Pericoma metatarsalis*, mihi, sp. nov.**

♀. Western Himalayas. Long. $1\frac{3}{4}$ mm.

This species differs from the *bella* form of *margininotata* in only two characters, but these are practically consistent in the three examples examined.

The metatarsus is, with the exception of its immediate base, covered rather thickly with whitish scales (in the type and in one other specimen), or at least for more than the apical half (as in the third specimen).

In *margininotata* the last three tarsal joints often have a greyish or blackish grey appearance, but in the present species they are all uniformly intensely black.

The second character is that the fringe of the wings possesses no admixture of whitish hairs either singly or in short sections, with the exception of a broad section at the tip, comprised between the lower branch of the 2nd longitudinal vein and the upper branch of the 4th vein.

The 2nd longitudinal vein forks a short distance before the base of the 3rd vein, at which spot is placed the anterior cross-vein; the fork of the anterior branch of the 2nd vein is distinctly proximad of the fork of the 4th vein.

In view of the close affinity of *lacteitarsis* and *gilvipes* to *margininotata*, although they appear to be perfectly good species, there seems no reason to refrain from establishing the present form as a distinct species.

Described from three ♀♀ from Simla district, two from Simla, 9-v-09 (type) and 12-v-09, the third from Phagu (9,000 ft.), 11-v-09, all taken by Dr. Annandale.

Type and the other specimens in the Indian Museum.

***Pericoma mixta*, mihi, sp. nov.**

♀ Western Himalayas. Long. 2 mm.

Of the general appearance of that form of *margininotata*, which was described as *bella*.

Body with blackish and grey hairs, the former predominating chiefly on the dorsum of the thorax and at the base of the wings.

The *wings* have a dark brown appearance. The 2nd longitudinal vein forks some little distance beyond the base of the 3rd vein, although still quite near the base of the wing, as the latter vein begins sooner than in most species, its exact origin near the root of the wings being obscured by the pubescence. The fork of the upper branch of the 2nd vein and the fork of the 4th vein are approximately opposite one another. The veins are closely covered with a double row of black or dark brown hairs, with a distinct black hair-spot at the tip of each vein; a few small pale hairs in front of some of these black hair-spots. Some erect short, snow-white hairs towards the bases of the veins, and others on the three branches of the 2nd vein, placed some little distance before their tips; also to a less extent in short sections on the veins in other parts of the wing.

A number of *bright yellow hairs*, distributed (1) along the veins, apparently thickest along the costa, especially at its base, intermixing with the normal, thick black or dark brown hairs forming the fringe, (2) at the bases of the veins, but disposed in

small sections separate from the snow-white ones in that region of the wing, and (3) on the three branches of the 2nd longitudinal vein proximad of the white hairs. To an apparently less extent they also occur on the veins in other parts of the wing. The wing-fringe on the posterior margin is really dark brown, although in some lights it appears light brown or even greyish here and there. The tip of the wing bears a few whitish hairs but of less white colour and to an extent of much less obvious demarcation than in the *bella* form of *margininotata*.

Legs dark yellowish grey, thickly clothed with stiff bristly hairs; the tibiae, the metatarsi and 2nd joint of tarsi with a narrow circlet of whitish scales at the tips of each.

Described from a single ♀ in good condition from Simla (7,000 ft.), taken by Dr. Annandale, 6-v-09.

Type in Indian Museum.

Pericoma lacteitarsis, mihi.

This form, originally described by me as a variety of my *margininotata*, with the suspicion that it might prove distinct, is now, to my thinking, sufficiently established as a good species through the acquisition of several specimens by the Indian Museum.

The black hair-spots at the tips of the veins, the relative positions of the forks of the 2nd and 4th longitudinal veins, and the coloration of the tarsi are constant. The 2nd longitudinal vein forks proximad¹ of the base of the 3rd vein; the anterior branch of the 2nd vein forks before the middle of the wing and a little distad of the fork of the 4th vein.

There are no white hair-spots in the fringe of the wing, nor on the absolute margin of the wing (at or very near the tips of the veins) as in typical *margininotata*, which character alone is almost sufficient to distinguish the two forms. The whole wing has a more brownish appearance, without the variegated appearance of *margininotata*, and the *absence of the white fringe* at the wing-tip will at once identify it from that species.

A second good character that I believe separates it from all other Oriental species is that of the whole of the tarsi being milk-white. In the allied species, *margininotata*, *gilvipes*, *proxima* and *mixta*, some portion of the tarsus is always black, often the major portion.

A specimen in the Indian Museum, taken by Dr. Annandale at Quilon, Travancore, 9-xi-08, has the hairs of the body, on the tibiae and metatarsi (except the tip of the latter) darker brown, also the lower branch of the 2nd longitudinal vein runs almost directly to the wing-tip. The blackish hair-spots on the

¹ This is the case in the original type specimen (a ♀). In a second specimen the pubescence obscures a vein of the base of the wing. In a specimen mounted for the microscope, the 2nd vein forks distad of the base of the 3rd, and for this reason it is doubtful if it is of this species.

disc of the wing, on the fork of the anterior branch of the 2nd vein, and on the fork of the 4th vein, are well marked.

***Pericoma gilvipes* mihi.**

This form also, is certainly a good species, distinct from *margininotata*, as a questionable variety of which I first described it. The distinguishing character is the absence of white hairs at the wing-tip and of white hair-spots on the margin of the wing, also of isolated small patches of erect white hairs on the veins. Another good character is the distad forking of the 2nd longitudinal vein in reference to the origin of the 3rd vein, instead of the proximad forking as in *margininotata*. From its nearest ally, *lacteitarsis*, it is known by the nearly wholly black metatarsi, and by the distad instead of proximad forking of the 2nd vein, in relation to the origin of the 3rd vein. The anterior branch of the 2nd vein forks a little before the middle of the wing and a little distad of the fork of the 4th vein.

Additional specimens in the Indian Museum afford the following data:—Calcutta, 9-ii-10, 17—18-vii-07, 28-vii-08, 8—23-viii-08, 1—26-ix-08 [all *Annandale*, some taken "at light"]; Madhupur, Bengal, 17-x-09 "at light" [*Paiva*]; Ernakulam, Cochin, Malabar Coast, 4-xi-08 [*Annandale*]; Quilon, Travancore, 9-xi-08 [*Annandale*].

***Pericoma proxima*, mihi, sp. nov.**

? ♂ Ceylon. Long. $1\frac{1}{3}$ mm.

Body with dark brown hairs, intermixed with grey hairs here and there; bushy white hair on head above, and black hair below also on palpi. Abdomen with black hairs. Antennae with black scales on scape; flagellum like *Psychoda bengalensis*, the verticillate hairs widely spread out, the hairs whitish.

Legs dark, with blackish scales, black bristles and paler stiff hairs; fore metatarsi with apical third bearing white scales, posterior metatarsi with white scales at tips only.

Wings with hairs only on the veins, rich, moderately dark chestnut-brown. Very distinct and moderately large black hair-spots at tips of veins, where there are also some small white scaly hair-spots. Isolated groups of a few white scaly hairs placed apparently irregularly on the veins.

A distinct arc of white scaly hairs on the wing-fringe between the lower branch of the 4th longitudinal vein, and the 5th vein, but the wing-tip itself has distinctly rich brown hairs and no trace of white hairs. The wing-fringe brownish grey.

A distinct spot of black bristly erect hairs at the fork of the anterior branch of the 2nd longitudinal vein, and another at the fork of the 4th vein, both spots with a few white hairs beyond them.

Anterior branch of 2nd vein forking approximately opposite the fork of the 4th vein, distinctly but not greatly before the

middle of the wing. The pubescence hides the base of the wing sufficiently for it not to be clearly seen whether the 2nd longitudinal vein forks before or after the origin of the 3rd.

The example appears to be a ♂; the genitalia are covered with bristly bright yellow hair.

Described from a single specimen in good condition in the Indian Museum collection, taken at Peradeniya, Ceylon, viii-1910, by Mr. Green.

***Pericoma impunctata*, mihi, sp. nov.**

Sex? South India. Long. $1\frac{1}{2}$ mm.

Body thickly clothed with long, very dark brown bristly hair; the surface of the body itself also dark brown. Antennae brownish yellow.

Legs with dark brown bristly hair; tarsi light brown but without traces of any pale scales at tips of joints.

Wings thickly clothed on all the veins with a double row of dark brown bristly hairs, denser and more bristly along the costa and at the base of the wing. In certain lights the fringe of the wing and some of the stiff hairs on the basal part appear greyish, but the true colour of practically every part of the insect is dark brown.

Described from one specimen (sex uncertain) from Tenmalai (west side of Western Ghats), Travancore, South India, 22-xi-08, captured by Dr. Annandale.

Type in Indian Museum.

N.B.—The 2nd longitudinal vein apparently forks beyond the base of the 3rd vein but the root of the wing is too closely covered with hairs to speak with certainty.

***Pericoma unicolor*, mihi, sp. nov.**

Sex? Darjiling district. Long. nearly $1\frac{3}{4}$ mm.

This species is wholly brown in colour, only the tarsi being rather lighter. The antennae (partly broken) have flask-shaped flagellar joints. The wings are very large, and bear almost wholly dark brown hairs which appear rich golden brown in certain lights and show a violet tinge when viewed from different directions. The 2nd longitudinal vein forks immediately proximad of the base of the 3rd vein, the anterior branch of the 2nd forking again near the middle of the wing, much distad of the fork of the 4th which occurs towards the base, only shortly after the almost invisible posterior cross-vein, which latter is situated in a line with the basal section of the 3rd vein. The hairs at the tips of some of the veins are blacker but do not form distinct spots.

Described from a single specimen (sex uncertain) in the Indian Museum, from Kurseong, taken by Mr. D'Abreu in November, 1910.

N.B.—Although the actual difference in length between this species and *impunctata* is so little, the present form has a much

larger appearance owing to the considerable enlargement of the wings, which in *impunctata* are smaller than usual.

BRUNETTIA, Annand., and PARABRUNETTIA, gen. nov.

The characters of *Brunettia* (as defined by its author) which appear to me to be most strikingly generic are the closely scaled wings and the presence of *prominent* S-shaped chaetae on the flagellar joints.

To these may be added the lesser ones of broader wings than in the other genera in this family, but this character is almost certain to be a somewhat variable one.

The original species was *superstes*, Annandale, which was at first placed by its author in *Diplonema*, Lw. (an extinct genus), and afterwards removed to the present genus, which was established by Dr. Annandale for its reception; and to this new genus he added a second species from South India, *travancorica*.

As *superstes* was placed first (of the two species) in the new genus, it must be regarded as the generic type, as indeed, was intended and expressed by its author. Moreover, as *superstes* has a venation identical with that of *Pericoma*,¹ that type of venation must stand good in all species of *Brunettia*.

B. travancorica, Annand. (which was afterwards recognised as synonymous with my *Psychoda atrisquamis*), has, however, *Psychoda*-like venation, and therefore this species cannot remain in *Brunettia*, for it would be illogical to allow the two types of wing in a single genus, when *Psychoda* and *Pericoma* themselves are mainly differentiated by this difference in the venation.

It therefore appears that the genus Dr. Annandale has flatteringly named after me, still contains but the original species *superstes*, the consequence being that a new genus must be formed for all those other species of the present group that possess *Psychoda*-like venation.

This new genus it is proposed to call *Parabrunettia*, and it differs from *Brunettia* primarily in the different venation.

Its other characters may be regarded as—

(2) the presence of closely placed dark imbricating scales on at least some considerable portion of the wings, on both their upper and lower surfaces, or on the under side alone²; (3) the *surface* of the wing generally rather thickly covered to some considerable extent with more or less longitudinally placed *hairs*³; (4) chaetae present on the flagellar joints (possibly not on all of them, irrespective of the apical joint, which, even in *B. superstes*, is devoid of them). They are not so large nor so conspicuous in any

¹ That is to say, the 3rd longitudinal vein ends a little *below* the wing tip, instead of *at* the tip.

² Any species (if discovered), with scales on the upper side of the wing *only*, would logically fall in the new genus.

³ These are absent in two species provisionally placed here, but this may be better regarded perhaps as a subgeneric character, as species both with and without hairs on the surface of the wings occur equally in *Psychoda* and *Pericoma*.

of the species as they are in *superstes*, and appear to vary a good deal in size, according to the species.¹

In many species there is a rather noticeable patch of smooth depressed silky long hairs extended posteriorly from the alulae, and which may probably figure as a secondary character of the new genus.

Both *Brunettia* and *Parabrunettia* belong distinctly to the Psychodinae subfamily of Psychodidae, the 7th longitudinal vein being conspicuously present, and the 2nd longitudinal vein forking quite near the base of the wing.

PARABRUNETTIA, mihi, gen. nov.

To this new genus must be admitted the three species placed by me in *Psychoda* but divided off from the others by the presence of large scale-covered areas in the wings: *squamipennis*, *atrisquamis* and *argenteopunctata*.

Brunettia travancorica, Annand., has been shown to be synonymous with my *atrisquamis*.

To these three species are now added four new ones, *albohumeralis*, *9-notata*, *flavicollis* and *longichaeta*.

Owing to the denseness of the vestiture of the wings (the basal hairs, the surface hairs and the opacity of the scales), it has been impossible to note the exact position of the forking of the 2nd longitudinal vein in some of the species, but in all those in which it has been noted, it occurs distad of the origin of the 3rd longitudinal vein.

PARABRUNETTIA.

Table of species.

- | | | |
|----|--|-----------------------------|
| A | Hairs thickly present on <i>surface</i> of wing. | |
| B | <i>Upper</i> surface of wing as well as lower surface covered to a considerable extent with small dark imbricating scales. | |
| C | No white spots on wing-border. (The 2nd longitudinal vein forks distad of origin of 3rd vein.) | <i>squamipennis</i> , Brun. |
| CC | White spots on wing-border | <i>atrisquamis</i> , Brun. |
| BB | <i>Upper</i> surface of wing without any considerable area covered with scales (a few may be present at the base of the wing). | |
| D | Under surface of wing <i>wholly</i> covered with dark scales. | |

¹ Similar chaetae but much smaller, have been detected by Dr. Annandale in *Pericoma margininotata* and *Psychoda distincta*, so they cannot be considered of generic importance.

- E A silvery white scale-spot below shoulder *albohumeralis*, sp. nov.
- EE Such silvery white spot absent . *argenteopunctata*, Brun.
- DD Under surface of wings with scales covering at most the basal half. (The 2nd longitudinal vein forks apparently distad of the base of the 3rd vein.) . *g-notata*, sp. nov.
- AA Hairs wholly absent from the surface of the wing. (The 2nd longitudinal vein forks distad of the origin of the 3rd vein.)
- F *flavicollis*, sp. nov.
- FF *longichaeta*, sp. nov.

***Parabrunettia atrisquamis*, mihi.**

Psychoda id., mihi.

Brunettia travancorica, Annand.

The brown or blackish short and moderately short scales on the upper surface of the wing are thickly present on the upper as well as the lower surface, but *on the basal half only*. They appear silky black when viewed in some directions and dull greyish white viewed from other directions. On the lower surface these dark scales cover the whole area.

The very small white hair-spots at the tips of the veins are placed on the absolute edge of the wing, almost in the adjacent fringe.

Some specimens taken by Mr. E. E. Green at Peradeniya, Ceylon, afford the data 18-vii, 14-viii and October (all 1910).

N.B.—A specimen in the Indian Museum, unfortunately in too bad condition to describe, certainly represents an undescribed species allied to *atrisquamis*, from which it differs by the scales on the under surface of the wings covering the basal half only. No obvious patch of silky hairs on the alulae. Traces of small white spots on the extreme border of the wing.

***Parabrunettia albohumeralis*, mihi, sp. nov.**

♀ Ceylon. Long. $1\frac{1}{4}$ – $1\frac{1}{2}$ mm.

Body covered with dark blackish brown hair, which, at least on the abdomen, appears dark greyish in certain lights. A small but very conspicuous tuft of snow-white scaly hairs at the sides of the thorax, nearly below the shoulders, a little in front of the base of the wing.

Antennae with general appearance of those of *Psychoda bengalensis*. *Legs* with brown hairs and scales, which are darker on the tarsi. *Tips of tibiae* and of *metatarsi* with white scales.

Wings with surface closely covered with dark brown hairs; the upper surface without any covering of scales except a very few at the base and the small ones forming the white spots. Under side of wing closely covered with dark brown imbricating small scales, extending almost to the margin. Conspicuous though small spots, composed of elongate snow-white scales, appear to be placed normally at the tips of nearly all the veins, but in the three examples present there is a little variability in their exact position. In the type they occur as follows: at a little distance before tip of 1st longitudinal vein; shortly before the 1st ending of the 2nd vein; at tips of the other two endings; at tips of 3rd vein, both branches of 4th, the 5th and 7th. A single white hair still remaining shows another spot to be present on the 7th vein some little distance before its tip. Tip of 6th vein without a spot. In one example there is a white spot behind the tip of the 6th vein, in another specimen the spot is at the vein tip. Venation *Psychoda*-like.

Described from three specimens, females, from Peradeniya, taken by Mr. E. E. Green, ix- and x-1910.

Type in Indian Museum.

N.B.—The white shoulder-spots immediately distinguish this from all other species.

***Parabrunettia 9-notata*, mihi, sp. nov.**

♀ Orissa Coast. Long. $1\frac{1}{2}$ mm.

Body covered with rich dark brown bristly hair on thorax, blackish brown on abdomen, with a few white hairs at the abdomen tip.

Antennal scape with dark elongate scales; flagellum with pear-shaped joints and brown verticillate hairs, which appear greyish when viewed in certain directions. Distinct long, curved chaetae present.

Legs blackish; femora with a considerable number of greyish, elongate, depressed scales; tibiae and metatarsi with whitish grey scales at tips; a few scales of a similar nature are also present at the tips of the tarsi.

Wings with the whole surface as well as the veins covered with blackish hair, which is much thicker and denser on the costa, where it is distinctly prominent and its colour distinctly black. Around the remainder of the border of the wing it is dark brown. A very conspicuous spot at the extreme edge of the wing-border, at the tips of every vein, composed of small white scale-like hairs. A number of white erect hairs on most of the veins in the basal half of the wing. Anterior branch of 2nd longitudinal vein forks opposite the fork of the 4th vein. The pubescence prevents a clear view of the base of the wings, but apparently the 2nd longitudinal vein forks distad of the base of the 3rd vein. Venation *Psychoda*-like.

Described from one ♀ from Puri, Orissa, east coast of India, 12-xi-10, taken by Dr. Annandale on a window pane; the specimen is now in the Indian Museum.

N.B.—The conspicuous, curved chaetae on the flagellum suggest that this species belongs here, and the hairy surface of the wing is a second character of the genus. However, the wing is destitute of scales, except the small ones forming the spots, and the species is placed here provisionally, pending the satisfactory elucidation of this group of forms.

***Parabrunettia flavicollis*, mihi, sp. nov.**

♂ Ceylon. Long. about $1\frac{1}{2}$ mm.

Vertex with bushy yellow bristly hair; frons and face with black bristly hair. Antennae with flask-shaped flagellar joints, long necked, the brown verticillate hairs widely spread: long S-shaped chaetae distinctly present: scapal joints with scales.

Thorax with rather bright yellowish hair, with some grey hair intermixed. Abdomen with moderately dark brown hair. Genital organs with close long bristly hair, apparently normal in form.

Legs covered with dark brown scales, some yellowish white bristly hairs on tibiae, longest on hind pair, which latter are thickened at their tips and bear a circlet there of yellowish grey scales. Tips of anterior tibiae and tips of all the metatarsi with narrow circlets of yellowish white scales.

Wings with the 2nd longitudinal vein forking considerably distad of the base of the 3rd. Anterior branch of 2nd vein forking distinctly before the middle of the wing and a little beyond the fork of the 4th vein. *Hairs placed only on the veins*, not on the surface of the wings. A black hair-spot at tips of the veins and a few stiff yellowish grey hairs at or just before the tips of the veins. A black bristly hair-spot at fork of anterior branch of 2nd longitudinal vein. Venation *Psychoda*-like.

Described from a single ♂ in the Indian Museum collection from Peradeniya, Ceylon, taken August, 1910.

***Parabrunettia longichaeta*, mihi, sp. nov.**

♂ South India. Long. $1\frac{1}{2}$ mm.

Thorax with dark ground colour and yellowish bristly hair. Abdomen with dark ground colour with light brownish grey hair. Hair on head brown. Palpi dark brown. Antennae generally as in *Psychoda bengalensis*; the verticils of hair widely spread out, light brown: the chaetae very long and conspicuous, although pale, S-shaped.

Legs light brown, with concolorous scales and bristles, also whitish scales on knees and on base of tibiae, on tips of tibiae and of metatarsi, and very minute yellowish white scales on the tips of the remaining joints. Femora and tibiae with short stiff black hairs here and there.

Genitalia large and distinct, very pubescent.

Wings (rather rubbed) with hairs on surface only; light brown or greyish, with small patches of light erect hairs irregularly disposed. The 2nd longitudinal vein forks distinctly distad of the base of the 3rd vein; the anterior branch forking a little beyond the fork of the 4th vein, both very near the middle of the wing. Venation *Psychoda*-like.

Described from a single ♂ in the Indian Museum, taken by Dr. Annandale at Maddathorai, Travancore State, South India, 17-xi-08.

N.B.—Referred doubtfully and provisionally to the present genus. There being no hairs on the surface of the wings and no scales, it is questionable whether a new genus should not be erected for it. The species, however, is quite a good one.

BLEPHAROCERIDAE.

Apistomyia trilineata, mihi, sp. nov.

♂. Darjiling district. Long. 4 mm.

Head.—Eyes closely, microscopically pubescent, upper facets very distinctly larger than lower ones, divided by a distinct narrow space, the upper ones being about one-fourth the total height of the eyes. Frons one-third the width of the head, bare, the eye-orbits narrowly silvery; ocellar triangle distinct, elevated the three ocelli conspicuous, reddish brown. Face whitish grey, with silvery reflections. Antennae black, bare; 1st scapal joint much broader at tip than at base, 2nd joint twice as long as the 1st, much broadened at tip, where it is produced on the under side into an elongate blunt point. Flagellum of 8 joints, the 1st barely half as long as the 2nd scapal joint, the following joints of thickened bead shape, the apical joint ovate.

The proboscis consists of a long elongo-conical rostrum, moderately stout at the base, whitish in colour, with blackish dorsum, thence produced into a tapering, very sharply pointed brownish yellow horny piece quite separate from the proboscis proper, which is very long, black, narrowly cylindrical, geniculated before the middle, beyond which it is bilobed, the ends curled up.

Thorax ash-grey, the central part of the dorsum up to beyond the middle occupied by three broad velvet-black stripes almost contiguous, extending laterally almost to the sides; the median stripe produced forwards to the anterior margin, which is wholly black to the shoulders, leaving a narrow grey space in front. Pleurae, scutellum and metanotum blackish.

Abdomen velvet-black, the anterior corners of most of the segments a little reddish brown with more or less silvery reflections. Belly reddish brown. Genitalia moderately small, oval, blackish, not conspicuous.

Legs.—Coxae wholly and the femora more or less at the base, brownish yellow: remainder of anterior legs blackish; tibiae and tarsi of hind legs brownish yellow, extreme tips of joints black. Anterior femora distinctly clubbed at the tips, the hind femora moderately thickened towards tips. The hind femora and tibiae are each twice as long as the anterior ones, and the hind tarsi are fully as long as the hind tibiae.

Wings absolutely clear, costa very narrowly black; a small brownish infuscation at extreme tip of wing. Venation normal, agreeing with Kellogg's figure.¹ Halteres black, stems yellowish.

Described from a single specimen in the Indian Museum taken by Dr. Annandale at Kurseong (5,000 ft.), 4-ix-09.

Blepharocera indica, mihi, sp. nov.

♂ ♀ Western Himalayas. Long. 4—5 mm.

Head.—Frons narrow,² dark grey or blackish; ocelli large and conspicuous. Face whitish. Proboscis brownish yellow, blackish at the base on upper side; elongate, pointed, about as long as the height of the head. Palpi elongate, four joints of about equal length, pale brownish yellow, with some stiff black hairs.

Thorax.—Dorsum blackish. Sides, scutellum and metanotum brownish yellow. A very small yellowish mark behind each shoulder.

Abdomen blackish; the base of each segment very narrowly yellowish white. Genitalia inconspicuous.

Legs brownish or brownish yellow; the hind femora slightly thickened towards the tips, about one-and-a-half times as long as the anterior femora.

Wings very pale yellowish grey; unmarked; venation normal. Halteres: stem yellowish, club black.

Described from two ♂♂ and a single ♀ in the Indian Museum from Phagu (9,000 ft.), Simla district, 12—15-v-09, taken by Dr. Annandale.

N.B.—Both sexes are presumed to be present from the appearance of the abdomens, which in the two examples I consider males is blunted, with an exceedingly small projecting piece; and in the supposed female is widened before the tip, with a short pointed ovipositor-like termination.

¹ Plate ii, fig. 20, in Gen. Ins., Fasc. 56.

² The head in each of the examples is either damaged or shrunk in drying, so that the proportionate width of the frons is not easily gauged. It is apparently quite narrow.

MISCELLANEA

SYNONYMY IN CORETHRINAE.—Many recent authors have followed Theobald (Gen. Ins., Fasc. 26) (1905) in referring to *Sayomyia*, Coq., most of the species till recently incorporated under *Corethra*, Mg., but the American author's genus must give way, on his own admission,¹ to *Chaoborus*, Lichtenstein, established as long ago as 1800; so that a few synonymical notes may be useful.

Corethra, Mg. (1803), was originally erected (Illig. Mag., ii, 260) for the *Tipula culiciformis* of De Geer (1776); and for many years it contained only that species, with *pallida*, F. (1781), and *plumicornis*, F. (1794). It was not until 1823 that another species was added,—*punctipennis*, Say., followed by *flavicans*, Mg., in 1830 and others of more recent date.

Mochlonyx, Loew (1844), was formed for *Corethra velutina*, Ruthe, and to this genus has been added *effoetus*, Wlk., and actually *culiciformis*, De Geer (!), the very type species of *Corethra*; even Prof. Kertész, in his catalogue of the world's diptera (vol. i, 1902), making the same error.

Theobald (Gen. Ins.) admitted Corethrinae as a subfamily of Culicidae and correctly replaced *culiciformis* in *Corethra*, with *velutina* (*effoetus*, Wlk., being added as synonymous with this)² and a third, recently described species, *cinctipes*, Coq. Therefore, unless *velutina* can be generically separated from *culiciformis* (and I have no means of forming an opinion on this), *Mochlonyx* must sink in favour of *Corethra*, Mg.

Schiner (Fauna Austr., ii, 624) placed *velutina* and *effoetus* (the latter not described, not being Austrian) in *Mochlonyx*; and placed *culiciformis* (also undescribed for the same reason), with the names of five other undescribed non-Austrian species, after his description of the three Austrian species (*pallida*, *plumicornis* and *fusca*) of *Corethra*. It is quite possible that he may not have seen all these species, and therefore his generic separation of *velutina* and *culiciformis* may not have represented an individual opinion.

Chaoborus, Lichtenstein, was erected for "*antisepticus* sp. nov.," which proved synonymous with *crystallina*, De Geer, this latter, queried by Theobald (Gen. Ins.) as synonymous with *plumicornis*, F., being definitely given by Kertész as identical with it.

¹ Proc. U. S. Nat. Mus., vol. 37, p. 603 (1910).

² As Mr. Theobald has presumably examined the type of Walker's species, some importance attaches to this opinion.

Now *plumicornis*, F., *pallida*, F., and *punctipennis*, Say. (a North American species), with others, are retained by Kertész under *Corethra*. This is obviously wrong, since Loew's principle in establishing *Mochlonyx* was a sound one, i.e., "metatarsus several times shorter than the next tarsal joint," as contrasted with those species in which the metatarsus is longer than the 2nd tarsal joint.¹ The separation of these groups is justified: Loew lost his genus through unfortunately giving the name *Mochlonyx* to that group of species containing the type species of *Corethra*, Mg. Of course, in the days in which he wrote it was sometimes not easy to distinguish which species was intended by an author as the type of his genus² and this may have authorised him to split off any group, or particular species at will.

Corethra, Mg., must therefore always stand for *culiciformis*, with its congeners.

Coquillett in 1903 erected *Sayomyia* for "*Corethra punctipennis*" Say., which he admitted as congeneric with *plumicornis*, F. (the latter species possessing *crystallina*, De G., and others as synonyms), both of which species have now to be placed in *Chaoborus*.

The synonymy of the species immediately concerned will stand thus:—

Corethrinae (Subfamily of *Culicidae*.)

CORETHRA, Mg., 1803.

(*Mochlonyx*, Loew, 1844.)

1. *culiciformis*, De Geer (*Tipula id.*). TYPE of genus.
2. *velutina*, Ruthe (*Mochlonyx id.*, Loew; TYPE of *Mochlonyx*) (*effoetus* Wlk.).
3. *cinctipes*, Coq.

CHAOBORUS, Lichtenstein, 1800.

(*Sayomyia*, Coq., 1903.)

1. *plumicornis*, F. (*Tipula id.*). TYPE of genus.
2. *punctipennis*, Say. (TYPE of *Sayomyia*).
3. All other species referred to *Sayomyia* since Theobald's acceptance of the genus, but previously placed in *Corethra*.

The three other genera recorded by Theobald appear to me built on very weak characters and I should prefer to regard them as subgenera of *Chaoborus* only. Each contains but one species. They are *Pelorempis* (Joh.) *americana*, Joh., *Corethrella* (Coq.) *brakeleyi*, Coq., and *Eucorethra* (Underwood) *underwoodi*, Underw.

E. BRUNETTI.

¹ Theobald (Gen. Ins.) is distinctly wrong in terming the joint following the metatarsus as the first, since the metatarsus itself is the 1st tarsal joint, the succeeding joint being the second.

² I have seen it stated somewhere that Meigen placed what he considered all the most typical species in the middle of the genus, and those tending to aberration at one end or the other of it.

FURTHER NOTES ON INDIAN *Phlebotomi*.—The recent acquisition of a number of specimens of *Phlebotomus* from different parts of India and especially from Ceylon enables me to amplify the notes published in these "Records" last year (vol. iv, No. ii, pp. 35—52), and I have been helped greatly to gain a true appreciation of certain characters by frequent discussions with Mr. E. Brunetti.

Hitherto I have laid great stress on the relative lengths of the different parts of the second longitudinal vein as a specific character, but these lengths are evidently more variable than I thought. They would provide a method of separating a species such as *P. himalayensis* from one such as *P. argentipes* at a glance, but in the latter the length of the upper branch of the vein, and consequently that of the other parts also, varies within fairly wide limits. I have had, therefore, to recognize that the form recently described by me as *P. marginatus* is not a "good" species but merely a colour variety of *P. argentipes*.

Regarding the sanitary importance of *Phlebotomus* attention may be directed to a paper just published by Major F. Wall, I.M.S.¹ The facts cited suggest (1) that troops moved into certain barracks in Chitral become infected with a fever akin to or identical with what is called *Papatacifieber* in Austria, these barracks being frequented by *P. papatasi* and *P. babu*, and (2) that men from districts in which these two species occur are less liable to suffer from this fever (having perhaps become to some extent immune) than those from districts in which the common species are *P. major* and *P. himalayensis*.

Phlebotomus argentipes, Annandale and Brunetti.

Rec. Ind. Mus., iv, p. 44, pl. iv, fig. 3, pl. vi, fig. 6; *Spolia Zeylanica*, vii, p. 59.

I have recently examined a good many specimens from Peradeniya, which is situated in the interior of Ceylon at an altitude of about 1,500 feet. The species occurs all over the plains of India except in the extreme north-west. Apparently it does not occur in the Himalayas.

Var. *marginatus*, Annandale.

P. marginatus, *Spolia Zeylanica*, vii, p. 62, fig. 7.

This form cannot be regarded as more than a colour variety, distinguished from the typical form of *P. argentipes* by the fact that the dorsum of the thorax is brown instead of black and the sides of the thorax rather darker than in the typical form.

The var. *marginatus* occurs in Calcutta as well as at Peradeniya and is apparently not a seasonal form.

¹ *Ind. Med. Gazette*, xlv, p. 41 (1911).

Phlebotomus major, Annandale.

Rec. Ind. Mus., iv, p. 46, pl. v, fig. 4, pl. vi, fig. 4.

Specimens appear to be invariably larger than those of *P. argentipes*, from which both the typical form and the variety here described may be distinguished by the fact that the dorsum of the thorax is never black or brown.

Var. *grisea*, nov.

Distinguished from the typical form by the general greyish or brownish (instead of golden) colour.

I took several specimens in a house at Kurseong in the Darjiling district (alt. 4,700 feet) in June, 1910, and also saw the variety in the same house in April, 1911. The two varieties are easily distinguished by the naked eye.

Phlebotomus babu, Annandale.

Rec. Ind. Mus., iv, p. 49, pl. iv, fig. 1, pl. vi, figs. 3, 3a; *Spolia Zeylanica*, p. 61.

As I have pointed out in a recent paper, this species is probably identical with "*Hebotomus*" *minutus*, Rondani, but it is impossible to state that it is synonymous without a comparison of specimens. I have recently obtained specimens of *P. babu* from Peradeniya in Ceylon and from Drosh in Chitral in the Hindu-Kush Mountains (4,700 ft.). The species is probably distributed all over the plains of India and ascends the Western Ghats to an altitude of at least 2,000 feet, but is not known from the Himalayas.

Var. *niger*, nov.

Darker than the typical form and as a rule larger.

This form was at first regarded as a distinct species and is marked as probably being so in Mr. F. M. Howlett's collection. I cannot, however, distinguish any constant difference in its venation or genitalia.

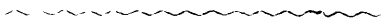
As yet the variety has only been taken in Bihar. I have not seen it in Calcutta.

Phlebotomus papatasi (Scopoli).

Rec. Ind. Mus., iv, p. 51, pl. iv, fig. 4, pl. vi, fig. 2.

I have recently received specimens from Drosh, Chitral (Major F. Wall, I.M.S.), and from Quetta, Baluchistan (Lt.-Col. Wimberley, I.M.S.). The species appears to be common, together with *P. babu*, all over the north-west of India, ranging as far east as Pusa in Bihar.

N. ANNANDALE.



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