

A journal of world insect systematics

# INSECTA MUNDI

---

---

1042

Notes on the tribe Chlorocorini with the description  
of a new species of *Chlorocoris* Spinola  
(Hemiptera: Heteroptera: Pentatomidae) from Panama

Donald B. Thomas

United States Department of Agriculture, Agricultural Research Service, Cattle Fever Tick Research Laboratory,  
22675 North Moorefield Road, Edinburg TX 78541

Date of issue: April 5, 2024

Center for Systematic Entomology, Inc., Gainesville, FL

**Thomas DB. 2024.** Notes on the tribe Chlorocorini with the description of a new species of *Chlorocoris* Spinola (Hemiptera: Heteroptera: Pentatomidae) from Panama. *Insecta Mundi* 1042: 1–7.

Published on April 5, 2024 by  
**Center for Systematic Entomology, Inc.**  
P.O. Box 141874  
Gainesville, FL 32614-1874 USA  
<http://centerforsystematicentomology.org/>

**INSECTA MUNDI** is a journal primarily devoted to insect systematics, but articles can be published on any non-marine arthropod. Topics considered for publication include systematics, taxonomy, nomenclature, checklists, faunal works, and natural history. *Insecta Mundi* will not consider works in the applied sciences (i.e. medical entomology, pest control research, etc.), and no longer publishes book reviews or editorials. *Insecta Mundi* publishes original research or discoveries in an inexpensive and timely manner, distributing them free via open access on the internet on the date of publication.

*Insecta Mundi* is referenced or abstracted by several sources, including the Zoological Record and CAB Abstracts. *Insecta Mundi* is published irregularly throughout the year, with completed manuscripts assigned an individual number. Manuscripts must be peer reviewed prior to submission, after which they are reviewed by the editorial board to ensure quality. One author of each submitted manuscript must be a current member of the Center for Systematic Entomology.

Guidelines and requirements for the preparation of manuscripts are available on the *Insecta Mundi* website at <http://centerforsystematicentomology.org/insectamundi/>

**Chief Editor:** David Plotkin, [insectamundi@gmail.com](mailto:insectamundi@gmail.com)  
**Assistant Editor:** Paul E. Skelley, [insectamundi@gmail.com](mailto:insectamundi@gmail.com)  
**Layout Editor:** Robert G. Forsyth  
**Editorial Board:** Davide Dal Pos, M. J. Paulsen, Felipe Soto-Adames  
**Founding Editors:** Ross H. Arnett, Jr., J. H. Frank, Virendra Gupta, John B. Heppner, Lionel A. Stange, Michael C. Thomas, Robert E. Woodruff  
**Review Editors:** Listed on the *Insecta Mundi* webpage

**Printed copies (ISSN 0749-6737) annually deposited in libraries**

Florida Department of Agriculture and Consumer Services, Gainesville, FL, USA  
The Natural History Museum, London, UK  
National Museum of Natural History, Smithsonian Institution, Washington, DC, USA  
Zoological Institute of Russian Academy of Sciences, Saint-Petersburg, Russia

**Electronic copies (online ISSN 1942-1354) in PDF format**

Archived digitally by Portico.  
Florida Virtual Campus: <http://purl.fcla.edu/fcla/insectamundi>  
University of Nebraska-Lincoln, Digital Commons: <http://digitalcommons.unl.edu/insectamundi/>  
Goethe-Universität, Frankfurt am Main: <http://nbn-resolving.de/urn/resolver.pl?urn:nbn:de:hebis:30:3-135240>

This is an open access article distributed under the terms of the Creative Commons, Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited.  
<https://creativecommons.org/licenses/by-nc/3.0/>

# Notes on the tribe Chlorocorini with the description of a new species of *Chlorocoris* Spinola (Hemiptera: Heteroptera: Pentatomidae) from Panama

Donald B. Thomas

United States Department of Agriculture, Agricultural Research Service, Cattle Fever Tick Research Laboratory,  
22675 North Moorefield Road, Edinburg TX 78541  
donald.thomas@usda.gov

**Abstract.** A new species, *Chlorocoris charluzae* Thomas (Hemiptera: Heteroptera: Pentatomidae), is described from Panama. *Eludocoris grandis* Thomas is reported from Panama for the first time. The distribution of *Chlorocoris rufispinus* Dallas to include Panama is confirmed. *Arawacoris* Thomas, described as a subgenus of *Chlorocoris* Spinola, is **elevated to full genus**.

**Key words.** Pentatomid, genitalia.

**ZooBank registration.** urn:lsid:zoobank.org:pub:F4E45B6C-5BD8-4B3E-B599-3BB61855B392

## Introduction

On a recent trip to the hinterlands of Panama, my colleague Charluz Marioli Arocho collected a number of pentatomid specimens pertaining to the tribe Chlorocorini. Based on the recent checklist for that republic (Chambra et al. 2018), the collecting established one new country record, *Eludocoris grandis* Thomas, confirmed the distribution of *Chlorocoris rufispinus* Dallas to include Panama, and discovered a species of *Chlorocoris* Spinola new to science, described herein.

The tribe Chlorocorini was formally proposed by Rider, Greve, Schwertner, and Grazia (Rider et al. 2018) to include the genera *Chlorocoris*, *Chloropepla* Stål, *Fecelia* Stål, *Eludocoris* Thomas, *Loxa* Amyot and Serville, *Mayrinia* Horváth, *Rhyncholepta* Bergroth, and provisionally *Arvelius* Spinola. Subsequently a phylogenetic analysis of the tribe was conducted by Greve (2010) and the results published by Genevcius et al. (2021) providing insight on the status and relationships of these genera. The authors suggested that certain rearrangements were in order, but took no formal action. In the process of describing the new species and considering its subgeneric assignment in the light of the knowledge gained in the years since *Chlorocoris* was last revised (Thomas 1985) such action now seems appropriate, and perhaps overdue.

## Materials and Methods

All stinkbugs mentioned in this article were collected under permit and attracted to a combination of mercury vapor and ultraviolet light, nocturnally, all from montane cloud forest habitats. The genitalia were extracted for microscopic examination from a male paratype after soaking for two hours in scalding water. The extracted genital cup was then macerated in a saturated aqueous solution of KOH overnight. The dissected organs were photomicrographed with a Keyence VHX-7000 Digital microscope. The habitus photograph was enhanced to improve focus with 3D-image stitching. One male holotype, was sent to the United States National Museum, Washington DC. Other specimens are deposited in the Florida State Collection of Arthropods, Gainesville, FL (FSCA), DB Thomas' personal collection, Edinburg, TX (DBTC) and J.E. Eger's personal collection, Gainesville, FL (JEE).

## Results and Discussion

***Eludocoris grandis* Thomas, new country record for Panama.** To my knowledge, this is only the second time that this species has been collected since the original description (Thomas 1992). The type series consisted of two males and a female from Guanacaste Province in Costa Rica, on the slopes of Volcan Cacao close to the border with Nicaragua. The holotype reposes in the INBIO collection in Heredia. Subsequently, a female specimen was taken by me at lights in central Costa Rica and is reported here for the first time. Verbatim label data: COSTA RICA: Alajuela Prov. Manuel Brenes N.P. 10°13.75'N; 84°34.26'W, 9-VIII-2010, D.B.Thomas. The single female specimen taken in Panama by Charluz Arocho was also collected at lights. Verbatim label data: PANAMA: Panama Oeste Prov. Altos de Maria, 08.64N; 80.04N, 12-VIII-2023. CM Arocho, DB Thomas, M Barria, DC Robacker. A photograph of the freshly captured specimen in the field confirms that it is green in life (Fig. 1).

Most green insects sequester pigments from chlorophyll metabolites in their cuticle (Heath et al. 2013), but some, including *Nezara viridula* (L.) combine two compounds, the common yellow carotenoid lutein and blue biliverdin (Hackman 1952), to form a green pigment called insectiverdin by Hinton (1973). Might the difference in chemistry explain why the green color fades at death in Chlorocorini but persists in specimens of Nezarini?

In the cladistical analysis of the Chlorocorini, Genevcius et al. (2021) found that, “Two genera were consistently placed outside of the tribe: *Arvelius* and *Eludocoris*.” While true of the former that was not the case with the latter. In the morphology-based analysis, *Eludocoris* claded with, and basal to, the six other genera of the tribe. *Eludocoris* has the minute spine at the apex of the femora, a primary synapomorphy for the tribe and is rare outside of the tribe. The gene-based analysis linked *Eludocoris* with the outgroup, an obscure Australian genus with



**Figure 1.** *Eludocoris grandis* in life at Altos de Maria, Panama.

which it shares no characters, morphological or molecular. Long branch attraction is a common source of error in phylogenetic analyses. Thus, the evidence to exclude or include *Eludocoris* from the Chlorocorini was equivocal. The authors wisely chose to leave formal changes in the tribal arrangement to future studies.

***Chlorocoris rufispinus* Dallas, distribution includes Panama.** Cambra et al. (2018) listed four species of *Chlorocoris* for Panama, but they only included a literature record for *C. rufispinus*, which in turn is the basis for the distribution as from Mexico to Panamá (Arismendi and Thomas 2003). The following specimens serve as confirmation of this species from Panamá (Fig. 2). PANAMA: Chiriqui Prov. Mount Totumas, 18-VIII-2023, 08.89N; 82.68W, MVL, CM. Arocho & DB Thomas [4 females, 1 male]; PANAMA: Chiriqui Prov. Santa Clara, Finca Hartmann, 08.88N; 82.73W, 19-VIII-2023, MVL, CM Arocho & DB Thomas [1 female]; PANAMA: Chiriqui Prov. Finca El Velo, 4 km W Boquete, Volcan Baru, 08.81N; 82.48W, 17-VIII-2023, C. Arocho, D. Thomas, D. Robacker [1 male]; PANAMA: Boquete, Palo Alto, 8°48'N; 82°23'73"W, el. 5540' 5 June 2019, C. Arocho & D. Thomas [one male, one female].

***Arawacoris* Thomas, 1998, new status.** *Arawacoris tarsalis* (Thomas) from Jamaica shares characteristics with *Chlorocoris* and other members of the Chlorocorini (the hypandrium, serrate anterolateral pronotal margins) but also has a unique characteristic: the enlarged basal metatarsomere in males. The author settled on a compromise of erecting a subgenus within *Chlorocoris*. Decisions to lump a species with an existing genus or splitting it off as its own genus may be the best reason to consider a cladistical approach. Subsequently a cladistical analysis of the Chlorocorini by Greve (2010) branched *Arawacoris* closer to *Fecelia* and *Loxa* than to *Chlorocoris* while affirming with both molecular and morphology-based data the close sister relationship of *Chlorocoris* with *Monochrocerus* Stål, the subgenera of *Chlorocoris*. Greve (2010) stated that the position of *Arawacoris* should be reassigned. I thus



**Figure 2.** Western Panama. Localities for *C. rufispinus* and *C. charluzae* (see text).

expected that she would do so in the ultimately published version (Genevcius et al. 2021). Instead, the matter was not discussed. There is no doubt that the Jamaican species deserves its own genus-group taxon on morphological grounds, and with the molecular evidence gathered by Greve (2010) its elevation to a full genus separate from *Chlorocoris* is justified and, in accordance with her judgement, I herein formally propose that assignment.

**A new species of *Chlorocoris*, subgenus *Monochrocerus*.** In 2019, a single male specimen of this new species came to lights at the Finca El Velo, a montane forest site on the slopes of the Volcan Baru, Panama. This specimen was dissected for examination of the genitalia. It was set aside in as much as the single specimen was inadequate for determining which characters are variable and which are stable. Four years later two more specimens, both males, were collected by Charluz Arocho each at a separate locality, though also in montane forest habitat at lights. It is notably smaller than most species in the genus. The sinuate margins of the paraclypei places it in the subgenus *Monochrocerus*. The color pattern is unique but the definitive difference is in the genitalia, particularly the parameres.

### ***Chlorocoris charluzae* Thomas, new species**

**Description.** Body elongate-oval, dorso-ventrally compressed (Fig. 3). Color pale yellow (green in life) with a red spot on disc of each corium, a diffuse red trans-humeral band on disc of pronotum, base of scutellum, humeri, anterolateral pronotum and head with narrow red margin. Each connexival segment with round black spot at posterior margin. Scutellum with pale irregular callus from base to apex at midline. Dorsum of humeri with a variable number of black punctations. Abdominal venter, coxae and legs pale yellow, concolorous with dorsum but lacking any black or red markings. Apices of femora obtuse, rounded. Length, from tip of anteclypeus to end of abdominal segment VII, 14–15 mm; width, across humeri, 7–8 mm (measurements from types, females unknown, are almost certainly larger).

Head flat dorsally; lateral margin of paraclypei sinuate in dorsal view, curving towards anteclypeus; anteclypeus and paraclypei subequal in length. Antennae yellow with reddish tinge on basal three segments. Ental side of antennal segment I with a thin, longitudinal dark line. Antennal segments narrowly cylindrical, segment I shortest about half length of V with its apex attaining, or just surpassing, end of paraclypeus; segment III slightly shorter than V; segment IV longest, slightly longer or subequal with segment II. Bucculae posteriorly evanescent; rostrum in repose nearly or just attaining posterior margin of second (first visible) abdominal sternite. Humeri angular but not produced; ostiolar sulcus short, extending about one-fifth distance to metapleural margin. Basal abdominal sternites at midline vaguely sulcate. Spiracles inconspicuous, rims concolorous with surrounding sternite.

Male genital cup (pygophore) opens postero-dorsally, lumen occluded by the large hypandrium, which is bilobate at its apex (Fig. 4a). Ventral margin of pygophore strongly, obtusely carinate; inferior ridge bears a process on each side. Proctiger (segment X) saddle-shaped, without long processes. Parameres (Fig. 4b) elaborately lobate as in other species, with terminus projecting over inferior rim and ectal to pygophoral lumen. Dorsal lobe has a distinctly sclerotized margin; ventral lobe has the margins undulate, but not lamellate nor spiculate as in related species. Phallus (aedeagus) (Fig. 4c) has a thick, cylindrical vesica which is attended at its base by a collar (vesical process); a thecal shield covers dorsal side; conjunctiva obsolete, whereas partly sclerotized and partly membranous thecal processes are present (Fig. 4d).

**Holotype.** Male, labeled (a): PANAMA: Chiriqui Prov. Santa Clara, Finca Hartmann MVL, 08.88N; 82.73W. 19-VIII-2023. C.M. Arocho & D.B. Thomas. (b) HOLOTYPE *Chlorocoris charluzae* Thomas. Deposited United States National Museum, Washington D.C.

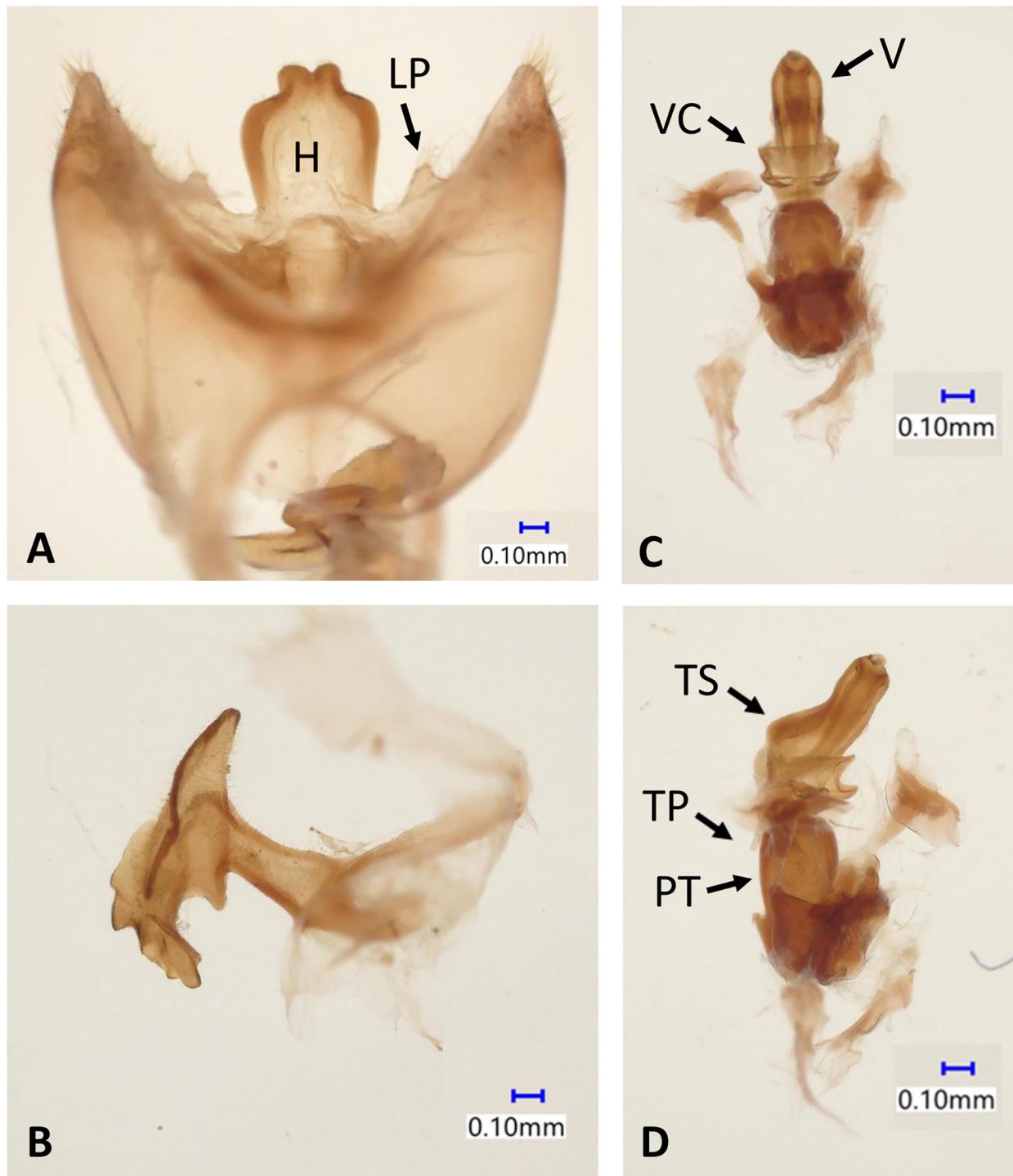
**Paratypes.** (4): One male labeled (a): PANAMA: Chiriqui Prov. Mount Totumas, 18-VIII-2023, 08.89N; 82.68W, MVL, C.M. Arocho & D.B. Thomas. (b) PARATYPE *Chlorocoris charluzae* Thomas. Deposited in DB Thomas collection (DBTC). One male labeled (a): PANAMA: Chiriqui, Boquete, El Velo. 8°49.47N; 82°29.39W, El. 6547' 3 June 2019, C. Arocho & D. Thomas. (b) PARATYPE *Chlorocoris charluzae* Thomas. (DBTC). One male labeled (a) PANAMA: Prov. Chiriqui: Mt. Totumas cloud forest, 8.883°–82.683° April 24–25, 2019, UV+MV lights at lodge. WB Warner. Deposited J.E. Eger personal collection (JEE). One male labeled,



**Figure 3.** *Chlorocoris charluzae* male paratype, dorsal habitus.

PANAMA: Chiriqui, Mt. Totumas Lodge NW Volcan, 1900m elev.9-13-VIII-2012, Malaise Trap. J.B. Hepner. Deposited Florida State Collection of Arthropods (FSCA).

**Diagnosis.** The new species keys to *Chlorocoris* (*Monochrocerus*) *hebetatus* Distant at couplet 6 in Thomas (1985) and is similar in size to that smaller species. The new species has the midline callus only on the scutellum and not the pronotum, as does *C. hebetatus*. Also, the new species has a thin line on the ental side of antennal segment I, which is absent in *C. hebetatus*. However, the male genitalia are not at all like that of *C. hebetatus*, but rather are similar to that of *Chlorocoris flaviviridis* Barber, differing mainly in the form of the paramere. In *C. flaviviridis*, the margin of the ventral lobe is spiculate, whereas in the new species the margin is undulate. A larger species (19-21 mm), *C. flaviviridis* has a black line or elongated spot at the end of the connexival segments and the rostrum is long, reaching the 3<sup>rd</sup> visible abdominal sternite. The geographic separation is also notable with *C. flaviviridis* and *C. hebetatus* found in Arizona and northern Mexico. The new species is known only from Chiriqui province, Panama (Fig. 2).



**Figure 4.** Male genitalia of *C. charluzae*, n. sp. **A)** Pygophore dorsal, (H = Hypandrium, LP = Lateral Process of ventral rim). **B)** Right paramere, ectal view. **C)** Aedeagus, ventral view. **D)** Aedeagus lateral view (PT = Phallotheca, TS = Thecal shield, TP = Thecal process, V = Vesica, VC = Vesical collar).

**Etymology.** The specific epithet *charluzae* is a genitive patronym based on the first name of its discoverer, Charluz Marioli Arocho.

## Acknowledgments

Specimens mentioned in this article were collected under permit from the Panamanian Ministerio de Ambiente, Permiso de acceso a recursos geneticos y/o biologicos. Permit No. ARB-002-2021. I am grateful to Albert Thurman for arranging the inclusion of myself and colleagues on that permit. Thanks also to Manuel Barria, Universidad de Panamá, for guiding and accompanying us to the localities in Panamá. David C. Robacker provided invaluable logistical assistance and friendship. David Rider and Joseph Eger provided expert reviews of the manuscript. Mention of trade names or commercial products is for informational purposes only and does not constitute endorsement by the U.S. Department of Agriculture. The USDA is an equal opportunity provider and employer.

## Literature Cited

- Arismendi N, Thomas DB. 2003.** Pentatomidae (Heteroptera) of Honduras: a checklist with description of a new ochlerine genus. *Insecta Mundi* 31: 219–236.
- Cambra RA, Carranza R, Aniño-Ramos YJ, Murgas AS. 2018.** Los Pentatomidos (Hemiptera: Heteroptera) de Panama. *Revista Nicaraguense de Entomologia* 149: 1–21.
- Genevicius BC, Greve C, Koehler S, Simmons RB, Rider DA, Grazia J, Schwertner CF. 2021.** Phylogeny of the stink bug tribe Chlorocorini (Heteroptera, Pentatomidae) based on DNA and morphological data: the evolution of key phenotypic traits. *Systematic Entomology* 46(2): 327–338.
- Greve C. 2010.** Filogenia do grupo *Chlorocoris* baseada em morfologia e evidencia total, descricao de cinco novas especies e synopsis de *Chloropepla* Stal incluindo analise cladistica e biogeografica. Doctoral Dissertation, Universidade Federal de Rio Grande do Sul, Brazil.
- Hackman RH. 1952.** Green pigments of the hemolymph of insects. *Archives of Biochemistry and Biophysics* 14: 166–174.
- Heath JJ, Cipilloni DF, Stireman JO. 2013.** The role of carotenoids and their derivatives in modulating interactions between insects and their environments. *Arthropod Plant Interactions* 7: 1–20.
- Hinton HE. 1973.** Some recent work on the colours of insects and their likely significance. *Proceedings and Transactions of the British Entomological Society* 6: 43–54.
- Rider DA, Schwertner CF, Vilimova J, Redei D, Kment P, Thomas DB. 2018.** Higher systematics of the Pentatomoidea. p. 25–201. In: McPherson JE. *Invasive stink bugs and related species (Pentatomoidea): biology, higher systematics, semiochemistry, and management*. CRC Press; Boca Raton, FL. 840 p.
- Thomas DB. 1985.** Revision of the genus *Chlorocoris* Spinola (Hemiptera: Pentatomidae). *Annals of the Entomological Society of America* 78: 674–690.
- Thomas DB. 1992.** *Eludocoris*, a new genus of Pentatomidae (Insecta: Heteroptera) from Costa Rica. *Annals of Carnegie Museum* 61: 63–67.
- Thomas DB. 1998.** A new species of *Chlorocoris* (Heteroptera: Pentatomidae) from Jamaica. *Florida Entomologist* 81: 483–488.

Received December 19, 2023; accepted March 4, 2024.

Review editor David Plotkin.

