

INSECTA MUNDI

A Journal of World Insect Systematics

0417

A new species of *Chrysobothris* Eschscholtz (Coleoptera: Buprestidae)
from nests of *Cerceris fumipennis* Say (Hymenoptera: Crabronidae)
in northeastern Florida, USA, with new state records for species of
Chrysobothris and a list of buprestid prey species
taken by the wasp in Florida

Richard L. Westcott
Entomologist Emeritus, Plant Division
Oregon Department of Agriculture
Salem, Oregon 97301 USA

Michael C. Thomas
Florida State Collection of Arthropods
Florida Department of Agriculture and Consumer Services
P.O. Box 147100
Gainesville, FL 32614-7100 USA

Date of Issue: April 17, 2015

Richard L. Westcott and Michael C. Thomas

A new species of *Chrysobothris* Eschscholtz (Coleoptera: Buprestidae) from nests of *Cerceris fumipennis* Say (Hymenoptera: Crabronidae) in northeastern Florida, USA, with new state records for species of *Chrysobothris* and a list of buprestid prey species taken by the wasp in Florida

Insecta Mundi 0417: 1–10

ZooBank Registered: urn:lsid:zoobank.org:pub:A717F26A-30E5-4CC5-A2A2-3C6DF90C074F

Published in 2015 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, CAB Abstracts, etc. **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.

Chief Editor: Paul E. Skelley, e-mail: insectamundi@gmail.com

Head Layout Editor: Eugenio H. Nearn

Editorial Board: J. H. Frank, M. J. Paulsen, Michael C. Thomas

Review Editors: Listed on the **Insecta Mundi** webpage

Manuscript Preparation Guidelines and **Submission Requirements** available on the **Insecta Mundi** webpage at: <http://centerforsystematicentomology.org/insectamundi/>

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

CSIRO, Canberra, ACT, Australia

Museu de Zoologia, São Paulo, Brazil

Agriculture and Agrifood Canada, Ottawa, ON, Canada

The Natural History Museum, London, UK

Muzeum i Instytut Zoologii PAN, Warsaw, Poland

National Taiwan University, Taipei, Taiwan

California Academy of Sciences, San Francisco, CA, USA

Florida Department of Agriculture and Consumer Services, Gainesville, FL, USA

Field Museum of Natural History, Chicago, IL, USA

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, CDROM ISSN 1942-1362) in PDF format:

Printed CD or DVD mailed to all members at end of year. 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>

Copyright held by the author(s). 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. <http://creativecommons.org/licenses/by-nc/3.0/>

Layout Editor for this article: Eugenio H. Nearn

A new species of *Chrysobothris* Eschscholtz (Coleoptera: Buprestidae) from nests of *Cerceris fumipennis* Say (Hymenoptera: Crabronidae) in northeastern Florida, USA, with new state records for species of *Chrysobothris* and a list of buprestid prey species taken by the wasp in Florida

Richard L. Westcott
Entomologist Emeritus, Plant Division
Oregon Department of Agriculture
Salem, Oregon 97301 USA
rwestcott@oda.state.or.us

Michael C. Thomas
Florida State Collection of Arthropods
Florida Department of Agriculture and Consumer Services
P.O. Box 147100
Gainesville, FL 32614-7100 USA
michael.thomas@freshfromflorida.com

Abstract. A new species, *Chrysobothris cerceripraeda* Westcott and Thomas (Coleoptera: Buprestidae), is described from prey specimens found in nests of the ground-nesting wasp, *Cerceris fumipennis* Say (Hymenoptera: Crabronidae), near Jacksonville, Florida, USA. A listing for all species of Buprestidae taken as prey of the wasp in that state is provided, four of which, including the species described herein, are new. Notes are also given for four new state records for Buprestidae.

Introduction

According to Nelson et al. (2008) there are 141 species and three subspecies of *Chrysobothris* Eschscholtz in the USA., including one that is questionable. No additions to our fauna have been published since. By our count, we find only 137 species, three represented by a single subspecies, two represented by two subspecies. Including the new species described herein brings the species-group taxon total to 140 (138 species). By far the greatest diversity in the USA occurs west of the 100th Meridian.

Although prey records—almost all are buprestids—for *Cerceris fumipennis* Say have been published in various papers over the years (e.g. Scullen and Wold 1969; Swink et al. 2013), it was not until the discovery of the exotic pest *Agrilus planipennis* Fairmaire in eastern North America (Cappaert et al. 2005) that special interest in that predator-prey relationship developed, with the idea that it would be of use in survey work to detect the pest (Careless et al. 2014; Marshall et al. 2005). Nelson et al. (2008) listed 19 species of *Chrysobothris* that occur in Florida, 14 of which have been recorded in the literature as prey of *C. fumipennis*, six of them in that state.

As part of the ongoing Florida survey for *Agrilus planipennis*, during 2010 and 2011 the Florida Cooperative Agricultural Pest Survey (CAPS) conducted excavations of *Cerceris fumipennis* at nine nest sites in the northern Florida counties of Alachua (Gainesville, including the University of Florida), Duval (Pelotes Island Preserve), Gadsden (Quincy), Marion (Ocala National Forest, Fore Lake Rec. Area), Santa Rosa (Milton, SR4 at Cold Water Creek) and Wakulla (Apalachicola National Forest Road 13). Two nest excavations (Fig. 12–13) on Pelotes Island in Duval County yielded the new species that is described below. Also we provide a table for the 35 species of Buprestidae known to have been taken as prey in Florida, which includes four new prey records for the wasp. In all, it appears we have 16 new prey records for Florida, one of which, *Chrysobothris scitula* Gory, also is a new state record for the species. Notes are provided for three additional state records of Buprestidae taken in traps for woodboring beetles.

All specimens taken from *Cerceris fumipennis* nests by the Florida CAPS and of the new state records are deposited in the Florida State Collection of Arthropods (FSCA), except as noted for some paratypes of the new species. Collection abbreviations follow Evenhuis (2012). In the description below, features that are obvious from the figures, such as shape and comparative measurements, may not be included in the description. Measurement (to nearest 1/10th mm) of specimen length is from front of head to tips of elytra, and width is across the elytra in line with the median foveae.

***Chrysobothris cerceripraeda* Westcott and Thomas, new species**

(Fig. 1–8)

Description: Holotype male (Fig. 1–7): 10.0 mm long, 4.0 mm wide, shallowly convex, dorsally black, punctures with dark brassy-bronze luster in certain lights, raised sculpturing moderately shining and impunctate; ventrally shining metallic black with bronzy luster, faint coppery reflections along front margin of prosternum and apex of last abdominal ventrite, tarsi greenish blue; head with front black with a dark bronze luster, vertex black; all vestiture white.

Head (Fig. 2) with front subflattened, densely clothed with long white subrecumbent setae, coarsely confusedly reticulate-punctate, with three irregularly-linear median callosities, above with a distinct chevron that merges to a bold median carina on vertex; front margin of clypeus broadly shallowly triangularly emarginate; antennae with first three antennomeres, especially the first, with faint brassy reflections, antennomeres 4–11 black, of equal size except the 11th slightly less wide.

Pronotum (Fig. 1) evenly convex, densely punctate, especially laterally, and with small irregular smooth callosities, mostly on middle, surface almost glabrous, with a few setae evident at sides and anterior and posterior margins near angles, the angles triangular and quadrate, respectively; front margin shallowly lobed at middle; hind margin evenly bisinuate, truncate in front of scutellum; lateral margins bold, well defined, entire and subparallel until they become arcuate near apical pronotal angles, where they are somewhat confused by punctures.

Elytra (Fig. 1) sculptured with raised smooth callosities, rugae and partial carinae, punctures similar to those on pronotum and especially concentrated in each median and paired postmedian callosities; lateral margins serrulate on about apical half, the teeth internally at apex obsolete; each elytron with deep median basal pit, humeral depression distinct, shallow; foveae distinct, the median one deepest; setae not apparent except for minute ones in marginal punctures.

Pygidium bluish black, vaguely greenish apically, densely and evenly punctured, with a small deep U-shaped median notch.

Underside (Fig. 3): prosternum (Fig. 4) with a distinct median lobe on front margin, densely punctate, the punctures finer anteriorly, moderately clothed with long, dense recumbent setae. Abdomen with lateral callosities distinct on sternites 3–5, puncturation and setae as in Fig. 3; last visible sternite with lateral margins serrulate, submarginal ridges vague (cf. Fig. 8), apex rather broadly semicircularly emarginate. Anterior femur with a prominent triangular tooth that is denticulate on outer margin. Anterior tibia (Fig. 5) distinctly arcuate, with a prominent elongate rounded dilation that is restricted well before apex.

Aedeagus gradually expanded to about middle, where strongly constricted, then subparallel to apex, as in Fig. 6–7.

Allotype female: 9.1 mm long, 3.9 mm wide, sexually differing from male as follows: head shining black; prosternal vestiture distinctly less dense; apex of last visible sternite (Fig. 8) much smaller, shallowly emarginate; pygidium not notched at apex, with blue-black portion mostly flattened and finely, sparsely punctured, the punctures changing to coarse and close in distinctly bluish area, from where pygidium is abruptly, moderately deflected, this apical portion golden green and very coarsely confluent punctate; foretibia less obviously arcuate, unmodified apically.

Type material. Holotype (FSCA) labeled “FLORIDA: Duval Co., Pelotes Is. Nat. Pres., 18-V-2010, A. J. Silagyi, L. Whilby, in burrow of *Cerceris fumipennis*/HOLOTYPE *Chrysobothris cerceripraeda* Westcott & Thomas”; Allotype, same except “ALLOTYPE”. Paratypes as follows: same data (2 M, 3 F); USA,



Figures 1–5. *Chrysobothris cerceripraeda* Westcott and Thomas, n. sp., male. 1) Dorsal habitus. 2) Front of head. 3) Ventral habitus. 4) Prosternum. 5) Protibia.

Florida, Duval Co., Jacksonville, JEA Pelotes Island, nest of *Cerceris fumipennis*, 11.v.11, L. Whilby, L. Hassell, K. Okins, P. Skelley (16 M, 8 F), deposited in CASC, CSCA, FMNH, FSCA, LACM, MCZC, RLWE, SGWC, TCMC, UCDC, USNM, WFBM.

Variation. Notwithstanding variation in size, which in the length of males varies from 6.3–10.0 mm ($n = 19$, mean = 7.5 mm) and in females from 7.1–10.4 mm ($n = 12$, mean = 8.8 mm), and dorsal sculpturing, particularly the median frontal callosity(ies) on the head and development of the pronotal callosities, this species is quite uniform in appearance. On the pronotum, there are always a pair of more or less distinct callosities, but elsewhere they are quite irregular, perhaps better described as the surface being smoothly raised between rows punctures (cf. Fig. 1).

Biology/Ecology. The type locality, Pelotes Island (Fig. 9), is part of the 170-acre Pelotes Island Nature Preserve owned by St. Johns River Power Park, which is co-owned by Jacksonville Electric Authority (JEA) and Florida Power and Light (FPL), two Florida utility companies. Pelotes Island is located approximately 3.4 km east of the Power Park, and approximately 2.5 km north of the Blount Island port facility of Jacksonville. The preserve consists of a string of low islands, composed of pine flatwoods, maritime hammocks and shell middens, surrounded by salt marsh (Fig. 10–11). *Chrysobothris cerceripraeda* has been collected only from nests of *Cerceris fumipennis*. Given its general appearance and that it keys nearest to *C. texana*, we might hazard a guess that its larval host is a conifer. However, there are many other potential hosts, as can be seen in a list of the plants found in the area accessed May 30, 2014 at: <http://pelotes.jea.com/NaturePreserve/PlantSpecies.htm>. A special effort was made during the 2011 visit to find adults on possible host plants, but that search was unsuccessful.

Comparison and Discussion. In general appearance, *C. cerceripraeda* resembles *C. quadriimpressa* Gory and Laporte and *C. semisculpta* LeConte; however, it is but remotely related to them. Rather, in Fisher's (1942) key it runs reasonably well to *C. texana* LeConte, to which it bears little resemblance, but with a slight problem in the first alternative of Couplet 24 because some specimens of *C. cerceripraeda* have distinct, albeit small, median pronotal callosities. The second alternative in that couplet is an obvious dead end. Some slight resemblance does exist between these two species, including the male genitalia and protibial dilation, but other than general facies they are immediately separable by the color of the front and vertex in both sexes, which are coppery or coppery-red color in *C. texana*, but dark in females or with a bronze luster in males of *C. cerceripraeda*.

Due to the fact that the eastern USA, Florida in particular, has been extremely well collected for Buprestidae, and Coleoptera in general, and that the site where this species was collected is so close to the Port of Jacksonville, we have considered that this beetle may be an introduced exotic, albeit one that clearly has established. However, according to foreign colleagues Wolfgang Barries, Svata Bílý and Mark Volkovitsh (pers. comm.), who are experts on Buprestidae, the first particularly with *Chrysobothris*, it does not resemble any species known to them. Their opinion is that it belongs to our fauna. Other species of Buprestidae in the USA are rarely collected, sometimes known by only a few specimens, notable examples in the Southeast being *Beerellus taxodii* Nelson, which is known from only two specimens cut from *Taxodium distichum* (L.) Richard (Taxodiaceae) at the same time and place in southern Georgia (Nelson 1982); and *Trachykele fattigi* Knull, which was described from one specimen collected in northern Georgia (Knull 1954) and is otherwise known from only seven specimens cut from *Juniperus virginiana* (L.) (Cupressaceae) at the type locality (Beer 1974).

Etymology. The specific epithet is a combination of the prefix *cerceri-*, from the generic name of the predator, *Cerceris fumipennis*; and the Latin suffix *praeda*, meaning booty or plunder.

New state records for Florida.

***Agrilus difficilis* Gory.** DeSoto Co., Arcadia, Peace River Campground, 27.22897, -81.88468, purple prism trap, manuka and hexanol lures, 19-IV-2012, Southerland (1); Hillsborough Co., Tampa, Lettuce Lake, 28.07515, -82.37454, purple prism sticky trap, manuka oil, 21-VII-2010, D. Gaskill (1); Monroe

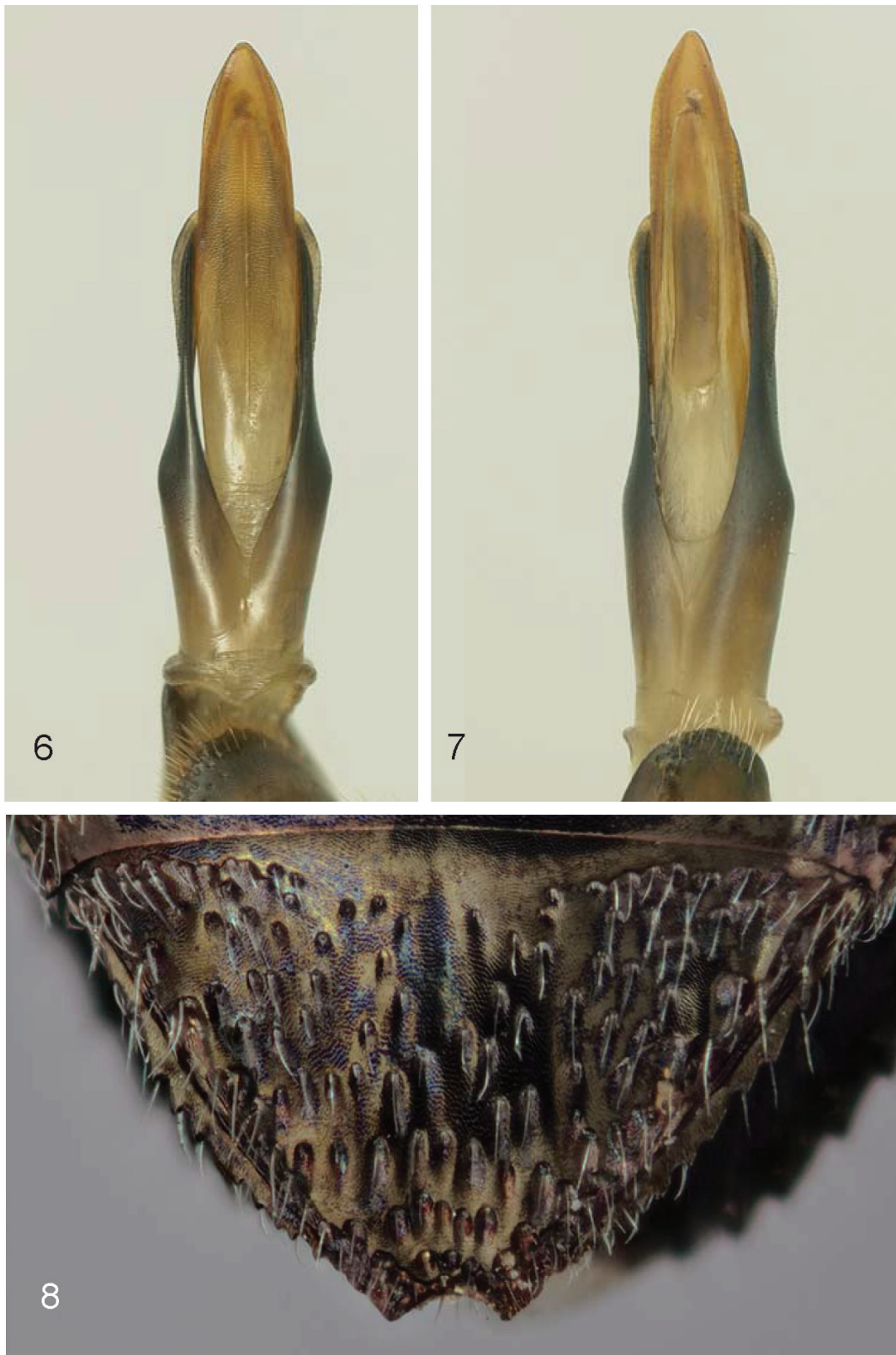


Figure 6–8. *Chrysobothris cerceripraeda* Westcott and Thomas, n. sp. **6)** Male aedeagus, dorsal. **7)** Male aedeagus, ventral. **8)** Female terminal ventrite.

Co., Key Largo, 28-IV-82, M.C. Thomas (1); Sarasota Co., Sarasota, Myakka River S.P., 27.27483, -82.27040, purple prism sticky trap, Phoebe oil, 26-VI-2011, A. Roux (2); Union Co., Hwy. 241 at Santa Fe River, 18-V-86, C.W. Mills, III (1).

***Agrilus subrobustus* Saunders.** Escambia Co., Pensacola, Navy Point Park, 30.37669°, -87.29211°, Lindgren funnel w/EtOH, 21-X-2013, Brooks (1). This Asian exotic was first reported in the USA by Westcott (2007) based on three specimens from Georgia. Subsequently it was found in Tennessee (Hanson et al. 2010), later to be widespread in Alabama and Georgia, and found in South Carolina (Hoebeke and Wheeler 2011). Its only known host is the introduced and widely escaped mimosa, *Albizia julibrissin* Durazzini (Fabaceae) (Jendek and Poláková 2014).

***Chrysobothris acutipennis* Chevrolat.** Hillsborough Co., Tampa, Port of Tampa, Lindgren funnel w/ alpha-beta-pinene, 27.916681°, -82.441696°, 21-IX-2011 (1); same except 27.93105°, -82.43696°, 19-II-2013 (1); same except 27.92516°, -82.43891°, w/ EtOH, 17-IV-2011, 27-II and 11-IV-2012 (3), all F. M. Parilla. This widely ranging species has been recorded from Texas to northern South America, and the larvae are known to feed in *Ebenopsis ebano* (Berlandier) Barneby & J. W. Grimes (Fabaceae) and *Leucaena pulverulenta* (Schlectendal) Bentham (Fabaceae) (Nelson et al. 2008). These Florida records undoubtedly represent an introduction.

***Chrysobothris scitula* Gory.** Alachua Co., Gainesville, Univ. of Florida, 6-10-V-2010, in burrow of *Cerceris fumipennis*, A.J. Silagyi, D. Saeger (1); Leon Co., Tall Timbers Research Station, Malaise trap #2, "06-8-20-1993" (1).



Figure 9. Google Earth image of Pelotes Island (outlined in white) and vicinity.

Specific collection data for new Florida prey records.

Agrilus dozieri (Fisher). Alachua Co., Gainesville, University of Florida, 6-10-V-2010, A.J. Silagyi and D. Saeger (1).

Buprestis apricans (Herbst). Alachua Co., Gainesville, 14-V-2010, A.J. Silagyi (9).

Chrysobothris scitula Gory. Alachua Co., Gainesville, University of Florida, 6-10-V-2010, A.J. Silagyi and D. Saeger (1).



Figure 10–13. Locality photographs. **10)** View of salt marsh surrounding Pelotes Island Nature Preserve, Duval Co., FL. **11)** Dirt road that runs length of Pelotes Island Nature Preserve. All *Cerceris fumipennis* Say nests were found on or next to road. **12)** Drs. Leroy Whilby, FDACS-DPI CAPS, and Adam Silagyi, formerly FDACS-DPI CAPS, excavating nest of *Cerceris fumipennis* on Pelotes Island. **13)** Excavation from nest of *Cerceris fumipennis* showing a common prey species, *Chrysobothris shawnee* Wellso and Manley.

Table 1. Buprestidae taken in Florida as prey of *Cerceris fumipennis* Say. Mueller et al. (1992) included *Chrysobothris femorata* (Olivier); however, this needs to be confirmed, as undoubtedly it refers to another of the species in this complex. Species in **bold** are new prey records. Species without a citation in third column apparently represent new prey records for Florida. *Careless et al. (2014) considered this species to be introduced from Australia, erroneously referenced to Paiero et al. (2012), when instead that idea must have come from Careless et al. (2010). It is native to Florida.

Species	2010-2011 FL CAPS	Other source
<i>Acmaeodera pulchella</i>		Careless 2009
<i>Actenodes acornis</i> (Say)	X	Careless 2009; Careless et al. 2010
<i>Actenodes auronotatus</i> (Gory & Laporte)	X	Careless 2009; Careless et al. 2010
<i>Agrilus arcuatus</i> (Say)	X	
<i>Agrilus bilineatus</i> (Weber)	X	
<i>Agrilus dozieri</i> Fisher	X	
<i>Agrilus obsoletoguttatus</i> Gory	X	
<i>Agrilus sayi</i> Saunders		Mueller et al. 1992, as <i>A. lateralis</i> (Say)
<i>Agrilus vittaticollis</i> (Randall)	X	
<i>Brachys ovatus</i> (Weber)	X	
<i>Buprestis apricans</i> Herbst	X	
<i>Buprestis consularis</i> Gory	X	Careless 2009
<i>Buprestis decora</i> F.		Mueller et al. 1992
<i>Buprestis lineata</i> F.	X	Careless 2009
<i>Buprestis maculipennis</i> Gory	X	Mueller et al. 1992
<i>Buprestis rufipes</i> Olivier	X	Careless 2009
<i>Buprestis striata</i> F.	X	
<i>Chrysobothris adelpha</i> Harold	X	Careless 2009
<i>Chrysobothris chrysoela</i> (Illiger)	X	Careless 2009; Careless et al. 2010
<i>Chrysobothris cerceripraeda</i> Westcott and Thomas	X	
<i>Chrysobothris cribraria</i> Mannerheim	X	Careless 2009
<i>Chrysobothris pusilla</i> Gory & Laporte	X	
<i>Chrysobothris rotundicollis</i> Gory & Laporte	X	Careless 2009
<i>Chrysobothris rugosiceps</i> Melsheimer	X	
<i>Chrysobothris scitula</i> Gory	X	
<i>Chrysobothris sexsignata</i> (Say)	X	
<i>Chrysobothris shawnee</i> Wellso & Manley	X	
* <i>Chrysobothris tranquebarica</i> (Gmelin)		Careless 2009; Careless et al. 2010
<i>Chrysobothris viridiceps</i> Melsheimer	X	
<i>Dicerca lurida</i> (F.)	X	Careless 2009
<i>Dicerca obscura</i> (F.)	X	Careless 2009
<i>Dicerca punctulata</i> (Schönherr)	X	Mueller et al. 1992
<i>Melanophila notata</i> (Laporte and Gory)		Careless et al. 2010, as <i>M. acuminata</i> (DeGeer)
<i>Phaenops aeneola</i> (Melsheimer)	X	Careless 2009
<i>Spectralia gracilipes</i> (Melsheimer)	X	

Acknowledgments

We thank buprestid specialists Wolfgang Barries, Vienna, Austria; Svatopluk Bílý, Prague, Czech Republic; and Hans Mühle, Augsburg, Germany for their opinions on the new species. Appreciation goes

to FDACS-DPI CAPS personnel, especially Dr. Adam Silagyi (now with USDA), Dr. Leroy Whilby, and Kate Okins, who collected the first specimens and alerted us to their presence. We also thank Tammy Hatfield, biologist in charge of Pelotes Island Nature Preserve, for her help and guidance in the field, and the administrators of St. Johns River Power Park for permission to conduct surveys at Pelotes Island. Kate Okins identified some of the species; Kyle Schnepf, FSCA, confirmed the identification of *A. difficilis*; and Stan Wellso, College Station, Texas confirmed the identification of *C. shawnee* Wellso and Manley in Fig. 13. Appreciation goes to Steve Valley, former Imaging Specialist, Plant Division, Oregon Department of Agriculture, for figures 4 and 8. Thanks to Wolfgang Barries, Vienna, Austria, and Chris Looney, Washington Department of Agriculture, Olympia, for reviewing the manuscript.

Literature Cited

- Beer, F. M. 1974.** New Buprestidae (Coleoptera). *The Coleopterists Bulletin* 28(1): 49–50.
- Cappaert, D., D. G. McCullough, T. M. Poland, and N. W. Siebert. 2005.** Emerald ash borer in North America: a research and regulatory challenge. *American Entomologist* 51: 152–165.
- Careless, P. D. 2009.** Biosurveillance: utilizing a beetle hunting wasp (*Cerceris fumipennis*, Hymenoptera: Crabronidae) to detect infestations of emerald ash borers (*Agrilus planipennis*, Coleoptera: Buprestidae). Master's thesis, Department of Environmental Biology, University of Guelph.
- Careless, P. D., M. Jackson, D. d'Entremont, and E. Czerwinski. 2010.** 2010 *Cerceris fumipennis* Project Report. Guelph, ON: Canadian Food Inspection Agency. (Available from <http://www.cerceris.info/pdf/2010%20Cerceris%20fumipennis%20Project%20Report.pdf>. Last accessed 14 January 2015).
- Careless, P., S. A. Marshall, and B. D. Gill. 2014.** The use of *Cerceris fumipennis* (Hymenoptera: Crabronidae) for surveying and monitoring emerald ash borer (Coleoptera: Buprestidae) infestations in eastern North America. *Canadian Entomologist* 146: 90–105.
- Fisher, W. S. 1942.** A revision of the North American species of buprestid beetles belonging to the tribe Chrysobothrini. United States Department of Agriculture Miscellaneous Publication 470: 1–275.
- Evenhuis, N. L. 2012.** The insect and spider collections of the world. (Available from: hbs.bishopmuseum.org/codens/. Last accessed 30 May 2014).
- Hansen, J. A., W. E. Klingeman, and J. K. Moulton. 2010.** Range expansion and adult flight activity of *Agrilus subrobustus*. *Florida Entomologist* 93(3): 444–445.
- Hellman, W. E., and M. K. Fierke. 2014.** Evaluating buprestid preference and sampling efficiency of the digger wasp, *Cerceris fumipennis*, using morphometric predictors. *Journal of Insect Science* 14(4): 1–18.
- Hoebeker, E. R., and A. G. Wheeler, Jr. 2011.** *Agrilus subrobustus* Saunders (Coleoptera: Buprestidae): New Southeastern U.S. Records of an Asian Immigrant on Mimosa, *Albizia julibrissin* (Fabaceae). *Proceedings of the Entomological Society of Washington* 113(3): 315–324.
- Jendek, E., and J. Poláková. 2014.** Host plants of World *Agrilus* (Coleoptera, Buprestidae). A critical review. Springer; Cham, Heidelberg, New York, Dordrecht London. lxiii + 706 p.
- Knull, J. N. 1954.** Two new North American Buprestidae with notes (Coleoptera). *The Ohio Journal of Science* 54: 294–295.
- Marshall, S. A., S. M. Paiero, and M. Buck. 2005.** Buprestid sampling at nests of *Cerceris fumipennis* (Hymenoptera: Crabronidae) in Southern Ontario: The first Canadian records of three buprestids (Coleoptera: Buprestidae). *Canadian Entomologist* 137: 416–419.
- Mueller, U. G., A. F. Warneke, T. U. Grafe, and P. R. Ode. 1992.** Female size and nest defense in the digger-wasp *Cerceris fumipennis* (Hymenoptera: Sphecidae, Philanthinae). *Journal of the Kansas Entomological Society* 65(1): 44–52.
- Nelson, G. H. 1982 [1981].** A new tribe, genus and species of North American Buprestidae with consideration of subfamilial and tribal categories. *The Coleopterists Bulletin* 35(4): 431–450.
- Nelson, G. H., G. C. Walters, Jr., R. D. Haines, and C. L. Bellamy. 2008.** A catalog and bibliography of the Buprestoidea of America north of Mexico. *The Coleopterists Society Special Publication* 4: 1–274 + iv.
- Scullen, H. A., and J. L. Wold. 1969.** Biology of wasps of the tribe Cercerini with a list of the Coleoptera used as prey. *Annals of the Entomological Society of America* 62: 209–214.

Swink, W. G., S. M. Paiero, and C. A. Nalepa. 2013. Buprestidae collected as prey by the solitary, ground-nesting philanthine wasp *Cerceris fumipennis* (Hymenoptera: Crabronidae) in North Carolina. *Annals of the Entomological Society of America* 106(1): 111–116.

Westcott, R. L. 2007. The exotic *Agrilus subrobustus* (Coleoptera: Buprestidae) is found in northern Georgia. *The Coleopterists Bulletin* 61: 111–112.

Received February 2, 2015; March 17, 2015.

Review Editor Michael L. Ferro.