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Cicadellinae of Ecuador and Cicadellidae of Galápagos

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ABSTRACT

An annotated list of the Cicadellinae (Hemiptera: Auchenorrhyncha: Cicadellidae) of Ecuador is presented. The collection in the Museum of Zoology Invertebrates Section of the Pontifical Catholic University of Ecuador (QCAZ) is comprised of 3763 specimens of Cicadellidae of which 2806 were in the subfamily Cicadellinae. These specimens were identified as belonging to 87 species. The collection contains an additional 28 species that appear to represent undescribed species. The specimens were distributed among all provinces of Ecuador except the new, small province of Santa Elena on the coast. The specimens were from every broad geographic region of Ecuador: Coast, Western Cloud Forest, Highlands, Eastern Cloud Forest and Amazonia. Many species were collected in multiple geographic regions. There are 18 new country records in this collection. The literature was searched for additional species of Cicadellinae and an additional 166 species were identified as part of the Ecuadorian fauna for a total of 253 species. Twenty-four species have host records that indicate they have the potential to be pests of cultivated and orchard crops. Twenty-four species of Cicadellidae in 16 genera are listed for the Galápagos Islands and many are considered endemic.

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Cicadellidae; Cicadellinae; Ecuador; Galápagos

Introduction

The Cicadellidae are the largest family in the Hemiptera with between 22,000 [1] and 19,500 [2] described species. Bartlett et al. [3] list 21,351 species of Cicadellidae. While the higher classification of this family is under debate, a recent series of papers has divided the family into 25 subfamilies [4–6]. They are referred to as leafhoppers and the subfamily Cicadellinae as sharpshooters. This subfamily contains about 2400 species [2]. This group is particularly diverse in the Neotropics and probably less than half of the species have been described. Dietrich and Ratikov [7] estimate that as many as 80% of the Neotropical Deltocephalinae remain undescribed. The host plants for most species are unknown as many species have only been collected from light traps, malaise traps and to a lesser extent sweep net samples. A promising method for collecting new species has been canopy fogging collections. A number of species are known only from these collections. This would indicate that there is a substantial Cicadellidae fauna high in the canopy of rain and cloud forests that are not accessible by traditional collecting methods.

Throughout the Neotropics and in Ecuador collecting efforts have centered on established scientific stations and areas accessible by road. There remain large areas that have not been explored entomologically. Unfortunately, as these areas are opened up through road building for petroleum exploitation, mining and timber extraction, colonists and agriculture have followed rapidly. In many cases these habitats are irrevocably altered before biological assessments and inventories can be made. Undoubtedly, there will be many new species described as remote areas are explored.

The objective of this paper is to catalog the known species of Cicadellinae of Ecuador and in the collection of the Museum of Zoology – Invertebrates at the Pontifical Catholic University of Ecuador (QCAZ). Additionally, we provide distribution data for biogeography studies and highlight areas of Ecuador that are underrepresented in collections. We also include in this list the Cicadellidae from the Galápagos Islands of Ecuador with notes on distribution and potential origins.

Materials and methods

The majority of the specimens are in the collection of the Pontifical Catholic University of Ecuador, Museum of Zoology-Invertebrate Section. The majority of species identifications were made by Pedro Lozada during an extended visit to the Museum. Records from the literature are annotated with the appropriate citations.

Provincial designations have been updated to current usages. Previously Santo Domingo was part of Pichincha Province; Santa Elena was part of Guayas Province but these are now autonomous provinces. Historically the northern Amazonian region was Napo Province but has since been split into Sucumbíos,

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Napo and Orellana Provinces. Collection records have been corrected to reflect the current provinces for ease of georeferencing.

Distributions have been noted as Province with specific localities in parentheses. These specific localities have been assigned to general biogeographic regions, Galápagos, Coast (0 to 500 m), Western Cloud Forest (500 to 1750 m), Highlands (above 1750 m), Eastern Cloud Forest (1750 to 500 m) and Amazonia (below 500 m) [8] (Figure 1). We have not attempted to further specify habitats within these general regions, (e.g. Chocó, páramo, etc.). Most frequently the label data does not permit more accurate assignments, especially in historical specimens without GPS data. We have attempted to resolve label data lacking provincial designation wherever possible.

Museum abbreviations

The majority of specimens are located in the Museum of Zoology – Invertebrate Section of the Pontifical Catholic University of Ecuador in Quito, Ecuador (QCAZ). Other museums with significant holdings are as follows:

BMNH – British Museum of Natural History
CAS – California Academy of Sciences
EPNC – Escuela Politécnica del Ecuador Collection
INHS – Illinois Natural History Survey
IZP – Universidade do Porto, Porto, Portugal
MMBC – Moravian Museum Brno, Czech Republic
NCSU – North Carolina State University
USNM – Smithsonian National Museum of Natural History

These museum designations indicate holdings of specimens as noted in Dmitriev [9] or Wilson, Turner & McKamey [2] when a specimen is not in the QCAZ collection. Additional references are supplied as necessary.

Genera and species are listed alphabetically without tribal designation. The specimens in the QCAZ collection are listed with provincial and locality data. Those from the literature have the appropriate citation listing the distribution as including Ecuador. Wherever possible more precise collection localities have been included. Other countries are not included. Taxonomic authorities and spellings were verified using Dmitriev [9] and Wilson et al. [2] using the McKamey catalog [10] as the authority for terminology.

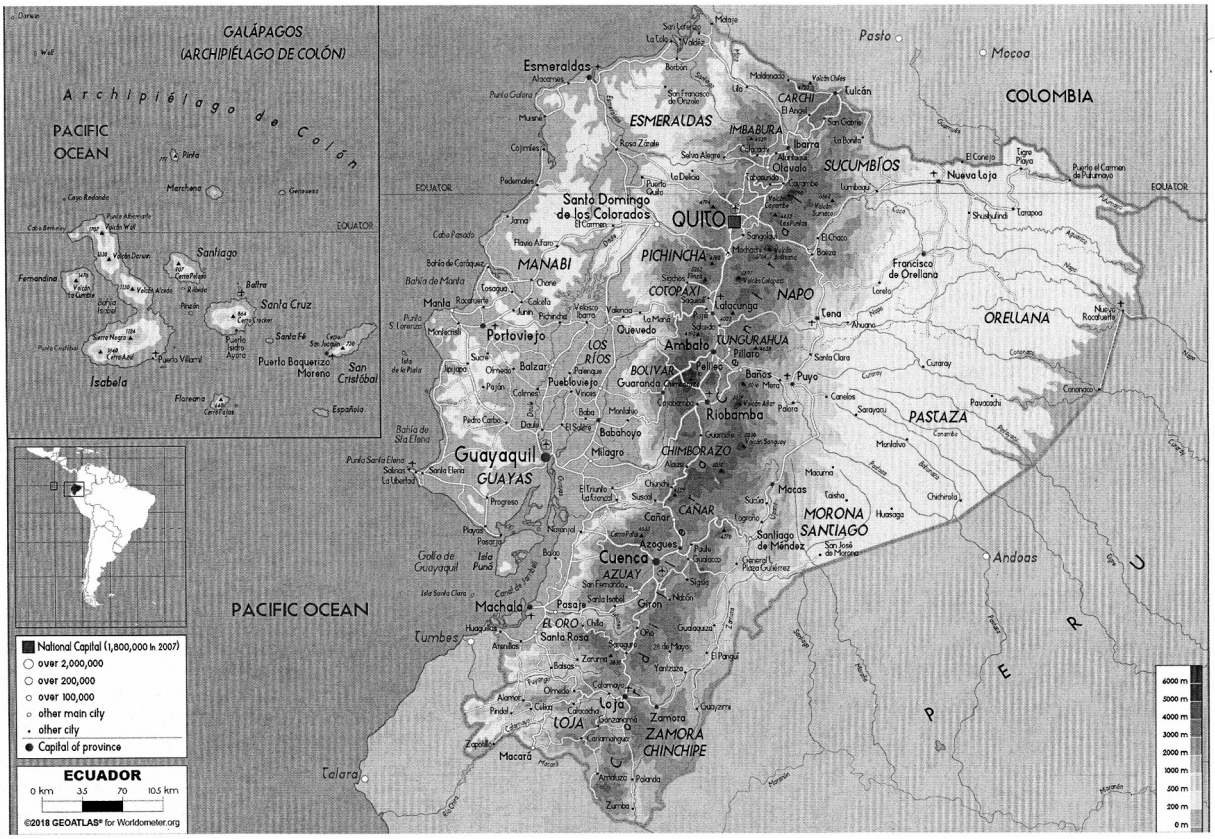

Figure 1. Map of Ecuador with provincial boundaries and principal cities. The Andean highlands run down the center of the country. On each side of the cordillera is a band of cloud forest, one in the west and one in the east. The cloud forest bands typically range from 500 m to 1750 m in elevation. The central highlands are all above 1750 m with a central plateau or inter-Andean valley. Volcanic peaks in semi-isolated islands of páramo occur on both the eastern and western margins of the highlands. To the east, Ecuador contains a large area of Amazonian rainforest below 500 m in elevation. Some of this remains pristine but it is increasing dissected by small towns, agriculture and oil exploitation. The Galápagos Islands are an isolated archipelago about 1000 km to the west of the mainland.

Results

A total of 2806 specimens in the QCAZ collection were identified as belonging to 87 species. An additional 28 could only be identified to genus and probably represent new species. There remain 2957 specimens to be identified. These represent Cicadellidae not belonging to the Cicadellinae, in part. The QCAZ collection contains specimens representing 18 new country records. These are listed below.

1.*Acrogonia virescens*
2.*Amblyscarta binotata*
3.*Cardioscarta quadrifasciata*
4.*Chlorogonalia coeruleovittata*
5.*Diestostemma huallagana*
6.*Diestostemma reticulata*
7.*Dilobopterus hyalinatulus*
8.*Egidemia* sp.
9.*Erythrogonia plagiella*
10.*Erythrogonia splendida*
11.*Ichthyobelus regularis*
12.*Iragua diversa*
13.*Jakrama krameri*
14.*Kogigonalia zarumoidea*
15.*Proconia esmeraldae*
16.*Pseudometopia phalaesia*
17.*Stictoscarta exoleta*
18.*Teleogonia clathrata*

The collection is biased toward the mid-northern tier of provinces, Esmeraldas and Manabí on the coast, Pichincha (Western Cloud Forest), Napo, Sucumbíos and Orellana (Eastern Cloud Forest and Amazonia). This reflects the intensity of collecting by PUCE faculty, staff and students. Additional concentrations of specimens are from Otonga in Cotopaxi Province, Baños in Tungurahua, Santo Domingo and Pastaza. The collection has specimens from every Ecuadorian province with exception of the small new province of Santa Elena on the coast which is arid so probably contains a much smaller leafhopper fauna than other provinces.

The distribution of species by general habitat classification (Figure 2) was interesting as most species were collected in more than one ecological zone type. For example, species collected in Amazonia were also typically collected in Eastern Cloud Forest and frequently in the Western Cloud Forest. Nevertheless, Amazonia had the majority of species (68) followed by the Western Cloud Forest (49), the Eastern Cloud Forest (36), the Coast (26) and the Highlands (19). Seven species from the Galápagos are in the collection. These species are endemic and do not occur in the Ecuadorian mainland.

With records from the literature and on-line databases, the list of Ecuadorian Cicadellinae is 253 species in 101 genera. The geographic bias in collection localities is very similar to that for the museum specimens (QCAZ). There are 24 species listed as from Galápagos. Most of the 16 genera of these Galápagos species also do not occur on the Ecuadorian mainland. The exceptions are *Agallia, Balclutha* and *Docalidia*. There are four species of *Balclutha* in the Galápagos and one specimen from the highlands of Ecuador that could not be determined to species. There are four relatively new species of *Docalidia* on the mainland and one species in the Galápagos

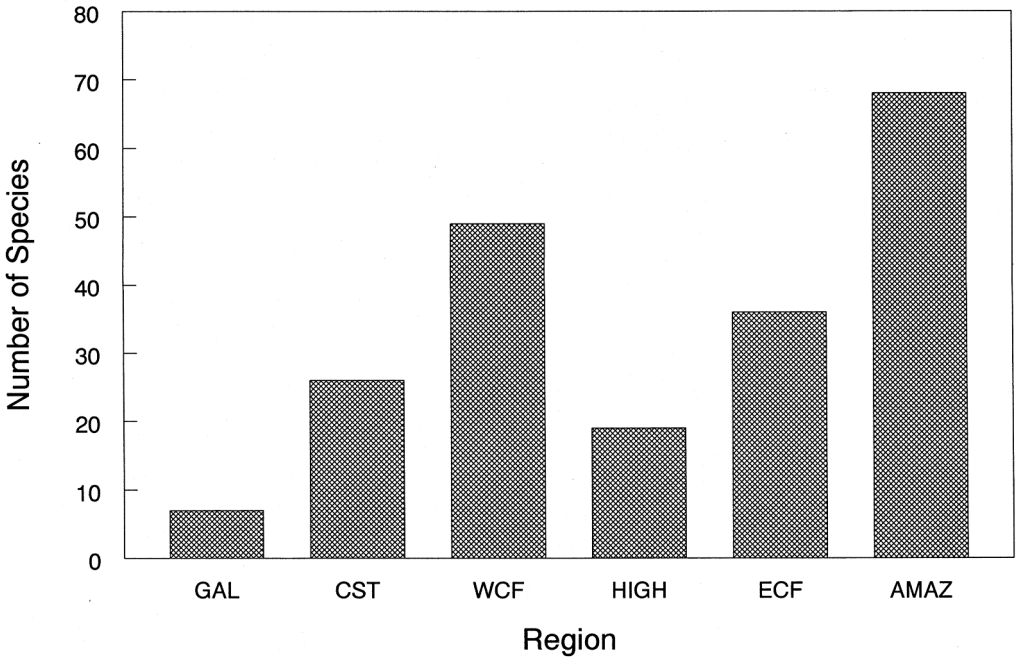

Figure 2. Distribution of Cicadellinae species in Ecuador in six broad geographic zones; Galápagos Islands (GAL), Coast (CST), Western Cloud Forest (WCF), Highlands (HIGH), Eastern Cloud Forest (ECF) and Amazonia (AMAZ).

The majority of specimens were collected with light traps, sweep netting, malaise traps and hand collected. Several species were collected only through canopy fogging techniques. Consequently, there are few specimens with good host records. Host records were appended wherever possible. Several species were collected during investigations of pest complexes on particular hosts. Other species are well-known pests of cultivated plants. These include the following. References are supplied with the individual species listings.

1.*Acrogonia sparsuta* on *Helianthus annus* (sunflower), *Gossypium hirsutum* (cotton), *Coffea* sp. (coffee).

2.*Acrogonia virescens* on *Elaeis guineensis* (oil palm) and *Citrus* sp.

3.*Caldwelliola reservata* on *Coffea* sp. (coffee), potential vector of *Xylella fastidiosa*.

4.*Caldwelliola tharma* on *Coffea* sp. (coffee), potential vector of *Xylella fastidiosa*.

5.*Chlorogonalia coeruleovittata* on *Phaseolus* sp. (beans), *Ipomoea batata* (sweet potato), vegetable crops.

6.*Chlorogonalia ultima* on *Coffea* sp. (coffee), potential vector of *Xylella fastidiosa*.

7.*Dichrophleps boliviana* on *Elaeis guineensis* (oil palm).

8.*Hortensia similis* – Pasture grass reducing forage quality, medicinal and ornamental plants, *Saccharum officinarum* (sugar cane), *Zea mays* (maize) and *Oryza sativa* (rice).

9.*Ichthyobelus regularis* on *Elaeis guineensis* (oil palm).

10.*Macugonalia moesta* on *Carica papaya* (papaya) and *Persea americana* (avocado).

11.*Macunolla ventralis* on beans, *Ipomoea batata* (sweet potato), *Solanum melongena* (eggplant) and *Solanum lycopersicum* (tomato).

12.*Molomea consorta* on *Elaeis guineensis* (oil palm).

13.*Molomea fatalis* on *Elaeis guineensis* (oil palm) and *Citrus* sp.

14.*Molomea virescens* on *Elaeis guineensis* (oil palm).

15.*Oncometopia facialis* on *Citrus* sp., implicated in the spread of *Xylella fastidiosa*.

16.*Oncometopia rubescens* on *Musa paradisiaca* (banana).

17.*Proconia fusca* on *Citrus sinenis* (orange).

18.*Proconia marmorata* on *Elaeis guineensis* (oil palm), *Theobroma cacao* (cacao).

19.*Pseudometopia amblardii* on *Elaeis guineensis* (oil palm).

20.*Pseudometopia phalaesia* on *Elaeis guineensis* (oil palm).

21.*Raphirrhinus phosphoreus* on *Elaeis guineensis* (oil palm) and *Theobroma cacoa* (cacoa).

22.*Teletusa límpida* on *Citrus sinensis*.

23.*Tretogonia notatifrons* on *Dacus carota* (carrot), *Helianthus annus* (sunflower), *Zea mays* (maize) and *Capsicum annum* (chili pepper).

24.*Tylozygus fasciatus* on *Oryza sativa* (rice), *Zea mays* (maize), *Phaseolus* sp. (beans) and *Glycine max* (soy).

There are additional records for Cicadellidae from Ecuador but many of these references lack literature citations or museum records where the specimens have been deposited. If the species could not be confirmed to have a range that includes Ecuador with other sources, the species was not included in the following list. Examples of these include *Agrosomna placetis, Cardioscarta flavifrons, Dilobopterus laetus, Oncometopia clarior, Sibovia prodigiosa*, and *Soosiulus regalis*. These species are listed in the website, Entomología en Ecuador [11], without citations, geographic localities or location of voucher specimens. Many of these appear to be incidental records with identifications based on poor quality photographs. Examples of this in other leafhopper subfamilies, include *Graminella striatella* and *Latusgallia vidua* [12], *Tantulidia rufifrons, Protalebrella brasiliensis* and *Planicephalus flavicosta* [13].

Species list – Cicadellinae of Ecuador

***Abana* Distant 1908**

Abana dives Walker 1851; Esmeraldas (La Boca), Pichincha (Endesa, Puerto Quito).

Abana gigas Fowler 1898; [2].

Abana hovarthi Jacobi 1905; Napo (Río Hollín, Tena), Pastaza (Puyo), Sucumbíos (El Reventador).

Abana tissa Distant 1908; Pichincha (Endesa, Puerto Quito).

***Acrobelus* Stål 1869**

Acrobelus columbianus Mejdalani & Emmrich 1998; Pastaza (Abitagua), NCSU [9].

Acrobelus ecuadorianus Young 1968; USNM [2].

Acrobelus rakitovi (Ceotto, Mejdalani & Takiya 2004); Orellana (Okanogare, Tiputini Biodiversity Station), INHS [9].

Ecological Notes: Collected by canopy fogging in primary forest in Amazonia.

Acrobelus sp.; Napo (Archidona, Cascada de San Rafael, Shushufindi) Pichincha (Las Palmeras).

***Acrogonia* Stål 1869**

Acrogonia flavoscutellata (Signoret 1855); Esmeraldas (La Sexta, Quinindé, Rio Sábalo), Pichincha (Pululahua) [14].

Acrogonia lobulata Dos Santos da Silva 2018; Orellana (Tiputini Biodiversity Station, Okonogare), EPNC [15].

Ecological Notes: Collected by canopy fogging in primary forest in Amazonia.

Acrogonia luizi Dos Santos da Silva 2018; Pastaza (Río Shiripuno), QCAZ [15].

*Acrogonia sparsuta (*Signoret 1855); Bucay. IZP, [2].

Plant Associations: *Helianthus annus, Gossypium hirsutum, Coffea* sp [16].

Acrogonia terminalis Young 1968; Orellana (Tiputini Biodiversity Station) [9].

*Acrogonia virescens (*Metcalf 1949); Napo (Cabañas Aliñahui), Orellana (Estación Científica Yasuní). New country record.

Plant Associations: *Elaeis guineensis, Citrus* sp. [17].

Acrogonia sp.1; Santo Domingo (Santo Domingo).

Acrogonia sp 2; Pichincha (Mindo).

***Agrosoma* Medler 1960**

Agrosoma cruciata (Signoret 1853); Esmeraldas (Cupa, La Concordia, Quinindé), Los Ríos (Montalvo), Napo (San Rafael), Pichincha (Alluriquin, Puerto Quito), Santo Domingo (Santo Domingo).

Agrosoma nabima Young 1977; Chimborazo (Riobamba), CAS [2].

***Amblyscarta* Stål 1869**

Amblyscarta binotata Young 1977; Esmeraldas (Quinindé), Napo (Archidona), Orellana (Coca, Estación Científica Yasuní), Sucumbíos (Cuyabeno). New country record.

Amblyscarta cazicula (Breddin 1901) [2].

Amblyscarta inca (Distant 1908); Pichincha (Endesa, La Esperie, Los Bancos, Mindo, Tandapi).

Amblyscarta opulenta (Walker 1851); Esmeraldas (Nuevo Ecuador), Napo (Archidona, Rio Hollín), Pastaza (Fátima, Mera).

Amblyscarta sp.; Napo (Rio Hollín) Orellana (Coca, Estación Chiruista).

***Apulia* Distant 1908**

Apulia elongata (Signoret 1854); Tungurahua (Baños), NCSU [2].

Apulia flora Distant 1908; [2].

Apulia punicea Young 1977; Tungurahua (Baños) [2].

Apulia quadrimacula (Walker 1851); Guayas (Sabanilla) [2].

***Aurogonalia* Young 1977**

Aurogonalia dorada Young 1977; USNM [2].

***Baleja* Melichar 1926**

Baleja marginula (Osborn 1926); Esmeraldas (El Placer, San Francisco), Los Ríos (Estación Científica Rio Palenque), Pichincha (Los Bancos), Santo Domingo (Santo Domingo).

Baleja rufofasciata (Distant 1879) [2].

Baleja serratula (Breddin 1902); Bolívar (Balzapamba (sic.) = Balsapamba), Cotopaxi (Otonga), Esmeraldas (Atacames, Caimito, Cupa, La Boca, Lita, Pitzará, Quinindé), Los Ríos (Estación Científica Rio Palenque), Napo (Rio Hollín), Pichincha (Allurinquin, Nanegalito, Pedro Vicente Maldonado, Tandapi, Unión del Toachi), Santo Domingo (Santo Domingo).

***Begonalia* Young 1977**

Begonalia hydra (Distant 1908) [2].

Begonalia rubicula (Osborn 1926) [2].

***Beirneola* Young 1977**

Beirneola anita Fowler 1900; [2].

***Borogonalia* Young 1977**

Borogonalia cruciatula (Breddin 1902) [2].

Borogonalia impressifrons (Signoret 1854) [18].

Borogonalia sp.; Pichincha (Quito, Tandapi, Volcán Pichincha).

***Caldwelliola* Young 1977**

Caldwelliola caucana Young 1977; Los Ríos [2].

Caldwelliola reservata (Fowler 1900) [2].

Host Plant Associations: Coffee, potential vector of *Xylella fastidiosa* [19].

Caldwelliola tharma (Young 1977) [2].

Host Plant Associations: Coffee, potential vector of *Xylella fastidiosa* [19].

Caldwelliola trilineata McKamey 2006; [2,20].

***Cardioscarta* Melichar 1926**

Cardioscarta electa Melichar 1932; Napo (Rio Hollín), Pastaza (Tuyo (sic.) = Puyo).

Cardioscarta obstinata Melichar 1932; Santa Jiménez [2].

Cardioscarta quadrifasciata (Linnaeus 1758); Pastaza (Puyo). New country record.

Cardioscarta sp.; Pichincha (Tumbaco).

***Catagonalia* Evans 1947**

Catagonalia conjunctula (Osborn 1926) [18,21].

Catagonalia lunata (Signoret 1854); Sucumbíos (Shushufindi).

***Chichahua* Young 1977**

Chichahua russeola Young 1977; Cañar (La Carbonería), Cotopaxi (Parque Nacional Cotopaxi, Laso, Machachi), Napo, (Campana Cocha, El Chaco, Jumandi), Pichincha (Alluriquín, Calacalí, Condado, Conocoto, El Cachaco, Guangopolo, Los Bancos, Maquipucuna, Nanegalito, Nayón, Palmeras, Pasochoa, Puembo, Puerto Quito, Quito, Tandayapa, Tumbaco, Yaruqui), Orellana (Estación Científica Yasuní), Santo Domingo (Santo Domingo), Tungurahua (Agoyán, Ambato, Baños, Rio Verde, Viñas).

Chichahua stygiana Young 1977; Chimborazo (Alausi), Lago Zurucuchu, CAS [2].

***Chlorogonalia* Young 1977**

*Chlorogonalia coeruleovittata (*Signoret 1855); Cotopaxi (Calupiña, Las Pampas, Otonga), Esmeraldas (Cupa, Esmeraldas, Quinindé), Loja (Loja), Manabí (Cerro de Hoja, Puerto López), Pichincha (Alluriquín, Chiriboga, Guajalito, Maquipucuna, Mindo, Nanegalito, Nono, Otongachi, Palmeras, Pasochoa, Puerto Limón, Pupusa, Quito, San Juan, Tandapi, Tandayapa Unión del Toachi), Napo (Archidona, Baeza), Santo Domingo (Santo Domingo), Sucumbíos (El Reventador), Tungurahua (Baños). New country record.

Plant Associations: Beans, sweet potato, vegetable crops and weeds [22].

Chlorogonalia ultima Young 1977; Tungurahua (Baños). NCSU [2].

Host Plant Associations: Coffee, potential vectors of *Xylella fastidiosa* [19].

***Cicadella* Latreille 1817**

Cicadella mellatula (Breddin 1901); Santa Jiménez [2].

***Ciccamera* Takiya, Carvalho & Mejdalani**

Ciccamera hamata Takiya, Carvalho & Mejdalani; Orellana (Tiputini Biodiversity Station) [23].

Ecological Notes: Collected by canopy fogging in primary forest in Amazonia.

***Ciccus* Latreille 1829**

Ciccus adspersus (Fabricius 1803) [2,24].

***Coronigoniella* Young 1977**

Coronigoniella ostenta Young 1977; Santa Cecilia [2].

Coronigoniella partita Young 1977; Cotopaxi (Latacunga) [2].

Coronigoniella rohweri Young 1977; El Oro (Zaruma) [2].

***Cyclogonia* Melichar 1926**

Cyclogonia serenula (Breddin 1901); Tungurahua (Baños) NCSU [2].

Cyclogonia sp.; Napo (Baeza, Campana Cocha, Jumandi).

***Depanisca* Young 1968**

*Depanisca incarnatula (*Melichar 1926); Bolívar (Balzapamba (sic.) = Balsapamba) [2,24].

***Deselvana* Young 1968**

Deselvana ezba (Distant 1908); Cachabe, BMNH [2].

***Dichrophleps* Stål 1869**

Dichrophleps boliviana Schmidt 1928; Orellana (Okanegare, Tiputini Biodiversity Station), INHS [9].

Plant Association: *Elaeis guineensis* (oil palm).

Ecological Notes: Collected by canopy fogging in primary Amazonian rainforest.

Dichrophleps symmetrica Young 1968; Los Ríos (Río Palenque Biological Station), USNM [9].

***Dictyodisca* Schmidt 1928**

Dictyodisca salvini (Fowler 1898) [9].

***Diedrocephala* Spinola 1850**

Diedrocephala elvina (Butler 1874) [2].

Diedrocephala bimaculata (Gmelin, 1789) [1,9].

***Diestostemma* Amyot & Serville 1843**

Diestostemma albinoi Pinto, Mejdalani & Takiya 2017; Orellana (Okanegare).

Diestostemma bicristata McKamey 2020; Napo (La Bonita) [25].

Diestostemma blantoni Young 1968; Pichincha (Pacto).

Diestostemma colombiae Young 1968; [2,24].

Diestostemma dolosum (Melichar 1924); Pichincha (San Rafael).

Diestotemma dubium Young 1968; Orellana (Okonegare, Tiputini Biodiversity Station), INHS [9].

Ecological Notes: Collected by canopy fogging in primary Amazonian rainforest.

Diestostemma excisum Schmidt 1910; [2,24].

Diestostemma gervasioi Pinto, Mejdalani & Takiya 2017; Orellana (Okanegare).

Diestostemma huallagana Young 1968; Orellana (Estación Científica Yasuní), Pichincha (Pacto), Sucumbíos (Shushufindi). New country record.

Diestostemma intermedium Young 1968; [2,24].

Diestostemma nasutum Schmidt 1910; Orellana (Coca) [2,24].

Diestostemma olivia Pinto; Orellana (Okanegare, Tiputini Biodiversity Station) [26].

Ecological Notes: Collected by canopy fogging in primary Amazonian rainforest.

Diestostemma parvum Schmidt 1910; Bolívar (Balzapamba (*sic*.) = Balsapamba) [2,24].

Diestostemma reticulata (Melichar 1924); Napo (Río Hollín). New country record.

Diestostemma rugicollis (Signoret 1855) [2,24].

***Dilobopterus* Signoret 1850**

Dilobopterus demissus (Fabricius 1803) [21].

Dilobopterus fenestratus Young 1977; [2].

Dilobopterus hyalinatulus (Osborn 1926); Esmeraldas (Caimito), Pichincha (Unión del Toachi). New country record.

Dilobopterus jemima (Distant 1908) [21].

Dilobopterus obliquatulus (Jacobi 1905) [21].

Dilobopterus politus (Schmidt 1928); Santa Jimenez, IZP [21].

Dilobopterus syrphoidulus (Jacobi 1905) [21].

Dilobopterus vicinus (Signoret 1853) [21].

Dilobopterus sp.; Morona Santiago (Indaza), Napo (Archidona, Loreto, Río Jondachi, Río Hollín).

***Draeculacephala* Ball 1901**

Draeculacephala alibipicta Dietrich 1994; Napo (Baeza, Santa Cecilia), Zamora Chinchipe (Zamora).

Draeculacephala sp1.; Imbabura (Chachimbiro, Yahuarcocha), Napo (Baeza, Campanococha, Rio Hollín, San Rafael, Tres Cruces), Orellana (Coca), Pichincha (Las Palmas, Mindo, Nanegalito, Potrerillos, Pululahua, Quito, Tandapi, Unión del Toachi), Santo Domingo (Santo Domingo), Sucumbíos (El Reventador).

Draeculacephala sp2. (=*Carneocephala* sp.); Napo (Misahualli), Orellana (Coca), Pastaza (Lorocachi).

***Egidemia* China 1927**

Egidemia sp.; Esmeraldas (La Mayronga, San Lorenzo). New country record.

***Erythrogonia* Melichar 1926**

Erythrogonia ekila Young 1977; Napo (Loreto, Rio Hollín), Orellana (Estación Científica Yasuní), Pastaza (Lorocachi, Moretecocha) [27].

Erythrogonia plagiella Melichar 1926; Orellana (Coca). New country record.

Erythrogonia quissota Medler 1963; Los Ríos [27].

Erythrogonia splendida (Fabricius 1803); Cotopaxi (Otonga), Esmeraldas (Caimito, Quinindé), Imbabura (Chachimbiro), Los Ríos (Estación Científica Río Palenque), Manabí (Isla de la Plata, Puerto López),

Napo (Archidona, Daimi, Rio Hollín, San Rafael), Orellana (Coca), Pastaza (Puyo), Pichincha (Unión del Toachi), Sucumbíos (El Reventador). New country record.

Erythrogonia vaccoma Medlar 1963; Napo (Rio Hollín), Pastaza (Lorocachi, Puyo), Orellana (Coca), Sucumbíos (El Reventador).

Erythrogonia yestula Medler 1963; Guayas (Sabanilla) [27].

Erythrogonia sp.; Pichincha (Calacalí).

***Homoscarta* Melichar 1924**

Homoscarta ecuadoriana Schmidt 1928; Napo (Loreto, Río Hollín), Pastaza (Mera, Puyo), Pichincha (Mindo, Pifo), Sucumbíos (Cuyabeno), Tungurahua (Baños, Río Negro), Zamora Chinchipe (Podocarpus National Park).

***Hortensia* Metcalf & Bruner 1936**

*Hortensia similis (*Walker 1851); Cotopaxi (Las Pampas, Parque Nacional Cotopaxi), Esmeraldas (Cachago, Caimito, Cupa, La Boca, La Sexta, La Unión, Quinindé, Río Sábalo, Rocafuerte, Ventanas), Los Ríos (Patricia Pilar), Loja (Loja), Manabí (Puerto López), Napo (Archidona, Cuyuja, Jondachi, Río Hollín, Río Malo, Tena), Orellana (Coca, Estación Científica Yasuní), Pastaza (Puyo), Pichincha (Alluriquín, Bosque Protector Pasochoa, Chiriboga, La Concordia, Las Pampas Argentinas, Maquipucuna, Mindo, Nono, Otongachi, Palmeras, Puerto Limón, Pupuzá, Río Guajalito, Río Silanchi, San Gabriel, Tandapi, Tandayapa, Unión del Toachi), Santo Domingo (Santo Domingo), Sucumbíos (Lago Agrio, Lumbaqui, Shushufindi), Tungurahua (Baños).

Plant Associations: Pasture grasses [28], *Axonopus scoparius, Ayapana palustris, Dieffenbachia oblicua, Kalanchoe pinnata, Aristolochia iquitensis* and *Teliostachya lanceolata* [29], rice (*Oryza sativa*) [30], sugar cane (*Saccharum* sp.) [31], maize (*Zea mays*) [22].

***Hyogonia* China 1927**

Hyogonia batesi (Distant 1908) [2].

Hyogonia reticulata (Melichar 1825) [32].

Hyogonia youngi Emmrich & Lauterer 1975; [32].

***Ichthyobelus* Melichar 1925**

Ichthyobelus bellicosus Melichar 1925; Esmeraldas (Quinindé), Napo (Pano, Taracoa).

Ichthyobelus regularis Young 1968; Orellana (Okanegare, Tiputini Biodiversity Station). New country record.

Plant Association: Oil palm (*Elaeis guineensis*) [17].

***Iragua* Melichar 1926**

Iragua diversa Signoret 1855; Napo (Limoncocha, Río Hollín, Tena), Orellana (Coca, Estación Chiruisla). New country record.

*Iragua estella (*Distant 1908) [2].

***Jakrama* Young 1977**

Jakrama krameri Young 1977; Napo (Río Hollín), Pastaza (Río Capahuari), Sucumbíos (Cuyabeno). New country record.

Jakrama servillei (Signoret 1853) [2].

Jakrama taeniata Young 1977; Sucumbíos (Sacha Lodge, Shushufindi).

***Janastana* Young 1977**

Janastana distingüenda (Fowler 1900) [2].

***Juliaca* Melichar 1951**

Juliaca carbuncula (Breddin 1901); Guayas (Sabanilla) [2].

Juliaca deanna Young 1977; [2,33].

Juliaca homalina (Melichar 1932); Pastaza (Puyo), USNM; [2].

Juliaca quadrigula (Jacobi 1905) [2].

Juliaca sertigerula (Jacobi 1905) [2].

***Kapateira* Young 1977**

Kapateira rosipennis (Osborn 1926) [2,33].

***Kogigonalia* Young 1977**

Kogigonalia zarumoidea Young 1977; Loja (Loja), Orellana (Estación Científica Yasuní), Sucumbíos (El Calvario, La Bonita, Santa Bárbara). New country record.

***Ladoffa* Young 1977**

Ladoffa donsana Young 1977; Bolívar (Balzapamba (*sic.*) = Balsapamba), USNM [34].

Ladoffa ignota (Walker 1851) [34].

Ladoffa obscurana Young 1977; [21,34].

Ladofa sannionis Young 1977; [18].

Ladoffa scopigera Young 1977; Sucumbíos (Lago Agrio), USNM [34].

Ladoffa yutsi Young 1977; Santo Domingo (Santo Domingo), USNM [34].

Ladoffa sp.; Esmeraldas (Caimito, San Lorenzo, Ventanas), Los Ríos (Estación Científica Río Palenque), Napo (Misahualli), Orellana (Coca), Pichincha (Alluriquín, Baba, Pachijal, Pahuma, Unión del Toachi), Santo Domingo (Santo Domingo).

***Lanceoscarta* Takiya & Cavichioli 2005**

Lanceoscarta bilobata Takiya & Cavichioli 2005; Orellana (Okanegare) [35].

Ecological Notes: Collected by canopy fogging in primary Amazonian rainforest.

Lanceoscarta ecuadoriana Takiya & Cavichioli 2005; Orellana (Okanegare, Tiputini Biodiversity Station) [35].

Ecological Notes: Collected by canopy fogging in primary Amazonian rainforest.

***Lautereria* Young 1977**

Lautereria dietzi Young 1977; Napo (Campana Cocha, Talag, Tena), Orellana (Coca, Estación Científica Yasuní), Pastaza (Moretecocha).

Lautereria tapirapensis Young 1977; BMNH [2].

***Lissoscarta* Stal 1869**

Lissoscarta caututara Young 1977; Orellana (Okonegare, Tipiutini Biodiversity Station). USNM, INHS.

Natural History Notes: These cicadellids are wasp mimics and were collected by canopy fogging in primary Amazonian rainforest.

Lissoscarta sp.; Orellana (Estación Científica Yasuní).

Natural History Notes: These cicadellids are wasp mimics.

***Lojata* Strand 1933**

Lojata ohausi (Schmidt 1932) [9,24].

***Macugonalia* Young 1977**

Macugonalia contaminata (Fabricius 1803) [2].

Macugonalia moesta (Fabricius 1803); Morona Santiago (Macas), Napo (Archidona, Campana Cocha, Loreto, Misahualli, Mondayacu, Río Hollín, San Jacinto, San Rafael, Tena, Talag), Orellana (Coca, Estación Científica Yasuní), Pastaza (Puyo), Sucumbíos (El Reventador).

Plant Associations: Papaya (*Carica papaya*), Avocado (*Persea americana*) [36].

Macugonalia picta (Distant 1908) [2].

Macugonalia umbrosa Young 1977; Cotopaxi (Otonga), Morona Santiago (Gualaquiza), Napo (Archidona, Baeza, Cosanga, Cuyuja, El Cañón, Daimi, El Chaco, Joya de los Sachas, Río Hollín, Río Malo, San Rafael, Shushufindi, Tena, Tres Cruces, Vía Papallacta-Cuyuja), Pastaza (Puyo), Pichincha (Checa, Maquipucuna, Mindo, Pacto, Palmeras, Papallacta, Pululahua, Tumbaco), Sucumbíos (Cascada de San Rafael, El Reventador, La Bonita, La Libertad, La Virgen, Lago Agrio, Lumbaqui). New country record.

Macugonalia sp.; Cotopaxi (Las Pampas), Esmeraldas (La Boca), Imbabura (Los Cedros), Orellana (Estación Científica Yasuní), Pichincha (Calacalí, Maquipucuna, Mindo, Nanegalito, Playa Rica, Unión del Toachi), Santa Elena (La Rinconada).

***Macunolla* Young 1977**

Macunolla ventralis (Signoret 1854); Cotopaxi (Otonga), Esmeraldas (Caimito, Cupa, El Cachaco, Hacienda Pallares, Kumanii, La Boca, Quinindé, Ventanas), Guayas (La Rinconada), Pichincha (Alluriquín, Baba, Chiriboga, Los Bancos, Nanegalito, Otongachi, Puerto Limón, Puerto Quito, Pedro Vicente Maldonado, San Gabriel, Toachi, Unión del Toachi) Santo Domingo (Santo Domingo).

Plant Associations: Beans, sweet potato, eggplant, tomato and a wide range of other crops and weeds [22].

***Mareba* Distant 1908**

Mareba eresia Distant 1908; Cachabe, BMNH [2].

***Mesogonia* Melichar 1926**

Mesogonia aliena Young 1977; Napo (Archidona) [2].

Mesogonia apulia (Distant 1908) [2].

Mesogonia brevisula (Osborn 1926) [2].

Mesogonia ferrugatula (Breddin 1901) [2].

Mesogonia ludicula (Osborn 1926) [2].

Mesogonia monsonensis Young 1977; Napo (Baeza) [2,33].

Mesogonia olivatula (Osborn 1926) [2].

*Mesogonia paganula (*Jacobi 1905) [2].

Mesogonia stillatula (Breddin 1902) [2].

Mesogonia valida Young 1977; Napo (Archidona). NCSU [2,33].

Mesogonia vinnula Young 1977; Napo (Archidona) [2,33].

Mesogonia sp.; Morona Santiago (Indaza), Napo (Baeza, Papallacta), Pichincha (Pupusa, Unión del Toachi),

***Microgoniella* Melichar 1926**

Microgoniella gracilis Young 1977; NCSU [2,33].

Microgoniella quevedoensis Young 1977; Cotopaxi (Las Pampas, Latacunga), Esmeraldas (Caimito), Napo (Archidona, Misahualli), Pichincha (Chiriboga, Mindo, Nanegalito, Otongachi, Pacto, Tandayapa, Unión del Toachi), Santo Domingo (Santo Domingo), Sucumbíos (El Reventador).

Microgoniella sp.; Orellana (Estación Científica Yasuní).

***Molomea* China 1927**

Molomea consolida Schröder; Pastaza (Puyo) [14].

Molomea consorta (Melichar 1925); Sucumbíos (Shushufindi), BMNH [17].

Plant Association: Oil palm (*Elaeis guineensis*) [17].

Molomea fatalis Bonfils & Perthuis 1992; Napo (Puerto Napo), Orellana (Coca, Tiputini Biodiversity Station), INHS

Plant Associations: Oil palm (*Elaeis guineensis*) [17], *Citrus* sp., *Bauhinia tarapotensis* (Fabaceae).

Ecological Notes: Specimens of this species have been collected in oil palm plantations, citrus plantations and by canopy fogging in primary rainforests in Amazonia.

Molomea virescens (Distant 1908); Napo (Napo River), Orellana (Estación Científica Yasuní, Tiputini Biodiversity Station), Pastaza (Lorocachi), Sucumbíos (Limoncocha).

Plant Association: Oil palm (*Elaeis guineensis*) [17].

Ecological Notes: Specimens of this species have been collected using canopy fogging in primary forests in Amazonia.

***Neiva* Melichar 1925**

Neiva crassa Young 1977; MMBC [2,33].

Neiva rufipes Melichar 1925; Tungurahua (Baños) [2].

***Nielsonia* Young 1977**

Nielsonia scissa Young 1977; [2,33].

***Omagua* Melichar 1925**

Omagua fitchii (Signoret 1855); Orellana (Okanegare, Tiputini Biodiversity Station), INHS [9].

Ecological Notes: Collected by canopy fogging in primary Amazonian rainforest.

***Oncometopia* Stål 1869**

Oncometopia asperula Melichar 1925; Bolívar (Balzapamba (*sic*.) = Balsapamba) [2].

Oncometopia expansa Melichar 1825; [2,24].

Oncometopia facialis Signoret 1854; [2].

Plant Associations: *Vernonia condesata, Vernonia polyantes, Vernonia* sp. (Asteraceae), *Citrus sinesis, Citrus* sp. (Rutaceae), *Aloysia virgata, Lantana cámara* (Verbenaceae) [37].

Ecological Notes: This species has been implicated in the spread of *Xylella fastidiosa* in citrus.

Oncometopia fuscipennis (Fowler 1899); Bolívar (Balzapamba (*sic*.) = Balsapamba) [2].

Oncometopia lineatifrons Melichar 1925; Tungurahua (Baños) [2,24].

Oncometopia rubscens Fowler1899; Los Ríos (Rio Palenque) [14].

Plant Association: *Musa paradisiaca* (banana) [24].

Oncometopia venosula Distant 1908; Napo (Archidona), Pastaza (Puyo), Sucumbíos (Rosa Florida).

Oncometopia sp1.; Pastaza (Puyo).

Oncometopia sp2.; Pichincha (Nono).

***Onega* Distant 1908**

Onega avella Distant 1908; Esmeraldas (Tonchigue), Manabí (Puerto Cayo), Napo (Baeza, Cosanga, Misahualli, Tres Cruces), Pichincha (Maquipucuna, Mindo, Unión del Toachi).

Onega bracteata Young 1977; Azuay [2,33].

Onega fassli Young 1977; Napo [2,33].

Onega freytagi Takiya & Cavichioli 2004; Carchi [38].

Onega krameri Takiya & Cavichioli 2004; Azuay (El Cajas), Bolívar [38].

Onega musa Ferreira, Lozada & Takiya 2018; Zimora (*sic*.) = Zamora Chinchipe [39].

Onega orphne Takiya and Cavichioli 2004; Bolívar (Guaranda), Carchi (Los Laureles),

Cotopaxi (Las Pampas, Otonga), Imbabura (Apuela), Napo (Archidona, Reventador, Río Hollín), Pastaza (Puyo), Pichincha (Bellavista, Calacalí, Chiriboga, Guajalito, La Favorita, Mindo, Nono, Pahuma, Palmeras, Pululahua, Tandapi, Tandayapa)

Onega sanguinicollis (Latreille, 1811); Napo [39].

Onega stella Distant 1908; Napo (Cosanga), Pichincha (Papallacta).

Onega stipata (Walker 1851); Pichincha [2].

***Oragua* Melichar 1926**

Oragua gregoirei Young 1997; Cotopaxi (Otonga), Esmeraldas (Quinindé), Napo (Archidona, Daimi, Río Hollín), Orellana (Coca), Pastaza (Puyo), Sucumbíos, (El Reventador, Shushufindi).

***Orechona* Melichar 1926**

Orechona trifoveolata Melichar 1926; Bolívar (Balsapamba) [2].

***Pachitea* Melichar 1926**

Pachitea habenula (Jacobi 1905); Esmeraldas (La Boca), Imbabura (Guallupe), Los Ríos (Quevedo), Pichincha (Endesa, Los Bancos, Otongachi, Puerto Quito), Orellana (Coca).

Pachitea ryma Young 1977; Ecuador.

Pachitea subflava (Walker 1851); Los Ríos (Quevedo), Morona Santiago (Sucúa), Napo (Archidona, Baeza, El Reventador, San Rafael), Orellana (Coca), Pastaza (Villano), Santo Domingo (Santo Domingo), Sucumbíos (Shushufindi). New country record.

***Pamplona* Melichar 1926**

Pamplona emarginata Young 1977 [2,33].

***Paracrocampsa* Young 1968**

Paracrocampsa amida (Distant 1908); Esmeraldas (Cachabé), Cotopaxi (Las Pampas, Otonga), Napo (El Chaco), Orellana (Parque Nacional Yasuní), Pichincha (Guajalito, Los Bancos, Machachi, Mindo, Pachijal, Pedro Vicente Maldonado, Tandapi, Unión del Toachi), Sucumbíos (San Rafael).

Paracrocampsa discreta (Melichar 1926); Bolívar (Balzapamba (*sic*.) = Balsapamba), Guayas (Guayaquil), Los Ríos (Rio Palenque Biological Station) USNM [2,9].

Paracrocampsa nativa (Melichar 1926); Ecuador [2,24].

***Paromenia* Melichar 1926**

Paromenia auroguttata (Signoret 1853) [2].

Paromenia falcata Young 1977; Napo (Baeza, Tena), Pichincha (Pachijal).

Paromenia maculosa Young 1977; Bolívar (Balzpamba (*sic*.) = Balsapamba) (NCSU) [2,33].

Paromenia pellucida (Signoret 1853) [2].

Paromenia rossi Young 1977; Orellana (Tiputini Biodiversity Station), INHS [9].

Ecological Notes: Collected by canopy fogging in primary Amazonian rainforest.

Paromenia rufa (Walker 1851) [2].

Paromenia sp.; Orellana (Estación Científica Yasuní).

Paromenia new species 1; Napo (Río Hollín), Pichincha (Nanegalito).

Paromenia new species 2; Cotopaxi (Las Pampas), Guayas (La Rinconada), Loja (Loja), Napo (Cascada de San Rafael, El Reventador, Misahualli, Río Hollín), Pichincha (Aloag, Calacalí, Guajalito, La Favorita, Mindo, Nanegalito, Niebli, Nono, Otongoro, Pahuma, Tandapi, Tandayapa, Vía Santo Domingo), Orellana (Dayuma).

***Pawiloma* Young 1977**

Pawiloma eclesia (Melichar 1926); Lofa (*sic*) = Loja.

Pawiloma feminina Young 1977; Los Ríos (Palenque), Napo (Papallacta), Pichincha (Guajalito, Palmeras, Pasochoa), Tungurahua (Baños).

*Pawiloma multilunatula (*Breddin 1901); Cotopaxi (Las Pampas), Orellana (Yasuní), Pichincha (Chiriboga, Las Palmas, Mindo, Nanegalito, Tandapi, Tandayapa).

Pawiloma sp1.; Esmeraldas (Kumanii).

Pawiloma sp2.; Esmeraldas (La Boca, San Lorenzo), Pichincha (Guayllabamba, Nanegalito, Pachijal, Puerto Quito, Quevedo), Santo Domingo (Santo Domingo).

***Peltocheirus* Walker 1858**

Peltocheirus paradoxus Melichar 1926; Pastaza (Villano). New country record.

***Platygonia* Melichar 1925**

Platygonia infulata Young 1977; Pastaza (Tuyo (*sic*) = Puyo) USNM [2,33].

Platygonia spatulata (Signoret 1854); BMNH [2].

Platygonia zea (Distant 1908); Cachabe, BMNH [2].

***Plesiommata* Provancher 1889**

Plesiommata corniculata Young 1977; [1,33].

Plesiommata mollicella Fowler 1900; [2].

***Procandea* Young 1968**

Procandea cirta (Distant 1908); Azuay (Cuenca) [2,24].

Procandea corticata (Signoret 1855); Pichincha (Quito) [2].

Procandea exasperatula Young 1968; Azuay (Yunguilla), Loja (Masanamaca), Pichincha (Puerto Quito, Pululahua), Santo Domingo (Santo Domingo).

Procandea marcia (Distant 1908) [2,24].

***Proconia* LePeletier and Serville 1825**

Proconia esmeraldae Melichar 1924; Napo (El Reventador, Río Hollín, San Rafael), Pastaza (Río Liquino). New country record.

Proconia fusca Melichar 1924; Napo (Avila Viejo, Cuyabeno, Hermano Miguel, Misahualli), Orellana (Estación Chiruisla, Estación Científica Yasuní, Estación Río Huiririma, Misahualli, Yasuní), Pastaza (Villano), Pastigga [40].

Host Plants: *Citrus sinenis* [41].

Proconia lutzi Schmidt 1928; Orellana (Coca) [2,24].

Proconia marmorata (Fabricius 1803) [17].

Plant associations: *Elaeis guineensis, Theobroma cacao.*

***Proconobola* Young 1968**

Proconobola dubia (Schmidt 1928) [2,24].

***Proconopera* Young 1968**

Proconopera cumingi (Schmidt 1928); Pichincha (Quito) [2,24].

***Proconosama* Young 1968**

Proconosama columbica (Signoret 1855); Napo (Campana Cocha, Cosanga, Cuyuja).

Proconosama haenschi (Melichar 1926); Napo (Archidona, Río Hollín), Pastaza (Puyo), Pichincha (Los Bancos, Palmeras), Zamora Chinchipe (Palanda).

***Pseudometopia* Schmidt 1928**

Pseudometopia amblardii (Signoret 1855); Esmeraldas (Kumanii), Loja (Saraguro), Morona Santiago (Gualaquiza), Napo (Archidona, Limoncocha, Misahualli, Mondayacu, Puerto Napo, Río Hollín, Sacha, San Bernardo, San Rafael, Shushufindi, Talag, Tena), Orellana (Coca, La Joya de los Sachas), Zamora Chinchipe (El Pangui).

Plant Association: *Elaeis guineensis* [17].

Pseudometopia phalaesia (Distant 1908); Napo (Puerto Napo, Río Hollín, Talag, Tena), Orellana (Tiputini Biological Station), Sucumbíos (Lumbaqui, Nueva Loja). New country record.

Plant Association: *Elaeis guineensis* [17].

Ecological Notes: Collected by canopy fogging.

***Pseudophera* Melichar 1925**

Pseudophera tibialis Schmidt 1928; Cotopaxi (Las Pampas), Esmeraldas (Teaone), Manabí (Barranco Colorado, La Pila), Pichincha (Otongachi).

***Ramosulus* Young 1977**

Ramosulus corrugipennis (Osborn 1926); Napo (Río Hollín), Pichincha (Pomasqui, Unión del Toachi).

***Raphirrhinus* LaPorte 1832**

Raphirrhinus phosphoreus (Linneaus 1758); Bolívar (Totoras), Guayas (La Rinconada), Napo (Archidona, Campana Cocha, Cascada de San Rafael, Jatun Sacha, La Joya de los Sachas, La Serena, Las Palmas, Loreto, Misahualli, Río Hollín, San Rafael, Shushufindi), Orellana (Coca, Estación Río Huiririma), Pastaza (Puyo), Pichincha (Guajalito), Sucumbíos (Campo Bermejo, El Reventador, Limoncocha), Tungurahua (Río Cristal).

Plant Associations: *Elaeis guineensis, Teobroma cacao* [17].

Ecological Notes: Collected by canopy fogging in primary Amazonian rainforest.

***Schildola* Young 1977**

Schildola abrupta Young 1977; [2,33].

***Selvitsa* Young 1977**

Selvitsa cachabensis (Distant 1908); Cachabe [2,33].

***Serpa* Distant 1908**

Serpa plumbae (Walker 1851); Tungurahua (Baños), NCSU [2,33].

***Sibovia* China 1927**

Sibovia festana Young 1977; [2,33].

Sibovia nielsoni Young 1977; [1,33].

Sibovia taeniatifrons (Schmidt 1928) [2,33].

Sibovia sp.; Cotopaxi (Cotopaxi, Las Pampas, Otonga), Imbabura (Rocafuerte), Manabí (Canoa), Napo (Archidona, El Chaco, Misahualli, Río Hollín, San Rafael), Pichincha (Chiriboga, El Reventador, Estación Científica Río Guajalito, Guajalito, Los Bancos, Mindo, Mitad del Mundo, Nanegalito, Nono, Otongachi, Pacto, Palmeras, Puerto Quito, San Juan, Tandapi, Tandayapa, Unión del Toachi), Santo Domingo (Santo Domingo), Sucumbíos (Cascada de San Rafael, El Reventador, La Virgen), Tungurahua (Baños, Río Verde).

***Soosiulus* Young 1977**

Soosiulus servulus (Melichar 1932); Napo (Jatun Sacha, Ñachiyacu), Orellana (Coca, Estación Científica Yasuní, Loreto), Pichincha (Puerto Quito), Sucumbíos (Shushufindi).

***Sphaeropogonia* Breddin 1901**

Sphaeropogonia aureatula Breddin 1901; Napo (La Joya de los Sachas, Taracoa), Orellana (Coca), Sucumbíos (Lago Agrio).

Sphaeropogonia maculipennis Schmidt 1928; Guayas (Sabanilla) [2].

***Splonia* Signoret 1891**

Splonia actualis Signoret 1891; Napo (Baeza), INHS [2].

Splonia brevis (Walker 1851); Tungurahua (Baños, Río Blanco, Yunguillas), Pastaza (Río Blanco), USNM [2,9].

Splonia flavoscutellata Takiya & Mejdalani 2011; Sucumbíos (Santa Barbará) [42].

Splonia nasti Young 1968; Bolívar (Balzapamba (sic.) = Balsapamba), NCSU, Morona Santiago (Macas), USNM [2,9,24].

***Stehlikiana* Young 1977**

Stehlikiana coalita Young 1977; [2,33].

Stehlikiana crassa (Walker 1851); Bolívar (Cashca Totoras, Guanujo, Guaranda, Totoras), Chimborazo (Chunchi), Cotopaxi (Laso, Pilaló), Napo (Río Hollín), Pichincha (Alluriquín, Calacalí, Chiriboga, El Cachaco, Lloa, Pasochoa, Pedro Vicente Maldonado, Pululahua, Quito, San Juan), Tungurahua (Baños).

Stehlikiana gryllula (Breddin 1901); Tungurahua (Baños), NCSU [2,33].

Stehlikiana latercula (Breddin 1901); Paramo de Anango, NCSU [2].

Stehlikiana torquata Young 1977; Tungurahua (Baños), NCSU [2,33].

Stehlikiana sp.; Loja (Loja), Napo (Archidona, Campana Cocha, Cosanga, Río Malo), Pichincha (Pifo), Tungurahua (Baños, Machay, Río Blanco).

***Stephanolla* Young 1977**

Stephanolla remota Young 1977; Esmeraldas (Kumanii, Quinindé), Pichincha (Pachijal, Unión del Toachi), Santo Domingo (Santo Domingo).

***Stictoscarta* Stål 1869**

Stictoscarta amazonensis Young 1968; NMNH [2,24].

Stictoscarta exoleta Melichar 1926; Manabí (Barranco Colorado), Orellana (Estación Rio Huiririma, Yasuní), Sucumbíos (Guarumo). New country record.

***Tapajosa* Melichar 1924**

Tapajosa spinata Young 1968; NCSU [2,24].

***Teleogonia* Melichar 1925**

Teleogonia clathrata (Signoret 1855); Napo (Baeza). New country record.

Teleogonia jacobi Melichar 1925; Napo (Cordillera de los Guacamayos, Cosanga), Orellana (Yanayacu), Sucumbíos (El Calvario), Tungurahua (Bados (*sic*.) = Baños).

Teleogonia nigrifrons Schmidt 1928; Guayas (Balzapamba (*sic*.) = Balsapamba), IZP [2].

Teleogonia sp.; Cotopaxi (Las Pampas, Otonga), Guayas (La Rinconada), Napo (Cosanga, San Rafael, Tres Cruces), Pastaza (Río Liquino), Pichincha (Calacalí, Chiriboga, Guajalito, La Ilusión, Las Palmas, Las Pampas Argentinas, Mindo, Nanegalito, Pacto, Palmeras, Tandayapa, Turbante), Sucumbíos (Parque Nacional Yasuní).

***Teletusa* Distant 1908**

Teletusa límpida Signoret 1855; Orellana (Okanegare, Tiputini Biodiversity Station), Sucumbíos (Sacha Lodge), INHS [9].

Plant Association: *Citrus sinensis*

Ecological Notes: Collected by canopy fogging in primary Amazonian rainforest.

***Tettigonia* Olivier 1789**

Tettigonia immaculata Walker 1851; Pichincha (Quito), BMNH [2].

***Tettisama* Young 1977**

Tettisama bisellata (Signoret 1862); Esmeraldas (Kumanii), Morona Santiago (Gualaquiza), Napo (Archidona, Campana Cocha, Campanallacu, Itaya, Joya de los Sachas, Limoncocha, Loreto, Misahualli, Punta Ahuano, Río Hollín, Río Zabalo, Sacha, Shushufindi, Yuturi), Orellana (Coca, Estación Científica Yasuní, La Joya de los Sachas), Pastaza (Pandanuque, Puyo), Pichincha (Mindo, Puerto Quito), Sucumbíos (Campo Bermejo, El Eno, El Reventador, Lago Agrio, Puerto Libre), Zamora Chinchipe (Zamora).

***Tettiselva* Young 1977**

Tettiselva pedia Young 1977; Abitagua, NCSU [2,33].

***Tipuana* Young 1977**

Tipuana chirensis Young 1977; Napo (Puerto Montúfar) USNM [2,33].

***Torresabela* Young 1977**

Torresabela fairmairei (Signoret 1853) [2].

***Tortigonalia* Young 1977**

Tortigonalia adunca Young 1977; Tungurahua (Baños), NCSU [2,33].

Tortigonalia treva Young 1977; BMNH [2,33].

***Tretogonia* Melichar 1926**

Tretogonia conspicua Melichar 1926; Paramba [2,24].

Tretogonia notatifrons Melichar 1926; [2,24].

Plant Associations: *Dacus carota, Rauwolfia ligustrina, Helianthus annus, Zea mays, Capsicum annum, Solanum gracile, Solanum sisimbriifolium* [16].

Tretogonia punctatissima Melichar 1926; Bolívar (Caluma), Carchi (El Ángel, El Chical), Cotopaxi (Guasaganda, Los Libres, Otonga), Esmeraldas (Durango, La Boca, Quinindé), Imbabura (El Corazón, Lita), Los Ríos (Patricia Pilar, Río Palenque), Manabí (Calceta, Machalilla), Pichincha (Alluriquín, Calacalí, Conocoto, Endesa, Guajalito, Las Palmeras, Las Pampas Argentinas, Los Bancos, Maquipucuna, Mindo, Nanegal, Nanegalito, Nono, Otongachi, Pachijal, Pacto, Pahuma, Palmeras, Puerto Quito, Pedro Vicente Maldonado, Unión del Toachi), Santo Domingo (Santo Domingo), MMBC.

Tretogonia tomentosa (Distant 1908); Santo Domingo (Santo Domingo). NCSU [2,24].

***Trichogonia* Breddin 1901**

Trichogonia ardentula Breddin 1901; Cotopaxi (Volcán Cotopaxi).

Trichogonia duplicaría (Distant 1891); Bolívar (Cashca Totoras, Salinas), Chimborazo (Alausí), Cotopaxi (Laso), Pichincha (Quito), Perú (Huancabamba).

Trichogonia intermedia Schmidt 1928; [2].

Trichogonia isabellula Breddin 1901; Tungurahua (Baños), Páramo de Anango [2].

***Tubiga* Young 1977**

Tubiga debilis Young 1977; [2,33].

***Tylozygus* Fieber 1866**

Tylozygus fasciatus (Walker 1851); El Oro (Santa Rosa), Esmeraldas (Cupa, Hacienda Pallares, La Boca, La Sexta, La Unión, Quinindé, San Lorenzo), Los Ríos (Quevedo), Manabí (Puerto López), Napo (Archidona, Tena), Orellana (Coca), Pichincha (Mindo, Otongachi, Río Alambi, Unión del Toachi), Santo Domingo (Santo Domingo), Sucumbíos (El Eno).

Plant Associations: Rice, maize, beans, soy [22].

Tylozygus geometricus (Signoret 1854) [1].

***Wolfniana* Cavichioli 2000**

Wolfniana limbatula (Osborn 1926) [2].

***Zaruma* Melichar 1926**

Zaruma vexata Melichar 1926; Pichincha (Peurto Quito (*sic*.) = Puerto Quito), BMNH [2].

***Zyzzogeton* Breddin 1902**

Zyzzogeton haenschi Breddin 1902; Bolívar (Balzapampa (*sic*.) = Balsapamba), Cotopaxi (Las Pampas), Napo (Yanayacu), Pastaza (Lorocachi), Pichincha (Otongachi, Unión del Toachi), Santo Domingo (Santo Domingo).

Zyzzogeton viridipennis (Latreille 1811); Carchi (El Chical), Cotopaxi (El Palmar, Las Pampas, Otonga), Esmeraldas (Cachabi), Imbabura (Los Cedros), Pichincha (Alluriquín, Aloag, Maquipucuna, Mindo, Palmeras, Río Umachaca, Tandapi), Tungurahua (Río Blanco).

Species List – Cicadellidae of the Galápagos Islands

***Agallia* Curtis 1833**

Agallia pecki Freytag 2004; Galápagos (Isabela, Santiago).

Agallia plana (Butler 1877); Galápagos (Floreana, Santa Cruz) [43].

Ecological notes; Endemic.

Agallia repleta Van Duzee 1907; [1].

Agallia striolaris (Butler 1877); Galápagos (Floreana, Santa Cruz) [43,44].

Ecological notes; Endemic.

***Amplicephalus* DeLong 1926**

Amplicephalus insularis (Van Duzee 1933); Galápagos (Fernandina, Floreana, San Cristóbal, Santa Cruz).

Ecological notes; Endemic.

***Austroagallia* Evans 1935**

Austroagallia mera (Van Duzee 1937); Galápagos (Santa Cruz, Santiago) [43,45,46].

Ecological Notes; Endemic, humid forest.

***Balclutha* Kirkaldy**

Balclutha aridula Linnavuori 1959; Galápagos (Fernandina, Isabela, Rábida, Santiago) [47].

Ecological notes; Introduced on plant material.

Balclutha incisa (Matsumura 1902); Galápagos (Española, Fernandina, Isabela, Rábida, Santa Cruz, Santiago) [43,47].

Ecological notes; Introduced on plant material. Littoral to humid forest and agricultural zones.

Balclutha lucida (Butler 1877); Galápagos (Fernandina, Isabela, Marchena, Pinta, Rábida, San Cristóbal, Santa Cruz, Santiago) [43].

Plant Associations: Grasses [48].

Ecological notes; Introduced on plant material. Arid to pampa and agricultural zones, very abundant.

Balclutha neglecta (DeLong & Davidson 1933); Galápagos (Fernandina, Isabela, Pinzón) [43,47].

Ecological notes: Introduced on plant material. Arid to pampa and agricultural zones.

Balclutha rosea (Scott 1876); Galápagos (Espanola, Floreana, Isabela, Marchena, Pinta, San Crtistóbal, Santa Cruz, Santiago).

Ecological notes, Arid to pampa and agricultural zones.

Balclutha sp.; Cotopaxi (San Francisco de las Pampas).

***Cicadulina* China 1926**

Cicadulina tortilla Caldwell 1952; Galápagos (Fernandina, Floreana, Isabela (Sierra Negra), San Cristóbal, Santa Cruz, Santiago) [43].

Ecological notes; Arid to pampa zones.

***Circulifer* Zachvakin 1935**

Circulifer tenellus (Baker 1895); Galápagos (Bartolomé, Española, Floreana, Genovesa, Isabela, Marchena, Pinta, Pinzón, Rábida, San Cristóbal, Santa Cruz, Santa Fé, Seymour) [43,47].

Ecological notes; Introduced on plant material. 0 to 40 m elevation, Littoral, mangrove and arid zones. Village hábitats.

***Coelidiana* Oman 1938**

Coelidiana krameri Freytag 2000; Galápagos (Floreana, Isabela, Santa Cruz) [43,47,49].

Ecological notes; Introduced on plant material. Transition and humid forest zones.

***Docalidia* Nielson 1979**

Docalidia longiuscula Nielson 2011; [50].

Docalidia mckameyi Nielson 2011; [50].

Docalidia spangleri Nielson 1997; Galápagos (Floreana, Isabela, San Cristóbal, Santa Cruz) [43].

Ecological Notes; Endemic, Arid to Pampa Zone, 100 to 1000 m.

Docalidia tantula Nielson 2011 [50].

Docalidia zahniseri Nielson 2011 [50].

***Empoasca* Walsh 1862**

Empoasca canavalia DeLong; Galápagos (Fernandina, Floreana, Isabela, Marchena, Pinta, Pinzón, San Cristóbal, Santa Cruz, Santiago).

Ecological notes: Introduced on plant material. Coastal zone.

***Exitianus* Ball 1929**

Exitianus fasciolatus (Melichar 1911); (Fernandina, Floreana, Isabela, Rábida, San Cristóbal, Santa Cruz, Santiago. Seymour) [43].

Ecological notes; 0 to 1320 m, coastal lagoon grasses, villages, agricultural areas to pampa zones.

***Jikradia* Nielsen 1979**

Jikradia galapagoensis (Osborn 1924); Galápagos (Isabela, Santa Cruz, Santiago) [43].

Ecological Notes: Littoral and arid zones on grass-sedges at coastal salt lagoons, mangroves.

***Macrosteles* Fieber 1866**

Macrosteles fascifrons (Stål 1858); Galápagos (Isabela, San Cristóbal, Santa Cruz, Santiago) [47].

Ecological notes; Introduced on plant material.

***Sanctanus* Ball 1932**

Sanctanus discalis (Melichar 1911); Galápagos (Fernandina, Floreana, Marchena, Pinta, Santiago) [43,47].

Ecological notes; Endemic, introduced on plant material, 0 to 400 m, littoral, arid, and transition zones.

***Scaphoideus* Uhler 1889**

Scaphoideus obliquus Van Duzee 1933; Galápagos (Fernandina, Isabela, Pinzón, San Cristóbal, Santa Cruz, Santiago) [47,51].

Ecological notes; Introduced on plant material.

***Scaphytopius* Ball 1931**

Scaphytopius (*Cloanthanus*) *aequinoctialis* (Van Duzee 1933); Galápagos (Fernandina, Floreana, Genovesa, Isabela, Marchena, Pinta, Pinzón, San Cristóbal, Santa Cruz, Santiago) [43].

Ecological notes, Endemic.

Scaphytopius (*Cloanthanus*) *obliquus* (Walker 1851); Galápagos (Fernandina, Isabela, Pinta, San Crtistóbal, Santa Cruz, Santiago) [43].

Ecological Notes; Endemic, Transition to evergreen shrub zones.

***Xestocephalus* Van Duzee 1892**

Xestocephalus desertorum (Berg 1879); Galápagos (Fernandina, Floreana, Isabela, Marchena, Pinta, San Cristóbal, Santa Cruz, Santiago, Seymour).

Ecological Notes; Widespread and common in arid to pampa zone. Introduced on plant material [43,47].

Discussion

It was not uncommon, especially in species represented by a large series of specimens, for there to be outliers from the distribution of the majority of specimens. In distributions that include the eastern or western cloud forests, these outliers have been collected in the highlands and probably represent wind-assisted dispersion. It was common for most of the species in the QCAZ collection to have distributions that encompass two, three or even four of the general biotic habitat zones. Some species have apparently followed the expansion of agriculture and inhabit these areas regardless of original habitat type. Another explanation for these wide distributions is that these insects are wind dispersed and can passively colonize a wide geographic region.

Some genera are conspicuously missing from the Ecuadorian fauna, e.g. *Fusigonalia, Isogonalia*. Species in these genera are noted in the literature as being present in every country surrounding Ecuador; Colombia, Brazil, Perú, but not in Ecuador. Comparison with the Colombian fauna [1] is interesting. For the Cicadellini and Proconiini in the Cicadellinae, our listing contains 64 of 157 genera (41%) and 27 of 56 genera (48%) found in Colombia, respectively. Conversely, most of the genera on our list are reported from Colombia. Only six of the genera (6%) in our list are not listed by Freytag and Sharkey [1] as found in Colombia. These genera are *Agallia, Cicadella, Lanceoscarta, Lautereria, Stictoscarta* and *Tretogonia*. However, Wilson et al. [2], citing Young [24], list one species of *Cicadella*, two species of *Lautereria* (one species, *L. dietzi*, that occurs in Ecuador), two species of *Stictoscarta* (the same two that occur in Ecuador) and two species of *Tretogonia* from Colombia. This leaves only *Agallia* from Galápagos and *Lanceoscarta* as two genera not shared with Colombia. The two species of *Lanceoscarta, L. bilobata* and *L. ecuadoriana*, were only collected by canopy fogging in primary Amazonian rainforest and were only recently described in 2005 [35].

Of the genera found in Galápagos, few have been recorded from the Ecuadorian mainland with the exception of *Docalidia* (four new species described by Nielson in 2007), a single specimen of *Balclutha* in the collection that could not be identified to species, and *Agallia*. This suggests that the Galápagos Cicadellidae dispersed to the Galápagos from other countries either by wind dispersion or in plant material shipped to Galápagos. The other genera (*Circulifer, Coelidiana, Empoasca, Jikradia, Macrosteles, Sanctanus, Scaphoideus, Scaphytopius* and *Xestocephalus*) found in Galápagos are all represented in the mainland of Colombia but not in Ecuador.

The collecting locale bias noted for the Cicadellinae of Ecuador is not unique to this subfamily. This pattern of intense collecting at only a few sites favored by easy road access or infrastructure of established scientific stations is widespread throughout the Neotropics. Donoso et al. [52] noted a similar pattern for type specimens collected in Ecuador.

In all probability, this list represents a fraction of the total Cicadellinae fauna of Ecuador. Much of the collecting activity for this group has been centered on established sites with relatively easy access. Much of the collecting in the Amazonian rainforest has been near the Estación Científica Yasuní, the Tiputini Biodiversity Station in Orellana and the Villano site in Pastaza. Vast areas of Amazonia in Ecuador remain unexplored entomologically. Although every province of Ecuador except Santa Elena is represented in this list, many areas remain under collected. We have a small section of the Chocó coastal forest in Esmeraldas province that represents a threatened habitat with unknown biodiversity. In general, the south of Ecuador including dry coastal areas, cloud forest, especially in the east, Podocarpus National Park and the Amazonian provinces of Zamora Chinchipe and Morona Santiago have not been adequately investigated or surveyed. Cloud forest habitats on both the eastern and western slopes of the central cordillera of the Andes have been sampled at only a few locations. It is likely that there is substantial undocumented biodiversity, not only in the Cicadellidae, in these areas.

Sixteen species were collected in canopy fogging samples taken in primary rainforest, *Acrobelus rakitovi, Acrogonia lobulata, Ciccamera hamata, Dichrophleps boliviana, Diestotemma dubium, Diestostomma olivia, Icthyobelus regularis, Lanceoscarta bilobata, Lanceolata ecuadoriana, Lissocarta caututaria, Molomea fatalis, Molomea virescens, Omagua fitchii, Paromenia rossi, Raphirhinus phosphoreus* and *Teletusa limpida*. Several of these are reported as feeding on oil palm and probably also feed on other palm species high in the canopy. Several others represent new country records for Ecuador. Six are new species only described from canopy fogging samples. These canopy samples were taken at only two sites in the Ecuadorian Amazon, Tiputini Biodiversity Station and the Okanegare site near the Estación Científica Yasuní. Canopy samples taken from other locations using fogging or other techniques are likely to yield additional new species. There is a large collection of unsorted canopy samples from Dr. Terry Erwin's canopy fogging program over a number of years. These samples are primarily stored at the Museum of the Escuela Politécnica Nacional (EPNC) in Quito and a smaller, more recent group (2019) at the Pontifical Catholic University of Ecuador Museum of Zoology – Invertebrate Section (QCAZ). The samples at EPNC are unsorted and uncurated (Dr. David Donoso, Personal Communication) but probably contain a number of new Cicadellinae taxa. The canopy represents an important habitat for entomological sampling of the Cicadellidae that should be explored further.

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