

small stone, and these workers followed chemical trails deposited by workers of *N. nigrescens*, *N. opacithorax*, *N. pilosus*, *N. harrisi* (= *wheeleri*), and *Labidus coecus* in the laboratory (Watkins, et al., 1967). Workers of *N. leonardi* from the same colony were also strongly attracted to secretions deposited by a queen of *N. nigrescens* (Watkins and Cole, 1966). On 10 June 1968, Watkins observed a few workers of *N. leonardi* traveling in a weak nocturnal raiding column of *N. opacithorax* at Waco, McLennan Co., Texas.

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NEW SPECIES OF CRANE FLIES FROM TROPICAL AMERICA. VII¹

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ABSTRACT

Seven new species of crane flies are described, three from Panama, *Gonomyia* (*Lipophleps*) **carsiostyla**, *G. (L.)* **platyphallus**, and *G. (L.)* **spinolateralis**; and four from Brazil, *Tipula* (*Eumicrotipula*) **belemensis**, *Helius* (*Helius*) **destitutus**, *Gonomyia* (*Paralipophleps*) **aitkeni**, and *G. (Lipophleps)* **helotos**.

In the present report I am describing further eriopterine crane flies from Panama, received from my friend and former student, Lt. Col. Gordon Field, together with further materials from Belém, Pará, Brazil, collected by my long-time friend, Dr. Thomas H. G. Aitken of the Belém Virus Laboratory of the Instituto Evandro Chagas. I am deeply

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indebted to Drs. Field and Aitken for the privilege of retaining the types of the novelties in my personal collection. The latter materials are of somewhat special interest because of their method of collection. A letter from Dr. Aitken explains this.

"This past year we have been using the so-called Disney traps to collect phlebotomines (see Disney, R. H. L., Bull. Ent. Res., 56:445; 1966). This is merely a castor-oil treated aluminum tray with a caged bait animal inserted in a square opening in the center of the tray. We are operating these 15 centimeters above the forest floor. Additional to the phlebotomines the traps catch numerous other insects, including some interesting tipulids. The insects are removed from the oil into a Petri dish of saline to which a few drops of Teepol (a detergent) have been added, after which they are transferred to alcohol. . . . The collecting area is secondary forest (Cato Forest), densely shaded, on the property of the agricultural institute, IPEAN (Instituto de Pesquisas e Experimentação Agropecuarias do Norte) just on the outskirts of the city of Belém. The traps operate only overnight, from late afternoon until about 7:30 A.M."

The Disney trap materials were collected between February and April, 1970, and include an unusual variety of species of Tipulidae. The great majority of these are small flies belonging to the Limoniinae, with only two representatives of the Tipulinae, one of which is described at this time. It is of further interest that a considerable proportion of the materials are females with only a few species being represented by males, the most conspicuous being *Polymera (Polymera) pulchricornis* Alexander. After the present paper was completed, a second shipment with materials collected from April through June 1970 was received from Dr. Aitken, and will be studied later.

Tipula (Eumicrotipula) belemensis, new species

Mesonotal praescutum yellow with three conspicuous dark brown stripes, pleura yellow, patterned with brown, especially the postnotal katapleurotergite; legs black, femora with a yellow subterminal ring; wings without macrotrichia, whitened, variegated by darker, cell C uniformly darkened except at outer end.

FEMALE. Length about 10.0 mm; wing 9.5 mm.

Described from alcoholic material. Head with frontal prolongation and palpi brown. Antennae with scape and pedicel brown, flagellum paler. Head brown.

Pronotum brownish yellow. Mesonotal praescutum obscure yellow laterally, disk with three conspicuous dark brown stripes, lateral pair short, interspaces narrow; scutum yellow, each lobe with a single large brown area, scutellum light yellow with a narrow pale brown central line; postnotum with mediotergite brownish yellow, anapleurotergite yellow, katapleurotergite conspicuously dark brown. Pleura yellow, patterned with brown, including anterior anepisternum and more conspicuously ventral sternopleurite and meron, dorsopleural region clear yellow. Halteres with stem yellow, knob brown. Legs with coxae yellow, restrictedly patterned with pale brown, trochanters yellow; femora

with extreme base yellowed, proximal half brown, outer end black with a broad light yellow subterminal ring slightly narrower than the blackened apex; tibiae and tarsi uniformly black. Wings with ground whitened, conspicuously patterned with brown, darker and more extensive along costal border, including all of cell *C* excepting outer end; cell *Sc* yellowed, with four brown areas slightly less extensive than pale yellow ground; remaining brown pattern paler, involving all cells, slightly less extensive than ground; darkenings before cord including anterior pre-arcular field, a postarcular area in bases of cells *R* and *M*, and slight extensions of subcostal darkenings into cell *R*; paler brown washes in all other cells before cord, beyond latter the color darker, especially in radial field and along medial veins beyond cell *1st M*₂; veins in ground areas yellow, darker in patterned parts. Macrotrichia of wing veins relatively short; no trichia in wing cells. Venation: *R*₁₊₂ atrophied; petiole of cell *M*₁ about twice *m*; *m-cu* very oblique, about two-thirds distal section of *Cu*₁.

Abdomen brown, variegated by yellow, including the posterior borders of segments.

Holotype, female, in alcohol, Catu Forest, Belém, Pará, Brazil, in Disney trap, March, 1970 (Aitken).

Of the approximately 25 small-sized known species of the subgenus, the present fly is most similar to *Tipula* (*Eumicrotipula*) *legitima* Alexander, of Paraguay. The latter species has the wing pattern much less contrasted and the trichia of the wing veins unusually long.

Helius (*Helius*) **destitutus**, new species

Thorax yellow and brown; legs yellow, extreme tips of femora darkened; wings yellowish subhyaline, restrictedly patterned with brown; base of *Rs* and outer end of vein *R*₂₊₃ atrophied; abdominal segments brown, apices broadly yellowed.

FEMALE. Length about 5.5 mm; wing 4.5 mm.

Type mounted on slide in Canada balsam. Rostrum yellow, only about half length of remainder of head and shorter than yellowed palpi. Antennae brownish yellow, short, only slightly longer than head; proximal flagellar segments nearly globular, outer ones progressively longer, terminal segment slender, slightly exceeding the penultimate. Head brown.

Pronotum yellow. Thoracic dorsum yellowed anteriorly, scutellum and postnotum brown. Pleura yellow below, more infuscated dorsally. Legs with coxae and trochanters yellow; remainder of legs yellow, extreme tips of femora darkened. Wings yellowish subhyaline, restrictedly patterned with brown, including darker stigma and pale brown seams at cord and in basal half of the cell *Cu*; veins yellow, slightly darker in the clouded areas. Venation: Anterior branch of *Rs* (*R*₂₊₃) atrophied beneath stigma, spur remaining about as long as *r-m*, base of *Rs* similarly atrophied; inner end of cell *1st M*₂ arcuated, basal section of

M_{1+2} about one-half longer than second section; *m-cu* shortly beyond fork of *M*.

Abdominal segments bicolored, brown, apices yellow, more extensively so on outer segments. Ovipositor with cerci very long and slender, subequal in length to stouter straight hypovalvae.

Holotype, female, on slide, Catu Forest, Belém, Pará, Brazil, in Disney trap, April, 1970 (Aitken).

In its general appearance the present fly is most similar to *Helius* (*Helius*) *rubicundus* (Alexander), differing in details of coloration, especially of the abdomen, and in the venation, as described. This venation appears to be normal since the described condition is virtually the same on both wings of the type.

Gonomyia (*Paralipophleps*) **aitkeni**, new species

General features as in *pleuralis* and allies, structure of male hypopygium entirely distinct; phallosome with each gonapophysis unequally bispinous, including a long outer spine and a shorter, more basal one; ventral plate consisting of two separate blades, each with the inner apical angle produced into an acute blackened spine.

MALE. Length about 5.0–5.5 mm; wing 3.2–3.5 mm.

FEMALE. Length about 5.0 mm; wing about 3.5 mm.

Types mounted on slides in Canada balsam. Rostrum and palpi brown. Antennae of male with scape and pedicel light brown, the latter very large; proximal two flagellar segments light yellow, remainder dark brown; flagellar verticils excessively long, the longest from more than one-third to nearly one-half the entire flagellum; in female verticils shorter but comparatively long for this sex. Head brown.

Prothorax brown. Mesonotum anteriorly chiefly brownish yellow, behind patterned with darker brown. Pleura brown with a broad conspicuous whitened longitudinal stripe, with subtending narrow darker lines. Halteres pale. Legs with fore coxae pale basally, tips brown, remaining coxae darkened basally, paler at tips, trochanters brown; remainder of legs brownish black. Wings yellow, stigma oval, dark brown; narrow but evident paler brown seams over cord and outer end of cell *1st M*₂, the color including veins, remaining veins yellowed. Venation: *Sc*₁ ending a short distance before origin of *Rs*; *m-cu* shortly before fork of *M*.

Proximal abdominal tergites brown, darker posteriorly, outer segments paler on central parts; sternites pale, posterior borders narrowly but conspicuously brown; hypopygium brownish yellow. Male hypopygium with apical lobe of basistyle short-oval, with very long setae; inner spine of style single, sometimes appearing unequally bifid by a narrow apical split. Dististyle subquadrate, with a small blackened spine, inner apical angle with the usual two fasciculate setae. Phallosome with aedeagus extended into a blackened terminal spine; gonapophyses distinctive, each unequally bispinous, including a long outer

spine from a long yellow base and a shorter spine more cephalad in position; ventral plate consisting of two separate blades; the inner apical angle of each produced into an acute blackened spine.

Holotype, male, on slide, Catu Forest, Belém, Pará, Brazil, in Disney trap, April, 1970 (Aitken). Allotopotype, female, on slide. Paratopotypes, males and females, on slides, February-April, 1970.

I take pleasure in dedicating this particularly distinct species to Dr. Aitken, distinguished student of the virus transmission of diseases by arthropods, especially in the American tropics. This is the most distinct of the approximately twenty species of the subgenus so far discovered, the male hypopygium being entirely different from all others.

Gonomyia (Lipophleps) carsiostyla, new species

Belongs to the *manca* group; size small (wing of male 3.3 mm); mesonotal praescutum dark gray, patterned with yellow, posterior sclerites of notum and the pleura extensively yellowed; male hypopygium with dististyle terminal, very small, slightly broader than long, unarmed except for setae; aedeagus very long, no developed spinoid gonapophyses; genital chamber with a large semicircular yellow cushion provided with very numerous strong setae.

MALE. Length about 3.5 mm; wing 3.3 mm.

Rostrum yellow, palpi black. Antennae with scape light yellow, enlarged pedicel black; flagellum black, segments long-cylindrical, verticils very long. Head gray.

Pronotum and pretergites light yellow. Mesonotal praescutum almost uniformly dark gray, humeral region very restrictedly yellow; scutal lobes dark gray, narrowly yellowed behind, central region pale; scutellum blackened basally, broadly yellow behind; postnotum yellow, posterior half of mediotergite brown. Pleura yellow, episternum, meron, and ventral half of sternopleurite light gray. Halteres with stem yellow, knob weakly darkened. Legs with coxae yellowed, fore pair darker; trochanters obscure yellow; remainder of legs dark brown. Wings pale brown, stigma very slightly darker, prearcular and costal regions light yellow; veins brown. Venation: *Sc* relatively long, *Sc*₁ ending a distance before origin of *Rs* subequal to vein *Sc*₁; *m-cu* close to fork of *M*.

Abdominal tergites medium brown, sternites and hypopygium yellow. Male hypopygium with basistyle long and slender; dististyle greatly reduced in size, slightly broader than long, terminal; fasciculate setae slightly unequal, considerably longer than style, normal setae about six in number. Aedeagus very long, narrowed gradually into a long spine; no developed spinoid gonapophyses; genital chamber with a large semicircular yellow cushion, provided with very numerous strong setae.

Holotype, male, Fort Gulick, Panama, January 19, 1954 (Gordon Field).

The species of the subgenus assigned to the *manca* group have the

dististyle of the hypopygium terminal in position and entirely unarmed. The numerous species are chiefly tropical American and are separated from one another almost entirely on hypopygial structures. The present fly and *Gonomyia* (*Lipophleps*) *minutistyla* Alexander, of Grenada, show the greatest reduction in size of the dististyle.

Gonomyia (*Lipophleps*) **helotos**, new species

General coloration brown, pleura patterned with paler; wings faintly tinged with brown, stigma slightly darker; male hypopygium with basistyle long-produced, lobe with conspicuous setae; dististyle elongate, terminating in a powerful blackened spine or claw; phallosome with the two developed gonapophyses shorter than slender aedeagus.

MALE. Length about 3.5 mm; wing 3.0 mm.

Type mounted on slide in Canada balsam. Rostrum and palpi brown. Antennae brown; flagellar segments elongate, with abundant erect setae, the longest subequal to segments. Head dark brown, paler anteriorly.

Pronotum pale brown. Mesonotum chiefly dark brown, pleura variegated brown and paler. Halteres light brown. Legs with coxae and trochanters brown; remainder of legs broken. Wings faintly tinged with brown, stigma only vaguely darker; veins pale brown. Venation: *Sc* relatively long, *Sc*₁ ending a short distance before origin of *Rs*, *Sc*₂ slightly removed; *m-cu* shortly before fork of *M*.

Abdominal tergites brown, sternites pale; hypopygium brownish yellow. Male hypopygium with basistyle long-produced apically, the lobe subequal in length to body of style, with long setae, those at and near apex very long. Dististyle distinctive, similar on the two sides, elongate, at apex with a powerful blackened spine or claw from a basal puncture; ventral or posterior margin of style with few setae, the outermost longer and stronger, apparently representing one of the usual fasciculate pair characteristic of this subgenus. Phallosome with aedeagus long and slender, with two pale apophyses, the shorter one narrowly darkened at apex, longer apophysis narrowed gradually to a point; body of phallosome with setae, more numerous but smaller near outer end.

Holotype, male, on slide, Catu Forest, Belém, Pará, Brazil, in Disney trap, March, 1970 (Aitken).

Several Neotropical species resemble and are allied to the present fly, the most similar being the larger *Gonomyia* (*Lipophleps*) *tribulator* Alexander, of Peru, differing in details of the male hypopygium, particularly the dististyle and phallosome. Other less similar species include the following: *G. (L.) dotata* Alexander, Peru; *G. (L.) lustralis* Alexander, Costa Rica; *G. (L.) mecophallus* Alexander, Honduras; *G. (L.) pedica* Alexander, *G. (L.) petronis* Alexander, and *G. (L.) secespita* Alexander, all of southeastern Brazil, and *G. (L.) subtribulator* Alexander and *G. (L.) tersa* Alexander, of Peru.

Gonomyia (Lipophleps) platyphallus, new species

Belongs to the *manca* group; coloration of thorax light brown, pleura striped longitudinally with light yellow; legs brown; wings light brown, stigma scarcely indicated; male hypopygium with dististyle terminal, unarmed; aedeagus very stout, sinuous, apex dilated into a subtriangular blade.

MALE. Length about 3.5 mm; wing 3.5 mm.

Rostrum light yellow, mouthparts darkened. Antennae with scape and pedicel brown; flagellum of type broken. Head obscure yellow anteriorly, posterior vertex brown.

Pronotum and pretergites whitened. Mesonotum almost uniformly light brown, including scutellum; postnotum more yellowed, especially pleurotergite. Pleura light brown with a narrow longitudinal very light yellow ventral stripe, dorsopleural region similarly light yellow, the color merging behind with pleurotergite. Halteres with stem light brown, base yellow, knob weakly darkened. Legs with coxae and trochanters yellowed, remainder brown. Wings light brown, stigma scarcely indicated, prearcular and costal fields more yellowed; veins brown. Venation: Sc_1 ending some distance before origin of Rs , the distance slightly exceeding Sc_1 ; *m-cu* close to fork of *M*.

Abdominal tergites light brown, narrowly yellowed laterally, sternites and hypopygium more yellowish brown. Male hypopygium with basistyle moderately long. Dististyle small, terminal, subconical, broadest at base, apex obtuse; fasciculate setae apical, shorter than style, the normal setae very sparse, one being subapical and about four on mesal face at base. Aedeagus very stout, sinuous, twisted near tip, the apex a subtriangular blade, its upper point acute, hyaline, lower part rounded; setiferous cushion at base of aedeagus with only about a score of setigerous punctures; no development of spinous apophyses. Tergite with conspicuous setal brushes on either side.

Holotype, male, El Valle, Panama, 2,000 feet, December 22, 1953 (Gordon Field).

Other regional members of the *manca* group of the subgenus have the aedeagus slender, gradually narrowed outwardly to a usually acute point, not expanded as in the present fly.

Gonomyia (Lipophleps) spinolateralis, new species

Size small (wing of male 3 mm); thoracic dorsum light brown, patterned with yellow behind, pleura chiefly pale, more yellowish brown ventrally; wings light brown, stigma scarcely indicated; male hypopygium with outer apical angle of basistyle produced into a powerful spine narrowing to acute tip; dististyle fleshy, before the two fasciculate setae on outer margin with a very stout blackened spine; aedeagus elongate.

MALE. Length about 3 mm; wing 3 mm.

Rostrum pale yellow, palpi black. Antennae with scape and pedicel brownish black; flagellum of type broken. Head in front light yellow, dark brown behind.

Pronotum and pretergites yellowed. Mesonotal praescutum light brown, slightly darker anteriorly; scutum yellow medially, lobes light brown; scutellum behind broadly yellowed, base darkened, parascutella yellow; postnotal mediotergite light brown, pleurotergite yellowed. Pleura chiefly pale yellow, more yellowish brown beneath, anepisternum very slightly clouded with darker. Halteres light brown, base of stem yellow. Legs with coxae yellow, fore pair slightly darker; trochanters yellow; remainder of legs broken. Wings light brown, stigma scarcely indicated, prearcular and costal fields light yellow; veins brown. Venation: *Sc* short, *Sc*₁ ending before origin of *Rs* a distance slightly greater than vein *Sc*₁; *m-cu* close to fork of *M*.

Abdominal tergites brown, sternites and hypopygium yellowed. Male hypopygium with outer apical angle of basistyle produced into a powerful spine narrowing gradually to acute tip, the spine subequal in length to body of style. Dististyle fleshy, before apex on outer margin with a very stout blackened spine, short apical part of style with two very stout fasciculate setae. Aedeagus with base dilated, remainder elongate (outer end broken). No apparent spinoid apophyses. Tergite with conspicuous setal brushes on either side.

Holotype, male, Fort Clayton, Panama, December 7, 1953 (Gordon Field).

Among the very numerous Neotropical species of the subgenus *Lipophleps* Bergroth, there are only about six that have the male hypopygium with the basistyle produced into a powerful spine as in the present fly. These species are *Gonomyia (Lipophleps) impedita* Alexander, Mexico; *G. (L.) macintyreii* Alexander, Ecuador; *G. (L.) misera* Alexander, Argentina; *G. (L.) reyesi* Alexander, Mexico; *G. (L.) tafiensis* Alexander, Argentina; and *G. (L.) troilus* Alexander, Peru. The most similar of these species is *impedita*, which differs in the structure of the dististyle and phallosome. The spine or blade of the basistyle differs in conformation in all species listed.