A Black Fly of the Subgenus *Simulium* *(Psaroniocompsa)* (Simuliidae, Diptera) from the High Andes of Colombia

**By Pedro Wygodzinsky**

**ABSTRACT**

*Simulium* *(Psaroniocompsa)* *schmidtummi*, new species, is described from the Colombian Andes, where it has been found at altitudes between 3050 and 3450 meters. All previously known species of the subgenus are found in lowland areas not exceeding 1000 meters altitude. The new species differs from all others in having only four filaments to the gill of the pupa; six is the usual number in *Psaroniocompsa*.

**INTRODUCTION**

One of the most surprising finds made during research on the black flies of cool and cold temperate western South America was the discovery of a high altitude species of *Simulium* *(Psaroniocompsa)* in the Andes of Colombia. The remaining species of this subgenus (*anamariae* Vulcano, *brevifurcatum* Lutz, *fuliginis* Field, *guttatum* [Enderlein], *incrustatum* Lutz, *jujuyense* Paterson and Shannon, and *opalinifrons* [Enderlein]) are lowland species of tropical and subtropical areas, and are not known to occur above 1000 meters altitude. The species described here differs from all others mentioned in the smaller number of filaments of the gill of the pupa, namely four as against six; in all other respects, differences are minor, and we do not hesitate to include the new species in this subgenus.

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1 Curator, Department of Entomology, the American Museum of Natural History.
Field and laboratory work leading to this paper was supported by National Science Foundation grants GB-5852 and GB-8783, which are gratefully acknowledged. I was aided in my collecting by my wife, Betty Wygodzinsky, and by our friend, Dr. Ernesto W. Schmidt-Mumm, of Bogotá; I am greatly obliged to both.

Mr. Matthew Cormons and I made the drawings.

**Simulium (Psaroniocompsa) schmidtmmum**, NEW SPECIES

**Diagnosis:** A species distinguished in having only four filaments in the pupal gill, there being six in all consubgeneric species.

**Description:** Female: Wing length 3.0–3.3 mm. Frons and clypeus from silver gray to nacreous. Mouthparts piceous; maxillary palps dull black. Antennae black, with scapus, pedicellus and base of first flagellomere dark orange-colored (fig. 1C). Thorax black. Pleura and sterna with silver gray, faintly nacreous pruinosity; pleural membrane dull piceous. Scutum velvet black, lateral and posterior margins nacreous; anterior border submedially with 1+1 short cuneiform spots, in many specimens difficult to perceive. Scutellum velvet black; metanotum dark piceous, with faint silvery or nacreous pruinosity. Scutum and scutellum with setae golden-green. General color of legs from piceous to black; light-colored areas yellowish brown; anterior surface of fore tibia with white reflection. General color pattern of legs as shown in figure 1J–L. Setae and scales of legs colored as respective background. Anterior wing veins light brown; scales and setae of wing base dark brown. Stem of halteres light grayish brown; knob light yellow. Color pattern of abdomen as shown in figure 2C. First tergum from piceous to black; fringe brass-colored. Segments II–V blackish, with III–V velvet black at center dorsally. Tergum II with 1+1 large silver white spots not quite attaining hind border of segment; III–V with hind borders silvery, this area deeper at sides than toward center. Terga VI–IX piceous, highly polished. Under surface of abdomen grayish.

Head as shown in figure 1A. Frons very wide; frontal angle 110 degrees. Fronto-ocular triangle distinct, much wider than long. Antennae 11-segmented, shape and proportions of segments as illustrated (fig. 1C). Cibarium (fig. 1G) with dorsolateral arms less strongly sclerotized than parts of margin proper; central portion of margin emarginated, glabrous; submedian and sublateral portions of margin with subtriangular denticles, larger and arranged in two irregular rows toward middle, laterally smaller and only in one row. Maxillary palp as shown in figure 1D; apical segment as long as the two preceding combined. Sensory vesicle (fig. 1F) elongate, with its diameter equal to about half the width of third segment.

of palp; neck short; tubercles as illustrated. Maxillae and mandibles serrate on both edges. Maxillae with 22–28 teeth. Mandibles (fig. 1E) with 5–13 (generally 11 or 12) teeth on outer and 25–28 teeth on inner margin.
Scutum without scales; setae elongate, narrow, adpressed, isolated or in small groups (fig. 1I), these groups somewhat longitudinally arranged, but not forming distinct lines. Setae of scutellum as on scutum.

C with hairlike and spinelike setae, its basal portion with scales intermixed between setae (fig. 3E). Sc and basal portion of R glabrous; extreme base of R with conspicuous scale patch (fig. 1O). R₁ with spiniform setae arranged in a single row beginning somewhat beyond base of vein; in some cases, basal setae substituted by scales (fig. 1N).

Shape of legs and proportions of segments as shown in figure 1J–L. First segment of fore tarsus widened, 5–5.7 times as long as maximum width. Calcipala shorter than wide, remote from level of pedisulcus (fig. 1M). Claws with minute subbasal tooth (fig. 1H). Femora and tibiae densely covered with scales (fig. 3G) in addition to setae.

Abdomen without scales, with scattered setae. Tergal plates well developed. Seventh sternite lacking specialized setae. Eighth sternite as shown in figure 2A, with about 10+10 setae. Gonapophyses (fig. 2A, F) broadly subtriangular, lacking true setae but with numerous microtrichia that become very long near median border of gonapophyses. Cerci and paraprocts as shown in figure 2G, paraprocts very short. Genital fork as illustrated (fig. 2B); stem slender, heavily pigmented; anterior processes of posterior arms very narrow. Spermatheca (fig. 2E) oval, its texture smooth; spicules of inner surface of variable size (fig. 2D), scattered or arranged in small comblike groups. Spermathecal duct and area of its insertion membranous.

**MALE:** Wing length 3.0 mm.

Color of clypeus and mouthparts as in female. Antennae entirely black. Color of thorax and its setae as in female; submedian spots of anterior margin of scutum difficult to perceive. General color scheme of legs similar to that of female and as shown in figure 3H, J. Abdomen velvet black; basal fringe dark brown. Segments II and IV–IX silver white laterally, extension of white area as shown in figure 3K; in many specimens spots on IV and V not distinct, although very conspicuous in other specimens such as the one illustrated.

Holoptic. Antennae 11-segmented; shape and proportions of segments as shown in figure 3B. Maxillary palp as shown in figure 3A; sensory vesicle (fig. 3C) subglobular, smaller, and with fewer tubercles than in female.

Setae of thorax as in female.

Wing venation and chaetotaxy as in female, but in some cases Sc with one or two setae on central portion.

Shape of legs and proportion of segments as shown in figure 3D, F, H–J.
Fore basitarsus widened, 5.2–5.3 times as long as maximum width. Hind basitarsus comparatively narrow (fig. 3F), 5.8–6.6 times as long as wide. Calcipala (fig. 3D) much as in female. Scales of legs more numerous than in female, very dense on femora and tibiae, and also present although only scattered, on coxae and basitarsi.

Parameres as shown in figure 3M, O, P. Basimere subquadrate. Distimere shorter than basimere, subrectangular, slightly longer than wide; apical spine in sublateral position. Ventral plate (fig. 3N) narrowly subtriangular, main body transverse, its setae as illustrated; pigment distinct, strongest on basal arms; faint median keel present. Endoparameral organ as shown in figure 3Q. Median sclerite (fig. 3L) very narrow, not incised apically.

Pupa: Cocoon (fig. 4A–C) slipper-shaped, with anteroventral collar absent; anterior dorsal margin projected at center, in shape of somewhat blunt triangle. Ventral wall of cocoon delicate but complete. Cocoon
translucent, its surface smooth but individual threads distinctly perceptible; borders of anterior opening slightly reinforced laterad of median projection. Color of cocoon light brown. Length of cocoon along dorsal surface 3.5–4.0 mm.; along ventral surface 4.0–4.2 mm. Length of pupa

3.5–3.8 mm.; of gills up to 4.3 mm., viz., distinctly longer than body of pupa.

Gills composed of four forwardly directed slender filaments (figs. 4A–C, F; 6B). Two extremely short primary branches each giving rise to two filaments; latter gradually tapering to rounded apices. Surface of filaments
with minute tubercles arranged in irregular spirals.

Head and thorax of pupa with numerous small, irregularly arranged, rather faint platelets (fig. 4E). Head with 2+2 frontal and 1+1 facial trichomes (figs. 4E, G, I; 6G); these trichomes from simple to four-branched (figs. 4D, H, J; 5B). Thorax with 5+5 anterodorsal, 1+1 posterodorsal and 1+1 posteroverentral trichomes (fig. 5A, C); these trichomes with up to 12 branches, many branches clavate at apex (fig. 5D).

Abdomen as illustrated (fig. 6A). Tergite I with one long hair on each side; tergite II with several setae on each side, one or two of which bifid; tergites III and IV with 4+4 simple hooks; tergite V with one or two simple setae; tergites VI–IX or VII–IX with short spine-combs along anterior borders; tergites V–IX with lateral areas of minute scalelike cuticular processes. Apex of abdomen with 1+1 short, slightly sclerotized tubercles. Sternite IV with 1+1 groups composed of a few setae. Sternites V–VII with 2+2 hooks, closely approximated on V, distant on VI and VII; inner hooks bifid or trifid, outer hooks from simple to trifid. Sternites III–VIII each with 1+1 fields of minute scalelike cuticular processes.

Larva: Length of mature larva 6.5 mm.; width of head capsule 0.60–

![Fig. 5. Simulium schmidtummi, pupa. A. Part of thorax, with trichomes. B. Trichomes of fronsoclypeus. C. Thoracic trichome. D. Apices of some branches of thoracic trichomes.](image-url)
0.65 mm. General body color yellowish white, somewhat reddish posteriorly. Head yellowish; pattern of cephalic apotome brownish (fig. 7H). Body integument glabrous, except for a few perianal setae.

General body shape as shown in figure 7A, B; abdomen gradually widened toward behind, not abruptly truncate at tip. Ventral papillae conspicuous.

Antennae as shown in figure 7C, K, faintly but distinctly pigmented.

throughout. Second segment as long as, or very slightly shorter than, first or third, with one or two more or less distinct constrictions. Large fan of mouth brush with 50–55 rays. Primary teeth of rays stout, secondary teeth only slightly decreasing in size from one primary tooth to the next. Toothing of mandible as shown in figure 7I, J, L; two outer teeth and one apical tooth, all strongly sclerotized; three subapical teeth, conspicuously decreasing in size from first to third; inner teeth arranged in two series; marginal teeth generally numbering two, in some cases with one very small additional tooth (fig. 7I, L). Maxillary palp as shown in figure 7F. Hypostomium as shown in figure 7G; median and lateral teeth equally prominent; sublateral teeth and serrations distinct. Hypostomial setae in one irregular row, their number approximately six in each row. Gular cleft deep, somewhat deeper than length of postgenal bridge (fig. 7E).

Lateral sclerite of proleg as shown in figure 7M; setae arranged in groups of three or four on prominent tubercles; the longest setae almost as long as body of sclerite. Anal sclerite as shown in figure 7O. Posterior circlet with approximately 66 rows of 14 or 15 hooks each. Anal gills composed of three lobes, each with 12–16 lobules (fig. 7N).


Biology: We have no information on the feeding habits of this species. Recently hatched females show very small ovaries that indicate they need to feed in order to start the first gonotrophic cycle. Well-developed mouthparts indicate hematophagous habits, and the very small tooth of the claws points to mammals as possible hosts.

Larvae and pupae of Simulium schmidtummi were found on grasses trailing in the water and on the upper and lower surfaces of rocks and stones, in clear streams with temperatures ranging between 9° and 12° C. The streams were generally small (less than 1 meter wide and not more
than 15 centimeters deep), with crystal clear water, although in some cases abundant organic material was deposited on the substrate. All the localities where we collected this species were in the páramo formation, and situated between 3050 and 3450 meters.