

The Black Fly, *Simulium (Eusimulium) smarti*, N.  
SP. (*Diptera: Simuliidae*), of the Onchocercotic  
Zone of the State of Chiapas, México<sup>1</sup>

By LUIS VARGAS

From the Institute of Public Health and Tropical Diseases, México City

**T**HIS species is named for Dr. John Smart, dipterologist of the British Museum.

**FEMALE:** Dichoptic. Black forehead with a metallic sheen; antenna composed of 11 segments, the lower two of a light brown color and the others black. Clypeus, silvery pruinose, with abundant black hairs. Black mesothorax covered with many bronze-colored scales evenly distributed over its entire length. Black scutellum with the same color scales covered by a row of long, black hairs. Metanotum black and bare. Pleura uniformly silvery gray and pruinose. Anterior coxae light brown, the other two black and silvery pruinose; in certain positions Coxa II shows a light brown sheen.

Leg I. Trochanter and femur light brown like coxae; all the rest black. Leg II. Black femur; lower third of tibia silvery; lateral and lower margins dark; basal halves of the second and third segments light brown in color; the rest black. Leg III. Broad, spindle-shaped femur; tibia slenderer than femur with 40 percent of its base light brown in color with a gray metallic sheen. Basitarsi and second segment light brown with a silvery gray sheen at its lower half; the rest black. Claw has strong tooth in its concave margin. Length of hind tarsi—4.0 mm.

*Wing.* Subcostal region pilose except in the distal sixth; radial sector pilose at base. No discal cell. Cu<sub>2</sub> vein curved. Halteres have yellowish knob and black stem. Length of wing—4.2 mm.

*Abdomen.* Black; final tergites have metallic sheen. On both sides of second and sixth tergites there are bright silvery spots, well separated from the midline. Sternites 1 and 2 yellowish.

*Terminalia.* Ovipositor points horizontally back, almost reaching anal lobe; handle of fork has terminal knob.

**MALE:** Holoptic. Outer characteristic markings same as in female. Tibia somewhat broad; basitarsi not quite so broad. Length of hind tarsi—3.5 mm.

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*Wing.* Subcostal region bare of hair except for scattered few at basal end; radial sector bare at base like the male of *mexicanum*. Length of wing—3.5 mm.

*Terminalia.* Clasper longer than side piece in a proportion approximating 1:1.25 (Fig. 1). It resembles *pulverulentum*;<sup>2</sup> has broad base rounded at tip. Anterior process of the falosome (Fig. 2), seen frontally, is a narrow body with long vertical axis, 1:2, with two diverging branches; heavily pilose and differing from *pulverulentum* by absence of basal expansions.

*PUPA:* Cocoon resembles *mexicanum*, *virgatum*, or *mathesoni*, but open entrance is smooth. Eighteen filaments branch off from small stems (Fig. 4); length of filaments—1.8 mm. Length of cocoon—6.7 mm. *S. mexicanum* has 12 branches (Fig. 5), *virgatum* and *mathesoni*, 8. Found in damp and dark breeding places attached to stones or wooden debris.

*LARVA:* Live in large quantities in fast running streams, attached to stones.

*TYPE MATERIAL:* Holotype—female; allotype—male; paratypes—1 male and 3 females in the collection of the Institute of Public Health and Tropical Diseases of México City. The material was taken from a creek, "El Rubí," on the estate "El Vergel" located in the State of Chiapas, México, at an altitude of 1,000 meters above sea-level. Some of it was also found in a waterfall on the estate "Belem" located in Mariscal County of the State of Chiapas, at 900 meters. The writer has seen numerous other specimens in Guatemala, but their locality was not indicated.

*COLLECTORS:* A. Díaz Nájera and Luis Vargas.

#### DISCUSSION

The species has been heretofore confused with *S. mexicanum*, to which it is closely related. The latter species was originally described in Latin by Bellardi,<sup>3</sup> and this description later translated into English by Malloch.<sup>4</sup>

Malloch's description of *S. aureopunctatum*<sup>5</sup> leaves no doubt as to its relationship with *mexicanum*, and Hoffmann's original paper

2. L. Vargas, Nuevos datos sobre simúlidos mexicanos. Rev.Inst.Sal.y Enf.Trop., México, 4:359-370, 1943.

3. L. Bellardi, Saggio di Ditterologia Messicana, 2 (Appendice p. 6), Torino, 1862.

4. J. R. Malloch, American black flies or buffalo gnats, U. S. Dept. Agric., Bur.Ent.Tech. Serv., 26:1-72, 1914.

5. *Ibid.*

on *Eusimulium turgidum*<sup>6</sup> stated: "Leg I—Tibia, dark almost all over," which is a characteristic of *mexicanum*. A photomicrograph of the female terminalia shows the absence of the terminal knob in the handle of the fork. The same characteristics are stressed in another of Hoffmann's papers,<sup>7</sup> wherein the fork with the tapering and curved end is mentioned.

The adults of *S. mexicanum* were also described by Bequaert,<sup>8</sup> which description is accompanied by a drawing of the cocoon and a detail of the 12 branchial branches of the pupa. Fairchild's<sup>9</sup> description of the female *mexicanum* included one of the cocoon; he also points out the 12 branches. There are drawings which illustrate the shape of the female terminalia fork and the branches of the pupa.

This author places *S. lugubre* Lutz and Nuñez Tovar, 1928, with the synonyms of this species, but Smart<sup>10</sup> believes that it probably corresponds to *S. guianense* Wise, 1911. Vargas<sup>11</sup> has given a complete list of the synonymy of *mexicanum*. This last species, however, differs sharply from *smarti*, n. sp., in that its mesonotum is covered with a gray pruinescence, which is wholly lacking in *smarti*.

In *mexicanum* the first tibia is bicolored, yellow at its lower half; it is completely black in *smarti*. We found the following differences in the male terminalia: the clasper of *mexicanum* is not as long as, though broader, than that of *smarti*. It does not show the processes mentioned in *smarti*.

#### SUMMARY

Two species, *Simulium mexicanum* and *Simulium smarti*, have been confused under the one name, *Simulium mexicanum*. The adult stages of *Simulium (Eusimulium) smarti*, n. sp., may be differentiated by:

1. Mesonotum is devoid of gray pruinosity.
2. Anterior tibia is dark all over.
3. Fork in female terminalia has knob on tip of handle.
4. Male clasper is slender and longer, supporting a triangular process.

6. C. C. Hoffmann, Estudios entomológicos y parasitológicos acerca de la Onchocercosis de Chiapas, Salubridad (Organo Depto.Sal.Pub., México), 1:669-697, 1930.

7. C. C. Hoffmann, Los simúlidos de la región onchocercosa de Chiapas, con descripción de nuevas especies. An.Inst.Biol., México, 1:293-306, 1930.

8. R. P. Strong, J. H. Sandground, J. C. Bequaert, and M. Muñoz Ochoa, Onchocerciasis, Part 3, pp. 175-224 (Cambridge: Harvard University Press, 1934).

9. G. B. Fairchild, Notes on the simuliidae of Panamá (*Diptera: Nematocera*), Ann.Ent.Soc. America, 33:701-719, 1930.

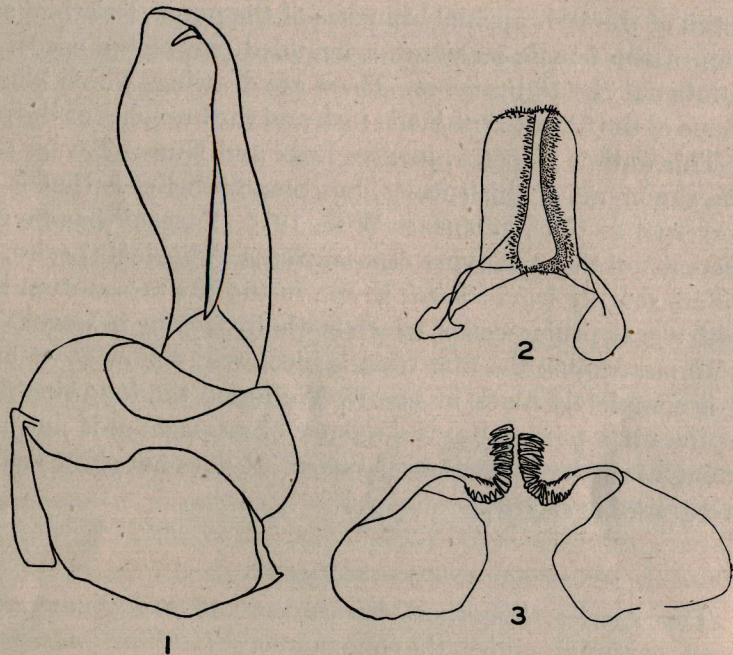
10. J. Smart, Notes on the simuliidae (*Diptera*), Proc.Roy.Ent. Soc., London, 11:46-50, 1942.

11. L. Vargas, Simúlidos del Nuevo Mundo, Mon. #1, Inst.Sal.y Enf.Trop., México, 1945.

5. Pupa has 18 filaments instead of 12 as in *mexicanum*.
6. Marginal tip of cocoon is smooth and lacks anterior processes.

ACKNOWLEDGMENT

Miss Anita Hoffmann's courtesy afforded us the opportunity of examining type material of *Eusimulium turgidum* (-*mexicanum*).



LEGEND

Fig. 1. *S. smarti*, n. sp., male terminalia; side section and clasper with lateral process.

Fig. 2. *S. smarti*, n. sp., male terminalia; anterior aspect of the mesosome.

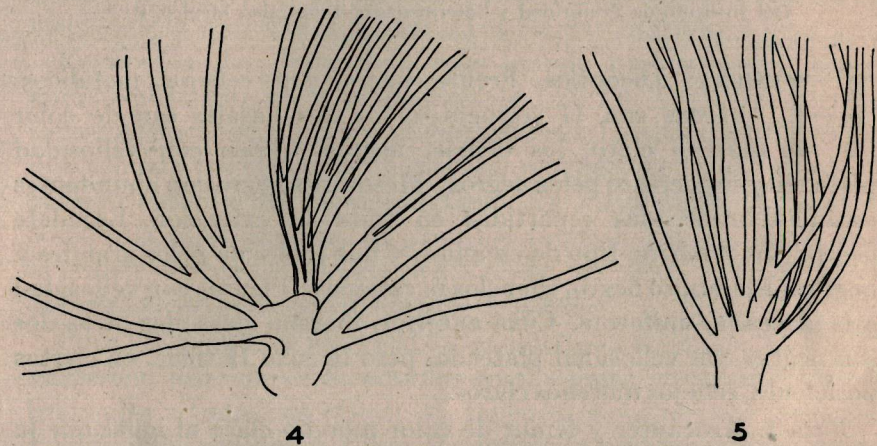
Fig. 3. *S. smarti*, n. sp., male terminalia; posterior process.

LEYENDA

Grab. 1. Terminalia masculina de *S. smarti*, n. esp. Pieza lateral y abrazadera mostrando el proceso lateral.

Grab. 2. Terminalia masculina de *S. smarti*, n. esp. Vista anterior del mesosoma.

Grab. 3. Terminalia masculina de *S. smarti*, n. esp. Procesos posteriores.



LEGEND

Fig. 4. *S. smarti*, n. sp., respiratory branches of the pupa.

Fig. 5. *S. mexicanum*, respiratory branches of the pupa.

LEYENDA

Grab. 4. Ramas branquiales de la pupa de *S. smarti*, n. esp.

Grab. 5. Ramas branquiales de la pupa de *S. mexicanum*.