Zootaxa 4375 (2): 287–295
http://www.mapress.com/j/zt/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

https://doi.org/10.11646/zootaxa.4375.2.9
http://zoobank.org/urn:lsid:zoobank.org:pub:2E7920B3-A4DE-4C8D-99A3-891237A9156A

Cryptochrysa Freitas & Penny, a generic homonym, replaced by *Titanochrysa* Sosa & Freitas (Neuroptera: Chrysopidae)

CATHERINE A. TAUBER[1,4], FRANCISCO SOSA[2] & ATILANO CONTRERAS-RAMOS[3]

[1]*Department of Entomology, Cornell University, Ithaca, New York, USA 14853 and Department of Entomology, University of California, Davis, California, USA 95616.*

[2]*Universidad Centroccidental "Lisandro Alvarado", Museo Entomológico "José Manuel Osorio" (MJMO), Barquisimeto, Lara, Venezuela. Current address: Universidade Federal Rural da Amazônia, Campus de Capitão Poço, PA, Brazil. E-mail: fransodu73@hotmail.com*

[3]*Universidad Nacional Autónoma de México, Instituto de Biología, Departamento de Zoología, México, 04510 DF. E-mail: acontreras@ib.unam.mx*

[4]*Corresponding author. E-mail: cat6@cornell.edu*

Abstract

The green lacewing genus name *Cryptochrysa* Freitas & Penny 2001 is identified as a junior homonym of *Cryptochrysa* Hampson 1926 (Lepidoptera: Noctuidae). Moreover, *Titanochrysa* Sosa & Freitas 2012 is determined to be an available junior synonym of *Cryptochrysa* Freitas & Penny. Thus, *Titanochrysa* becomes the substitute name for the preoccupied generic name. Here, we also provide (i) new information and images for *Titanochrysa chloros* (Freitas & Penny) **comb**. **nov**., the only species ever included in the chrysopid genus *Cryptochrysa*, (ii) a clarified set of diagnostic features for the reconstituted genus *Titanochrysa*, and (iii) a key and images for identifying the six described *Titanochrysa* species.

Key words: Neuroptera, Chrysopidae

Resumen

El género *Cryptochrysa* Freitas & Penny 2001 se identifica como un homónimo junior de *Cryptochrysa* Hampson 1926 (Lepidoptera: Noctuidae). También, *Titanochrysa* Sosa & Freitas 2012 se determina como sinónimo junior disponible de *Cryptochrysa* Freitas & Penny. Así, *Titanochrysa* se convierte en el nombre sustituto del género preocupado. Además, se aporta (i) nueva información e imágenes para *Titanochrysa chloros* (Freitas & Penny) **comb. nov.**, la única especie incluida originalmente en *Cryptochrysa*, (ii) un conjunto revisado de características diagnósticas para el género *Titanochrysa*, y (iii) una clave e imágenes para identificar las seis especies descritas en el género *Titanochrysa*.

Introduction

The generic name *Cryptochrysa* was found to occur in both Noctuidae (Lepidoptera) and Chrysopidae (Neuroptera). The chrysopid name, which was proposed by Freitas and Penny (2000: 165) for a monotypic genus of green lacewings from Brazil, is the junior homonym and thus in need of replacement. By original designation, *Cryptochrysa chloros* Freitas & Penny, 2001, is its type species.

As we describe below, we also identified *C. chloros* as congeneric with species in the genus *Titanochrysa* Sosa & Freitas 2012, thus rendering *Titanochrysa* as a synonym of *Cryptochrysa* Freitas & Penny 2001. In accordance with the Principle of Priority (Article 23.3.5), the name *Titanochrysa* is available as the substitute name for the homonym.

In addition to the nomenclatural changes above, here we provide (i) new information and images for

Accepted by B. Price: 26 Oct. 2017; published: 24 Jan. 2018

Titanochrysa chloros (Freitas & Penny) **comb. nov.**, (ii) a clarified set of diagnostic features for the genus *Titanochrysa*, (iii) a catalog of *Titanochrysa* species, and (iv) a key for identifying all described *Titanochrysa* species. As a result of the findings here, the number of valid Neotropical genera in the chrysopid tribe Chrysopini is reduced to nine (*Ceraeochrysa* Adams, *Chrysoperla* Steinmann, *Chrysopodes* Navás, *Furcochrysa* Freitas & Penny, *Meleoma* Fitch, *Parachrysopiella* Brooks & Barnard, *Plesiochrysa* Adams, *Titanochrysa* Sosa and Freitas, and *Ungla* Navás).

Materials and methods

Our report is based largely on two field-collected specimens of *T. chloros* (the holotype from Itiquira, Mato Grosso, Brazil (SFC) and a male collected in Choroni, Aragua, Venezuela (MJMO), as well as six lab-reared specimens. The lab-reared specimens originated from specimens collected at the type locality; the culture had been maintained in the laboratory of Sergio de Freitas (now deceased) for over four generations. All the specimens mentioned here were examined and imaged by FS.

We use the following abbreviations for collections:

CAS—California Academy of Sciences, Golden Gate Park, San Francisco, California, USA
INBio—Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica
MCZ—Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA
MJMO—Museo Entomológico José Manuel Osorio, Universidad Centroccidental "Lisandro Alvarado", Lara, Venezuela
MZUSP—Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil
SFC—Sergio de Freitas Collection, Departamento de Fitossanidade, Universidade Estadual Paulista "Julio de Mesquita Filho" Campus de Jaboticabal, São Paulo, Brazil
SMPM—Science Museum, University of Minnesota, St. Paul, Minnesota, USA
ZMB—Museum für Naturkunde Berlin, Germany
ZMUH—Zoologisches Institut und Zoologisches Museum, Universität von Hamburg, Hamburg, Germany

Diagnostic features of the newly constituted genus *Titanochrysa*

Based on our recent studies, here we conclude that *C. chloros*, the sole species in *Cryptochrysa*, is congeneric with the four species that currently comprise *Titanochrysa*. The features of *C. chloros* that led us to this conclusion are described and illustrated below. For images and descriptions of the species previously assigned to *Titanochrysa*, see Sosa & Freitas (2012) and Tauber *et al*. (2012).

Male terminalia. The most prominent structural features that support the synonymy of *Titanochrysa* and *Cryptochrysa* occur in the terminal segments of the male abdomen (Figs 1C, 3A, 3B, 4A–4E). Specifically, males of both groups share: (i) abdomen long and slender, with sternites S8 and S9 fused (= S8+9), but well demarcated, (ii) S9 especially well sclerotized, elongate, and shallow (lateral view), (iii) tergite T9 with dorsal apodeme prominent, straight or only slightly convex, and unbranched distally, (iv) S8+9 with ventral apodeme also relatively straight, extending along the dorsal margin of S8+9, and (v) dorsal and ventral apodemes meeting basally at the intersection of S8 and S9, but well proximal to the distal margin of T8. Also, S3–S8 are usually with microtholi (absent from *T. circumfusa*).

Note: Freitas & Penny (2000: 165) stated that the elongated S8+9 of *T. chloros* (as *Cryptochrysa chloros*) was partially fused with S7, a characteristic not reported previously for any chrysopid. A careful re-examination of this feature on the *T. chloros* specimens indicated that S8 and S9 are fused (= S8+9), and that S8+9 is elongated, as reported; however there is no evidence of fusion between S7 and S8+9.

Male genitalia. *Titanochrysa chloros* shares the suite of male genital features that characterize *Titanochrysa* species [compare Figs 1D–1F, 3C–3F, 4G–4I here with those published earlier by Sosa & Freitas (2012) and Tauber *et al*. (2012)]: (i) gonarcus lightly sclerotized, U-shaped, with narrow bridge; (ii) arcessus short, wide, with

a trilobate apex consisting of a mesal beak flanked by a pair of lateral lobes; (iii) gonapsis substantial, flat, approximately one-half length of S9; (iv) gonosaccus with long gonosetae generally on prominent papillae; (v) gonocornua absent or greatly reduced [see (v) in paragraph below]; and (vi) tignum, parameres, entoprocessus, and spinellae absent.

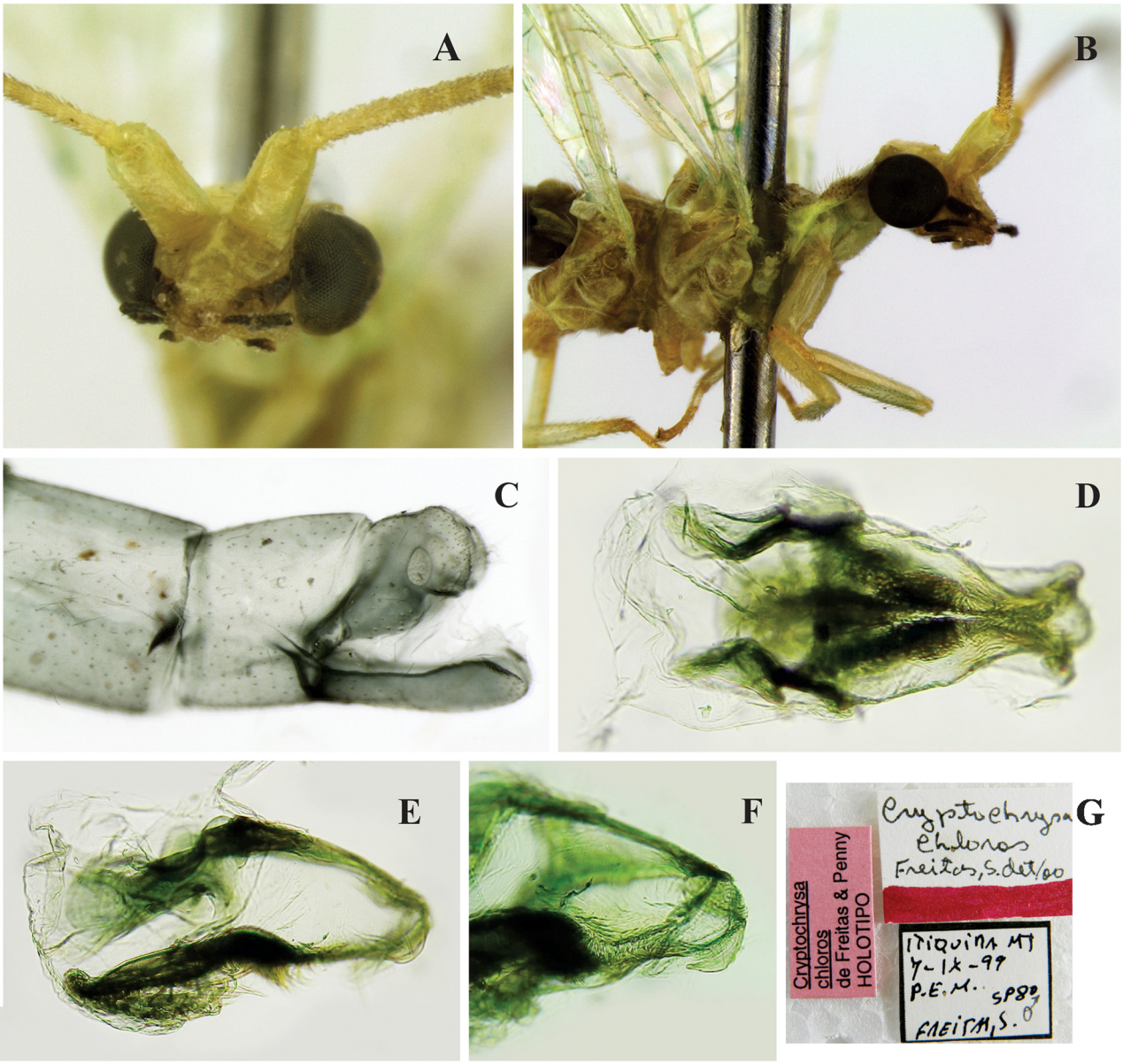

FIGURE 1. *Cryptochrysa chloros* Freitas & Penny holotype (male), Mato Grosso, Brazil. A. Head, frontal; B. Head and thorax, lateral; C. Terminalia, lateral; D. Gonarcal complex, dorsal; E. Gonarcal complex, lateral; F. Apex of arcessus, lateral; G. Labels.

With one exception, the structure of the gonarcus [# (i) above], *T. chloros* has its own modifications on each of the above traits:

(ii) The *T. chloros* arcessus appears to lack the striations that typify most *Titanochrysa* species (see Sosa & Freitas 2012); it shares the absence of this feature with *T. simpliciala* (see Tauber *et al*. 2012).
(iii) The *T. chloros* gonapsis has the typical *Titanochrysa* size and shape, and one edge is serrated as in *T. annotaria, T. ferreirai,* and *T. simpliciala*. However, the *T. chloros* gonapsis has a sharply acute tip (Fig 3E, 4I); thus the structure appears knife-shaped, rather than spoon-shaped as in other *Titanochrysa* species. Also, at the base of the *T. chloros* gonapsis is a tuft of setae (Figs 3E); this feature is unreported for other species in the genus.

(iv) In addition to the gonosaccus bearing long gonosetae on papillae (as in other *Titanochrysa* species), the membrane above the *T. chloros* gonosaccus bears patches of clavate papillae (Fig. 3C, 3D, 4G, 4H). We suspect that these papillae may be modified gonosetae. This feature appears to be unique to *T. chloros*.
(v) In *T. chloros* the gonocornua may not be completely absent like they are in other *Titanochrysa* species. There are small, weakly sclerotized, flat structures on the surface of the *T. chloros* arcessus immediately in front of the gonarcal bridge (the "gc" in Fig. 3C), at the location where gonocornua usually occur. These structures could be reduced gonocornua; their homology needs exploration.

Female genitalia. The *T. chloros* female genitalia include a simple spermathecal complex (Figs 3G–3J) that is similar to that of other *Titanochrysa* species. There is a pillbox-shaped, invaginated spermatheca, double-coiled spermathecal duct, and unremarkable subgenitale. These features are also shared with many chrysopid genera (e.g., *Chrysoperla*, *Ungla*).

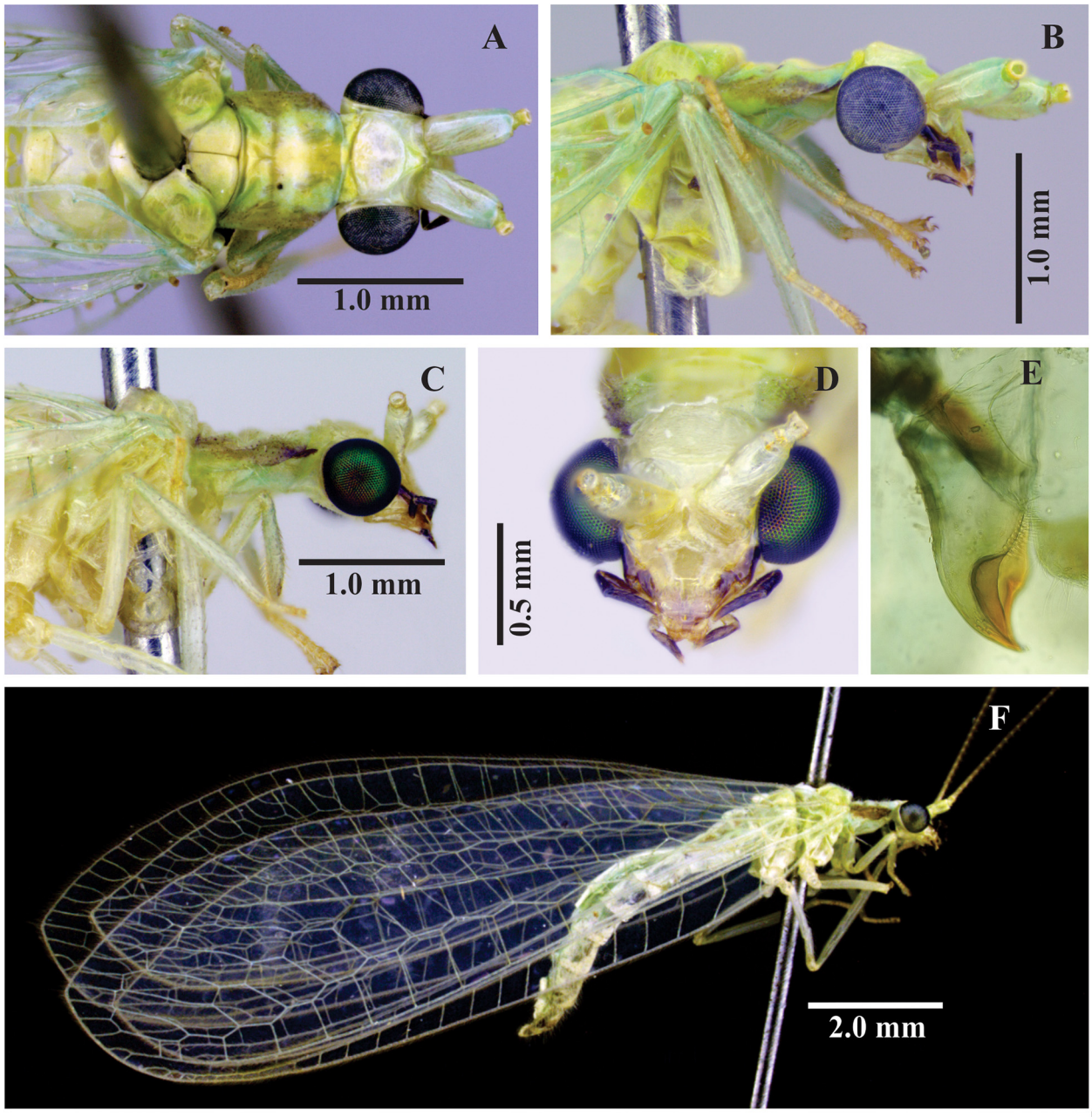

FIGURE 2. *Titanochrysa chloros* (Freitas & Penny); specimens: laboratory-reared from females collected in Mato Grosso, Brazil. A–B. Head and thorax, dorsal and lateral (male); C–D. Head, lateral and frontal (female); E. Mandible, dorsal; F. Habitus, lateral (female).

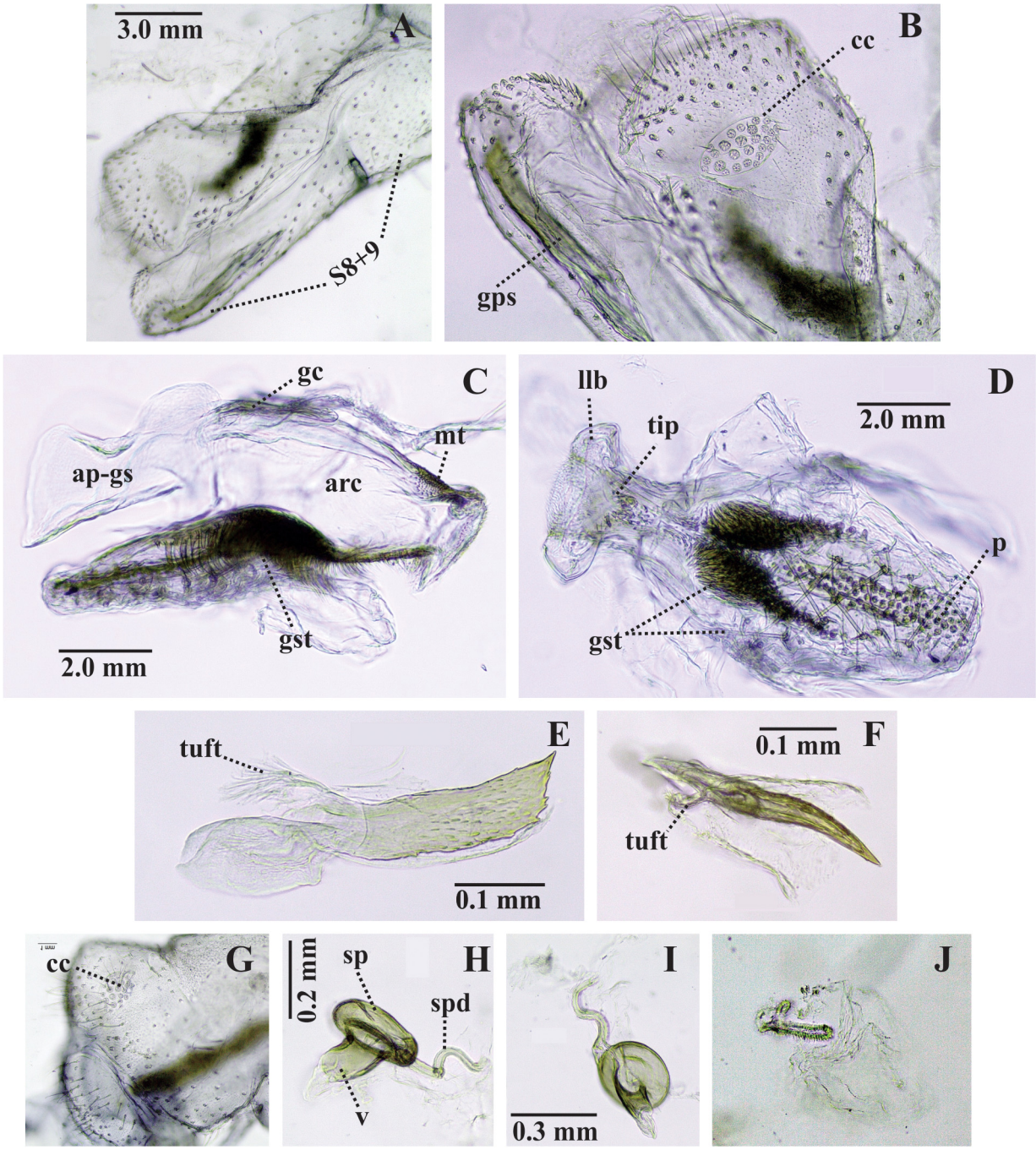

FIGURE 3. *Titanochrysa chloros* (Freitas & Penny); specimens: laboratory-reared from females collected in Mato Grosso, Brazil. A, B. Male terminalia, lateral; C. Gonarcal complex, lateral; D. Gonarcal complex, ventral; E. Gonapsis, lateral; F. Gonapsis, dorsal G. Female terminalia, lateral (Note round callus cerci.); H–I. Spermatheca, lateral and ventral; J. Apex of spermathecal duct. Abbreviations: ap-gs, lateral apodemes of gonarcus; arc, arcessus; cc, callus cerci; gc, gonocornua; gps, gonapsis; gst, gonosetae; llb, lateral lobe; mt, microtrichiae; sp, spermatheca; spd, spermathecal duct; S8+9, fused eighth and ninth sternites; tip, distal end of arcessus; tuft, tuft of setae attached to base of gonapsis; v, velum.

External features. *Titanochrysa chloros* resembles other congeners in size and general appearance. But several features are noteworthy.

All previously recognized *Titanochrysa* species (males and females) were reported to have a prominent dark red, brown, or black stripe on the lateral margin of the scape and pedicel (Sosa & Freitas 2012, Tauber *et al*. 2012). However, in *T. chloros* the scapes are unmarked; rather, they are greatly enlarged (Figs 1A, 1B, 2A–2D). Thus, our newly modified notion of the genus *Titanochrysa* includes a broader range of interspecific variation in the scapes than previously recognized (markings or enlargement).

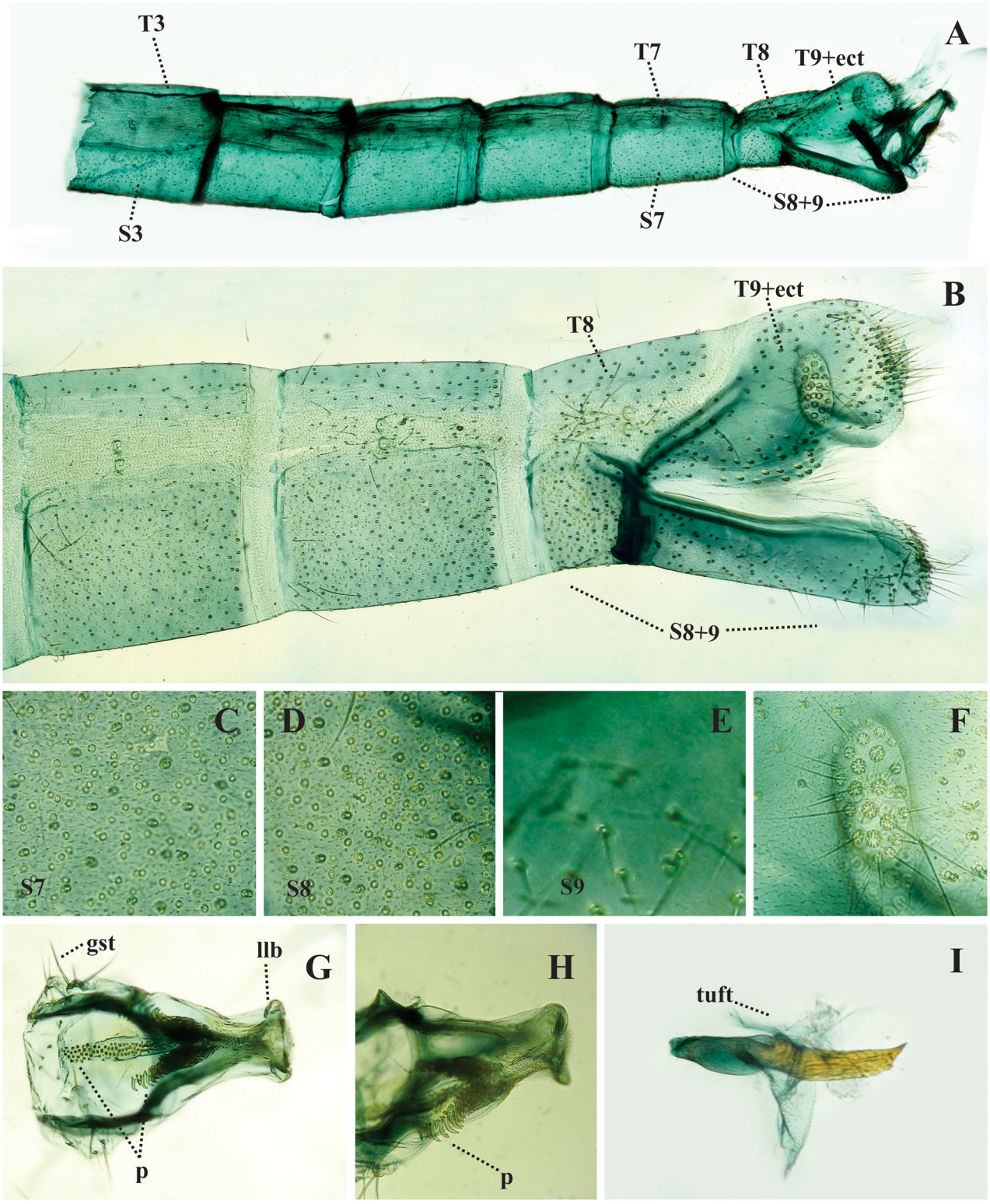

FIGURE 4. *Titanochrysa chloros* (Freitas & Penny); specimen from Aragua, Venezuela. Male abdomen and genitalia. A. Segments A3–A9, lateral; B. Segments A6–A9, lateral; C–D. Surface of S7, S8, with dense microtholi; E. Surface of S9, without microtholi; F. Callus cerci (oval); G. Gonarcal complex, ventral; H. Arcessus and distal end of gonarcus, ventrolateral; I. Gonapsis, lateral. Abbreviations: gst, gonosetae; llb, lateral lobes; p, papillae bordering gonosaccus; S3, S7, third, seventh sternite; S8+9, fused eighth and ninth sternites; tuft, tuft of elongate setae; T3, T7, T8, numbered tergites; T9+ect, fused ninth tergite and ectoproct.

Based on the *Titanochrysa* species that were described originally, the genus was characterized as having wings with a broad costal area (Sosa & Freitas 2012). Later *T. simpliciala* was described as having wings with a narrow costal area (Tauber *et al*. 2012). Now, with the addition of the narrow-winged *T. chloros,* it is clear that the *Titanochrysa* costal area typically varies from quite narrow as in *T. chloros* and *T. simpliciala* to somewhat wider in *T. circumfusa* and *T. annotaria*.

Titanochrysa chloros was described as having a pair of dense tufts of setae in the buccal cavity behind the mandibles (Freitas & Penny 2000: 165, as *Cryptochrysa*). Indeed, this feature was proposed as typical of *Cryptochrysa*. We were unable to confirm the report of these setae in the specimens that we studied. Given our relatively small sample size, this character is in need of further study.

Sexual dimorphism. For the most part, the male and female specimens of *T. chloros* that we studied have similar features; other than the presence of abdominal microtholi in the male, the only external structures with possible sexual dimorphism that we observed are: (i) the shape of the callus cerci and (ii) the amount of enlargement of the scapes. In the males the callus cerci is ovate (Fig. 3B), whereas in the females it is round (Fig. 3G). Although the scapes are distinctly enlarged in both males and females, in the males (Figs 2A, 2B), the enlargement is considerably more prominent than in the females (Figs 2C, 2D). In considering these features, it is important to keep in mind that our sample of *T. chloros* was very restricted—our two field-collected specimens were both males, no field-collected females were available; the six lab-reared specimens were of both sexes.

Larval features. Significant features distinguish the larvae of *T. trespuntensis* from those of species in other Neotropical genera of chrysopids (Tauber *et al*. 2012). It would be useful to rear and describe the larvae of *T. chloros* for comparison.

Catalog of *Titanochrysa* species

Titanochrysa Sosa & Freitas, 2012

Type species. *Chrysopa circumfusa* Burmeister, 1839, by original designation (Sosa & Freitas 2012: 2).

Synonymy. *Cryptochrysa* Freitas & Penny, 2001; type species *Cryptochrysa chloros* Freitas & Penny, 2001, by original designation; preoccupied by *Cryptochrysa* Hampson 1926: 109 (Lepidoptera: Noctuidae; type species *Hypogramma auripennis* Schaus, by original designation). **syn. nov.**

Known distribution: Central America (Costa Rica, Panama) and South America (Argentina, Bolivia, Brazil, Colombia, Suriname, Venezuela).

Titanochrysa annotaria (Banks, 1946)

Chrysopa annotaria Banks, 1945 [1946]: 152. Lectotype, designated by Tauber *et al*. 2012: 17; "Boquete, Chiriqui Province, Panama, 10 May (Fairchild)"; depository: MCZ; images and combination by Tauber *et al*. 2012: 17.

Ceraeochrysa pseudovaricosa Penny, 1998: 62. Holotype, by original designation; depository: INBio, paratypes: CAS; redescription, images by Sosa & Freitas 2012: 7, Tauber *et al*. 2012: 20; *Titanochrysa pseudovaricosa* (Penny), combination by Sosa & Freitas 2012: 7; synonymy by Tauber *et al*. 2012: 17.

Known distribution: Costa Rica (Puntarenas), Panama (Chiriqui).

Titanochrysa chloros (Freitas & Penny, 2001), comb. nov.

Cryptochrysa chloros Freitas & Penny, 2000 [2001]: 165. Holotype, by original designation; "BRASIL: MT [Mato Grosso]: Itiquira, 7 September 1999, Freitas, S. (1 ♂)"; depository indicated in the original description: MZUSP; current location: SFC; examined and imaged by FS (Fig. 1).

Known distribution: Brazil (Mato Grosso), Venezuela (Aragua).

Titanochrysa circumfusa (Burmeister, 1839)

Chrysopa circumfusa Burmeister, 1839: 980. Lectotype, designated by Adams 1985: 7; "Aus Brasilien, von Herrn Thoren in Hamburg."; depository ZMB; combination by Sosa & Feitas 2012: 3; images and notes by Tauber et al. 2012: 20.
Cintameva circumfusa (Burmeister, 1839).
Chrysopodes (*Chrysopodes*) *circumfusus* (Burmeister, 1839).
Chrysopa nigripalpis Banks 1910: 153. Lectotype, designated by Tauber *et al*. 2012: 22; depository: MCZ; images and synonymy by Tauber *et al*. 2012: 20, 24.
Chrysopa burmeisteri Navás, 1929: 858. Lectotype; depository: ZMUH, probably destroyed; synonomy by Banks 1944: 10.

Known distribution: Brazil (Espírito Santo, Minas Gerais, Rio Grande do Sul), Bolivia (Cochabamba), Colombia (Tolima), Suriname (Paramaribo), Venezuela (Lara, Yaracuy).

Titanochrysa ferreirai Sosa & Freitas, 2012

Titanochrysa ferreirai Sosa & Freitas, 2012: 10. Holotype, by original designation; "Brazil. Minas Gerais. Tres Pontas [21°25'S / 45°30'W, 900 m], 8.viii.2009, Ferreira C. S Leg."; depository designated in the original description: MZUSP; current temporary location: APTA Ribeirao Preto, SP, Brazil.

Known distribution: Brazil (Minas Gerais, São Paulo), Venezuela (Aragua).

Titanochrysa simpliciala Tauber, 2012

Titanochrysa simpliciala Tauber *et al*. 2012: 12. Holotype, by original designation; "COSTA RICA: Heredia, Quebrada Amistad, 1.8 km (road) NW Porosail, 10.097°N, 84.119°W. 8.ii.1992, el. 1920 m, Holzenthal, Muñoz, Kjer"; depository: SMPM.

Known distribution: Costa Rica (Heredia).

Titanochrysa trespuntensis Sosa & Freitas, 2012

Titanochrysa trespuntensis Sosa & Freitas, 2012: 13. Holotype, by original designation; "Minas Gerais. Tres Pontas [21°25'S / 45°30'W, 900 m], 10.i.2009, Ferreira C. S Leg."; depository designated in the original description: MZUSP; current temporary location: APTA Ribeirao Preto, SP, Brazil. Larval description: Tauber *et al*. 2012: 2-11.

Known distribution: Argentina (Tucumán), Brazil (Minas Gerais, Rio de Janeiro, Rio Grande do Sul), Venezuela (Mérida).

Key to *Titanochrysa* species

(modified from key in Sosa & Freitas 2012: 17)

1 Forewing crossveins with or without infuscation; mandibles symmetrical or asymmetrical; male: sternites S2–S8 with microtholi; dorsal rods of arcessus parallel; membrane beneath arcessus with or without two mesal lines of setae 2
1' Forewing crossveins with infuscation; mandibles symmetrical; male: sternites S2–S8 without microtholi; dorsal rods of arcessus X-shaped; membrane beneath arcessus with two mesal lines of setae (Figs 1–3 in Sosa & Freitas 2012, Figs 16–18 in Tauber *et al*. 2012) . . . . . *T. circumfusa* (Burmeister)
2 Forewing inner gradates with infuscation; mandibles asymmetrical; male: membrane beneath arcessus without small setae mesally 3
2' Forewing inner gradates without infuscation; mandibles symmetrical; male: membrane beneath arcessus with small setae mesally 4
3 Forewing with network of short, dark, reticulate veins covered by a black spot on medial area; male: arcessus with dorsal rods short, merging apically; female: seventh sternite length ~3.5 times width (Figs 5–7 in Sosa & Freitas 2012, Figs 13–14 in Tauber *et al*. 2012) . . . . . *T. annotaria* (Banks)

3' Forewing without reticulate network of veins; male: arcessus with sclerotized dorsal rods long, merging basally; female: seventh sternite length ~2.4 times width (Figs 9–11 in Sosa & Freitas 2012). . . . . *T. ferreirai* Sosa & Freitas

4 Scape with dark red or black lateral stripe 5

4' Scape without lateral stripe (Figs 1A, 1B, 2A–2D) . . . . . *T. chloros* (Freitas & Penny)

5 Forewing with entirely green venation; flagellar setae amber-colored; subcostal veinlets slanted; dorsum of mediuncus not striated (Figs 8–11 in Tauber *et al*. 2012). . . . . *T. simpliciala* Tauber

5' Forewing with longitudinal veins green, crossveins marked with black or dark brown; flagellar setae black; subcostal veinlets perpendicular to Sc or almost so; dorsum of mediuncus striated (Figs 13–15 in Sosa & Frietas 2012) . . . . . *T. trespuntensis* Sosa & Freitas

Acknowledgments

The authors thank Dr. Jürg De Marmels (UCV-MIZA), Dr. Carlos Vásquez (UCLA-UCOB), Dr. Nelson Wanderley Perioto, Dra. Rogéria Inês Rosa Lara (APTA, Ribeirão Preto, Brazil) and Msc. Caleb Martins (USP, Ribeirão Preto, Brazil) for valuable suggestions and John D. Oswald (Texas A & M University) for his thoughtful review of the manuscript. CAT's work has benefitted from support by the National Science Foundation, the USDA/NRI Competitive Grants Programs, Regional Project W-4185, and Cornell University.

References

Adams, P.A. (1985) Notes on *Chrysopodes* of the M.N.H.N. in Paris [Neuroptera, Chrysopidae]. *Revue Française d'Entomologie (N.S.),* 7, 5–8.

Banks, N. (1910) New South American neuropteroid insects. *Proceedings of the Entomological Society of Washington,* 12, 146–160.

Banks, N. (1944) Neuroptera of northern South America. Part III. Chrysopidae. *Boletín de Entomología Venezolana,* 3, 1–34.

Banks, N. (1945) [1946] A review of the Chrysopidae (Nothochrysidae) of Central America. *Psyche,* 52, 139–174. https://doi.org/10.1155/1945/39092

Burmeister, H.C.C. (1839) *Handbuch der Entomologie. Zweiter Band. Besondere Entomologie. Zweite Abtheilung. Kaukerfe. Gymnognatha. (Zweite Hälfte; vulgo Neuroptera).* Theod. Chr. Friedr. Enslin, Berlin. [i]–xii + 757–1050 pp.

Tauber, C.A. & Winterton, S.L. (2014) Third instar of the myrmecophilous *Italochrysa insignis* (Walker) from Australia (Neuroptera: Chrysopidae: Belonopterygini). *Zootaxa,* 3811 (1), 95–106. http://dx.doi.org/10.11646/zootaxa.3811.1.5

Freitas, S. de & Penny, N.D. (2000) [2001] Two new genera of Neotropical Chrysopini (Neuroptera: Chrysopidae). *Journal of the Kansas Entomological Society*, 73 (3), 164–170.

Hampson, G.F. (1926) *Descriptions of new genera and species of Lepidoptera Phalaenae of the subfamily Noctuinae (Noctuidae) in the British Museum (Natural History)*. Taylor & Francis, London, 641 pp.

Navás, L. (1929) Insectos del Brasil. 3.a serie [IIIa]. *Revista do Museu Paulista, Sao Paulo,* 16, 857–864.

Penny, N.D. (1998) New Chrysopidae from Costa Rica (Neuroptera: Chrysopidae). *Journal of Neuropterology,* 1, 55–78.

Sosa, F. & Freitas, S. de (2012) A new genus of Neotropical Chrysopini (Neuroptera: Chrysopidae). *Zootaxa*, 3351, 1–14 [Errata: 3351, 1–18].

Sosa, F. & Tauber, C.A. (2017) The genus *Vieira* Navás (Neuroptera: Chrysopidae): a new species, a key to the species, and new geographic records. *Zootaxa*, 4258 (1), 43–59. http://dx.doi.org/10.11646/zootaxa.4258.1.3

Tauber, C.A. (2014) Apochrysinae (Neuroptera: Chrysopidae): new larval description and subfamilial comparisons. *Zootaxa,* 3835 (2), 198–208. http://dx.doi.org/10.11646/zootaxa.3835.2.2

Tauber, C.A., Albuquerque, G.S. & Tauber, M.J. (2012) The Neotropical genus *Titanochrysa* (Neuroptera, Chrysopidae): larval descriptions, biological notes, a new species, and taxonomic changes. *Zootaxa*, 3514, 1–26.

Tauber, C.A., Sosa, F., Albuquerque, G.S. & Tauber, M.J. (2013) Adults and larvae of two *Leucochrysa* (*Leucochrysa*) species (Neuroptera, Chrysopidae): descriptions, biological notes, and relationships. *Zootaxa,* 3750 (2), 101–129.

Tauber, C.A., Albuquerque, G.S. & Tauber, M.J. (2012) The Neotropical genus *Titanochrysa* (Neuroptera, Chrysopidae): larval descriptions, biological notes, a new species, and taxonomic changes. *Zootaxa,* 2514, 1–16.

Tauber, C.A., Mantoanelli, E., Albuquerque, G.S., Reguilón, C., González Olazo, E. & Tauber, M.J. (2011) A taxonomically significant polymorphism in *Leucochrysa* (Neuroptera: Chrysopidae): Nomenclature, larval and adult descriptions, and phenotypic variation. *Zootaxa,* 3130, 1–29.

Tauber, C.A. & Flint, Jr., O.S. (2010) Resolution of some taxonomic and nomenclatural issues in a recent revision of *Ceraeochrysa* (Neuroptera: Chrysopidae). *Zootaxa*, 2565, 55–67.

Tauber, C.A., Albuquerque, G.S. & Tauber, M.J. (2008) A new species of *Leucochrysa* and a redescription of *Leucochrysa* (*Nodita*) *clepsydra* Banks (Neuroptera: Chrysopidae). *Zootaxa,* 1781, 1–19.