

## A review of the Neotropical sharpshooter genus *Onega* Distant, 1908 (Hemiptera: Cicadellidae: Cicadellini)

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### Abstract

*Tettigonia sanguinicornis* Latreille, 1811, and its junior synonym *Tettigonia farinaria* Amyot & Serville, 1843, are herein transferred to the genus *Onega* Distant, 1908. Thus, the previously *incertae sedis* genus *Paragonalia* Evans, 1947 (type-species: *T. sanguinicornis*), becomes a new junior synonym of *Onega*. *Onega sanguinicornis* **comb. nov.** is redescribed and its female genitalia are described and illustrated for the first time. A color variant of *Onega fassli* Young, 1977 is described. Three new species of *Onega* are described and illustrated: *O. freytagi* **sp. nov.** from Colombia (Cauca Department), *O. krameri* **sp. nov.** from Ecuador (Azuay and Bolívar provinces), and *O. orphne* **sp. nov.** from Ecuador (Bolívar and Pichincha provinces). A key to all nine species now included in *Onega* is provided along with notes on the distribution of the species. *O. bracteata* Young, 1977 is newly recorded from Azuay province (Ecuador) and Junín and Pasco departments (Peru), and *O. fassli* is newly recorded from Ecuador (Napo Province) and Cundimarca Department (Colombia). Records of *Onega* from Cuba are considered doubtful.

**Key words:** Hemiptera, Cicadellidae, *Onega*, Neotropical, review, new species

### Introduction

The genus *Onega* Distant, 1908 was described based on the type-species, *O. avella* Distant, 1908, and also *O. stella* Distant, 1908, which share the presence of concavities on the vertex and frons, a swollen mesoscutellum, and reticulate claval venation (Distant 1908: 528). Later, Young (1977) included in this genus *Tettigonia stipata* Walker, 1851, and described two new species, *O. bracteata* Young, 1977 and *O. fassli* Young, 1977. With this composition, the genus *Onega* was restricted to the Andean-Amazonian countries Bolivia, Colombia, Ecuador, and Peru.

*Onega* is closely related to *Paromenia* Young, 1977, being apparently derived from within it, making the latter paraphyletic (Cavichioli 1992). It is included in the *Paromenia* genus group, currently composed of 13 genera (Young 1977, Cavichioli 1996). Surprisingly, females of *Onega* species described herein (*O. krameri* **sp. nov.**, *O. orphne* **sp. nov.**, and *O. sanguinicornis* Young) and *O. bracteata* Young (Cavichioli & Wyler 1992) do not have a strongly concave ventral margin of the second ovipositor valvulae, an apparently apomorphic trait shared by several genera of the *Paromenia* genus group (Young 1977, Cavichioli 1992), such as *Albiniana* Cavichioli, *Alocha* Melichar (Cavichioli 1996), *Tacora* Melichar (Takiya & Mejdalani 2002), and *Paromenia* itself (Young 1977).

*Paragonalia* Evans, 1947 was proposed as a new name for *Paragonia* Melichar, 1926, which was established by Melichar (1926) in his key to 101 genera of Cicadellaria ( $\approx$  Cicadellini) (Evans 1947). Because of Melichar's death, this and 54 other genera were left without original descriptions or assignments of type-species. China (1938) subsequently studied Melichar's unpublished manuscripts and assigned type-species to Melichar's genera, including *Tettigonia sanguinicornis* Latreille, 1811 as the type-species of *Paragonalia*. *Tettigonia sanguinicornis* was described based on material from Cuba (Valley of Güines) and was later considered a senior synonym of *Tettigonia farinaria* Amyot & Serville, 1843 (of unknown locality) by Signoret (1853). It was only in Young's (1977, 1986) revision of the tribe Cicadellini that many of Melichar's cicadelline genera were formally described, synonymized, or transferred to other tribes. Although, Young (1968, 1977) never examined any type-specimen of species described by the French workers Pierre André Latreille, Charles Jean Baptiste Amyot, and Jean Guillaume Audinet-Serville, he was able to establish identities for most of their species through comparisons with material determined by other workers, such as Leopold Melichar and Victor Signoret. However, at the time of his revision, Young (1977: 1098) did not study any specimen determined as *T. sanguinicornis* or *T. farinaria*, and therefore treated this species and the genus *Paragonalia* Evans as *incertae sedis*. A recent visit to the Signoret collection at the Naturhistorisches Museum in Vienna (NHMW) led to the discovery of a single female specimen, labeled from Cuba and determined by Signoret as *Tettigonia farinaria*. This specimen is in agreement with the original description of this species by Amyot & Serville (1843: 570, plate 10, figure 11) and the redescription of *T. sanguinicornis* by Signoret (1853: 371, plate 12, figure 12). This species, along with its senior synonym *Tettigonia sanguinicornis*, are herein transferred to the genus *Onega*; thus *Paragonalia* becomes a junior synonym of *Onega*.

The external morphology and female genitalia of *Onega sanguinicornis* **comb. nov.**, based on the above NHMW specimen, is herein described and illustrated. In addition, one new species of *Onega* from Colombia and Ecuador and two new species from Ecuador are described. A description of a color variant of *Onega fassli* is given. A diagnosis of the genus *Onega*, including new characters from the female genitalia, and a key to all nine species included, are presented. Notes on the distribution of *Onega* are provided along with new country and departmental or provincial records.

## Materials and methods

Morphological terminology follows mainly Young (1968, 1977), but terminology for the head structures follows Hamilton (1981), and that for the female genitalia follows Nielson (1965), with the exception of the third valvulae, which are treated herein as the gonoplares as suggested by Mejdalani (1998). Techniques for preparation of genital structures follow those of Oman (1949). The dissected parts are stored in microvials with glycerin and pinned below the specimen. In quotations of label data, a reversed virgule (\) separates lines on a label.

The specimens studied are deposited in the following collections: Coleção Entomológica Pe. Jesus Santiago Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba (DZUP); Departamento de Zoologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro (DZRJ); Zoologische Abteilung, Naturhistorisches Museum Wien, Vienna (NHMW); Department of Entomology, The Natural History Museum, London (BMNH); Illinois Natural History Survey, Champaign (INHS); Insect Collection, Ohio State University, Columbus (OSU); Entomological Research Collection, University of Kentucky, Lexington (UKL); Department of Entomology, North Carolina State University, Raleigh (NCSU); Carnegie Museum of Natural History, Pittsburgh (CMNH); American Museum of Natural History, New York (AMNH); National Museum of Natural History, Smithsonian Institution, Washington D.C. (USNM); and Los Angeles County Museum of Natural History, Los Angeles (LACM).

## Genus *Onega* Distant

*Onega* Distant, 1908: 528. Type species: *Onega avella* Distant, by original designation.

*Paragonia* Melichar, 1926: 342. Type species: *Tettigonia sanguinicollis* Latreille, by subsequent designation of China, 1938: 183 (preoccupied).

*Paragonalia* Evans, 1947: 163 (new name for *Paragonia* Melichar). **New synonym.**

**Diagnosis.** Large cicadelline sharpshooters ranging in length from 12.4–16.8 mm; crown-frons transition with transverse carina; apex of crown and superior portion of frons with concavities; pronotum much wider than transocular width of head with lateral margins convergent anteriorly; scutellum swollen; male paraphysis, when present, a median sclerite; second valvulae of ovipositor with ventral margin rectilinear and teeth noncontiguous.

**Female genitalia.** Internal abdominal sternite VIII forming simple membranous plate. Pygofer (Figs 3G, 4I, 5C) with apex narrowly round. First valvulae (Fig. 3F, 4H) of ovipositor with base in ventral view with short lateral external projection connecting to valvifers; inner side with lobed evagination. Second valvulae of ovipositor (Fig. 5D) in lateral view regularly broadened along apical 3/4 beyond basal curvature, ventral margin rectilinear; blade bearing 43–45 noncontiguous teeth, each tooth (Fig. 5F) subtriangular, irregu-

larly emarginated, and declivous posteriorly; preapical area of blade with denticles more conspicuous on ventral area; apex (Fig. 5F) round.

### Species included in *Onega*

- avella* Distant, 1908: 528. ECUADOR: Napo Province and PARAGUAY (**new record**).
- bracteata* Young, 1977: 286. BOLIVIA; COLOMBIA: Boyacá and Valle del Cauca departments; ECUADOR: Azuay Province (**new record**); and PERU: Cuzco, Huánuco, Junín (**new record**), Lima, and Pasco (**new record**) departments.
- fassli* Young, 1977: 289. COLOMBIA: Cundimarca (**new record**) and Santander departments; ECUADOR (**new record**): Napo Province; and PARAGUAY (**new record**).
- freytagi* **sp. nov.** COLOMBIA: Cauca Department and ECUADOR: Carchi Province.
- krameri* **sp. nov.** ECUADOR: Azuay, Bolívar, and Pichincha provinces.
- orphne* **sp. nov.** ECUADOR: Bolívar and Pichincha provinces.
- sanguinicollis* (Latreille), 1811: 191 (*Tettigonia*). **New combination.** Cuba [?]
- farinaria* (Amyot & Serville), 1843: 570 (*Tettigonia*). Synonymy *vide* Signoret (1853).
- stella* Distant, 1908: 529. ECUADOR: Napo Province.
- stipata* (Walker), 1851: 749. ECUADOR: Pichincha Province.

### Distribution of *Onega*

Previous and present geographic records for the genus are predominantly from rainforests along the Andes. The new records from Paraguay (for *O. avella* and *O. fassli*), based on old repinned material (BMNH) collected by G. Morewood, are (if reliable) of interest, as eastern Paraguay is dominated by subtropical deciduous forest and dry forests.

Also of interest is the distribution of *O. sanguinicollis*. The records of this species from Cuba are from its original description and from the single female specimen, noted above, studied by Signoret (1853). In subsequent literature this species is recorded from Surinam by Stoll (1788 *apud* Metcalf 1965), from Colombia and Cuba by China (1938) (based on Melichar's manuscript), and from Colombia by Evans (1947). However, it seems unlikely that these authors actually saw specimens of this species. On the other hand, *Onega* has never been subsequently recorded from Cuba or any Caribbean island, even though many sharpshooters were studied from Cuba in recent times (Dlabola & Novoa 1976, Young 1977, Novoa & Alayo 1985, 1986, 1987, Alayo & Novoa 1986, 1987, Hidalgo-Gato *et al.* 1999). Of the sixteen genera of Cicadellini recorded from the West Indies (excluding Trinidad and Tobago), there is no other sharpshooter genus distributed only in the Caribbean islands and South America (Table 1). There is also no recent Fulgoroidea, Cicadoidea, Cercopoidea, and Membracidae genus or species with this distributional pattern (Ramos 1988, excluding erroneous records of *Spinodarnoides* Funkhouser

from Guyana and *Phormophora* Stål from Jamaica noted by McKamey 1998, Bartlett 2000, excluding doubtful records of flatid *Petrusa epilepsis* (Kirkaldy) from South America, C. Bartlett *in litt.*). A Caribbean-South American distribution is only exemplified by the evacanthine leafhopper genus *Jassoqualus* Kramer, of which a fossil species was described from Dominican amber, while the recent species occurs in Brazil (Dietrich & Vega 1995, Dietrich 2004).

**TABLE 1.** Number of species of Cicadellini genera occurring in Caribbean islands distributed in different regions of the New World: WI= West Indies (except of Trinidad and Tobago), NA= North America (including Mexico), CA= Central America, and SA= South America. Based on Dlabola & Novoa (1976), Young (1977), Dietrich (1994), Nielson & Godoy (1995), and Cavichioli (2004).

New World regions	WI	NA	CA	SA	WI	NA	CA	WI	NA	WI
					+NA	+CA	+SA	+CA	+CA	+NA
Genera								+SA	+SA	+CA
<i>Apogonalia</i> Evans	6	5	1			6				
<i>Bubacua</i> Young	1									
<i>Camaija</i> Young	4									
<i>Caribovia</i> Young	7									
<i>Cibra</i> Young	1									
<i>Ciminius</i> Metcalf & Bruner		3		3				1		
<i>Cubrasa</i> Young	1									
<i>Draeculacephala</i> Ball		18		3	2				2	
<i>Ehagua</i> Melichar	2									
<i>Hadria</i> Metcalf & Bruner	18									
<i>Hortensia</i> Metcalf & Bruner				1			1			1
<i>Macugonalia</i> Young	1			25		1	1			
<i>Plesiommata</i> Provancher		3		1					1	1
<i>Sibovia</i> China	1	6	5	12		4				1
<i>Tylozygus</i> Fieber		1	2							2
<i>Xyphon</i> Hamilton	2	7	1							

Based on the above information, it seems improbable that *Onega* occurs on Caribbean islands and that the specimen of *O. sanguinicollis* from the Signoret collection is mislabeled. Several specimens from the Signoret collection are believed to bear labels with erroneous localities (see Takiya & Mejdalani 2004). Although, the type-locality of *O. sanguinicollis* as stated by Latreille (1811) is also Cuba, in a short introduction to this work, Alexander von Humboldt stated that the material described there was collected by the botanist Aimé Bonpland during their Amazonian trip along the rivers Orinoco, Casiquiare, and Negro (bordering Brazil, Colombia, and Venezuela).

Key to species of *Onega*

- 1) Forewings without supernumerary crossveins ..... 2
- 1') Forewings with supernumerary crossveins on corium and clavus ..... 3
- 2) Crown-frons transition with carina only on median portion, not continuous with carina on antennal ledges; forewings light brown maculate with translucent white (Fig. 1D); male pygofer with posterior margin forming a lobe bearing short stout macrosetae (Fig. 2A); subgenital plates much shorter than pygofer (Fig. 2A); aedeagus with single apical process (Fig. 2D); female unknown..... *O. freytagi* **sp. nov.**
- 2') Crown-frons transition with carina complete, continuous with carina on antennal ledges; forewings translucent yellow with few small lighter yellow spots at base (Fig. 1B); male pygofer without setigerous lobe (Young 1977: Fig. 232c); subgenital plates extending posteriorly beyond pygofer apex (Young 1977: Fig. 232c); aedeagus with pair of apical processes (Young 1977: Figs 232f, p); female sternite VII with very elongate lateral margins (Cavichioli & Wyler 1992: Fig. 4)..... *O. bracteata* Young
- 3) Forewings mostly dark with large unpigmented oblique area on basal half of clavus (usually covered with brochosomes) (Figs 1F, G) ..... 4
- 3') Forewings variably colored, but without large unpigmented area on basal half of clavus (Figs 1A, C, E, H) ..... 5
- 4) Females smaller, 12.3–13.3 mm; forewings dark brown to black (Fig. 1F); male pygofer with apical margin serrate (Fig. 4A); aedeagus with dorsal robust elongate process extending from base posteriorly beyond apex of shaft (Fig. 4D); female sternite VII with posterior margin broadly round and without median projection (Fig. 4G); female pygofer with macrosetae along most of posteroventral margin (Fig. 4I) ..... *O. orphne* **sp. nov.**
- 4') Females larger, approximately 14.9 mm; forewings dark red (Fig. 1G); male unknown; female sternite VII with small median projection on posterior margin (Fig. 5A); female pygofer with few macrosetae restricted to dorsal anteapical region (Fig. 5C) ... *O. sanguinicollis* Latreille
- 5) Forewings with costal margin bordered with red and clavus never red (Figs 1C, E); males with paraphysis present as median sclerite (Fig. 3D, Young 1977: Fig. 233f); female sternite VII abruptly narrowed on apical portion (Fig. 3E, Young 1977: Fig. 233i) ..... 6
- 5') Forewings with costal margin usually not bordered with red (Figs 1A, H), if costal margin is red then clavus is red; males without paraphysis (Young 1977: Figs 234f, 235f, 236f); female sternite not abruptly narrowed distally (female of *O. stella* unknown) (Young 1977: Figs 234i, 235i) ..... 7
- 6) Forewings with small translucent white speckles (Fig. 1F); male pygofer with apex broadly round (Fig. 3A); aedeagus without dorsal elongate process (Fig. 3D) ..... *O. krameri* **sp. nov.**
- 6') Forewings without speckles (Fig. 1C); male pygofer with apex modified into a narrow

- lobe extending posterodorsally (Young 1977: Fig. 233c); aedeagus with dorsal elongate process arising near base, extending posteriorly almost to apex of median ventral process (Young 1977: Fig. 233f)..... *O. fassli* Young
- 7) Male pygofer produced apically into an acute process (Young 1977: Figs 235c, p, 236c); styles with apex broadened and foot-shaped (Young 1977: Figs 235e, 236e)... 8
- 7') Male pygofer with apex broadly round (Young 1977: Fig. 234c); styles with apex round, not foot-shaped (Young 1977: Fig. 234e)..... *O. stipata* (Walker)
- 8) Forewings with broad black subcostal stripe extending from near base to just beyond middle (Fig. 1A); claval crossveins limited posteriorly and laterally by outer claval vein ..... *O. avella* Distant
- 8') Forewings without black subcostal stripe; claval crossveins occurring more extensively ..... *O. stella* Distant

### *Onega fassli* Young

(Fig. 1C)

**Notes.** The color pattern of Colombian material of this species (Fig. 1C) is considerably different from that originally described and from other specimens from Ecuador and Paraguay studied herein (which agree well with the description). In these Colombian specimens, the crown and pronotum are mostly bright red with small irregular tan areas, instead of mostly tan with red markings (as originally described) and forewings with large dark brown stripe along the commissural margin of clavus and more extensive red apical area extending onto apical and most of anteapical cells (Fig. 1C). All specimens however, have indistinguishable male and female genitalia from those described and illustrated in the original description (Young 1977: 289).

**Material examined.** Male and female, "COLOMBIA, Cundimarca Dpt. \ Carpanta Res. 45.8 km E. Bogotá \ X=998.850, Y=1°045.750, BL trap \ 16.Aug.1988, E. A. Lisowski", INHS (**new departamental record**); female, "ECUADOR: Napo Prov. \ Santa Barbara \ Cerro Mirador \ elev. 2800 meters \ 10 April 1986 \ Stuart McKamey", LACM (**new country record**); male and female, "Paraguay \ Sapucay \ G. Morewood. \ 1919-76", BMNH (**new country record**).

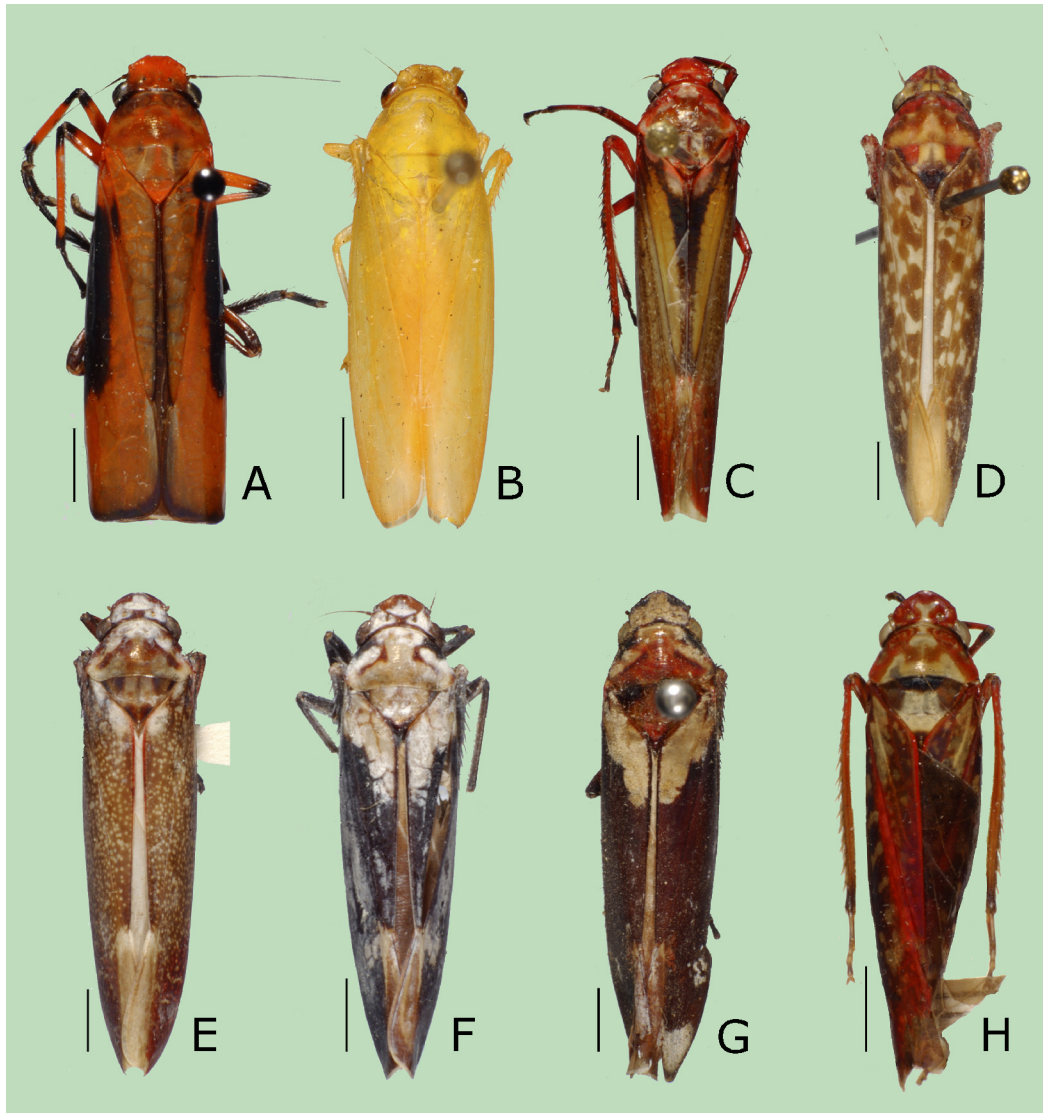
### *Onega freytagi* sp. nov.

(Figs 1D, 2)

**Length.** male 14.4–14.8 mm.

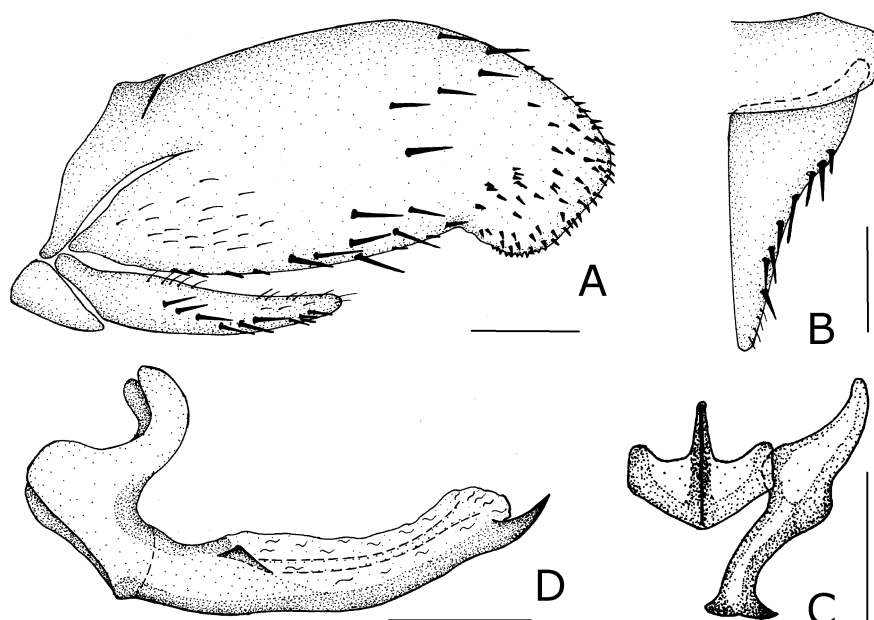
**External morphology.** Crown (Fig. 1D) with median length 6/10 interocular and slightly less than 4/10 transocular width; apical and lateral concave areas on crown not confluent. Frons mostly concave. Pronotum (Fig. 1D) with posterior margin slightly con-

cave. Forewings (Fig. 1D) translucent with membrane extending over first, second, and third apical cells, and apex of inner anteapical cell; venation distinct; without anteapical plexus of veins. Hindlegs with femoral setal formula 2:1:1; first tarsomeres with length approximately equal to combined length of distal ones. Other external characters as in generic description (Young 1977: 285).



**FIGURE 1.** Dorsal habitus of species of *Onega* Distant. (A) *O. avella* Distant, male, LACM; (B) *O. bracteata* Young, male, DZRJ; (C) *O. fassli* Young, male, INHS; (D) *O. freytagi* **sp. nov.**, male holotype, UKL; (E) *O. krameri* **sp. nov.**, male holotype, USNM; (F) *O. orphne* **sp. nov.**, male holotype, USNM; (G) *O. sanguinicollis* (Latreille) **comb. nov.**, female, NHMW; (H) *O. stipata* (Walker), male, OSU. Scale bar = 2.0 mm.

**Male genitalia.** Pygofer (Fig. 2A) strongly produced; without processes; posterior margin forming an apical lobe with ventral portion serrate; few microsetae on basiventral region; few regular macrosetae on posterior portion, but over apical lobe these more numerous and differentiated into very short and stout. Subgenital plates (Figs 2A, B) attaining roughly midlength of pygofer; not fused basally; with uniseriate macrosetae. Styles (Fig. 2C) extending posteriorly beyond apex of connective; apex broad and foot-shaped. Connective (Fig. 2C) approximately V-shaped; dorsal keel strong, elongate, extending anteriorly. Aedeagus (Fig. 2D) with shaft elongate; short lateral flanges on basal portion; dorsal region of shaft membranous; ventral region forming single short apical process extending posteriorly beyond gonopore; basal apodemes sclerotized. Paraphysis absent.



**FIGURE 2.** Male genitalia of *Onega freytagi* sp. nov. (A) Pygofer, valve, and subgenital plate, lateral view. (B) Valve and subgenital plate, ventral view. (C) Connective and style, dorsal view. (D) Aedeagus, lateral view. Scale bar = 0.5 mm.

**Female genitalia.** Females unknown.

**Coloration.** Crown (Fig. 1D) pale yellow; pair of large red semicircular areas on apical portion over muscle scars, this pair connected by thin line over apical margin, apical portion of antennal ledges, median line, and external lateral areas of ocelli, brown. Face red; apical margin of clypeus and most of genae and lora brown; antennae pale yellow. Pronotum with anterior fourth red except median portion; this and posterior 3/4 irregularly pale yellow and light brown. Mesonotum with scutum pale yellow, lateral angles red; scutellum dark brown. Forewings mostly light brown, with several irregular translucent

white spots; base and costal margin red. Hindwings white. Thoracic pleura and legs mostly red.

**Notes.** *Onega freytagi* **sp. nov.** shares with other *Onega* species, e.g., *O. avella* Distant and *O. krameri* **sp. nov.**, the foot-shaped apex of the styles (Fig. 2C) and the single ventral aedeagal process (Fig. 2D); but it can be easily distinguished from other *Onega* species by its unique male pygofer with apical lobe and differentiated macrosetae (Fig. 2A).

**Etymology.** This species is named in honor of Dr. Paul H. Freytag (University of Kentucky at Lexington, retired) in recognition of his numerous contributions to leafhopper taxonomy. Dr. Freytag made available the holotype of this species and many other Colombian leafhoppers for study.

**Habitat.** Montane rainforest.

**Material examined.** Holotype: male, "COLOMBIA Dept. Cauca \ Cerro de Munchique \ Altitude 2450m Lower \ Montane Rain Forest", "Flight trap \ R. Wilkerson \ I-16-76-9", UKL. Paratype: male, "ECUADOR: Carchi. 35km \ W Tufino, west slope \ 3120 m. 20 Nov 1987 \ R. Davidson, C. Young \ Cloud forest.", CMNH.

***Onega krameri* sp. nov.**

(Figs 1E, 3)

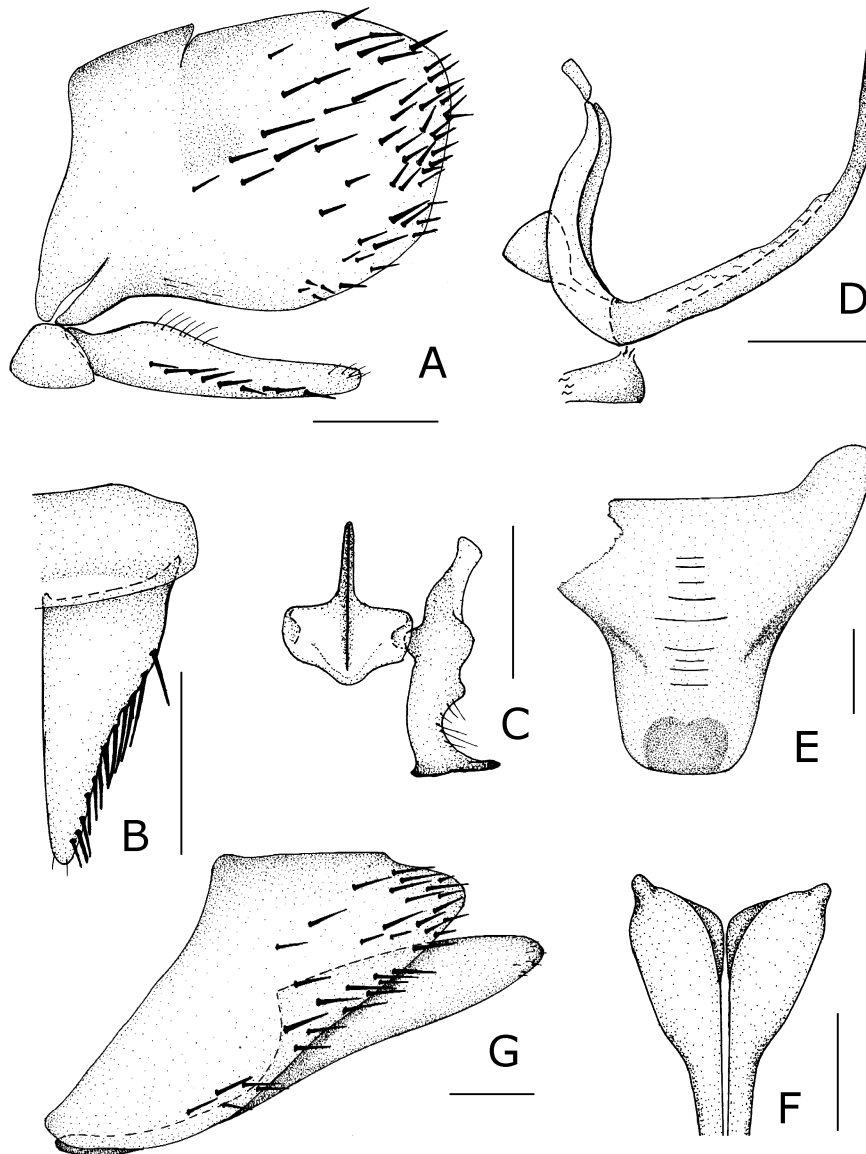
**Length.** males 13.1–15.0 mm and female 15.2 mm.

**External morphology.** Crown (Fig. 1E) with median length 5/10 interocular and slightly less than 4/10 transocular width; apical and lateral concave areas on crown not confluent in males, but confluent in female. Frons mostly flattened, concave only on superior portion. Pronotum (Fig. 1E) with posterior margin straight to very slightly concave. Forewings (Fig. 1E) translucent with membrane extending only over first apical cell; venation distinct; most of corium with plexus of veins, this absent on apical, brachial, and costal cells; clavus with crossveins between claval veins. Hindlegs with femoral setal formula 2:1:1; first tarsomeres with length approximately equal to combined length of distal ones. Other external characters as in generic description (Young 1977: 285).

**Male genitalia.** Pygofer (Fig. 3A) moderately produced; without processes; few microsetae on basiventral region; macrosetae dispersed throughout posterior 2/3. Subgenital plates (Figs 3A, B) extending nearly to apex of pygofer; not fused basally; with uniseriate macrosetae. Styles (Fig. 3C) extending posteriorly beyond apex of connective; apex broad and foot-shaped. Connective (Fig. 3C) subrectangular; posterior margin with median convexity; dorsal keel strong, elongate, extending anteriorly. Aedeagus (Fig. 3D) with shaft elongate and slender; dorsal region membranous; ventral region forming single elongate apical process, extending posteriorly beyond gonopore; basal apodemes sclerotized. Paraphysis (Fig. 3D) present as a median sclerite.

**Female genitalia.** Sternite VII (Fig. 3E) well produced posteriorly as a broad truncate lobe; abruptly narrowed on apical half; disc with fine transverse striations. Pygofer (Fig.

3G) with numerous macrosetae distributed along posteroventral margin. Gonoplags (Fig. 3G) with apex broadly round. Second valvulae of ovipositor (similar to Fig. 5D) bearing 43 noncontiguous teeth; ventral prominence absent. Other invariant generic characters as described above.



**FIGURE 3.** Genitalia of *Onega krameri* sp. nov. Figures 3A–D, Male genitalia. (A) Pygofer, valve, and subgenital plate, lateral view. (B) Valve and subgenital plate, ventral view. (C) Connective and style, dorsal view. (D) Aedeagus and paraphysis, lateral view. (E–G) Female genitalia. (E) Sternite VII, ventral view. (F) Bases of first valvulae of ovipositor, ventral view. (G) Pygofer and gonoplac, lateral view. Scale bar = 0.5 mm.

**Coloration.** Crown, pronotum, and mesonotum (Fig. 1E) tan; pair of large red semi-circular areas on apical portion over muscle scars connected by thin line over apical margin, posterior margin of crown, anterolateral margins of pronotum, irregular large median area of pronotum, and mesoscutellum, red to dark brown (holotype also with anterolateral angles of mesoscutum dark brown); posterior margin of crown behind eyes, short portion of anterolateral margin of mesoscutum, and apical margins of mesoscutellum dark brown to black. Frons and clypeus red; apical portion of clypeus black. Genae, lora, and antennae mostly tan with some irregular brown regions. Forewings (Fig. 1E) mostly light brown with numerous tiny translucent white spots, these sometimes connected; claval commissural margin, costal margin, and large apical area covering apical (except first) and antepical cells, bright red. Hindwings white. Thoracic pleura either tan or red; ventral portion of mesosternum black. Legs tan to red; femur-tibia joints, apices of front- and midtibiae, dorsal portion of hindfemora, most of hindtibiae, and tarsi, dark brown to black.

**Notes.** *Onega krameri* sp. nov. (Fig. 1E) is similar in general coloration to *O. fassli* Young (Fig. 1C), especially to specimens with typical color pattern (see notes on the latter species above). Both species have tan to light brown forewings with red covering the base, costal margin, and apex; but *O. krameri* can be easily separated by the small white spots covering most of its forewings.

**Etymology.** This species is named in honor of the late Dr. James P. Kramer (United States National Museum) for his contributions to leafhopper taxonomy. The holotype of *O. krameri* sp. nov. was previously studied by Dr. Kramer, who labeled it with “*Onega psaros* n. sp.” probably because of its speckled forewing coloration.

**Habitat.** Occurring on montane rainforests above 1,900 m, reaching *Polylepis* Ruiz et Pav. (Rosaceae) forests (=Yacutuviana in El Cajas National Park).

**Material examined.** Holotype: male, “ECUADOR. Bolivar \ Guaranda (23km NE) \ elev. 7400 ft. [2,255 m] \ 20 June 1975 \ Langley and Cohen”, “Ecuador-Peace-Corps- \ Smithsonian Institution \ Aquatic Insect Survey”, USNM. Paratypes: male “ECUADOR: \ Cuenca [Azuay Province] \ [Parque Nacional] El Cajas \ Yacutuviana”, “ix.1983 – 2400m \ R. Hadfield \ B.M. 1984-24”, BMNH; male, “ECUADOR: Pichincha \ 26km WNW Machachi \ 1900m. 12 nov 1987”, “J. Rawlins, C. Young \ R. Davidson. Humid \ primary forest”, CMNH; female, “ECUADOR \ Cuenca [Azuay Province] \ [Parque Nacional] El Cajas \ Angus [?]”, “viii.1983 \ R. Hadfield \ B.M. 1984-24”, BMNH.

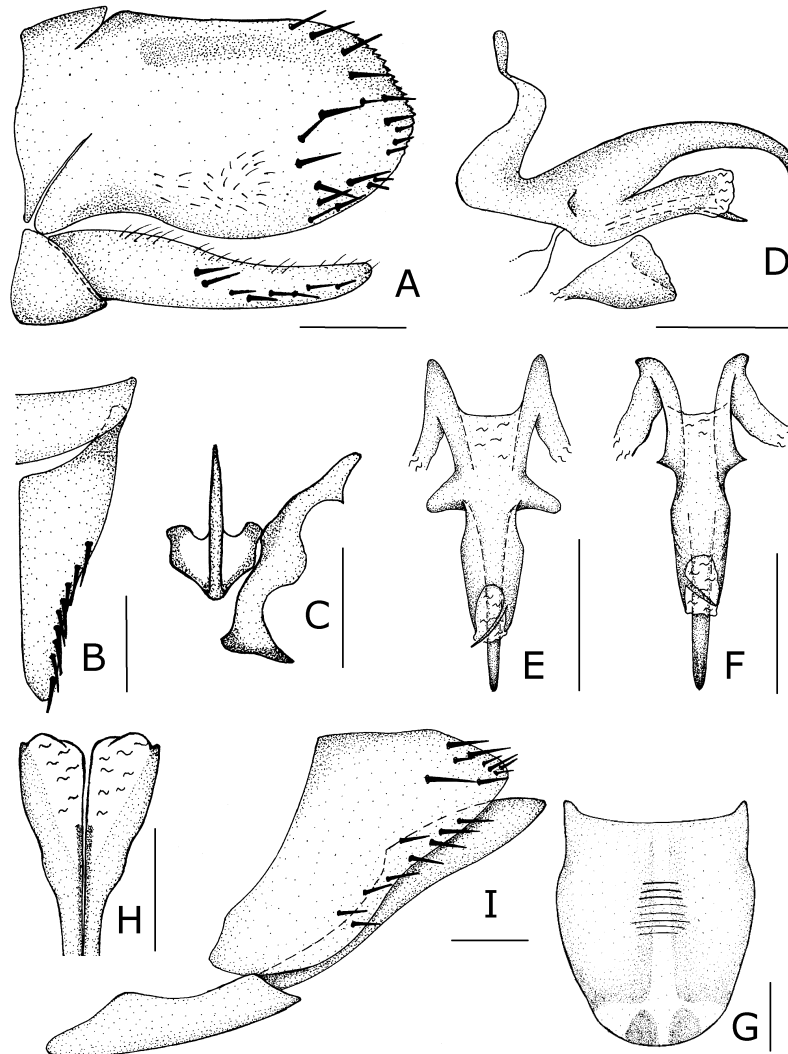
***Onega orphne* sp. nov.**

(Figs 1F, 4)

**Length.** males 12.4–12.9 mm and females 12.7–13.3 mm.

**External morphology.** Crown (Fig. 1F) with median length slightly more than 6/10 interocular and 4/10 transocular width; apical and lateral concave areas on crown not confluent. Frons mostly concave. Pronotum (Fig. 1F) with posterior margin very slightly con-

cave. Forewings (Fig. 1F) mostly opaque; membrane extending only over first apical cell; most of corium with plexus of veins, this absent on apical and brachial cells; clavus with crossveins between claval veins and between inner claval and claval margin. Hindlegs with femoral setal formula 2:1:1; first tarsomeres with length approximately equal to combined length of distal ones. Other external characters as in generic description (Young 1977: 285).



**FIGURE 4.** Genitalia of *Onega orphne* sp. nov. (A–F) Male genitalia. (A) Pygofer, valve, and subgenital plate, lateral view. (B) Valve and subgenital plate, ventral view. (C) Connective and style, dorsal view. (D) Aedeagus and paraphysis, lateral view. (E) Aedeagus, ventral view, holotype, USNM. (F) Aedeagus, ventral view, specimen from Pichincha, USNM. (G–I) Female genitalia. (G) Sternite VII, ventral view. (H) Bases of first valvulae of ovipositor, ventral view. (I) Sternite VII, pygofer, and gonoplac, lateral view. Scale bar = 0.5 mm.

**Male genitalia.** Pygofer (Fig. 4A) moderately produced; posterior margin serrate; without processes; microsetae on basiventral region; macrosetae dispersed throughout posterior 1/3. Subgenital plates (Figs 4A, B) extending nearly to apex of pygofer; not fused basally; with uniseriate macrosetae, Styles (Fig. 4C) extending posteriorly beyond apex of connective; apex broad and foot-shaped. Connective (Fig. 4C) approximately V-shaped; dorsal keel strong and elongate, extending anteriorly. Aedeagus (Figs 4D, E, F) with shaft elongate; lateral flanges on basal portion in ventral view short and acute (Fig. 4F, males from Pichincha Province) or more elongate and round (Fig. 4E, as in holotype and additional male from Bolívar Province); dorsal robust elongate process extending from base posteriorly beyond apex of shaft; apical spine-like process arising from left (Fig. 4E, as in holotype) or right (Fig. 4F) ventrolateral sclerotized margin; basal apodemes sclerotized. Paraphysis (Fig. 4D) present as median sclerite.

**Female genitalia.** Sternite VII with posterior margin broadly round (Fig. 4G); disc with fine transverse striations. Pygofer (Fig. 4I) with macrosetae distributed along poster-oventral margin. Gonoplasts (Fig. 4I) with apex narrowly round. Second valvulae (similar to Fig. 5D) bearing 43 non-contiguous teeth; ventral prominence slightly conspicuous. Other invariant generic characters as described above.

**Coloration.** Head and proepimeron pale orange to pale red (Fig. 1F); crown with apices of antennal ledges and median square on posterior margin dark brown; tan areas on external sides of ocelli. Pronotum and mesonotum tan (Fig. 1F); pair of maculae on anterolateral margin of pronotum behind eyes, anterior angles of mesoscutum, and apex of mesoscutellum, black; lateral margins of pronotum and pair of C-shaped lines on disc of pronotum continuous to black maculae on anterior margin, castaneous. Forewings (Fig. 1F) dark brown to black; clavus with basal half with band along anal margin (continuous basally with small region of corium) and small transverse transcommissural stripe crossing apex, translucent white or tan; specimens from Pichincha Province (Ecuador) with additional translucent stripe on corium along apical portion of claval suture; claval venation over translucent area castaneous; membrane light brown. Thoracic pleura dark-brown to black, sometimes with irregular tan areas. Legs mostly dark brown to black; bases of femora tan. Abdomen dark brown to black; sternites thinly tan posteriorly.

**Notes.** *Onega orphne* **sp. nov.** (Fig. 1F) is very similar in general coloration to *O. sanguinicollis*, known only from a single female (Fig. 1G). Although forewings of the former species are mostly dark brown to black, and the latter's are mostly dark red, both species have an oblique translucent area on the basal half of the clavus, where brochosomes tend to accumulate. Additional characteristics of females, such as adult body size and shape of the posterior margin of the sternite VII (Figs 4G, 5A), can further differentiate both species. The male genitalia of *O. orphne* resemble most closely those of *O. fassli*, sharing with the latter the presence of a paraphysis (also present in *O. krameri* **sp. nov.**) and the dorsal median process of the aedeagus. Furthermore, *O. orphne* **sp. nov.** can easily be separated from other *Onega* species by the extensively serrate posterior margin of the male pygofer and ventrolateral apical process of aedeagal shaft.

**Etymology.** The specific epithet refers to its dark coloration, unique for *Onega* species (Gr. *orphne* = the darkness of the night). Dr. Kramer also studied the USNM male specimen from Chiriboga and labeled it “*Onega tristis* n. sp.”. It is very amusing to imagine that this name was due to the color pattern of the crown and pronotum, which when looked at creatively, does reveal a portrait of a sad person: ocelli as the eyes, oblique convexities on crown as eyebrows, posterior margin of crown as downcast mouth, and C-shaped lines on pronotum as the outlines of the neck (see Fig. 1F).

**Habitat.** Montane rainforests above 1,900 m.

**Material examined.** Holotype: male, “ECUADOR. Bolivar \ Guaranda (23km NE) \ elev. 7400 ft. [2,255 m] \ 20 June 1975 \ Langley and Cohen”, “Ecuador-Peace-Corps- \ Smithsonian Institution \ Aquatic Insect Survey”, USNM. Paratypes: male and 3 females, same data as holotype, USNM; male, “ECUADOR: \ Chiriboga, \ Pichincha Prov. \ 30 March 1958 \ R. W. Hodges \ Elev. 6500 Ft. [1,981 m]”, USNM; male, “ECUADOR: Prov. \ Pichincha, 1900 m. \ Road Aloag-S.Domingo \ VIII-15-1969 \ P. & B. Wygodzinsky”, AMNH; 1 male and 1 female, “ECUADOR: Pichincha \ 26km WNW Machachi \ 1900m. 12 nov 1987”, “J. Rawlins, C. Young \ R. Davidson. Humid \ primary forest”, CMNH.

***Onega sanguinicollis* (Latreille) comb. nov.**

(Figs 1G, 5)

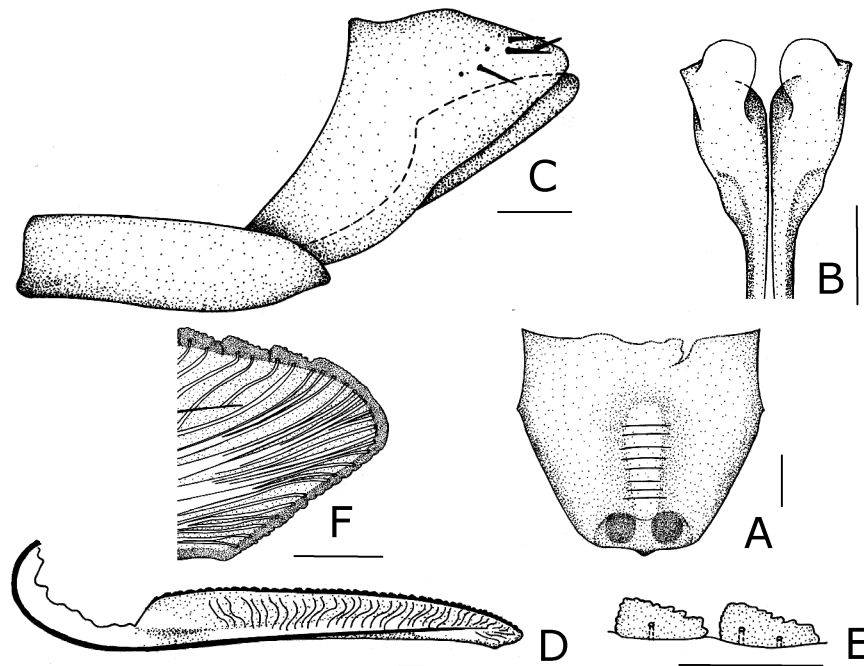
**Length.** female 14.9 mm.

**External morphology.** Crown (Fig. 1G) with median length 6/10 interocular and 4/10 transocular length; apical and lateral concave areas on crown not confluent. Frons mostly concave. Pronotum (Fig. 1G) with posterior margin straight. Forewings (Fig. 1G) mostly opaque; membrane extending only over first apical cell; most of corium with plexus of veins, this absent on apical and brachial cells; clavus with crossveins between claval veins and between inner claval and claval margin. Hindlegs with femoral setal formula 2:1:1; first tarsomeres with length approximately equal to combined length of posterior ones. Other external characters as in generic description (Young 1977: 285).

**Female genitalia.** Sternite VII with posterior margin with small median acute projection (Fig. 5A); fine transverse striations on disc. Pygofer (Fig. 5C) with few macrosetae distributed dorsally on anteapical region. Gonopods (Fig. 1C) with apex broadly round. Second valvulae (Fig. 5D) bearing 45 noncontiguous teeth; ventral prominence (Fig. 5F) slightly conspicuous. Other invariant generic characters as described above.

**Coloration.** Crown tan (Fig. 1G); pair of large semicircular areas on apical portion over muscle scars and posterior margin, dark-brown. Frons and clypeus dark-brown. Genae and lora castaneous. Pronotum and mesonotum (Fig. 1G) tan; pronotum with pair of faint castaneous stripes convergent anteriorly on posterior half; large triangular area on posterior 2/3 of pronotum and mesoscutellum, red; pair of maculae on anterolateral margin of pronotum behind eyes, anterior angles of mesoscutum, and apical margin of mesoscu-

tellum, black. Forewings (Fig. 1G) dark red; clavus with basal half with translucent tan band along anal margin (continuous basally with small region of corium); membrane light brown. Thoracic pleura red, with small irregular tan and dark brown areas. Mesosternum mostly dark brown. Legs with femora mostly red; apical portions of femora and tibiae dark brown to black; tarsi dark brown with bases tan.



**FIGURE 5.** Female genitalia of *Onega sanguinicollis* (Latreille) **comb. nov.** (A) Sternite VII, ventral view. (B) Bases of first valvulae of ovipositor, ventral view. (C) Sternite VII, pygofer, and gonoplac, lateral view. (D–F) Second valvula of ovipositor, lateral view. (D) General aspect. (E) Teeth from median portion of shaft. (F) Apex. Scale bar = 0.5 mm or 0.1 mm on E and F.

**Notes.** See notes on *O. orphne* **sp. nov.** above.

**Material examined.** Female, “Cuba \ Coll. Signoret”, “sanguinicollis \ det. Signoret.”, NHMW.

#### Additional species studied

***Onega avella* Distant:** male, “ECUADOR: Napo Prov. \ Hac. Aragon (Sierra \ Azul) 2250m. 0.67°S \ 77.92°W. 17.ii.- \ 8.iii.1996 P. Hibbs. MT”, LACM; male, “ECUADOR: Napo \ SierrAzul [sic!] el. 2100m. \ 14 km. W. Cosanga \ 0°41'N, 77°56'W \ 8–10 May '02 Stockwell”, NCSU; male and female (compared with type by M. Webb), “Paraguay \ Sapucay \ G. Morewood. \ 1919-76”, BMNH (**new country record**).

*Onega bracteata* Young: male, "ECUADOR: \ Cuenca [Azuay Province] \ [Parque Nacional] El Cajas \ Yacutuviana", "ix.1983. 2400m \ B. Hadfield \ B.M. 1984-24", BMNH (**new provincial record**); female, "PERU, JU, 1-3Km SW \ Mina Pichita 2100m \ 23.viii.88 P. Lozada", "luz Hg [Mercury light]", DZUP (**new departamental record**); male, "PERU, PA, San Juan \ de Cacazú 830m \ 24.IX.87 P. Lozada", DZRJ (**new departamental record**); male, same as preceding except "8.IX.87", DZRJ.

*Onega stipata* (Walker): male (compared with type by M. Webb), "Above \ Chimbo \ 3000'. VII.97. \ (Rosenberg).", "Ecuador \ Rosenberg \ 99-104", BMNH; female (compared with type by M. Webb), "Ecuador. \ Gilbert Hammond \ 1920-469", BMNH; male, "ECUADOR \ S. Domingo DLC \ IV.1982 Onore", OSU.

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