

PROCEEDINGS
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SIMULIIDÆ OF PERU.

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In his investigation of the transmission of the disease called "verruca peruana" and the search for the insect transmitter, Prof. C. H. T. Townsend collected blood-sucking Diptera in the verruca zone. Among those submitted to the writer for determination were four species of *Simulium*, and of these three proved to be new to science. Another species still undescribed was collected by Professor Townsend in 1911 on the eastern slopes of the Andes and still another was collected in 1911 by the Yale Peruvian Expedition. Five species have been previously reported from Peru and this brings the number of species known from this country up to ten. These may be separated as follows:

1. Mesonotum black or grey, without contrasting colors 6
 - Mesonotum not black and grey throughout 2
2. Mesonotum with black markings 3
 - Mesonotum without black markings 4
3. Mesonotum margined with yellow and with a median reddish stripe *gaudeatum* n. sp.
 - Margins yellow, disk entirely velvet black *bicoloratum* Mall.
4. Scutum orange, paler at sides, a pair of whitish spots at anterior margin *dinellii* Joan
 - Not so marked 5
5. Scutum ferruginous with four broad grey stripes *escomeli* Roub.
 - Scutum orange and yellow *flavipictum* n. sp.
6. Scutum with stripes on the disk 8
 - Scutum without stripes on the disk 7
7. Scutellum drawn out to a sharp point; small species . . . *spinifer* n. sp.
 - Scutellum blunt; large species; scales on the scutum in small groups *seriatum* n. sp.

8. Small species; scutum with broad lateral iridescent areas

nitidum Mall.

Large species; without broad lateral iridescent areas on scutum . . . 9

9. Front femora and tibiae for the most part light colored

townsendi Mall.Front femora and tibiae for the most part black . . . *chalcocoma* n. sp.***Simulium gaudeatum*** new species.

Female.—Occiput black, with coarse black hair projecting from the nape; frons and face pale silvery grey, the frons flat, broad, nearly parallel-sided, bilobed over the antennae. Antennae black. Palpi black. Scutum marked with yellow, ferruginous red and velvet black; sides of the disk black, the extreme lateral margins rather broadly light yellow, a very broad light yellow zone along anterior margins and involving prothoracic lobes, divided at the middle by a broad black strip which merges with the sublateral black areas, the hind margins of yellow anterior zones concave; behind the anterior median black strip a broader stripe of ferruginous red occupying fully one-third the width of the scutum, limited at the antescutellar depression, which is also ferruginous, by a transverse wavy band of light yellow. Scutellum light yellow, with long black hairs. Dorsal vestiture of long, pale golden hairs evenly distributed, some erect very long black ones before scutellum. Postnotum blackish brown. Pleurae blackish, grey pruinose, prothoracic portion luteous, with pale yellow hairs. Abdomen with the first segment yellow, the succeeding ones blackish with the posterior margins, particularly towards the sides, and the lateral folds yellowish. Legs variegated, all the tarsi black throughout; femora black, pale brown at bases; anterior tibiae white with black apices; middle and posterior tibiae brownish yellow on basal halves; in addition to the coarser black hairs there are finer pale yellow hairs on the femora and tibiae; first joint of hind tarsi broad and long, longer than the tibia. Claws slender, with a minute tooth towards base in addition to the basal thickening. Wings clear, with red iridescent spot in the anal area; venation normal; costa, first and second veins black, subcostal vein brownish. Halteres bright yellow, the base of the stalk darkened.

Length.—Body about 2 mm.; wing, 3 mm.

Peru, two females (C. H. T. Townsend, No. 8092).

Type.—Cat. No. 18,346.

Closely related to *S. bicoloratum* Malloch, but differs particularly in the ornamentation of the scutum, as well as in other details.

Simulium dinellii (Joan).

Melusina dinellii Joan, Bol. Minist. Agric. (Buenos Aires), xiv, No. 4, pp. 363, 385 (April, 1912).

Simulium bipunctatum, Malloch, Proc. U. S. Nat. Mus., xliii, p. 650 (Dec. 31, 1912).

In establishing the synonymy for this species (Insec. Inscit. Menstr., i, 1913, p. 155) the dates of publication were inadvertently given as 1913, instead of 1912. For this reason the corrected references are here introduced.

***Simulium escomeli* Roubaud.**

This species appears to be the commonest and most widely distributed *Simulium* in western Peru and in northern Chile. It was originally described from the neighborhood of Arequipa. Prof. Townsend has sent specimens from the following Peruvian localities: Santa Eulalia, July 5, 1913; Lima, March, 1914; Chosica, March, 1914. The National Museum has a series from northern Chile, taken by Prof. Carlos E. Porter in the Valle de Lluta and the Valle de Azapa in June, 1912. Usually the ground color of the scutum is bright ferruginous, but specimens occur in which it is rich chocolate brown. Two females, one from Lima, the other from Chosica, show this variation. This species closely resembles in coloration *S. bivittatum* from New Mexico and Colorado, but in spite of this the two are readily separable. In *S. escomeli* the scutellum is broad and blunt, while in the North American species it is narrow and drawn out to an acute angle.

***Simulium flavipictum* new species.**

Female.—Occiput dull black, frons and face white, pruinose; frons moderately broad, widening on upper portion. Antennæ ferruginous yellow on basal half, shading from brown to dull black on distal half. Palpi blackish. Scutum ferruginous, marked with ocher yellow somewhat similarly to *S. gaudeatum*, but the markings less regular and less sharply delimited; rather broad lateral yellow stripes joining very broad yellow zones along the anterior margin, which latter are broadly divided in the middle, involve the prothoracic lobes and are deeply concave on their posterior margins; posterior margin narrowly bordered with yellow, a narrow median line extending forward to near middle of disk, a transverse yellow shade crossing it before antescutellar depression and sending forward branches at its outer angles. Scutellum yellow, broad and obtuse. Postnotum yellow, pruinose. Dorsal vestiture of coarse, evenly distributed blackish hairs with golden luster. Pleuræ yellow and ferruginous. Abdomen ferruginous yellow at base, dull blackish brown beyond first segment. Legs with the femora ferruginous yellow, the tibiæ shading to brown at their apices; anterior tarsi black, median pair with the first joint ferruginous, darker towards the tip, the second pale at base, the last three black; hind tarsi black, with bases of the first and second joints yellowish brown; vestiture of femora and tibiæ dark with golden luster. Claws slender, with a prominent tooth near base in addition to basal thickening. Wings clear, the membrane between the subcostal and first veins yellow; venation normal; costa and end of first vein brown, with black spines and hairs, the subcostal vein yellow. Halteres ferruginous yellow.

Length: Body, about 2.5 mm.; wing, 3.5 mm.

Rio Charape, Peru, 14 September, 1911, one specimen (C. H. T. Townsend).

Type.—Cat. No. 18,347, U. S. Nat. Mus.

This species is remarkable for the pigmentation of the wing-membrane of the submarginal cell, a condition which has not been observed in any other simuliid.

***Simulium spinifer* new species.**

Female.—Frons light grey pruinose, broad above, much narrowed to a point a short distance above the antennæ, then again slightly widened; face light grey pruinose. Antennæ blunt at tip, three joints at base yellowish ferruginous, the others deep black. Scutum greyish black, evenly clothed with fine brassy hairs, two indistinct black depressed longitudinal stripes, at anterior margin a pair of large triangular pearly white spots, a whitish spot on lateral margins before roots of wings, a large subquadrate grey patch before antescutellar area, this last triangularly produced into scutellum. Prothoracic lobes dull ferruginous, with a pearly white spot at the outer angles. Scutellum triangularly produced to an acute point, obscurely ferruginous, with coarse erect black hairs on the posterior margins. Postnotum black. Pleuræ black and brown, with a large whitish pruinose patch. Abdomen dull black, the two basal segments dull brown and with long brassy hairs. Legs blackish, marked with white; tibiæ of fore legs with a whitish sheen along one side, the tarsi entirely black; middle pair with the base of the tibia and the basal two-thirds of the first tarsal joint whitish, the second and third tarsal joints pale at their bases; hind legs with the tibiæ broadly yellowish near base, the first tarsal white and with the apical fourth black, the second joint pale at base. Claws simple, produced tooth-like at the base. Wings hyaline, the venation normal; heavy veins on anterior portion of wing yellowish, the costa slightly darkened distally, the spines and hairs black; thin veins unpigmented. Halteres pale yellow, the stem dark at base.

Length: Body, about 1.3 mm.; wing, 2 mm.

Verrugas Canyon, Peru, 5 July, 1913, three females (C. H. T. Townsend).

Type.—Cat. No. 18,348, U. S. Nat. Mus.

***Simulium seriatum* new species.**

Female.—Occiput black; frons grey pruinose, broad above, tapered regularly to the antennæ, where it is narrowed almost to a point; face grey pruinose. Antennæ with two basal joints dull ferruginous yellow, the others blackish, clothed with whitish pubescence, the tip pointed. Scutum uniformly greyish black; vestiture of lustrous, yellowish white, hair-like scales disposed in little groups which form indistinct longitudinal series. Scutellum broad, transverse, concolorous with the mesonotum, the pale scales directed transversely; posterior margin with coarse, black erect hairs. Postnotum black, pruinose. Pleuræ grey, pruinose. Abdomen black, the posterior margins of the segments narrowly pale grey.

Legs ochraceous, black and white; anterior pair with the coxæ and femora ochraceous, the tibiæ black, with white sheen on the under side on the basal two-thirds, the tarsi entirely black; middle legs with the coxæ blackish, femora and tibiæ ochraceous, the latter dark distally and with whitish luster, tarsi with the first joint white, black at tip, the second with pale basal ring, the last three all black; hind legs with the coxæ black, femora blackish brown, ochraceous at base, the tibiæ blackish, yellowish at base, the tarsi with the first joint white on the basal half, the distal half and all of the succeeding joints black. Claws long, with a short stout tooth near base in addition to the basal thickening. Wings hyaline, the venation normal; thick veins yellowish brown, the spines and dense black setæ on the costa causing it to appear nearly black; anal field with strong green and red iridescence. Halteres with brown stem and pale yellow knob.

Length.—Body, about 2.3 mm.; wing, 4.5 mm.

Santa Eulalia, Peru, July 5, 1913, and Chosica, Peru, September, 1913 (C. H. T. Townsend); two females.

Type.—Cat. No. 19,349, U. S. Nat. Mus.

Very close to *Simulium orbitale* Lutz. Differs particularly in the absence of vestiture from the frons and face and in the wedge-like narrowing of the frons towards the antennæ. In *S. orbitale*, of which an authentic specimen kindly sent by Dr. Lutz is before me, the frons is broad throughout, nearly parallel-sided.

***Simulium chalcocoma* new species.**

Female.—Body black. Mesonotum grey-black, in certain lights velvet black on the disk and with three light grey longitudinal lines, the median line straight, narrow and anteriorly abbreviated, the others sinuate and ending in large bright spots on the anterior margin; lateral margins and anterior angles broadly grey; vestiture of coarse and rather dense, evenly distributed, brassy hairs. Scutellum deep brown, rather narrow and produced to a distinct angle. Legs rather stout, black; all three pairs of tibiæ white at bases; fore tarsi all black; middle and hind tarsi with slightly more than the basal half of the first joint white. Claws with a stout tooth in addition to basal thickening. Wings hyaline; costa black, the other thick veins brown. Halteres white.

Length.—Body, about 3 mm.; wing, 4 mm.

Tincochchoca, Peru, 7,000 feet altitude, 10 August, 1911 (Yale Peruvian Expedition).

Type.—Cat. No. 18,350, U. S. Nat. Mus.

A full description of this species will appear in a forthcoming report on the Diptera of the Yale Peruvian Expedition. It is included here for the sake of completeness.



Knab, Frederick. 1914. "Simuliidæ of Peru." *Proceedings of the Biological Society of Washington* 27, 81–86.

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