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## Article

# New Records of Sharpshooters (Hemiptera, Cicadellidae, Cicadellinae) in Citrus Orchards in the Amazonas State, Brazil

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**Simple summary:** We investigated the distribution of eight sharpshooter species in seven citrus orchards in Amazonas State, Brazil. These insects are ecologically significant and can carry the bacterium *Xylella fastidiosa*, which causes citrus variegated chlorosis, a disease that can severely impact crop yields. While some sharpshooter species were previously known locally, we formally document their presence and distribution, a crucial first step in understanding their role in the ecosystem and potential disease risks. We also identified new records of sharpshooter species in Amazonas. Mapping the locations of these insects can provide valuable insights into their habits, aiding in the development of strategies to manage the threat of this bacterium in local citrus crops.

**Abstract:** This study reports new records of eight species of Cicadellini (Hemiptera, Cicadellidae, Cicadellinae), all potential vectors of the bacterium *Xylella fastidiosa* Wells et al. 1987, which causes citrus variegated chlorosis. The sharpshooters were captured using a sweeping net in citrus orchards across seven municipalities in Amazonas State, Brazil. This research addresses the lack of information on sharpshooter occurrence in the Amazonas region, emphasizing the need for further investigations in this area.

**Keywords:** amazonia; citrus variegated chlorosis; vector; *Xylella fastidiosa*

## Introduction

The Cicadellinae is the third most populous subfamily of Hemiptera, comprising approximately 2,400 species (Bartlett et al., 2018). It includes two tribes: Proconiini Stål, 1869, which is limited to the New World and accounts for about 20% of the species, and Cicadellini Latreille, 1825, which has around 80% of the species and is found in all zoogeographic regions, particularly abundant in the Neotropical region (South America) (Young, 1968, 1977; Mejdalani, 1998). This subfamily encompasses numerous species widely distributed across various biomes (Redak et al., 2004; Cornara et al., 2019; Haddad et al., 2024). Cicadellinae species are polyphagous and serve as vectors for plant pathogens. *Xylella fastidiosa*, the bacterium responsible for citrus variegated chlorosis (CVC), is confined to xylem vessels and causes diseases in various agricultural plants (Hopkins, 1989). In Brazil, 25 vector species transmit this bacterium to citrus, plums, coffee, and olive trees (Cornara et al., 2019; Müller et al., 2021; Carvalho et al., 2022; Froza, 2022).

In Brazil, citrus cultivation has been extensively studied within the context of the CVC pathosystem (Cornara et al., 2019; Carvalho et al., 2022). The Amazonas State ranks as the third-largest orange (*Citrus sinensis* (L.) Osbeck) producer in the Northern region, with a production of 22,027 tons (IBGE, 2022). However, research on CVC disease and its vectors in this area is still in its

early stages. Recent studies have indicated the presence of the disease (Araújo, 2023) and have identified sharpshooter species with the potential to transmit *X. fastidiosa* (Feitosa, 2017).

In a recent study in the Amazonas region, Feitosa (2017) conducted a doctoral thesis (unpublished) that represents the first survey of sharpshooters (Cicadellinae) in three citrus orchards across two municipalities: Manacapuru and Rio Preto da Eva. A total of 51 taxa were identified, including 39 from the tribe Cicadellini and 12 from the tribe Proconiini. Among these taxa, 32 species were recognized, while 19 were identified as morphospecies that are likely new to science or misidentified. The presence of these species poses a potential risk for the spread of CVC, which could result in significant economic losses for the local citrus industry.

Despite their potential role as disease vectors, information on the distribution and diversity of sharpshooters (Cicadellinae) in Amazonian citrus orchards is limited. In this scenario, this study addresses this knowledge gap by morphologically characterizing sharpshooter species and establishing new occurrence records within the Amazonas state. By doing so, we aim to enhance our understanding of the geographical distribution of these species throughout the Amazon biome and across Brazil.

## Methods

The collections were conducted between March 2022 and April 2023 in sweet orange orchards situated in the municipalities of Beruri, Careiro, Iranduba, Itacoatiara, Manaus, Presidente Figueiredo, and Rio Preto da Eva in the Amazonas State.

Sharpshooters were collected using a sweeping net from both ground vegetation and canopy trees. The collection process was conducted in 10 rows. For the ground-level collection, approximately 80 sweeps were performed over 50 linear meters of ground vegetation. For the canopy collection, 30 trees were selected, and sweeps were conducted along the entire outer edge of each canopy tree.

The sharpshooters were identified by examining their morphological characteristics and comparing them to genus reviews, species descriptions, and digital images of Cicadellinae on the website "Sharpshooter Leafhoppers of the World" (Wilson et al., 2009). Additionally, species identifications were confirmed by separating the male terminalia according to the methodology described by Azevedo-Filho and Carvalho (2006). Images of adult specimens and their terminal structures were captured using a Nikon SMZ25 trinocular stereomicroscope. All specimens used in this study were accurately identified, preserved in 70% alcohol, and deposited in the Entomology and Acarology Laboratory's collection (LEA) at the Universidade Federal do Amazonas/UFAM – CEA.

The map depicting the geographic distributions of sharpshooter species was created using QGIS-OSGeo4w-3.34-1 (<http://qgis.org>). Additionally, the distribution records were compiled from a literature review, which included published articles on faunistic records and surveys of sharpshooters across various regions of Brazil.

## Results

A total of 1,922 sharpshooter individuals were collected from seven locations in the Amazonas State, representing eight species. These species have expanded their geographical distribution to include the Amazon biome and Brazil (Figure 1). *Scopogonalia amazonensis* Leal & Creão-Duarte, 2016 (seven individuals) was recorded for the second time in Amazonas (Leal et al., 2016), albeit with a new collection site (Figure 1). Similarly, *Macugonalia moesta* (Fabricius, 1803) (463 individuals), *Plesiommata corniculata* Young, 1977 (622 individuals), *Erythrogonia sexguttata* (Fabricius, 1803) (31 individuals), *Diedrocephala bimaculata* (Gmelin, 1789) (three individuals), and *Hortensia similis* (Walker, 1851) (785 individuals) we also recorded for the second time for the state, with the first documentation originating from Feitosa's (2017) unpublished work. Consequently, we propose formalizing and expanding the geographic distribution of these species in the Amazonas region. Additionally, *Xyphon reticulatum* (Signoret, 1854) (nine individuals) and *Scoposcartula oculata*

(Signoret, 1853) (two individuals) were recorded for the first time in the Northern region and Amazonas State, respectively (Figure 1).

*Diedrocephala bimaculata* (Gmelin, 1789)

Figures 1, 2A, 3A

**New record.** BRAZIL – **Amazonas** • Beruri; 3°43'38"S, 61°15'00"W; 23.IV.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 1♀, UFAM-CEA 0001 • Careiro; 3°29'21.0"S, 60°08'59.0"W; 20.IV.2023; P.V.M. Franco leg.; orange orchard; sweeping net; 1♂, UFAM-CEA 0002 • Presidente Figueiredo; 1°26'28.2"S, 60°15'17.3"W; 08.III.2023; P.V.M. Franco leg.; orange orchard, sweeping net; 1♀, UFAM-CEA 0003.

**Previous records in Brazil.** Amazonas (Manacapuru and Rio Preto da Eva) (Feitosa 2017); Bahia (Miranda et al. 2009); Espírito Santo (Antunes et al. 2015; Resende 2020), Minas Gerais (Froza 2017); Paraná (Molina et al. 2006); Rio de Janeiro (Mejdalani et al. 2009); Rio Grande do Sul (Ott et al. 2006; Müller 2008; Ringenberg et al. 2010; Paris et al. 2013; Faprin et al. 2014; Peruzo et al. 2014; Schneider et al. 2017); Santa Catarina (Menegatti et al. 2008; Giacomelli et al. 2022); São Paulo (Giustolin et al. 2009; Froza 2017).

**Identification.** Specimens of *Diedrocephala bimaculata* were identified using Young's (1977) key to genera and the species' original description. Additionally, morphological characteristics, including overall coloration and those of the male genitalia, were compared to those described by Azevedo-Filho et al. (2011, 2016). *Diedrocephala bimaculata* is generally brown to black in color. The crown and pronotum are dark brown with irregularly distributed white spots. A yellow-white stripe runs along the dorsal portion of the mesonotum, and a whiter stain, thickly bordered in black, is located near the apex of the clavus. The apical region of the forewings exhibits variations in spot patterns and colorations, including prominent red lines (Sakakibara & Cavichioli, 1982; Defea et al., 2022; Froza, 2022).

*Erythrogonia sexguttata* (Fabricius, 1803)

Figures 1, 2B, 3B

**New record.** BRAZIL – **Amazonas** • Beruri; 3°43'38"S, 61°15'00"W; 23.IV.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 1♂, UFAM-CEA 0004 • Iranduba; 3°12'15.6"S, 60°13'39.4"W; 01.IV.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 1♂, 4♀, UFAM-CEA 0005; 01.II.2023; *ibid*; *ibid*; 1♀, UFAM-CEA 0006 • Itacoatiara; 2°56'08.0"S, 59°09'18.6"W; 05.V.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 5♂, 13♀, UFAM-CEA 0007; 24.VIII.2022; *ibid*; *ibid*; 1♂, 2♀, UFAM-CEA 0008 • Presidente Figueiredo; 1°26'28.2"S, 60°15'17.3"W; 08.III.2023; P.V.M. Franco leg.; orange orchard, sweeping net; 1♀, UFAM-CEA 0009 • Rio Preto da Eva; 2°43'00.7"S, 59°26'40.3"W; 25.X.2022; *ibid*; *ibid*; 2 ♀, UFAM-CEA 0010.

**Previous records in Brazil.** Amazonas (Manacapuru and Rio Preto da Eva) (Feitosa 2017); Bahia (Miranda et al. 2000); Pará (Medler 1963); Rio de Janeiro (Mejdalani et al. 2009); São Paulo (Yamamoto and Gravena 2000; Coelho et al. 2008).

**Identification.** *Erythrogonia sexguttata* was identified based on Medler's (1963) review of genera and the work by Carvalho and Mejdalani (2014). The visual characteristics of our specimens matched the diagnostic characters provided in these references. The crown is reddish-brown with a pale-yellow, bifurcated, triangular spot on the posterior margin. This spot continues onto the pronotum, taking an oval shape. The forewings are reddish-brown with three large, pale-yellow spots bordered in black. One spot is located in the middle of the clavus, adjacent to the mesonotum's apex. Another spot lies on the median corium, adjacent to the costal margin. The third spot occupies the apical portion of the clavus and the adjacent area of the corium.

*Hortensia similis* (Walker, 1851)

Figures 1, 2C

**New record.** BRAZIL – Amazonas • Beruri; 3°43'38"S, 61°15'00"W; 23.IV.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 2♂, 6♀, UFAM-CEA 0011; 06.X.2022; *ibid*; *ibid*; 1♂, 3♀, UFAM-CEA 0012 • Careiro; 3°29'21.0"S, 60°08'59.0"W; 12.VIII.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 9♂, 11♀, UFAM-CEA 0013 • Iranduba; 3°12'15.6"S, 60°13'39.4"W; 01.IV.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 86♂, 72♀, UFAM-CEA 0014; 01.II.2023; *ibid*; *ibid*; 35♂, 20♀, UFAM-CEA 0015 • Itacoatiara; 2°56'08.0"S, 59°09'18.6"W; 05.V.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 102♂, 82♀, UFAM-CEA 0016; 24.VIII.2022; *ibid*; *ibid*; 17♂, 5♀, UFAM-CEA 0017 • Manaus; 2°52'44.6"S, 60°04'39.9"W; 11.III.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 124♂, 96♀, UFAM-CEA 0018; 29.VIII.2022; *ibid*; *ibid*; 26♂, 32♀, UFAM-CEA 0019 • Presidente Figueiredo; 1°26'28.2"S, 60°15'17.3"W; 06.XII.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 2♂, 2♀, UFAM-CEA 0020 • Rio Preto da Eva; 2°43'00.7"S, 59°26'40.3"W; 18.IV.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 31♂, 21♀, UFAM-CEA 0021.

**Previous records in Brazil.** Amazonas (Manacapuru and Rio Preto da Eva) (Feitosa 2017); Bahia (Miranda et al. 2009); Espírito Santo (Antunes et al. 2015; Resende 2020); Minas Gerais (Froza 2017); Paraná (Molina et al. 2006; Nunes et al. 2007; Molina et al. 2016); Pernambuco (Ringenberg et al. 2014); Rio de Janeiro (Mejdalani et al. 2009); Rio Grande do Sul (Ott et al. 2006; Müller 2008; Ringenberg et al. 2010; Paris et al. 2013; Faprin et al. 2014; Peruzo et al. 2014; Schneider et al. 2017); Roraima (Cavichioli and Zanol 1991); Santa Catarina (Hickel et al. 2001; Giacomelli et al. 2022); São Paulo (Yamamoto and Gravena 2000; Marucci et al. 2002; Yamamoto et al. 2002; Coelho et al. 2008; Giustolin et al. 2009; Graner 2014; Froza 2017); Sergipe (Santos-Filho et al. 2017).

**Identification.** We identified this species using Young's (1977) key guide to morphological characteristics and compared them to our specimens. Additionally, we consulted the illustrations provided by Azevedo-Filho et al. (2011, 2016) for reference. *Hortensia similis* is characterized by a bright green coloration. The crown and anterior margin of the pronotum are light green, with a series of black linear marks and a central stripe. This stripe bifurcates anteriorly, forming the base of a triangle and containing two black spots at the line of the anterior mesonotum. The edges and posterior portion of the forewings are colorless, while the hindwings are brownish-black. The clypeus is brownish-yellow, and the anterior portion of the scutellum is yellowish with black marks. Notably, the clypeus is brownish-yellow, but the chest and legs are yellow (Marucci 1998; Prando 2017).

*Macugonalia moesta* (Fabricius, 1803)

Figures 1, 2D, 3C

**New record.** BRAZIL – Amazonas • Beruri; 3°43'38"S, 61°15'00"W; 23.IV.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 3♀, UFAM-CEA 0022 • Careiro; 3°29'21.0"S, 60°08'59.0"W; 20.IV.2023; P.V.M. Franco leg.; orange orchard, sweeping net; 1♂, UFAM-CEA 0023 • Iranduba; 3°12'15.6"S, 60°13'39.4"W; 01.IV.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 225♂, 159♀, UFAM-CEA 0024; 01.II.2023; *ibid*; *ibid*; 1♀, UFAM-CEA 0025 • Itacoatiara; 2°56'08.0"S, 59°09'18.6"W; 05.V.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 15♂, 18♀, UFAM-CEA 0026; 24.VIII.2022; *ibid*; *ibid*; 5♂, 1♀, UFAM-CEA 0027 • Manaus; 2°52'44.6"S, 60°04'39.9"W; 11.III.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 1♂, 1♀, UFAM-CEA 0028; 29.VIII.2022; *ibid*; *ibid*; 4♂, 6♀, UFAM-CEA 0029 • Presidente Figueiredo; 1°26'28.2"S, 60°15'17.3"W; 06.XII.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 12♂, 11♀, UFAM-CEA 0030.

**Previous records in Brazil.** Amazonas (Rio Preto da Eva) (Feitosa 2017).

**Identification.** This species was identified using Young's (1977) key guide, which relies on morphological characteristics, particularly the position of the aedeagus. *Macugonalia moesta* has a bright coloration. A bright blue lateral band covers most of the crown, extending to the apex of the margins of the compound eyes. The apical crown appears black and round in dorsal view. Additionally, two lateral bands adorn the pronotum, and a black band borders the anterior margin of the mesonotum. The forewings display a thick blue band adjacent to the posterior apex of the mesonotum. This band expands toward the apical portion of the clavus, where it merges to form a heart-shaped marking.

*Plesiommata corniculata* Young, 1977

Figures 1, 2E, 3D

**New record.** BRAZIL – Amazonas • Beruri; 3°43'38"S, 61°15'00"W; 23.IV.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 5♂, 13♀, UFAM-CEA 0031; 06.X.2023; *ibid*; *ibid* 2♀, UFAM-CEA 0032 • Careiro; 3°29'21.0"S, 60°08'59.0"W; 12.VIII.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 94♂, 90♀, UFAM-CEA 0033 • Iranduba; 3°12'15.6"S, 60°13'39.4"W; 01.IV.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 46♂, 28♀, UFAM-CEA 0034; 01.II.2023; *ibid*; *ibid*; 7♂, 5♀, UFAM-CEA 0035 • Itacoatiara; 2°56'08.0"S, 59°09'18.6"W; 05.X.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 4♂, UFAM-CEA 0036; 24.VIII.2022; *ibid*; *ibid*; 1♂, UFAM-CEA 0037 • Manaus; 2°52'44.6"S, 60°04'39.9"W; 11.III.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 70♂, 49♀, UFAM-CEA 0038; 29.VIII.2022; *ibid*; *ibid*; 81♂, 84♀, UFAM-CEA 0039 • Presidente Figueiredo; 1°26'28.2"S, 60°15'17.3"W; 06.XII.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 2♀, UFAM-CEA 0040 • Rio Preto da Eva; 2°43'00.7"S, 59°26'40.3"W; 18.IV.2022; P.V.M. Franco leg.; orange orchard; sweeping net; 18♂, 12♀, UFAM-CEA 0041; 25.X.2022; *ibid*; *ibid*; 4♂, 7♀, UFAM-CEA 0042.

**Previous records in Brazil.** Amazonas (Manacapuru and Rio Preto da Eva) (Feitosa 2017); Bahia (Miranda et al. 2000); Paraná (Molina et al. 2016); Rio de Janeiro (Mejdalani et al. 2009); Rio Grande do Sul (Ott et al. 2006); Roraima (Cavichioli and Zanol 1991); Santa Catarina (Hickel et al. 2001); São Paulo (Yamamoto and Gravena 2000; Marucci et al. 2002; Yamamoto et al. 2002; Coelho et al. 2008; Giustolin et al. 2009; Graner 2014).

**Identification.** Species identification was based on the description provided by Young (1977). The crown is pale yellow, with two black circles encircling the ocelli and a central black spot at the apex. In dorsal view, the apical crown appears rounded. The pronotum bears two transverse bands of a brownish color. The forewings are hyaline with prominent brown longitudinal veins (Marucci 1998).

*Scopogonalia amazonensis* Leal & Creão-Duarte, 2016

Figures 1, 2F, 3E

**New record.** BRAZIL – Amazonas • Careiro; 3°29'21.0"S, 60°08'59.0"W; 20.IV.2023; P.V.M. Franco leg.; orange orchard, sweeping net; 6♂, 1♀, UFAM-CEA 0043.

**Previous records in Brazil.** Amazonas, Itacoatiara (Leal et al. 2016).

**Identification.** We identified the species by comparing its morphological characteristics to the descriptions provided by Leal et al. (2016). These are green sharpshooters with translucent green forewings marked with scattered dark spots of varying sizes. The background color of the crown, along with the anterior third of the pronotum and mesonotum, is greenish-yellow. The remaining dorsal surfaces are green. The crown bears a spot at the central apex of the anterior margin and possesses round green maculae surrounding the ocelli. These maculae are separated by a central black stripe. The pronotum has dark maculae located laterally on the posterior margin. The ventral body region is yellow, and the abdominal tergum is dark brown to black.

*Scoposcartula oculata* (Signoret, 1853)

Figures 1, 2G

**New record.** BRAZIL – Amazonas • Presidente Figueiredo; 1°26'28.2"S, 60°15'17.3"W; 18.X.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 2♀, UFAM-CEA 0044.

**Previous records in Brazil.** Bahia, Goiás, Maranhão, Mato Grosso, Minas Gerais, Rondônia, and São Paulo (Leal et al. 2009).

**Identification.** The identification of *Scoposcartula oculata* followed Leal et al. (2009). This species is a brown sharpshooter characterized by a punctate dorsal body surface. The crown has dark brown to black stripes along its lateral margins, which converge on the clypeus. The mesonotum has two dark bands, with the anterior band being wider than the posterior band. A dark brown to black macula adorns the scutellum, just anterior to the transverse sulcus. The forewings display a series of small white to yellow maculae scattered across the corium and clavus, positioned between the

longitudinal veins from the base to the median region. Additionally, two large, yellow-white spots bordered in black are located at the apical portion of the clavus, adjacent to the costal margin.

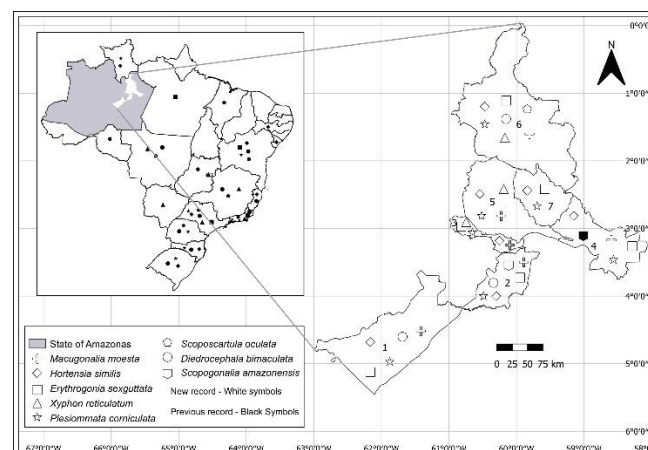
*Xyphon reticulatum* (Signoret, 1854)

Figures 1, 2H, 3F

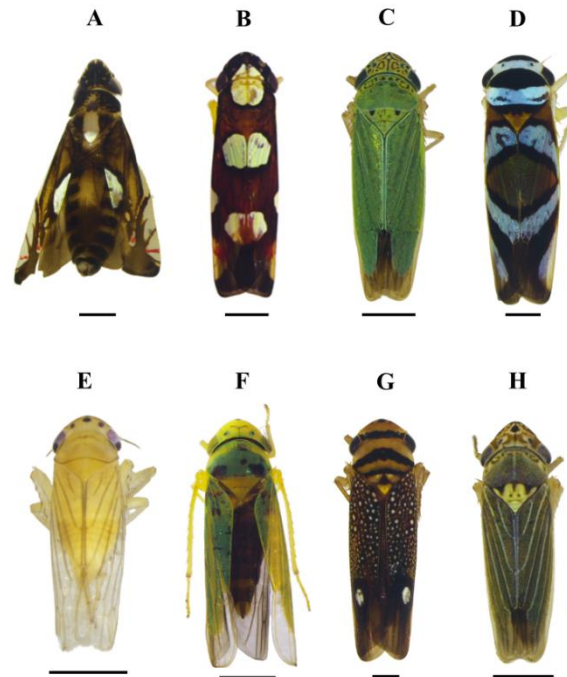
**New record.** BRAZIL – **Amazonas** • Iranduba; 3°12'15.6"S, 60°13'39.4"W; 01.IV.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 1♂, UFAM-CEA 0045 • Manaus; 2°52'44.6"S, 60°04'39.9"W; 11.III.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 1♂, 1♀, UFAM-CEA 0046 • Presidente Figueiredo; 1°26'28.2"S, 60°15'17.3"W; 06.XII.2022; P.V.M. Franco leg.; orange orchard, sweeping net; 3♂, 3♀, UFAM-CEA 0047.

**Previous records in Brazil.** Brasília, Mato Grosso, Mato Grosso do Sul, Minas Gerais (Catanach et al. 2013), Rio de Janeiro (Catanach et al. 2013; Silva et al. 2016), and São Paulo (Yamamoto 1996).

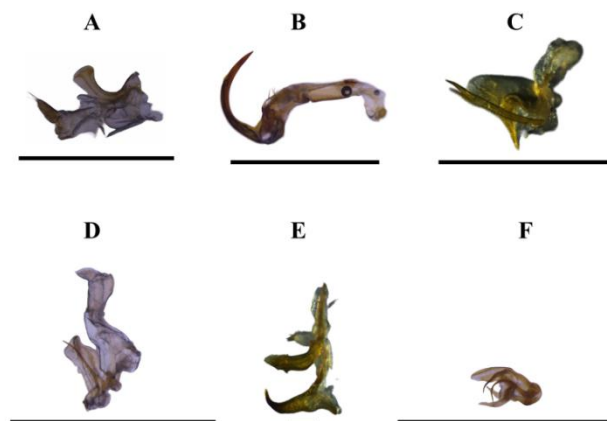
**Identification.** Species identification relied on the review of genera provided by Catanach et al. (2013). *Xyphon reticulatum* has a dark green coloration with variable marks on the crown. These marks are similar on the anterior pronotum. The central region of the pronotum is dark green, transitioning to yellow on the posterior portion. A well-defined median spot is present. The crown has a well-defined median spot and a dark brown medioapical macula. The median spot is encircled by cream pigment. Additional dark marks are visible, and the crown appears convex in lateral view. The pronotum exhibits dark green to brown circular marks with a white midline. The mesonotum is light green with two submedial spots. The forewings lack green pigmentation. Wings green-brown. The anal veins are green, and the apex has few crossveins.



**Figure 1.** Geographic distribution of eight species of the tribe Cicadellini. Black symbols: previous records for Brazil; white symbols: new records for the Amazonas State. 1. Beruri. 2. Careiro. 3. Iranduba. 4. Itacoatiara. 5. Manaus. 6. Presidente Figueiredo. 7. Rio Preto da Eva.



**Figure 2.** Sharpshooters collected with a sweep net in orange orchards in the Amazonas State, Brazil. Dorsal view. **A.** *Diedrocephala bimaculata*. **B.** *Erythrogonia sexguttata*. **C.** *Hortensia similis*. **D.** *Macugonalia moesta*. **E.** *Plesiommata corniculata*. **F.** *Scopogonalia amazonensis*. **G.** *Scoposcartula oculata*. **H.** *Xyphon reticulatum*. Scale bar = 1.0 mm.



**Figure 3.** Sharpshooters collected with a sweep net in orange orchards in the Amazonas State, Brazil. Aedeagus lateral view. **A.** *Diedrocephala bimaculata*. **B.** *Erythrogonia sexguttata*. **C.** *Macugonalia moesta*. **D.** *Plesiommata corniculata*. **E.** *Scopogonalia amazonensis*. **F.** *Xyphon reticulatum*. Scale bar = A, B, C, D, F = 1.0 mm; E = 0.10 mm.

## Discussion

The cultivation area of orange orchards in Amazonas has rapidly expanded by over 100% in the past four years, increasing from 340 hectares in 2019 to 79 hectares in 2022 (IDAM 2019, 2022). This significant growth has introduced various challenges that impact productivity, including phytosanitary issues. One particular concern is the presence of Cicadellinae species, which are known for their potential role in disease transmission. Limited information is currently available on faunal

surveys and species records of sharpshooters in Amazonian citrus orchards (Feitosa 2017; Franco 2023).

Four of the eight sharpshooter species formally recorded in this study – *Diedrocephalabimaculata*, *Erythrogonia sexguttata*, *Hortensia similis*, and *Plesiommata corniculata* – were previously found in citrus orchards in Manacapuru and Rio Preto da Eva, Amazonas (Feitosa 2017). These species are also commonly recorded in the southern, southeastern, and central-western regions of Brazil (Figure 1).

This study expands the known distribution of these sharpshooter species within the Amazonas State. New occurrences of *H. similis* and *P. corniculata* were recorded in orange orchards across six additional municipalities: Beruri, Careiro, Iranduba, Itacoatiara, Manaus, and Presidente Figueiredo. *Erythrogonia sexguttata* was found in four municipalities: Beruri, Iranduba, Itacoatiara, and Presidente Figueiredo. *Diedrocephala bimaculata* was found in three: Beruri, Careiro, and Presidente Figueiredo. These new records extend the known distribution range of these species by 33 km to 276 km. Notably, there are gaps exceeding 150 km between previously documented and present records.

*Macugonalia moesta*, previously only known from Rio Preto da Eva (Feitosa 2017), has now been recorded in six additional municipalities within the state: Beruri, Careiro, Iranduba, Itacoatiara, Manaus, and Presidente Figueiredo. This widespread occurrence suggests that the species is well adapted to the Amazonian biome, as it has also been found in medicinal and ornamental plant cultivations of the Peruvian Amazon (Vásquez and Lozada 2014). Notably, this study establishes the first record of *M. moesta* in Brazil.

*Scopogonalia amazonensis* was originally described from forest material collected in the municipality of Itacoatiara (Leal et al. 2016). In the present work, this species is recorded for the first time in orange orchards in the municipality of Careiro, which is distanced about 159 km west of Itacoatiara.

This study represents the first recorded occurrence of *Scoposcartula oculata* and *Xyphon reticulatum* in the Amazonas State, marking a significant finding for both species. *Scopogonalia oculata* is documented here for the first time in orange orchards, while *X. reticulatum*, previously known as *Carneocephala reticulatum* DeLong & Caldwell, 1937, was previously observed in invasive vegetation in citrus orchards in the southeast region (Yamamoto 1996). The study also establishes the first record of *X. reticulatum* in the northern region of the country.

In conclusion, we formalize the recorded occurrence of sharpshooter species of the tribe Cicadellini in the Amazonas region, enhancing our understanding of entomofauna diversity. We also expand the known geographical distribution within the Amazon biome, the North region, and Brazil. These results underscore the current lack of information regarding the distribution of this group in Amazonas and emphasize the urgent need for more taxonomic studies, particularly those describing new species. Increased collection efforts and studies on species distribution and diversity are crucial, given the economic significance of this group, which poses a threat to the spread of CVC in Amazonian citrus orchards.

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