

### XXXIII. INDIAN PSYCHODIDÆ

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Until *Phlebotomus argentipes* was described by Dr. Annandale and myself in an earlier number of this Journal (vol. ii, p. 101), no species of this family had been described from the East. I therefore now offer descriptions of fourteen Indian species, the types of which are in the Indian Museum collection.

For the common Calcutta species, *Psychoda bengalensis*, I was about to erect a new genus, the flagellum of the antenna apparently consisting of only ten instead of thirteen or fourteen joints, but on a microscopic examination of fresh specimens, thirteen joints are plainly visible, the last three being exceedingly small. This fact I had overlooked, but the oversight was pointed out to me by Dr. Annandale; to which gentleman I desire to express my thanks for a considerable amount of assistance in the microscopic examinations in this group, and especially in the study of the genital apparatus; for it is mainly due to help thus received that I have had the courage to attack this family at all.

Many of the species herein characterised will be fairly easily recognised by some character found in none of the others. Many of them are described from the females only, but the sexes do not appear to differ, in those species of which both are known, except in the generative organs.

These organs in the male are apparently more or less uniformly shaped in all the species, consisting (in those species before me, in which this sex is present) of two pairs of appendages, the lower pair much the larger, and clothed with dense, long hairs. In the female this apparatus also appears very uniformly shaped in all the species, and consists of a moderately large, scythe-like, chitinous appendage, evidently capable of erection or depression, also of protrusion or withdrawal, for in some specimens it is erect, in others horizontal, and in others not visible at all. Dr. Annandale found that upon pressure from above, it is seen to be formed of two symmetrical valves, and below it are two very small, single-jointed, palpus-like organs, apparently springing from a common base. These I have not observed in all the species, but they are probably present.

In *Phlebotomus* no ovipositor is visible. I do not touch upon *Phlebotomus*, however, in this paper, as Dr. Annandale is occupied with a study of the Indian species of this genus.

## TABLE OF SPECIES.

*Psychoda*, Latr.

(Third longitudinal vein running straight to wing-tip.)

- A Wings with numerous, distinct scales, in addition to ordinary pubescence.
- B No white spots on wing-border . *squamipennis.*
- BB White spots on wing-border.
- C Brown species; legs mainly brown . *argenteopunctata.*
- CC Coal-black species; legs black . *atrisquamis.*
- AA Wings without scales but clothed with hairs.
- D Wing-border with black or white spots, or both.
- E Spots at end of veins black only.
- F Greyish yellow species. Wings with seven black spots at tips of veins, and no scale-spots along the costa . *bengalensis.*
- FF Black and white species. White scale-spots along the black costa . *albonigra.*
- EE Spots at end of veins formed of white scales.
- G Tips of veins with silvery white hair-spots . *albonotata.*
- GG Tips of veins with black hair-spots and with white intermediate spots . *distincta.*
- DD Wing-border unspotted.
- H Wing covered uniformly with blackish grey hairs . *nigripennis.*
- HH Wing crossed by a band of light brown hairs with one or more areas of white hairs . . . *vittata.*

*Pericoma*, Wlk.

(Wing-tip occurs between lowest branch of second vein, and the third vein.)

- A Lower fork of fourth vein with an appendix at base.
- B First joint of flagellum long, with several long spines . *spinicornis.*
- BB First joint of flagellum normal, unspined . *appendiculata.*
- AA Lower fork of fourth vein without appendix.
- C Wing wholly jet-black, with white tip, and five white spots on wing-border . . . *annandalei.*
- CC Wing blackish grey, with black and grey spots.
- D A black hair-spot at end of each vein . *margininotata.*
- DD The black hair patches irregularly placed on disc and border of wing . *bella.*

*N.B.*—I retain all the species in the above two genera, which appear ample for the species in this sub-family, the genera proposed by the Rev. A. E. Eaton (*Entomologist's Monthly Magazine*, 1904, p. 55), appearing to me to be based upon insufficiently strong characters.

***Psychoda bengalensis*, mihi, sp. nov.**

♂ ♀ Bengal. Long. 1–1 $\frac{3}{4}$  mm.

*Body* entirely clothed with hair, varying from yellowish grey to whitish, and of a nature varying from soft long hairs to bristly ones, which latter on some parts, and around the tip of the abdomen, are distinctly scale-like. In certain lights some of the scale-like bristles appear blackish or even wholly black.

*Head*: Eyes black, with very large facets; frontal groove very narrow with long, greyish hair. Lower part of head covered with long hair. Antennæ fifteen-jointed; scape of two larger joints egg-shaped; the flagellum of ten joints of nearly uniform size, each shaped like a long-necked flask, and three further very minute joints, invisible except under a microscope. Each joint of the whole antenna bears a rather thick verticel of hairs. Palpi of four joints of equal length, with some hairs, last joint very thin, pointed.

The genital process in the male consists of a pair of small, bare, upper chitinous appendages, and a much larger and longer lower pair, densely covered with long hair. In the female it consists of a pair of very small, pointed, chitinous appendages forming a small ovipositor, which it is somewhat difficult to distinguish amidst the hair.

*Legs* of the same colour as the body, clothed rather thickly with concolorous scales, and with numerous black bristles, the former being thickest on the tibiæ and tarsi.

*Wings* with all the veins bearing a double row of hairs, pointing respectively anteriorly and posteriorly. The fork of the upper prong of the second longitudinal vein originates a little before the middle line of the wing; and the fork of the fourth longitudinal vein originates a little behind this middle line, but the linear space between the two forks varies in different specimens. A few black bristly hairs forming a small black spot occurs at the tip of each of the four veins *above* the third longitudinal (which is unmarked); also at the tip of the upper prong of the fourth, and at the tips of the fifth and seventh. These black hairs gradually become more scale-like towards the last spot, which is usually the deepest of all.<sup>1</sup> The whole border of the wing is thickly fringed with long blackish grey hair, which extends over the tegulæ also.

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<sup>1</sup> In some specimens there is a collection of black hairs showing a tendency to form an irregularly shaped spot at the base of the wing, and, more often, two similar vague spots, one below the costa, the other above the hind border, both near the base of the wing.

*Genitalia*: Superior appendages consisting of two sub-equal joints; the proximal joint cylindrical, often concealed in a vertical position in the body, distal joint sickle-shaped, its ventral edge being somewhat sinuous. Inferior appendages very long, arising from an elongated, broad ventral plate; themselves sickle-shaped, clothed with long, fine hairs at their base, and bearing very minute, straight bristles on their ventral surface, each appendage terminating in a single, short, flattened, almost triangular spinule.

*Described* from about fifty examples in good condition in the Indian Museum collection, taken chiefly on windows, both in Calcutta during January, 1908, and in Simla and neighbouring places in May of the same year. Specimens are also present from: *Bengal*; Calcutta (Jan., Feb., May, July, Aug., Oct., Dec.), Port Canning, Ganges delta (Dec.), Katihar, Purneah district (Oct.): *Oudh*; Lucknow (Jan., Feb., April): *Western Himalayas*; Simla (May), Kasauli (May), Dharampur (May), Naini Tal (May or June): *Eastern Himalayas*; Kurseong, Darjiling district (July), both sexes common on windows and in grass at Darjiling (21-ix to 2-x-1908): *Burma*; Rangoon (March), Moulmein, Tenasserim (March).

### *Psychoda distincta*, mihi, sp. nov.

♀ Sylhet. Long. 1½ mm.

*Body* pale brownish yellow, entirely clothed with long, pale brownish yellow, bristly hair, with some concolorous elongated scales, and with a few black bristles here and there. The bristles are long, and become scale-like on the dorsum of the thorax and towards the tip of the abdomen, where, in the latter case, the black bristles are also more numerous.

*Head*: Eyes black, with dense, soft, pale yellowish grey hair between them. Antennæ sixteen-jointed; first joint of scape cylindrical, second spherical; flagellum of fourteen elongated, pear-shaped joints, each surrounded by numerous long hairs in the form of a rather thick irregular verticel.

*Legs* with numerous bristles, which are very long on the tibiæ, which, in addition, have short scales of the same colour lying rather close, and a circlet of rather long, scale-like bristles at the tips. The metatarsus, which is nearly as long as the four remaining sub-equal joints together, has a few irregular bristles, and the tarsi are covered by close-lying, pale yellowish white scales, giving a whitish appearance in certain lights.

*Wings*: The upper prong of the second longitudinal vein forks near the base, before one-third of the wing, and the fourth longitudinal vein forks at exactly one-third. All the veins seem to bear the usual double row of hairs, and the intervening spaces are also covered with brown hairs rather thickly. The basal half only of the wing is covered moderately closely with pale brownish yellow, semi-transparent elongated scales of rather small size. There is

a patch of black hairs at the tip of all the veins from the first to the lower fork of the fourth (inclusive), with a trace of a patch at the tip of the fifth; and a patch of white hairs appears between all these black patches; so that the border of the wing appears spotted alternately black and white, and is fringed along its entire length with close, long, light brown hair. The hair of the wing appears lighter or darker in different specimens, and according to the direction in which the light falls on it, a brilliant iridescence being at times visible.

*Described* from two specimens in the Indian Museum from Sylhet (Major Hall), 1-1-05 and 30-1-05, also from a third specimen mounted on a slide, in the same collection.

***Psychoda albonotata*, mihi, sp. nov.**

♀ Calcutta. Long. 1 mm.

*Body*: Ground colour black. Thorax and abdomen with whitish grey hairs which in certain lights appear silvery.

*Head*: Eyes black, facets large; interocular space light brown, filled with strong, rather long black bristles. Antennæ sixteen-jointed, light brown; two basal joints cup-shaped, rather short, with circlets of stiff black bristles; the flagellum of fourteen cup-shaped joints placed rather close together, and bearing the usual long hairs which are both thick and long. Palpi dark brown, hairy.

The *genital* apparatus appears to be a moderate-sized, bare, pointed, pale yellowish brown appendage, similar to that of this sex in other species.

*Legs* with livid yellow femora and tibiæ, the latter black towards the tips; tarsi brownish black, covered with close, brownish scales. The extreme tip of the tibiæ, of the metatarsus, and of the last tarsal joint, with a few brilliant, snow-white hairs.

*Wings* with the upper prong of the second longitudinal vein originating much before the fourth part of the total length of the wing; the fourth longitudinal vein bifurcates at about one-fourth of the wing. Ground colour dark grey, the veins with the usual double row of hairs, which are black, giving, with the long fringe of black hairs around the whole wing-border, a wholly black appearance to the wing. A silvery white spot formed by a few minute, very elongate, hair-like white scales, at the tip of all the veins, from the first to the sixth inclusive, nine spots altogether.

*Described* from a female in excellent condition in the Indian Museum collection, taken in Calcutta, 5-6-1-08.

*N.B.*—The general appearance of this species is that of a black *Psychoda* with nine snow-white spots on the wing-border, and with white spots on the legs. In certain lights nearly all parts of the body in turn appear more or less silvery white, including the black wing-fringe, the femora and tibiæ, and nearly the whole

of the pubescence on the body; the wings also, in certain lights, present a beautiful iridescence.

A second example in the same collection, from Sylhet (Major Hall), 8-i-05, is apparently the same species. The hairs on the wing are golden brown, and those on the body more brownish than in the Calcutta specimen, whilst the white scales cover the whole of the metatarsus.

The antennæ are missing, and there are a few white, elongated, hair-like scales in the centre of the wing towards the base. The wing-fringe is golden brown on the distal half and black on the basal part of the costa and on most of the posterior margin.

On the dorsum of the abdomen are a few remaining short white scales, lying rather close to the surface, but there are no such scales in *albonotata*, yet as the general resemblance between the specimens is so great, I regard this latter as a possible variety, in preference to describing it as new.

***Psychoda albonigra*, mihi, sp. nov.**

♀ (?). Calcutta. Long. nearly 1 mm.

*Head*: Form and face with white bristly hair on upper part and black scaly bristles below. Antennæ with second joint of scape short, cup-shaped, both joints encircled by white scales; flagellum of fourteen distinct, pale yellow, flask shaped joints, and an additional very minute spherical one; each joint bearing a thick vertical of stiff greyish white hair. Palp black, with black bristly hair.

*Thorax* covered with thick, bristly greyish white hair, with some darker hairs intermixed.

*Abdomen* (damaged): Dirty yellow, with some black hairs.

*Legs*: Femora pale dirty yellow. Tibiæ with closely-placed black scales, with black bristles intermixed, and bearing, placed irregularly, isolated white scales and white bristles; the posterior pairs with rather long black hair behind: tips of tibiæ with a few white scales. Tarsi covered with black scales and a few bristles; the tips of the metatarsi and of the last joint, with a few white scales.

*Wings*: Very pale grey, nearly clear round the posterior border. The veins with the usual double row of blackish grey hairs, with some white, nearly erect hairs placed in irregular rows and patches about the middle of and (more abundantly) across the base of the wing. A small bunch of black, bristly hairs at the tip of each vein, and the costal border clothed nearly to the tip of the wing with stiff, black, bristly hairs; along which are placed, at shortly regular intervals, one or two small white scales. Towards the tip of the costa the wing-fringe becomes greyish, and from thence, round the border, nearly to the base, it is greyish white, rather long and thick. Near the base of the posterior margin the fringe becomes blackish grey.

The bifurcations of the upper branch of the second vein, and of the fourth vein, occur just before the middle of the wing.

*Described* from a perfect unique ♀ (?) in the Indian Museum collection, captured by Dr. Annandale in the Museum, 30-vii-08.

***Psychoda squamipennis*, mihi, sp. nov.**

♀ Calcutta. Long.  $1\frac{1}{4}$  mm.

*Body* blackish brown, with brownish grey hair, which appears much lighter when the light falls on it in a certain direction. Eyes black, large facets. Antennæ: first joint elongate, one-and-a-half times as long as the second, which is short and subspherical; both with some bristly hairs; flagellum of apparently only thirteen joints, which are cup-shaped, with a central cylindrical prolongation, each joint bearing a thick verticel of long, close, scale-like, light brownish grey hairs, in addition to some ordinary hairs on each joint; the last joint tapers to a point and may really be separable into two.

*Legs* with close, greyish pubescence, and some apparently irregularly placed bristles of various lengths; some stiff black ones on the metatarsus.

*Wings* with the surface between the veins closely covered with distinct, moderately large, brown scales, and both veins and the intermediate spaces covered with brown and black hairs. Border of wing with a fringe of long brown hairs, which appear grey in certain lights; and along the extreme edge of the wing is placed, here and there, a single, small, snow-white scale-like hair.

The example is apparently a ♀ as no trace of a genital appendage is visible, but from the manner the specimen is mounted, it is very difficult to see the body and legs.

*Described* from a unique ♀ in the Indian Museum collection, taken by Dr. Annandale in Calcutta, 5-viii-07.

***Psychoda argenteopunctata*, mihi, sp. nov.**

♀ Calcutta. Long. nearly 1 mm.

Considerably resembling *squamipennis*.

The antennæ have a flagellum of thirteen spindle-shaped joints, each bearing a thick verticel of hairs.

Mouth with rather long bristles; the four-jointed palpi are thin, moderately hairy, gradually tapering towards the tip; the second joint being twice as long as the first, the rest sub-equal. The genital appendage appears bare, conical, horny, upright. The legs are covered with brownish scales which, in certain lights, show a greyish white shimmer. The tibiæ have rather long hairs of irregular length, and a circlet of strong bristles of different lengths at the tip; the apical half of the metatarsus has some white scales.

*Wings*: The second longitudinal vein divides almost directly after its divergence from the third, and the prong forks at a quarter

the length of the wing. The first longitudinal vein ends at the centre of the costa; the third ends at the extreme, slightly blunted, tip of the wing; the fourth divides from apparently a common stem just below the divergence of the second and third; the fourth forking a little beyond the fork of the upper prong of the second; the seventh is curved downward at the tip. The wings have a small spot of snow-white scale-like bristles at the tip of all the veins (not always very distinct), and two rather larger, similar spots on the costa, one before the tip of the first longitudinal vein, and the other before the uppermost branch of the second longitudinal vein. The under side of the wing in certain lights shows a brilliant iridescence, due to numerous, scattered, small scales of variegated colours.

In all remaining points, as in *squamipennis*, but a very distinct species.

*Described* from one ♀ in the Indian Museum collection taken in Calcutta, 27-viii-07.

***Psychoda atrisquamis*, mihi, sp. nov.**

♀ Calcutta. Long.  $1\frac{1}{2}$  mm.

Very near *squamipennis* and *argenteopunctata*. The wings are almost entirely clothed with soft black hairs, and the basal and central portions with thick black scales which, in certain lights, and from the under side view, appear partly iridescent. At the tip of each vein is a small bunch of snow-white, moderately long, scale-like hairs. The legs are almost wholly black, with a few small white scales at the tip of the tibiæ, and (at least, on the hind pair) a few at the tips of the metatarsus and succeeding joint.

Type (a perfect unique ♀) in the Indian Museum, taken on a window of the Museum building by Dr. Annandale, 22-vii-08.

*N.B.*—It is possible that this may be identical with *argenteopunctata*, as, though they appear quite distinct when viewed side by side, it is difficult to specify any strong point of difference, except that this species is coal-black, whilst *argenteopunctata* is brownish.

***Psychoda nigripennis*, mihi, sp. nov.**

♂ ♀ Himalayas (Simla and Darjiling districts); Bengal. Long.  $\frac{2}{3}$  to  $1\frac{1}{2}$  mm.

*Body* yellow, wholly covered with greyish brown hair, which in certain lights appears whitish.

*Head*: Eyes jet-black, facets very large. Antennæ: basal joints short and not broader than the flagellum, yellow, with some black bristles; second joint spherical; flagellum of fourteen joints, of which the first ten are flask-shaped (as in *bengalensis*); the eleventh has no "neck," and is roughly ovate; the twelfth, thirteenth and fourteenth are very minute, the two former cup-shaped, the terminal joint spherical. The verticels of greyish white hair on each

joint are very thick, lying closely, directed forwards and clustering together, thus giving the antenna the usual appearance of an organ of solidity, with parallel sides, of a grey colour, marked with small, black, round spots. Palpi of four elongated cylindrical joints, hairy, of equal length, except that the fourth is slightly longer and pointed at the tip.

*Legs* pale blackish brown; the femora with some white hairs below, the tibiæ rather closely covered with snow-white hairs, the tarsi blacker, with white hairs which, towards the tip, are replaced by small, elongated white scales.

*Wings*: These have the appearance of being pale blackish, but are really pale grey, wholly unmarked; the veins distinct, each with the usual double row of hairs, which appear black when viewed from above, but which appear white when viewed horizontally from the tip of the wing. Fringe of wing, longest on posterior border, grey, appearing dark in some lights and nearly white in others. Wing with a purplish iridescence.

*Genitalia*: In the male very similar to those of *bengalensis*, but the inferior appendages decidedly shorter. In the female it consists of a very concave (on the upper side), leaf-shaped appendage, bending backwards, but the appendage probably consists of two symmetrical blade-like halves, as in the other species.

*Described* from four ♂♂ and twelve ♀♀ in the Indian Museum collection from the following localities: Kasauli (Simla district), 6,300 feet, 15-v-08; Simla, 7,000 feet, 10-v-08; Kurseong (Darjiling district), 5,000 feet, 4-vii-08. Types in the Indian Museum. At Kasauli Dr. Annandale found the species common in bungalows on the date given. He has also taken it on mossy walls and at light in Calcutta.

*N.B.*—In a specimen from Calcutta (3-vi-08) there is a slight but distinct spot of black hairs at the tip of each of the veins, and the tarsi are more densely covered with white scales. It may possibly be distinct, but I can detect no other differences of value.

***Psychoda vittata*, mihi, sp. nov.**

♀ Calcutta. Long. 1 mm.

*Body* pale yellow with grey and white hair.

White bristly hair between the eyes, with black bristly hair below. Scape of antennæ with the joints barely broader at the tip; second rather short, both with black bristles. Flagellum of ten dirty yellow, distinct, long-necked, flask-shaped joints, each surrounded by a thick verticel of stiff blackish grey hairs, also a terminal conical joint which is composed of three small coalescing subspherical ones. The antennæ have the thickened appearance noticeable in *nigripennis*.

*Legs* pale yellow, with a few irregular black bristles; hind femora with a row of long bristles and hind tibiæ with two rows of long bristly hair. Tibiæ with a few black spines at the tip.

*Wings* pale grey: the veins bearing the usual blackish grey hairs, with a wide transverse band (composed of erect light brown hairs) across the centre of the wing, and the apical portion of the wing is also broadly covered with similar brown hairs. At the base of the wing is a space covered with erect, soft, white hairs, and some traces of a similar patch towards the costa between the two areas of brown hairs. Fringe of wing on costa brownish grey, on posterior margin, more grey or whitish.

*Described* from five ♀♀, dated Calcutta, 11-vii to 2-viii-08, taken by Dr. Annandale; common on mossy walls.

*N.B.*—Further specimens in the Indian Museum collection may represent a small variety of this species with less conspicuously banded wings, and one or two of them show a darkening of the tips of some of the tarsal joints. The hair on the thorax is sometimes snow-white, sometimes yellowish grey, which inclines me to the opinion that they all represent the present species.

### *Pericoma spinicornis*, mihl, sp. nov.

♂. Himalayas (Simla and Darjiling districts). Long.  $1\frac{1}{4}$  to  $1\frac{3}{4}$  mm.

Very near *appendiculata* (*v. post.*) in general appearance, but very distinctly differing in the *first joint of the flagellum*, which is  $3\frac{1}{2}$  times as long as the second, sub-cylindrical, slightly narrowed and rounded at base, and slightly contracted just before the tip. This joint bears on its upper surface a row of *five or six long, strong, black, vertical straight spines*, set in raised sockets, followed by, placed almost at the apex of the joint, two (perhaps three) other still longer spines springing from a common socket. The under side of this joint is beset with narrow, curved, greyish scales. The remainder of the flagellum consists of thirteen sub-equal, elongated joints, gradually shortening to the last one, which is styliform. The two basal joints are thickly beset with very elongate, whitish grey scales, with which are intermixed some long, stiff, black bristles. On the face and anterior part of the thorax the bristles become almost scale-like, and are nearly white.

*Legs*: Femora slightly curved, sometimes considerably so, sometimes nearly straight. The femora and tibiæ are covered with long, pale yellowish grey, bristly hair; the tibiæ tips having a circlet of rather elongate, whitish, scaly bristles, with some short black bristles intermixed; the tarsi are covered with black scales and bristly black hair. The base of the metatarsus, and of the following joint, and the tip of the last joint are covered with small, cream-white scales.

*Wings*: Venation and general appearance as in *appendiculata*; the veins with the double row of hairs each, as are present in most species. The wing-border has a fringe of grey hairs, which appear lighter or darker according to the direction in which the light falls on them; whitish towards the tip of the wing, and both blackest and longest on the basal portions of both anterior and

posterior borders. On the surface of the wing are short rows of quite white, short, bristly hairs, placed at apparently irregular intervals along the veins, these hairs being intermixed with black ones towards the base of the wing. The hairs on the surface of the wing on its apical half, and towards the centre portions of both anterior and posterior margins are much darker than on the remaining surface, thus leaving the base, and the proximal part of the centre of the wing apparently much clearer, as in *appendiculata*.

*Genitalia*: Superior appendages consisting of a short, elliptical, basal joint, and a thin, curled, cylindrical, pointed distal one, the whole appendage being small and easily overlooked; the basal joint bearing stout bristles with sockets, the distal joint bare. Inferior appendages arising from a triangular basal plate, sickle-shaped, bearing a number (about twenty) of flattened spatulate spinules on the distal two-thirds of the dorsal surface.

*Described* from eight ♂♂ in good condition in the Indian Museum taken by Dr. Annandale at Kurseong (5,000 feet), 5-vii-08, and some others in less good condition from the same source; also two ♂♂ from Simla (7,000 feet), 11-v-08. I took three males at Darjiling on windows, 2-x-08.

***Pericoma appendiculata*, mihi, sp. nov.**

♀ North Bengal. Long. 1½ to 2 mm.

*Body* blackish, rather sparsely covered above and below with whitish grey hair, which is thickest towards the posterior borders of the abdominal segments, and is darker in some specimens. The posterior part of the thoracic dorsum bears long, black, bristly hair.

*Head*: Eyes black, facets very large, bronze; palpi long, brownish grey, with a few hairs. Antennæ sixteen-jointed, scape thick, first joint cylindrical, second globular; a narrower flagellum of fourteen ovate joints, each with a rather thin verticel of hairs, *first joint only barely longer than second: without spines*.

*Legs* pale yellowish white, *fore and hind femora distinctly curved*, tarsi mainly black. The legs with numerous bristles of unequal length, some long bristly hairs on the tibiæ, which have a circlet of scale-bristles at the tip; some close-lying small scales on the femora.

*Wings* dark grey. The lower prong of the fourth longitudinal vein springs at right angles from the upper, and then forms a second right angle, *bearing a distinct appendiculation* at that spot, directed backwards. The fourth longitudinal vein forks a little behind the fork of the second, which itself is placed just before the centre line of the wing. The veins, which are very distinct, all bear the usual double row of partly erected hairs, directed forwards and backwards, and at the tip of each vein is a small bunch of stronger bristly hair; the intervening space (especially on the hind borders) being nearly clear, thus giving the border of the wing the appearance of bearing alternate black and white spots. The hairs

are in the main black, but those on the proximal half of the disc (except those in the immediate vicinity of the third vein) are distinctly more erect than the others, and are distinctly *grey*. A thick row of bushy, long, black bristly hair on nearly the whole length of the seventh vein. Wing-border with fringe of black hair which is rather short on the apical half, longer on the basal half of the costa, and longest and thickest on the basal half of posterior border. Towards the ends of some of the veins are a few silvery white, irregularly placed, elongated scales.

The *genital apparatus* consists of a single, horny, pointed, bare appendage of moderate size, projecting rather prominently.

*Described* from ten ♀ ♀ in the Indian Museum collection from Kurseong, taken by Dr. Annandale, 5-vii-08. A ♀ from Siliguri, North Bengal, 18—20-vii-07, is in the same collection.

*N.B.*—I suspect that this species is the ♀ of *spinicornis* on account of all the specimens of that species being ♂ ♂, and all those of *appendiculata* ♀ ♀; taken into consideration with the fact that they were nearly all captured at the same time, and in the same locality. I also found both sexes at Darjiling from September 20th this year up to October 2nd, the females being rather common on windows and attached to the under side of large leaves on the hillside, in both situations in company with an abundance of *Psychoda bengalensis*. As I know of no other species in the family varying sexually to such a striking extent as occurs between the present two forms in the first joint of the flagellum, I refrain from uniting both forms under one name: should they represent one species only, the name *spinicornis* must stand.

***Pericoma annandalei*, mihi, sp. nov.**

♀ Darjiling district. Long. 2 mm.

*Head*: Frons with long greyish white bristly hairs, and a few black bristles about the mouth. Eyes black, facets large, those on upper border of eyes bronze. Antennal scape thickly clothed with long white scales, and on upper side with some blackish brown ones; flagellum of thirteen elongated, cigar-shaped, light brown joints, clothed rather thickly with long greyish white, bristly hairs. Palpi well developed, long, black, thickly clothed with black scaly bristles and hairs. Back of head black, bare.

*Thorax* moderately shining black, with long black hair which in certain lights has a blackish grey tint. Humeral calli bare, distinct, shining black.

*Abdomen* black, with black bristly hairs. Ovipositor brown, of moderate size and normal shape.

*Legs* brown, with black and grey hairs, and both black and white bristles, the latter less numerous than the black ones. The tips of the tibiæ have a few white scales, the metatarsi are nearly wholly clothed thickly with white scales, and there are also a few at the extreme tips of the tarsi.

*Wings* brownish grey, rather thickly covered with black hairs, and with a fringe of long black hairs around the whole border except at the tip of the wing, where, for the distance between the lower branch of the second longitudinal vein and the upper branch of the fourth, the black hairs are replaced by long, snow-white bristly hairs. Five spots on the wing-border (each consisting of a few silvery white scales, which have a faint bluish tint) are placed as follows: a larger one in the centre of the fore border, the second (a small one) just beyond the first; the third at the end of the lower branch of the fourth longitudinal vein; and the fourth and fifth at the tips of the sixth and seventh longitudinal veins, the fourth spot being the largest.

*Described* from a perfect unique ♀ in the Indian Museum collection captured by Dr. Annandale at Kurseong, 5-vii-08.

***Pericoma margininotata*, mihi, sp. nov.**

♂ ♀ Western Himalayas (Simla district). Long.  $1\frac{1}{4}$ – $1\frac{3}{4}$  mm.

*Body*: Ground colour of thorax blackish brown, of abdomen, blackish, both covered with thick, long, pale yellowish grey bristly hair, plentifully intermixed on the thorax with black hairs, and likewise, to a less degree, on the base of the abdomen. The hairs on the thoracic dorsum show a tendency to be arranged in fan-shaped sets. On the abdomen they are arranged in a thick row of long ones on the posterior border of every segment, with a shorter, erect row in front of them. Pleuræ light to dark mahogany brown, bare, or nearly so. Eyes bronze, with large facets. The antennæ have the two large basal joints (second one cylindrical, wider than the first, which is cup-shaped) covered with short white scales, and are surrounded by a cluster of longer ones; flagellum of thirteen small globular joints of equal size, last one conical, each with a circlet of a few long black hairs, and more numerous, short white ones.

*Legs*: Femora and tibiæ grey, with minute greyish white pubescence, a number of longer, white bristly hairs (with black reflections in certain lights). These are apparently irregularly placed on the fore legs and the femora, but show a tendency to form longitudinal rows. Those, at least on the hind tibiæ are arranged in three such longitudinal rows, one pointing outwards, the other two rows, posteriorly. The apical part of the tibiæ is narrowly but thickly clothed with jet-black scaly bristles, and the extreme tip with a circlet of white scaly bristles. The tarsi are thickly covered with jet-black scaly bristles, the tips of the metatarsus and following joint bearing a circlet of white scaly bristles. The metatarsus bears several very strong long black bristles, and the extreme tarsi tips have minute cream-coloured scales.

*Wings*: Dark grey, with all the veins bearing a double row of spreading hairs, and without scales. Upper fork of second longitudinal vein bifurcates at two-fifths of the wing, and the

fourth longitudinal bifurcates between one-fourth and one-third of the wing. A small spot, consisting of numerous rather strong black hairs, at the tip of each vein, and a similar spot at the bifurcations of the upper prong of the second longitudinal vein, and of the fourth vein, these two spots being in a straight line with the last spot on the posterior margin. The first spot on the anterior border, the last one on the posterior border, and the upper discal spot, are all larger and darker than the others, but this may be accidental.

The hairs in some parts of the disc of the wing are distinctly darker and show a tendency to form black patches, and along most of the veins are short rows and bunches, here and there, of quite white, erect, short, bristly hairs, becoming almost scale-like in the small tuft-like spots of them on the margin of the wing, placed alternately with the black marginal hair-spots. These give the border of the wing a strikingly distinct, tessellated appearance composed of black and white spots alternately. Wing-border with a fringe of blackish grey hair, which is shortest on the distal portion, especially on the apical part of the costa. Halteres rather large, cup-shaped, with hairy upper edge, the stem being very narrow and short.

*Genitalia* in ♂: Superior appendages consisting of a short, stout, cylindrical basal joint, and a distal one which is shaped like a scorpion's sting, consisting of a basal bulb, and a slightly coiled, tube-like prolongation of about the same length. Inferior appendages arising from a broad, rather short basal plate, than which they are considerably larger; themselves sickle-shaped, each bearing at the distal end, on the dorsal surface, a pair of flattened, spatulate spinules, the whole joint covered with fine hairs.

*Described* from a male and two females in the Indian Museum collection, taken by Dr. Annandale during May 1907 and 1908 at Simla (7,000 feet).

#### Var. *lacteitarsis*, mihi.

Three ♀ specimens in the Indian Museum taken by Dr. Annandale at Kurseong, 4-vii-08, agree perfectly with the above description, but differ by the pubescence of the thorax and abdomen being much darker (nearly black), and by all the tarsi being wholly milk-white. This variety approaches *gilvipes*, but the black hair-spots at the tips of the veins in the wings are as distinct as in the typical *margininotata*, whereas in *gilvipes* they are much less distinct, and in this latter form the metatarsi are black, whilst in *lacteitarsis* they are white.

#### Var. *gilvipes*, mihi.

♀ Considerably resembling typical *margininotata*, but is smaller, and the general colour of the long hair of the thorax and abdomen is more brownish grey. The basal joints of the antennæ are invisible, owing to the position of the head in the

type specimen; the thirteen joints of the flagellum resemble those of *Psychoda bengalensis*. The legs have the tarsi (except the metatarsus, which is black nearly to the tip) entirely covered with cream-coloured microscopic, scaly pubescence. The wings resemble *margininotata*, and there appears to be a tendency to dark spots of a similar nature, placed irregularly on the disc of the wing, but especially on the bifurcations of the veins.

The genital appendages as in *margininotata*, but rather longer.

*Described* from three ♀ ♀ in the Indian Museum, from Calcutta, dated 28-vii-08 (type), 2-viii-08, and 17—18-viii-07.

*N.B.*—I place *lacteitarsis* and *gilvipes* as varieties of my *marginipunctata*, as the markings of the wing seem to keep them all within the range of one species and the variation in colour is not more than is known to occur in other species. The technical differences, therefore, rest with those of the tarsi, which may be regarded as black with white tips in the typical form; wholly white in *lacteitarsis*; and white with black metatarsi in *gilvipes*. It is possible that my two varieties represent one species, distinct from *marginipunctata*, in which case the name *lacteitarsis* had better stand.

### *Pericoma bella*, mihi, sp. nov.

♀. Darjiling.

*Body* covered with dense, greyish white bristly hair; very dense between the eyes and on lower part of face; arranged on the abdomen in transverse rows at the base of each segment. They are long and semi-erect, thus covering most of the abdominal surface. Antennæ with both joints of the scape covered with dense white scales, both joints appearing dark at their bases; flagellum of fourteen subconical joints, the apical one produced to a blunt conical point, each joint bearing a verticil of hairs, the whole flagellum having a grey appearance. Palpi apparently black, with white bristly hair. Genital appendage inconspicuous.

*Legs*: Femora with long bristly grey hair; hind pair thickly covered with whitish scales. Tibiæ blackish brown with long, irregularly placed bristles; a ring of close, short black bristles towards the tip, and a circlet of closely packed, elongated white scales at the tip. Metatarsus and tarsal joints black, with a circlet of short white scales at the tip of most of them.

*Wings*: Fork of the upper branch of second longitudinal vein and the fork of the fourth vein both occur a little before the middle of the wing. The upper branch of the second vein, immediately after its origin, takes a rather sudden curve upwards, descending slightly to where it forks, and the lower branch ends only slightly above the extreme tip of the wing. The third vein originates in a right angle from the fourth, just beyond where the second vein divides into its upper and lower branches. The veins bear the usual double row of greyish, semi-erect hairs, and patches of black, erect, bristly hairs are distributed as follows: at the fork of

the upper branch of the second vein, and at (or just beyond) the similar fork of the fourth vein. Also about the middle of the sixth and along the seventh, except in its centre. The fringe round the border of the wing is generally greyish white, with an arc of black bristly hairs near the middle of the costa, and just beyond the middle; on the posterior border between the lower fork of fourth vein, and the fifth; also from the end of the sixth, nearly to the base of the wing.

*Described* from six females taken by me on windows at Darjiling during the last few days of September, and on October 1st, 1908. It was not uncommon.

*N.B.*—The patches of black hairs on the wing are by no means of regular size or shape, but the markings of the six examples examined agree fairly well with the distribution of black hairs as herein described. Small irregular patches occur in nearly all the specimens. Sometimes the general appearance of the wing is wholly blackish or black, with a slightly curved band of lighter hairs across it near the tip; a patch of white hairs in the middle of the costa, and beyond the middle on the hind border, and also at the tip of the wing.

The species is closely allied to (but, I have no doubt, distinct from) *margininotata*.

