Five new species, a new genus and a new record of cicadas from French Guiana with four new combinations and three new synonymies (Insecta, Hemiptera, Cicadoidea, Cicadidae)

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ABSTRACT
A new genus and five new species *Ariasa maryannae* n. sp., *Ariasa russelli* n. sp., *Guyalna jamesi* n. sp., *Guyalna maxineae* n. sp., and *Malloryalna susanae* n. gen., n. sp. are described. *Cicada kirkaldyi* Metcalf, 1963 and its synonyms (*C. obtusa* Uhler, 1903 and *C. brasiliensis* Kirkaldy, 1909) are transferred to the genus *Fidicinoides* Boulard & Martinelli, 1996 to become *Fidicinoides kirkaldyi* (Metcalf, 1963) n. comb. *Cicada egregia* Uhler, 1903 is transferred to the genus *Ariasa* Distant, 1905 to become *Ariasa egregia* (Uhler, 1903) n. comb. *Dorisiana bicolor* (Olivier, 1790) is transferred to the genus *Guyalna* Boulard and Martinelli, 1996 to become *Guyalna bicolor* (Olivier, 1790) n. comb. *Fidicinoides passerculus* (Walker, 1850) n. syn., *Fidicinoides spinicosta* (Walker, 1850) n. syn. and *Cicada lacrines* Walker, 1850 n. syn. are shown to be junior synonyms of *Guyalna bicolor* n. comb. *Fidicina parvula* Jacobi, 1904 is transferred to the genus *Guyalna* Boulard & Martinelli, 1996 to become *Guyalna parvula* (Jacobi, 1904) n. comb. Previous records of *Fidicinoides passerculus* (Walker, 1850) and *Carineta illustris* Distant, 1905 from French Guiana are shown to be *Dorisiana bicolor* (Olivier, 1790) and *Carineta cearana* Distant, 1906, respectively, and are removed from the cicada fauna of French Guiana; this is the first record of *C. cearana* for French Guiana. The cicada fauna of French Guiana is hereby increased to 62 species in 17 genera.

KEY WORDS
Insecta,
Hemiptera,
Cicadoidea,
Cicadidae,
Cicadinae,
Cicadettinae,
French Guiana,
new record,
new combinations,
new synonyms,
new species,
new genus.

RÉSUMÉ
Cinq nouvelles espèces, un nouveau genre et une nouvelle signalisation des cigales de Guyane française avec quatre nouvelles combinaisons et trois nouvelles synonymies (Insecta, Hemiptera, Cicadoidea, Cicadidae).
Un nouveau genre et cinq nouvelles espèces *Ariasa maryannae* n. sp., *Ariasa russelli* n. sp., *Guyalna jamesi* n. sp., *Guyalna maxineae* n. sp., et *Malloryalna susanae* n. gen., n. sp. sont décrits. *Cicada kirkaldyi* Metcalf, 1963 et ses synonymes (*C. obtusa* Uhler, 1903 et *C. brasiliensis* Kirkaldy, 1909) sont transférés dans le genre *Fidicinoides* Boulard & Martinelli, 1996 pour devenir *Fidicinoides kirkaldyi* (Metcalf, 1963) n. comb. *Cicada egregia* Uhler, 1903 est transféré dans le genre *Ariasa* Distant, 1905 pour devenir *Ariasa egregia* (Uhler, 1903) n. comb. *Dorisiana bicolor* (Olivier, 1790)

MOTS CLÉS
Insecta,
Hemiptera,
Cicadoidea,
Cicadidae,
Cicadinae,
Cicadettinae,
Guyane française,
signalisation nouvelle,
combinaisons nouvelles,
synonymes nouveaux,
espèces nouvelles,
genre nouveau.

est transféré dans le genre *Guyalna* Boulard et Martinelli, 1996 pour devenir *Guyalna bicolor* (Olivier, 1790) n. comb. *Fidicinoides passerculus* (Walker, 1850) n. syn., *Fidicinoides spinicosta* (Walker, 1850) n. syn. et *Cicada lacrines* Walker, 1850 n. syn. sont présentés comme des synonymes juniors de *Guyalna bicolor* n. comb. *Fidicina parvula* Jacobi, 1904 est transféré dans le genre *Guyalna* Boulard & Martinelli, 1996 pour devenir *Guyalna parvula* (Jacobi, 1904) n. comb. Les précédentes signalisations de *Fidicinoides passerculus* (Walker, 1850) et *Carineta illustris* Distant, 1905 de Guyane française sont attribuées à *Dorisiana bicolor* (Olivier, 1790) et *Carineta cearana* Distant, 1906 respectivement, et sont retirées de la faune de cigales de la Guyane française; ceci constitue la première signalisation de *C. cearana* en Guyane française. La faune de cigales de Guyane française est portée à 62 espèces réparties dans 17 genres.

INTRODUCTION

The cicada fauna of French Guiana was recently summarized (Sanborn 2011). Since that work, additional articles have been published describing new species (Thouvenot 2011, 2012; Boulard & Martinelli 2011). The welcoming nature of the country for scientific researchers has led to further expeditions and continued collection of new species.

The present work is the result of the collection efforts of the Société entomologique Antilles-Guyane (SEAG) to catalogue the insect fauna of the country. I have received several shipments of specimens collected at various localities within the country for determination since my previous paper on the cicadas of French Guiana (Sanborn 2011). Within those shipments were the new species identified here. In addition, I take this opportunity to correct the identification of two species from my previous work (Sanborn 2011) and to reassign species originally described by Uhler (1903) to clarify their taxonomy. *Fidicina explanata* Uhler, 1903 is determined to be correctly assigned and *Ariasa bilaqueata* (Uhler, 1903) has already been reassigned (Sanborn 2007) from Uhler (1903) so that all species described in that work will be assigned correctly to currently available genera.

MATERIAL AND METHODS

Specimens representing new species were sent to the author as part of the SEAG faunal survey of French Guiana. Holotypes will be deposited in the Muséum national d'Histoire naturelle with vouchers in the author's collection. Hiroyuki Imai also sent the author specimens that are included in a type series. Measurements were made with Vernier calipers. Terminology follows Moulds (2005, 2012) and higher taxonomy follows Sanborn (2013).

ABBREVIATIONS

Institutions

BMNH	Natural History Museum, London;
CMNH	Carnegie Museum of Natural History, Pittsburgh;
FSCA	Florida State Collection of Arthropods, Gainesville;
LSAM	Louisiana State Arthropod Museum, Bâton-Rouge;
MNHN	Muséum national d'Histoire naturelle, Paris;
NCSU	North Carolina State University Insect Collection, Raleigh;
UGCA	Georgia Museum of Natural History, Athens;
USNM	Smithsonian Institution, National Museum of Natural History, Washington DC;
ZMHB	Museum für Naturkunde, Berlin.

Private collections

Coll. AFSC	author's collection, Miami Shores;
Coll. MTC	Marc Thouvenot collection, Lyon.

SYSTEMATICS

Family CICADIDAE Latreille, 1802
Subfamily CICADINAE Latreille, 1802
Tribe FIDICININI Distant, 1905
Subtribe FIDICININA Distant, 1905

Genus *Fidicinoides* Boulard & Martinelli, 1996

TYPE SPECIES. — *Fidicina picea* Walker, 1850 (Walker 1850: 81) (Central America).

Fidicinoides kirkaldyi (Metcalf, 1963) n. comb.
(Fig. 1)

Cicada kirkaldyi Metcalf, 1963b: 776 (nom. nov. pro *Cicada brasiliensis* Kirkaldy, 1909 *nec Cicada brasiliensis* Gmelin, 1789).

Cicada obtusa Uhler, 1903: 11, **n. syn**.

Cicada brasiliensis Kirkaldy, 1909: 391 (nom. nov. pro [*Cicada*] *obtusa* Uhler, 1903 *nec Cicada obtusa* Fabricius, 1787), **n. syn**.

TYPE LOCALITY. — Mato Grosso, Brazil.

MATERIAL EXAMINED. — "Chapada // Braz. / Sept. // *Cicada* / *obtusa* / Uhler, / Type." ♂ (CMNH); "Chapada // Braz. / Sept. // *Cicada* / *obtusa* / Uhler, / Type." ♂ (USNM).

DISTRIBUTION. — Specimens have been reported previously from Brazil (Uhler 1903).

REMARKS

While examining species in an attempt to identify the new species described here, I determined that *Cicada obtusa* Uhler, 1903 should actually be assigned to the genus *Fidicinoides*. I have studied syntype specimens of *Cicada obtusa* in the CMNH and USNM. The species has not been discussed

Fig. 1. — *Fidicinoides kirkaldyi* (Metcalf, 1963b) n. comb. Syntype ♂ (CMNH). Scale bar: 2 cm.

in the literature other than the original description (Uhler 1903), being catalogued by Henshaw (1903), Distant (1906a, 1912) or Sanborn (2013), and the renaming of the species by Kirkaldy (1909) and Metcalf (1963b) due to the previously given name being preoccupied. The lateral metascutellar plate is rudimentary, the dorsal timbal cover is open to the timbal cavity so the timbal is visible dorsolaterally, and the eyes do not extend beyond the lateral margins of the pronotum in the syntype of *C. obtusa* meeting the characteristics of the genus *Fidicinoides* (Boulard & Martinelli 1996). Thus, *Cicada obtusa* is determined here to be a member of the genus *Fidicinoides* and its synonyms, *Cicada obtusa* Uhler, 1903, *Cicada brasiliensis* Kirkaldy, 1909 and *Cicada kirkaldyi* (Metcalf, 1963), are hereby transferred to the genus *Fidicinoides* to become *Fidicinoides kirkaldyi* (Metcalf, 1963) n. comb.

Subtribe Guyalnina Boulard & Martinelli, 1996

Genus *Ariasa* Distant, 1905

Type species. — *Tympanoterpes colombiae* Distant, 1892 (Distant 1892: 60)(Colombia).

Ariasa egregia (Uhler, 1903) n. comb.
(Fig. 2)

Cicada egregia Uhler, 1903: 5.

Type locality. — Rio de Janiero, Brazil.

Material examined. — "Rio de Janiero // *Cicada* / *egregia*, / Uhler. / Type." ♀ (CMNH).

Distribution. — Specimens have been reported previously from Brazil (Uhler 1903).

Remarks

While examining species in an attempt to identify the new species of *Ariasa* described here, I determined that *Cicada egregia* Uhler, 1903 should actually be assigned to the genus *Ariasa*. I have studied a syntype specimen of *Cicada egregia* in the CMNH. The species has not been discussed in the literature other than the original description (Uhler 1903) or being catalogued by Henshaw (1903), Distant (1906a, 1912), Metcalf (1963b) or Sanborn (2013). Following Distant's (1906a) key, *Cicada egregia* is determined to be a member of the genus *Ariasa*. Further comparison to other *Ariasa* species, including the new species described here and *A. bilaqueata* (Uhler, 1903) that is similar to *C. egregia* and was originally described (Uhler 1903) in the genus *Cicada* along with *C. egregia* but was transferred subsequently to *Ariasa* (Sanborn 2007), and the generic description for *Ariasa* (Distant 1905) confirm the reassignment to *Ariasa*. The head being wider than the mesonotum, globose, sulcate postclypeus, trapezoidal pronotum, parallel and oblique radial and radiomedial crossveins, three segmented tarsi, triangular opercula, incomplete timbal cover enclosing only the lateral timbal cavity, and the abdomen being as long as distance from apex of head to cruciform elevation are all found in the type and specimens in the author's collection. The structure of the uncus in particular, which is significantly different than other Fidicinini, also places the species in *Ariasa*. *Cicada egregia* is hereby transferred to the genus *Ariasa* to become *Ariasa egregia* (Uhler, 1903) n. comb.

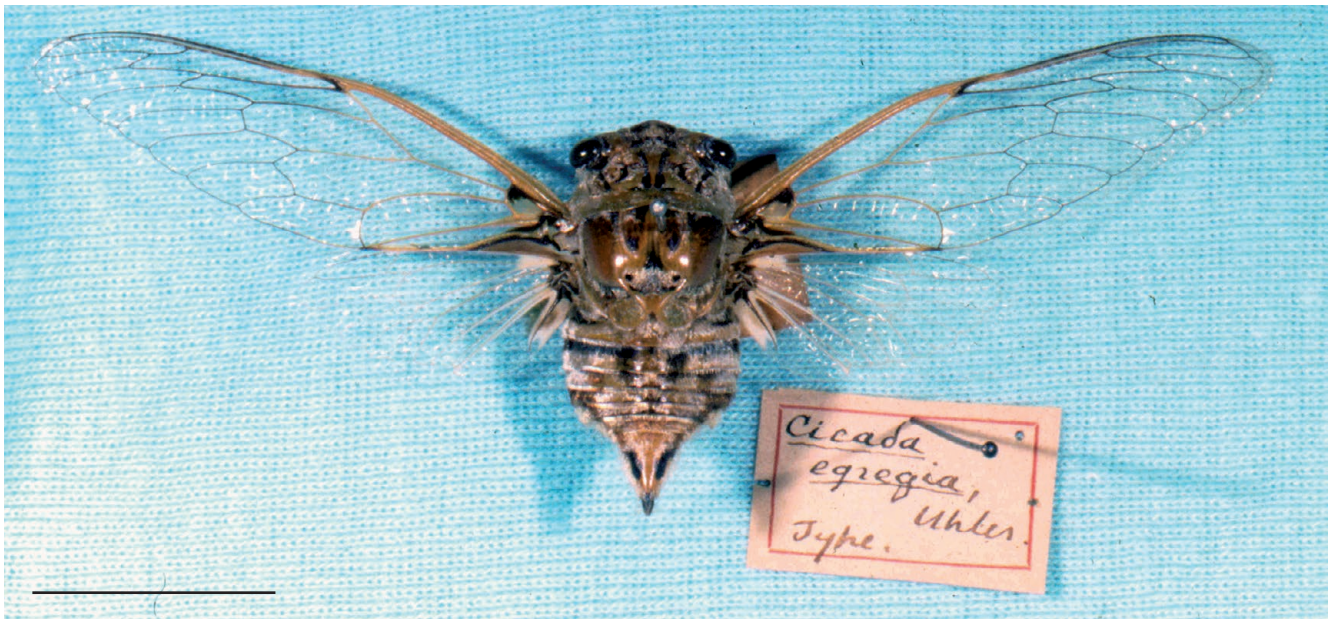

Fig. 2. — *Ariasa egregia* (Uhler, 1903) n. comb. Syntype ♀ (CMNH). Scale bar: 2 cm.

Ariasa maryannae n. sp.
(Fig. 3)

Type material. — **Holotype**. "FRENCH GUIANA / Piste d'Apatou pk 25, Commune de / Saint-Laurent, 06-VIII-2013 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♂ MNHN-EH-23002. **Paratypes**. Same data as holotype, 7 ♂ and ♀ (coll. AFSC); "FRENCH GUIANA / Piste d'Apatou pk 25, Commune de / Saint-Laurent, 11-VIII-2013 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♂ (coll. AFSC); "Fr. Guyana" ♀ (coll. AFSC); "FRENCH GUIANA / STM Mont Saint Marcel de la / Haute-Camopi, (inselberg), / N 2°23'03.00" O 53°00'37.00", altitude / 635m, Commune de Camopi, 23-IX-2014 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♀ (coll. AFSC); "FRENCH GUIANA / STM Mont Saint Marcel de la / Haute-Camopi, (inselberg), / N 2°23'03.00" O 53°00'37.00", altitude / 635m, Commune de Camopi, 25-IX-2014 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♀ (coll. AFSC).

Etymology. — The species is named in honor of my mother Mary Ann Sanborn for unending support, assistance in the field and logistical support for my work on cicadas that resulted in several publications.

Material examined. — "FRENCH GUIANA / Montagne des Chevaux / Automatic Light Trap /15-X-2012 / Soc. Ent. Antilles-Guyane coll." ♀ (coll. AFSC). This specimen is teneral so it was not included in the type series.

Measurements (mm). — N = 9 ♂ or 4 ♀, mean (range). Length of body: ♂ 31.36 (29.5-34.8), ♀ 30.95 (29.9-30.2); length of fore wing: ♂ 41.82 (39.8-43.9), ♀ 44.28 (43.1-44.8); width of fore wing: ♂ 12.12 (11.6-12.5), ♀ 12.43 (12.0-12.7); length of head: ♂ 5.18 (4.8-5.4), ♀ 5.23 (5.1-5.4); width of head including eyes: ♂ 12.62 (12.3-13.0), ♀ 12.73 (12.3-13.1); width of pronotum including suprahumeral plates: ♂ 12.22 (11.6-12.7), ♀ 12.20 (11.6-12.3); width of mesonotum: ♂ 10.37 (10.0-11.0), ♀ 10.55 (10.1-10.8).

Diagnosis. — The lateral red abdomen promptly distinguishes *A. nigrorufa* (Walker, 1850) from the new species. The green and brown body and the white pubescent spots lateral to the genitalia simply distinguish *A. alboapicata* (Distant, 1905) from the new species. Although *A. diupsilon* (Walker, 1850) has a general appearance similar to the new species, it is significantly smaller (19 mm for the female type vs 28-33 mm body length for females of the new species) and lacks the black in the basal cell of the fore wing. The smaller body size (19 mm) and lack of marking in the fore wing basal cell promptly distinguish *A. urens* (Walker, 1852). The lateral ochraceous areas of the abdomen, ochraceous pronotal collar and costal margin distinguish *A. arechavaletae* (Berg, 1884) from the new species. The white basal area of the hind wings and unicolorous dorsal abdominal segments are unique to *A. albiplica* (Walker, 1858). The black basal areas of the fore wing and hind wing, black mesothorax, and black arch across the dorsal abdomen distinguish *A. nigrovittata* Distant, 1905 from the new species. The more narrow body, green marked with tawny coloration, and the primarily tawny abdominal tergites promptly distinguish *A. marginata* (Olivier, 1790) from the new species.

The new species is most similar in general appearance to *A. bilaqueata* (Uhler, 1903), *A. colombiae* (Distant, 1892), *A. egregia* (Uhler, 1903) n. comb., and *A. russelli* n. sp. Both *A. colombiae* and *A. russelli* n. sp. have black abdominal segments with a tawny posterior margin rather than the more elaborate, variegated abdominal coloration with pile that gives the appearance of an arch across the abdominal tergites in the new species. The most similar species in general appearance are *A. bilaqueata* (Uhler, 1903) and *A. egregia* (Uhler, 1903) n. comb. as both species have similar variegated dorsal abdominal markings. The basal membrane of the fore wing is, respectively, heavily marked with black or white marked with brown in *A. bilaqueata* and *A. egregia* and the plaga of the hind wing is marked with brown in these species while the fore wing basal membrane is light blue marked with brown and the hind wing plaga is white in the new species. The new species is marked with black on the posterior of the lateral angle of the pronotal collar and the abdominal sternite markings cross the midline both of which are missing in *A. bilaqueata* and *A. egregia*. Finally, the uncus of *A. bilaqueata* is sinuate on the ventral surface and the uncus of *A. egregia* is smoothly arched on the ventral side with a slight concavity forming a more globate posterior terminus and the basal lobes of the pygofer are rounded on their terminus in both of these species while the uncus has an extension at the angle on the ventral side (the lighter area in Fig. 3F) and the terminus of the basal lobes of the pygofer is straight in the new species.

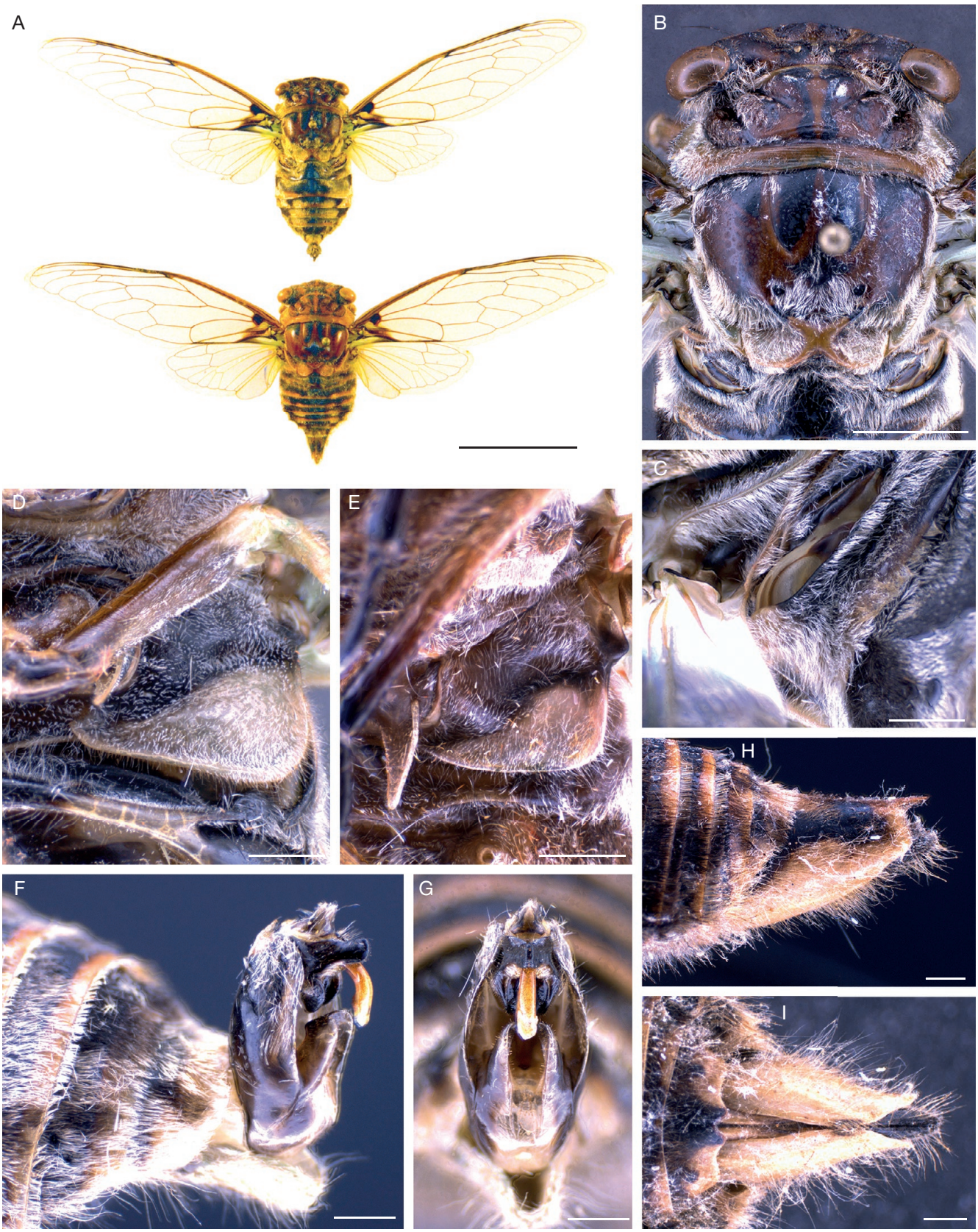

FIG. 3. — *Ariasa maryannae* n. sp.: **A**, holotype ♂ and paratype ♀ habitus; **B**, holotype ♂ dorsum; **C**, holotype ♂ timbal cover; **D**, paratype ♂ operculum. **E**, paratype ♀ operculum; **F**, holotype ♂ lateral view of genitalia; **G**, holotype ♂ posterior view of genitalia; **H**, paratype ♀ lateral view of genitalia; **I**, paratype ♀ ventral view of genitalia. Scale bars: A, 2 cm; B, 5 mm; C-E, 2 mm; F-I, 1 mm.

Distribution. — The species is known only from the type series collected in French Guiana.

Description

General coloration

Ground color of head and thorax castaneous marked with black, abdomen black marked with tawny.

Head

Head wider than mesonotum with arching black transverse mark from anterior vertex posterior to supra-antennal plate surrounding ocelli extending anteriorly on either side of midline to frontoclypeal suture and posterolaterally into anterior and posterior cranial depressions. Supra-antennal plate tawny with black spot on anteromedial margin with postclypeus, ovoid tawny mark on anterior vertex. Eye surrounded by black and small black spot along posterior margin between posterior cranial depression and eye. Covered with short golden pile dorsally, longer silvery pile posterior to eye. Ocelli golden, eyes darker. Ventral head ground color, black mark surrounding eye extending medially to supra-antennal plate. Lorum black, gena black anteriorly, tawny between postclypeus, anterior lorum and black mark surrounding eye, black replacing most tawny area in some paratypes. Long white pile on lorum and gena. Postclypeus centrally sulcate, with eleven transverse grooves, castaneous dorsal surface, black extending into transverse groove and along postrior sulcus, tawny ovoid spot on ventral midline near apex extending onto dorsal side in some paratypes, black on lateral margins with anteclypeus. Short white pile in transverse grooves, more dense on lateral postclypeus. Anteclypeus black with tawny mark on anterior midline covered with short golden and white pile. Mentum tawny, labium castaneous with piceous tip reaching to anterior abdominal sternite II. Antennae black except tawny annulus on distal scape.

Thorax

Dorsal thorax ground color. Pronotum with black mark on either side of midline expanding anteriorly and posteriorly, black within fissures, mark in paramedian fissure extending posteriorly onto disc from middle of fissure and tawny midline and anterior margin. Pronotal collar tawny mottled with green, black marks on margin of lateral angle and dorsolateral posterior margin, with dense silvery pile laterally and short black setae radiating from lateral margin. Mesonotum castaneous, lighter surrounding sigillae, cruciform elevation tawny, wing groove tawny laterally and posteriorly, black on anterior and anteromedial lateral sigilla, submedian sigilla, disc between parapsidal sutures and scutal depressions, scutal depression, mark across anterior portion of anterior arm of cruciform elevation, and posterior mesonotum. Posterior black mark extending onto disc along median lateral sigilla or along lateral margin in some paratypes. Metanotum tawny with black transverse mark. White pubescent spot on anterolateral margin. Long, dense silvery pile on mesonotum, more dense on lateral and posterior mesonotum, in wing groove, between arms of cruciform elevation, and on posterior metanotum. Ventral thoracic segments dusted with white pubescence, ground color except black basisternum 2, episternum 2, basisternum 3, medial trochantin 3, and meron 2 and tawny anepisternum 2, medial katepisternum 2 and trochantin 2. Black reduced or absent and tawny more expansive in some paratypes. Ventral segments with long white pile.

Wings

Fore wings and hind wings hyaline with eight and six apical cells respectively. Venation tawny proximally, castaneous in some paratypes, becoming black distally. Basal cell, elongate spot on proximal costal margin, spot on proximal cubitus posterior + anal vein 1, and posterior to anal vein 2 + 3 black, basal cell not completely black in some paratypes. Pterostigma to proximal apical cell 1, infuscation on posteroproximal cubital cell and proximal clavus. Basal membrane of fore wing greenish, black distally. Venation of hind wing similary colored except green median veins, cubitus posterior, and anal vein 1. Anal cell 3 and anal cell 2 along anal veins 2 and 3, proximal anal cell 1, and proximal cubital cell 2 grayish-green.

Legs

Legs ground color, lighter anteriorly, with greenish tawny distal coxa, trochanters, femora and proximal tibiae, middle trochanters black, middle femur greenish on proximal third, hind tibia greenish with castaneous distal end. Greenish areas tawny or bluish-green in some paratypes. Fore femora with proximal spine oblique, secondary spine largest and upright and small tertiary spine, all within a black fascia. Distal femora and tibiae marked with darker green. Tarsi black with castaneous distal end, hind tarsi green in middle, pretarsal claws castaneous with piceous tips. Tibial spurs and comb castaneous.

Operculum

Male operculum triangular with smoothly rounded posterolateral margin, reaching to anterior of sternite II, tawny, greenish in some paratypes, with a black base. Medial margin extending to median meracanthus. Meracanthus pointed, tawny with a black base. Female operculum with rounded posterolateral margin, terminating medially at meracanthus reaching to anterior of sternite II, tawny with a black base. Female meracanthus almost twice as long as operculum, tawny with a black base. Opercula covered with white pubescence and long silvery pile radiating from edge.

Abdomen

Abdomen ground color covered with long silvery pile. Tergites black with tawny on posterior tergite 2 posterior to timbal and timbal cover, entire posterior of tergite 3, posterior of tergite 4 except black extension to posterior margin on dorsolateral surface, middle half of posterior tergite 5, posterior tergite 6, lateral posterior tergite 7, and medial tergite 8, the tawny marks forming a black arch on the dorsal tergites. Female abdominal segment 9 tawny with black dorsolateral surfaces with dense, long, golden pile. Posterior margin of abdominal segment 9 sinuate, dense dark testaceous spines on either side of ovipositor on posterior ventral margin. Sternite I black,

sternite II black with tawny area on posterolateral margin, sternites III-VI castaneous with tawny posterior margin, sternite VII castaneous with posterilateral tawny spots, and sternite VIII tawny with castaneous extended pyramidal anteromedial mark and lateral spots. Female sternite VII with sinuate posterior margin and medial notch, black extending to posterior margin enclosing notch. Sternites and epipleurites dusted with white pubescence, more dense laterally, and long silvery pile. Timbal cover incomplete exposing timbal dorsally, anterior margin of tergite 2 curled posteriorly with long silvery pile, curved at dorsal base, ventral margin straight.

Genitalia

Male. Pygofer black medially, castaneous laterally, and tawny between pygofer basal lobes, with rounded distal shoulder dorsal beak not reaching to anal styles, with long silvery pile distally. Pygofer basal lobe elongate, flattened laterally, apex turned, terminus straight, short golden pile radiating medially. Anal styles castaneous, anal tube tawny. Median uncus lobe expanding distally, black, flattened laterally with a dorsal extension at the terminus, ventral side with tawny extension where it joins with lateral uncus lobes, golden pile radiating dorsally. Lateral uncus lobes black, curving under median uncus lobes, bulbous extension laterally with radiating golden pile. Aedeagus tawny at base becoming ochraceous distally.

Female. Gonapophyses VIII and IX tawny. Gonocoxites IX and X black extending beyond dorsal beak with radiating golden pile. Anal styles castaneous or black.

Ariasa russelli n. sp.
(Fig. 4)

TYPE MATERIAL. — **Holotype**. "FRENCH GUIANA / STM Mont Saint Marcel de la / Haute-Camopi, (inselberg), / N 2°23'03.00" O 53°00'37.00", altitude / 635m, Commune de Camopi, 19-IX-2014 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♂ MNHN-EH-23299. **Paratypes**. "FRENCH GUIANA / Montagne des Chevaux, (forest on / quartzite), N 4°44'31.54" O 52°25'53.02" / altitude 90m, commune de Roura / Automatic Luminating Trap with blue light / Soc. Ent. Antilles-Guyane leg." (no date) ♂ and ♀ (coll. AFSC): "FRENCH GUIANA / Montagne des Chevaux, (forest on / quartzite), N 4°44'31.54" O 52°25'53.02" / altitude 90m, commune de Roura / 14-IX-2013 / Automatic Luminating Trap with Gemlight / Soc. Ent. Antilles-Guyane leg." ♂ (coll. AFSC); "FRENCH GUIANA / Montagne des Chevaux, (forest on / quartzite), N 4°44'31.54" O 52°25'53.02" / altitude 90m, commune de Roura / 27-X-2013 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♀ (coll. AFSC); "FRENCH GUIANA / Montagne des Chevaux, (forest on / quartzite), N 4°44'31.54" O 52°25'53.02" / altitude 90m, commune de Roura / 19-X-2013 / Automatic Luminating Trap with Gemlight / Soc. Ent. Antilles-Guyane leg." ♂ (coll. AFSC); "FRENCH GUIANA / Montagne des Chevaux, (forest on / quartzite), N 4°44'31.54" O 52°25'53.02" / altitude 90m, commune de Roura / 06-XII-2014 / Automatic Luminating Trap with Gemlight / Soc. Ent. Antilles-Guyane leg." ♂ (coll. AFSC); "FRENCH GUIANA / Réserve de la Trinité, zone Aya / N 4° 35' 20", O 53° 18' 1", Commune de / Saint Elie, 07-XI-2013 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♀ (coll. AFSC); "FRENCH GUIANA / Réserve de la Trinité, zone Aya / N 4° 35' 20" N, O 53° 18' 1", Commune de / Saint Elie, 06-XI-2013 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♀ (coll. AFSC); "FRENCH GUIANA / Réserve de la Trinité, zone Aya / N 4° 35' 20" N, O 53° 18' 1", Commune de / Saint Elie, 08-09-XI-2013 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♀ (coll. AFSC); "FRENCH GUIANA / Montagne des Chevaux, (forest on / quartzite), N 4°44'31.54" O 52°25'53.02" / altitude 90m, commune de Roura / 22-X-2013 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♀ (coll. AFSC); "FRENCH GUIANA / Montagne des Chevaux, (forest on / quartzite), N 4°44'31.54" O 52°25'53.02" / altitude 90m, commune de Roura / 31-X-2013 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♀ (coll. AFSC); "FRENCH GUIANA / STM Mont Saint Marcel de la / Haute-Camopi, (inselberg), / N 2°23'03.00" O 53°00'37.00", altitude / 635m, Commune de Camopi, 20-IX-2014 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♂ (coll. AFSC); "FRENCH GUIANA / STM Mont Saint Marcel de la / Haute-Camopi, (inselberg), / N 2°23'03.00" O 53°00'37.00", altitude / 635m, Commune de Camopi, 21-IX-2014 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♂ (coll. AFSC); "FRENCH GUIANA / STM Mont Saint Marcel de la / Haute-Camopi, (inselberg), / N 2°23'03.00" O 53°00'37.00", altitude / 635m, Commune de Camopi, 26-IX-2014 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." 2 ♂ and 1 ♀ (coll. AFSC); "FRENCH GUIANA / STM Mont Saint Marcel de la / Haute-Camopi, (inselberg), / N 2°23'03.00" O 53°00'37.00", altitude / 635m, Commune de Camopi, 16-IX-2014 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." 2 ♂ (coll. AFSC); "FRENCH GUIANA / STM Mont Saint Marcel de la / Haute-Camopi, (inselberg), / N 2°23'03.00" O 53°00'37.00", altitude / 635m, Commune de Camopi, 23-IX-2014 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♂ (coll. AFSC); "Fr. Guyana" 2 ♂ (coll. AFSC).

ETYMOLOGY. — The species is named in honor of my father M. Russell Sanborn for unending support, assistance in the field and logistical support for my work on cicadas that resulted in several publications.

MEASUREMENTS (MM). — N = 12 ♂ or 10 ♀, mean (range). Length of body: ♂ 32.75 (31.4-34.4), ♀ 31.24 (28.6-35.4); length of fore wing: ♂ 42.44 (40.8-45.6), ♀ 43.21 (41.1-45.0); width of fore wing: ♂ 12.55 (11.9-13.1), ♀ 12.35 (11.6-13.0); length of head: ♂ 5.18 (4.8-5.7), ♀ 5.23 (5.1-5.4); width of head including eyes: ♂ 12.80 (12.5-13.4), ♀ 12.92 (12.1-13.6); width of pronotum including suprahumeral plates: ♂ 12.43 (12.1-12.9), ♀ 12.62 (11.7-13.6); width of mesonotum: ♂ 10.70 (10.3-11.3), ♀ 10.82 (10.1-11.2).

DIAGNOSIS. — The lateral red abdomen promptly distinguishes *A. nigrorufa* (Walker, 1850), from the new species. The green and brown body and the white pubescent spots lateral to the genitalia simply distinguish *A. alboapicata* (Distant, 1905) from the new species. Although *A. diupsilon* (Walker, 1850) has a general appearance similar to the new species, it is significantly smaller (19 mm for the female type vs 28-33 mm body length for females of the new species) and lacks the black in the basal cell of the fore wing. The smaller body size (19 mm) and lack of marking in the fore wing basal cell promptly distinguish *A. urens* (Walker, 1852). The lateral ochraceous areas of the abdomen, ochraceous pronotal collar and costal margin distinguish *A. arechavaletae* (Berg, 1884) from the new species. The white basal area of the hind wings and unicolorous dorsal abdominal segments are unique to *A. albiplica* (Walker, 1858). The black basal areas of the fore wing and hind wing, black mesothorax, and black arch across the dorsal abdomen distinguish *A. nigrovittata* Distant, 1905 from the new species. The more narrow body, green marked with tawny coloration, and the primarily tawny abdominal tergites promptly distinguish *A. marginata* (Olivier, 1790) from the new species.

The new species is most similar in general appearance to *A. bilaqueata* (Uhler, 1903), *A. colombiae* (Distant, 1892), *A. egregia* (Uhler, 1903) n. comb., and *A. maryannae* n. sp. *Ariasa bilaqueata* (Uhler, 1903), *A. egregia* (Uhler, 1903) n. comb. and *A. maryannae* n. sp. have more elaborate, variegated abdominal coloration with pile that gives the appearance of an arch across the dorsal tergites rather than the black abdominal segments with a tawny posterior margin found in the new species. The basal membrane of the fore wing is heavily marked with black or brown in *A. bilaqueata* and *A. egregia* and the plaga of the hind wing is marked in these species. The most similar species in general appearance is *A. colombiae* (Distant, 1892) but it can be distinguished by the dark brown basal membrane of the fore wing, the infuscated plaga of the hind wing, the markings on the abdominal sternites cross the midline, and the dark spots on the posterior lateral angles of the pronotal collar distinguish it from the new species. Finally, the uncus of *A. colombiae* lacks the ventral extension and is smoothly curved, the basal pygofer lobes are more rounded on the apex than the straight terminal margin found in the new species, and the caudal beak extends the length of the anal styles in *A. colombiae* while the caudal beak only reaches to the base of the anal styles in the new species.

Distribution. — The species is known only from the type series collected in French Guiana.

Description

General coloration

Ground color of head and thorax dark castaneous marked with black, abdomen black marked with castaneous and tawny.

Head

Head wider than mesonotum with arching black transverse mark from anterior vertex posterior to supra-antennal plate surrounding ocelli extending anteriorly on either side of midline to frontoclypeal suture and posterolaterally into anterior and posterior cranial depressions. Supra-antennal plate dark tawny with black spot on anteromedial margin with postclypeus, dark tawny mark on anterior vertex lateral to supra-antennal plate, tawny marks reduced in some paratypes. Eye surrounded by black and small black spot along posterior margin between posterior cranial depression and eye. Covered with golden pile dorsally, longer posterior to eye. Ocelli rosaceous, eyes golden. Ventral head black except dark tawny on medial lorum along anterior junction of gena laterally to half the distance to eye. Long white pile and white pubescence on lorum and gena. Postclypeus centrally sulcate, with twelve transverse grooves, black with castaneous dorsal surface, ovoid tawny spot crossing apex on midline from dorsal to ventral side, transverse grooves tawny medially, castaneous laterally. Long white pile and white pubescence on lateral postclypeus. Anteclypeus black with dark tawny mark on anterior midline margin and along posterior midline covered with white pubescence and long white pile. Mentum tawny with castaneous stripes, labium tawny with castaneous stripes at base, becoming castaneous with black tip distally, reaching to middle of abdominal sternite I. Antennae black.

Thorax

Dorsal thorax ground color. Pronotum with black mark on either side of midline expanding anteriorly and posteriorly, black within fissures, mark in paramedian fissure extending posteriorly onto disc from middle of fissure and dark tawny midline and anterior margin. Pronotal collar castaneous with dense golden pile laterally and short black setae radiating from lateral margin. Mesonotum castaneous, cruciform elevation light castaneous, wing groove tawny laterally and posteriorly, lateral sigilla, submedian sigilla, disc between parapsidal sutures and scutal depressions, and scutal depressions black. Metanotum black. Long, dense golden pile on mesonotum, more dense on lateral and posterior mesonotum, in wing groove, between arms of cruciform elevation, and on posterior metanotum. Ventral thoracic segments with thick white pubescence. Ground color except black basisternum 2, episternum 2, katepisternum 2, basisternum 3, and trochantin 3, medial episternum 3, and tawny anepisternum 2, trochantin 2 and epimeral lobe. Black reduced laterally in some paratypes. Ventral segments with long white pile.

Wings

Fore wings and hind wings hyaline with eight and six apical cells respectively. Venation castaneous proximally, becoming black distally. Basal cell, spot on proximal cubitus posterior + anal vein 1, and posterior to anal vein 2 + 3 black. Pterostigma to level of radial crossvein, infuscation on proximal radial cell and proximal medial cell along arculus and median vein, posteroproximal cubital cell and proximal clavus, infuscation reduced in some paratypes. Basal membrane of fore wing greenish, black distally. Venation of hind wing tawny proximally becoming black distally except green median distal portions of cubitus anterior, cubitus posterior, and anal vein 1. Anal cell 3 and anal cell 2 along anal veins 2 and 3, proximal anal cell 1, and proximal cubital cell 2 grayish-green.

Legs

Legs dark castaneous with greenish tawny distal coxa, proximal trochanters, distal femora and proximal tibiae, fore trochanters striped with black, middle femur greenish on proximal third, hind tibia greenish with castaneous distal end. Legs dusted with white pubescence and sparse long silvery pile. Fore femora with proximal spine oblique, secondary spine largest less oblique and small tertiary spine, all within a black fascia. Tarsi black with castaneous distal end, hind tarsi tawny in middle, pretarsal claws castaneous with piceous tips. Tibial spurs and comb castaneous.

Operculum

Male operculum with straight lateral margin parallel to long body axis, smoothly rounded posterolateral margin, and straight posterior margin to round medial margin at level of medial meracanthus, not reaching to anterior of sternite II, tawny, greenish in some paratypes, with a black base. Meracanthus pointed, tawny with a black base. Female operculum with rounded posterolateral margin, terminating medially at meracanthus reaching to anterior of sternite II, tawny with a black base. Female meracanthus almost twice as long as operculum, tawny with a black base. Opercula covered with white pubescence and long silvery pile radiating from edge.

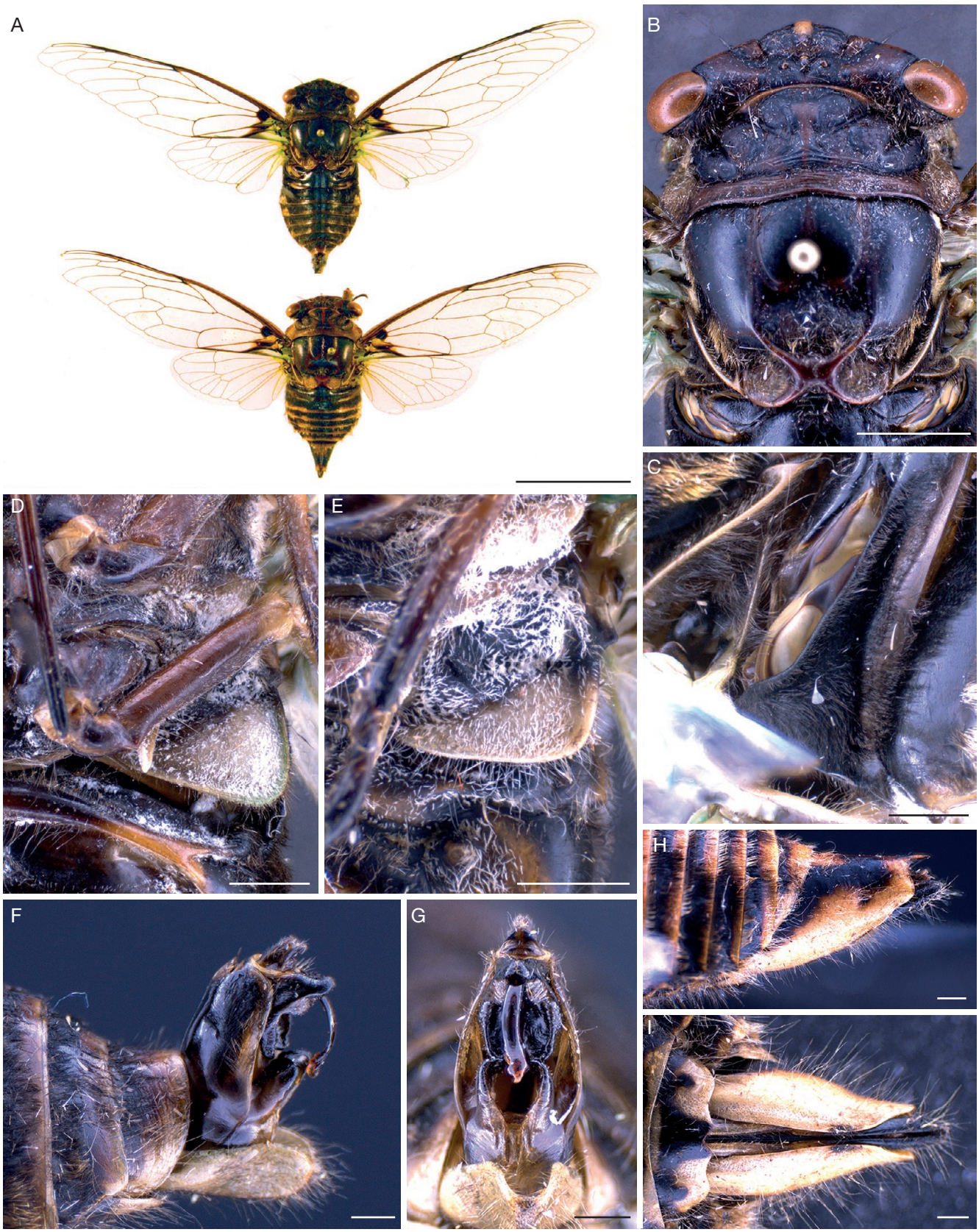

Fig. 4. — *Ariasa russelli* n. sp.: **A**, holotype ♂ and paratype ♀ habitus; **B**, holotype ♂ dorsum; **C**, holotype ♂ timbal; **D**, paratype ♂ operculum; **E**, paratype ♀ operculum; **F**, holotype ♂ lateral view of genitalia; **G**, holotype ♂ posterior view of genitalia; **H**, paratype ♀ lateral view of genitalia; **I**, paratype ♀ ventral view of genitalia. Scale bars: A, 2 cm; B, 5 mm; C-E, 2 mm; F-I, 1 mm.

Abdomen
Abdomen black marked with tawny covered with dense pile. Tergites black with tawny on posterior tergite 2 posterior to timbal, reduced in some paratypes, entire posterior of tergites 3-8, black pile extending over tawny on dorsolateral surface, dense silvery pile on lateral tergites 3 and 4, dense golden pile on lateral tergites 5-7. Female abdominal segment 9 tawny with black dorsolateral surfaces and castaneous posterior midline on dorsal surface with dense, long golden pile. Posterior margin of abdominal segment 9 sinuate, dense dark testaceous spines on either side of ovipositor on posterior ventral margin. Sternites greenish tawny, sternite I black anteriorly, sternite II with transverse castaneous mark on anterior medial margin, sternite VII castaneous with posterolateral tawny spots, and sternite VIII tawny with castaneous extended pyramidal mark extending from large anteromedial spot. Female sternite VII with sinuate posterior margin and medial notch, black extending to posterior margin enclosing notch and lateral spots. Sternites and epipleurites dusted with white pubescence, more dense laterally, and long silvery pile. Timbal cover incomplete exposing timbal dorsally, anterior margin of tergite 2 curled posteriorly, covered with golden pile, slightly curved at dorsal base, ventral margin straight.

Genitalia
Male. Pygofer black medially, castaneous laterally, and dark tawny between pygofer basal lobes, with rounded distal shoulder dorsal beak not reaching to anal styles, with long silvery pile distally. Pygofer basal lobe elongate, flattened laterally, apex turned, terminus straight, short golden pile radiating medially, dark tawny at base, black at terminus. Anal styles black, anal tube tawny. Median uncus lobes with rounded terminus, ventral side with dark castaneous extension where it joins with lateral uncus lobes, golden pile radiating dorsally. Lateral uncus lobes curved under median uncus lobes, terminus straight. Aedeagus castaneous.

Female. Gonapophyses VIII and IX tawny, small castaneous mark in middle along midline. Gonapophysis IX castaneous. Gonocoxites IX and X black extending beyond dorsal beak with radiating golden pile. Anal styles castaneous.

Genus *Guyalna* Boulard & Martinelli, 1996

TYPE SPECIES. — *Fidicina bonaerensis* Berg, 1879 (Berg 1879: 140) (Argentina).

Guyalna bicolor (Olivier, 1790) n. comb.
(Fig. 5)

Cicada bicolor Olivier, 1790: 748.

Cicada passerculus Walker, 1850: 125, **n. syn.**

Cicada spinicosta Walker, 1850: 126, **n. syn.**

Cicada lacrines Walker, 1850: 132, **n. syn.**

Fidicina bicolor – Stål 1866a: 171.

Fidicina cayennensis Kirkaldy, 1909: 391.

Dorisiana bicolor – Boulard 1996: 142.

TYPE LOCALITY. — Cayenne, French Guiana.

MATERIAL EXAMINED. — "FRENCH GUIANA: / Amazone Nature Lodge / 30 km SE Roura on / Kaw Rd. 5-19-II-2010, J. E. Eger, coll., 300 m // N04°33.570' / W052°12.433' / 300m UV Light Trap" 2 ♂ (FSCA), ♂ (coll. AFSC); "FRENCH GUIANA: 32 / km SE Roura on Kaw / Rd., 9-10-II-2010, J. E. / Eger, MV Light, 287 m // N04°33.612' / W052°11.350'" 2 ♂, 5 ♀ (FSCA), ♂, ♀ (coll. AFSC); "FRENCH GUIANA: / 12 km W of Risquetout / 10-XII-2002, J. E. Eger / N04° 54.673' W052° / 11.150' 58 m MV Light" 4 ♀ (FSCA), 2 ♀ (coll. AFSC); "FRENCH GUIANA: / Entomotech Lodge / 30 km SE Roura on / Kaw Rd. 1-12-XII- / 2002 J. E. Eger // N04°33.570' W052°12.433'/ 300 m MV Light" ♀ (FSCA), 2 ♀ (coll. AFSC); "FRENCH GUIANA: / 8 km W of Risquetout / 2-XII-2002, J. E. Eger / N04°55.097' W052° / 33.121', 45 m MV Light" ♂ (FSCA), 2 ♀ (coll. AFSC); "FRENCH GUIANA: / 8 km W of Risquetout / 8-VI-2005, J. E. Eger / N04°55.097' W052° / 33.121', 45 m MV Light" ♂, ♀ (coll. AFSC); "FRENCH GUIANA: / 14 km E of N2 on rd / to Dégrad Corréze, 6- / XII-2002 J. E. Eger // N04°29.964' / W052° / 20.260' / 108 m MV Light" ♂ (FSCA), ♂ (coll. AFSC); "FRENCH GUIANA / Belizone, Montagues de / Tortue, 427 m / 4°14'42 N 52°35'06"W / 27 Jan. – 6 Febr. 2003 / H. von Schmeling" 2 ♂, ♀ (UGCA), ♀ (coll. AFSC); "FRENCH GUIANA: 8 / km west of Risquetout / 15-IV-2007, D G Hall / & J E Eger, coll. // N 04°55.097' / W 052°33.121' / 45 m MV Light" 4 ♂ (coll. AFSC); "FRENCH GUIANA: / 27 km SE Roura on / Kaw Rd., 14-IV-2007 / D G Hall & J E / Eger, coll., MV Light" ♂ (coll. AFSC); "FRENCH GUIANA: Ama- / zona Nature Lodge, 30 / km SE Roura on Kaw Rd / 10-18-IV-2007, D / G Hall & J E Eger, coll. // N04°33.570' / W052°12.433' / 300m UV Light" ♂, 4 ♀ (coll. AFSC); "FRENCH GUIANA: 27 / km SE Roura on Kaw / Rd 5-II-2010, J. E. / Eger coll., MV Light // N04°34.116' / W052°12.614" ♀ (FSCA), ♀ (coll. AFSC); "FRENCH GUIANA: 27 / km SE Roura on Kaw / Rd 21-IV-2007, J. E. / Eger coll., MV Light" 3 ♂ (coll. AFSC); "FR. GUIANA: Hwy N2 to / Regina, 67 km. s. of / Cayenne, 6 VI-1986 / E. G. Riley & D. A. Rider // collected at / mercury vapor" ♀ (LSAM); "NICARAGUA: Rio San Juan / Prov. Refugio Bartolo, 51 m / 10.97254°N, 084.33906°W / VIII-5-15-2002 / Coll. R. M. Caesar, UV Light" ♂, ♀ (coll. AFSC); "PANAMA, Panama Pr. / Cerro Campana, 1700' / May 17-19. 1987 / E. Giesbert, coll." ♂ (coll. AFSC); "PANAMA: Panama Provll / Reserva Sobrina Pine- / line road, 9 km mark / VI-25-1994, blacklight / N. Smith & D. Mitchell" ♀ (coll. AFSC); "PANAMA, San Blas Pr. / Nusagandi / 28 may '95 Cavan" ♀ (coll. AFSC); "Fca. Biesnan, Colonia / Refug. Los Angeles, 11 / km E Quebrada Grande, / Guan. Prov. COSTA RICA / 500m 13 Jun 1985 / DHJansen & W. Hallwachs // INB0003980785 / INBIOCRI COSTA RICA" ♀ (coll. AFSC); "COSTA RICA. Prov. Alajuela. Upala. P. N. / Volcán Tenorio. Albergua Heliconias. / 800-900m. 6-9 JUN 2006. B. Gamboa, M. / Moraga. Tp. Luz. L_N_299800_423800 #86394 // INB0004017652 / INBIOCRI COSTA RICA" ♂ (coll. AFSC).

DISTRIBUTION. — The species has been reported under various names from Brazil Colombia, Costa Rica, French Guiana, Nicaragua, and Panama (Metcalf 1963a, Duffels and van der Laan 1985, Martinelli & Zucchi 1997, Boulard 1996, 1998, 2005, 2006, Sanborn 2011, 2013, 2014, Sanborn & Maes 2012, Maes *et al.* 2012).

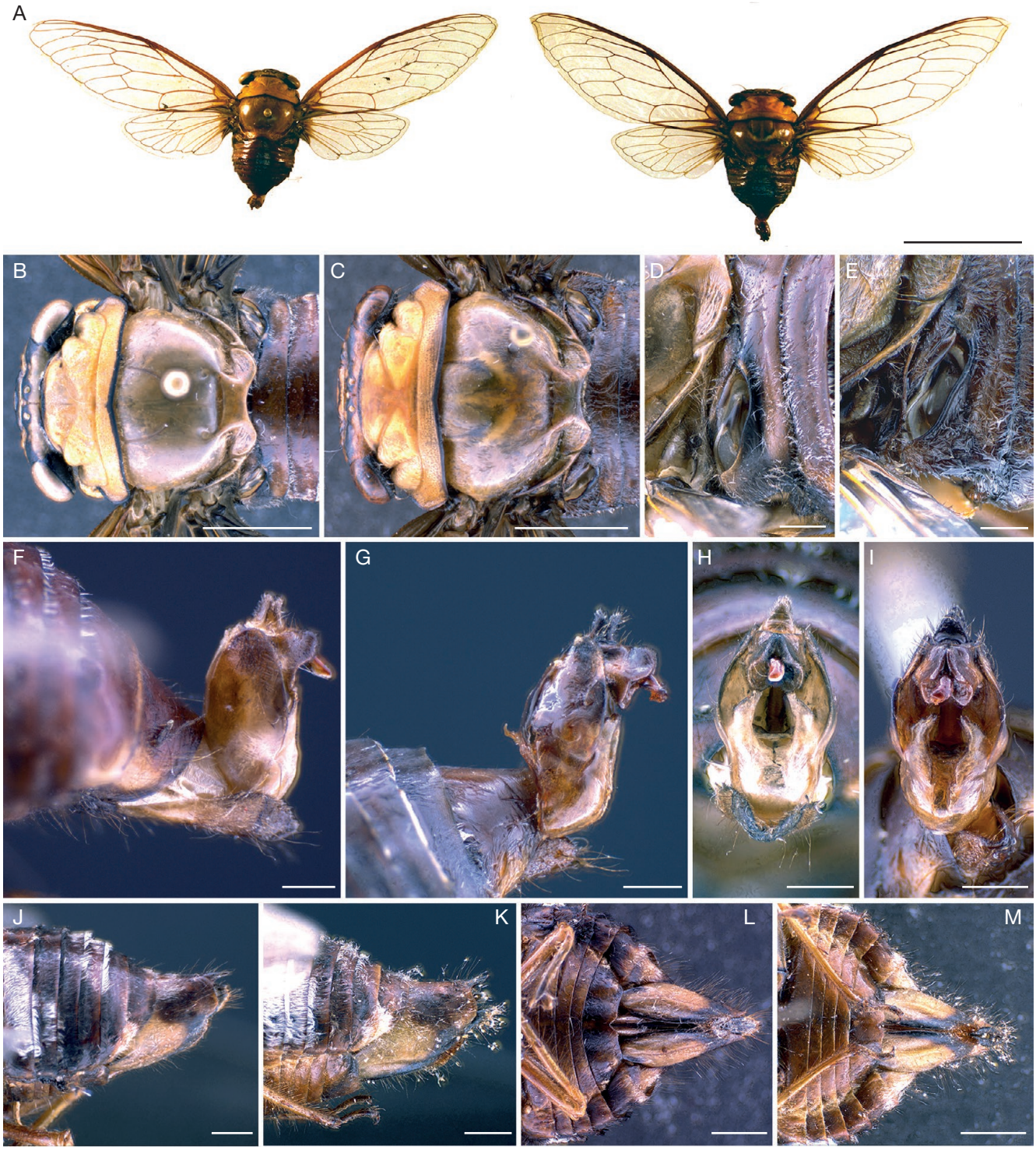

Fig. 5. — *Guyalna bicolor* (Olivier, 1790) n. comb.: **A**, ♂ habitus, French Guiana (left) (AFSC) and ♂ habitus, Costa Rica (right) (AFSC); **B**, ♂ dorsum, French Guiana; **C**, ♂ dorsum, Costa Rica; **D**, ♂ timbal cover, French Guiana; **E**, ♂ timbal cover, Costa Rica; **F**, ♂ lateral view of genitalia, French Guiana; **G**, ♂ lateral view of genitalia, Costa Rica; **H**, ♂ posterior view of genitalia, French Guiana; **I**, ♂ posterior view of genitalia, Costa Rica; **J**, ♀ lateral view of genitalia, French Guiana; **K**, ♀ lateral view of genitalia, Costa Rica; **L**, ♀ posterior view of genitalia, French Guiana; **M**, ♀ posterior view of genitalia, Costa Rica. Scale bars: A, 2 cm; B-C, 5 mm; D-I, 1 mm; J-M, 2 mm.

Remarks

The generic assignment of this species was reviewed in the context of the synonymies discussed below. Boulard (1996) assigned the species to *Dorisiana* Metcalf, 1952 without comment. Both *Dorisiana* (Delétang 1919) and *Guyalna* (Boulard & Martinelli 1996) were introduced in the literature as part of keys so a complete morphological analysis of the genera has yet to be produced. Boulard & Martinelli (1996) list three-

segmented tarsi, rounded timbal cover apex, pronotum shorter than mesonotum, head as wide or slightly wider than the mesonotum and slightly protruding eyes as characteristic of the genus *Guyalna* all of which are found in *C. bicolor*. Delétang (1919) lists a cruciform elevation notched in the form of a more or less open semicircle and Boulard & Marinelli (1996) list a tapered, triangular timbal cover as characteristic of *Dorisiana*, both of which are absent in *C. bicolor*. As a result, *C. bicolor* is hereby transferred to the genus *Guyalna* to become *Guyalna bicolor* (Olivier, 1790) n. comb.

My previous report (Sanborn 2011) of *Fidicinoides passerculus* (Walker, 1850) from French Guiana was in error. The specimens have three segmented tarsi and are thus part of the Guyalnina and not the Fidicinina. Boulard (1996, 1998, 2005, 2006) has described and illustrated *G. bicolor* n. comb. originating from French Guiana and Brazil which appear to be identical to the specimens previously identified as *F. passerculus*. Boulard (1996) also recorded and identified *G. bicolor* n. comb. in the type locality (Pará) for *F. passerculus*. The specimens I previously identified as *F. passerculus* also fit the original description of *G. bicolor* n. comb. (Olivier 1790). As a result, *F. passerculus* is determined here to be a junior synonym of *G. bicolor* n. comb. and *F. passerculus* is removed from the cicada fauna of French Guiana.

The misidentification of specimens as *F. passerculus* initiated a review of the status of species previously synonymized with it. *Fidicinoides spinicosta* (Walker, 1850) was first synonymized with *F. passerculus* by Distant (1906a) perhaps after comparing the type material in the BMNH. Mick Webb has been unable to locate the holotype of *F. passerculus* in the BMNH (personal communication) but it may have been available when Distant synonymized the species. It was considered a junior synonym of *F. passerculus* in Metcalf (1963a) but was considered later as a valid taxon by a number of authors (Young 1977, 1980a, b, 1981a, b, 1983, 1984; Duffels & van der Laan 1985; Humphreys 2005; Salazar Escobar 2005; Sanborn 2005, 2010, 2014; Sanborn *et al.* 2008; Salazar and Sanborn 2009; Santos *et al.* 2010; Sanborn & Maes 2012; Maes *et al.* 2012). No comment was given when the species was resurrected and later authors (including myself) perpetuated the use of the taxon based on the earlier works. However, with the reassignment of the French Guiana specimens of *F. passerculus* to *G. bicolor* n. comb., the status of *F. spinicosta* also comes into question.

Cicada spinicosta was described on the following page of Walker (1850) using specimens that originated in the same location (Para, Brazil) as the type of *F. passerculus*. Boulard (1996) made sound recordings and identified *G. bicolor* n. comb. in Pará. Walker (1852) again identified specimens as both *F. passerculus* and *F. spinicosta* from the same location ("Ega, on the Amazon") suggesting Walker used minor color variations to distinguish the species. Specimens in my possession from Central and South America fit the original descriptions for both species, which are very similar and differ in minor details, as well as the original description of *C. bicolor* (Olivier 1790). Mick Webb compared a syntype of *F. spinicosta* in the BMNH to images of *G. bicolor* n. comb. originating in French Guiana and specimens previously identified as *F. spinicosta* from Costa Rica (Fig. 5) and found no significant differences. Thus, *Fidicinoides spinicosta* is determined here to be a junior synonym of *G. bicolor* n. comb. as well.

Examples of *G. bicolor* n. comb. from French Guiana and what had been identified as *F. spinicosta* from Costa Rica are illustrated in Figure 5. The collection localities are near the extremes of the known distribution for the species yet there are no significant differences in the morphology of the specimens supporting the contention that the species are the same and should be synonymized.

Finally, *C. lacrines* was first synonymized with *F. spinicosta* by Distant (1883) after comparing the type material of both species in the BMNH. The synonymy of *C. lacrines* with *F. spinicosta* has never been questioned (Metcalf 1963a; Sanborn 2013) and *C. lacrines* is considered here a junior synonym of *G. bicolor* n. comb.

Guyalna parvula (Jacobi, 1904) n. comb.
(Fig. 6)

Fidicina parvula Jacobi, 1904: 157.

TYPE LOCALITY. — Rio Grande do Sul, Brazil.

MATERIAL EXAMINED. — "R. Grande / do Sul // *Fidicina* / *parvula* / A. Jacobi deter." ♂ co-type (ZMHB); "Nova Teutonia / Santa Catarina / Brazil // Dec. 3 1953 / F. Plaumann" ♂ (coll. AFSC); "Nova Teutonia / Santa Catarina / Brazil // Nov. 24 1953 / F. Plaumann" ♀ (coll. AFSC).

DISTRIBUTION. — The species has been reported previously from Brazil (Jacobi 1904).

REMARKS

While examining species in an attempt to identify the new species of *Guyalna* described here, I determined that *Fidicina parvula* Jacobi, 1904 should be placed in the genus *Guyalna*. Examination of the syntype specimen in the ZMHB and specimens in the author's collection obtained from the NCSU shows the species has the three-segmented tarsi and the curved timbal cover apex characteristic of the genus *Guyalna* (Boulard and Martinelli 1996). *Fidicina parvula* is hereby transferred to the genus *Guyalna* to become *Guyalna parvula* (Jacobi, 1904) n. comb.

Guyalna jamesi n. sp.
(Fig. 7)

TYPE MATERIAL. — **Holotype**. "FRENCH GUIANA / STM Mont Saint Marcel de la / Haute-Camopi, 16-IX-2014, (inselberg), / N 2°23'03.00" O 53°00'37.00", altitude / 635m, Commune de Camopi / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♂ MNHN-EH-23998. **Paratypes**. Same data as holotype, ♀ (coll. AFSC); "FRENCH GUIANA / STM Mont Saint Marcel de la / Haute-Camopi, 26-IX-2014, (inselberg), / N 2°23'03.00" O 53°00'37.00", altitude / 635m, Commune de Camopi / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♂ and 4 ♀ (coll. AFSC); "FRENCH GUIANA / STM Mont Saint Marcel

Fig. 6. — *Guyalna parvula* (Jacobi, 1904) n. comb.: **A**, syntype ♂ (ZMNB); **B**, ♂, Brazil (AFSC). Scale bars: 2 cm.

de la / Haute-Camopi, 20-IX-2014, (inselberg), / N 2°23'03.00" O 53°00'37.00", altitude / 635m, Commune de Camopi / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♀ (coll. AFSC); "FRENCH GUIANA / STM Mont Saint Marcel de la / Haute-Camopi, 23-IX-2014, (inselberg), / N 2°23'03.00" O 53°00'37.00", altitude / 635m, Commune de Camopi / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♀ (coll. AFSC).

Etymology. — The species is named in honor of James E. Heath for his 80th birthday, mentor and friend who started me on the cicada journey so many years ago and to whom I will always be grateful.

Measurements (mm). — N = 3 ♂ or 6 ♀, mean (range). Length of body: ♂ 34.3 (32.2-36.7), ♀ 30.91 (29.2-32.6); length of fore wing: ♂ 47.57 (43.8-50.2), ♀ 45.23 (43.1-46.8); width of fore wing: ♂ 13.97 (12.9-14.7), ♀ 13.38 (12.8-13.7); length of head: ♂ 6.68 (4.55-4.8), ♀ 4.63 (4.4-4.8); width of head including eyes: ♂ 13.7 (13.2-14.3), ♀ 13.6 (13.3-14.3); width of pronotum including suprahumeral plates: ♂ 13.42 (13.0-13.7), ♀ 13.4 (12.8-14.1); width of mesonotum: ♂ 11.87 (11.6-12.0), ♀ 11.6 (11.1-12.1).

Diagnosis. — The new species has a body length (32-37 mm) greater than *G. bicolor* (Olivier, 1790) n. comb., *G. bleuzeni* Boulard & Martinelli, 2011, *G. cuta* (Walker, 1850), *G. densusa* Boulard & Martinelli, 2011, *G. jauffreti* Boulard & Martinelli, 2011, *G. maxineae* n. sp., *G. nadae* Gogala, Šporar, Sanborn & Maccagnan, 2015, *G. nigra* Boulard, 1999, *G. parvula* (Jacobi, 1904) n. comb., *G. platyrhina* Sanborn & Heath, 2014 and *G. sublaqueata* (Uhler, 1903) n. comb. all of which have body lengths less than 25 mm. The smaller body size (26 mm), the infuscated basal area of the fore wing and hind wing and the circular light area of the ventral abdomen promptly distinguish *G. rufapicalis* Boulard, 1998. The new species can be distinguished simply from *G. atalapae* Boulard & Martinelli, 2011 by the orange basal area and smoky distal edge of the fore wing of *G. atalapae*. The closest in body size to *G. jamesi* n. sp. are *G. bonaerensis* (Berg, 1879) and *G. chlorogena* (Walker, 1850). The yellow and green body markings promptly distinguish *G. bonaerensis* from the almost monochromatic new species. Finally, *G. jamesi* n. sp. can be distinguished promptly from *G. chlorogena* by the lack of green in the basal membranes of the wings, the infuscation of the basal area of the wings and the black in the basal cell of the fore wing of the new species.

Distribution. — The species is known only from the type series collected in French Guiana.

Description

General coloration

Ground color dark brown marked with black.

Head

Head wider than mesonotum with transverse black fascia through ocelli expanding and surrounding margin of eye, fascia incomplete in some paratypes. Posterior margin of head black. Vertex with sparse, short golden pile dorsally, longer and more dense posterior to eye. Ocelli rosaceous. Eyes golden, greenish in some paratypes. Ventral head ground color, greenish in some paratypes, with thick, transverse black fascia between lateral postclypeus and eye, posterior half of lorum except lateral margin black. Postclypeus brown, greenish in some paratypes, centrally sulcate, transverse grooves, central sulcus, posterolateral area next between last transverse groove and margins with anteclypeus and dorsal area proximal to frons black. Short white pile within transverse grooves. Anteclypeus black except anterior, posterior and lateral margins and along midline. Long white pile on lorum, gena, and lateral anteclypeus. Rostrum brown with black distal half, reaching to posterior coxae. Antennal segments black except for tawny annulus on distal scape.

Thorax

Dorsal thorax ground color. Prothorax with longitudinal black mark on either side of midline at posterior end of paramedian fissure narrowly connecting across midline, curved transverse black mark across midline in ambient fissure, missing or split into two spots in some paratypes, and black mark extending from anterior paramedian fissure into anterior lateral fissure. Some black mottling on disc in some paratypes. Pronotal collar lighter than disc with greenish mottling and black spot on lateral angle. Mesothorax ground color with black markings on anterior margin, lateral surfaces, posterior to anterior arm of cruciform elevation, and along parasidal sutures, markings reduced in some paratypes. Scutal depressions and area along anterior margins of anterior arms of cruciform elevation black. Metanotum ground color. Variable amounts of short golden pile on dorsal thoracic segments. Long, dense golden pile on lateral and posterior mesonotum, in wing groove, and on posterior metanotum. Less dense golden pile between anterior arms of cruciform elevation. Ventral thoracic segments ground color with variable black markings even in an individual, dusted with white pubescence. Black markings on anepisternum 2,

Fig. 7. — *Guyalna jamesi* n. sp.: **A**, holotype ♂; **B**, holotype ♂ dorsum; **C**, holotype ♂ timbal; **D**, paratype ♂ operculum; **E**, paratype ♀ operculum; **F**, holotype ♂ lateral view of genitalia; **G**, holotype ♂ posterior view of genitalia; **H**, paratype ♀ lateral view of genitalia; **I**, paratype ♀ ventral view of genitalia. Scale bars: A, 2 cm; B, 5 mm; C-I, 2 mm.

katepisternum 2, anepimeron 2, katepimeron 2, and lateral episternum 3 to variable degrees. Thoracic sternites covered with white pubescence and white pile.

Wings
Fore wings and hind wings hyaline. Venation ground color becoming black distally, costal margin black beyond node. Basal cell ground color with black margin except along arculus, black reduced in some paratypes, pterostigma extending to about middle of apical cell 1, proximal half of clavus infuscated, basal membrane of fore wing grayish black. Hind wing infuscated proximally, venation ground color except testaceous median vein, proximal half of cubitus anterior, cubitus posterior and anal vein 1, and proximal quarter of anal vein 2, black distal anal vein 2 and all of anal vein 3. Anal cell 3 and anal cell 2 along anal veins 2 and 3, anal cell 1 along anal vein 2, proximal three quarters of cubital cell 2 along cubitus posterior vein, and basal cubital, radial and medial cells grayish-black.

Legs
Legs ground color, black along medial coxa, and junction of proximal femur with the trochanter. Fore femora with black fasciae and distal annulus, spines black, proximal spine oblique, secondary spine less angled with lighter tip, and small tertiary spine, white pubescence along basal spines continuing along margin of trochanter. Middle femur darkened on sides lightened distally, hind femur lightened ground color with small darkened areas. Tibiae darkened medially and distally. Tarsi and pretarsal claws black. Tibial spurs black with castaneous base, tibial comb black.

Operculum
Male operculum tawny with a black base and lateral margin, with slightly angled lateral base, curving smoothly towards posterolateral margin, posterior margin sinuate to rounded medial margin, reaching to anterior of sternite II. Medial margin extending to medial junction of trochanter and hind coxa. Meracanthus pointed, tawny with black base. Female operculum with posterolateral margin about a right angle, posterior margin sinuate, terminating medially at pointed meracanthus reaching to middle of sternite II. Opercula and meracanthus covered with white pile and white pubescence, more dense laterally and at base.

Abdomen
Abdomen tergites ground color, greenish in some paratypes, with black anterior region, covered with long golden and silvery pile, more dense laterally. Female sternites tawny with black pile. Sternites and epipleurites translucent tawny, dusted with white pubescence, more dense laterally. Timbal cover black, incomplete exposing timbal dorsally, anterior margin curled posteriorly with long silvery pile, curved at dorsal base, straight along timbal cavity and curving to semicircular anterior apex, ventral margin straight. Timbal white with large dark markings visible through opening in timbal cover. Male sternite VII black on posterior half, sternite VIII black with lateral tawny spots and long black pile. Female sternite VII with sinuate posterior margin, most posterior extension on either side of single medial notch. Female abdominal segment 9 tawny with large black mark dorsolaterally and black along the middle of the ventral margin with long golden pile. Dorsal beak extending beyond tawny anal styles. Posterior margin of abdominal segment 9 sinuate, dense, dark testaceous pile on either side of ovipositor on posterior ventral margin. Long golden pile in medial margin of abdominal segment 9, short golden pile on surface of abdominal segment 9.

Genitalia
Male. Pygofer black with golden pile except for the tawny lateral and posterior anal tube, posterior margin of rounded distal shoulder and basal half of pygofer upper lobe and medial base. Dorsal beak absent. Pygofer upper lobe extended with rounded terminus bent medially and long golden pile. Pygofer basal lobe indistinct. Median uncus lobes short, flattened laterally, expanding dorsally and surrounding aedeagus with stout black pile at base. Lateral uncus lobes extending from median uncus lobes at approximate right angle, curving lateroventrally and meeting along midline. Aedeagus castaneous with a tawny terminus, terminus with some 20 spines.

Female. Gonocoxite IX tawny. Gonapophysis IX and X black. Ovipositor sheath extends beyond dorsal beak. Dorsal beak extending just beyond anal styles. Long golden pile on ovipositor sheath.

Guyalna maxineae n. sp.
(Fig. 8)

TYPE MATERIAL. — **Holotype**. "FRENCH GUIANA / STM Mont Saint Marcel de la / Haute-Camopi, 26-IX-2014, (inselberg), / N 2°23'03.00" O 53°00'37.00", altitude / 635m, Commune de Camopi / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♂ (MNHN-EH-23001). **Paratypes**. Same data as holotype, 3 ♂ and 1 ♀ (coll. AFSC).

ETYMOLOGY. — The species is named in honor of Maxine S. Heath for her 80th birthday, mentor and friend who saw potential in me and started me on the cicada journey so many years ago and to whom I will always be grateful.

MEASUREMENTS (MM). — N = 4 ♂ or 1 ♀, mean (range). Length of body: ♂ 22.85 (22.2-23.5), ♀ 23.9; length of fore wing: ♂ 32.13 (31.6-32.9), ♀ 34.95; width of fore wing: ♂ 9.8 (9.3-10.1), ♀ 10.75; length of head: ♂ 3.9 (3.8-4.1), ♀ 4.3; width of head including eyes: ♂ 10.88 (10.6-11.2), ♀ 11.4; width of pronotum including suprahumeral plates: ♂ 10.49 (10.0-11.0), ♀ 11.3; width of mesonotum: ♂ 9.18 (8.9-9.55), ♀ 9.5.

DIAGNOSIS. — The new species has a body length (22-24 mm) less than *G. bonaerensis* (Berg, 1879), *G. chlorogena* (Walker, 1850), *G. jamesi* n. sp. and *G. rufapicalis* Boulard, 1998 all of which have body lengths greater than 25 mm. Although *G. rufapicalis* has a slightly larger body size (26 mm), the pronotum being the same color as the mesonotum and the circular light area of the ventral abdomen promptly distinguish it from the new species. The smaller body size (21 mm or less) of *G. bicolor* (Olivier, 1790) n. comb.; *G. cuta* (Walker, 1850); *G. nadae* Gogala, Šporar, Sanborn & Maccagnan, 2015; *G. nigra* Boulard, 1999; *G. parvula* (Jacobi, 1904)

n. comb.; *G. platyrhina* Sanborn & Heath, 2014 and *G. sublaqueata* (Uhler, 1903) n. comb. distinguish them from the new species. The new species can be distinguished simply from *G. atalapae* Boulard & Martinelli, 2011 by the orange basal area and smoky distal edge of the fore wing of *G. atalapae*. The new species can be distinguished promptly from *G. bleuzeni* Boulard & Martinelli, 2011 which lacks the expanded infuscation at the base of the wings and whose mesothorax is marked only along the parasidal suture with black. The ochraceous ventral surfaces of *G. densusa* Boulard & Martinelli, 2011 and *G. jauffreti* Boulard & Martinelli, 1996 promptly distinguish them from the new species.

DISTRIBUTION. — The species is only known from the type series collected in French Guiana.

DESCRIPTION

General coloration

Ground color of head and abdomen black, thorax dark testaceous marked with black.

Head

Head wider than mesonotum, black except green anterior margin of vertex. Short golden pile dorsally at junction of frons and postclypeus, longer and more dense pile posterior to eye. Ocelli and eyes green. Ventral head black. Postclypeus centrally sulcate, black except green transverse ridges and medial transverse grooves 2-7 forming a pair of green spots on apex split by black central sulcus. Anteclypeus black. Long golden pile on lorum, gena, lateral postclypeus and anteclypeus. Mentum tawny, black distally, labium castaneous becoming black distally with black lateral surfaces. Rostrum reaching to posterior coxae. Antennal segments black.

Thorax

Dorsal thorax dark testaceous marked with black. Prothorax with transverse black marks posterior to head and within ambient fissure anterior to pronotal collar, transverse marks expanding across midline, anterior mark extending posteriorly into anterior end of paramedian fissure, anterior paramedian fissure marked in some paratypes. Pronotal collar lighter than disc with black mottling. Mesothorax dark testaceous with black lateral sigillae, submedian sigillae, wing grooves, scutal depressions, and elongate black mark with parallel sides that curve to a point anteriorly between submedian sigillae with a rounded posterior terminus between the anterior arms of cruciform elevation. Metanotum black. Variable amounts of short golden pile on dorsal thoracic segments. Long, dense golden pile on lateral and posterior mesonotum, in wing groove, on posterior metanotum, and between anterior arms of cruciform elevation. Ventral thoracic segments black except greenish lateral anepisternum 2 and lateral episternum 3. Ochraceous spot on anteromedial basisternum 3, extending to middle of posterior margin in one paratype and absent in another. Green variable in paratypes. Thoracic sternites covered with long golden pile.

Wings

Fore wings and hind wings hyaline, slight bronzing on apical cells of fore wing. Venation ochraceous at base becoming black distally, costal margin testaceous, black beyond node. Basal cell black with ochraceous spot at base, black reduced in some paratypes so basal cell almost completely ochraceous, pterostigma extending to about middle of apical cell 1, proximal half of clavus infuscated, basal membrane of fore wing grayish black. Hind wing infuscated proximally, venation black, proximally testaceous in some paratypes, except ochraceous proximal cubitus anterior, cubitus posterior and anal vein 1. Infuscation at base of all hind wing cells. Anal cell 3 and anal cell 2 along anal veins 2 and 3, anal cell 1 along anal vein 2, proximal three quarters of cubital cell 2 along cubitus posterior vein, and basal cubital, radial and medial cells grayish-black.

Legs

Legs castaneous with a black posterior stripe, black along medial coxa, anterior trochanter, tarsi and pretarsal claws. Lateral posterior coxae greenish. Fore femora with black distal annulus, proximal spine castaneous adpressed against femur, secondary spine at approximate right angle with broad base, black, and small black tertiary spine. Distal anterior femora and proximal tibiae ochraceous. Tibial spurs and tibial combs castaneous with black tips.

Operculum

Male operculum black with golden pile, slightly angled at lateral base to auditory capsule, rounded posterolateral margin, posterior margin straight to rounded medial margin, not covering tympanum reaching only about three quarters of the distance to sternite II. Medial margin extending to middle of hind coxa. Meracanthus pointed, black with ochraceous lateral margin. Female operculum similarly shaped and colored, reaching to middle of sternite II.

Abdomen

Abdomen tergites black covered with long golden pile, pile very long on posterolateral portions of tergites 7 and 8. Male sternites I, II, VII and VIII black, sternites III-VI translucent green with transversly elongated tawny spot on midline, dense, long golden pile on posterior margin of sternite II. Female sternites black with short golden pile. Timbal cover black, incomplete exposing timbal dorsally, anterior margin curled posteriorly, arching from dorsal base along timbal cavity to semicircular anterior apex, ventral margin slightly angled ventrally. Timbal white with dark brown markings visible through opening in timbal cover. Male sternites VII and VIII black, sternite VIII notched posteriorly. Female sternite VII with sinuate posterior margin and single medial notch. Female abdominal segment 9 black with large green dorsolateral mark, covered with long golden pile. Dorsal beak extending beyond black anal styles. Posterior margin of abdominal segment 9 sinuate.

Genitalia

Male. Pygofer black except tawny dorsal outside and inner anal tube and medial base. Dorsal beak absent. Pygofer upper lobe flattened against pygofer. Pygofer basal lobe small, flattened with rounded apex. Median uncus lobes short, recurved

Fig. 8. — *Guyalna maxineae* n. sp.: **A**, holotype ♂ and paratype ♀ habitus; **B**, holotype ♂ dorsum; **C**, holotype ♂ timbal; **D**, holotype ♂ operculum; **E**, paratype ♀ operculum; **F**, holotype ♂ lateral view of genitalia; **G**, holotype ♂ posterior view of genitalia; **H**, paratype ♀ lateral view of genitalia; **I**, paratype ♀ ventral view of genitalia. Scale bars: A, 2 cm; B, 2 mm; C-I, 1 mm.

dorsally and rounded at terminus. Lateral uncus lobes curving under median uncus lobes, lateral margin curving away from median uncus lobe, posterior margin semicircular angling under the median uncus lobe before meeting along midline and surrounding aedeagus. Aedeagus castaneous with a tawny membrane and long endotheca.

Female. Gonocoxite IX tawny. Gonapophysis IX and X black. Ovipositor sheath extends beyond dorsal beak. Dorsal beak extending just beyond anal styles. Long golden pile on ovipositor sheath.

Subfamily Cicadettinae Buckton, 1889
Tribe Carinetini Distant, 1905

Genus *Carineta* Amyot & Audinet-Serville, 1843

Type species. — *Cicada formosa* Germar, 1830 (Germar 1830: 45) (Brazil).

Carineta cearana Distant, 1906b
(new record)
(Fig. 9)

Carineta cearana Distant, 1906b: 153.

Carineta illustris Sanborn, 2011: 395 (*nec* Distant).

Type locality. — Ceará, Brazil.

Material examined. — "FRENCH GUIANA: / Amazone Nature Lodge / 30 km SE Roura on / Kaw Rd. 5-19-II-2010, J. E. Eger, coll., 300 m // N04°33.570' / W052°12.433' / 300m UV Light Trap" 2 ♂ (FSCA); "FRENCH GUIANA: 41 / km SE Roura on Kaw Rd / 18-XII-2006 / J. E. Eger coll." ♂ (FSCA); "FRENCH GUIANA: 41 / km SE Roura on Kaw Rd / 5-7-VI-2005, J. E. Eger / & M. T. Messenger, coll. // N04°32.214' / W052°07.420' / 272m MV Light" 7 ♂ (coll. AFSC); "FRENCH GUIANA: 1 km S /Amazon Nature Lodge, 30 / km SE Roura on Kaw Rd., / 3-4-VI-2005, J. E. Eger / & M. T. Messenger, coll. // N04°32.961' / W052°12.830' / 288m MV Light" 6 ♂, 2 ♀ (coll. AFSC); "FRENCH GUIANA: 33 / km SE Roura on Kaw / Rd., 12-13-IV-2007, D / G Hall & J. E. Eger, coll. // N04°34.135' / W052°11.150' / 227m MV Light" 2 ♂ (coll. AFSC); "FRENCH GUIANA: Ama- / zona Nature Lodge, 30 / km SE Roura on Kaw Rd / 18-23-IV-2007, J E Eger // N04°33.570' / W052°12.433' / 300m UV Light" ♂, ♀ (coll. AFSC); "FRENCH GUIANA: Ama- / zon Nature Lodge, 30 / km SE Roura on Kaw / Rd., 10-18-VI-2007, D / G Hall & J E Eger, coll. // N04° 33.570' / W052° 12.433' / 300m UV Trap" 8 ♂, ♀ (coll. AFSC); "FRENCH GUIANA: 33 / km SE Roura on Kaw / Rd., 1-2-VI-2005, J E Eger / & M. T. Messenger, coll. // N04°34.135' / W052°11.150' / 227m MV Light" 2 ♂ (coll. AFSC); "FRENCH GUIANA: 33 / km SE Roura on Kaw / Rd., 16-17-IV-2007, D / G Hall & J. E. Eger, coll. // N04°34.135' / W052°11.150' / 227m MV Light" ♂, ♀ (coll. AFSC); "Fr. Guyana" 2 ♂ (coll. AFSC); "FR. GUIANA: Hwy D6 / to Kaw, 33.5 km SE / of Roura, I-1986 / G. Tavakilian // Light / trap" ♂ (coll. MTC).

Distribution. — The species has been reported previously only from Brazil (Distant 1906b).

Remarks

The specimens I reported (Sanborn 2011) as examples of *C. illustris* Distant, 1905 from French Guiana are in actuality *C. cearana*. The very similar body coloration of the two species, the variable infuscation patterns of the wings found in the species combined with the abbreviated original descriptions led to the misidentification. After comparing the French Guiana specimens to images of the types of both *C. cearana* and *C. illustris* in the BMNH and comparing the genitalia of the French Guiana specimens to specimens of *C. illustris* from Peru (Fig. 9), it is clear that the French Guiana specimens are *C. cearana*. As a result, *C. cearana* is now added to the French Guiana cicada fauna and *C. illustris* is removed since Sanborn (2011) is the only record of that species in French Guiana. *Carineta illustris* also appears to have a more western distribution than *C. cearana* (Metcalf 1963c). The species and genitalia are illustrated here to facilitate identification by future researchers.

Tribe Taphurini Distant, 1905
Subtribe Taphurina Distant, 1905

Genus ***Malloryalna*** n. gen.

Type species. — *Malloryalna susanae* n. sp. (French Guiana).

Etymology. — The genus is named in honor of my niece Mallory Sills who often assisted the author with fieldwork on cicadas with the addition of "–alna" that is used to signify a cicada. The genus is feminine.

Diagnosis. — The following structures place the new genus in the Taphurina of the Taphurini based on the diagnostic characters provided in Moulds (2005): metanotum partially visible at dorsal midline, fore wing cubitus posterior and anal vein 1 fused in part, median vein and cubitus anterior separated when meeting the basal cell, costa and radius + subcosta close together, and radius anterior 1 aligned with subcosta, hind wing radius posterior and median veins fused at their bases, cubitus posterior and anal vein 1 unfused, and distal end of anal vein 3 curved, postclypeus rounded in transverse section, width of head greater than width of pronotum, lateral margins of pronotal collar confluent with adjoining pronotal sclerites, lack of timbal cover, timbals extending below wing bases, male operculum not covering tympanal cavity or encapsulating meracanthus curving towards abdominal midline, meracanthus tapering to a point, epipleurites reflexed to ventral surface, pygofer distal shoulder undeveloped, pygofer upper lobe absent, uncus absent, claspers developed, and male aedeagus lacking a strong basal recurve of the theca.

The large expanding, hood-like aedeagus promptly distinguishes male specimens from all other Taphurini. The new genus can be distinguished from *Dulderana* Distant, 1905 and *Nosola* Stål, 1866b by the large, arching costal margin of these genera. The head is about as wide and not wider than the mesonotum in the Panamanian *Dorachosa* Distant, 1892, the Brazilian *Prosotettix* Jacobi, 1907, the Guatemalan *Chrysolasia* Moulds, 2003, as well as *Chalumalna* Boulard, 1998 known only from St. Martin in the Lesser Antilles. *Psallodia* Uhler, 1903 is recorded only from Hispaniola and is characterized by the strongly curved costal margin at its base, the highly arched cubital cell of the fore wing and seven apical cells in the hind wings. The lack of infuscation in the forewings of the Ecuadorian *Imbabura* Distant, 1911 and *Chrysolasia* promptly distinguish them from the new genus. The only known species of the Argentine genus

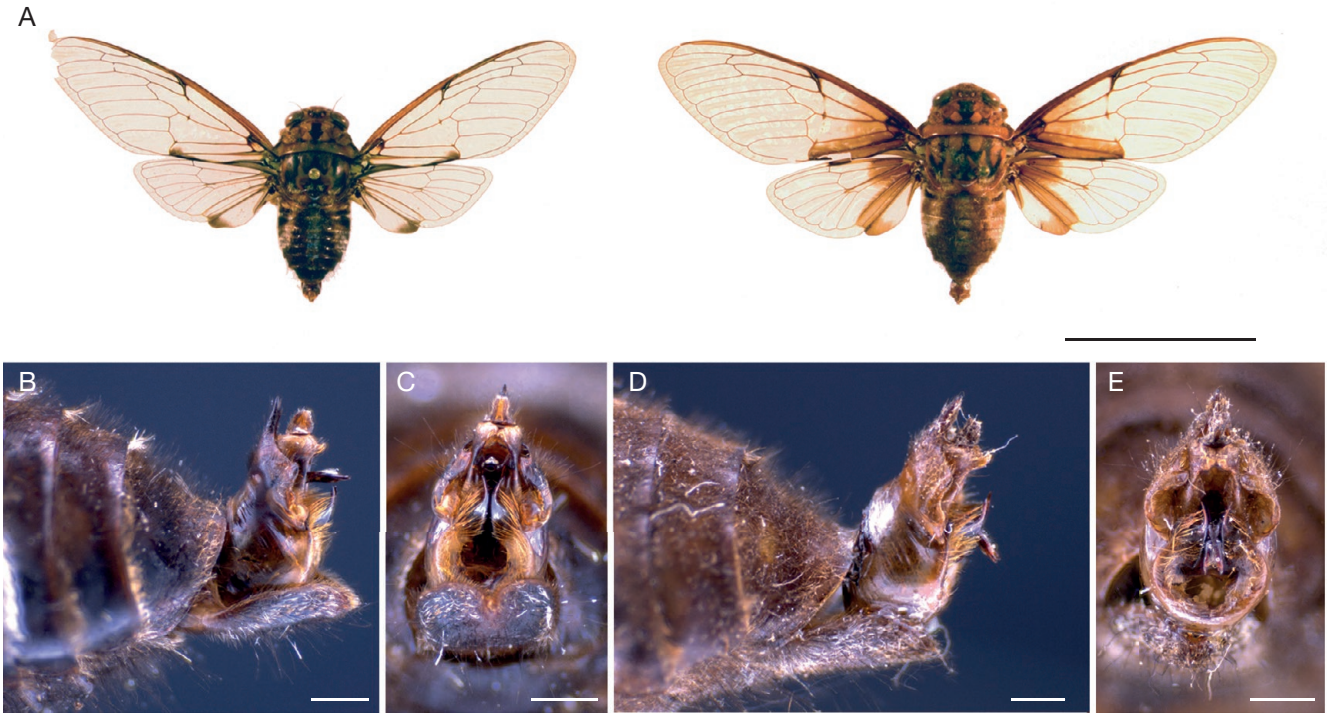

Fig. 9. — *Carineta cearana* Distant, 1906 and *C. illustris* Distant, 1905: **A**, *C. cearana* ♂ habitus, French Guiana (AFSC) (left) and *C. illustris* ♂ habitus, Peru (AFSC) (right); **B**, *C. cearana* ♂ lateral view of genitalia; **C**, *C. cearana* ♂ posterior view of genitalia; **D**, *C. illustris* ♂ lateral view of genitalia; **E**, *C. illustris* ♂ posterior view of genitalia. Scale bars: A, 2 cm; B-E, 1 mm.

Elachysoma Torres, 1964 has a body length less than 13 mm with male claspers short and recurved both dorsally and ventrally to the aedeagus. The species of the genus *Taphura* Stål, 1862 are also much smaller (body length less than 15 mm), the costal margin is strongly bent proximal to the node in most species, the cubital cell of the fore wing is highly arched, the postclypeus lacks a sulcus, the timbals are rudimentary, and male pygofers are characterized by elaborate processes. *Selymbria* Stål, 1861 is the most similar to the new genus. However, males of *Selymbria* can be distinguished by the expansion of ventrolateral tergite 2 extending towards or covering part of the timbal, the opercula are larger and more lobate reaching to sternite II, the widely sulcate postclypeus of most species, the highly angled tergite-epipleurite margin, and the flattened claspers and the lack of the expansive aedeagus in the male genitalia.

Distribution. — The genus is known only from French Guiana.

Species included. — The genus is currently only represented by the type species *Malloryalna susanae* n. gen., n. sp.

Description

Body small (19.3-21.1 mm body length in males). Head wider than mesonotum, postclypeus centrally sulcate, rounded anteriorly, rostrum reaching to between middle and hind coxae. Lateral margins of pronotal collar confluent with adjoining pronotal sclerites, metanotum partially visible at dorsal midline. Fore wing cubitus posterior and anal vein 1 fused in part, median vein and cubitus anterior separated when meeting the basal cell, costa and radius + subcosta close together, radius anterior 1 aligned with subcosta, with eight apical cells. Hind wing radius posterior and median veins fused at their bases, cubitus posterior and anal vein 1 unfused, and distal end of anal vein 3 curved, with six apical cells. Fore femora with primary and secondary spines oblique and parallel, and small, upright tertiary spine with wider base. Male operculum not covering tympanal cavity or encapsulating meracanthus curving towards abdominal midline, meracanthus tapering to a point. Abdominal segments begin tapering posteriorly at tergite 3, epipleurites reflexed to ventral surface, timbal cover absent, timbals extending below wing bases. Pygofer distal shoulder undeveloped, pygofer upper lobe absent, uncus absent, claspers developed, and male aedeagus large, hood-like lacking a strong basal recurve of the theca. Female unknown.

Malloryalna susanae n. sp.
(Fig. 10)

Type material. — **Holotype**. "FRENCH GUIANA / Réserve de la Trinité, zone Aya / N 4° 35' 20", O 53° 18' 1", Commune de / Saint Elie, 07-XI-2013 / Automatic Luminating trap / Soc. Ent. Antilles-Guyane leg." ♂ MNHN-EH-23000. **Paratypes**. "FRENCH GUIANA / Montagne des Chevaux, (forest on / quartzite), N 4°44'31.54" O 52°25'53.02" / altitude 90m, commune de Roura / 19-X-2013 / Automatic Luminating Trap with Gemlight / Soc. Ent. Antilles-Guyane leg." 1 ♂ (coll. AFSC); "FRENCH GUIANA / Montagne des Chevaux, (forest on / quartzite), N 4°44'31.54" O 52°25'53.02", altitude 90m, commune de Roura / 04-I-2014 / Automatic Luminating Trap with blue light / Soc. Ent. Antilles-Guyane leg." 1 ♂ (coll. AFSC).

Etymology. — The species is named in honor of my sister Susan Sills and mother of Mallory so they may always be together.

Measurements (mm). — N = 3 ♂ (range). Length of body: 19.98 (19.3-21.1); length of fore wing: 24.78 (24.4-25.4); width of fore wing: 8.4 (8.2-8.7); length of head: 3.43 (3.2-3.7); width of head including eyes: 6.95 (6.75-7.2); width of pronotum including supra-humeral plates: 6.68 (6.45-6.8); width of mesonotum: 6.13 (5.9-6.3).

Diagnosis. — The male genitalia are distinct from all known genera in the Americas and will promptly distinguish male specimens. The combination of generic characteristics outlined above can be used to distinguish the new species from any other currently known species from South America.

Distribution. — The species is known only from the type series collected in French Guiana.

Description of Male

General coloration

Ground color castaneous marked with black and ochraceous.

Head

Head wider than mesonotum, castaneous with ochraceous mark along posterior epicranial suture beginning between lateral ocelli and expanding laterally towards posterior head, dorsal surface ochraceous centrally in one paratype. Black supra-antennal plate, anterior margin of vertex, posterior margin of eye lateral to medial angle, black annulus around each ocellus, and black spots in anterior and posterior cranial depressions, spots around ocelli and cranial depressions fuse in one paratype. Ocelli rosaceous, tawny in one paratype, eyes greenish. Dorsal head with long golden pile posterior to eyes. Ventral head ground color, ochraceous in one paratype, except black lorum, black mark posterior to eye. Postclypeus centrally sulcate ventrally, dark castaneous on dorsal surface, except lighter areas on lateral junction with frons, apex and posterior ventral surface, middle third of ventral surface and ventral and posterior margins tawny, with ten transverse grooves. Tawny area expanded on ventral postclypeus in one paratype. Anteclypeus dark castaneous with tawny margin and mark on posterior midline, castaneous area black in one paratype. Long golden pile on lorum and lateral gena. Rostrum with castaneous with tawny proximolateral mentum, labium castaneous proximally becoming darker distally to piceous tip, reaching to between middle and hind coxae. Antennal segments castaneous except black annulus on distal pedicel.

Thorax

Dorsal thorax ground color, midline ochraceous anterior to paramedian fissure mark expanding laterally posterior to head. Curving black marks on either side of anterior ochraceous midline mark, extending along posterior head in one paratype, fusing with transverse, triangular black mark between medial ends of fissures extending posteriorly to posterior of pronotal collar, triangular mark reduced in one paratype. Pronotal collar with small ochraceous spot on anterior midline, black mark across dorsal collar, ochraceous laterally, lateral part of pronotal collar confluent with sclerites. Mesonotum ground color with black submedian sigillae and lateral sigillae, mark of lateral sigilla extends posteriorly to margin, scutal depression, mark on medial disc between medial sigillae, scutal depressions and anterior arms of cruciform elevation, black mark laterally between anterior and posterior arms of cruciform elevation, and black posterolateral cruciform elevation margin. Wing groove and small spot in middle of anterior arm of cruciform elevation ochraceous. Metanotum ground color, lightened in one paratype. Long golden pile between anterior arms of cruciform elevation, lateral cruciform elevation, along lateral mesonotum and wing groove. Ventral thoracic segments ochraceous medially, castaneous laterally, black spot on lateral epimeron 2. Ventral thorax covered with golden pile.

Wings

Fore wings and hind wings hyaline, fore wing with eight apical cells, hind wing with six apical cells. Venation ochraceous, becoming black distally, except black along anterior proximal costal margin, black spot on arculus, along anterior basal cell, anal vein 2 + 3, and black spot on wing base. Basal cell hyaline, pterostigma extending to distal fusion of subcostal vein and radius anterior 1, small spot of infuscation in proximal clavus, infuscation along proximal fifth of radius anterior 2 continuing across radial crossvein proximal radius posterior and radiomedial crossvein, infuscation along distal fifth of radius anterior 2 expanding posteriorly along ambient vein in apical cell 2 and anteriorly to radius anterior 1, basal membrane of fore wing grayish black. Hind wing venation ochraceous becoming black distally. Infuscation along distal anal cell 2. Anal cell 3 and anal cell 2 along anal veins 2 and 3 grayish-black.

Legs

Coxae and trochanters ochraceous, darker in fore leg. Legs castaneous with ochraceous distal femora and proximal tibiae. Fore femora with black stripe along spines, primary and secondary spines oblique and parallel, primary spine longest, and small, upright tertiary spine with wider base. Spines dark castaneous with black tips. Pretarsal claws castaneous with black tips. Tibial spurs and comb dark castaneous with piceous tips. Long golden pile on all segments from coxae to tibiae.

Operculum

Opercula ochraceous, black at base with black marking extending onto middle of opeculum, covered with long golden pile that also radiates from margin. Lateral margin straight, angled medially, smoothly curving to transverse posterior margin, rounded medial margin and concave anteriomedial margin parallel to posterior margin, not covering tympanal cavity. Medial margins not reaching medial abdominal sternite I. Meracanthus pointed, castaneous with ochraceous lateral margin and lighter spot at base, almost as wide as base of operculum reaching to anterior tympanal cavity.

Abdomen

Abdomen ground color, lighter on anterior margins. Sternites ochraceous anteriorly becoming tawny posteriorly, sternite VII large with notched, tranverse posterior margin, sternite VIII castaneous with lighter mark on anterior midline at base with notched, transverse posterior margin. Abdomen covered with golden pile, very dense on medial sternite I, very long pile on sternite VIII. Timbal with ten long ribs and nine intercalary ribs.

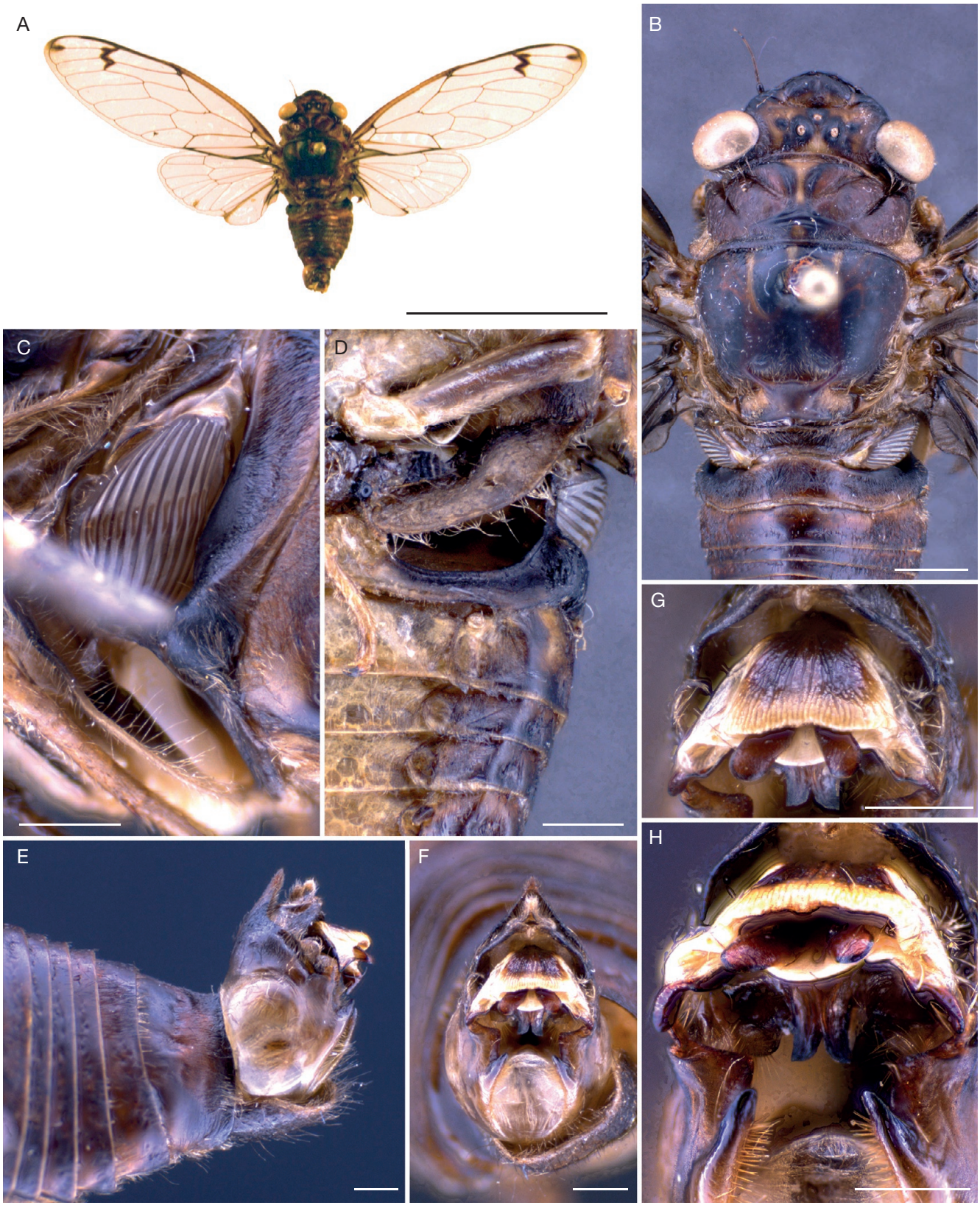

Fig. 10. — *Malloryalna susanae* n. gen., n. sp.: **A**, holotype ♂ habitus; **B**, holotype ♂ dorsum; **C**, holotype ♂ timbal; **D**, paratype ♂ operculum; **E**, holotype ♂ lateral view of genitalia; **F**, holotype ♂ posterior view of genitalia; **G**, holotype ♂ aedeagus; **H**, holotype ♂ claspers. Scale bars: A, 2 cm; B, 2 mm; C-H, 1 mm.

Genitalia

Male. Male pygofer ground color with ochraceous base and black spot on posterior margin between dorsal beak and pygofer upper lobe. Pygofer basal lobe pointed with black tip, upper pygofer lobe absent, distal shoulder undeveloped. Pygofer covered with long golden pile, more dense on posterior margin. Uncus lobes absent, claspers castaneous with slightly tapering base with rounded medial margin terminating in a small black point bent ventrolaterally. Aedeagus large, hood-like, castaneous with ochraceous posterior margin and black lateral margin. Conjunctival claws castaneous, curved laterad.
Female. Unknown.

DISCUSSION

Alpha species diversity for French Guiana is now 62 species, 17 genera, six tribes, and two subfamilies. The endemism within the French Guiana fauna has increased to 38.7% (24 species) with the new species described here. The specimens used in this study were the byproduct of a large-scale survey project to determine the insect fauna of the country. These efforts continue to collect new taxa and have been successful in expanding the known fauna for French Guiana which is significantly greater than both Surinam and Guyana (Sanborn 2011).

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REFERENCES

Berg C. 1879. — Hemiptera Argentina (Continuacion.) Hemiptera Homoptera Latr. *Anales de la Sociedad Cientifica Argentina* 8: 135-144.
Boulard M. 1996. — Postures de cymbalisation, cymbalisations et cartes d'identité acoustique des cigales. 2. Espèces forestières afro- et néotropicales (Cicadoidea, Cicadidae et Tibicinidae). *École pratique des Hautes Études, Travaux du laboratoire Biologie et évolution des insectes Hemipteroidea* 9: 113-158.
Boulard M. 1998. — Aperçu de cicadologie antillo-guyanaise. 123e Congrès national des sociétés historiques et scientifiques, Antilles-Guyane, 1998, *Histoire naturelle*: 75-94.
Boulard M. 2005. — Acoustic signals, diversity and behaviour of cicadas (Cicadidae, Hemiptera), *in* Drosopoulos S. & Claridge M. F. (eds), *Insect Sounds and Communication: Physiology, Behaviour, Ecology and Evolution*. CRC Press, Boca Raton: 331-349.
Boulard M. 2006. — Facultés acoustiques, éthologie sonore des cigales, entomophonateurs par excellence. École pratique des Hautes Études, *Travaux du Laboratoire Biologie et Évolution des Insectes Hemipteroidea* 16: 1-181.
Boulard M. & Martinelli N. M. 1996. — Révision des Fidicini, nouveau statut de la tribu, espèces connues et nouvelles espèces (Cicadomorpha, Cicadidae, Cicadinae). Première partie : Sous-tribu nouvelle des Fidicinina. École pratique des Hautes Études, *Travaux du laboratoire Biologie et évolution des insectes Hemipteroidea* 9: 11-81.
Boulard M. & Martinelli N. M. 2011. — Nouvelles cigales néotropicales de la sous-tribu des Guyalinina (Rhynchota, Cicadidae, Cicadinae, Fidicinini). *Lambillionea* 61: 219-232.
Delétang L. F. 1919. — Contribución al estudio de los Cicádidos (Cicadidae) argentinos (Hemiptera-Homoptera) ensayo filogenético. *Anales de la Sociedad Cientifica Argentina* 88: 25-94.
Distant W. L. 1883. — Rhynchota: Homoptera. *Biologia Centrali-Americana: contributions to the knowledge of the fauna and flora of Mexico and Central America* 1: 17-24.
Distant W. L. 1892. — On some undescribed *Cicadidae*, with synonymical notes. *Annals and Magazine of Natural History* (6) 10: 54-67.
Distant W. L. 1905. — Rhynchotal notes XXX. *Annals and Magazine of Natural History* (7) 15: 304-319.
Distant W. L. 1906a. — *A Synonymic Catalogue of Homoptera. Part I. Cicadidae*. Trustees of the British Museum, London. 207 p.
Distant W. L. 1906b. — Undescribed Cicadidae. *Annales de la Sociéte entomologique de Belgique* 50: 148-154.
Distant W. L. 1912. — Homoptera Fam. Cicadidae, Subfam. Cicadinae. *Genera Insectorum* 142: 1-64.
Duffels J. P. & van der Laan P. A. 1985. — *Catalogue of the Cicadoidea (Homoptera, Auchenorhyncha) 1956-1980*. Dr W. Junk Publishers, Series Entomologica 34, Dordrect, 414 p.
Fabricius J. C. 1787. — *Mantissa insectorum sistens species nuper detectas adiectis synonymis, observationibus, descriptionibus, emendationibus. Tom. II*. Impensis Christ. Gottl. Proft, Hafniae, 382 p.
Germar E. F. 1830. — Species Cicadarium enumeratae et sub genera distributae. *Thon's Entomologichen Archives* 2: 37-57.
Gmelin J. F. 1789. — *Caroli a Linné, Systema Naturae per regna tria naturae, secundum classes, ordines, genera, species cum characteribus, differentiis, synonymis, locis. Tom. 1, Pars IV.* Impensis Georg. Emanuel. Beer, Lipsiae: 1517-2224.
Henshaw S. B. 1903. — The Hemiptera described by Philip Reese Uhler. IV. *Psyche* 10: 224-238.
Humphreys G. S. 2005. — Variation in population density of cicadas (Hemiptera: Cicadidae) in the Sydney region: *Psaltoda moerens* (Germar), *Thopha saccata* (Fabricius) and the 'spreta' form of *Cyclochila australasiae* (Donovan). *Australian Entomologist* 32: 67-77.
Jacobi A. 1904. — Neue Cicadiden und Fulgoriden Brasiliens. *Sitzungsberichte der Gesellschaft naturforschender Freunde zu Berlin* 1904: 155-164.
Kirkaldy G. W. 1909. — Hemiptera, old and new, No. 2. *Canadian Entomologist* 41: 388-392.
Maes J.-M., Moulds M. & Sanborn A F. 2012. — Cicadidae (Homoptera) de Nicaragua: catálogo ilustrado, incluyendo especies exóticas del Museo Entomólogico de Léon. *Revista Nicaragüense Entomología* 72 (Suplemento 2): 1-138.
Martinelli N. M. & Zucchi R. A. 1997. — Sobre algumas espécies de *Fidicina* depositadas em coleções de instituições brasileiras. *XVI Congresso Brasileiro de Entomologia, 1997, Salvador. Anais do 16º Congresso Brasileiro de Entomologia* 16: 346-347.
Metcalf Z. P. 1963a. — General catalogue of the Homoptera, Fascicle VIII. Cicadoidea. Part 1. Cicadidae. Section I. Tibiceninae. *North Carolina State College Contribution* 1502: i-vii, 1-585.
Metcalf Z. P. 1963b. — General catalogue of the Homoptera, Fascicle VIII. Cicadoidea. Part 1. Cicadidae. Section II. Gaeninae and Cicadinae. *North Carolina State College Contribution* 1502: 587-919.
Metcalf Z. P. 1963c. — General catalogue of the Homoptera, Fascicle VIII. Cicadoidea. Part 2. Tibicinidae. *North Carolina State College Contribution* 1564: 1-492.

MOULDS M. S. 2003. — An appraisal of the cicadas of the genus *Abricta* Stål and allied genera (Hemiptera: Auchenorrhyncha: Cicadidae). *Records of the Australian Museum* 55: 245-304.
MOULDS M. S. 2005. — An appraisal of the higher classification of cicadas (Hemiptera: Cicadoidea) with special reference to the Australian fauna. *Records of the Australian Museum* 57: 375-446.
MOULDS M. S. 2012. — A review of the genera of Australian cicada (Hemiptera: Cicadoidea). *Zootaxa* 3287: 1-262.
OLIVIER G. A. 1790. — Cigale, *Cicada*. *Encyclopédie méthodique, Histoire naturelle, Insectes* 5: 735-760.
SALAZAR J. A. & SANBORN A. F. 2009. — Nota rectificativa sobre artículo. *Boletím Científico Centro de Museos Museo de Historia Natural* 13 (2): 270-271.
SALAZAR ESCOBAR J. A. 2005. — Algunos cicádidos de Colombia (Homptera: Cicadidae). *Boletín Científico, Centro de Museos, Museo de Historia Natural* 9: 192-204.
SANBORN A. F. 2005. — *Fidicina variegata*, a new cicada species from Costa Rica (Hemiptera: Cicadomorpha: Cicadidae). *Annals of the Entomological Society of America* 98: 187-190.
SANBORN A. F. 2007. — Additions to the cicada fauna of Venezuela with the description of a new species and checklist of the Venezuelan cicada fauna (Hemiptera: Cicadoidea: Cicadidae). *Zootaxa* 1503: 21-32.
SANBORN A. F. 2010. — The cicadas of Colombia including new records and the description of a new species (Hemiptera: Cicadidae). *Journal of Natural History* 44: 1577-1607.
SANBORN A. F. 2011. — Checklist of the cicadas of French Guiana including new records and the description of nine new species (Insecta, Hemiptera, Cicadoidea, Cicadidae). *Zoosystema* 33 (3): 377-418. http://dx.doi.org/10.5252/z2011n3a6
SANBORN A. F. 2013. — *Catalogue of the Cicadoidea (Hemiptera: Cicadoidea). With Contributions to the Bibliography by Martin H. Villet*. Elsevier/Academic Press, San Diego, 1001 p.
SANBORN A. F. 2014. — Checklist of the cicadas (Insecta: Hemiptera: Cicadidae) of Costa Rica including new records for fourteen species. *Check List* 10: 246-252.
SANBORN A. F. & HEATH M. S. 2014. — The cicadas of Argentina with new records, a new genus and fifteen new species (Hemiptera: Cicadoidea: Cicadidae). *Zootaxa* 3883: 1-94, http://dx.doi.org/10.11646/zootaxa.3883.1.1
SANBORN A. F. & MAES J.-M. 2012. — Checklist of the cicadas (Insecta: Hemiptera: Cicadidae) of Nicaragua including new records for seventeen species. *Check List* 8: 437-442.
SANBORN, A. F., MOORE T. E. & YOUNG A. M. 2008. — Two new cicada species from Costa Rica (Hemiptera: Cicadomorpha: Cicadidae) with a key to *Fidicinoides* in Costa Rica. *Zootaxa* 1846: 1-20.
SANTOS R. S., MARTINELLI N. M., MACCAGNAN D. H. B., SANBORN A. F. & RIBEIRO R. 2010. — Description of a new cicada species associated with the coffee plant and an identification key to the species of *Fidicinoides* (Hemiptera: Cicadidae) from Brazil. *Zootaxa* 2602: 48-56.
STÅL C. 1866a. — Analecta Hemipterologica. *Berliner Entomologischer Zeitschrift* 10: 151-172.
STÅL C. 1866b. — Hemiptera Homoptera Latr. *Hemiptera Africana* 4: 1-276, plate 1.
THOUVENOT M. 2011. — Quelques nouvelles des cigales de Guyane (Homoptera Cicadoidea). *L'Entomologiste* 67: 25-27.
THOUVENOT M. 2012. — Une sixième *Taphura* de Guyane française (Homoptera Tibicinidae). *L'Entomologiste* 68: 313-315.
UHLER P. R. 1903. — Enumeration of the Cicadidae of Brazil in the collection of Mr. Herbert H. Smith. *Transactions of the Maryland Academy of Sciences* 2: 1-17.
WALKER F. 1850. — *List of the Specimens of Homopterous Insects in the Collection of the British Museum*. British Museum Trustees, London, 260 p.
WALKER F. 1852. — Supplement. *List of the Specimens of Homopterous insects in the collection of the British Museum* 4: 1119-1188.
YOUNG A. M. 1977. — Notes on the faunistic complexity of cicadas (Homoptera: Cicadidae) in Northern Costa Rica. *Revista de Biologica Tropical* 24: 267-279.
YOUNG A. M. 1980a. — Observations on the aggregation of adult cicadas (Homoptera: Cicadidae) in tropical forests. *Canadian Journal of Zoology* 58: 711-722.
YOUNG A. M. 1980b. — Environmental partitioning in lowland tropical rain forest cicadas. *Journal of the New York Entomological Society* 88: 86-101.
YOUNG A. M. 1981a. — Temporal selection for communicatory optimization: The dawn-chorus as an adaptation in tropical cicadas. *American Naturalist* 117: 826-829.
YOUNG A. M. 1981b. — Notes on seasonality and habitat associations of tropical cicadas (Homoptera: Cicadidae) in premontane and montane tropical moist forest in Costa Rica. *Journal of the New York Entomological Society* 89: 123-142.
YOUNG A. M. 1983. — Ecological studies of tropical cicadas. *Field Museum of Natural History Bulletin* 54: 20-25.
YOUNG A. M. 1984. — On the evolution of cicada × host-tree associations in Central America. *Acta Biotheoretica* 33: 163-198.

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