PROCEEDINGS OF THE

ENTOMOLOGICAL SOCIETY OF WASHINGTON

VOL. 46 OCTOBER, 1944 No. 7

TWO NEW SPECIES OF HAEMAGOGUS FROM COLOMBIA, H. ANDINUS AND H. BOSHELLI (Diptera: Culicidae)[1]

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In the course of a yellow fever survey conducted during the month of July 1942, at Bahía de Solano and Bahía Utria, Intendencia of the Chocó, on the Pacific Coast of Colombia, the author found in tree holes and in coconut shells on the ground, larvae of what later appeared to be a new species of *Haemagogus*. From those larvae, male and female adults were eventually obtained, some of them being kept individually with their associated larval skins. Similarly in May 1942 larvae of a second new species of *Haemagogus* were secured from holes in some of the shade trees of a coffee plantation near the town of Fusagasugá, in the Department of Cundinamarca. The recorded altitude of this locality is 1,746 meters (5,728 feet). This is the highest altitude at which any species of *Haemagogus* has been found hitherto in Colombia.

The morphological characteristics of these two species, heretofore undescribed, form the basis of the present communication.

Haemagogus boshelli, new species

Larva (Figs. 1–5). Head rounded, slightly broader than long; antenna medium in size, smooth, tapering near tip, with a single hair arising beyond the middle. Dorsal anterior head hairs usually double; posterior usually single. Ante-antennal tuft with five elements (Fig. 1).

Skin glabrous. The lateral comb on the eighth abdominal segment a triangular patch of about 34 blunt scales, disposed in three irregular rows. These scales are finely spinulate apically, a detail which is visible under high magnification only (Fig. 3). On both sides of the comb, both dorsally and ventrally,

[1] The studies and observations on which this paper is based were conducted with the support and under the auspices of the Section of Special Studies maintained by the Ministry of Labor, Hygiene, and Social Welfare of the Republic of Colombia and the International Health Division of The Rockefeller Foundation.

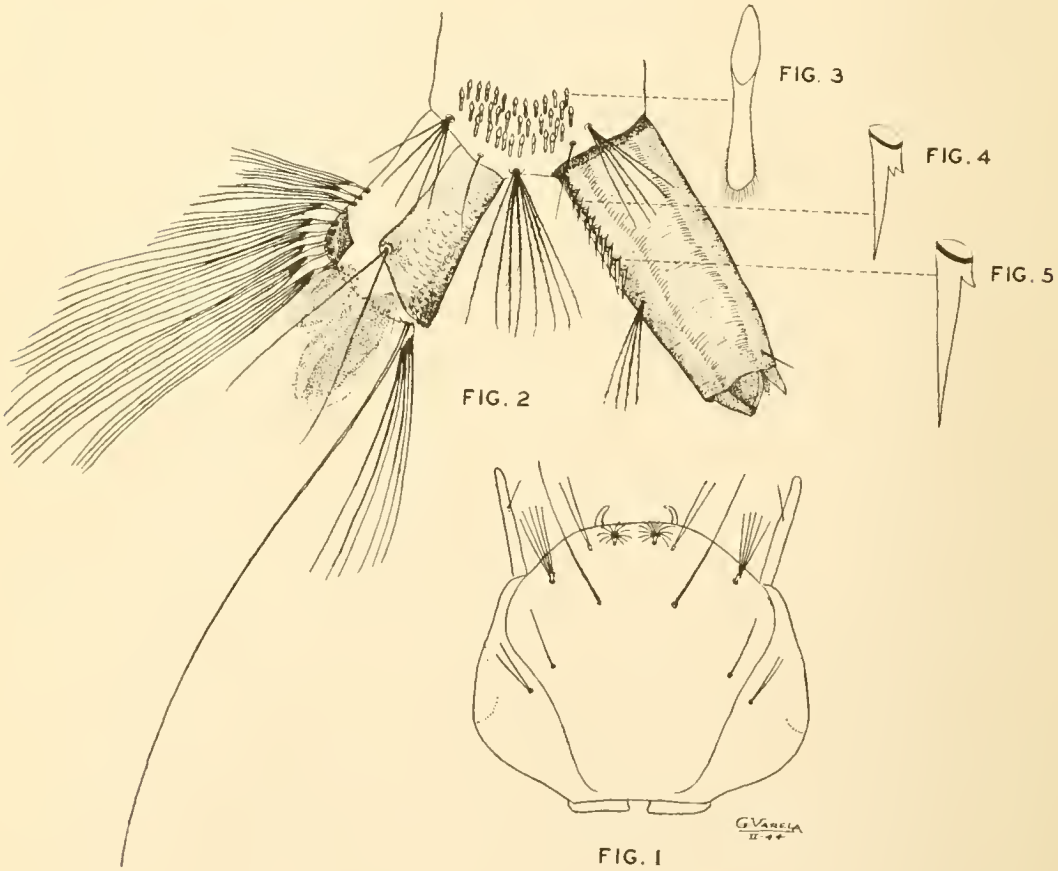
there are tufts of four or five hairs, and posteriorly there is another tuft composed of six slightly plumose elements; these latter arise from a strong sclerotized base, on each side of which a single simple hair arises, quite close to the comb.

Air tube approximately two and a half times as long as wide, bearing a pecten of about 14 spines, which reaches to its middle. The size of the spines increases progressively, starting from the base; the first two, which are quite rudimentary, bear two small teeth each, and the others only one (Figs. 4–5). Just beyond the pecten, there is a tuft of four plumose hairs.

Anal segment longer than wide. The dorsal plate, which extends laterally to the middle of the segment, has a moderately rugose and spiny appearance on the postero-dorsal surface; the dorsal tuft consists of a long hair and a brush on each side. Lateral tuft of two hairs; ventral tuft well developed, with three tufts preceding the barred area (Fig. 2).

Anal gills short, slightly rounded, the dorsal pair longer than the ventral.

Adult female. Proboscis slightly longer than femur, slender and curved, very dark blue with coppery reflection. Palpi short, one-tenth the length of the



Haemagogus boshelli, n. sp. Fourth stage larva. Fig. 1: Head, dorsal view. Fig. 2: Air tube; eighth and anal segment. Fig. 3: Scale of comb of eighth segment. Fig. 4: Basal spine of pecten of air tube. Fig. 5: Apical spine of pecten of air tube.

proboscis, and of the same color. Antennae with black tori and setae. Clypeus conspicuous, bare, black, and shiny. Occiput with a row of iridescent scales on the vertex and along the posterior margin of eyes, surrounding a zone of ultramarine blue; dorsal margin of eyes fringed by a row of stout, black setae. Vertex without white scales. Prothoracic lobes with dark-blue scales, and black bristles along the anterior edge. Mesonotum with integument black, entirely covered with bright emerald-green scales; a patch of blue scales anterior to the wing-base. Scutellum trilobed, clothed with blue scales, bearing long stout setae on the lobes. Sternopleura, mesopleura, mesepimera and coxae covered with silvery scales. Postnotum black, shiny, with two small setae posteriorly, near the base of the first abdominal tergite.

Abdomen purple with bronzy reflections. The dorsum of sixth and seventh segments with a few white scales basally; the first three abdominal sternites

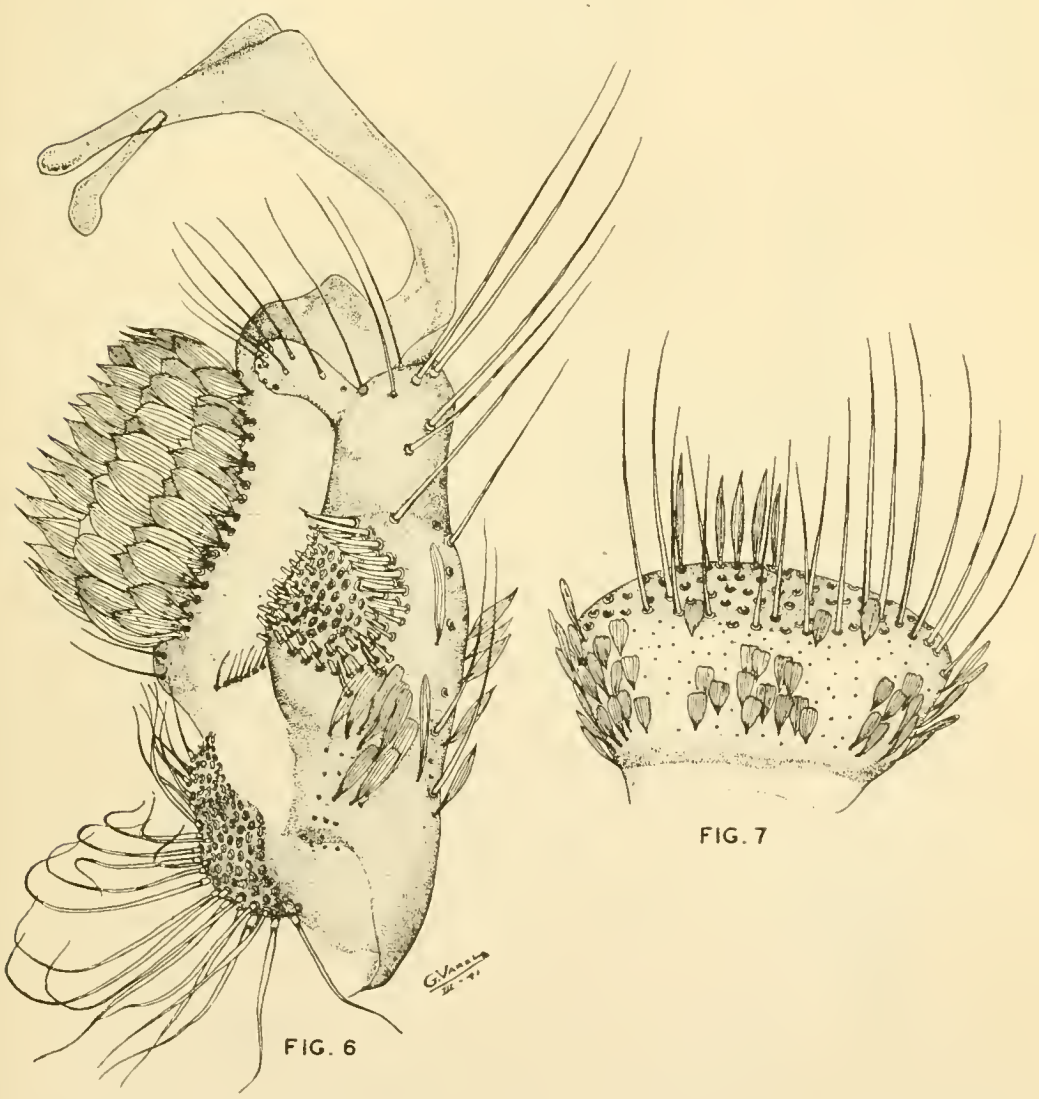


FIG. 6

FIG. 7

Male terminalia of *H. boshelli*, n. sp. Fig. 6: Side-piece. Fig. 7: Eighth tergite.

covered with white scales; all the other segments with lateral patches of white scales. Legs: Femora violet blue with bronzy reflection; a mother-of-pearl sheen covers the medial aspect of the apical third of the fore legs, the inner edge of the middle legs, and the inner and lateral aspects of the apical half of

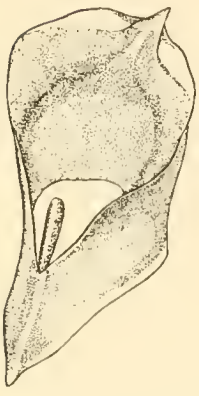


FIG. 8

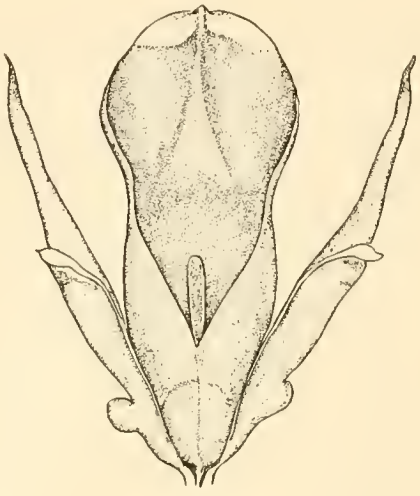


FIG. 9

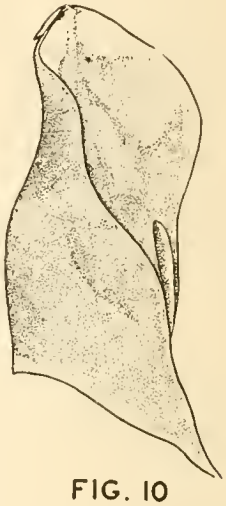


FIG. 10

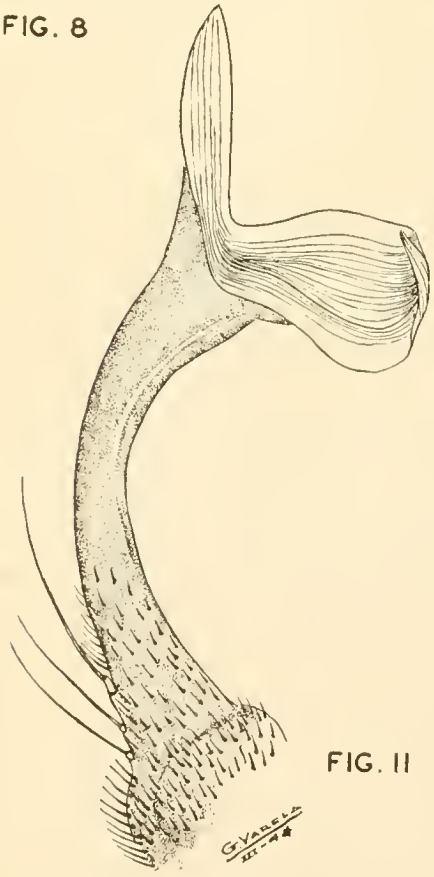


FIG. 11

FIG. 12

Male terminalia of *H. boshelli*, n. sp. Fig. 8: Mesosome, vertical view. Fig. 9: Mesosome, dorso-ventral view. Fig. 10: Mesosome, lateral view. Fig. 11: Claspette. Fig. 12: Tenth sternite.

the hind legs. Claws simple. Wings slightly shorter than the abdomen, their scales with metallic reflection, more dense along the costa, subcosta, and first vein. Second marginal cell longer than its petiole, as measured from the third cross-vein.

Adult male. Same coloration as female. Palpi short, one-fifth as long as proboscis. Antennae sparsely plumose.

Claw formula: 1/0.1/0—0/0.0/0—0/0.0/0.

Male terminalia (Figures 6–12). Side-piece roughly conical and truncate, two and a half times as long as wide; basal lobes ample, well sclorotized, bearing numerous strong and slightly hooked setae of variable length, interspersed with small spatulate scales; the scales on the apical part of medial edge of the side-piece are crowded, striate, and lanceolate, of different shapes, and lengths, some of them curved (Fig. 6). Apical lobe clear cut, thumb-shaped, with numerous fine setae. Near the middle of the dorsal surface, there is an almost circular area from which arise a number of small, short, prong-like scales bordered externally by a row of saber-shaped ones. An oblique row of seven strong setae with curved tips is on the inner aspect, midway between the basal lobe, the circular patch of scales, and the apical one.

The clasper, which is two-thirds as long as the side-piece, is greatly hypertrophied, expanded, and curved at a right angle, near its middle. The apex is distinctly spatulate, and bears a long, spatulate appendicle, inserted subterminally. The claspette (Fig. 11) has a long stem, more slender in the middle, curved in its distal third, and finely setose at the base, especially on its medial surface, from which three stout setae arise. The filament of the claspette is large, leaflike, and striate; and flexed at a right angle towards its middle, forming a posterior narrow upright pointed portion, and an anterior portion which is widened, somewhat concave, and has a short reflexed tip. Tenth sternite (Fig. 12) long, strongly sclerotized, pointed, with three or four subapical setae.

The mesosome (Figs. 8–9–10) is roughly comparable to a hollow, irregular cylinder, slightly constricted near the middle, and expanded apically; being somewhat pear-shaped. A small erect appendage arises from the mid-ventral line; at the apex is a short, sharp point, projecting dorsally.

Ninth tergites with atrophied lobules, without setae.

Eighth tergites bearing a distal row of lanceolate scales, and numerous long and strong setae (Fig. 7).

Type locality.—Bahía de Solano, Intendencia of Chocó, on the Pacific Coast of Colombia, South America.

Additional material was obtained from Bahía Utria, to the south of the type locality, some 14 kilometers from the village of El Valle, also from Napipi on the Atlantic slope of the coastal range.

Type material.—Adults of both sexes, reared from larvae obtained from tree holes and coconut shells at Bahía de Solano and Bahía Utria, altitude from 2 to 20 meters, in July 1942.

Holotype male, allotype female, larval skin, and whole larva mount to be deposited in the U. S. National Museum, Washington, D. C., U. S. A.

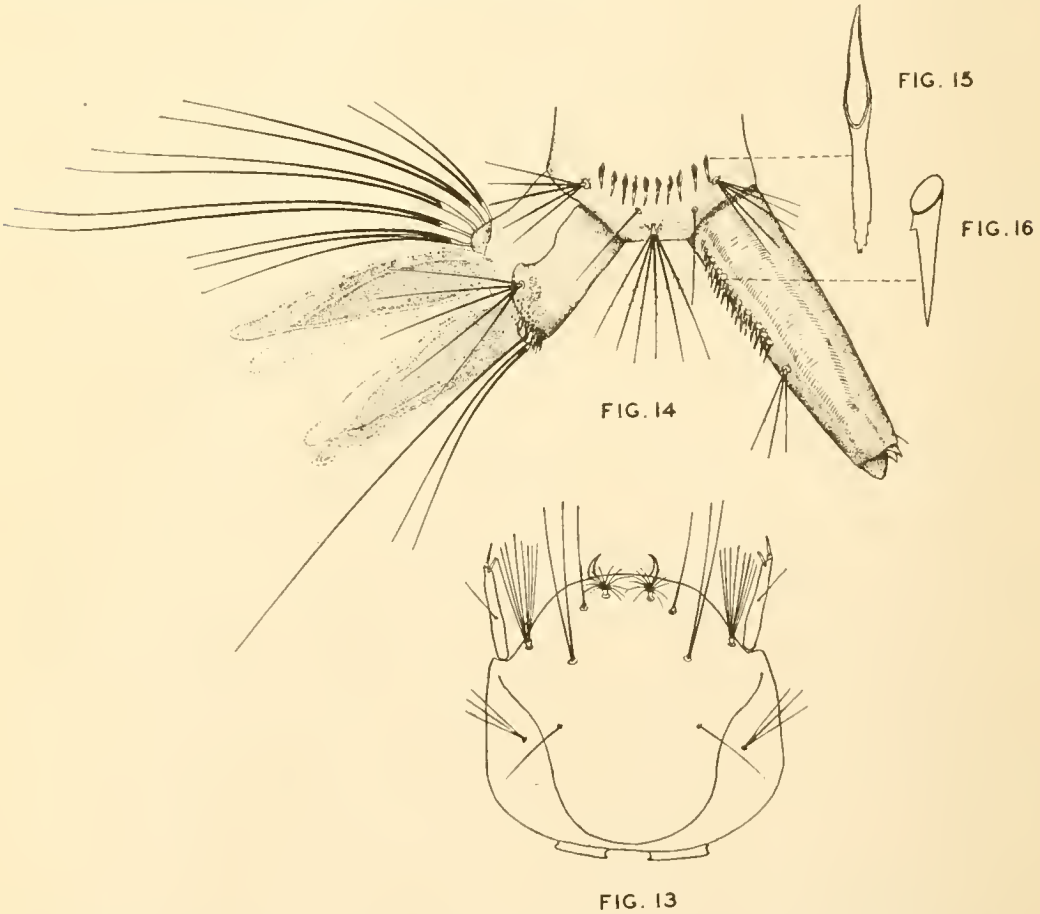
Paratype males and females, larval skins, and whole larva mounts to be deposited in the Yellow Fever Laboratory of the Section of Special Studies, Bogotá, Colombia; in the Institute of Natural Sciences, Bogotá, Colombia; and in the Laboratory of the Yellow Fever Service in Rio de Janeiro, Brazil.

This species is named *boshelli* in honor of my esteemed friend and associate in scientific investigations, Dr. Jorge Boshell-Manrique.

Haemagogus andinus, new species

Larva (Figs. 13–16). Head rounded, slightly wider than long; antenna moderate, smooth, and tapering, with a single hair at the middle. Anterior head hairs single, posterior double. Ante-antennal tufts with eight long elements, almost as long as the antenna (Fig. 13).

Skin glabrous; the lateral comb of the eighth segment consists of a curved line of ten blunt scales, serrate at their tips (Fig. 15). Dorsally and ventrally to the comb, there are tufts of five hairs each; and posteriorly, there is a tuft of six elements, minutely and sparsely feathered.



Haemagogus andinus, n. sp. Fourth stage larva. Fig. 13: Head, dorsal view. Fig. 14: Air tube; eighth and anal segments. Fig. 15: Scale of comb of eighth segment. Fig. 16: Spine of pecten of air tube.

The air tube is three times as long as wide. The pecten reaches to the middle of the tube and is followed by a three-haired tuft; the pecten is composed of about seventeen pointed spines, each of them with a single tooth at the base (Fig. 16).

Anal segment almost square. The dorsal plate is smooth and reaches to the middle on the sides; the posterior margin has numerous minute spicules and a patch of larger ones. Dorsal tuft of one long hair and a pair of shorter ones on each side. Ventral brush poorly developed, without any elements preceding the barred area. Lateral anal tuft of about five hairs.

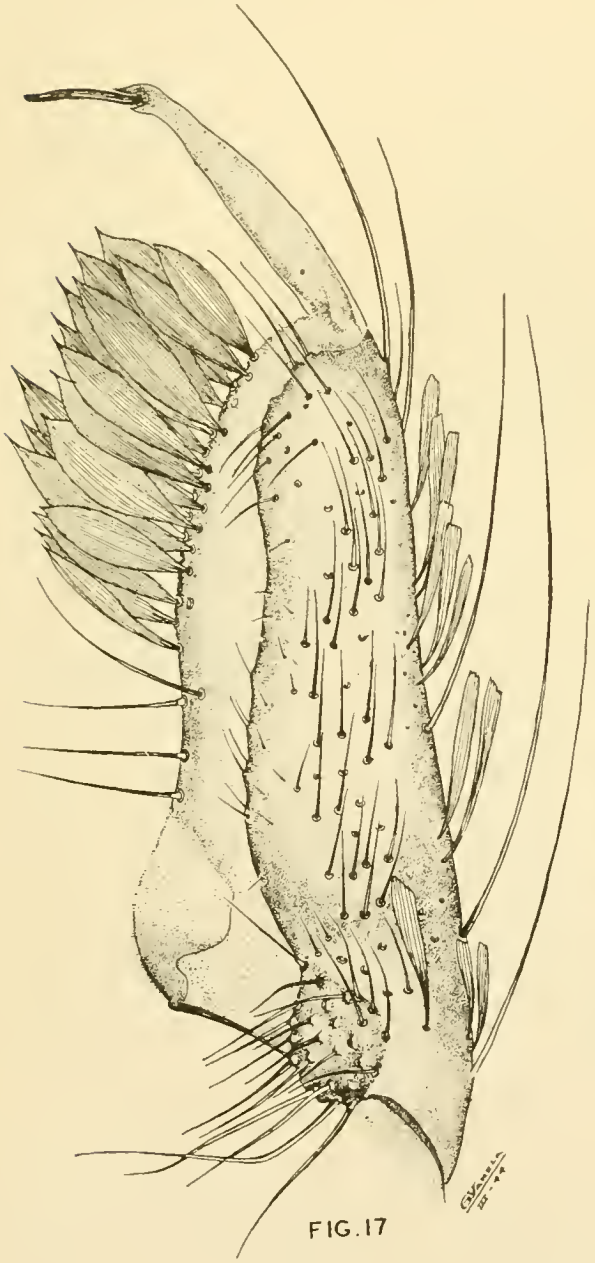


FIG. 17

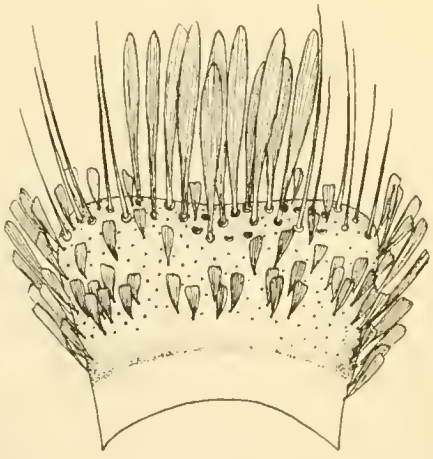


FIG. 18

Male terminalia of *H. andinus*, n. sp. Fig. 17: Side-piece. Fig. 18: Eighth tergite.

Anal gills long and tapering; the ventral ones slightly longer than the dorsal ones.

Adult female. Proboscis dark blue, curved, slightly longer than femur. Palpi dark, short, approximately one-eighth the length of proboscis. Clypeus black, bare, and shiny. Occiput with brilliant green scales; a line of white silvery scales, interrupted laterally, borders the dorsal margin of eyes; cheeks with a patch of white scales. Vertex without white scales.

Prothoracic lobes blue, with silvery scales on anterior border, and strong black marginal setae.

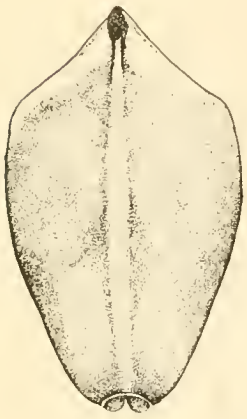


FIG. 19

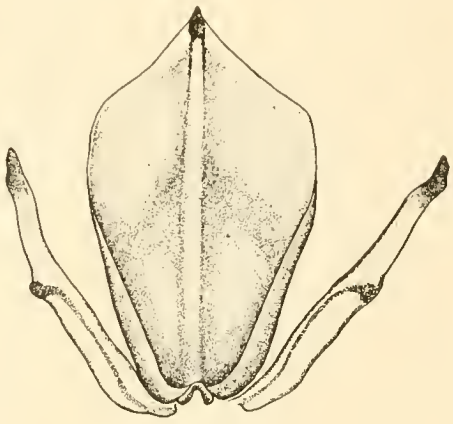


FIG. 20

FIG. 21

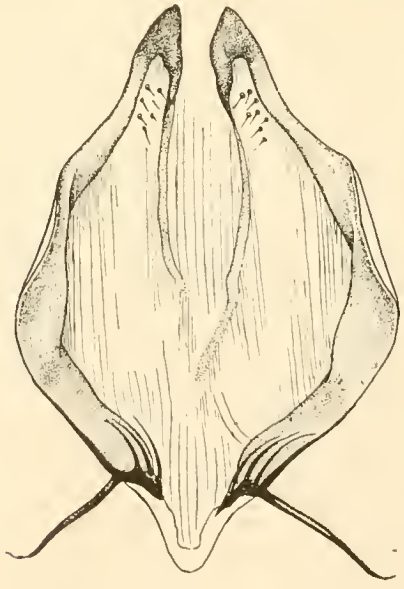


FIG. 22

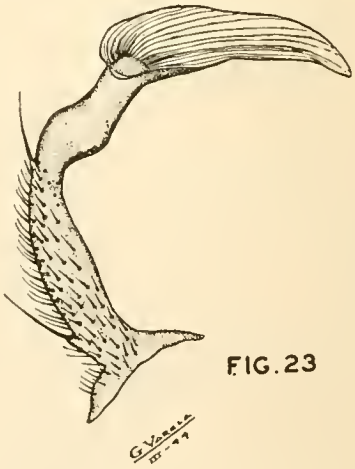


FIG. 23

Male terminalia of *H. andinus*, n. sp. Fig. 19: Mesosome, dorsal view. Fig. 20: Mesosome, ventral view. Fig. 21: Mesosome, lateral view. Fig. 22: Tenth sternites and lobes of the ninth tergites. Fig. 23: Claspette.

Mesonotum with black integument, covered with oval, brilliant green scales in some specimens, and ultramarine ones in others. Scutellum with broad truncate scales of the same color as those on the mesonotum, and bearing long stout setae on the lobes. Pleura and coxae with white scales. The sternopleuron bears two black setae, of different sizes.

Abdomen covered dorsally with greenish scales. A lateral white patch on almost all segments, extending from the anterior to the posterior margin of the tergites.

Legs ultramarine blue. Anterior and mid femora speckled with white scales on inner surface of basal half, more extensively and intensively so on mid femur; similar scales forming a continuous patch extend over almost all the length of the posterior femur. There are distinct white rings at tips of mid and posterior femora.

Wings of the same length as abdomen, with iridescent scales. Second marginal cell longer than its petiole.

Claw formula: 1/1.1/1—1/1.1/1—0/0.0/0.

Adult male. Of the same type of coloration as the female; with short palpi and very plumose antennae.

Male terminalia (Figs. 17–23). Side-piece shaped like a sugar loaf, with a basal expansion, three times as long as wide, covered with long setae on its entire surface, with the exception of a longitudinal area on the internal aspect. On the basal third of this area, a few long setae are to be seen. Basal lobe well defined, bearing numerous setae of different lengths, none of them flattened. From the outer margin of the side-piece arise many long, striate, truncate scales, and a few large setae. Along the upper half of the internal border, is a crowded and homogeneous group of leaflike, striate, pointed scales.

Clasper slightly less than half the length of the side-piece, tapering apically, with a terminal spine about one-third its length.

Claspettes with stout stem (Fig. 23), bent at an angle of over 90° at the outer third; some irregularities in the width of the stem, which is larger in its basal third, narrowed below the angle of flexion, and expanded again beyond it, give to the stem a sinuous, crab, claw-like appearance; there are two strong setae on inner edge, one toward the base, and the other below the angulation; the basal two-thirds are covered with numerous short setae. The filament is striate, moderately broad, sickle-shaped in lateral aspect, with a slightly recurved tip.

Mesosome lightly sclerotized, narrow at base, expanding distally and then tapering abruptly to a reduced, sclerotized crista which projects to form a small beak. There is a narrow opening at base (Figs. 19–20–21).

Tenth sternites heavily sclerotized, especially at tip, with seven or eight small setae. The ninth tergites have three strong, curved setae on each side (Fig. 22).

The eighth tergite has a patch of long lanceolate scales apically, and a few long bristles on each side (Fig. 18).

Type locality.—Fusagasugá, Department of Cundinamarca, Colombia, South America.

Type material.—Adults of both sexes reared from larvae obtained from rot-holes in trees locally called "guamos" (*Inga*

sp.), in Fusagasugá, Cundinamarca, Colombia (altitude 1746 meters), in May 1942.

Holotype male, allotype female, larval skin, and whole larva mount, to be deposited in the U. S. National Museum, Washington, D. C., U. S. A.

Paratype males and females, larval skins and whole larval mounts to be deposited in the Yellow Fever Laboratory of the Section of Special Studies, Bogotá, Colombia; in the Institute of Natural Sciences, Bogotá, Colombia; and in the Laboratory of the Yellow Fever Service, in Rio de Janeiro, Brazil.

This species is named *andinus*, because it is found at a high altitude in the butresses of the eastern cordillera of the Andes. It is the species occurring at the greatest altitude of any of the *Haemagogus* hitherto discovered in Colombia.

DISCUSSION

Haemagogus andinus is apparently closely allied to *H. equinus*, so far as the females and larvae are concerned. The femora of the mid and hind legs have an apical band of white scales. Both species have sternopleural setae, and wings with the petiole of the second vein (from the bifurcation to the cross-vein of the 3rd vein) equal to the length of the second marginal cell. The larvae have glabrous skins, scales of the eighth abdominal segment in a slightly curved line, and the dorsal head hairs simple.

The present study is based on the examination of a sufficient number of males and females; 23 larvae and 49 larval skins of *H. boshelli*, and 38 larval skins of *H. andinus*.

The principal differences between *H. equinus* and *H. andinus* are set forth in the following tabulation:

	H. equinus	*H. andinus*
Larva:		
Posterior head-hairs	single	double
Number of hairs in ante-antennal tuft	3	8
Number of scales in pecten of air tube	12	17
Number of hairs in the lateral tuft of the anal segment	2	5
Proportion of length of air tube to width	2:1	3:1
Males:		
Palpi	long	short
Abdomen: dorsum	Dark-blue scales	greenish scales
venter	few setae	many setae

Terminalia:		
Claspette.....	Stem thick, notably widened in apical half with a lateral membrane on each side; filament mushroom-shaped.	Stem slender; filament in shape of a narrow, pointed leaf, slightly folded.

SUMMARY

Two new species of *Haemagogus*, *boshelli* and *andinus*, are described. The former is from the Pacific coast of Colombia, and the latter from high altitudes. Each one of these species is a representative respectively of the two groups into which, taxonomically and logically, the eight species of *Haemagogus* found to date in Colombia may be placed. These two groups have the following characteristics:

a) larva with comb of eighth abdominal segment formed of scales in a patch; male with sparsely plumose antennae; females with simple tarsal claws and postnotal setae.

b) larva with comb of eighth abdominal segment formed of a few scales in a line; male with densely plumose antennae; females with toothed tarsal claws, and without postnotal setae.

ACKNOWLEDGMENTS

The author expresses his thanks to H. W. Kumm, Chief of the Section of Special Studies, for his continuous stimulation and kind collaboration in the course of this work; to Mr. W. H. W. Komp, entomologist of the U. S. Public Health Service, for his effective aid in the study of material of the two species here described; to Dr. J. Boshell-Manrique, with whom the author collected part of the material from the type locality of *H. boshelli;* to Sr. N. Cerqueira, for comparison of our species with others closely allied; and to Sr. G. Varela, the artist who drew the excellent figures which illustrate this paper.