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New state records for 33 species of Nearctic false click beetles (Coleoptera: Eucnemidae)

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0934: 1–13 **INSECTA MUNDI** 2022

New state records for 33 species of Nearctic false click beetles (Coleoptera: Eucnemidae)

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Abstract. New state records for 33 species of Eucnemidae (Coleoptera) are reported from the eastern United States based on the examination and identifications of specimens from four institutional and personal collections over the past several years. Images of 12 eucnemid species are also provided.

Key words. United States, distribution, bark beetle surveys.

ZooBank registration. urn:lsid:zoobank.org:pub:DAFE70DF-394F-4ECF-A518-3EF5DD8B8B6F

Introduction

Recently, opportunities were presented to identify more than 880 Eucnemidae from four institutional and personal collections. Most of the specimens came from the Carnegie Museum of Natural History and were collected during the national bark beetle surveys conducted by the United States Department of Agriculture. The survey has been instrumental in providing more state records of Eucnemidae than any national surveys conducted in the past. This material has served to close many distributional gaps and has uncovered interesting range extensions for a number of species previously thought to be endemic within a particular state or restricted to a certain region. The national bark beetle survey has led to a far more accurate distributional picture for Eucnemidae as a whole in eastern United States. As these surveys continue, many additional distributional records are expected to be discovered. Here, new distributional records for 33 species of Eucnemidae are presented based on the specimens studied and identified from submitted images, private correspondences as well as loans from several museums and private collections.

Materials and Methods

Twelve randomly selected species covered in this study are included so that additional resources are available for future identifications. Habitus images were taken with a JVC KY-F75U digital camera attached to a Leica® Z16 APO dissecting microscope with apochromatic zoom objective and motor focus drive, using a Synchroscopy Auto-Montage® Pro System and software version 5.01.0005, resulting image stacks were processed using CombineZP®. All images were captured as TIFF files during the imaging process. Each image was modified through a paint program and Photoshop® Elements 10® software on a Toshiba Satellite® C55 series laptop computer and all were collated into plates. The size of each plate was modified to 300 dpi. Label data are presented verbatim. Line breaks on labels are denoted by a single slash (/); breaks between two different labels are denoted by double slash (//); metadata and notes (not written on the labels, themselves) are presented in brackets ([]). Scientific names are uniformly presented in *italics*.

Specimens are deposited in the following collections:

CMNH Carnegie Museum of Natural History, Pittsburg, PA
FSCA Florida State Collection of Arthropods, Gainesville, FL
GERP Global Eucnemid Research Project, UW-Madison, Dept. Entomology, Madison, WI
JMLC John M. Leavengood, Jr. Collection, Tampa, FL
SNMC Sam Noble Oklahoma Museum of Natural History, Norman, OK

Results

Subfamily Schizophilinae Muona, 1993

Schizophilus subrufus (Randall, 1838)

This widespread, but rarely seen eucnemid species was previously recorded from Alabama, Florida, Indiana, Maine, Maryland, Michigan, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, Rhode Island, Tennessee, Virginia, Wisconsin (Muona 2000; Otto and Karns 2017) and is reported here for the first time from Connecticut, Illinois, Massachusetts, New Hampshire, and Vermont. **CONNECTICUT:** CONNECTICUT: New Ha-/ ven Co., 2.4 km SE Oakville/ 41.57899, −73.06254, 141 m/ 12–25 Jul 2018, LFT/ K. Bjarnason, BSF# 81434 (2, CMNH); **ILLINOIS:** ILLINOIS: Clinton County/ 5.4km SSW Harbor Light/ Bay, 38.665875, −89.31787/ 141m, 8–22 Jun 2018/ S. Mills, LFT/ BSF# 82139 (1, CMNH); **MASSACHUSETTS:** MASSACHUSETTS: Worchester/ Co., 2.7 km NE of Millford/ 42.15735, −71.49277/ 105m, 11–25 Jul 2019, LFT/ K. Bjarnason, BSF# 88962 (1, CMNH); **NEW HAMPSHIRE:** NEW HAMPSHIRE: Merri-/ mack Co., 4.1km SSW Allens-/ town, 43.126246, −71.430872/ 95 m; 12–30 Jul 2018, LFT/ D. Dudley, BSF# 81130 (2, CMNH; 2, GERP); **VERMONT:** VERMONT: Chittenden Co./ 2.1 km N of Burlington/ 44.494754, −73.209812/ 34m, 12–23 Jul 2019, LFT/ E. Inoue, BSF# 87041 (1, CMNH).

Subfamily Melasinae Fleming, 1821
Tribe Melasini Fleming, 1821

Melasis pectinicornis Melsheimer, 1844

(Fig. 1)

This widespread, common eucnemid species was previously recorded from Alabama, Connecticut, Delaware, District of Columbia, Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Texas, Virginia, and West Virginia (Muona 2000; Otto and Karns 2017). It is reported here for the first time from Rhode Island and Tennessee. **RHODE ISLAND:** RHODE ISLAND: Bristol/ Co., 1.1km ESE Warren/ 41.723481, −71.274963/ 18 m, 9–23 May 2018/ K. DiVito, LFT, BSF# 79119 (1, CMNH); RHODE ISLAND: Providence/ Co., 2 km ENE East Provi-/ dence, 41.81579, −71.346178/ 15 m; 9–23 May 2018/ K. DiVito, LFT, BSF# 79117 (3, CMNH); RHODE ISLAND: Washing-/ ton Co., 3.7km SSE Westerly/ 41.345606, −71.813159, 12m/ 22 May–5 Jun 2018, LFT/ K. DiVito, BSF# 79088 (2, CMNH); RHODE ISLAND: Providence/ Co., 1.8km SSW Simmonsville/ 41.78602, −71.50918, 106m/ 6–20 Jun 2019, LFT/ K. DiVito, BSF# 85349 (1, CMNH); **TENNESSEE:** TENNESSEE: Haywood County/ Hatchie R. NWR/ Lake Oneal, Apr/ 1 2003, R. Ward (1, CMNH).

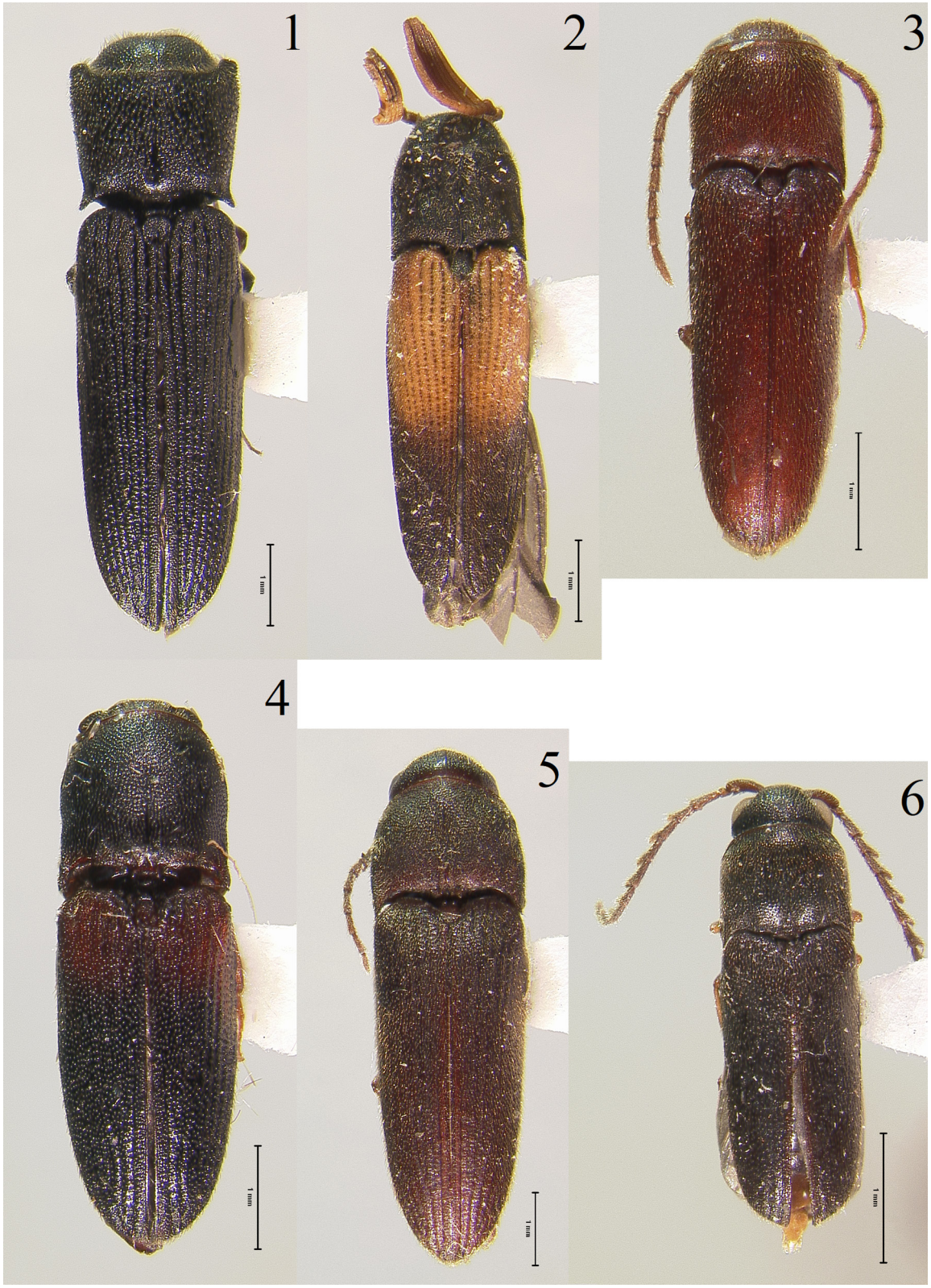
Isorhipis obliqua (Say, 1836)

In Canada, this common, widespread species has been found in Manitoba, Nova Scotia, Ontario and Québec. In the United States, *I. obliqua* was previously recorded from Alabama, Connecticut, District of Columbia, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Massachusetts, Maryland, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia, and Wisconsin (Muona 2000; Otto and Karns 2017). The new state record is for Delaware. **DELAWARE:** DELAWARE: Kent Co./ 5.2km SE Felton, 13m/ 38.9764698, −75.353456/ 28 May–10 Jun 2019 // Lindgren funnel trap/ S. Hauss, K. Bielicki/ BSF# 84936 (1, CMNH).

Isorhipis ruficornis (Say, 1823)

(Fig. 2)

In Canada, this uncommonly collected eucnemid species has been taken in Nova Scotia, Ontario and Québec. In the United States, *I. ruficornis* was previously known from Arkansas, Connecticut, District of Columbia, Georgia, Illinois, Indiana, Iowa, Kansas, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, Texas, Vermont, Virginia, and



Figures 1–6. Nearctic Eucnemidae, dorsal habitus **1)** *Melasis pectinicornis* Melsheimer. **2)** *Isorhipis ruficornis* (Say). **3)** *Entomophthalmus rufiolus* (LeConte). **4)** *Rhagomicrus humeralis* (Say). **5)** *Golbachia impressicollis* (Bonvouloir). **6)** *Microrhagus brunneus* Otto. (Scale: 1–6 = 1.0 mm.)

Wisconsin (Muona 2000; Otto and Karns 2017). Herein, I confirm it from Alabama. One specimen was taken from a light trap. **ALABAMA:** ALABAMA: Blount Co./ Highland Lake/ 12–14-VI-2011/ Coll. T. King Light Trap (1, FSCA).

Tribe Xylobiini Reitter, 1911

Xylophilus crassicornis Muona, 2000

Another widespread but rarely seen eucnemid species, *X. crassicornis* was previously recorded from Arkansas, Connecticut, Delaware, Maryland, Massachusetts, New Jersey, North Carolina, Ohio, Vermont, Virginia, West Virginia, and Wisconsin (Evans 2011; Muona 2000; Otto 2010, 2012; Otto and Karns 2017). It is reported here for the first time from Maine. **MAINE:** MAINE: Waldo County/ 0.2km E Northport, 45m/ 44.33759, –68.9591/ 8–22 Jul 2019, LFT/ K. Kimball, BSF# 86855 (1, CMNH); MAINE: Piscataquis Co./ 3.9km WSW West Seboeis/ 45.51621, –68.92467, 189m/ 11–25 Jul 2019, LFT/ M. Smith, BSF# 86837 (1, CMNH).

Tribe Epiphanini Muona, 1993

Hylis frontosus (Say, 1836)

This widespread, uncommonly encountered eucnemid species was previously recorded from District of Columbia, Georgia, Illinois, Indiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, Vermont, and Wisconsin (Muona 2000; Otto and Karns 2017). I confirm it here for the first time from Connecticut. **CONNECTICUT:** CONNECTICUT: New Haven/ Co., 1.4km, NE Union City/ 41.50639, –73.03851, 154m/ 28 Jun–12 Jul 2018, LFT/ K. Bjarnason, BSF# 80896 (1, CMNH); CONNECTICUT: Hartford/ Co., 5.1km NNW Southing-/ ton, 41.64037, –72.8932/ 107 m, 11–25 Jul 2018/ N. Carrier, LFT, BSF# 81450 (1, CMNH); CONNECTICUT: New Haven/ Co., 1.4km, NE Union City/ 41.50639, –73.03851, 154m/ 12–25 Jul 2018, LFT/ K. Bjarnason, BSF# 81436 (1, CMNH).

Tribe Dirhagini Reitter, 1911

Entomophthalmus rufiolus (LeConte, 1866)

(Fig. 3)

In Canada, this uncommonly encountered eucnemid species was found in Ontario and Québec. In the United States, *E. rufiolus* was previously recorded in Alabama, Arkansas, Delaware, Florida, Georgia, Illinois, Indiana, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Vermont, Virginia, West Virginia, and Wisconsin (Muona 2000; Otto and Karns 2017). The new state record is for Connecticut. **CONNECTICUT:** CONNECTICUT: Windham/ Co., 2.8 km E Ashford/ 41.87081, –72.08868, 138m/ 18–28 Jun 2018, LFT/ E. Chamberlain, BSF# 80920 (1, CMNH); CONNECTICUT: Fairfield/ Co., 4.4km WSW Redding/ 41.290176, –73.443001/ 150 m, 6–20 Jul 2018, LFT/ K. DiVito, BSF# 81426 (1, CMNH); CONNECTICUT: Hartford/ Co., 5.1 km NNW Southing-/ ton, 41.64037, –72.8932/ 107m, 11–25 Jul 2018/ N. Carrier, LFT, BSF# 81450 (1, CMNH); CONNECTICUT: New Ha-/ ven Co., 1.4 km NE Union/ City, 41.50639, –73.03851/ 154m, 12–25 Jul 2018, LFT/ K. Bjarnason, BSF# 81437 (2, CMNH); CONNECTICUT: Windham/ Co., 2.9 km SW Pomfret/ 41.88059, –71.98673, 169m/ 24 Jul–3 Aug 2018, LFT/ E. Chamberlain, BSF# 82886 (1, CMNH).

Rhagomicrus bonvouloiri (Horn, 1886)

In Canada, this species has been confirmed from Ontario, only. In the United States, *R. bonvouloiri* was previously known from Alabama, Arkansas, Connecticut, District of Columbia, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maryland, Massachusetts, Missouri, New Jersey, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas, Vermont, Virginia, West Virginia, and Wisconsin (Muona 2000; Otto and Karns 2017). The new record reported here is for Delaware. **DELAWARE:** DELAWARE: New Castle Co./

4km NNW Wilmington, 73m/ 39.7672, –75.5685, LFT/ 12 Jun–12 Jul 2018, A. Thomp-/ son, N. Nieves, BSF# 83109 (1, CMNH); DELAWARE: New Castle/ Co., 4km NNW Wilmington/ 39.76669, –75.5687, 72m/ 20 Jun–9 Jul 2019, LFT/ N. Nieves, BSF# 85742 (2, CMNH); DELAWARE: Kent Co./ 2.8 km WSW of Dover/ 39.146373, –75.55339/ 23m, 29 Jun–9 Jul 2019 // Lindgren funnel trap/ S. Hauss, K. Bielicki/ BSF# 86138 (1, CMNH).

Rhagomicrus humeralis (Say, 1836)

(Fig. 4)

This widespread, uncommonly encountered eucnemid species was previously recorded from Alabama, Florida, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maryland, Michigan, Missouri, New Hampshire, New York, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Vermont, and Wisconsin (Muona 2000; Otto 2012; Otto and Karns 2017). Two new state records are reported here for the first time. **ARKANSAS:** ARK. Polk Co.,/ Shady Lake/ 7 Aug. 1968/ R.& A. Graves (1, CMNH); **MAINE:** MAINE: Piscataquis Co./ 3.3km ESE Dover-Fox-/ croft, 45.17392, –69.18764/ 142m, 12–25 Jul 2018/ R. Nyce, LFT, BSF# 81966 (1, CMNH); MAINE: Piscataquis Co./ 3.3km ESE Dover-Fox-/ croft, 45.17392, –69.18764/ 142m, 25 Jul–8 Aug 2018/ R. Nyce, LFT, BSF# 81967 (1, CMNH); MAINE: Hancock County/ 2.8km SSW Bar Harbor/ 44.36252, –68.20782, 34m/ 27 Jul–10 Aug 2018, LFT/ R. Nyce, BSF# 82006 (1, CMNH).

Adelothyreus downiei Muona, 2000

This rarely encountered eucnemid species has been recorded from Illinois, Indiana, Missouri, Ohio, Oklahoma, Pennsylvania, and West Virginia (Muona 2000; Otto and Karns 2017). It is confirmed here for the first time from Kansas as a photo submission through bugguide.net (Betros 2020). Betros (2020) observed the eucnemid from a combination blacklight/mercury vapor light trap placed in a remnant tall grass prairie on 7 August 2020 in Lenexa, Kansas.

Golbachia impressicollis (Bonvouloir, 1872)

(Fig. 5)

This rarely encountered eucnemid species was previously recorded from Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Texas (Muona 2000). The new state record is for Illinois. **ILLINOIS:** ILLINOIS: St. Clair County/ 2.2km WNW East St. Louis/ 38.62971, –90.175515/ 121m, 22 Jun–6 Jul 2018/ S. Mills, LFT, BSF# 82225 (1, CMNH).

Microrhagus brunneus Otto, 2013

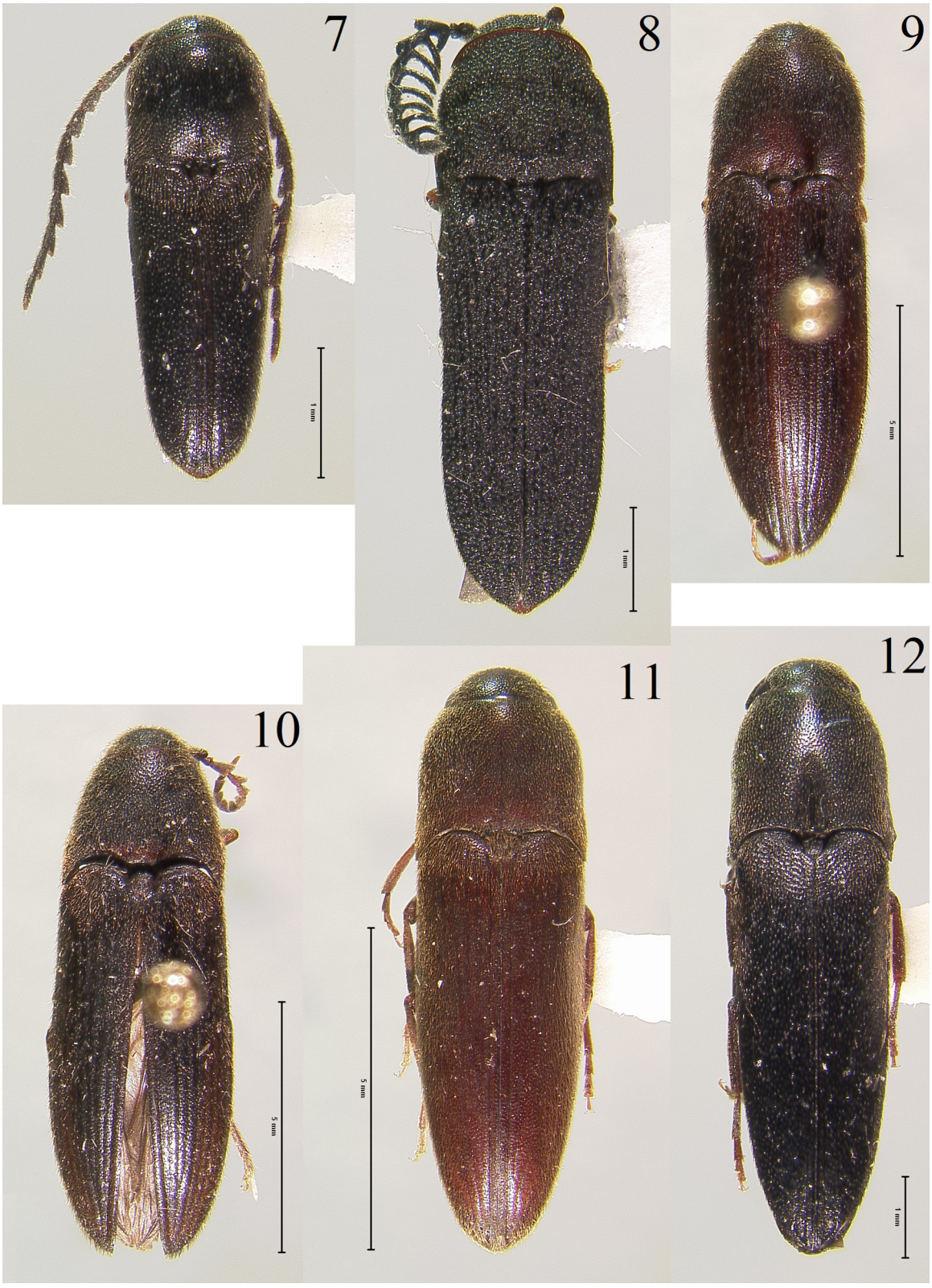
(Fig. 6)

This widespread, uncommon eucnemid species was previously recorded from Arkansas, Georgia, Indiana, Kansas, Kentucky, Louisiana, Missouri, New Hampshire, North Carolina, Ohio, Oklahoma, Pennsylvania, Virginia, West Virginia, and Wisconsin (Otto 2013a; Quinn 2014; Otto and Karns 2017). Herein, three new states are added to the distributional range: Alabama, Massachusetts, and New Jersey. **ALABAMA:** ALABAMA: Blount Co./ Highland Lake/ 12–14-VI-2011/ Coll. T. King Light Trap (1, FSCA); **MASSACHUSETTS:** MASSACHUSETTS: Essex/ Co., 3.8km WSW Haverhill/ 42.76008, –71.11768, 39m/ 11–25 Jul 2019, LFT/ K. DiVito, BSF# 89006 (1, CMNH); **NEW JERSEY:** NEW JERSEY: Bergen Co./ 0.5km N of Wyckoff, 101m/ 41.014183, –74.173081/ 12–25 Jun 2019, LFT/ R. Poage, BSF# 85371 (1, CMNH); NEW JERSEY: Warren Co./ 1.1km ESE of Alpha, 116m/ 40.661867, –75.146595/ 2–17 Jul 2019, N. Aponte-/ Rivera, LFT, BSF# 86196 (1, CMNH).

Microrhagus carinicollis Otto, 2015

(Fig. 7)

This apparently uncommon eucnemid species was previously recorded in Alabama, Florida, Georgia, Illinois, Indiana, Kansas, Michigan, New Hampshire, New Jersey, Ohio, South Carolina, Tennessee, Texas, Vermont, Virginia and West Virginia, and Wisconsin (Otto 2015; Otto and Karns 2017). New state records include Connecticut, Maine, Massachusetts, and Rhode Island. **CONNECTICUT:** CONNECTICUT: Fairfield/ Co., 4.4km



Figures 7–12. Nearctic Eucnemidae, dorsal habitus **7)** *Microrhagus carinicollis* Otto. **8)** *Sarpedon scarbrosus* Bonvouloir. **9)** *Onichodon downiei* Muona. **10)** *Onichodon rugicollis* (Fall). **11)** *Dromaeolus badius* (Melsheimer). **12)** *Dromaeolus cylindricollis* (Say). (Scale: 7–8, 12 = 1.0 mm; 9–11 = 5.0 mm.)

WSW Redding/ 41.290176, –73.443001/ 150m, 22 Jun–6 Jul 2018/ K. DiVito, LFT, BSF# 80886 (2, CMNH); CONNECTICUT: Fairfield/ Co., 0.9km NNE Wilton/ 41.202922, –73.434774/ 96m, 22 June–6 Jul 2018/ K. DiVito, LFT, BSF# 80885 (1, GERP); CONNECTICUT: New Haven/ Co., 3.6km ESE Woodbridge/ 41.34495, –72.96683, 68 m/ 28 Jun–12 Jul 2018, LFT/ K. Bjarnason, BSF# 80898 (1, CMNH); CONNECTICUT: New Ha-/ ven Co., 1.6 km W Walling-/ ford, 41.4586, –72.84214/ 76m, 11–25 Jul 2018, LFT/ N. Carrier, BSF# 81444 (1, CMNH); CONNECTICUT: New Ha-/ ven Co., 3.7km SE Ham-/ den, 41.36416, –72.866842/ 22m, 12–25 Jul 2018, LFT/ K. Bjarnason, BSF# 81443 (1, CMNH); **MAINE:** MAINE: Androscoggin Co./ 4.8 km SSE of Lewiston/ 44.0613, –70.19063, 86m/ 29 May–12 Jun 2019, LFT/ R. Smith, BSF# 88743 (1, CMNH); MAINE: Aroostook County/ 20.6 km SSE Masardis/ 46.33408, –68.25135, 200m/ 25 Jun–10 Jul 2018, LFT/ J. Bither, BSF# 81284 (1, CMNH); MAINE: Aroostook Co./ 20.7 km SSE Masardis/ 46.33408, –68.25135/ 199m, 10–24 Jul 2019/ J. Bither, LFT, BSF# 86377 (1, CMNH); MAINE: Somerset Co./ 7.1km SSE Solon, 181m/ 44.89562, –69.80982/ 3–17 Aug 2018, K. Kimball/ M. Smith, LFT, BSF# 82015 (1, CMNH); **MASSACHUSETTS:** MASSACHUSETTS: Essex/ Co., 3km NNE North Andover/ 42.72384, –71.1227, 40 m/ 27 Jun–11 Jul 2019, LFT/ K. DiVito, BSF# 87867 (1, CMNH); MASSACHUSETTS: Middlessex/ Co., 0.8 km WNW of Stoneham/ 42.48255, –71.10806, 28 m/ 2–16 Jul 2019 // Intercept Panel Trap/ K. Bjarnason/ BSF# 87853 (1, CMNH); MASSACHUSETTS: Essex/ Co., 3km NNE North Andover/ 42.72384, –71.1227, 40 m/ 7–21 Aug 2019, LFT/ K. DiVito, BSF# 90095 (1, CMNH); **RHODE ISLAND:** RHODE ISLAND: Providence/ Co., 1.6km WSW Central Falls/ 41.88603, –71.41096, 26 m/ 5–19 Jul 2019, LFT/ K. Bjarnason, BSF# 87885 (1, CMNH).

Microrhagus lecontei Otto, 2015

This widespread, but rarely seen eucnemid species was previously recorded in Indiana, Kansas, Maine, and Wisconsin (Otto 2015; Otto and Karns 2017). It is reported here for the first time from Alabama, Connecticut and New Jersey. **ALABAMA:** ALABAMA: Winston County/ Bankhead Nat'l For., Reserve Rd./ off Big Bear Branch Rd., BLT/ S 34.074288° W 87.285412°/ Coll. J.M. Leavengood, Jr. &/ E.G. Chapman 9–14-VIII-2020 (1, JMLC); **CONNECTICUT:** CONNECTICUT: Fairfield/ Co., 4.4km WSW Redding/ 41.290176, –73.443001/ 15.m, 22 Jun–6 Jul 2018/ K. DiVito, LFT, BSF# 80886 (1, CMNH); CONNECTICUT: Hartford Co./ 5.5 km ESE of Southington/ 41.57406, –72.81817, 112m/ 23 Jun–12 Jul 2019, K. Dugas/ J. Gross, LFT, BSF# 87170 (1, CMNH); **NEW JERSEY:** NEW JERSEY: Burlington/ Co., 2.4km NW Moorestown/ 39.97937, –74.98505, 34m/ 26 Jul–10 Aug 2018, LFT/ D. Armstrong, BSF# 81167 (1, CMNH).

Microrhagus pectinatus LeConte, 1866

In Canada, this uncommonly collected eucnemid species has been recorded in British Columbia, Manitoba, Nova Scotia, Ontario and Québec. In the United States, *M. pectinatus* was previously recorded in Alabama, Arkansas, Georgia, Illinois, Indiana, Iowa, Kansas, Maine, Maryland, Michigan, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Tennessee, Texas, Virginia, West Virginia, and Wisconsin (Muona 2000; Otto and Karns 2017). New northeastern records reported here for the first time include Connecticut, Massachusetts and Vermont. **CONNECTICUT:** CONNECTICUT: Hartford Co./ 7.3 km S of New Britain/ 41.59577, –72.78116, 59 m/ 17 May–21 Jun 2019, K. Dugas/ J. Gross, LFT, BSF# 85542 (1, CMNH); CONNECTICUT: Fairfield/ Co., 2.1 km N Old Greenwich/ 32 m, 41.04147, –73.56358/ 30 May–13 Jun 2019, LFT/ K. Bjarnason, BSF# 85220 (1, CMNH); **MASSACHUSETTS:** MASSACHUSETTS: Middle-/ sex Co., 2.3 km NE Chelms-/ ford, 42.61701, –71.35109/ 44 m, 21 May–4 Jun 2019 // intercept panel trap/ K. Bjarnason/ BSF# 84725 (1, CMNH); MASSACHUSETTS: Essex/ Co., 0.6km WNW West Box-/ ford, 42.70841, –71.07058/ 57 m, 13–27 Jun 2018 // cross-vane panel/ trap, J. Klein/ BSF# 80416 (1, CMNH); **VERMONT:** VERMONT: Washington/ Co., 2km SE South Barre/ 44.1633631, –72.489567/ 367 m, 5–19 Jun 2018 // cross-vane panel/ trap, R. Karros/ BSF# 80528 (1, CMNH).

Microrhagus triangularis (Say, 1823)

In Canada, this widespread eucnemid species was found in New Brunswick, Nova Scotia, Ontario and Québec. In the United States, *M. triangularis* was previously recorded in Alabama, Arkansas, Connecticut, District of Columbia, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts,

Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, West Virginia, and Wisconsin (Muona 2000; Majka 2007; Webster et al. 2012; Otto and Karns 2017). It is reported for the first time from Rhode Island. **RHODE ISLAND:** RHODE ISLAND: Kent Co./ 3.3 km SSE of Centerville/ 41.66816, −71.51265/ 84 m, 17–31 Jul 2019 // intercept panel/ trap, K. DiVito/ BSF# 89104 (1, CMNH).

Dirrhagofarsus ernae Otto, Muona, and McClarin, 2014

This widespread, somewhat common eucnemid species was previously known from Alabama, Connecticut, Delaware, Florida, Illinois, Indiana, Iowa, Georgia, Kansas, Maine, Massachusetts, Michigan, Missouri, New Hampshire, New Jersey, Ohio, Oklahoma, Pennsylvania, Rhode Island, Tennessee, Texas, Vermont, Virginia, West Virginia, and Wisconsin (Otto et al. 2014; Otto and Karns 2017). New York is now confirmed as a new state record. **NEW YORK:** NEW YORK: Franklin Co./ 4.6km WSW Hogansburg/ 44.9531, −74.7144, 59 m/ 2–18 Jul 2019, LFT/ A. Johnson, BSF# 86284 (1, CMNH).

Dirrhagofarsus lewisi (Fleutiaux, 1900)

This seemingly uncommon eucnemid species was found in Alabama, Arkansas, Florida, Illinois, Georgia, Kansas, Maryland, Missouri, Ohio, Pennsylvania, Texas, Vermont, Virginia, West Virginia, and Wisconsin (Muona 2000; Otto and Karns 2017). The two new state records reported here for the first time are Connecticut and New Jersey. **CONNECTICUT:** CONNECTICUT: Hartford County/ 2.5km SE Windsor Locks/ Locks, 41.91064, −72.60915/ 32m, 19 Jul–2 Aug 2019 // intercept panel/ trap, K. DiVito/ BSF# 88912 (1, CMNH); **NEW JERSEY:** NEW JERSEY: Middlesex/ Co., 5.2km SE Edison/ 40.4977, −74.3575, 3m/ 24 May–14 Jun 2018, LFT/ S. Coachman, BSF# 79374 (1, CMNH) ; NEW JERSEY: Warren Co./ 1.2 km SE Alpha, 104 m/ 40.661464, −75.145893/ 13–26 Jun 2018, LFT/ P. Rockermann, BSF# 79653 (1, CMNH); NEW JERSEY: Mercer Co./ 3.6km NNE Trenton, 37m/ 40.248013, −74.730852/ 26 Jun–9 Jul 2018, LFT/ D. Armstrong, BSF# 80360 (1, CMNH); NEW JERSEY: Warren Co./ 1.9 km NE Columbia, 105 m/ 40.938756, −75.078049/ 17 Jul–1 Aug 2019, N. Aponte-/ Rivera, LFT, BSF# 86623 (1, CMNH).

Sarpedon scabrosus Bonvouloir, 1875

(Fig. 8)

This rarely seen eucnemid species was previously recorded from British Columbia and Ontario in Canada. In the United States, *S. scabrosus* was taken in Alabama, California, Colorado, Indiana, Iowa, Kansas, Maryland, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New York, Ohio, Oklahoma, Oregon, Tennessee, Texas, Utah, Washington, and Wisconsin (Muona 2000; Otto and Karns 2017). It is reported here for the first time from Illinois and Maine. **ILLINOIS:** ILLINOIS: Fayette County/ 5.4 km SSE Ramsay/ 39.09839, −89.08755/ 172m, 7–21 Jun 2019/ T. Vorce, LFT BSF# 89180 (1, GERP); ILLINOIS: Fayette County/ 5.6km SSE Ramsay, 170m/ 39.096554, −89.087693/ 7–21 Jun 2019, LFT/ T. Vorce, BSF# 89190 (1, CMNH); ILLINOIS: Will County/ 0.3km S Lidice, 191m/ 41.55162, −88.09015/ 28 Jun–12 Jul 2019 // translucent cross-/ vane panel trap/ J. Scott, BSF# 90891 (4, CMNH; 1, GERP); **MAINE:** MAINE: Kennebec Co./ Oakland/ 11-VII-2001/ F.W. Skillman Jr. (1, FSCA).

Subfamily Eucneminae Eschscholz, 1829
Tribe Mesogenini Muona, 1993

Stethon pectorosus LeConte, 1866

This apparently rare eucnemid species was previously recorded from the Canadian provinces of New Brunswick, Ontario, and Québec. In the United States, *S. pectorosus* was taken in Alabama, Arkansas, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New York, Ohio, Oklahoma, Pennsylvania, Texas, Virginia, and Wisconsin (Otto and Gruber 2016; Otto and Karns 2017). Here it is reported for the first time from Rhode Island and Tennessee.

RHODE ISLAND: RHODE ISLAND: Providence/ Co., 2.3km SW Pawtucket/ 41.867562, –71.405309/ 21 m, 3–17 Jul 2018, LFT/ K. DiVito, BSF# 80975 (2, CMNH); RHODE ISLAND: Providence/ Co., 2 km NW of Seekonk/ 41.822939, –71.351664, 8m/ 15–29 Jul 2019, LFT/ M. Picozzi, BSF# 88473 (1, CMNH); RHODE ISLAND: Kent Co./ 2.4 km ESE Lippitt, 22m/ 41.711739, –71.499511/ 22m, 17–30 Jul 2019, LFT/ M. Picozzi, BSF# 88437 (1, CMNH); **TENNESSEE:** TENESSEE: David-/ son Co., Madison./ light, 22-vi-1997/ B & B Valentine [date, month and year handwritten] // Valentine/ Coll'n/ Rec. 2016 (1, FSCA); TENESSEE: David-/ son Co., Madison./ light, 23-vi-1997/ B & B Valentine [date, month and year handwritten] // Valentine/ Coll'n/ Rec. 2016 (1, FSCA); TENESSEE: David-/ son Co., Madison./ light, 24-vi-1997/ B & B Valentine [date, month and year handwritten] // Valentine/ Coll'n/ Rec. 2016 (1, FSCA).

Subfamily Macraulacinae Fleutiaux, 1922
Tribe Euryptychini Mamaev, 1976

Euryptychus ulkei (Horn, 1886)

This widespread, rarely seen species has been recorded from Florida, Georgia, Mississippi, Ohio, Pennsylvania, Rhode Island, Texas, Virginia, and Wisconsin (Muona 2000; Hoffman et al. 2009; Otto and Karns 2017; Otto and Young 2017). It is now reported for the first time from Connecticut. **CONNECTICUT:** CONNECTICUT: Fairfield/ Co., 1.6 km SSE Stamford/ 41.04023, –73.53254, 5m/ 13–27 June 2019, LFT/ K. Bjarnason, BSF# 86410 (1, CMNH).

Tribe Macraulacini Fleutiaux, 1922

Diphytaxis excavata Horn, 1890

Recently, an image of the species was submitted for identification on bugguide.net in 2020 by William Hull. It was identified as *D. excavata*, a highly diagnostic species newly recorded in Cincinnati, Ohio and a first record for the lower Great Lakes region. Additionally, I received a personal correspondence from Art Evans a few years ago regarding the new record of this species in Virginia. These two records greatly expand the range of the species, as it was previously thought to be restricted in south-central United States. This rarely encountered eucnemid species was previously known from Belize, Cuba, Guatemala, Mexico and newly recorded in Costa Rica (pers. obs.). In the United States, *D. excavata* has now been taken in Arkansas, Missouri, Ohio, Texas, and Virginia (Muona 2000; Otto 2011a; Hull 2020; Evans, pers. comm.).

Onichodon canadensis (Brown, 1940)

In Canada, this widespread, apparently rare eucnemid was previously recorded from New Brunswick, Nova Scotia, Ontario, Prince Edward Island, and Québec (Muona 2000; Majka 2007). In the United States, *O. canadensis* were found in Connecticut, Maine, Massachusetts, Michigan, Minnesota, New Hampshire, New York, Pennsylvania, Vermont, and Wisconsin (Muona 2000; Otto and Karns 2017). Herein, I confirm it from New Jersey and Rhode Island. **NEW JERSEY:** NEW JERSEY: Warren/ Co., 1.1 km SE Alpha/ 40.661903, –75.145968/ 110m, 26 Jun–10 Jul 2018 // Cross-vane panel trap/ P. Rockermann/ BSF# 80283 (1, CMNH); NEW JERSEY: Warren Co./ 1.9km NE Columbia/ 40.939011, –75.07712/ 20 Jun–2 Jul 2019, N. Aponte-/ Rivera, LFT, BSF# 85393 (1, CMNH); **RHODE ISLAND:** RHODE ISLAND: Washington/ Co., 3.9 km SW Hope Valley/ 41.482028, –71.747417, 29m/ 9–26 Jul 2019. LFT/ M. Picozzi, BSF# 85343 (1, CMNH).

Onichodon downiei Muona, 2000

(Fig. 9)

In Canada, this widespread, but rarely encountered eucnemid species has been recorded from Ontario, only. In the United States, *O. downiei* was previously recorded from Illinois, Indiana, Maryland, Massachusetts, Michigan, Missouri, New York, Ohio, Pennsylvania, Vermont, Virginia, and Wisconsin (Muona 2000; Otto 2011b; Otto and Karns 2017). Four new state records reported here for the first time include Arkansas, Connecticut, New

Jersey, and Rhode Island. **ARKANSAS:** AR Garland Co./ FS CampClearFork/ VI/11/06, U.V./ Light Traps/ Brian Baldwin (1, SNMC); AR Garland Co./ FS CampClearFork/ VI/16/05, UVlight/ Brian Baldwin (1, SNMC); AR Faulkner Co./ Camp J Robinson/ FlightIntercept/ July 13th, 2003/ Brian Baldwin (2, SNMC); **CONNECTICUT:** CONNECTICUT: New Haven/ Co., 2 km W of West Haven/ 41.27028, −72.97048, 8 m/ 1–15 Jul 2019, LFT/ E. Chamberlain, BSF# 87800 (1, CMNH); **NEW JERSEY:** NEW JERSEY: Monmouth/ Co., 2.2 km S Allaire, 18m/ 40.138953, −74.129244/ 11 Jun–9 Jul 2019, LFT/ D. Armstrong, BSF# 85802 (1, CMNH); **RHODE ISLAND:** RHODE ISLAND: Provi-/ dence Co, 1.5km NW Glen-/ dale, 41.98285, −71.61610/ 110 m, 29 Jun–13 Jul 2018/ K. DiVito, LFT, BSF# 80973 (1, CMNH).

Onichodon rugicollis (Fall, 1925)

(Fig. 10)

This widespread, rarely seen eucnemid species was previously recorded from Alabama, Florida, Illinois, Iowa, Kentucky, Louisiana, Michigan, Mississippi, North Carolina, Pennsylvania, Texas, and Wisconsin (Muona 2000; Otto 2010, 2013b; Otto and Karns 2017). The new state record is for Georgia. **GERORGIA:** GEORGIA: Chatham Co./ 1.9 km N Garden City/ 32.13098, −81.15114, 0.5m/ 25 Aug–8 Sep 2016, LFT/ S. Davis, BSF# 70855 (1, CMNH).

Onichodon wappesi Muona, 2000

This rarely encountered eucnemid species was previously recorded from Oklahoma and Texas (Muona 2000; Otto and Karns 2017). Arkansas is newly confirmed. **ARKANSAS:** AR Little Rock/ July 12th 2003/ Blacklight Trap/ Brian Baldwin (1, SNMC); USA Little Rock/ June 22nd 2001/ Malaise Trap/ Brian Baldwin (1, SNMC).

Isarthrus calceatus (Say, 1836)

In Canada, this uncommonly encountered eucnemid species was taken in Ontario and Québec. In the United States, *I. calceatus* was previously recorded from Arkansas, District of Columbia, Georgia, Illinois, Indiana, Kansas, Maine, Maryland, Massachusetts, Michigan, Missouri, New Hampshire, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, Rhode Island, Texas, Vermont, and Wisconsin (Muona 2000; Otto and Karns 2017). Herein, I confirm it from Connecticut. **CONNECTICUT:** CONNECTICUT: Middle-/ sex Co., 4.2km W old Say-/ brook, 41.29359, −72.43375/ 34m, 16–30 May 2018, LFT/ N. Carrier, BSF# 78971 (1, CMNH); CONNECTICUT: Middlesex Co/ 7.7 km SSE of Durham/ 41.41621, −72.64968, 89m/ 31 May–19 Jun 2019, K.Dugas,/ S. Carsen, LFT, BSF# 87231 (1, CMNH); CONNECTICUT: New Lon-/ don Co., 1.4km E East Lyme/ 41.35431, −72.21327, 15 m/ 2–16 May 2018, LGT/ N. Carrier, BSF# 78974 (1, CMNH); CONNECTICUT: New Lon-/ don Co., 5.2km N Waterford/ 41.4007, −72.16488, 71 m/ 16–30 May 2018, LFT/ N. Carrier, BSF# 78983 (2, CMNH); CONNECTICUT: New London/ Co., 4.4km ESE Jewett City/ 41.593642, −71.931402, 69 m/ 21 May–17 Jun 2019, K.Dugas/ J. Gross, LFT, BSF# 86026 (1, CMNH); CONNECTICUT: Wind-/ ham Co., 1.6km N Eastford/ 41.91525, −72.07854/ 138m, 23 May–5 Jun 2018 // intercept panel trap/ E. Chamberlain/ BSF# 79142 (3, CMNH).

Isarthrus rufipes (Melsheimer, 1844)

In Canada, this eucnemid species was previously recorded from Ontario, only. In the United States, *I. rufipes* has been found in Alabama, Connecticut, District of Columbia, Georgia, Illinois, Indiana, Iowa, Maine, Maryland, Michigan, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Tennessee, Virginia, and Wisconsin (Muona 2000; Otto and Karns 2017). Two new state records reported for the first time are Vermont and West Virginia. **VERMONT:** VERMONT: Caledonia Co/ 5.3km W of Groton, 424m/ 44.211146, −72.262024/ 10–24 Jul 2019, LFT/ A. Slowik, BSF# 87953 (1, CMNH); **WEST VIRGINIA:** WEST VIRGINIA: Cabell Co./ 3.3 km ENE of Huntington/ 38.43269, −82.41144/ 1–15 Jul 2019, LFT/ R. Rose, BSF# 85906 (1, CMNH).

Dromaeolus badius (Melsheimer, 1844)

(Fig. 11)

In Canada, this widespread, common eucnemid species was taken in Ontario and Québec. In the United States, *D. badius* was previously recorded from Alabama, Arizona, District of Columbia, Florida, Georgia, Idaho, Illinois, Indiana, Kansas, Louisiana, Maryland, Massachusetts, Missouri, Nebraska, New Jersey, New York, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, and Wisconsin (Muona 2000; Otto and Karns 2017). Three new state records reported for the first time include Connecticut, Delaware, and Rhode Island. **CONNECTICUT:** CONNECTICUT: New Ha-/ ven Co., 3.7km SE Hamden/ 41.36416, –72.866842, 22m/ 28 Jun–12 Jul 2018, LFT/ K. Bjarnason, BSF# 80903 (1, CMNH); **DELAWARE:** DELAWARE: Kent Co./ 2.8 km WSW of Dover/ 39.146373, –75.55339/ 23m, 29 Jun–9 Jul 2019 // Lindgren funnel trap/ S. Hauss, K. Bielicki/ BSF# 86138 (1, CMNH); **RHODE ISLAND:** RHODE ISLAND: Providence/ Co., 2km ENE East Provi-/ dence, 41.81579, –71.346178/ 15 m, 3–17 Jul 2018, LFT/ K. DiVito, BSF# 80978 (1, CMNH)

Dromaeolus cylindricollis (Say, 1836)

(Fig. 12)

In Canada, this eucnemid species was previously known from Ontario and Québec. In the United States, *D. cylindricollis* has been recorded from Alabama, Arkansas, Connecticut, District of Columbia, Florida, Georgia, Illinois, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, Tennessee, Texas, Vermont, Virginia, and Wisconsin (Muona 2000; Otto 2012; Otto and Karns 2017). The three new state records are for and reported for Maine, Mississippi, and New Hampshire. **MAINE:** MAINE: Aroostook Co./ 7.1 km S Portage, 193m/ 46.699579, –68.479389/ 25 Jun–10 Jul 2018 // black cross-vane panel/ trap, J. Bither/ BSF# 81314 (1, CMNH); MAINE: Aroostook Co./ 7.1 km S Portage, 193m/ 46.699579, –68.479389/ 25 Jun–10 Jul 2018, LFT/ J. Bither, BSF# 81278 (1, CMNH); MAINE: Cumberland Co./ 7.5 km SSE of Raymond/ 43.83763, –70.44084/ 95m, 11–23 Jul 2019, LFT/ R. Smith, BSF# 88739 (1, CMNH). A number of images were submitted for identification on bugguide.net from both Mississippi and New Hampshire which represents records for these two states (McClarin 2007; Insinga 2021; Jones 2021).

Dromaeolus punctatus (LeConte, 1878)

This rarely seen eucnemid species was previously recorded from Arkansas, Florida, Georgia, Mississippi, and North Carolina (Muona 2000). I can now confirm Alabama. **ALABAMA:** ALABAMA: Baldwin/ Co., Weeks Bay Est./ Reserve, 31-vii-00/ B&BValentine, u/v // 7.5 mi. W. Foley/ 30°25′03″N/ 87°49′50″W (1, FSCA); ALABAMA: Winston County/ Bankhead Nat'l For., Reserve Rd./ off Big Bear Branch Rd., BLT/ S 34.074288° W 87.285412°/ Coll. J.M. Leavengood, Jr. &/ E.G. Chapman 9–14-VIII-2020 (1, JMLC).

Dromaeolus striatus (LeConte, 1852)

This widespread, but rarely seen eucnemid species was previously recorded from Alabama, Arkansas, Connecticut, District of Columbia, Florida, Georgia, Iowa, Louisiana, Maryland, Massachusetts, Mississippi, New Jersey, New York, North Carolina, Pennsylvania, South Carolina, Tennessee, Texas, Vermont, Virginia, and Wisconsin (Muona 2000; Otto and Karns 2017). The new state record reported for the first time is West Virginia. **WEST VIRGINIA:** WEST VIRGINIA: Putnam/ Co., 3.2 km SSW Buffalo/ 38.59092, –81.99447/ 173m, 2–23 Jul 2018, LFT/ D. Pickens, BSF# 80647 (1, CMNH).

Dromaeolus turnbowi Muona, 2000

This widespread, rarely encountered eucnemid species was previously known from Alabama, Florida, Georgia, Louisiana, Mississippi, Ohio, Pennsylvania, Tennessee, Texas, and West Virginia (Muona 2000; Otto 2012; Otto and Karns 2017). It is recorded here for the first time from Arkansas. **ARKANSAS:** USA ARL ittleRock/ VI/16/97 Flight/ Intercept Trap/ Brian Baldwin (1, SNMC).

Discussion

Two of the 33 species of Eucnemidae covered in this study newly recorded in a number of states east of the Mississippi River are worth noting further. The recorded specimens of both *Golbachia impressicollis* and *Diphytaxis excavata* significantly extends their respective ranges beyond what was expected.

Historically, *G. impressicollis* have been known largely from the southeastern United States, taken from Texas, Louisiana and Mississippi east to Alabama and Florida northeast up to North Carolina. A single record from southern Illinois extends the range further northward towards the southern Midwest region. The new Illinois record offers potential for *G. impressicollis* to be taken in nearby states like Kentucky and Tennessee. It would be possible for the eucnemid species extending its range in Arkansas and Missouri given close proximity of the state lines to the locality in which *G. impressicollis* have been taken in southern Illinois. *Golbachia impressicollis* may also be present in West Virginia and Virginia, but it is as yet unknown in these two states.

Prior to 2016, *D. excavata* was known from a single specimen taken from Caldwell Country Texas (Muona 2000) and also from Arkansas through a bugguide.net submission in 2011 (Otto 2011a). Otto and Karn (2017) added Missouri to the list of states where *D. excavata* were taken. The new Virginia record observed by A. Evans and W. Hull's record from Cincinnati Ohio further extends the range of the species eastward and northward from south-central United States. The potential is great for numerous new state records of *D. excavata* to exist in future surveys in the eastern United States. This eucnemid enjoys a very large range on the North American continent extending southward towards Costa Rica in Central America. Very little biological information is known for the species, based on a small number of specimens taken from the United States and locales outside the United States.

Discovery of *D. excavata* in Virginia by A. Evans has resulted in an epiphany regarding the theoretical identity of the mysterious larval type found in southern Wisconsin. Osten Saken (1862) described two larvae of Eucnemidae from Virginia, *Fornax badius* (now *Dromaeolus badius*) and a putative *Fornax orchesides* (*Onichodon orchesides*). Otto (2013b) have determined the larval description of the putative *Fornax orchesides* identified by Osten Saken was incorrect and surmised the larva may belong to either *Anelastes drurii* Kirby, *Dendrocharis inexspectata* Muona or *Euryptychus heterocerus* (Say). The mysterious larva, which is structurally similar to Osten Saken's partial illustration was first collected in southern Wisconsin by D.K. Young in 1994. Wood pieces containing other larvae were stored in the freezer hoping to rear to adults in an attempt to identify the larval type. Due to a mechanical malfunction of the freezer, the opportunity to fix the identity of the remaining larvae was lost when maintenance discarded all the wood pieces during the time repair work commenced inside the freezer. Identity of the larval type has still remained a mystery since 1994.

With the presence of *D. excavata* in Virginia and Ohio, the species is now added to the list of possibilities to the identification of the mysterious larval type. Efforts are still being made in search of additional larval types in a second attempt to rear them and fix their identification through association with the reared adults. Regardless of what the end result will be on the identity of the mysterious larval type, it will result in a major discovery that will change the way we look at the classification in respect to other genera within the family, based on observed primitive external morphology (i.e. presence of small, well-developed legs and spiniform urogomphi) of the larval type. If the larval type is identified as *D. excavata*, it will further extend its range into southern Wisconsin with possible records in Illinois, Indiana, Iowa, and southern Michigan. Only time will tell with the success in locating and rearing these larvae to adults and finally putting this 27+ year mystery to rest.

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