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The Scarabaeoidea (Coleoptera) of Iowa: An annotated checklist

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The Scarabaeoidea (Coleoptera) of Iowa:
An annotated checklist

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The Scarabaeoidea (Coleoptera) of Iowa: An annotated checklist

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Abstract. An annotated checklist of 227 species of Scarabaeoidea (Coleoptera) known to occur in Iowa is presented, including seven families and 79 genera. This list was developed from information gleaned during literature review, from examination of specimens deposited in 22 regional and comprehensive collections, as well as from several years of active collecting conducted by the authors around the state. Thirty-six species included here represent new state records.

Key words. Scarabaeidae, Lucanidae, Passalidae, Geotrupidae, Trogidae, Ochodaeidae, Hybosoridae, faunal survey.

Introduction

The superfamily Scarabaeoidea is a large diverse group of beetles containing approximately 35,000 species world-wide. North America is home to about 1,500 species and 10 families (Jameson and Ratcliffe 2002). Smith (2006, 2009) assembled the most recent review of the nomenclature for this superfamily in North America.

Well documented scarab beetle surveys have been published for five Midwestern states. Dawson (1922b) first considered the Nebraska fauna, while Ratcliffe (1991) and Ratcliffe and Paulsen (2008) provided significant updates for that state. Kriska and Young (2002) provided an annotated checklist for Wisconsin. Helgeson and Post (1967) and Lago et al. (1979) treated the saprophagous scarabs and the phytophagous scarabs and Trogidae of North Dakota, respectively. Kirk and Balsbaugh (1975) included scarabs in their list of beetles of South Dakota, while Blatchley (1910) presented a more in-depth treatment of the Coleoptera of Indiana.

No comprehensive survey of Iowa scarabs has been published, but records of scarab species occur in various articles concerning Iowa insects. Putnam (1876) listed Coleoptera found near Davenport, Iowa, including 29 species of scarabs. Wickham (1911) published a more thorough listing of Iowa Coleoptera that included 110 species of Scarabaeoidea and followed two years later with a description of a new species from Iowa, *Aphodius iowensis* (Wickham 1913). King (1914) compiled a list of Coleoptera from Henry County, Iowa, and reported 52 species of scarabs. Hendrickson (1930) mentioned a few scarab species encountered on Iowa prairies. A Survey of Iowa Insects was begun in the early 1930s, but no scarab list was published (Jaques 1932). Jaques (1926, 1928), Travis (1934, 1939), and Rice and Riley (2000) published information concerning 33 of the species of *Phyllophaga* Harris known from the state. Rice (2001) first reported the imported pest Japanese beetle (*Popillia japonica* Newman) as occurring in Iowa. Worthington and Larsen (2010) presented an annotated checklist of scarab beetles collected in Winneshiek and Allamakee counties, while Lago and Freese (2016) provided the most recent addition to the Iowa fauna with a description of a new species of *Aegialia* Latreille.

Many published Iowa scarab records were located by checking the literature at the generic or group level. Dawson (1919a, 1919b, 1922a, 1932) described several new species of *Serica* MacLeay and recorded specimens from Iowa. Horn (1887) and Luginbill and Painter (1953) provided extensive information concerning distribution of May beetles (*Phyllophaga* Harris) north of Mexico. Vaurie (1955, 1956, 1958,

1960) revised the Trogidae and the genus *Diplotaxis* Kirby. Hoffman (1935) revised the genus *Trichiotinus* Casey (Trichinae), Howden (1955a, 1964, 1968) updated the taxonomy of geotrupines and trichiines, while Howden and Cartwright (1963) revised the genus *Onthophagus* Latreille (Scarabaeinae). Gordon (1976, 1983), Stebnicka (1994), Stebnicka and Lago (2005), and Gordon and Skelley (2007) covered most of the species of the Aphodiinae. Potts (1977) updated the genus *Anomala* Samouelle, while Downie and Arnett (1996) provided a taxonomic treatment of beetles of northeastern North America. Paulsen and Smith (2005) published a synopsis of the genus *Nicagus* LeConte while Paulsen (2007) updated the family Ochodaeidae. Orozco (2012) revised the American cetoniine genus *Euphoria* Burmeister.

The number of species of Scarabaeoidea previously known from Iowa increased from the original 29 species reported by Putnam (1876) to the current total of 191 published scarab species (Worthington and Larsen 2010; Evans 2014; Lago and Freese 2016). This includes 72 genera and 7 families.

Materials and Methods

This checklist began with the scarab beetles listed by Wickham (1911). The literature, as indicated above, was examined for additional Iowa records. Articles, books, and various specialists were consulted to update nomenclature and to aid with identification.

Several insect collections were accessed to locate additional specimens from Iowa and to compare specimens for identification. In particular, collections held by Iowa State University, Ames; Iowa Wesleyan University (Iowa Insect Survey Collection), Mt. Pleasant; University of Northern Iowa, Cedar Falls; Cornell College, Mt. Vernon, Iowa; University of Nebraska State Museum, Lincoln (which also has part of the Smithsonian scarab collection on loan); Enns Entomological Museum, University of Missouri, Columbia; Wisconsin Insect Research Collection, University of Wisconsin, Madison; and University of Mississippi, University were examined. We also obtained label data via e-mail from collections of the Illinois Natural History Survey and University of Illinois at Urbana/Champaign, Urbana, when a new state record was discovered and we needed additional information concerning the species' range east of Iowa.

Specimens were actively collected in the field from 1995 through 2018. Many specimens were collected at lights such as black lights, combination UV-fluorescent lights, porch lights, security lights, gas station lights, as well as checking vegetation and logs and standing dead trees at night. Diurnal collecting activities included sweeping vegetation, hand picking from flowers, checking dung, animal carcasses, animal burrows, ant nests, sifting through leaves, digging under soil pushups on paths, peeling back bark, turning over logs and rocks, netting insects in flight, picking beetles from paths, digging into rotten logs and trees, and baited pitfalls. Along streams, sand and debris was sifted, while substrates under large rocks and pieces were examined by moving the obstacles. Pitfalls were set in pocket gopher tunnels (*Geomys bursarius* var. *majusculus* Swenk) and the soil of many mounds was sifted. Field sampling was concentrated in several state parks and preserves in eastern and southern Iowa and near our home counties. We also tended to sample the outer tier of counties with the idea that this may produce species whose ranges barely reach the state. Most specimens collected in the field during this survey are housed in the author's personal collections, with a few specimens in the collections of other collectors as indicated.

Following is a list of codons used for collections in which specimens are deposited and for individual collectors who assisted us greatly by providing additional material.

CASC	California Academy of Science Collection, San Francisco, CA
CCMV	Cornell College Collection, Mt. Vernon, IA
DAVC	Doug A. Veal collector/collection, Cedar Rapids, IA
ELFC	Edwin L. Freese collector/collection, Adel, IA
FMNH	Field Museum of Natural History, Chicago, IL
FSCA	Florida State Collection of Arthropods, Gainesville, FL
ISIC	Iowa State University Insect Collection, Ames, IA
IWUC	Iowa Wesleyan University Insect Collection, Mt. Pleasant, IA
JPGC	Jeff P. Gruber collection, Madison, WI

KJLC	Kirk J. Larsen, Luther College Insect Collection, Decorah, IA
MBC	Matt Brust collection, Chadron, NE
MCZC	Museum of Comparative Zoology Collection, Harvard, Cambridge, MA
MJHC	Mary Jane Hatfield collection, Cresco, IA
MJLC	Mark J. Leoschke collection, Des Moines, IA
MJPC	M. J. Paulsen collector/collection, Lincoln, NE
MSNC	Museo de Storia Naturale e del Territorio, Calci, Italy
PKLC	Paul K. Lago collection, Oxford, MS
RG	Robert Gordon collection, Willow City, ND
RJWC	Reese John Worthington collection, Macon, MO
UMRC	Enns Entomological Museum, University of Missouri, Columbia, MO
UNIC	University of Northern Iowa Insect Collection, Cedar Falls, IA
UNSM	University of Nebraska State Museum collection, Lincoln, NE
USNM	United States National Museum, Smithsonian Institution, Washington, DC
WCIC	Wartburg College Insect Collection, Waverly, IA
WIRC	University of Wisconsin Insect Research Collection, Madison, WI
WWC	William Warner collection, Chandler, AZ

Results

The annotated checklist of Iowa Scarabaeoidea now contains 227 species including 7 families and 79 genera. Thirty-six species represent new state records for Iowa. The checklist follows the family arrangement of Scarabaeoidea of Ratcliffe and Paulsen (2008). The organization provided by Gordon and Skelley (2007) for Aphodiini was used. Smith (2006, 2009) was consulted for placement of taxa not present in the other publications.

This checklist contains all known Iowa records. New state records are noted in capital letters and, in most cases, are coupled with label data from field-collected specimens. Previously published records are presented first, followed by codons of collections housing known Iowa specimens, and finally codons or initials of individuals having specimens in personal collections. Following are notes on month or months of collection and information on methods of collection and relative abundance. Precise label data are presented for a few species that are seldom collected. Several species included in older literature clearly represent questionable records and were excluded from our list. These species are discussed at the end of the checklist. Species that are not native to Iowa (e. g. introduced European species) are noted with an asterisk. Following the checklist are maps indicating counties in which specimens have been collected. Range maps for species known from one county only were not prepared and the reader should consult Figure 1 to determine relative location within the state.

Annotated Checklist of Iowa Scarabaeoidea

Superfamily SCARABAEOIDEA Latreille, 1802
 Family PASSALIDAE Leach, 1815
Odontotaenius Kuwert, 1896

Odontotaenius disjunctus (Illiger, 1800)

Wickham 1911; Schuster 1983; ISIC; IWUC; DAVC; ELFC; MJLC.

Collection dates: April–July, October.

Specimens were collected in red rotten logs, tunnels in white-rot logs, walking on trails during day, on collecting sheet at UV light, and observed flying to collecting light.

Specimen label data: Keokuk, Lee Co., Iowa, 5 May 1932, G. L. Weber (ISIC); Promise City, Wayne Co., Iowa, 24 September 1961 [15], H. A. Borchers (ISIC); Wildcat Den State Park, Muscatine Co., Iowa, 7 July 2006, flew to lighted collecting sheet, ELF (ELFC).

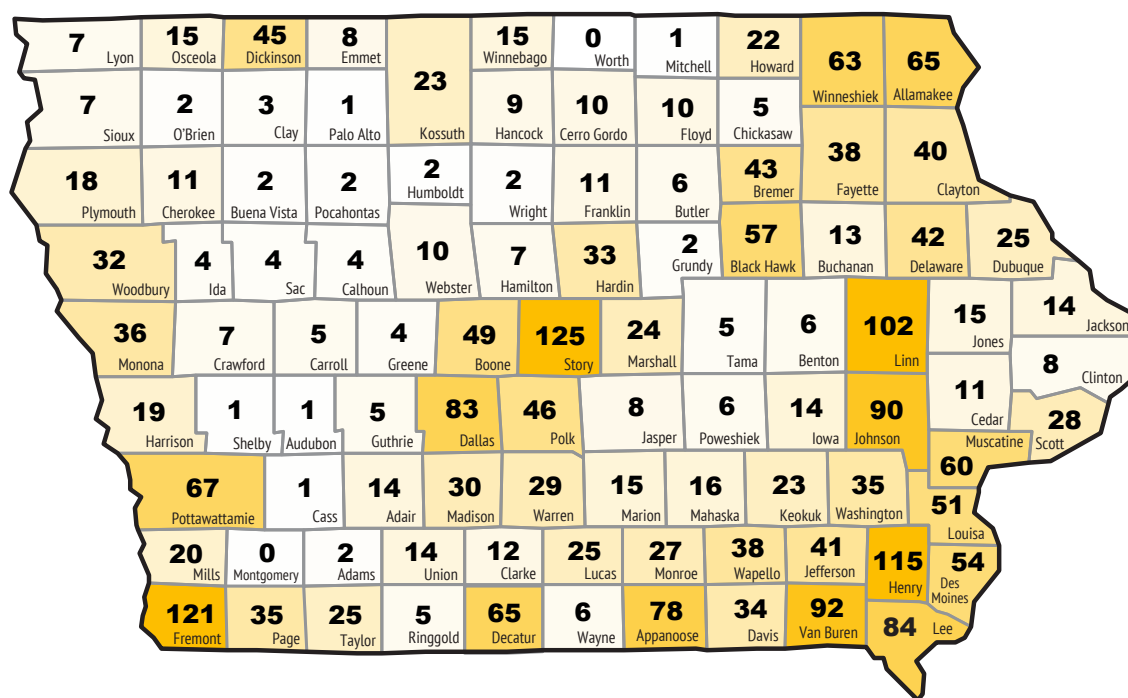


Figure 1. Map of Iowa, with number of species collected from each county.

County records (Figure 2): Appanoose, Clark, Davis, Decatur, Des Moines, Fremont, Harrison, Henry, Jefferson, Johnson, Keokuk, Lee, Linn, Monroe, Muscatine, Page, Pottawattamie, Scott, Van Buren, Wapello, Washington.

Family GEOTRUPIDAE Latreille, 1802
Subfamily BOLBOCERATINAE Mulsant, 1842
Bolbocerosoma Schaeffer, 1906

***Bolbocerosoma biplagiatum* Dawson and McColloch, 1924**

IWUC.

Collection dates: October.

Specimen label data: First report from Iowa and **NEW STATE RECORD**: Mt. Pleasant, Henry Co., Iowa, 8 October 1926, M. Ruse (IWUC); Mt. Pleasant, Henry Co., Iowa, 14 October 1932, Edwards (IWUC).

Only two specimens from Iowa.

County record: Henry.

***Bolbocerosoma bruneri* Dawson and McColloch, 1924**

Wickham 1911; Dawson and McColloch 1924; Howden 1955a; ISIC; IWUC; WCIC; DAVC; ELFC; PKLC.

Collection dates: May–October.

Specimens were collected at light and under soil pushup on path.

County records (Figure 3): Adair, Appanoose, Black Hawk, Bremer, Cerro Gordo, Cherokee, Clayton, Crawford, Dallas, Davis, Decatur, Dickinson, Fayette, Fremont, Henry, Howard, Jefferson, Johnson,

Kossuth, Linn, Louisa, Lyon, Monona, Osceola, Page, Polk, Pottawattamie, Story, Union, Van Buren, Wapello, Washington, Winnebago, Winneshiek, Woodbury.

***Bolbocerosoma confusum* Brown, 1928**

Howden 1955a; ISIC (Paratype); MJLC; DAVC.

Collection dates: October.

Specimen label data: Ames, Story Co., Iowa, [no date], [no collector], yellow PARATYPE label *Bolbocerosoma confusum* Brown (ISIC); Wayne Co., Iowa, 21 October 1998, in flight, MJL (MJLC); Catfish Creek State Preserve, Dubuque Co., Iowa, 9 October 2003, in flight, DAV (DAVC).

Only three Iowa specimens known.

County records (Figure 4): Dubuque, Story, Wayne.

***Bolbocerosoma farctum* Fabricius, 1781**

Wickham 1911; Hendrickson 1930; DAVC.

Collection dates: August.

Specimen label data: Geode State Park, Henry Co., Iowa, 13 August 2003, UV light, DAV (DAVC).

This is the only specimen currently known from Iowa.

All specimens in university collections previously determined to be *Bolbocerosoma farctum* where actually *B. bruneri*.

County record: Henry.

***Bolbocerosoma pusillum* Dawson and McCulloch, 1924**

DAVC; MJPC; ELFC; PKLC.

Collection dates: June–July.

Specimen label data: First two known Iowa specimens and **NEW STATE RECORD**: Waubonsie State Park, Fremont Co., Iowa, 15 June 2003 [2], under horse dung and under soil pushup ridge top path, DAV, MJP (DAVC); Turin Loess Hills Prairie State Preserve, Monona Co., Iowa, 17 June 2008, under soil pushup path, ELF (ELFC).

Specimens were also collected flying, circling low, over path and walking on path; occasionally at UV light. The specimen collected in Monona County represents a range extension north of about 190 km (120 miles) from specimens collected as a new Nebraska state record during 2002 at Indian Cave State Park (M.J. Paulsen, pers. comm., 2003; Ratcliffe and Paulsen 2008).

County records (Figure 5): Fremont, Mills, Monona, Pottawattamie.

Odonteus Samouelle, 1819

***Odonteus filicornis* (Say, 1823)**

Wickham 1911; IWUC; DAVC.

Collection dates: June–October.

Specimens were collected at light.

Specimen label data: Mt. Pleasant, Henry Co., Iowa, 16 October 1928, Bruhn (IWUC); Boone County, Iowa, 1 August 1934, H. E. Jaques, determined O. L. Cartwright (IWUC); Palisades Kepler State Park, Linn Co., Iowa, 19 August 2006, combination light, DAV (DAVC).

County records (Figure 6): Boone, Clayton, Fremont, Henry, Jasper, Johnson, Linn.

***Odonteus liebecki* (Wallis, 1928)**

ELFC; DAVC.

Collection dates: May–July.

Specimen label data: First known Iowa specimens and **NEW STATE RECORD**: Yellow River State Forest, Allamakee Co., Iowa, 4 June, 1 July 2004, UV light, ELF (ELFC); Behrens Ponds and Woodland State Preserve, Linn Co., Iowa, 16–29 May 2007, Malaise trap, DAV (DAVC).

Only five specimens from Iowa.

County records (Figure 7): Allamakee, Delaware, Linn.

***Odonteus thoracicornis* Wallis, 1928**

Howden 1955a; Harpootlian 2001; ISIC; DAVC; ELFC; MJPC.

Collection dates: May–June, August, November.

Specimens were collected under soil pushup along shaded path and at light.

Specimen label data: Hitchcock Nature Area, Pottawattamie Co., Iowa, 13 June 2004, under soil pushup on path, ELF (ELFC); Backbone State Park, Delaware Co., Iowa, 29 May 2006, UV light, ELF (ELFC).

County records (Figure 8): Appanoose, Clayton, Dallas, Des Moines, Fremont, Linn, Muscatine, Pottawattamie, Story.

Eucanthus Westwood, 1848

***Eucanthus impressus* Howden, 1964**

Howden 1964; Prill and Russell 1991; CASC; ELFC.

Collection dates: June–July.

Specimen label data: Waubonsie State Park, Fremont Co., Iowa, 12 June 2005, UV light, ELF, determined MJP 2005 (ELFC).

County records (Figure 9): Fremont, Johnson, Linn.

***Eucanthus lazarus* (Fabricius, 1775)**

Putnam 1876; Wickham 1911; Howden 1955a; Howden 1964; ISIC; IWUC; CASC; ELFC; DAVC.

Collection dates: May–September.

Specimens were collected at light and under soil pushup on path.

County records (Figure 10): Allamakee, Appanoose, Black Hawk, Boone, Bremer, Buena Vista, Calhoun, Cerro Gordo, Chickasaw, Clay, Crawford, Dallas, Dickinson, Emmett, Fremont, Hancock, Henry, Keokuk, Kossuth, Johnson, Linn, Lyon, Monona, Monroe, Page, Polk, Pottawattamie, Sioux, Story, Wayne, Woodbury.

Subfamily GEOTRUPINAE Latreille, 1802

Geotrupes Latreille, 1796

***Geotrupes balyi* Jekel, 1865**

Howden 1955a.

Collection dates: August.

County record: Winnebago.

***Geotrupes blackburnii excrementi* Say, 1823**

Howden 1955a; Evans 2014; ISIC; IWUC; DAVC; ELFC.

Collection dates: April–December.

Specimens were collected at horse dung.

County records (Figure 11): Allamakee, Davis, Des Moines, Henry, Jasper, Jefferson, Johnson, Keokuk, Lee, Louisa, Monroe, Story, Wapello, Van Buren, Washington.

***Geotrupes hornii* Blanchard, 1888**

Howden 1955a; Ratcliffe and Paulsen 2008; DAVC; ELFC.

Collection dates: June, August.

Specimen label data: Waubonsie State Park, Fremont Co., Iowa, 8 August 2003, 9 June 2012, UV light, DAV, ELF (DAVC, ELFC).

Only three specimens known from Iowa.

County records (Figure 12): Fremont, Winnebago.

***Geotrupes opacus* Haldeman, 1853**

Putnam 1876; Wickham 1911; Howden 1955a; ISIC; IWUC; ELFC; DAVC; MJPC.

Collection dates: April, September–October.

Specimens were collected from dung and on log.

Specimen label data: Lacey Keosauqua State Park, Van Buren Co., Iowa, 14 October 2005, on log, ELF (ELFC).

County records (Figure 13): Black Hawk, Cedar, Dallas, Henry, Johnson, Linn, Louisa, Pottawattamie, Story, Van Buren, Woodbury.

***Geotrupes semiopacus* Jekel, 1865**

Putnam 1876; Wickham 1911; Howden 1955a; ISIC; IWUC; DAVC; ELFC.

Collection dates: April–September.

Specimens were collected from horse dung.

Specimen label data: Volga River Recreation Area, Fayette Co, Iowa, 22 September 1996 [2], horse dung, ELF (ELFC).

County records (Figure 14): Allamakee, Appanoose, Clayton, Dallas, Fayette, Fremont, Hardin, Henry, Johnson, Jones, Keokuk, Lee, Linn, Madison, Story, Tama, Webster, Winnebago, Winneshiek.

***Geotrupes splendidus* (Fabricius, 1775)**

Putnam 1876; Wickham 1911; Howden 1955a; ISIC; IWUC; DAVC; ELFC; MJPC.

Collection dates: April–October.

Specimens were collected from dung, deer carcass, and at light.

Specimen label data: Sharon Bluffs State Park, Appanoose Co., Iowa, 20 August 2013, light, ELF (ELFC).

County records (Figure 15): Adair, Allamakee, Appanoose, Black Hawk, Bremer, Clayton, Clinton, Dallas, Davis, Decatur, Delaware, Des Moines, Dickinson, Fayette, Fremont, Hancock, Henry, Jasper, Jefferson, Johnson, Keokuk, Kossuth, Lee, Linn, Louisa, Madison, Marshall, Monona, Muscatine, Page, Polk, Pottawattamie, Story, Taylor, Van Buren, Wapello, Washington, Winnebago, Winneshiek.

Family TROGIDAE MacLeay, 1819
Subfamily TROGINAE MacLeay, 1819
Trox Fabricius, 1775

***Trox aequalis* Say, 1831**

Putnam 1876; Wickham 1911; ISIC; IWUC; ELFC; DAVC; MJPC.

Collection dates: March–July.

Specimens were collected at light.

County records (Figure 16): Allamakee, Appanoose, Black Hawk, Buchanan, Dallas, Davis, Decatur, Delaware, Des Moines, Emmet, Fayette, Fremont, Hardin, Harrison, Henry, Johnson, Jones, Lee, Linn, Louisa, Monroe, Muscatine, Polk, Pottawattamie, Story, Van Buren, Warren, Washington.

***Trox affinis* (Robinson, 1940)**

Robinson 1941; Vaurie 1955; Downie and Arnett 1996; Zidek 2013.

Collection dates: no date of collection given with literature record.

The above papers cite Robinson (1940) as the source for the Iowa record, but the only mention of Iowa with regard to this species occurred in a later paper: Robinson 1941 (page 230), no location of collection given.

County record: no specific location given.

***Trox atrox* LeConte, 1854**

Vaurie 1958; Zidek 2013; ISIC; UMRC; DAVC; ELFC; PKLC.

Collection dates: April–July.

Collected at lights, in carrion baited pitfall, under leaves old animal burrow in sandy soil, and sifted from sandy soil from within animal burrow.

Specimen label data: Ames, Story Co., Iowa, 1 May 1937, Norval Baker (ISIC); Denison, Crawford Co., Iowa, June 1949, C. and P. Vaurie (Vaurie 1958); Algona, Kossuth Co., Iowa, 23 May 1958, light, [no collector] (UMRC); Hitaga Sand Prairie, Linn Co., Iowa, 17 April 2005 [1], 30 April 2007 [5], sifting through sand and leaves at entrance of old mammal burrow, DAV (DAVC); Waubonsie State Park, Fremont Co., Iowa, 4 June 2006, UV light, DAV (DAVC).

County records (Figure 17): Crawford, Dickinson, Fremont, Kossuth, Linn, Mills, Monona, Osceola, Story.

***Trox capillaris* Say, 1824**

Vaurie 1955; Zidek 2013; ISIC; IWUC; WIRC; DAVC; ELFC; MJPC.

Collection dates: April–June.

Collected under old deer carcasses along highways.

Specimen label data: Waubonsie Access, Fremont Co., Iowa, 12 June 2005 [2], deer carcass, ELF, DAV, determined MJP 2005 (DAVC, ELFC); south of Farmington, Van Buren Co., Iowa, 5 May 2011 [18], deer carcass, DAV, ELF (DAVC, ELFC).

County records (Figure 18): Dallas, Fremont, Jefferson, Linn, Van Buren, Story.

***Trox foveicollis* Harold, 1872**

Wickham 1911; MJPC.

Collection dates: July.

Specimen label data: Waubonsie Wildlife Area, 2 miles east of Nebraska along highway 2, Fremont Co., Iowa, 19 July 2005, deer carcass, M. Herrmann, MJ Paulsen (MJPC).

County records (Figure 19): Buchanan, Fremont, Johnson.

***Trox hamatus* Robinson, 1940**

UMRC; DAVC; ELFC; MJPC.

Collection dates: May–July.

Collected at lights and carnivore dung.

Specimen label data: First report from Iowa and **NEW STATE RECORD**: Waubonsie State Park, Fremont Co., Iowa, 15 June 2003, carnivore dung, DAV (DAVC); Shimek State Forest, Van Buren Co., Iowa, 21 June 2003, UV light, DAV (DAVC); Yellow River Forest, Allamakee Co., Iowa, 20 May 2004, dung, ELF (ELFC).

County records (Figure 20): Allamakee, Appanoose, Dallas, Fremont, Hardin, Henry, Lee, Pottawattamie, Van Buren, Warren.

***Trox laticollis* LeConte, 1854**

Vaurie 1955, 1958; Zidek 2013; ELFC; DAVC.

Collection dates: April–May.

Specimen label data: Cedar Hills Sand Prairie State Preserve, Black Hawk Co., Iowa, 24 April 1998, flying entrance badger hole, ELF (ELFC); Cedar Hills Sand Prairie State Preserve, Black Hawk Co., Iowa, 18 April 2005, dung baited pitfall, ELF (DAVC).

There are only five specimens from Iowa.

County records (Figure 190): Black Hawk, Story.

***Trox robinsoni* Vaurie, 1955**

Vaurie 1955; DAVC.

Collection dates: June.

Collected at light.

Specimen label data: Waubonsie State Park, Fremont Co., Iowa, 15 June 2003, UV light, DAV (DAVC).

County records (Figure 21): Des Moines, Dickinson, Fremont.

***Trox scaber* (Linnaeus, 1767)**

Wickham 1911; Vaurie 1955; ISIC; IWUC; CASC; DAVC; ELFC; MJPC.

Collection dates: March–June.

Specimens collected at light.

Specimen label data: Hitchcock Nature Area, Pottawattamie Co., Iowa, 10 June 2008, light, ELF (ELFC).

County records (Figure 22): Des Moines, Henry, Johnson, Kossuth, Linn, Monona, Pottawattamie, Story.

***Trox sordidus* LeConte, 1854**

Wickham 1911; King 1914; Vaurie 1955, 1958; IWUC; CASC.

Collection dates: July.

Specimen label data: Washington, Washington Co., Iowa, 8 July 1913, Mayhew, determined Cartwright 1938 (IWUC).

County records (Figure 23): Henry, Johnson, Story, Washington.

***Trox spinulosis spinulosis* Robinson, 1940**

Vaurie 1955; ELFC; DAVC.

Collection dates: April–July.

Specimens were collected at light, carnivore dung, and road kill.

County records (Figure 24): Appanoose, Black Hawk, Bremer, Dallas, Decatur, Dickinson, Fremont, Hardin, Henry, Johnson, Lee, Linn, Madison, Mills, Monona, Muscatine, Page, Pottawattamie, Scott, Story, Van Buren, Woodbury.

***Trox striatus* Melsheimer, 1846**

UMRC; DAVC; ELFC.

Collection dates: April–June.

Specimen label data: First two known Iowa specimens and **NEW STATE RECORD**: Wildcat Den State Park, Muscatine Co., Iowa, 6 June 2004 [2], UV light, DAV (DAVC, ELFC); Timberhill Savanna, Decatur Co., Iowa, 10 May 2011 [3], UV light, ELF (ELFC); RR Adel, Dallas Co., Iowa 11 June 2013, porch light, ELF (ELFC).

There are only nineteen specimens known from Iowa.

County records (Figure 25): Appanoose, Boone, Dallas, Decatur, Fremont, Lee, Muscatine, Van Buren.

***Trox tuberculatus* (DeGeer, 1774)**

Wickham 1911; Vaurie 1955, 1958; ISIC; IWUC; UMRC; DAVC; ELFC; MJPC.

Collection dates: March–August.

Collected at light and carnivore dung.

County records (Figure 26): Appanoose, Dallas, Davis, Des Moines, Dickinson, Fayette, Fremont, Henry, Johnson, Lee, Mills, Muscatine.

***Trox unistriatus* Palisot de Beauvois, 1818**

Wickham 1911; ISIC; IWUC; UMRC; DAVC; ELFC; PKLC.

Collection dates: April–August.

Specimens were collected at light.

County records (Figure 27): Allamakee, Appanoose, Black Hawk, Boone, Bremer, Clayton, Dallas, Delaware, Dickinson, Dubuque, Fayette, Fremont, Henry, Howard, Jefferson, Johnson, Kossuth, Lee, Linn, Page, Pottawattamie, Scott, Story, Van Buren, Wapello, Washington.

***Trox variolatus* Melsheimer, 1846**

Vaurie 1958; ISIC; WCIC; DAVC; ELFC; PKLC; MJPC.

Collection dates: March–June.

Specimens were collected on carnivore dung and owl pellets.

Specimen label data: Wickiup Hill Nature Area, Linn Co., Iowa, 25 March 2004 [6], carnivore dung, DAV (DAVC); Sharon Bluffs State Park, Appanoose Co., Iowa, 16 April 2004 [2], under owl pellets, DAV, ELF (DAVC, ELFC); Waubonsie State Park, Fremont Co., Iowa, 16 April 2004, dung, ELF (ELFC).

County records (Figure 28): Allamakee, Appanoose, Black Hawk, Boone, Bremer, Clayton, Dallas, Decatur, Fayette, Fremont, Hardin, Lee, Linn, Madison, Pottawattamie, Story.

***Omorgus* Erichson, 1847**

***Omorgus asper* LeConte, 1854**

Vaurie 1955; IWUC; WIRC; DAVC; ELFC.

Collection dates: May–August.

Collected on carnivore dung and deer carcass.

County records (Figure 29): Appanoose, Decatur, Fremont, Jefferson, Linn, Pottawattamie.

***Omorgus monachus* (Herbst, 1790)**

IWUC; ELFC; DAVC.

Collection dates: May–August.

Specimens collected at light.

Specimen label data: First report from Iowa and **NEW STATE RECORD**: Waubonsie State Park, Fremont Co., Iowa, 8 August 2003, dung, ELF (ELFC); Shimek State Forest, Van Buren Co., Iowa, 8 May 2004, UV light, DAV (DAVC); Waubonsie State Park, Fremont Co., Iowa, 2 July 2005 [2], deer carcass, DAV (DAVC).

County records (Figure 30): Decatur, Fremont, Henry, Lee, Monona, Van Buren.

***Omorgus punctatus* (Germar, 1824)**

Wickham 1911; ISIC; IWUC.

Collection dates: May–July.

Specimen label data: Mt. Pleasant, Henry Co., Iowa, 26 May 1913, light, Jaques (IWUC).

County records (Figure 31): Des Moines, Fremont, Henry, Pottawattamie, Story.

***Omorgus scabrosus* (Palisot de Beauvois, 1818)**

King 1914; DAVC; ELFC.

Collection dates: June–July.

Specimens collected at carcasses and at UV light.

Specimen label data: Cedar Rapids, Linn Co., Iowa, 8 July 2000, mouse carcass, DAV (DAVC).

County records (Figure 32): Fremont, Henry, Linn.

***Omorgus suberosus* (Fabricius, 1775)**

Wickham 1911; ISIC; DAVC; ELFC.

Collection dates: May–August.

Specimens were collected at light and deer carcass.

Specimen label data: Shimek State Forest, Van Buren Co., Iowa, 8 May 2004, light, ELF (ELFC); Waubonsie State Park, Fremont Co., Iowa, 2 July 2005 [2], deer carcass, DAV (DAVC).

County records (Figure 33): Cherokee, Dallas, Davis, Fremont, Henry, Jefferson, Lee, Linn, Louisa, Muscatine, Story, Van Buren, Wapello, Washington, Woodbury.

Family LUCANIDAE Latreille, 1804

Subfamily Aesalinae MacLeay, 1819

Tribe Nicagini LeConte, 1861

Nicagus LeConte, 1861

***Nicagus obscurus* (LeConte, 1847)**

Paulsen and Smith 2005; Evans 2014; ISIC; USNM; WIRC; DAVC; ELFC; MJPC; PKLC.

Collection dates: April–June.

Males and females collected small wooded stream, under and on debris, on sandbar, and sifted from sand. Specimens also collected in flight above sandbar and near stream. A few females have been collected in a small chamber under debris sandbar small wooded stream. Males have been observed “swarming” or flying zig-zag and circling in groups of ten to twenty or more over a small area of sandbar. Specimens have also been collected under horse dung on a bike path near wooded stream and flying some distance from stream.

Specimen label data: Ames, Story Co., Iowa, 23 May 1929, H. M. Harris (ISIC); Ames, Story Co., Iowa, 27 April 1931, R. H. Nelson, determined Howden 1955 (ISIC); Shimek State Forest, Lee Co., Iowa, 6 May 2006, small chamber under piece of debris sandbar [female], 2 April 2010, sifted from sandbar [male], 20 May 2011, in flight over sandbar [male], ELF (ELFC).

County records (Figure 34): Johnson, Lee, Linn, Story.

Subfamily SYNDESINAE MacLeay, 1819

Tribe CERUCHINI Jacquelin du Val, 1857

Ceruchus MacLeay, 1819

***Ceruchus piceus* (Weber, 1801)**

Wickham 1897, 1911; ISIC; IWUC; UMRC; DAVC; ELFC; MJPC.

Collection dates: May–June.

Collected at lights and in rotten logs.

County records (Figure 35): Allamakee, Appanoose, Boone, Dallas, Decatur, Delaware, Des Moines, Dickinson, Dubuque, Emmet, Fremont, Henry, Jefferson, Johnson, Linn, Louisa, Muscatine, Scott, Story, Van Buren, Washington, Winneshiek.

Subfamily PLATYCERINAE Mulsant, 1842

Platycerus Geoffroy, 1762

***Platycerus quercus* (Weber, 1801)**

Wickham 1911; ISIC; IWUC; DAVC; ELFC; MJPC.

Collection dates: March–November.

Collected at light.

At various times over the decades this species has been identified as *Platycerus virescens* (Fabricius, 1775). Smith and Paulsen (2017) discussed the situation and applied the correct name listed here.

County records (Figure 36): Appanoose, Benton, Boone, Cedar, Davis, Des Moines, Fremont, Henry, Jefferson, Johnson, Lee, Louisa, Madison, Page, Story, Van Buren, Wapello, Washington, Wayne, Webster.

Subfamily LUCANINAE Latreille, 1804

Tribe LUCANINI Latreille, 1804

Dorcus MacLeay, 1819

***Dorcus parallelus* (Say, 1824)**

Wickham 1911; Paulsen 2010; ISIC; IWUC; MJHC; DAVC; ELFC; MJPC.

Collection dates: March–August.

Collected at lights and on tree trunks after dark; also several from small chambers under bark of one log with legs towards bark.

Specimen label data: Ames, Story Co., Iowa, 16 May 1889, B. Mellreich (ISIC); Sharon Bluffs State Park Appanoose Co., Iowa, 20 May 2006 [4], chambers under bark of log, ELF, DAV (ELFC, DAVC).

County records (Figure 37): Allamakee, Appanoose, Dallas, Decatur, Fremont, Hardin, Henry, Johnson, Keokuk, Linn, Madison, Muscatine, Page, Story, Van Buren, Washington, Webster, Winneshiek.

Lucanus Scopoli, 1763

***Lucanus capreolus* (Linnaeus, 1764)**

Wickham 1911; ISIC; IWUC; DAVC; ELFC; PKLC; MJPC.

Collection dates: June–August.

Collected at light.

County records (Figure 38): Adair, Allamakee, Appanoose, Benton, Boone, Calhoun, Cerro Gordo Clayton, Dallas, Decatur, Delaware, Des Moines, Fremont, Hardin, Henry, Humboldt, Iowa, Jackson, Jefferson, Johnson, Keokuk, Kossuth, Lee, Linn, Louisa, Lucas, Monona, Monroe, Muscatine, Page, Polk, Sac, Scott, Story, Union, Van Buren, Wapello, Warren, Washington, Webster.

***Lucanus elaphus* Fabricius, 1775**

Wickham 1911; King 1914; Staines 2001; MCZC.

Collection dates: no date of collection given with literature record.

Staines (2001) indicated specimen was collected at Keokuk, Iowa (MCZC).

County records (Figure 191): Henry, Lee.

***Lucanus placidus* Say, 1825**

Wickham 1911; King 1914; ISIC; IWUC; DAVC; ELFC.

Collection dates: March–July.

Collected at light, walking on sandy ground of wooded habitat at night, and sifted from sandbar.

County records (Figure 39): Appanoose, Bremer, Clinton, Dallas, Delaware, Fremont, Greene, Henry, Linn, Louisa, Marion, Muscatine, Pottawattamie, Story, Warren.

Family OCHODAEIDAE Mulsant and Rey, 1871

Subfamily OCHODAEINAE Mulsant and Rey, 1871

Tribe OCHODAEINI Mulsant and Rey, 1871

Xenochodaeus Paulsen, 2007

***Xenochodaeus americanus* (Westwood, 1852)**

Paulsen 2007; ISIC; IWUC; UMRC; DAVC; ELFC.

Collection dates: April–August.

Specimen label data: Ames, Story Co., Iowa, 27 April 1931, S. E. Shields (ISIC); Dickinson Co., Iowa, 19 June 1936 [3], H. E. Jaques (IWUC); Ames, Story Co., Iowa, 30 May 1950 [2], W. E. Picklum (ISIC); Mitchell Co., Iowa, 6 July 1975, in flight, T. Orwig, determined MJP 2005 (ELFC); Yellow River Forest, Allamakee Co., 3 July 2004, UV light, DAV (DAVC).

County records (Figure 40): Allamakee, Dickinson, Lyon, Mitchell, Story.

***Xenochodaeus musculus* (Say, 1835)**

Evans 2014; DAVC; ELFC; MJPC.

Collection dates: May–June.

Specimen label data: Hitchcock Nature Area, Pottawattamie Co., Iowa, 29 June 2007 [2], under soil pushup on slightly shaded ridge top trail, ELF (ELFC).

Specimens were also collected at Waubonsie State Park, Fremont Co., Iowa, flying at night using headlamp (M.J. Paulsen, pers. comm., 2005).

County records (Figure 41): Fremont, Pottawattamie, Van Buren.

Family HYBOSORIDAE Erichson, 1847
Subfamily CERATOCANTHINAE Martinez, 1968
Germarostes Paulian, 1982

***Germarostes aphodioides* (Illiger, 1800)**

Wickham 1911; ISIC; IWUC; DAVC; ELFC; PKLC.

Collection dates: April–August.

Collected at light, under bark dead oak tree, and associated with tunnels of *Odontotaenius*.

County records (Figure 42): Allamakee, Appanoose, Dallas, Decatur, Delaware, Fremont, Hardin, Henry, Lee, Linn, Lucas, Monona, Polk, Pottawattamie, Scott, Story, Van Buren.

***Germarostes globosus* (Say, 1835)**

DAVC; ELFC.

Collection dates: April–June.

Specimen label data: First known Iowa specimens and **NEW STATE RECORD**: Waubonsie State Park, Fremont Co., Iowa, 18 June 2003, UV light, DAV (DAVC); Shimek State Forest, Van Buren Co., Iowa, 21 May 2004, UV light, ELF (ELFC).

Only a few specimens from Iowa.

County records (Figure 43): Fremont, Van Buren.

Family SCARABAEIDAE Latreille, 1802
Subfamily APHODIINAE Leach, 1815
Tribe AEGIALIINI Laporte, 1840
Aegialia Latreille, 1807

***Aegialia conferta* Horn, 1871**

Wickham 1911.

Collection dates: no date of collection given with literature record.

Littoral species of sandy stream banks (Stebnicka 2011).

County record: Buchanan.

***Aegialia shimeki* Lago and Freese, 2016**

Lago and Freese 2016; UNSM; FSAC; CASC; MSNC; RGC; WWC; JPGC; MJPC; PKLC; DAVC; ELFC.

Collection dates: April–May

Many specimens were collected sifting sand from the type location (Lick Creek) at Shimek State Forest with the first specimen being found under a piece of woody debris or driftwood; a few specimens were sifted from flood debris of a log jam.

County record: Lee.

Tribe APHODIINI Leach, 1815
Alloblackburneus Bordat, 2009

***Alloblackburneus lentus* (Horn, 1870)**

Worthington and Larsen 2010; WIRC; DAVC; ELFC.

Collection dates: April–June.

Often collected in sandy areas (Dellacasa et al. 2011) at deer dung; also collected at light.

Specimen label data: Hitaga Sand Prairie, Linn Co., Iowa, 24 April 2005, under deer dung, ELF (ELFC); Marietta Sand Prairie State Preserve, Marshall Co., Iowa, 28 May 2005, deer dung, ELF (ELFC); Hitchcock Nature Area, Pottawattamie Co., Iowa, 10 June 2008, UV light, ELF (ELFC).

County records (Figure 44): Allamakee, Black Hawk, Linn, Marshall, Pottawattamie, Winneshiek.

***Alloblackburneus rubeolus* (Palisot de Beauvois, 1809)**

King 1914; IWUC; UMRC; DAVC; ELFC.

Collection dates: June.

Collected from horse and deer dung; at Waubonsie State Park found associated underground in *Dichotomius carolinus* tunnel with deer dung on two different occasions, DAV, ELF (Howden 1955b).

County records (Figure 45): Fremont, Henry, Lee, Story.

Aphodius Illiger, 1798

****Aphodius fimetarius* (Linnaeus, 1758)**

Putnam 1876, Wickham 1897, 1911, ISIC, IWUC, USNM; ELFC; DAVC.

Collection dates: March–November.

Collected from dung.

County records (Figure 46): Adair, Allamakee, Appanoose, Black Hawk, Boone, Clarke, Clayton, Dallas, Davis, Decatur, Des Moines, Dickinson, Fayette, Floyd, Franklin, Fremont, Guthrie, Hamilton, Hardin, Henry, Jasper, Jefferson, Johnson, Keokuk, Lee, Linn, Louisa, Lucas, Mahaska, Marion, Marshall, Monroe, Muscatine, Page, Plymouth, Polk, Ringgold, Scott, Sioux, Story, Taylor, Union, Van Buren, Wapello, Washington.

Blackburneus (Melsheimer, 1844)

***Blackburneus stercorosus* (Melsheimer, 1845)**

Wickham 1911; Worthington and Larsen 2010; ISIC; IWUC; DAVC; ELFC.

Collection dates: March–October.

Collected at light and from dung.

County records (Figure 47): Allamakee, Appanoose, Black Hawk, Buchanan, Dallas, Decatur, Delaware, Dickinson, Fremont, Hardin, Harrison, Henry, Lee, Linn, Johnson, Pottawattamie, Story, Van Buren, Winneshiek, Woodbury.

Calamosternus Motschulsky, 1859

****Calamosternus granarius* (Linnaeus, 1767)**

Putnam 1876; Wickham 1911; Worthington and Larsen 2010; ISIC; DAVC; ELFC; PKLC.

Collection dates: March–December.

Collected from dung.

County records (Figure 48): Adair, Allamakee, Appanoose, Buena Vista, Calhoun, Davis, Des Moines, Dickinson, Fayette, Fremont, Hancock, Hardin, Harrison, Henry, Howard, Iowa, Jefferson, Johnson, Jones, Lee, Linn, Louisa, Mahaska, Marshall, Monona, Monroe, Muscatine, Scott, Story, Taylor, Union, Wapello, Washington, Winnebago, Winneshiek.

Chilo thorax Mulsant, 1859

****Chilo thorax distinctus* (Muller, 1776)**

Wickham 1911; Worthington and Larsen 2010; ISIC; IWUC; DAVC; ELFC; PKLC.

Collection dates: April–November.

Collected from dung and in flight.

County records (Figure 49): Appanoose, Black Hawk, Boone, Calhoun, Clarke, Crawford, Davis, Delaware, Des Moines, Emmet, Fayette, Fremont, Grundy, Guthrie, Hamilton, Hardin, Henry, Jasper, Jefferson, Jones, Lee, Linn, Louisa, Madison, Mahaska, Marion, Marshall, Mills, Monona, Monroe, O'Brien, Osceola, Polk, Scott, Story, Taylor, Union, Van Buren, Wapello, Washington, Winnebago, Winneshiek, Woodbury, Wright.

Colobo pterus Mulsant, 1842

****Colobo pterus erraticus* (Linnaeus, 1758)**

Ratcliffe 1991; Worthington and Larsen 2010; DAVC; ELFC.

Collection dates: April, June–July.

Collected from horse and deer dung and at light.

Specimen label data: Waubonsie State Park, Fremont Co., Iowa, 12 June 2004 [2], deer dung, ELF (ISIC).

County records (Figure 50): Dallas, Fremont, Linn, Winneshiek.

Cryptoscatomaseter Gordon and Skelley, 2007

***Cryptoscatomaseter brevicollis* (LeConte, 1878)**

Gordon and Skelley 2007.

Collection dates: no date of collection given in literature record.

County record: no specific locality given.

***Cryptoscatomaseter iowensis* (Wickham, 1913)**

Wickham 1913; ISIC; CASC; FSAC; DAVC; ELFC.

Collection dates: May–June, October–November.

Type specimen collected by A. O. Thomas, Lake Okiboji area, Dickinson Co. (Wickham 1913), Type depository USNM (Gordon and Skelley 2007);

Specimen label data: Ames, Story Co., Iowa, October 1911, determined Carter 1955 (ISIC); Wickiup Hill Nature Area, Linn Co., Iowa, 28 October 2005, walking on path sandy soils, F. L. Olsen (DAVC); Cedar Hills Sand Prairie State Preserve, Black Hawk Co., Iowa, 2 November 2005, pitfall pocket gopher tunnel (*Geomys bursarius*), ELF (ELFC).

County records (Figure 51): Black Hawk, Dickinson, Howard, Johnson, Linn, Marshall, Polk.

***Cryptoscatomaseter magnificens* (Robinson, 1940)**

Worthington and Larsen 2010; ELFC.

Collection dates: September–November.

Specimen label data: Winneshiek Co., Iowa, 21 September 2009, restored tallgrass prairie, Reese Worthington (Worthington and Larsen 2010); Marietta Sand Prairie State Preserve, Marshall Co., Iowa, 21 October 2011, sifted from sand pocket gopher mound, ELF (ELFC); Puccoon Prairie, Polk

Co., Iowa, 28 October, 7 November 2011, baited pitfall pocket gopher tunnel (*Geomys bursarius*), ELFC (ELFC).

Only four specimens from Iowa.

County records (Figure 52): Marshall, Polk, Winneshiek.

***Cryptoscatomaseter punctissimus* (Brown, 1928)**

Gordon and Skelley 2007; ELFC.

Collection dates: October–November.

Specimen label data: Cedar Hills Sand Prairie State Preserve, Black Hawk Co., Iowa, 10 November 2005, pitfall pocket gopher tunnel (*Geomys bursarius*), ELF, determined MJP 2010 (ELFC).

County records (Figure 53): Black Hawk, Hamilton, Marshall, Polk.

Dellacasiellus Gordon and Skelley, 2007

***Dellacasiellus concavus* (Say, 1823)**

Wickham 1911; Gordon 1983; Worthington and Larsen 2010; Connior et al. 2014; ISIC; IWUC; UMRC; FSCA; DAVC; ELFC; PKLC.

Collection dates: May–June, August.

Collected at lights, on pocket gopher mounds, and sifted from pocket gopher mounds (*Geomys bursarius*) late afternoon to dusk.

County records (Figure 54): Allamakee, Black Hawk, Des Moines, Harrison, Henry, Howard, Kossuth, Linn, Johnson, Osceola, Polk, Pottawattamie, Story, Winneshiek.

***Dellacasiellus kirni* (Cartwright, 1944)**

Worthington and Larsen 2010; Connior et al. 2014; ISIC; WIRC; FSCA; DAVC; ELFC.

Collection dates: May–June, August–September.

Collected at light and pitfall pocket gopher tunnel (*Geomys bursarius*).

County records (Figure 55): Black Hawk, Fayette, Linn, Marshall, Muscatine, Polk, Winneshiek.

Dialytes Harold, 1869

***Dialytes striatulus* (Say, 1825)**

Wickham 1911; Gordon and Skelley 2007; MCZC; ELFC; DAVC; MJPC.

Collection dates: June–August.

Gordon and Skelley (2007) designated a specimen labeled “IOWA” as the Neotype to replace Say’s destroyed type: “Jackson Co., Maquoketa Caves St. Pk., 29 vii 1968, S. Beck, Ber#147, forest litter u. carrion/ Neotype (red paper)/ M. C. Z. Neotype 32754/ *Dialytes striatulus* (Say) Des. F. Chalumeau ‘82/ Neotype *Trox striatulus* Say, des. P. Skelley 2006.”

Also collected at lights.

County records (Figure 56): Fremont, Jackson, Johnson.

***Dialytes truncatus* (Melsheimer, 1846)**

Stebnicka 1994; Worthington and Larsen 2010; ELFC; DAVC.

Collection dates: July–October.

Collected on horse dung and at lights.

Specimen label data: Shimek State Forest, Van Buren Co., Iowa, 4 August 2006 [3], light, ELF (ELFC); Hardin City Woodland State Preserve, Hardin Co., Iowa, 19 July 2004, UV light, ELF (ELFC); Shimek State Forest, Van Buren Co., Iowa, 8 September 2006, horse dung, ELF (ELFC).

County records (Figure 57): Allamakee, Fayette, Hardin, Jackson, Linn, Muscatine, Van Buren, Winnebago.

***Dialytes ulkei* Horn, 1875**

DAVC; ELFC.

Collection dates: July.

Specimen label data: First two known Iowa specimens and **NEW STATE RECORD**: Wildcat Den State Park, Muscatine Co., Iowa, 8 July 2006, UV light, DAV (DAVC); Wildcat Den State Park, Muscatine Co., Iowa, 28 July 2006, UV light, ELF (ELFC).

Only two specimens from Iowa.

County record: Muscatine.

Diapterna Horn, 1887

***Diapterna hyperborea* (LeConte, 1850)**

Gordon and Skelley 2007.

Collection dates: no date of collection given with literature record.

County record: no specific locality given.

***Diapterna pinguis* (Haldeman, 1848)**

Gordon and Skelley 2007 (“northern Iowa”).

Collection dates: no date of collection given with literature record.

County record: no specific locality given.

Drepanocanthoides Schmidt, 1913

***Drepanocanthoides walshii* (Horn, 1870)**

Gordon and Skelley 2007.

Collection dates: no date of collection given with literature record.

County record: no specific locality given.

Geomyphilus Gordon and Skelley, 2007

***Geomyphilus insolitus* (Brown, 1928)**

FSCA; ELFC; DAVC; PKLC.

Collection dates: May–June, September–November.

Specimen label data: First known Iowa specimens and **NEW STATE RECORD**: Cedar Hills Sand Prairie, Black Hawk Co., Iowa, 14 September 1996, insect sweep sample, Nancy L. Slife, ELF (ELFC); Cedar Hills Sand Prairie State Preserve, Black Hawk Co., Iowa, 2 September 2006, pitfall pocket gopher tunnel (*Geomys bursarius*), ELF (ELFC).

County records (Figure 58): Black Hawk, Marshall, Polk.

***Geomyphilus leptotarsis* (Brown, 1928)**

Gordon and Skelley 2007.

Collection dates: no date of collection given with literature record.

County record: no specific location given.

***Geomyphilus russeus* (Brown, 1928)**

Gordon 1983; Gordon and Skelley 2007; DAVC.

Collection dates: November.

Specimen label data: Cedar Hills Sand Prairie State Preserve, Black Hawk Co., Iowa, 11 November 2005, walking on pocket gopher mound (*Geomys bursarius*), DAV (DAVC).

Only a few specimens from Iowa.

County records (Figure 59): Black Hawk, Mills, Scott.

Labarrus Mulsant and Rey, 1870

****Labarrus cincticulus* (Hope, 1847)**

Ratcliffe 1991 (as *Aphodius lividus* (Olivier, 1789); Gordon and Skelley 2007 (as *Labarrus pseudolividus*); Ratcliffe and Paulsen 2008 (as *A. pseudolividus*); Stebnicka 2009 (synonymized *pseudolividus* with *cincticulus*); Evans 2014 (as *L. pseudolividus*); USNM; CASC; DAVC; ELFC.

Collection dates: August–October.

Specimen label data: Sidney, Fremont Co., Iowa, 12 September 1971, B. C. Ratcliffe (USNM); Shimek State Forest, Van Buren Co., Iowa, 4 August 2006, UV light, DAV (DAVC); RR Adel, Dallas Co., Iowa, 3 October 2006, porch light, ELF (ELFC).

County records (Figure 60): Dallas, Fremont, Linn, Van Buren.

Lechorodius Gordon and Skelley, 2007

***Lechorodius terminalis* (Say, 1823)**

Gordon and Skelley 2007; ISIC; IWUC; ELFC; DAVC; MJPC.

Collection dates: March–May, November.

Collected in flight just above leaf litter and on deer dung.

Specimen label data: Brush Creek Canyon State Preserve, Fayette Co., Iowa, 20 November 2003, deer dung, ELF (ELFC); Waubonsie State Park, Fremont Co., Iowa, 20 April 2010, deer dung, ELF (ELFC).

County records (Figure 61): Appanoose, Clayton, Dallas, Decatur, Delaware, Fayette, Fremont, Hardin, Harrison, Henry, Jefferson, Keokuk, Lee, Linn, Madison, Marion, Story, Tama, Washington.

Liothorax Motschulsky, 1859

***Liothorax alternatus* (Horn, 1870)**

Hendrickson 1930; Gordon 1977; ISIC.

Collection dates: April–May.

Specimen label data: Ames, Story Co., Iowa, 16 April 1926, GH, determined O. L. Cartwright 1955 (ISIC); Ames, Story Co., Iowa, 3 April 1930, H. E. Guthrie, determined O. L. Cartwright 1955 (ISIC); Ames, Story Co., Iowa, 29 April 1931 [2], W. E. Heston, determined O. L. Cartwright 1955 (ISIC).

County records (Figure 62): Dickinson, Story, Winnebago.

Melinopterus Mulsant, 1842

***Melinopterus femoralis* (Say, 1823)**

Wickham 1911; ISIC; IWUC; ELFC; DAVC.

Collection dates: March–May.

Collected from dung.

County records (Figure 63): Black Hawk, Boone, Bremer, Dallas, Davis, Des Moines, Fremont, Hamilton, Henry, Jefferson, Johnson, Linn, Louisa, Mahaska, Marion, Marshall, Monroe, Page, Scott, Story, Taylor, Union, Van Buren.

****Melinopterus prodromus* (Brahm, 1790)**

Gordon and Skelley 2007; Worthington and Larsen 2010; ISIC; DAVC; ELFC; PKLC.

Collection dates: March–October.

Collected from dung.

Specimen label data: RR Adel, Dallas Co., Iowa, 3 October 2006, porch light, ELF (ELFC).

County records (Figure 64): Appanoose, Black Hawk, Boone, Bremer, Dallas, Davis, Des Moines, Fayette, Floyd, Fremont, Hardin, Jones, Linn, Madison, Marshall, Page, Polk, Story, Van Buren, Winneshiek.

Oscarinus Gordon and Skelley, 2007

***Oscarinus rusicola* (Melsheimer, 1845)**

Wickham 1911; Worthington and Larsen 2010; ISIC; IWUC; DAVC; ELFC.

Collection dates: March–August.

Collected from dung.

County records (Figure 65): Allamakee, Black Hawk, Bremer, Cherokee, Dallas, Davis, Dickinson, Fremont, Hardin, Henry, Howard, Johnson, Lee, Linn, Marshall, Muscatine, Plymouth, Story, Van Buren, Winneshiek.

Otophorus Mulsant, 1842

****Otophorus haemorrhoidalis* (Linnaeus, 1758)**

Worthington and Larsen 2010; ISIC; USNM; ELFC; DAVC.

Collection dates: April–July.

Collected from deer dung.

Specimen label data: Marietta Sand Prairie State Preserve, Marshall Co., Iowa, 28 May 2005 [2], deer dung, ELF (ELFC); Cedar Hills Sand Prairie, Black Hawk Co., Iowa, 17 May 2006, deer dung, ELF (ELFC); RR Adel, Dallas Co., Iowa, 27 April 2007, deer dung, ELF (ELFC).

County records (Figure 66): Black Hawk, Dallas, Des Moines, Emmet, Fremont, Howard, Jefferson, Jones, Linn, Marshall, Story, Warren, Winneshiek.

Pardalosus Gordon and Skelley, 2007

***Pardalosus sayi* (Gordon, 2006)**

MJPC.

Collection dates: November.

Specimen label data: First nine known Iowa specimens and **NEW STATE RECORD**: Waubonsie State Park, Fremont Co., Iowa, 11 November 2009, in leaf litter of steps at picnic shelter, MJP (MJPC).

Only nine specimens from Iowa.

County record: Fremont.

***Pardalosus serval* (Say, 1835)**

Gordon and Skelley 2007; ISIC; IWUC; DAVC; ELFC.

Collection dates: February–April, October–November.

Collected in flight, on horse dung, and under leaf litter.

Specimen label data: Ames, Story Co., Iowa, 15 October 1907 [2], JRC, determined O. L. Cartwright 1955 (ISIC); Ames, Story Co., Iowa, 3 April 1939, Ada Fiens, determined O. L. Cartwright 1955 (ISIC); Matsell Bridge, Linn Co., Iowa, 23 March 2004, in flight, DAV (ELFC); Janesville, Black Hawk Co., Iowa, 13 October 2005, in flight, ELF (ELFC).

County records (Figure 67): Black Hawk, Clarke, Dallas, Des Moines, Dickinson, Fremont, Henry, Keokuk, Linn, Louisa, Mahaska, Marshall, Monroe, Muscatine, Story, Van Buren.

Planolinellus Dellacasa and Dellacasa, 2005

****Planolinellus vittatus* (Say, 1825)**

Wickham 1911; King 1914; ISIC.

Collection dates: April–August.

Specimen label data: Ames, Story Co., Iowa, 28 April 1930 [2], George Thurber (ISIC); Ames, Story Co., Iowa, 17 August 1944, H. Evers, determined Carter 1955 (ISIC).

County records (Figure 68): Des Moines, Henry, Story.

Pseudagolius Schmidt, 1913

***Pseudagolius bicolor* (Say, 1823)**

Wickham 1911; Worthington and Larsen 2010; ISIC; IWUC; UMRC; DAVC; ELFC.

Collection dates: June, September–November.

Collected from horse and deer dung.

County records (Figure 69): Dallas, Delaware, Fayette, Fremont, Hardin, Henry, Johnson, Lee, Madison, Polk, Story, Van Buren, Washington, Winneshiek.

***Pseudagolius coloradensis* (Horn, 1879)**

Gordon 1976; Gordon and Skelley 2007; IWUC.

Collection dates: June–July.

Specimen label data: Plymouth Co., Iowa, 6 July 1934 [2], H. C. Knutson, determined O. L. Cartwright (IWUC); Dickinson Co., Iowa, 24 June 1936, H. E. Jaques (IWUC).

County records (Figure 70): Dickinson, Iowa, Plymouth.

Scabrostomus Gordon and Skelley, 2007

***Scabrostomus peculiosus peculiosus* (Schmidt, 1922)**

ELFC.

Collection dates: November.

Specimen label data: First known Iowa specimens and **NEW STATE RECORD**: Cedar Hills Sand Prairie State Preserve, Black Hawk Co., Iowa, 6 November 2004, in flight late afternoon calm 70 F, ELF (ELFC); Cedar Hills Sand Prairie State Preserve, Black Hawk Co., Iowa, 7 November 2005, pit-fall pocket gopher tunnel (*Geomys bursarius*), ELF (ELFC).

Few specimens from Iowa.

County record: Black Hawk.

Stenotothorax Schmidt, 1913

***Stenotothorax badipes* (Melsheimer, 1845)**

Gordon and Skelley 2007; ISIC; DAVC; ELFC.

Collection dates: March–June, November.

Collected at light, on concrete bathroom wall, under leaf litter, and in tunnel under bark of log (27 March 2005).

Specimen label data: Cedar Bend County Park, Bremer Co., Iowa, 13 April 2006, UV light, ELF (ELFC).

County records (Figure 71): Bremer, Dallas, Decatur, Fayette, Fremont, Kossuth, Lee, Linn, Monona, Muscatine, Story, Van Buren.

Teuchestes Mulsant, 1842

****Teuchestes fossor* (Linnaeus, 1758)**

Wickham 1911; ISIC; IWUC.

Collection dates: May–June.

Specimen label data: Winnebago Co., Iowa, 21 June 1932, Russell (IWUC); Manchester, Delaware Co., Iowa, 7 May 1948, W. H. Tate, determined H. F. Howden 1953 (ISIC); Ames, Story Co., Iowa, 6 May 1962, R. V. Rydberg (ISIC).

County records (Figure 72): Linn, Story, Winnebago.

Tribe EUPARIINI Schmidt, 1910

Aphotaenius Cartwright, 1952

***Aphotaenius carolinus* (Van Dyke, 1928)**

MJPC; DAVC; ELFC

Collection dates: April–May.

Specimen label data: First known Iowa specimens and **NEW STATE RECORD**: Waubonsie State Park, Fremont Co., Iowa, 22 May 2010, deer dung in leaf litter, MJP, DAV, ELF (DAVC, ELFC).

County record: Fremont.

Ataenius Harold, 1867

***Ataenius abditus* Haldeman, 1848**

Putnam 1876; Wickham 1911; Worthington and Larsen 2010; ISIC; IWUC; ELFC; DAVC.

Collection dates: April–August.

Collected under debris on sandbar and sifted from sandbar along a wooded stream.

County records (Figure 73): Clayton, Dallas, Des Moines, Dickinson, Henry, Howard, Johnson, Keokuk, Lee, Muscatine, Story, Winneshiek.

***Ataenius cognatus* LeConte, 1858**

Wickham 1911; Hendrickson 1930; IWUC.

Collection dates: April–September.

Specimen label data: Mt. Pleasant, Henry Co., Iowa, 8 August 1928, E. P. Meiners (IWUC); Clayton Co., Iowa, 4 August 1932, MWJ (IWUC); Wapello Co., Iowa, 3 May 1934, Albert, determined Marshall 1943 (IWUC).

County records (Figure 74): Appanoose, Black Hawk, Boone, Buchanan, Clayton, Des Moines, Harrison, Henry, Howard, Iowa, Jasper, Johnson, Louisa, Page, Polk, Pottawattamie, Poweshiek, Scott, Sioux, Story, Union, Wapello.

***Ataenius gracilis* (Melsheimer, 1844)**

Wickham 1911; Cartwright 1974; Worthington and Larsen 2010; ISIC; IWUC; DAVC; ELFC; MJPC.

Collection dates: March–September.

Collected at light.

County records (Figure 75): Allamakee, Dallas, Henry, Johnson, Lee, Linn, Louisa, Marion, Scott, Story, Winneshiek.

***Ataenius imbricatus* (Melsheimer, 1846)**

ELFC.

Collection dates: July.

Specimen label data: First known Iowa specimen and **NEW STATE RECORD**: Yellow River State Forest, Allamakee Co., Iowa, 9 July 2005, UV light, ELF (ELFC).

This is the only Iowa specimen.

County record: Allamakee.

***Ataenius platensis* (Blanchard, 1846)**

ELFC.

Collection dates: July.

Specimen label data: First known Iowa specimen and **NEW STATE RECORD**: Timberhill Savanna, Decatur Co., Iowa, 19 July 2011, UV light, ELF (ELFC).

This is the only specimen from Iowa.

County record: Decatur.

***Ataenius robustus* Horn, 1871**

Wickham 1911; Cartwright 1974; ISIC; IWUC; CASC.

Collection dates: April, June, September.

Specimen label data: Davis Co., Iowa, September 1943, W. D. Klimstra, determined O. L. Cartwright 1955 (ISIC).

County records (Figure 76): Clayton, Davis, Henry, Johnson.

***Ataenius spretulus* Haldeman, 1848**

Cartwright 1974; Stebnicka and Lago 2005; Worthington and Larsen 2010; ISIC; ELFC; PKLC.

Collection dates: March–September.

Collected at light and in flight during day.

County records (Figure 77): Allamakee, Appanoose, Black Hawk, Dallas, Decatur, Fremont, Lee, Lucas, Osceola, Polk, Scott, Story, Taylor, Van Buren, Winneshiek.

***Ataenius strigatus* (Say, 1823)**

Wickham 1911; Cartwright 1974; Stebnicka and Lago 2005; Worthington and Larsen 2010; ISIC; IWUC; ELFC; DAVC; PKLC.

Collection dates: March–September.

Collected at light.

County records (Figure 78): Adair, Appanoose, Black Hawk, Boone, Bremer, Butler, Cherokee, Dallas, Decatur, Des Moines, Dickinson, Dubuque, Emmet, Fayette, Floyd, Fremont, Greene, Hardin, Henry, Howard, Jefferson, Johnson, Lee, Linn, Louisa, Lyon, Mahaska, Marion, Osceola, Page, Plymouth, Polk, Pottawattamie, Scott, Story, Union, Van Buren, Wapello, Warren, Washington, Winneshiek, Woodbury.

***Ataenius texanus* Harold, 1874**

Cartwright 1974; ISIC; ELFC; DAVC.

Collection dates: March–July.

Collected under soil pushup of dirt road, sifted from sandbar, and at light.

County records (Figure 79): Appanoose, Black Hawk, Boone, Dallas, Decatur, Fremont, Lee, Linn, Polk, Pottawattamie, Van Buren, Winneshiek.

Tribe PSAMMODIINI Mulsant, 1842

Pleurophorus Mulsant, 1842

***Pleurophorus caesus* (Panzer, 1796)**

Wickham 1911.

Collection dates: no date of collection given with literature record.

County record: no specific locality given.

Neopsammodius Rakovic, 1986

***Neopsammodius interruptus* (Say, 1835)**

Cartwright 1955.

Collection dates: no date of collection given with literature record.

County record: no specific locality given.

Rhyssemus Mulsant, 1842

***Rhyssemus sonatus* LeConte and Horn, 1881**

Wickham 1911; Gordon and Cartwright 1980; ISIC; MJPC; ELFC; DAVC.

Collection dates: April–May.

Collected under carnivore dung and under leaf litter along trail.

Specimen label data: Experiment Station, Ames, Story Co., Iowa, 28 May 1897, [no collector], determined Carter 1955 (ISIC); Waubonsie State Park, Fremont Co., Iowa, 19 May 2009 [6], carnivore dung, 22 May 2010 [3], under leaf litter ridge top trail, ELF (ELFC).

County records (Figure 80): Fremont, Mills, Muscatine, Pottawattamie, Story.

Subfamily SCARABAEINAE Latreille, 1802

Tribe ONTHOPHAGINI Burmeister, 1846

Onthophagus Latreille, 1802

***Onthophagus hecate hecate* (Panzer, 1794)**

Putnam 1876; Wickham 1897, 1911; Howden and Cartwright 1963; Worthington and Larsen 2010; ISIC; IWUC; ELFC; DAVC; PKLC.

Collection dates: April–October.

Collected from raccoon, horse, and Canada goose dung.

County records (Figure 81): Adair, Allamakee, Appanoose, Black Hawk, Boone, Bremer, Buchanan, Cedar, Cherokee, Dallas, Davis, Decatur, Delaware, Des Moines, Dickinson, Fayette, Fremont, Hancock, Hardin, Henry, Howard, Ida, Iowa, Jackson, Jefferson, Johnson, Jones, Lee, Linn, Louisa, Lucas, Madison, Mahaska, Marion, Monona, Monroe, Muscatine, Osceola, Page, Plymouth, Polk, Pottawattamie, Scott, Story, Taylor, Van Buren, Warren, Wapello, Washington, Wayne, Winnebago, Winneshiek, Woodbury, Wright.

***Onthophagus knausi* Brown, 1927**

MJPC; DAVC; ELFC.

Collection dates: April, June–September.

Collected from deer, horse, and carnivore dung.

Specimen label data: First known Iowa specimen and **NEW STATE RECORD**: Waubonsie State Park, Fremont Co., Iowa, 26 June 2003 [9], deer dung, MJP, ELF (MJPC, ELFC); Bluffton Fir Stand State Preserve, Winneshiek Co., Iowa, 15 August 2008, on mushroom, DAV (DAVC).

County records (Figure 82): Fremont, Pottawattamie, Winneshiek.

***Onthophagus orpheus canadensis* (Fabricius, 1801)**

Howden and Cartwright 1963; Worthington and Larsen 2010; ELFC; DAVC; PKLC; MJPC.

Collection dates: April–July, September–October.

Collected from deer dung, on dead toad, under leaves, and on a log.

County records (Figure 83): Allamakee, Appanoose, Black Hawk, Bremer, Butler, Clayton, Dallas, Delaware, Dubuque, Fayette, Hardin, Johnson, Jones, Lee, Winneshiek.

***Onthophagus orpheus orpheus* (Panzer, 1794)**

Howden and Cartwright 1963; ISIC.

Collection dates: April–June.

Specimen label data: Ames, Story Co., Iowa, 15 June 1932, H. M. Harris, determined H. F. Howden 1953 (ISIC); Davis Co., Iowa, June 1948 [2], W. D. Klimstra, determined H. F. Howden 1953 (ISIC).

County records (Figure 84): Boone, Davis, Des Moines, Story.

***Onthophagus orpheus pseudorheus* Howden and Cartwright, 1963**

Howden and Cartwright 1963; ISIC; CASC (Paratype); DAVC.

Collection dates: April–June.

Specimen label data: Fish Farm Mounds, Allamakee Co., Iowa, 25 May 2003, horse dung, DAV (DAVC); Shimek State Forest, Lee Co., Iowa, 26 June 2005, horse dung, DAV (DAVC).

County records (Figure 85): Henry, Johnson, Story, Winneshiek.

***Onthophagus pennsylvanicus* Harold, 1871**

Wickham 1911; Howden and Cartwright 1963; ISIC; IWUC; DAVC; ELFC.

Collection dates: March–September.

Collected from dung.

County records (Figure 86): Allamakee, Des Moines, Dickinson, Fremont, Henry, Howard, Ida, Johnson, Jones, Lee, Linn, Louisa, Lucas, Madison, Mills, Monroe, Muscatine, Plymouth, Pottawattamie, Sac, Story, Wapello, Warren, Winneshiek.

***Onthophagus striatulus* (Palisot de Beauvois, 1809)**

Wickham 1911; Howden and Cartwright 1963; ISIC; MJPC; DAVC; ELFC.

Collection dates: April–August.

Collected from pushups on trail, at light, dog dung, and under rotting fungi.

County records (Figure 87): Appanoose, Boone, Davis, Fremont, Linn, Muscatine, Story.

***Onthophagus subaeneus* (Palisot de Beauvois, 1811)**

DAVC; ELFC.

Collection dates: April–July.

Specimen label data: First known Iowa specimens and **NEW STATE RECORD**: Waubonsie State Park, Fremont Co., Iowa, 4 June 2006, carnivore dung, DAV (DAVC); Hitchcock Nature Area, Pottawattamie Co., Iowa, 29 April 2008, soil pushup, ELF (ELFC); Waubonsie State Park, Fremont Co., Iowa, 4 July 2008, light, ELF (ELFC).

Only four specimens from Iowa.

County records (Figure 88): Fremont, Pottawattamie.

Tribe ATEUCHINI Laporte, 1840

Ateuchus Weber, 1801

***Ateuchus histeroides histeroides* Weber, 1801**

Wickham 1911; ISIC; IWUC; DAVC; ELFC; PKLC.

Collection dates: April–August.

Collected from horse dung and at lights.

County records (Figure 89): Appanoose, Dallas, Decatur, Des Moines, Fremont, Henry, Jefferson, Lee, Louisa, Lucas, Muscatine, Pottawattamie, Story, Taylor, Van Buren, Warren.

Tribe COPRINI Leach, 1815
Copris Muller, 1764

***Copris fricator fricator* (Fabricius, 1787)**

Putnam 1876; Wickham 1911; Worthington and Larsen 2010; ISIC; IWUC; CCMV; USNM; DAVC; ELFC; PKLC.

Collection dates: April–October.

Collected at lights and from dung.

County records (Figure 90): Adair, Allamakee, Appanoose, Black Hawk, Boone, Buchanan, Carroll, Cherokee, Clayton, Dallas, Decatur, Delaware, Des Moines, Dickinson, Floyd, Fremont, Henry, Howard, Iowa, Jefferson, Johnson, Keokuk, Kossuth, Lee, Linn, Louisa, Lucas, Mahaska, Monona, Monroe, Muscatine, Osceola, Page, Polk, Pottawattamie, Poweshiek, Scott, Story, Taylor, Union, Van Buren, Wapello, Warren, Washington, Wayne, Winneshiek.

***Copris minutus* (Drury, 1770)**

Wickham 1911; Mathews 1961; Evans 2014; IWUC; MJLC; DAVC; ELFC; MJPC.

Collection dates: March–November.

Collected from horse and carnivore dung and at lights.

County records (Figure 91): Appanoose, Dallas, Decatur, Des Moines, Fremont, Henry, Iowa, Johnson, Lee, Linn, Louisa, Lucas, Monroe, Muscatine, Page, Polk, Story, Taylor, Van Buren, Washington.

Dichotomius Hope, 1838

***Dichotomius carolinus* (Linnaeus, 1767)**

ISIC; IWUC; CASC; DAVC; ELFC.

Collection dates: May–October.

Specimen label data: First report from Iowa and **NEW STATE RECORD:** Page Co., Iowa, 8 October 1934, Rogers (IWUC); Waubonsie State Park, Fremont Co., Iowa, 5 June 2006, 3 June 2007, specimens collected underground associated with deer dung (*Alloblackburneus rubeolus* specimens also collected with deer dung in tunnel), DAV (DAVC).

Specimens collected at Waubonsie State Park were about ten inches down in loess soil under deer dung.

County records (Figure 92): Fremont, Henry, Louisa, Page, Story, Warren.

Tribe PHANAEINI Kolbe, 1905
Phanaeus MacLeay, 1819

***Phanaeus triangularis* (Say, 1823)**

King 1914.

Collection dates: no date of collection given with literature record.

Listed by King (1914) from Henry Co., Iowa. An Atlantic and Gulf coastal species occurring west to Texas and we are inclined to consider this an erroneous record. However, specimens have been collected at Indian Cave State Park in southeastern Nebraska, which is nearly as far north as Henry County, Iowa, so the occurrence of this species in the state is certainly within the realm of possibility.

County record: Henry.

***Phanaeus vindex* MacLeay, 1819**

Wickham 1911; Blume and Aga 1978; Edmonds 1994; Worthington and Larsen 2010; ISIC; IWUC; DAVC; ELFC.

Collection dates: April–October.

Collected from deer and horse dung.

Specimen label data: Experiment Station, Ames, Story Co., Iowa, [no date], Osborn, determined W. D. Edmonds 1983 (ISIC); Leon, Decatur Co., Iowa, 15 June 1932, Travis, determined W. D. Edmonds 1983 (ISIC).

County records (Figure 93): Allamakee, Appanoose, Boone, Clarke, Clayton, Davis, Decatur, Des Moines, Dickinson, Fayette, Fremont, Henry, Jefferson, Keokuk, Lee, Linn, Louisa, Madison, Marion, Mills, Monroe, Muscatine, Page, Pottawattamie, Story, Van Buren, Wapello, Warren, Washington, Winneshiek, Woodbury.

Tribe CANTHONINI Lansberge, 1874
Canthon Hoffmannsegg, 1817

***Canthon chalcites* (Haldeman, 1843)**

ISIC; IWUC; CASC.

Collection dates: April–July.

Specimen label data: First report from Iowa and **NEW STATE RECORD**: Ames, Story Co., Iowa, [no date], [no collector], determined Brown 1928 (ISIC); Ames, Story Co., Iowa, 8 June 1931, B. V. Travis (ISIC); Mt. Pleasant, Henry Co., Iowa, 8 June 1933, WGJ, determined Cartwright (IWUC); Plymouth Co., Iowa, 25 June 1940, Jean Jaques, determined Allen 1941 (IWUC); Sigourney, Keokuk Co., Iowa, 10 May 1956, K. L. Rhodebeck (ISIC).

County records (Figure 94): Henry, Johnson, Keokuk, Plymouth, Story, Warren.

***Canthon pilularius* (Linnaeus, 1758)**

Putnam 1876; Wickham 1911; Worthington and Larsen 2010; DAVC; KJLC; ELFC.

Collection dates: May–September.

Collected from horse dung and baited pitfalls.

County records (Figure 95): Adair, Adams, Allamakee, Clayton, Davis, Delaware, Des Moines, Dickinson, Floyd, Fremont, Hamilton, Harrison, Henry, Jefferson, Lee, Linn, Louisa, Lucas, Marion, Muscatine, Page, Plymouth, Sioux, Story, Tama, Van Buren, Washington, Winneshiek, Woodbury.

***Canthon vigilans* LeConte, 1858**

Wickham 1911; IWUC; DAVC.

Collection dates: April–July.

Specimen label data: Fairfield, Jefferson Co., Iowa, 14 July 1935, [no collector], determined O. L. Cartwright 1938 (IWUC); Matsell Bridge Natural Area, Linn Co., Iowa, 11 July 2004, UV light, DAV (DAVC).

County records (Figure 96): Des Moines, Fremont, Henry, Jefferson, Linn, Louisa.

***Canthon viridis* (Palisot de Beauvois, 1805)**

Wickham 1911; Worthington and Larsen 2010; ISIC; IWUC; DAVC; ELFC.

Collection dates: May–August.

Collected on turkey, horse, and human dung and at light.

County records (Figure 97): Allamakee, Appanoose, Dallas, Decatur, Fremont, Henry, Lee, Linn, Lucas, Pottawattamie, Story, Winneshiek.

Melanocanthon Halffter, 1958

***Melanocanthon nigricornis* (Say, 1823)**

King 1914; WIRC; ELFC; DAVC.

Collection dates: May–September.

Collected from deer and dog dung, deer dung baited pitfall, walking on path, and rolling dung ball on path; majority of individuals collected or observed were on sand prairies with eolian soils, a few from “goat prairies” with sandy soils nearby; a few specimens from the Iowa loess hills which is loess soil; no individuals from other habitats. Vestal (1913) associated this species with sand prairie.

County records (Figure 98): Allamakee, Benton, Black Hawk, Fremont, Henry, Linn, Pottawattamie, Woodbury.

Pseudocanthon Bates, 1887

***Pseudocanthon perplexus* (LeConte, 1847)**

UNSM; ELFC; DAVC.

Collection dates: May–August.

Specimen label data: First known Iowa specimens and **NEW STATE RECORD**: Mills Co., Iowa, 8 July 1985, C. A. Springer (UNSM); Lake of Three Fires State Park, Taylor Co., Iowa, 14 August 2003, dung, ELF (ELFC); Wildcat Den State Park, Muscatine Co., Iowa, 6 June 2004, UV light, DAV (DAVC).

County records (Figure 99): Appanoose, Dallas, Decatur, Fremont, Mills, Muscatine, Taylor, Van Buren.

Subfamily MELOLONTHINAE Leach (in Samouelle), 1819

Tribe DICHELONYCHINI Burmeister, 1855

Dichelonyx Harris, 1826

***Dichelonyx albicollis* (Burmeister, 1855)**

DAVC.

Collection dates: June.

Specimen label data: First known Iowa specimen and **NEW STATE RECORD**: Cedar Rapids, Linn Co., Iowa, June 2003, UV light, J. O. Durbin (DAVC).

Only one specimen from Iowa.

County record: Linn.

***Dichelonyx fuscula* LeConte, 1856**

DAVC, ELFC; MJPC.

Collection dates: May.

Specimen label data: First known Iowa specimens and **NEW STATE RECORD**: Shimek State Forest, Van Buren and Lee Co., Iowa, 20 May 2003 [7], UV light, DAV, ELF (DAVC, ELFC); Wildcat Den State Park, Muscatine Co., Iowa, 26 May 2006, UV light, F. L. Olsen (DAVC).

The first specimens represent a range extension of approximately 175 km (110 miles) from the nearest known specimen from Missouri (Cornell 1972; Robert Sites, pers. comm., 2005).

County records (Figure 100): Lee, Muscatine, Van Buren.

***Dichelonyx kirbyi* Brown, 1946**

ELFC.

Collection dates: May–June.

Specimen label data: First known Iowa specimens and **NEW STATE RECORD**: Cedar Bend Park, Bremer Co., Iowa, 27 May 1998, under playground equipment, ELF, J. J. Freese (ELFC); Backbone State Park, Delaware Co., Iowa, 2 June 2006, UV light, ELF (ELFC).

Only two specimens from Iowa.

County records (Figure 101): Bremer, Delaware.

***Dichelonyx linearis* (Gyllenhal, 1817)**

Wickham 1911; Cornell 1972; Worthington and Larsen 2010; ISIC; IWUC; DAVC; ELFC; MJPC.

Collection dates: April–June.

Collected at light; located mating pairs on basswood leaves (*Tilia americana*) after sunset.

County records (Figure 102): Allamakee, Benton, Boone, Buchanan, Chickasaw, Clayton, Dallas, Delaware, Fayette, Floyd, Fremont, Hardin, Howard, Johnson, Lee, Linn, Polk, Story, Van Buren, Winnebago, Winneshiek.

***Dichelonyx subvittata* (LeConte, 1856)**

Wickham 1897, 1911; Worthington and Larsen 2010; ISIC, IWUC; DAVC; ELFC.

Collection dates: May–July.

Collected at light.

County records (Figure 103): Allamakee, Appanoose, Boone, Bremer, Clayton, Crawford, Dallas, Delaware, Dickinson, Dubuque, Guthrie, Hardin, Henry, Johnson, Jones, Kossuth, Lee, Linn, Monroe, Story, Winneshiek, Woodbury.

Tribe DILOTAXINI Kirby, 1837

Diplotaxis Kirby, 1837

***Diplotaxis atlantis* Fall, 1909**

Vaurie 1956, 1960; Lago and McCleve 1992; ISIC; DAVC; ELFC; PKLC.

Collection dates: May–August.

Collected at lights.

Specimen label data: Ames, Story Co., Iowa, 15 June 1931, H. M. Harris (ISIC); Rathbun Lake, Appanoose Co., Iowa, 18 June 2002, UV light, DAV (DAVC); Waubonsie State Park, Fremont Co., Iowa, 3 July 2003, combination light, DAV (DAVC); Hitchcock Nature Area, Pottawattamie Co., Iowa, 10 June 2008 [5], UV light, ELF (ELFC).

County records (Figure 104): Appanoose, Fremont, Lucas, Mills, Page, Pottawattamie, Story, Wapello.

***Diplotaxis basalis* Fall, 1909**

ISIC; IWUC.

Collection dates: April–June.

Specimen label data: First report from Iowa and **NEW STATE RECORD**: Experiment Station, Ames, Story Co., Iowa, 22 April 1897, [no collector] (ISIC); Ames, Story Co., Iowa, 29 May 1916, R. L. Webster (ISIC); Ottumwa, Wapello Co., Iowa, 29 May 1937 [2], Floyd Andre (ISIC).

County records (Figure 105): Boone, Davis, Henry, Jefferson, Lee, Louisa, Scott, Story, Wapello, Washington.

***Diplotaxis blanchardi* Vaurie, 1956**

Vaurie 1956, 1960; ELFC; DAVC.

Collection dates: May–June, September.

Collected at light.

County records (Figure 106): Dallas, Decatur, Fremont, Hardin, Henry, Linn, Lucas, Plymouth, Story, Van Buren.

***Diplotaxis frondicola* (Say, 1825)**

Wickham 1911; ISIC; IWUC; DAVC; ELFC.

Collection dates: April–June, August.

Collected at light, under soil pushup on path, and dead on path.

Specimen label data: Ames, Story Co., Iowa, 1 June 1932, Mary Murphy, determined H. F. Howden 1953 (ISIC).

County records (Figure 107): Appanoose, Dallas, Decatur, Delaware, Fremont, Henry, Lyon, Pottawattamie, Story, Winneshiek.

***Diplotaxis harperi* Blanchard, 1851**

Wickham 1911; Vaurie 1956, 1960; Worthington and Larsen 2010; ISIC; IWUC; ELFC; DAVC.

Collection dates: April–September.

Collected at light.

Specimen label data: Ames, Story Co., Iowa, 25 April 1947, J. Laffoon, determined J. Laffoon 1947 (ISIC).

County records (Figure 108): Allamakee, Appanoose, Boone, Bremer, Butler, Clarke, Clayton, Dallas, Decatur, Delaware, Des Moines, Dubuque, Fremont, Hamilton, Hardin, Henry, Jefferson, Johnson, Kossuth, Lee, Linn, Madison, Monona, Muscatine, Pottawattamie, Poweshiek, Story, Taylor, Van Buren, Wapello, Warren, Winneshiek.

***Diplotaxis liberta* (Germar, 1824)**

Wickham 1911; Vaurie 1956, 1960; Evans 2014; ELFC.

Collection dates: May.

Specimen label data: Waverly, Bremer Co., Iowa, 20 May 1969, T. Baru (ELFC).

The majority of Iowa specimens previously determined to be *Diplotaxis liberta* were actually *D. atlantis*; this indicates the literature record, when based on institutional specimens collected prior to this project, is likely incorrect; the single remaining Iowa specimen thus represents either an interesting range extension when compared to specimens in the USNM or a mislabeled specimen (M.J. Paulsen, pers. comm., April 2019).

County record: Bremer.

***Diplotaxis tristis* Kirby, 1837**

ELFC; DAVC.

Collection dates: June–July.

First known Iowa specimens and **NEW STATE RECORD**: Yellow River State Forest, Allamakee Co., Iowa, 3 July 2005, UV light, ELF (ELFC); Backbone State Park, Delaware Co., Iowa, 15 July 2005, UV light, ELF (ELFC).

Only a few records from Iowa.

County records (Figure 109): Allamakee, Delaware, Dubuque, Winneshiek.

Tribe HOPLIINI Latreille, 1829
Hoplia Illiger, 1803

***Hoplia laticollis* LeConte, 1856**

Worthington and Larsen 2010; ELFC; DAVC.

Collection dates: June–July.

Specimens collected from dogwood flowers (*Cornus* spp.) and sweeping; one specimen from deer dung baited pitfall trap.

Specimen label data: Fish Farm Mounds Wildlife Area, Allamakee County, Iowa, 2 July 2003, sweeping, ELF (ELFC).

County records (Figure 110): Allamakee, Black Hawk, Winneshiek.

***Hoplia modesta* Haldeman, 1843**

Wickham 1911; Boyer 1940; Hardy 1977; Harpootlian 2001; ISIC; USNM; DAVC; ELFC.

Collection dates: June.

Collected from dogwood flowers (*Cornus* spp.).

County records (Figure 111): Allamakee, Black Hawk, Dallas, Dickinson, Henry, Iowa, Johnson, Lee, Linn, Polk, Story, Van Buren.

***Hoplia trifasciata* Say, 1825**

Wickham 1911; Boyer 1940; Hardy 1977; IWUC; ELFC; DAVC.

Collection dates: April–May.

Collected from dogwood (*Cornus* spp.) and wild plum (*Prunus americana*) flowers and in flight.

County records (Figure 112): Allamakee, Black Hawk, Boone, Bremer, Dallas, Henry, Johnson, Lee, Linn, Muscatine, Ringgold, Story, Van Buren, Washington.

***Hoplia trivialis* Harold, 1869**

Evans 2014; DAVC.

Collection dates: May.

Specimen label data: Shimek State Forest, Van Buren Co., Iowa, 8 May 2004, viburnum flowers, DAV (DAVC).

This is the only specimen from Iowa.

County record: Van Buren.

Tribe MACRODACTYLINI Kirby, 1837
Macroductylus Latreille, 1825

***Macroductylus angustatus* Palisot de Beauvois, 1805**

IWUC; DAVC; ELFC.

Collection dates: June–July.

Collected at light and on wood nettle (*Laportea canadensis*)

Specimen label data: First report from Iowa and **NEW STATE RECORD**: Shimek State Forest, Van Buren Co., Iowa, 26 July 2003 [2], combination fluorescent UV light, DAV, ELF (DAVC, ELFC); Wildcat Den State Park, Muscatine Co., Iowa, 15 June 2007, combination light, DAV (DAVC); RR Adel, Dallas Co., Iowa, 1 July 2011, light, ELF (ELFC).

County records (Figure 113): Appanoose, Cedar, Dallas, Decatur, Fremont, Johnson, Linn, Muscatine, Van Buren.

***Macrodactylus subspinosus* (Fabricius, 1775)**

Wickham 1911; Worthington and Larsen 2010; ISIC; IWUC; USNM; DAVC; ELFC.

Collection dates: May–July.

Collected on vegetation and in flowers during day, open woodland: daisy fleabane flower (*Erigeron strigosus*), yarrow flower (*Achillea millefolium*), goldenrod leaves (*Solidago* spp.), and dogwood (*Cornus* spp.).

County records (Figure 114): Allamakee, Appanoose, Boone, Cedar, Clinton, Decatur, Des Moines, Dubuque, Fremont, Hancock, Henry, Howard, Jefferson, Johnson, Lee, Marshall, Monroe, Polk, Story, Van Buren, Winneshiek.

Tribe MELOLONTHINI Samouelle, 1819

Phyllophaga Harris, 1827

***Phyllophaga affabilis* (Horn, 1887)**

ISIC; ELFC.

Collection dates: May–August.

Collected at light.

Specimen label data: First known Iowa specimen and **NEW STATE RECORD**: Hastings, Mills Co., Iowa, 6 July 1961, light trap, [no collector], determined W. S. Craig (ISIC); Waubonsie State Park, Fremont Co., Iowa, 24 July, 14 August 2009, 27 July, 5 August 2010, lights, ELF (ELFC).

Only five specimens from Iowa.

County records (Figure 115): Fremont, Mills.

***Phyllophaga anxia* (LeConte, 1850)**

Putnam 1876; Wickham 1911; Travis 1934; Worthington and Larsen 2010; ISIC; IWUC; UMRC; ELFC; PKLC.

Collection dates: April–June.

Collected at light and sifted from sandbar sand.

Travis (1934) reported 397 specimens from Iowa indicating the species was uncommon to infrequent in Iowa.

County records (Figure 116): Allamakee, Bremer, Chickasaw, Dickinson, Fremont, Henry, Lee, Osceola, Sioux, Story, Van Buren, Wapello.

***Phyllophaga apicata* Reinhard, 1939**

ELFC.

Collection dates: April, June.

Specimen label data: First known Iowa specimen and **NEW STATE RECORD**: Hitchcock Nature Area, Pottawattamie Co., Iowa, 29 April 2008, under soil pushup on path, 10 June 2008, UV light, ELF (ELFC).

Only two specimens from Iowa.

County record: Pottawattamie.

***Phyllophaga balia* (Say, 1825)**

Wickham 1911; Travis 1934; Rice and Riley 2000; Worthington and Larsen 2010; ISIC; IWUC; UMRC; WCIC; ELFC; DAVC.

Collection dates: April–July.

Collected at light and under horse dung.

Travis (1934) reported 23 specimens from Iowa indicating this species was rarely encountered during his collecting activities in Iowa; Rice and Riley (2000) found it to be very common in the East Reactor Woods, Ames, Iowa.

County records (Figure 117): Allamakee, Appanoose, Boone, Clayton, Dallas, Decatur, Fremont, Henry, Jones, Lee, Linn, Muscatine, Story, Van Buren, Winneshiek.

***Phyllophaga barda* (Horn, 1887)**

Travis 1934; IWUC; DAVC; ELFC.

Collection dates: May–June.

Travis (1934) reported only two specimens from Iowa indicating it was rare in the state.

Specimen label data: Mt. Pleasant, Henry Co., Iowa, 3 May 1926, [no collector] (IWUC); Batavia, Jefferson Co., Iowa, 3 May 1938, H. E. Jaques, determined Luginbill (IWUC); Sharon Bluffs State Park, Appanoose Co., Iowa, 1 June 2007, UV light, DAV (DAVC).

Only seven specimens from Iowa.

County records (Figure 118): Appanoose, Decatur, Henry, Jefferson.

***Phyllophaga bipartita* (Horn, 1887)**

Travis 1934; ISIC; IWUC; ELFC; PKLC.

Collection dates: May–July.

Collected at light.

Travis (1934) reported only 17 specimens from Iowa indicating it was rare here.

Specimen label data: McGregor, Clayton Co., Iowa, 9 July 1932, G. L. Weber, determined B. Travis (ISIC); Lee Co., Iowa, 11 May 1936, Kenneth Newby, determined Luginbill (IWUC); Nine Eagles State Park, Decatur Co., Iowa, 4 June 2003, light, ELF (ELFC); Cedar Bend Park, Bremer Co., Iowa, 19 May 2006, light, ELF (ELFC).

County records (Figure 119): Appanoose, Bremer, Clayton, Davis, Decatur, Henry, Lee, Lucas, Story, Van Buren.

***Phyllophaga congrua* (LeConte, 1856)**

Travis 1934; Luginbill and Painter 1953; ISIC; DAVC; ELFC.

Collection dates: March, May, September.

Collected at light.

Travis (1934) reported 44 specimens from Iowa indicating it was infrequent to rare in the state.

Specimen label data: Missouri Valley, Harrison Co., Iowa, 20 May 1932 [14], G. C. Decker (ISIC); Super 8 Motel, Decatur Co., Iowa, 31 March 2012 [2], lights, ELF (ELFC).

County records (Figure 120): Decatur, Harrison, Taylor.

***Phyllophaga corrosa* (LeConte, 1856)**

Wickham 1911; Travis 1934; Luginbill and Painter 1953; ISIC.

Collection dates: June.

Travis (1934) reported only nine specimens from Iowa indicating it was rare in the state.

Specimen label data: Ames, Story Co., Iowa, [no date], [no collector], determined Davis (ISIC); Dyersville, Dubuque Co., Iowa, 22 June 1914, white oak, R.L.W. (ISIC).

County records (Figure 121): Delaware, Dubuque, Story.

***Phyllophaga crassissima* (Blanchard, 1851)**

Travis 1934; ISIC; IWUC; DAVC; ELFC; PKLC.

Collection dates: May–June, August.

Collected at light.

County records (Figure 122): Appanoose, Clarke, Dallas, Davis, Decatur, Fremont, Lee, Louisa, Lucas, Madison, Mills, Muscatine, Ringgold, Page, Polk, Scott, Story, Van Buren, Woodbury.

***Phyllophaga crenulata* (Froelich, 1792)**

Wickham 1911; Travis 1934; Worthington and Larsen 2010; ISIC; IWUC; ELFC; DAVC.

Collection dates: April–August.

Collected at light.

County records (Figure 123): Allamakee, Appanoose, Black Hawk, Boone, Bremer, Butler, Clayton, Dallas, Decatur, Delaware, Emmet, Fayette, Franklin, Fremont, Henry, Howard, Jackson, Johnson, Lee, Linn, Louisa, Madison, Marshall, Monona, Muscatine, Pottawattamie, Story, Taylor, Van Buren, Webster, Winneshiek.

***Phyllophaga delata* (Horn, 1887)**

ELFC; DAVC.

Collection dates: May–June.

Specimen label data: First two known Iowa specimens and **NEW STATE RECORD**: Sharon Bluffs State Park, Appanoose Co., Iowa, 20 May 2006 [2], UV light, ELF, DAV (ELFC, DAVC).

This is a range extension northward of approximately 145 km (90 miles) from nearest known specimen collected in Missouri (Kristin B. Simpson, pers. comm., 2007).

Only eighteen specimens from Iowa.

County records (Figure 124): Appanoose, Van Buren.

***Phyllophaga drakii* (Kirby, 1837)**

Wickham 1911; Travis 1934; ISIC; IWUC; ELFC; DAVC.

Collection dates: April–June.

Collected at light.

Travis (1934) reported 340 specimens from Iowa indicating the species was uncommon to infrequent in Iowa.

County records (Figure 125): Cedar, Cerro Gordo, Dallas, Emmet, Henry, Johnson, Lee, Madison, Monona, Page, Poweshiek, Story, Van Buren, Wapello.

***Phyllophaga ephilida* (Say, 1825)**

Jaques 1926; Travis 1934; ISIC; ELFC; DAVC.

Collection dates: July–August.

Collected at light.

Travis (1934) reported this species as present in Iowa based on a survey conducted by H. E. Jaques (1926) and suggested this species was rare in Iowa.

Specimen label data: Farmington, Van Buren Co., Iowa, 17 July 2004 [8], gas station lights, ELF (ELFC).

County records (Figure 126): Fremont, Louisa, Van Buren.

***Phyllophaga fervida* (Fabricius, 1775)**

Wickham 1911; Travis 1934; ISIC; DAVC; ELFC.

Collection dates: May–June.

Collected at light.

Travis (1934) reported 28 specimens collected from Iowa indicating it was rare in the state.

Specimen label data: Sharon Bluffs State Park, Appanoose Co., Iowa, 20 May 2006 [4], light, ELF (ELFC).

County records (Figure 127): Appanoose, Decatur, Henry, Howard, Lee, Linn, Mahaska, Van Buren.

***Phyllophaga forsteri* (Burmeister, 1855)**

Wickham 1911; King 1914; Travis 1934; Luginbill and Painter 1953; ISIC; IWUC; ELFC.

Collection dates: May–July.

Travis (1934) reported only eleven specimens collected from the state indicating it was rare in Iowa.

Specimen label data: Dyersville, Dubuque Co., Iowa 2 June 1914 [3], collected from hazel [2] and from white oak [1], R. L. Webster (ISIC); Leon, Decatur Co., Iowa, 14 June [3], 15 June [1], 1932, B. V. Travis (ISIC); Warren Co., Iowa, 14 June 1940, H. E. Jaques, determined Luginbill 1941 (IWUC); Timberhill Savanna, Decatur Co., Iowa, 7 July 2011, light, ELF (ELFC).

County records (Figure 128): Decatur, Delaware, Dubuque, Henry, Warren.

***Phyllophaga fraterna* Harris, 1842**

Putnam 1876; Horn 1887; Wickham 1911; Travis 1934; ISIC; IWUC; ELFC.

Collection dates: March–July.

Collected at light.

County records (Figure 129): Dubuque, Harrison, Henry, Jackson, Jefferson, Johnson, Louisa, Story, Van Buren, Wapello.

***Phyllophaga fusca* (Froelich, 1792)**

Putnam 1876; Wickham 1911; Travis 1934; Worthington and Larsen 2010; ISIC; IWUC; WIRC; DAVC; ELFC.

Collection dates: March–July.

Travis (1934) reported 15,549 specimens collected from Iowa indicating this species was the third most common species encountered in the state.

County records (Figure 130): Adair, Allamakee, Appanoose, Boone, Bremer, Clayton, Dallas, Davis, Decatur, Delaware, Des Moines, Dickinson, Dubuque, Fayette, Franklin, Fremont, Hardin, Henry, Howard, Iowa, Jefferson, Johnson, Jones, Keokuk, Kossuth, Linn, Louisa, Mahaska, Marion, Monona, Monroe, Muscatine, Page, Polk, Poweshiek, Story, Taylor, Van Buren, Wapello, Warren, Washington, Winneshiek, Woodbury.

***Phyllophaga futilis* (LeConte, 1850)**

Wickham 1911; Travis 1934; Worthington and Larsen 2010; ISIC; IWUC; DAVC; ELFC; PKLC.

Collection dates: March, May–July.

Collected at light.

County records (Figure 131): Allamakee, Appanoose, Black Hawk, Boone, Bremer, Cerro Gordo, Clayton, Dallas, Davis, Decatur, Des Moines, Dickinson, Dubuque, Fayette, Floyd, Fremont, Harrison, Henry, Jefferson, Johnson, Kossuth, Lee, Linn, Louisa, Lucas, Lyon, Madison, Marshall, Monroe, Muscatine, Osceola, Page, Pottawattamie, Sioux, Story, Taylor, Union, Van Buren, Wapello, Winneshiek, Woodbury.

***Phyllophaga glabricula* (LeConte, 1856)**

DAVC.

Collection dates: July.

Specimen label data: First known Iowa specimen and **NEW STATE RECORD**: Rolfe, Pocahontas Co., Iowa, 10 July 1963, at light, R. Fisher (DAVC).

This male is the only specimen known from Iowa.

This single specimen from Iowa is an interesting range extension compared to specimens in the USNM and UNSM (M.J. Paulsen, pers. comm., March 2019).

County record: Pocahontas.

***Phyllophaga gracilis* (Burmeister, 1855)**

Wickham 1911; Travis 1934; Worthington and Larsen 2010; ISIC; ELFC.

Collection dates: June–July.

Travis (1934) reported only one specimen from Iowa indicating that this species was very rare here.

Specimen label data: Ames, Story Co., Iowa, [no date], [no collector], determined B. Travis (ISIC); Hitchcock Nature Area, Pottawattamie Co., Iowa, 19 July 2004, UV light, W. Allgeier (ELFC).

County records (Figure 132): Pottawattamie, Story, Winneshiek.

***Phyllophaga hirticula* (Knoch, 1801)**

Wickham 1897; Travis 1934; ISIC; IWUC; ELFC; PKLC.

Collection dates: May–July.

Travis (1934) reported 42,102 specimens from Iowa indicating this species was the most commonly encountered species of May beetle in Iowa.

County records (Figure 133): Allamakee, Appanoose, Bremer, Dallas, Delaware, Des Moines, Dickinson, Dubuque, Fayette, Henry, Johnson, Keokuk, Lee, Louisa, Lucas, Madison, Mahaska, Marion, Monona, Monroe, Muscatine, Polk, Scott, Story, Van Buren, Wapello, Warren, Washington.

***Phyllophaga hirtiventris* (Horn, 1887)**

Luginbill and Painter 1953; ISIC; IWUC; UMRC; MJPC; ELFC.

Collection dates: May–June.

Collected at light.

County records (Figure 134): Decatur, Dickinson, Fremont, Lee, Mills, Van Buren.

***Phyllophaga hornii* (Smith, 1889)**

Travis 1934; ISIC; IWUC; DAVC; ELFC.

Collection dates: May–July.

Collected at light.

County records (Figure 135): Appanoose, Dallas, Davis, Decatur, Fremont, Henry, Mahaska, Pottawattamie, Van Buren, Warren.

***Phyllophaga ilicis* (Knoch, 1801)**

Putnam 1876; Wickham 1911; Travis 1934; Worthington and Larsen 2010; ISIC; IWUC; UNIC; DAVC; ELFC; MJPC.

Collection dates: May–August.

Collected at light.

Travis (1934) reported 149 specimens from Iowa indicating the species was infrequent in the state.

Specimen label data: Geode State Park, Henry Co., Iowa, 17 August 2003, light, ELF (ELFC); Hardin City Woodland State Preserve, Hardin Co., Iowa, 28 May 2005, UV light, ELF (ELFC).

County records (Figure 136): Appanoose, Black Hawk, Boone, Buchanan, Clayton, Dallas, Decatur, Delaware, Fayette, Fremont, Hardin, Henry, Iowa, Jackson, Jefferson, Johnson, Jones, Lee, Linn, Madison, Muscatine, Scott, Story, Taylor, Van Buren, Warren, Webster, Winneshiek.

***Phyllophaga implicita* (Horn, 1887)**

Horn 1887; Wickham 1911; Travis 1934; Worthington and Larsen 2010; ISIC; IWUC; DAVC; ELFC; PKLC.

Collection dates: April–June.

Collected at light.

Travis (1934) reported 17,208 specimens collected from Iowa indicating this species was the second most common species in Iowa.

County records (Figure 137): Allamakee, Appanoose, Boone, Bremer, Cerro Gordo, Clayton, Dallas, Delaware, Des Moines, Dickinson, Fayette, Fremont, Hancock, Harrison, Henry, Jefferson, Johnson, Lee, Linn, Louisa, Mahaska, Mills, Monona, Monroe, Muscatine, O'Brien, Osceola, Polk, Pottawattamie, Sac, Story, Taylor, Van Buren, Wapello, Winnebago, Winneshiek, Woodbury.

***Phyllophaga inversa* (Horn, 1887)**

Wickham 1911; Travis 1934; Worthington and Larsen 2010; ISIC; IWUC; ELFC; DAVC; PKLC.

Collection dates: May–June.

Collected at light.

County records (Figure 138): Appanoose, Bremer, Dallas, Davis, Decatur, Dickinson, Dubuque, Henry, Jefferson, Johnson, Louisa, Lucas, Monroe, Polk, Story, Wapello, Winneshiek.

***Phyllophaga knochii* (Schonherr and Gyllenhal, 1817)**

Luginbill and Painter 1953; Downie and Arnett 1996; Harpootlian 2001; CASC; DAVC.

Collection dates: May, July.

Specimen label data: Iowa City, Johnson Co., Iowa, 5 May 1896, Wickham (A. Fenyes Collection, CASSF); Waubonsie State Park, Fremont Co., Iowa, 2 July 2012, combination light, DAV determined MJP 2012 (DAVC).

County records (Figure 139): Fremont, Johnson.

***Phyllophaga lanceolata* (Say, 1824)**

Travis 1934, 1939; ISIC; IWUC; DAVC; ELFC; MJLC.

Collection dates: June–August.

Travis (1934) reported only one specimen from Iowa indicating the species was very rare in Iowa. Species fairly common in some areas collected in loess hills on stems of purple prairie clover (*Dalea purpurea*) and big blue stem (*Andropogon gerardii*) and in sweep samples, mornings and early afternoon; also collected walking on soil surface and under soil pushups on path.

This species is diurnal and probably not attracted to lights; males have been observed flying but females are flightless (Travis 1939).

Specimen label data: Sioux Co., Iowa, 28 June 1932, Russell (IWUC); Murray, Clarke Co., Iowa, 15 June 1934 [5], B. Travis (ISIC); Fremont Co., Iowa, 15 July 1938, H. E. Jaques (IWUC); Onawa, Monona Co., Iowa, 12 July 1941 [42], G. C. Decker (ISIC).

County records (Figure 140): Clarke, Fremont, Mills, Monona, Plymouth, Pottawattamie, Sioux, Story, Woodbury.

***Phyllophaga longitarsa* (Say, 1824)**

Wickham 1911; King 1914; IWUC; UMRC; ELFC; DAVC.

Collection dates: June–August.

Travis (1934) reported only one specimen from Iowa indicating the species was very rare in Iowa. Recent collecting in western Iowa indicates species quite common in some areas. Collected on grass stem, sand prairie, after sunset; common at gas station lights, Missouri River valley, southwest Iowa (sandy alluvial soils).

Specimen label data: Mt. Pleasant, Henry Co., Iowa, 26 May 1913, light, Jaques (IWUC); Muscatine Co., Iowa, 4 August 1937, B. Berger, determined Luginbill 1938 (IWUC); Cedar Hills Sand Prairie, Black Hawk Co., Iowa, 18 July 1996, big blue stem culm (*Andropogon gerardii*), ELF (ELFC); I-29 Truck stop, Percival, Fremont Co., Iowa, 4 July [17], 16 July [5], 2004, ELF, DAV (ELFC, DAVC).

County records (Figure 141): Black Hawk, Fremont, Henry, Johnson, Louisa, Monona, Muscatine, Polk, Story.

***Phyllophaga luctuosa* (Horn, 1887)**

Luginbill and Painter 1953 (no location of collection given); Harpootlian 2001.

Collection dates: no date of collection given with literature record.

County record: no specific locality given.

***Phyllophaga marginalis* (LeConte, 1856)**

Putnam 1876; Wickham 1911; Travis 1934; Harpootlian 2001; ISIC; IWUC; WIRC; DAVC; ELFC.

Collection dates: April–July.

Collected at light.

Travis (1934) reported 53 specimens collected in Iowa indicating this species was infrequent to rare in Iowa; Rice and Riley (2000) also found this species to be rare to infrequent.

Specimen label data: Wapello Co., Iowa, 14 April 1934, Warnacutt, determined Luginbill 1935 (IWUC); Johnson Co., Iowa, 18 June 1934, H. C. Knutson, determined Luginbill 1935 (IWUC); Fremont Co., Iowa, 19 June 1940, H. E. Jaques, determined Luginbill 1941 (IWUC).

County records (Figure 142): Allamakee, Appanoose, Boone, Butler, Clayton, Dallas, Decatur, Delaware, Fayette, Fremont, Henry, Johnson, Lee, Story, Union, Van Buren, Wapello, Warren.

***Phyllophaga micans* (Knoch, 1801)**

Wickham 1911; Travis 1934; Luginbill and Painter 1953; Evans 2014; ISIC; IWUC.

Collection dates: April–June.

Travis (1934) reported 137 specimens from Iowa indicating this species was infrequent in Iowa.

Specimen label data: Mt. Pleasant, Henry Co., Iowa, 12 May 1926, Gloeckley (IWUC); Leon, Decatur Co., Iowa, 6, 15 May 1931, 15 June 1932, B. V. Travis (ISIC).

County records (Figure 143): Cass, Decatur, Des Moines, Henry, Jefferson, Johnson, Linn, Lucas, Van Buren.

***Phyllophaga nitida* (LeConte, 1856)**

Wickham 1911; Jaques 1928; Travis 1934; ISIC; IWUC; ELFC; DAVC.

Collection dates: May–July.

Collected at light.

Travis (1934) reported 26 specimens collected from Iowa indicating the species was rare in the state.

Specimen label data: Farmersburg, Clayton Co., Iowa, 29 May 1914 [2], R.L.W. and J.J.D. (ISIC); Hampton, Franklin Co., Iowa, 22 June 1932, B. V. Travis (ISIC); Kossuth Co., Iowa, 25 June 1933, Jaques (IWUC); Brush Creek Canyon, Fayette Co., Iowa, 11 May 2004, UV light, ELF (ELFC); Yellow River Forest, Allamakee Co., Iowa, 20 May 2004, UV light, ELF (ELFC).

County records (Figure 144): Allamakee, Bremer, Clayton, Decatur, Dickinson, Fayette, Floyd, Franklin, Henry, Kossuth, Story, Wapello.

***Phyllophaga prunina* (LeConte, 1856)**

King 1914; Travis 1934; Luginbill and Painter 1953; ISIC; ELFC.

Collection date: May–July.

Collected at light.

Travis (1934) reported 52 specimens from Iowa, which he concluded was infrequent to rare in the state.

Specimen label data: Dyersville, Dubuque Co., Iowa, 2 June 1914 [3], R. W. Webster, determined Davis (ISIC); Timberhill Savanna, Decatur Co., Iowa 10 May 2011, light, ELF (ELFC).

County records (Figure 145): Decatur, Delaware, Dubuque, Henry.

***Phyllophaga quercus* (Knoch, 1801)**

Wickham 1911; Jaques 1926; Travis 1934.

Collection dates: no date of collection given with literature record.

No specimens located in collections examined.

County records (Figure 146): Allamakee, Story, Wapello.

***Phyllophaga rugosa* (Melsheimer, 1846)**

Wickham 1911; Travis 1934; Worthington and Larsen 2010; ISIC; IWUC; UNIC; ELFC; DAVC; PKLC.

Collection dates: April–July.

Collected at light.

County records (Figure 147): Adair, Allamakee, Appanoose, Black Hawk, Boone, Bremer, Butler, Cedar, Cherokee, Clay, Clayton, Dallas, Decatur, Dickinson, Dubuque, Fayette, Franklin, Fremont, Hardin, Harrison, Henry, Jackson, Jefferson, Johnson, Keokuk, Kossuth, Linn, Louisa, Lucas, Lyon, Mahaska, Marion, Marshall, Mills, Monona, Monroe, Muscatine, Page, Polk, Pottawattamie, Scott, Story, Union, Van Buren, Wapello, Washington, Webster, Winneshiek.

***Phyllophaga spreta* (Horn, 1887)**

Horn 1887; Wickham 1911; King 1914; Travis 1934; Rice and Riley 2000; Evans 2009; MCZC; ELFC; DAVC.

Collection dates: May–June.

Travis (1934) did not record a specimen from Iowa but included this species in his work because a male type specimen had been collected in Iowa (Horn 1887).

Rice and Riley (2000) reported 15 specimens from the East Reactor Woods, Ames, Iowa.

The male “Type” specimens have been located in the Museum of Comparative Zoology at Harvard University, with two specimens from Maryland and one from Iowa labeled “Iowa 1864” (hand written) and “PARA-TYPE 3676” (the latter an old ANSP label) (Dr. Phillip D. Perkins, pers. comm.).

This species is listed as apparently rare throughout its range (Luginbill and Painter 1953; Evans 2009).

Specimen label data: Ames, Story Co., Iowa, 12–18 May 1994 [3], UV light, oak-maple-basswood-forest, M. E. Rice, determined E. G. Riley 1996 (ISIC); Yellow River State Forest, Allamakee Co., Iowa, 20 May 2004, UV light, ELF (ELFC); Sharon Bluffs State Park, Appanoose Co., Iowa, 20 May 2006 [2], UV light, ELF, DAV (ELFC, DAVC); Hitchcock Nature Area, Pottawattamie Co., Iowa, 10 June 2008, UV light, ELF (ELFC).

County records (Figure 148): Allamakee, Appanoose, Henry, Johnson, Pottawattamie, Story.

***Phyllophaga tristis* (Fabricius, 1781)**

Putnam 1876; Wickham 1911; Travis 1934; Worthington and Larsen 2010; ISIC; IWUC; ELFC; DAVC; PKLC.

Collection dates: April–June.

Collected at light and under soil pushup on path.

Travis (1934) reported this species as the fourth most common species in Iowa based on collections.

County records (Figure 149): Allamakee, Appanoose, Bone, Bremer, Dallas, Decatur, Delaware, Des Moines, Dubuque, Franklin, Fremont, Henry, Jackson, Johnson, Kossuth, Linn, Louisa, Lucas, Madison, Pottawattamie, Ringgold, Scott, Story, Van Buren, Wapello, Washington, Winneshiek.

***Phyllophaga vehemens* (Horn, 1887)**

Travis 1934; ISIC; IWUC; UMRC; ELFC; DAVC; PKLC.

Collection dates: April–July.

Collected at light.

Travis (1934) reported 434 specimens collected from Iowa indicating this species was infrequent.

County records (Figure 150): Appanoose, Clayton, Dallas, Fremont, Harrison, Iowa, Keokuk, Lee, Louisa, Mahaska, Mills, Monona, Ringgold, Story, Wapello.

***Phyllophaga vilifrons* (LeConte, 1856)**

Horn 1887; Wickham 1911; Travis 1934; Luginbill and Painter 1953; Harpootlian 2001; ISIC; IWUC; ELFC.

Collection dates: April–July.

Collected at light; also collected under rock in April.

Travis (1934) reported only four specimens from Iowa indicating it was rare in the state.

Specimen label data: Ames, Story Co., Iowa, 1 June 1929, Ralfs, determined Davis (ISIC); Cedar Bend Park, Bremer Co., Iowa, 24 May 2005, UV light, ELF (ELFC); Pammel State Park Madison Co., Iowa, 20 April 2007, under rock, ELF (ELFC); Sharon Bluffs State Park, Appanoose Co., Iowa, 12 July 2018, light, ELF (ELFC).

County records (Figure 151): Allamakee, Appanoose, Bremer, Henry, Johnson, Madison, Story.

***Polyphylla* Harris, 1841**

***Polyphylla hammondi* LeConte, 1856**

Wickham 1911; Young 1972; ISIC; IWUC; UNIC; DAVC; ELFC.

Collection dates: June–July.

Collected at light at dusk from prairie habitat; also at lights of rest areas and gas stations.

Prefers bunchgrass prairie (Vestal 1913).

Specimen label data: Monona Co., Iowa, 30 June 1932, Russell (IWUC); Cedar Hills Sand Prairie State Preserve, Black Hawk Co., Iowa, 3 July 2003, 14 July 2006, at dusk at light, both males, ELF (ELFC); Hayden Prairie State Preserve, Howard Co., Iowa, 4 July 2003, light, male, ELF (ELFC).

County records (Figure 152): Black Hawk, Cedar, Crawford, Fremont, Howard, Johnson, Keokuk, Linn, Mills, Monona, Muscatine, Pottawattamie, Warren, Woodbury.

Tribe SERICINI Kirby, 1837

Maladera Mulsant and Rey, 1871

****Maladera castanea* (Arrow, 1913)**

ISIC.

Collection dates: April.

Specimen label data: First known Iowa specimen and **NEW STATE RECORD**: Ames, Story Co., Iowa, April 1930, [no collector], determined H. F. Howden 1953 (ISIC).

County record: Story.

Serica MacLeay, 1819

***Serica campestris* Dawson, 1919**

Dawson 1919a; ISIC; IWUC; USNM; ELFC; DAVC; PKLC.

Collection dates: March–July.

Collected at light.

County records (Figure 153): Appanoose, Dallas, Decatur, Des Moines, Henry, Jackson, Linn, Lucas, Polk, Pottawattamie, Sac, Story, Taylor, Van Buren, Washington.

***Serica evidens* Blatchley, 1910, 1919 (name change)**

Dawson 1932; ISIC; IWUC; USNM; DAVC; ELFC.

Collection dates: April–July.

Collected at light and in leaf litter of woodland.

County records (Figure 154): Appanoose, Boone, Delaware, Fayette, Fremont, Henry, Johnson, Keokuk, Lee, Linn, Madison, Muscatine, Story.

***Serica intermixta* Blatchley, 1910**

Dawson 1932; ISIC; IWUC; ELFC; USNM; DAVC; PKLC.

Collection dates: April–July.

Collected at light and in prairie sweep sample.

County records (Figure 155): Black Hawk, Dickinson, Henry, Kossuth, Lee, Linn, Louisa, Plymouth, Pottawattamie, Story, Van Buren, Webster.

***Serica mystaca* Dawson, 1922**

Dawson 1922; ISIC; ELFC; DAVC; PKLC.

Collection dates: April–July.

Collected at light.

County records (Figure 156): Appanoose, Boone, Dallas, Fremont, Johnson, Linn, Polk, Story, Van Buren, Winneshiek.

***Serica sericea* (Illiger, 1802)**

Wickham 1897, 1911; Dawson 1922; Worthington and Larsen 2010; ISIC; IWUC; WCIC; ELFC; DAVC; PKLC.

Collection dates: April–August.

Collected at light and under bark of log.

County records (Figure 157): Allamakee, Appanoose, Black Hawk, Boone, Bremer, Buchanan, Cedar, Cerro Gordo, Clayton, Dallas, Decatur, Delaware, Dickinson, Dubuque, Fayette, Fremont, Hancock, Hardin, Henry, Jasper, Johnson, Jones, Kossuth, Lee, Linn, Monona, Muscatine, Polk, Pottawattamie, Story, Taylor, Van Buren, Warren, Winnebago, Winneshiek, Woodbury.

***Serica sponsa* Dawson, 1919**

Dawson 1919b; Worthington and Larsen 2010; IWUC; DAVC; ELFC.

Collection dates: May–August.

Collected at light.

Specimen label data: Linn Co., Iowa, 8 June 1932, Russell, determined O. L. Cartwright (IWUC).

County records (Figure 158): Allamakee, Appanoose, Black Hawk, Delaware, Dubuque, Fayette, Johnson, Linn, Winneshiek.

***Serica vespertina accola* Dawson, 1921**

Putnam 1876; Wickham 1897, 1911; ISIC; IWUC; UNSM; ELFC; DAVC; MJPC.

Collection dates: April–July.

Mating pair collected on flowering culm of prairie cinquefoil (*Potentilla arguta*) after sunset during July; collected on vertical stems of willow (*Salix* spp.) a few feet above ground after sunset; also collected at light.

Specimen label data: Cedar Hills Sand Prairie, Black Hawk Co., Iowa, 7 July 1996, UV light, 28 June 2006 [2], *Potentilla arguta* culm, ELF (ELFC); Fish Farm Mounds State Preserve, Allamakee Co., Iowa, 2 July 2003, sweeping prairie, ELF (ELFC).

County records (Figure 159): Allamakee, Appanoose, Black Hawk, Clayton, Delaware, Dickinson, Linn.

Subfamily RUTELINAE MacLeay, 1819

Tribe RUTELINI MacLeay, 1819

Cotalpa Burmeister, 1844

***Cotalpa lanigera* (Linnaeus, 1758)**

Putnam 1876; Wickham 1897, 1911; Hardy 1991; ISIC; IWUC; USNM; DAVC; ELFC.

Collection dates: April–August.

Collected at light and sifted from sandbar.

Specimen label data: LeMars, Plymouth Co., Iowa, 15 August 1935, Gale Bleasdall, determined H. F. Howden 1953 (ISIC); Pike's Peak State Park, Clayton Co., Iowa, 26 May 2006, restroom lights, ELF (ELFC).

County records (Figure 160): Allamakee, Clayton, Delaware, Des Moines, Henry, Johnson, Linn, Louisa, Monroe, Muscatine, Plymouth, Pottawattamie, Story.

Parastasia Westwood, 1841

***Parastasia brevipes* (LeConte, 1856)**

USNM; DAVC; ELFC.

Collection dates: July–August, October.

Specimen label data: First known Iowa specimens and **NEW STATE RECORD**: Mt. Pleasant, Henry Co., Iowa, 3 October 1927, Rohde (USNM); Shimek State Forest, Van Buren Co., Iowa, 2 August 2003, UV light, DAV (DAVC); Waubonsie State Park, Fremont Co., Iowa, 8 August 2003, UV light, ELF (ELFC); Wildcat Den State Park, Muscatine Co., Iowa, 7 July 2006 [2], under bark standing dead oak, DAV, ELF (DAVC, ELFC).

County records (Figure 161): Appanoose, Decatur, Fremont, Henry, Muscatine, Van Buren.

Pelidnota MacLeay, 1819

***Pelidnota punctata* (Linnaeus, 1758)**

Putnam 1876; Wickham 1911; King 1914; Hardy 1991; Worthington and Larsen 2010; ISIC; IWUC; WCIC; ELFC; DAVC; PKLC.

Collection dates: May–November.

Collected at light wooded habitat.

County records (Figure 162): Allamakee, Appanoose, Black Hawk, Boone, Bremer, Carroll, Cerro Gordo, Cherokee, Clayton, Dallas, Decatur, Des Moines, Dickinson, Franklin, Fremont, Ida, Hardin, Henry, Johnson, Jones, Keokuk, Kossuth, Lee, Linn, Louisa, Madison, Mills, Monona, Monroe, Muscatine, Osceola, Page, Plymouth, Polk, Pottawattamie, Story, Taylor, Union, Van Buren, Wapello, Warren, Washington, Winneshiek, Woodbury.

Tribe ANOMALINI Streubel, 1839

Anomala Samouelle, 1819

***Anomala binotata* (Gyllenhal, 1817)**

Wickham 1911; Potts 1977; Hardy 1991; ISIC; IWUC; DAVC; ELFC.

Collection dates: March–June.

Collected at light and in flight during day.

Specimen label data: Shimek State Forest, Van Buren Co., Iowa, 30 May 2003, light, ELF (ELFC).

County records (Figure 163): Des Moines, Fremont, Henry, Linn, Louisa, Johnson, Monona, Page, Pottawattamie, Scott, Story, Van Buren, Webster.

***Anomala flavipennis* Burmeister, 1844**

DAVC; ELFC.

Collection dates: June–July.

Collected at light.

Specimen label data: First known Iowa specimens and **NEW STATE RECORD**: Waubonsie State Park, Fremont Co., Iowa, 3 July 2003, UV light, DAV (DAVC); Shimek State Forest, Van Buren Co., Iowa, 4 July 2004, UV light, ELF (ELFC).

County records (Figure 164): Fremont, Pottawattamie, Van Buren.

***Anomala innuba* (Fabricius, 1787)**

Wickham 1911; Hendrickson 1930; Potts 1977; Hardy 1991; ISIC; DAVC; ELFC.

Collection dates: June–August.

Collected sweeping prairies.

Specimen label data: Ames, Story Co., Iowa, 18 June 1925 [6], H. H. Knight, determined H. F. Howden 1953 (ISIC); Sioux City Prairie, Woodbury Co., Iowa, 11 July 1986, T. Orwig (ELFC); Cedar Rapids,

Linn Co., Iowa, 26 June 1999, black light residential back yard, DAV (DAVC); Hitchcock Nature Area, Pottawattamie Co., Iowa, 13 June 2004, sweeping prairie, DAV (DAVC).

County records (Figure 165): Clinton, Linn, Johnson, Pottawattamie, Story, Woodbury.

***Anomala ludoviciana* Schaeffer, 1906**

Potts 1977; Hardy 1991; ISIC; IWUC; UMRC; USNM; DAVC; ELFC.

Collection dates: April, June–July.

Collected sweeping prairie and in flight over prairie.

Specimen label data: Cedar Hills Sand Prairie State Preserve, Black Hawk Co., Iowa, 5 July 2003, sweeping, ELF (ELFC); Marietta Sand Prairie State Preserve, Marshall Co., Iowa, 13 June 2003, vervain flower (*Verbena stricta*), ELF (ELFC).

County records (Figure 166): Black Hawk, Linn, Marshall, Monona, Pottawattamie, Story, Woodbury.

***Anomala undulata* Melsheimer, 1846**

IWUC; DAVC; ELFC; MJHC; MJPC.

Collection dates: March–August.

Collected at light and under log.

Specimen label data: First report from Iowa and **NEW STATE RECORD**: Van Buren Co., Iowa, 22 June 1930, Rambo, determined Hayes 1931 (IWUC); Des Moines Co., Iowa, 1 August 1936, Knutson, determined O. L. Cartwright 1938 (IWUC); Rock Island Preserve, Linn Co., Iowa, 20 June 2002, UV light, DAV (DAVC); Preparation Canyon State Park, Monona Co., Iowa, 17 April 2004, combination light, DAV (DAVC); Cedar Hills Sand Prairie, Black Hawk Co., Iowa, 26 March 2005, under log, ELF (ELFC); Waubonsie State Park, Fremont Co., Iowa, 22 May 2010 [3], light. ELF (ELFC).

County records (Figure 167): Black Hawk, Des Moines, Fremont, Harrison, Linn, Monona, Van Buren.

***Popillia* Serville, 1825**

****Popillia japonica* Newman, 1838**

Lewis 1995; Carlisle 1999; Rice 2001; ISIC; UNIC; DAVC; ELFC.

Collection dates: June–September.

Collected on woody vegetation especially basswood trees (*Tilia americana*) and grape vine (*Vitis* spp.).

First reported from Iowa during 1994 (Marlin E. Rice, pers. comm. from Donald R. Lewis, 2014) and now known from 55 Iowa counties (Anonymous 2011; Donald R. Lewis, pers. comm., 2014).

County records (Figure 168): Allamakee, Audubon, Benton, Boone, Black Hawk, Bremer, Buchanan, Butler, Carroll, Cedar, Cherokee, Chickasaw, Clayton, Clinton, Dallas, Davis, Delaware, Des Moines, Dubuque, Fayette, Floyd, Franklin, Fremont, Greene, Grundy, Hamilton, Harrison, Henry, Howard, Humboldt, Ida, Iowa, Jackson, Jasper, Johnson, Jones, Lee, Linn, Louisa, Madison, Marshall, Mills, Muscatine, Page, Polk, Pottawattamie, Poweshiek, Scott, Shelby, Story, Tama, Van Buren, Washington, Webster, Winneshiek, Woodbury.

***Strigoderma* Burmeister, 1844**

***Strigoderma arboricola* (Fabricius, 1792)**

Putnam 1876; Wickham 1911; Worthington and Larsen 2010; ISIC; IWUC; ELFC; DAVC.

Collection dates: June–July.

Collected feeding on leadplant flowers (*Amorpha canescens*) and many other plant species; and in flight.

Subfamily DYNASTINAE MacLeay, 1819
Tribe CYCLOCEPHALINI Laporte, 1840

Cyclocephala borealis Arrow, 1911

County record: Clinton.

County record: Woodbury.

County records (Figure 170): Appanoose, Black Hawk, Boone, Bremer, Clarke, Dallas, Decatur, Delaware, Fremont, Hardin, Henry, Jefferson, Johnson, Lee, Linn, Louisa, Lucas, Muscatine, Page, Polk, Pottawattamie, Story, Taylor, Van Buren, Warren, Woodbury.

County records (Figure 171): Fremont, Pottawattamie.

Dyscinetus Harold, 1869

***Dyscinetus morator* (Fabricius, 1798)**

Wickham 1911; Evans 2014; Ratcliffe and Cave 2017; ISIC; IWUC; UMRC; CASC; DAVC; ELFC.

Collection dates: April–July.

Specimen label data: Nevada, Story Co., Iowa, 3 April 1902 [2], [no collector], determined H. F. Howden 1953 (ISIC); Ottumwa, Wapello Co., Iowa, 29 May 1937, Floyd Andre, determined H. F. Howden 1953 (ISIC); Soldier, Monona Co., Iowa, 1 June 1971, light trap, T. Orwig (ELFC); Shimek State Forest, Van Buren Co., Iowa, 9 June 2016 [2], UV light, ELF (ELFC).

County records (Figure 172): Fremont, Jackson, Johnson, Henry, Lee, Monona, Muscatine, Polk, Story, Tama, Van Buren, Wapello.

***Dyscinetus picipes* (Burmeister, 1847)**

Ratcliffe and Cave 2017 (one specimen, no specific locality)

Collection dates: no date of collection given with literature record.

County record: no specific locality given.

Tribe PENTODONTINI Mulsant, 1842

Aphonus LeConte, 1856

***Aphonus densicauda* Casey, 1915**

Ratcliffe and Cave 2017; USNM; FMNH.

Collection dates: no collection date given with literature record.

Specimen label data: Elma, Howard Co., Iowa, [no date], [no collector] [USNM] (Ratcliffe, pers. comm., February 2018); Elma, Howard Co., Iowa, [no date], F. Psota Coll. Ex. J. G. Warren Coll. [FMNH] (Margaret Thayer, pers. comm., February 2018).

Only two specimens from Iowa.

County record: Howard.

***Aphonus tridentatus* Say, 1823**

Wickham 1897, 1911; Worthington and Larsen 2020; Ratcliffe and Cave 2017; IWUC; WCIC; ELFC; DAVC.

Collection dates: June, September–October.

Specimen label data: Black Hawk Co., Iowa, 20 June 1934, H. C. Knutson (IWUC); Bremer Co., Iowa, 27 September 1979, M. Weinberg (WCIC); Cedar Hills Sand Prairie State Preserve, Black Hawk Co., Iowa, 16 June 1999, 10 June 2005, UV light, ELF (ELFC, DAVC).

Only a few Iowa specimens in collections.

County records (Figure 173): Black Hawk, Bremer, Howard, Johnson, Linn, Winneshiek.

Euetheola Bates, 1888

***Euetheola rugiceps* (LeConte, 1856)**

King 1914; Ratcliffe and Cave 2017; UMRC; ELFC; DAVC.

Collection dates: May, July–August.

Iowa specimen record: Ames, Story Co., Iowa, 6 July 1956, W. S. Craig (UMRC); Donnellson, Lee Co., 21 May 2004, gas station lights, MJP (ELFC); Fremont Co., 4 July 2004, gas station lights I-29 truck stop, DAV (DAVC).

Only a few records from Iowa.

County records (Figure 174): Dallas, Fremont, Henry, Johnson, Lee, Story.

Tomarus Erichson, 1847

***Tomarus gibbosus* (DeGeer, 1774)**

Putnam 1876; Wickham 1911; Hardy 1991; Ratcliffe and Cave 2017; ISIC; IWUC; ELFC; DAVC.

Collection dates: April–August.

Collected at light.

County records (Figure 175): Adair, Bremer, Cherokee, Dallas, Decatur, Delaware, Dickinson, Franklin, Fremont, Guthrie, Harrison, Henry, Jefferson, Johnson, Lee, Linn, Louisa, Mahaska, Marion, Monona, Monroe, Muscatine, Osceola, Page, Plymouth, Polk, Pottawattamie, Poweshiek, Scott, Story, Taylor, Van Buren, Wapello, Winnebago, Winneshiek, Woodbury.

***Tomarus relictus* (Say, 1825)**

Wickham 1911; Hardy 1991; Worthington and Larsen 2010; Ratcliffe and Cave 2017; ISIC; IWUC; CCMV; DAVC; ELFC; PKLC.

Collection dates: April–November.

Collected at light and from horse dung.

County records (Figure 176): Appanoose, Black Hawk, Boone, Bremer, Carroll, Cerro Gordo, Cherokee, Dallas, Davis, Decatur, Delaware, Des Moines, Dickinson, Fremont, Henry, Jefferson, Johnson, Keokuk, Linn, Louisa, Lucas, Marion, Monona, Monroe, Muscatine, Osceola, Page, Plymouth, Pottawattamie, Scott, Story, Van Buren, Wapello, Winneshiek.

Tribe ORYCTINI Mulsant, 1842

Xyloryctes Hope, 1837

***Xyloryctes jamaicensis* (Drury, 1773)**

Putnam 1876; Wickham 1911; Ratcliffe and Cave 2017; ISIC; IWUC; DAVC; ELFC; MJLC.

Collection dates: May, July–October.

Collected at light and walking on path during day.

Specimen label data: Waubonsie State Park, Fremont Co., Iowa, 15 August 2012 [2], UV light, females, ELF (ELFC).

County records (Figure 177): Black Hawk, Clayton, Decatur, Delaware, Franklin, Fremont, Henry, Linn, Lucas, Polk, Story, Woodbury.

Subfamily CETONIINAE Leach, 1815

Tribe GYMNETINI Kirby, 1827

Cotinis Burmeister, 1842

***Cotinis nitida* (Linnaeus, 1758)**

ISIC; DAVC; ELFC; MBC.

Collection dates: July–August.

Specimen label data: First report from Iowa and **NEW STATE RECORD**: Hamburg, Fremont Co., Iowa, 17 August 1963, D. R. Riley (ISIC); Waubonsie State Park, Fremont Co., Iowa, 2 August 2008 [11], specimens eating ripe blackberry fruit (*Rubus* spp.), DAV (DAVC, ELFC); Shimek State Forest,

Lee Co., Iowa, 8–17 July 2018, beer and molasses baited bucket trap [1]; sweet red wine baited bucket trap [1], DAV (DAVC).

County records (Figure 178): Fremont, Page, Van Buren.

Tribe CETONIINI Leach, 1815

Euphoria Burmeister, 1842

***Euphoria fulgida* (Fabricius, 1775)**

Wickham 1911; Worthington and Larsen 2010; Orozco 2012; ISIC; IWUC; DAVC; ELFC; MJLC.

Collection dates: April–August.

Collected in flight near dogwood flowers, on dogwood flowers, and mating pair on dogwood flowers (*Cornus* spp.); also collected under leaf litter shallow depression (May) and on very ripe blackberries (*Rubus* spp.) in August with *Cotinis nitida*.

Specimen label data: Burlington, Des Moines Co., Iowa, 28 May 1936, F. Andre (ISIC); Nine Eagles State Park, Decatur Co., Iowa, 12 June 2005 [3], dogwood flowers (*Cornus* spp.), DAV (DAVC, ELFC); Waubonsie State Park, Fremont Co., Iowa, 2 August 2008, eating ripe blackberries [*Rubus* spp.], DAV (DAVC).

County records (Figure 179): Appanoose, Boone, Clarke, Dallas, Decatur, Des Moines, Fremont, Harrison, Henry, Iowa, Jefferson, Johnson, Lee, Madison, Plymouth, Story, Van Buren, Warren, Wineshiek, Woodbury.

***Euphoria inda* (Linnaeus, 1758)**

Putnam 1876; Wickham 1911; Worthington and Larsen 2010; Orozco 2012; ISIC; IWUC; CCMV; ELFC; DAVC.

Collection dates: March–June, August–October.

Collected flying low in zig-zag pattern and under dung during spring; on bull thistle flowers (*Cirsium vulgare*) in fall.

County records (Figure 180): Adair, Black Hawk, Boone, Bremer, Buchanan, Clarke, Clayton, Dallas, Davis, Decatur, Des Moines, Dubuque, Fayette, Fremont, Guthrie, Hancock, Henry, Jasper, Johnson, Keokuk, Linn, Madison, Marshall, Polk, Pottawattamie, Scott, Story, Washington, Wineshiek, Woodbury.

***Euphoria pilipennis* (Kraatz, 1883)**

Orozco 2012; USNM (two specimens labeled only “IA” in Smithsonian collection (M.J. Paulsen, pers. comm., 2012)).

Collection dates: no date of collection given with literature record.

County record: no specific locality given.

***Euphoria sepulcralis* (Fabricius, 1801)**

Orozco 2012; RJWC; ISIC; IWUC; DAVC; ELFC; MJPC.

Collection dates: April–July, September–October.

Collected on dogwood flowers (*Cornus* spp.) in June and goldenrod flowers (*Solidago* spp.) in fall; collected flying zig-zag low to ground in June; sifted from sandbar April and May.

Specimen label data: Mt. Pleasant, Henry Co., Iowa, 12 October 1930, Kauffman (IWUC); Nine Eagles State Park, Decatur Co., Iowa, 4 June 2003 [2], dogwood flowers (*Cornus* spp.), ELF (ELFC); Waubonsie State Park, Fremont Co., Iowa, 18 September 2003 [6], goldenrod flowers [*Solidago* spp.], ELF, DAV (ELFC, DAVC).

County records (Figure 181): Davis, Decatur, Des Moines, Fremont, Henry, Jefferson, Lee, Pottawattamie, Van Buren, Wapello, Warren.

Tribe CREMASTOCHEILINI Burmeister and Schaum, 1841
Cremastocheilus Knoch, 1801

***Cremastocheilus castaneae* Knoch, 1801**

ISIC.

Collection dates: May.

Specimen label data: First report from Iowa and **NEW STATE RECORD**: Ames, Story Co., Iowa, 12 May 1933, B. F. Freman (ISIC).

Only one specimen from Iowa.

County record: Story.

***Cremastocheilus harrisii* Kirby, 1827**

Wickham 1911; Harpootlian 2001; DAVC.

Collection dates: May.

Specimen label data: Shimek State Forest, Lee Co., Iowa, 26 May 2018, landed in parking area near Lick Creek, DAV (DAVC).

County record: Lee

***Cremastocheilus knochii* LeConte, 1853**

Wickham 1911; ISIC; IWUC; CASC; USNM; DAVC; PKLC; ELFC.

Collection dates: May–August.

Specimen label data: Ames, Story Co., Iowa, 19 June 1925, C.W.M. (ISIC); Dickinson Co., Iowa, 24 June 1935, Gould Warren, determined O. L. Cartwright (IWUC); LeMars, Plymouth Co., Iowa, 18 August 1935, Gale Bleasdale, determined H. F. Howden 1953 (ISIC); Ames, Story Co., Iowa, 5 May 1937, H. H. Knight (ISIC).

County records (Figure 182): Davis, Dickinson, Johnson, Plymouth, Story, Woodbury.

***Cremastocheilus retractus* LeConte, 1874**

Wickham 1911; Potts 1945; Ratcliffe 1991; Ratcliffe and Paulsen 2008; ISIC; DAVC; ELFC.

Collection dates: April–June.

Specimen label data: Ledges State Park, Boone Co., Iowa, 22 April 1950, N. DeHass, determined H. F. Howden 1953 (ISIC); Marietta Sand Prairie State Preserve, Marshall Co., Iowa, 18 June 2004, dead on gopher mound, DAV (DAVC); Pammel State Park, Madison Co., Iowa, 20 April 2007, flew in low then landed on dry cracked mudflat near Middle River, ELF (ELFC); Shimek State Forest, Lee Co., Iowa, 9 May 2007, sifted from sandbar, ELF (ELFC); Ledges State Park, Boone Co., Iowa, 13 May 2008 [2], on gravel bar with ants nearby, ELF (ELFC).

County records (Figure 183): Boone, Lee, Madison, Marshall.

Tribe TRICHIINI Fleming, 1821
Osmoderma LePeletier and Serville, 1828

***Osmoderma eremicola* (Knoch, 1801)**

Putnam 1876; Wickham 1911; Howden 1968; Evans 2014; ISIC; IWUC; WCIC; DAVC; ELFC.

Collection dates: July–September.

Collected at light.

Specimen label data: Sharon Bluffs State Park Appanoose Co., Iowa, 5 July 2012, UV light, ELF (ELFC).

County records (Figure 184): Allamakee, Appanoose, Bremer, Clayton, Clinton, Dallas, Des Moines, Dubuque, Henry, Johnson, Linn, Muscatine, Washington.

***Osmoderma scabra* (Palisot de Beauvois, 1807)**

Wickham 1911; Howden 1968; Evans 2014; ISIC; ELFC; DAVC; PKLC; MERC.

Collection dates: June–August.

Collected at light and in panel traps June to August at white Pine Hollow State Preserve.

Specimen label data: Brush Creek Canyon State Preserve, Fayette Co., 13 July 2003, under bark of black locust tree (*Robinia pseudoacacia*), ELF.

County records (Figure 185): Boone, Dubuque, Clayton, Fayette, Linn, Osceola, Story, Winneshiek.

***Osmoderma subplanata* Casey, 1915**

Howden 1968; Worthington and Larsen 2010; WCIC; UNIC; DAVC; ELFC.

Collection dates: June–August, September.

Collected at light.

Specimen label data: RR Adel, Dallas Co., Iowa, 18 July 2011, ELF (ELFC).

County records (Figure 186): Appanoose, Black Hawk, Boone, Bremer, Dallas, Dickinson, Fremont, Kossuth, Monona, Page, Plymouth, Pocahontas, Polk, Pottawattamie, Story, Winneshiek, Woodbury.

Gnorimella Casey, 1915

***Gnorimella maculosa* (Knoch, 1801)**

Howden 1968; Majka 2010.

Collection dates: no date of collection given with literature records.

Howden (1968) indicated this species occurs “west to Iowa” and provided a range map (Map # 4, p. 18) that includes parts of Des Moines and Lee counties in the extreme southeastern corner of the state, but provides no specific localities, nor dates of collection; Majka (2010) references the Howden record (1968, p. 337) and lists as a new state record with his distribution map (Fig. 1. p. 338) as occurring in extreme southeast Iowa with no specimen indicated.

No Iowa specimens are known to us.

County record: Lee.

Trichiotinus Casey, 1915

***Trichiotinus assimilis* (Kirby, 1837)**

Howden 1968; DAVC.

Collection dates: June.

Specimen label data: Fish Farm Mounds Wildlife Area, Allamakee Co., Iowa, 8 June 2006, dogwood flowers (*Cornus* spp.), DAV (DAVC).

County record: Allamakee.

***Trichiotinus piger* (Fabricius, 1775)**

Wickham 1911; Howden 1968; Worthington and Larsen 2010; ISIC; IWUC; DAVC; ELFC.

Collection record: May–July.

Collected from dogwood (*Cornus* spp.), wild rose (*Rosa* spp.), common milkweed (*Asclepias syriaca*), and fleabane (*Erigeron* spp.) flowers.

County records (Figure 187): Adams, Allamakee, Appanoose, Crawford, Dallas, Des Moines, Fremont, Harrison, Henry, Jackson, Johnson, Kossuth, Lee, Linn, Madison, Muscatine, Page, Pottawattamie, Story, Taylor, Union, Warren, Washington, Wayne, Winneshiek.

***Trichiotinus viridans* (Kirby, 1837)**

Howden 1968; ISIC; MJLC; DAVC; ELFC.

Collection dates: May–July.

Collected on dogwood flowers (*Cornus* spp.) and Canada anemone flowers (*Anemone canadensis*).

County records (Figure 188): Allamakee, Dallas, Davis, Decatur, Fayette, Fremont, Jackson, Johnson, Lee, Linn, Muscatine, Polk, Pottawattamie, Story, Van Buren.

Tribe VALGINI Mulsant, 1842

Valgus Scriba, 1790

***Valgus canaliculatus* (Olivier, 1789)**

IWUC; DAVC.

Collection dates: May.

Specimen label data: First known Iowa specimens and **NEW STATE RECORD**: Mt. Pleasant, Henry Co., Iowa, 17 May 1932, Hagedorn (IWUC); Savage Woods State Preserve, Henry Co., Iowa, 3 May 2004, under bark, DAV (DAVC).

Only two known specimens from Iowa.

County record: Henry.

***Valgus seticollis* (Palisot de Beauvois, 1805)**

Putnam 1876; Jameson and Swoboda 2005; IWUC; DAVC; ELFC.

Collection dates: April–June.

Specimen label data: Mt. Pleasant, Henry Co., Iowa, 18 May 1933 [2], Miller, determined O. L. Cartwright (IWUC); Geode State Park, Henry Co., Iowa, 7 June 2001, dogwood flowers (*Cornus* spp.), DAV (DAVC); Waubonsie State Park, Fremont Co., Iowa, 16 April 2004, sweeping, ELF (ELFC); Shimek State Forest, Lee Co., Iowa, 7 May 2005, on stem of shrub, ELF (ELFC).

County records (Figure 189): Fremont, Henry, Lee, Louisa.

Excluded species***Ataeniopsis rugopygus* (Cartwright, 1974)**

Cartwright 1974 (as *Ataenius rugopygus*: “Iowa – Casey Collection USNM”); Stebnicka 2003

Collection dates: no date of collection given in literature record.

Initially, we wondered if this record might represent *Ataeniopsis figurator* (Harold, 1874), which is known from the central and eastern USA (Cartwright 1974, Fig. 5) and recently eastern Nebraska (M.J. Paulsen, pers. comm., December 2018), but has not yet been collected in Iowa. *Ataeniopsis rugopygus* is primarily a southwestern species (AZ, NM, TX), with isolated records from central Colorado, southwestern Arkansas and Iowa (Cartwright 1974). In describing this species, Cartwright examined

five specimens from Iowa that were present in the Thomas Lincoln Casey collection and designated as paratypes. These specimens, clearly *A. rugopygus*, are labeled simply “1a” with no additional data. Since the species has not been encountered again in Iowa, nor in any neighboring states, we are very skeptical of the record.

***Ataenius stercorator* Fabricius, 1775.**

This is a South American species listed by Putnam (1876).

Ataenius wenzelii Horn, 1887. An Atlantic and Gulf coastal species listed by Cartwright (1974) from Clayton Co., Iowa. We suspect this was an accidental occurrence.

***Diapterna hamata* (Say, 1824).**

A species of Canada and the Rocky Mountains listed by Wickham (1911) [as *Aphodius hamatus*] from Dickinson, Howard, and Muscatine counties, Iowa; also listed by King (1914) from Henry County. These specimens are very likely *Diapterna hyberborea*, but we have not been able to check them.

****Labarrus lividus* (Olivier, 1789).**

Until recently, *L. lividus* labels were applied to all North American members of this genus, which are nearly cosmopolitan. Iowa specimens were mentioned by Ratcliffe (1991) [as *Aphodius lividus*] and Ratcliffe and Paulsen (2008) [as *Labarrus pseudolividus* Balthasar], and are present in the USNM and CASC. All specimens we examined are, in fact, *L. pseudolividus*, which is very common throughout most of the New World, and perhaps, “the most commonly collected species in southern North America, both at light and in dung” (Gordon and Skelley 2007). Stebnicka (2009) synonymized *L. pseudolividus* under *L. cinctulus* Hope. While it is possible *L. lividus* may occur somewhere in Iowa, we have not seen specimens.

***Odonteus cornigerus* Melsheimer, 1845.**

An Atlantic coastal species listed by Wickham (1911) from Johnson Co., Iowa; Putnam (1876) from Davenport, Iowa; King (1914) from Henry Co., Iowa. These records are more than likely the result of the misidentification of one or more of the three species of *Odonteus* occurring here.

***Trichiotinus affinis* (Cory and Percheron, 1833).**

Listed by Wickham (1911) from Iowa, but this is probably based on a misidentification as the species occurs from eastern Illinois to the Atlantic Coast (Howden 1968).

***Trox terrestris* Say, 1825.**

Listed by Wickham (1911) from Johnson and Des Moines counties, Iowa, this is an Atlantic coastal species.

Discussion

Much of Iowa was, until European settlement, covered by a mixture of tallgrass prairie and oak savanna (Hayden 1998, Nuzzo 1986, Madson 1982). This ecological community and associated insect fauna was actually quite young on the geologic timescale only recently becoming established after glacial retreat and subsequent climate changes (Ross 1970; Anderson 2006; Ratcliffe and Paulsen 2008).

Prior to Euro-American settlement, the vegetation of Iowa was a constantly changing patchwork or mosaic of prairie, marsh, savanna, woodland, and forest, influenced by climate, fire, topography, landform, and herbivores (Shimek 1948; Conard 1952; Davis 1977; Baker et al. 1992, 1996; Schwert 1996; Jungst et al. 1998; Mutel 2008; NCDC 2010). The dominant vegetation was prairie covering as much as 80% of Iowa (Smith 1998). Savanna, woodlands, and forest were more common in the south-central and eastern half of the state covering about 18% of the landscape (Smith 1998). Woody vegetation was more common in river valleys, and other sheltered areas less affected by fires, while prairie was more common on level

uplands: topography, moisture, and location made a difference (Mutel 2008). Following settlement, the vast oceans of prairie grasslands were mostly converted to agriculture, trees were cleared from fields and cut for lumber while, at the same time, fires were suppressed (Smith 1998; Mutel 2008). By 1900, 97% of Iowa had been converted to farmland (Jackson and Jackson 2002). In other words, a vegetation complex that had taken nearly 10,000 years to develop was dismantled in less than a century. As the end of the twentieth century approached, acreage of woodland or forest had rebounded to about 7% (Smith 1998). Trees returned to many areas cleared during early settlement and invaded uncultivated areas around Iowa formerly kept clear by fire and agriculture (Mutel 2008). The total area covered by grasslands or prairie has fluctuated, with some being lost to encroachment by woody vegetation and development, while other areas were reclaimed by active management (Packard and Ross 1997; Mutel 2008).

The far corners and edges of Iowa are not only separated by many kilometers but also are characterized by different landforms (Prior 1991) and/or ecoregions and subregions (Griffith et al. 1994) based mostly on geology, topography, soils, climate, vegetation, and location. Scarab species known from these far corners of Iowa vary by location and collection effort as well as species range and habitat requirements. To date, more species are known from southern Iowa compared to northern Iowa and more species are known from eastern Iowa compared to western Iowa. A large part of this difference is most likely associated with relative lack of forest habitats in the northwest quadrant of the state. In addition, less collecting effort occurred in northwest Iowa during our survey. This is due, at least in part, to greater travel distance for us and the fact that the land has been converted to cropland extensively. Presently the geology, topography, and human disturbance of eastern and south-central Iowa favor growth of woodlands over row-crops as before settlement. The presence of quality woodland habitat simply invites frequent collecting trips, particularly to the state parks and state forests of these areas of Iowa.

Scarab beetle collecting has been uneven throughout the state of Iowa with the number of scarab species known per county being influenced by location and available quality collecting habitat. Story County has the longest checklist (125 species) probably because of collecting in the local area by Iowa State University students and faculty. The next longest list is from Fremont County (121 species) in the Loess Hills along the Missouri River in far southwestern Iowa; the main attraction here is Waubesa State Park which is now mostly wooded with prairie vegetation on steep west-facing slopes. The next longest list is from Henry County (115 species), which is also the home county of the Iowa Insect Survey and Collection, Iowa Wesleyan University, initially started by Henry Jaques (Jaques 1932). The only other county that currently has a checklist over 100 species is Linn County (102 species), being the home county of the second author and probably also benefiting from the nearness of Coe College and University of Iowa and their students and faculty. Next is Van Buren County at 92 species (Shimek State Forest), Johnson County at 90 (University of Iowa), Lee County at 84 (Shimek State Forest), Dallas County at 83 (home county of first author), Appanoose County at 78 (Sharon Bluffs State Park), Pottawattamie County at 67 (Hitchcock Natural Area), Decatur County at 65 (Nine Eagles State Park), Allamakee County at 65 species (Yellow River State Forest), and Winneshiek County at 63 (Luther College).

Iowa has 99 counties and the majority of those are in need of more scarab sampling. Currently there are two counties with no scarab records. Collecting has been concentrated in a few counties with either higher quality habitat or more accessible locations, or both.

Several scarab species known from nearby states may be found in Iowa eventually and increased collecting effort around the Iowa perimeter may reveal the presence of some of these species. A better understanding of the biology and ranges may also help in finding certain species.

A century has now passed since the last complete listing of Iowa scarabs was published (Wickham 1911). Eighty-three additional species records were published over the following ten decades. The current total of 227 scarab species now known from Iowa more than doubles the listing given by Wickham. With continued collecting and searching we expect more species may be found during the next 100 years.

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Literature Cited

- Anderson, R. C. 2006.** Evolution and origin of the central grassland of North America: Climate, fires, and mammalian grazers. *Journal of the Torrey Botanical Society* 133(4): 626–647.
- Anonymous. 2011.** Japanese beetles now in 52 counties. *The Des Moines Register* 163(1): 2B (Sunday 19 June 2011).
- Baker, R. G., E. A. Bettis, D. P. Schwert, D. G. Horton, C. A. Chumbley, L. A. Gonzalez, and M. K. Reagan. 1996.** Holocene paleoenvironments of northeast Iowa. *Ecological Monographs* 66(2): 203–234.
- Baker, R. G., L. J. Maher, C. A. Chumbley, and K. L. Van Zant. 1992.** Patterns of Holocene environmental change in the midwestern United States. *Quaternary Research* 37(3): 379–389.
- Blatchley, W. S. 1910.** Coleoptera or beetles known to occur in Indiana. The Nature Publishing Co.; Indianapolis, Indiana. 1,386 p.
- Blatchley, W. S. 1919.** Change of name. *The Canadian Entomologist* 51: 153.
- Blume, R. R., and A. Aga. 1978.** Observation on ecological and phylogenetic relationships of *Phanaeus difformis* LeConte and *Phanaeus vindex* MacLeay (Coleoptera: Scarabaeidae) in North America. *Southwestern Entomologist* 3(2): 113–120.
- Boyer, L. B. 1940.** A revision of the species of *Hoplia* in America North of Mexico (Coleoptera: Scarabaeidae). *Microentomology* 5(1): 1–31.
- Carlisle, N. 1999.** Green thumbs battle beetle invasion. *Telegraph Herald*: 10 July.
- Cartwright, O. L. 1955.** Scarab beetles of the genus *Psammodius* in the Western Hemisphere. *Proceedings of the United States National Museum* 104(3344): 413–462.
- Cartwright, O. L. 1974.** *Ataenius*, *Aphotaenius*, and *Pseudoataenius* of the United States and Canada (Coleoptera: Scarabaeidae: Aphodiinae). *Smithsonian Contribution to Zoology* 154: 1–106.
- Conard, H. S. 1952.** The vegetation of Iowa. *State University of Iowa Studies in Natural History* 19(4): 1–166.
- Connior, M. B., P. W. Kovarik, S. Chordas III, H. W. Robison, and P. E. Skelley. 2014.** Coleoptera (Histeridae, Leiodidae, and Scarabaeidae) inhabiting the burrows of Baird's Pocket Gopher (Rodentia: Geomyidae: *Geomys breviceps*) in Arkansas. *Insecta Mundi* 0389: 1–27.
- Cornell, J. F., Jr. 1972.** A taxonomic review of the beetle genus *Dichelonyx* Harris in North America (Scarabaeidae: Melolonthinae). PhD. Dissertation. Oregon State University. 253 p.
- Davis, A. M. 1977.** The prairie-deciduous forest cctone in the Upper Middle West. *Annals of the Association of American Geographers* 67(2): 204–213.
- Dawson, R. W. 1919a.** New species of *Serica* (Scarabaeidae). *Journal of the New York Entomological Society* 27(1): 32–39.
- Dawson, R. W. 1919b.** New species of *Serica* (Scarabaeidae). II. *Journal of the New York Entomological Society* 27(3–4): 223–225.
- Dawson, R. W. 1921.** New species of *Serica* (Scarabaeidae). IV. *Journal of the New York Entomological Society* 29(3–4): 160–168.
- Dawson, R. W. 1922a.** New species of *Serica* (Scarabaeidae). V. *Journal of the New York Entomological Society* 30(4): 154–168.
- Dawson, R. W. 1922b.** A synopsis of the Scarabaeidae of Nebraska (Coleoptera). University

Studies (University of Nebraska) 22: 163–244.

Dawson, R. W. 1932. New species of *Serica* (Scarabaeidae). VI. Journal of the New York Entomological Society 40(4): 529–562.

Dawson, R. W. and J. W. McColloch. 1924. New species of *Bolbocerosoma* (Scarabaeidae). The Canadian Entomologist 56: 9–15.

Dellacasa, M., G. Dellacasa, and R. D. Gordon. 2011. Systematic revision of the American taxa belonging to the genera *Alloblackburneus* Bordat, 2009, and *Blackburneus* Schmidt, 1913, with description of seven new species (Coleoptera: Scarabaeidae: Aphodiinae). Insecta Mundi 0204: 1–52.

Downie, N. M., and R. H. Arnett, Jr. 1996. The beetles of northeastern North America. Sandhill Crane Press; Gainesville, Florida. 1,721 p.

Edmonds, W. D. 1994. Revision of *Phanaeus* MacLeay, a New World Genus of Scarabaeinae dung beetles (Coleoptera: Scarabaeidae: Scarabaeinae). Natural History Museum of Los Angeles County, Contributions in Science 443: 1–105.

Evans, A. V. 2009. *Phyllophaga spreta* (Horn), a rare species of June beetle, new to the fauna of Virginia, North Carolina, and Pennsylvania (Coleoptera: Scarabaeidae). Banisteria 33: 37–42.

Evans, A. V. 2014. Beetles of eastern North America. Princeton University Press; Princeton, NJ. 560 p.

Gordon, R. D. 1976. Studies of the genus *Aphodius* of the United States and Canada (Coleoptera: Scarabaeidae). IV. A taxonomic revision of Horn's Group A. Proceedings of the Entomological Society of Washington 78(4): 458–478.

Gordon, R. D. 1977. Studies of the genus *Aphodius* of the United States and Canada (Coleoptera: Scarabaeidae). V. An evaluation of Horn's Group F. Proceedings of the Entomological Society of Washington 79(2): 157–167.

Gordon, R. D. 1983. Studies on the genus *Aphodius* of the United States and Canada (Coleoptera: Scarabaeidae). VII. Food and habitat; distribution; key to eastern species. Proceedings of the Entomological Society of Washington 85(4): 633–652.

Gordon, R. D., and O. L. Cartwright. 1980. The western hemisphere species of *Rhyssemus* and *Trichiorhyssemus* (Coleoptera: Scarabaeidae). Smithsonian Contributions to Zoology 317: 1–29.

Gordon, R. D., and P. E. Skelley. 2007. A monograph of the Aphodiini inhabiting the United States and Canada (Coleoptera: Scarabaeidae: Aphodiinae). The American Entomological Institute Memoirs 79: 1–580.

Griffith, G. E., J. M. Omernik, T. F. Wilton, and S. M. Pierson. 1994. Ecoregions and subregions of Iowa: A framework for water quality assessment and management. Journal of the Iowa Academy of Science 101(1): 5–13.

Hardy, A. 1991. A catalog of Coleoptera of America north of Mexico. Family: Scarabaeidae. Subfamilies Rutelinae and Dynastinae. Volume 34, part 2. United States Department of Agriculture Handbook 529: 1–57.

Hardy, A. R. 1977. A revision of the *Hoplia* of the Nearctic realm (Coleoptera: Scarabaeidae). California Department of Food and Agriculture, Occasional Papers in Entomology 23: 1–48.

Harpootlian, P. J. 2001. Scarab beetles (Coleoptera: Scarabaeidae) of South Carolina. Biota of South Carolina. Volume 2. Clemson University; Clemson, SC. 157 p.

Hayden, B. P. 1998. Regional climate and the distribution of tallgrass prairie. p. 19–34. In: A. K. Knapp, J. M. Briggs, D. C. Hartnett, and S. C. Collins (eds.). Grassland dynamics: Long-term ecological research in tallgrass prairie. Oxford University Press; New York. 364 p.

Helgeson, R. G., and R. L. Post. 1967. Saprophagous Scarabaeidae (Coleoptera) of North Dakota. North Dakota insects. Publication No. 7. Department of Entomology, Agriculture Experiment Station, North Dakota State University; Fargo. 60 p.

Hendrickson, G. O. 1930. Studies on the insect fauna of Iowa prairies. Iowa State Journal of Science 4(2): 49–175.

Horn, G. W. 1887. Revision of the species of *Lachnosterna* of America north of Mexico. Transactions of the American Entomological Society 14: 209–296.

Howden, H. F. 1955a. Biology and taxonomy of North American beetles of the subfamily Geotrupinae with revisions of the genera *Bolbocerosoma*, *Eucanthus*, *Geotrupes*, and *Peltotrupes* (Scarabaeidae). Proceedings of the United States National Museum 104(3342): 151–319.

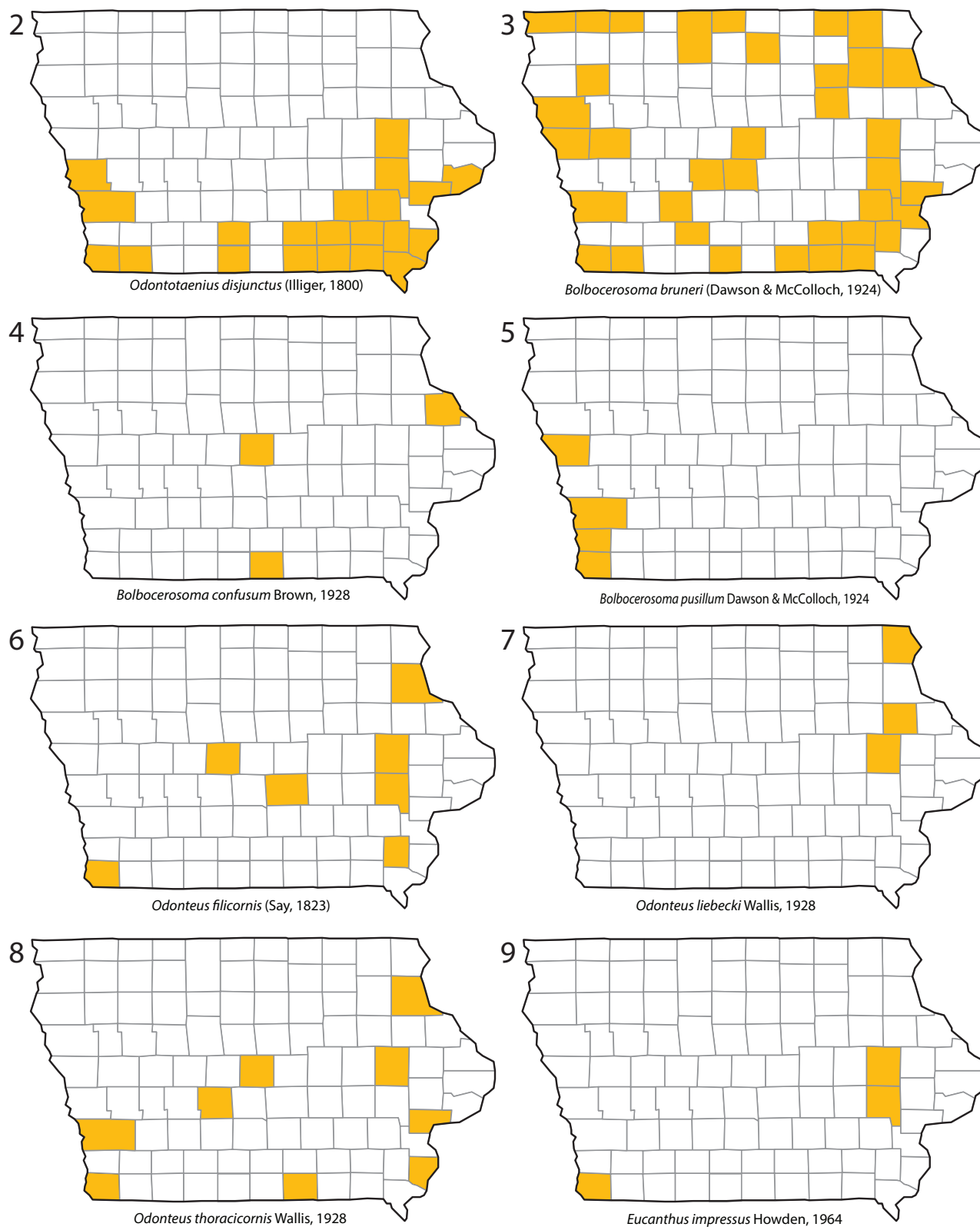
- Howden, H. F. 1955b.** Cases of interspecific "Parasitism" in Scarabaeidae (Coleoptera). *Journal of the Tennessee Academy of Science* 30: 64–66.
- Howden, H. F. 1964.** The Geotrupinae of North and Central America. *Memoirs of the Entomological Society of Canada* 39: 1–91.
- Howden, H. F. 1968.** A review of the Trichiinae of North and Central America (Coleoptera: Scarabaeidae). *Memoirs of the Entomological Society of Canada* 64: 1–77.
- Howden, H. F., and O. L. Cartwright. 1963.** Scarab beetles of the genus *Onthophagus* Latreille north of Mexico (Coleoptera: Scarabaeidae). *Proceedings of the United States National Museum* 114(3467): 1–135.
- Jackson, D. L., and L. J. Jackson. 2002.** The farm as natural habitat: Reconnecting food systems with ecosystems. Island Press; Washington, DC. 250 p.
- Jameson, M. L., and B. C. Ratcliffe. 2002.** Series Scarabaeiformia Crowson 1960, Superfamily Scarabaeoidea Latreille 1802. p. 1–5. *In*: R. H. Arnett, Jr., M. C. Thomas, P. E. Skelley, and J. H. Frank (eds.). *American beetles. Volume 2. Polyphaga: Scarabaeoidea through Curculionoidea*. CRC Press; Boca Raton, Florida. 861 p.
- Jameson, M. L., and K. A. Swoboda. 2005.** Synopsis of scarab beetle tribe Valgini (Coleoptera: Scarabaeidae: Cetoniinae) in the New World. *Annals of the Entomological Society of America* 98(5): 658–672.
- Jaques, H. E. 1926.** A preliminary survey of May beetles (*Phyllophaga* spp.) in Iowa. *Proceedings of the Iowa Academy of Science* 33: 337–339.
- Jaques, H. E. 1928.** The distribution of white grubs in Iowa in 1927. *Proceedings of the Iowa Academy of Science* 35: 303–304.
- Jaques, H. E. 1932.** Progress report of a survey of Iowa insects. *Proceedings of the Iowa Academy of Science* 39: 257–260.
- Jungst, S. E., D. R. Farrar, and M. Brandrup. 1998.** Iowa's changing forest resources. *Journal of the Iowa Academy of Science* 105(2): 61–66.
- King, I. N. 1914.** The Coleoptera of Henry County, Iowa. *Proceedings of the Iowa Academy of Science* 21: 317–340.
- Kirk, V. M., and E. U. Balsbaugh, Jr. 1975.** A List of the beetles of South Dakota. Agricultural Experiment Station, South Dakota State University, Technical Bulletin 42: 1–139.
- Kriska, N. L., and D. K. Young. 2002.** An annotated checklist of Wisconsin Scarabaeoidea (Coleoptera). *Insecta Mundi* 16(1–3): 31–48.
- Kriska, N. L., and D. K. Young. 2005.** New Wisconsin records for *Cyclocephal lurida* (Coleoptera: Scarabaeidae). *The Great Lakes Entomologist* 38(3–4): 201–202.
- Lago, P. K., and E. L. Freese. 2016.** A new species of *Aegialia* Latreille (Coleoptera: Scarabaeidae: Aphodiinae) from southeastern Iowa, USA. *The Coleopterists Bulletin* 70(2): 341–346.
- Lago, P. K., and S. McCleve. 1992.** New distributional records for *Diplotaxis atlantis* (Coleoptera: Scarabaeidae). *Entomological News* 103(2): 53–54.
- Lago, P. K., R. L. Post, and C. Y. Oseto. 1979.** The phytophagous Scarabaeidae and Troginae (Coleoptera) of North Dakota. North Dakota Insects. Publication No. 12. Department of Entomology, Agriculture Experiment Station, North Dakota State University; Fargo. 131 p.
- Lewis, D. 1995.** Watch for Japanese beetles in Iowa. *Horticulture & Home Pest News* IC-470(19): 113.
- Luginbill, P., and H. R. Painter. 1953.** May beetles of the United States and Canada. United States Department of Agriculture Technical Bulletin 1061: 1–102.
- Madson, J. B. 1982.** Where the sky began: Land of the tallgrass prairie. Houghton Mifflin Co.; Boston. 321 p.
- Majka, C. G. 2010.** The distribution of *Gnorimella maculosa* (Knoch) (Coleoptera: Scarabaeidae: Cetoniinae) in North America. *The Coleopterists Bulletin* 64(4): 337–340.
- Mathews, E. G. 1961.** A revision of the genus *Copris* Muller of the Western Hemisphere (Coleoptera: Scarabaeidae). *Entomologica Americana* 41: 1–139.
- Mutel, C. F. 2008.** The emerald horizon: The history of nature in Iowa. University of Iowa Press; Iowa City. 304 p.

- NCDC. 2010. Climate of Iowa. National Climatic Data Center. Asheville, North Carolina. Available at http://www.crh.noaa.gov/images/dvn/downloads/Clim_IA_01.pdf (Last accessed March 2011.)
- Nuzzo, V. A. 1986. Extant and status of midwest oak savanna: Presettlement and 1985. *Natural Areas Journal* 6(2): 6–36.
- Orozco, J. 2012. Monographic revision of the American genus *Euphoria* Burmeister, 1842 (Coleoptera: Scarabaeidae: Cetoniinae). *The Coleopterists Society Monograph* 11: 1–182.
- Packard, S., and L. M. Ross. 1997. Restoring remnants. p. 63–88. *In*: S. Packard and C. F. Mutel (eds.). *The tallgrass restoration handbook: for prairies, savannas, and woodlands*. Island Press; Washington DC. 463 p.
- Paulsen, M. J. 2007. Nomenclatural changes in the Nearctic Ochodaeinae and description of two new genera (Coleoptera: Scarabaeidae: Ochodaeidae). *Insecta Mundi* 0021: 1–13.
- Paulsen, M. J. 2010. Stag beetles of the genus *Dorcus* MacLeay in North America (Coleoptera: Lucanidae). *Zookeys* 34: 199–207.
- Paulsen, M. J., and A. D. Smith. 2005. A new species of stag beetles from sand dunes in west Texas, and a synopsis of the genus *Nicagus* (Coleoptera: Lucanidae: Aesalinae: Nicagini). *Zootaxa* 1050: 45–60.
- Potts, R. W. 1945. A key to the species of Cremastocheilini of North America and Mexico (Coleoptera: Scarabaeidae). *Bulletin of the Brooklyn Entomological Society* 40: 72–78.
- Potts, R. W. L. 1977. Revision of the Scarabaeidae: Anomalinae 2. An annotated checklist of the *Anomala* of the United States and Canada. *The Pan-Pacific Entomologist* 53(1): 34–42.
- Prill, J. D., and K. B. Russell. 1991. New records for *Eucanthus impressus* Howden (Coleoptera: Scarabaeidae: Geotrupinae) from central Illinois. *The Coleopterists Bulletin* 45(4): 367.
- Prior, J. C. 1991. *Landforms of Iowa*. University of Iowa Press; Iowa City. 153 p.
- Putnam, J. D. 1876. List of Coleoptera found in the vicinity of Davenport, Iowa. *Proceedings of the Davenport Academy of Natural Sciences* 1: 169–173.
- Ratcliffe, B. C. 1991. The scarab beetles of Nebraska. *Bulletin of the University of Nebraska State Museum* 12: 1–333.
- Ratcliffe, B. C., and R. D. Cave. 2017. The dynastine scarab beetles of the United States and Canada (Coleoptera: Scarabaeidae: Dynastinae). *Bulletin of the University of Nebraska State Museum* 30: 1–298.
- Ratcliffe, B. C., and M. J. Paulsen. 2008. The scarabaeoid beetles of Nebraska. *Bulletin of the University of Nebraska State Museum* 22: 1–570.
- Rice, M. 2001. Japanese beetle – another new soybean pest. Iowa State University Extension. *Integrated Crop Management IC-486* (21): 173.
- Rice, M. E., and E. G. Riley. 2000. Biodiversity and rarity of *Phyllophaga* (Coleoptera: Scarabaeidae) in a temperate hardwood forest. *Annals of the Entomological Society of America* 93(2): 277–281.
- Robinson, M. 1940. Studies in the Scarabaeidae II. *Transactions of the American Entomological Society* 66(2): 141–160.
- Robinson, M. 1941. Notes on some rare Scarabaeidae with the description of one new species. *Entomological News* 52(8): 227–232.
- Ross, H. H. 1970. The ecological history of the Great Plains: evidence from grassland insects. p. 225–240. *In*: W. Dordt, Jr. and J. K. Jones, Jr. (eds.). *Pleistocene and recent environments of the central Great Plains*. University of Kansas Press; Lawrence. 443 p.
- Schuster, J. C. 1983. The Passalidae of the United States. *The Coleopterists Bulletin* 37(4): 302–305.
- Schwert, D. P. 1996. Effects of Euro-American settlement on an insect fauna: Paleontological analysis of the recent chitin record of beetles (Coleoptera) from northeastern Iowa. *Annals of the Entomological Society of America* 89(1): 53–63.
- Shimek, B. 1948. The plant geography of Iowa. *State University of Iowa Studies in Natural History* 18(4): 1–178.
- Smith, A. B. T. 2006. A review of the family-group names for the superfamily Scarabaeoidea (Coleoptera) with corrections to nomenclature and current classification. *Coleopterists Society Monograph Number* 5: 144–204.

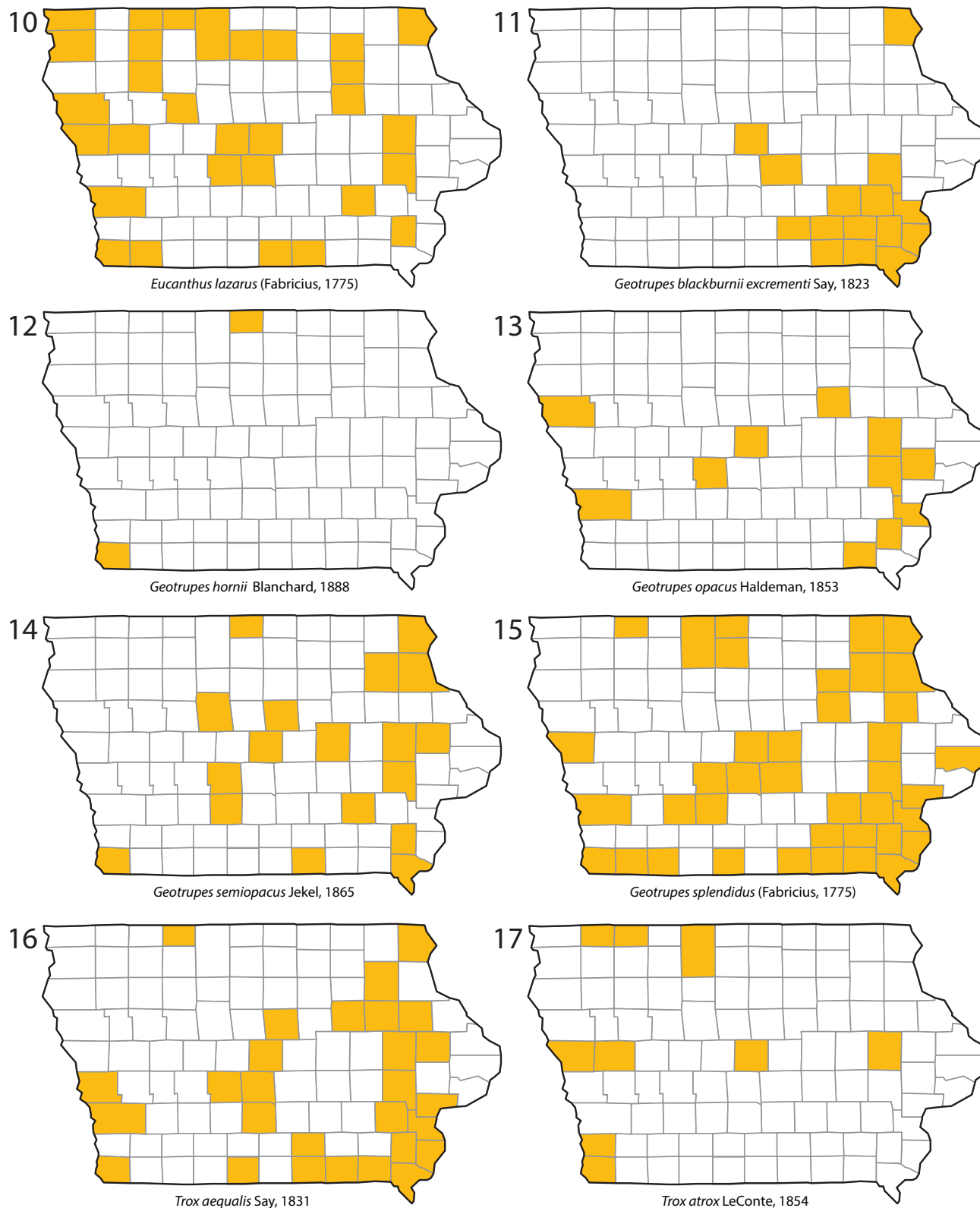
- Smith, A. B. T. 2009.** Checklist and nomenclatural authority file of the Scarabaeoidea of the Nearctic Realm. Version 4. Electronically published; Ottawa, Canada. 97 p. Available at <http://www.museum.unl.edu/research/entomology/SSSA/nearctic.htm> (Last accessed March 2011.)
- Smith, A. B. T., and M. J. Paulsen. 2017.** Corrections to the nomenclature of the species of North American Lucanidae (Coleoptera). *The Coleopterists Bulletin* 71(3): 571–577.
- Smith, D. D. 1998.** Iowa prairie: original extent and loss, preservation and recovery attempts. *Journal of the Iowa Academy of Science* 105(3): 94–108.
- Staines, C. L. 2001.** The distribution of *Lucanus elaphus* L. (Coleoptera: Lucanidae) in North America. *The Coleopterists Bulletin* 55(4): 397–404.
- Stebnicka, Z. 1994.** The status of some taxa of Aphodiinae with descriptions of new genus and species (Coleoptera: Scarabaeidae). *Acta Zoologica Cracov* 37(1): 71–80.
- Stebnicka, Z. T. 2003.** Revision and hypothetical analysis of the species of the New World genus *Ataeniopsis* (Coleoptera: Aphodiinae: Eupariini). *European Journal of Entomology* 100: 101–113.
- Stebnicka, Z. T. 2009.** Aphodiinae of Australia (Coleoptera: Scarabaeidae). Iconography. Institute of Systematics and Evolution of Animals, Polish Academy of Science; Krakow, Poland. 187 p.
- Stebnicka, Z. T. 2011.** Aegialiini and Eremazini of the World (Coleoptera: Scarabaeidae). Iconography. Institute of Systematics and Evolution of Animals, Polish Academy of Sciences; Krakow, Poland. 92 p.
- Stebnicka, Z. T., and P. K. Lago. 2005.** The New World species of *Ataenius* Harold, 1867. V. Revision of the *A. strigatus* group (Scarabaeidae: Aphodiinae: Eupariini). *Insecta Mundi* 19(1–2): 55–83.
- Travis, B. V. 1934.** *Phyllophaga* of Iowa. *Iowa State Journal of Science* 8(2): 313–365.
- Travis, B. V. 1939.** Habits of the June beetle, *Phyllophaga lanceolata* (Say) in Iowa. *Journal of Economic Entomology* 32(5): 690–693.
- Vaurie, P. 1955.** A revision of the genus *Trox* in North America (Coleoptera: Scarabaeidae). *Bulletin of the American Museum of Natural History* 106(1): 1–89.
- Vaurie, P. 1956.** *Diplotaxis* of the eastern United States, with a new species and other notes (Coleoptera, Scarabaeidae). *The Coleopterists Bulletin* 10: 1–9.
- Vaurie, P. 1958.** New distribution records of North American *Trox* (Coleoptera: Scarabaeidae). *The Coleopterists Bulletin* 12: 43–46.
- Vaurie, P. 1960.** A revision of the genus *Diplotaxis* (Coleoptera, Scarabaeidae, Melolonthinae). Part 2. *Bulletin of the American Museum of Natural History* 120(2): 161–434.
- Vestal, A. G. 1913.** An associational study of Illinois sand prairie. *Bulletin of the Illinois State Laboratory of Natural History* 10: 1–96.
- Wickham, H. F. 1897.** A list of the Coleoptera from the southern shore of Lake Michigan. *Proceedings of the Davenport Academy of Sciences* 6: 125–169.
- Wickham, H. F. 1911.** A list of the Coleoptera of Iowa. *Bulletin of the State University of Iowa Laboratory of Natural History* 6(2): 1–40.
- Wickham, H. F. 1913.** New North American Elateridae and Scarabaeidae. *Psyche* 20: 27–31.
- Worthington, R. J., and K. J. Larsen. 2010.** An annotated checklist of scarab beetles (Coleoptera: Scarabaeidae) from northeastern Iowa. *The Great Lakes Entomologist* 43(1–4): 77–90.
- Young, R. M. 1972.** A new state record for *Polyphylla* and its zoogeographic implications (Scarabaeidae: Melolonthinae). *The Coleopterists Bulletin* 26(1): 31–34.
- Zidek, J. 2013.** Checklist and bibliography of the Trogidae (Coleoptera: Scarabaeoidea). *Insecta Mundi* 0314: 1–38.

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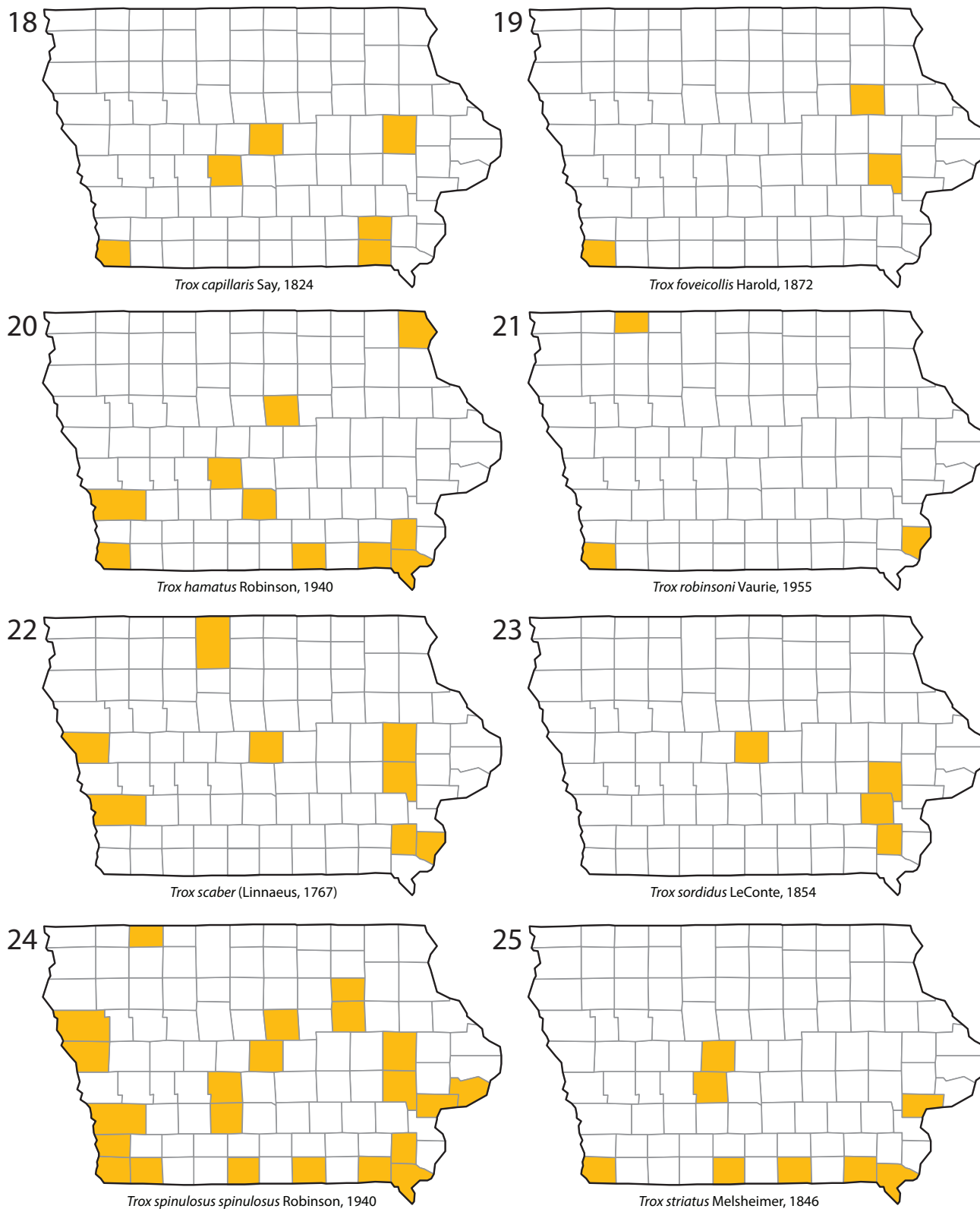
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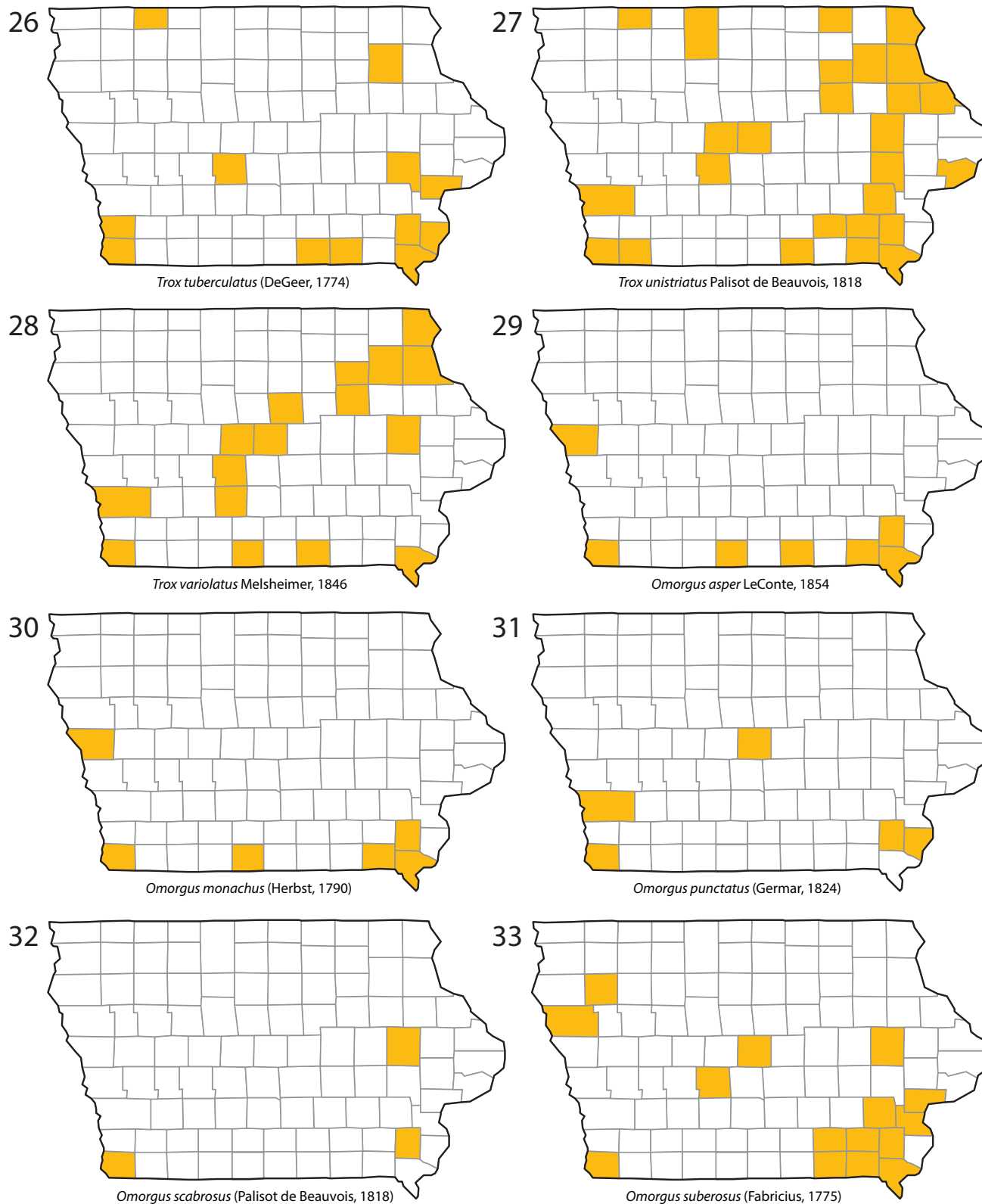
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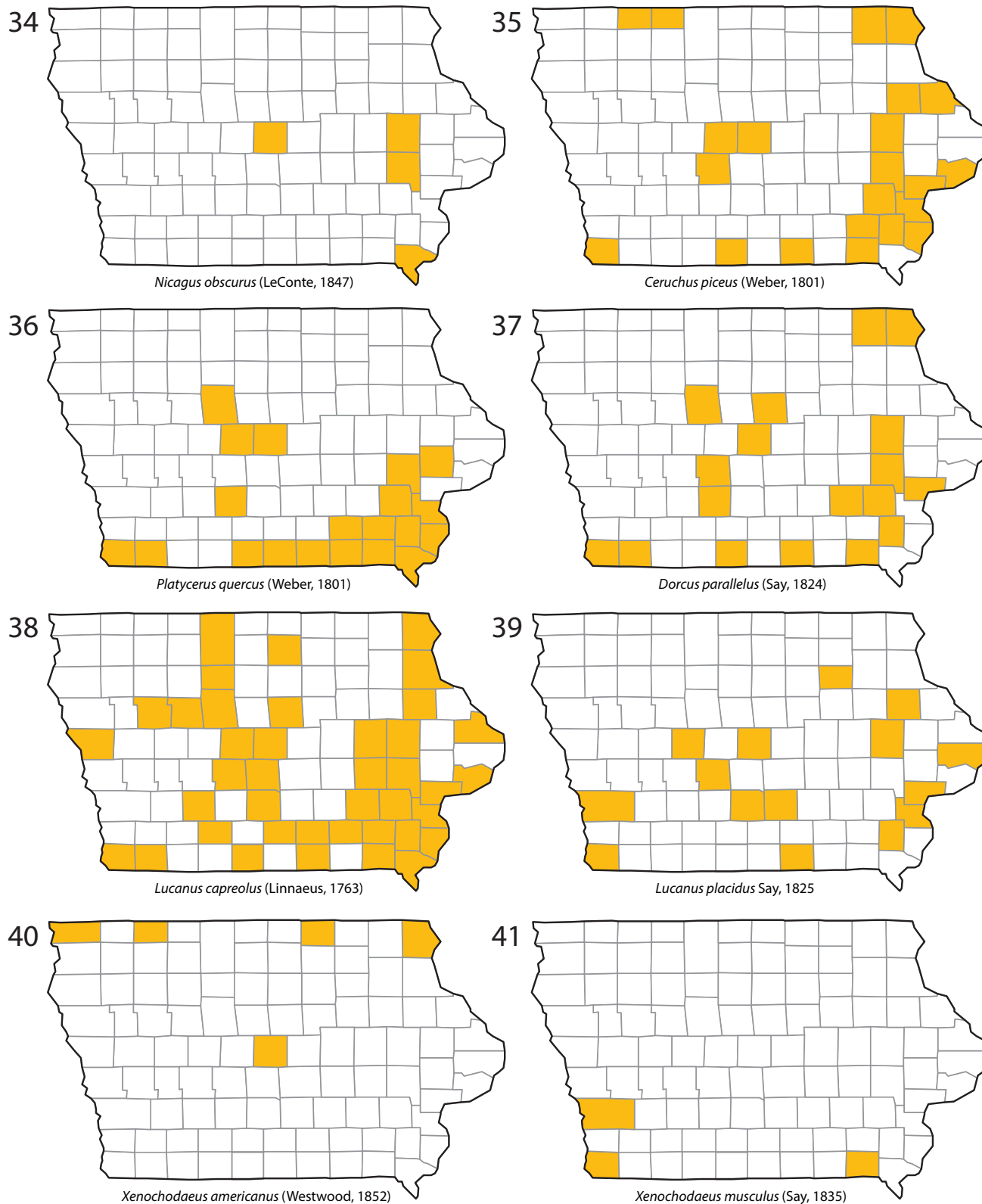
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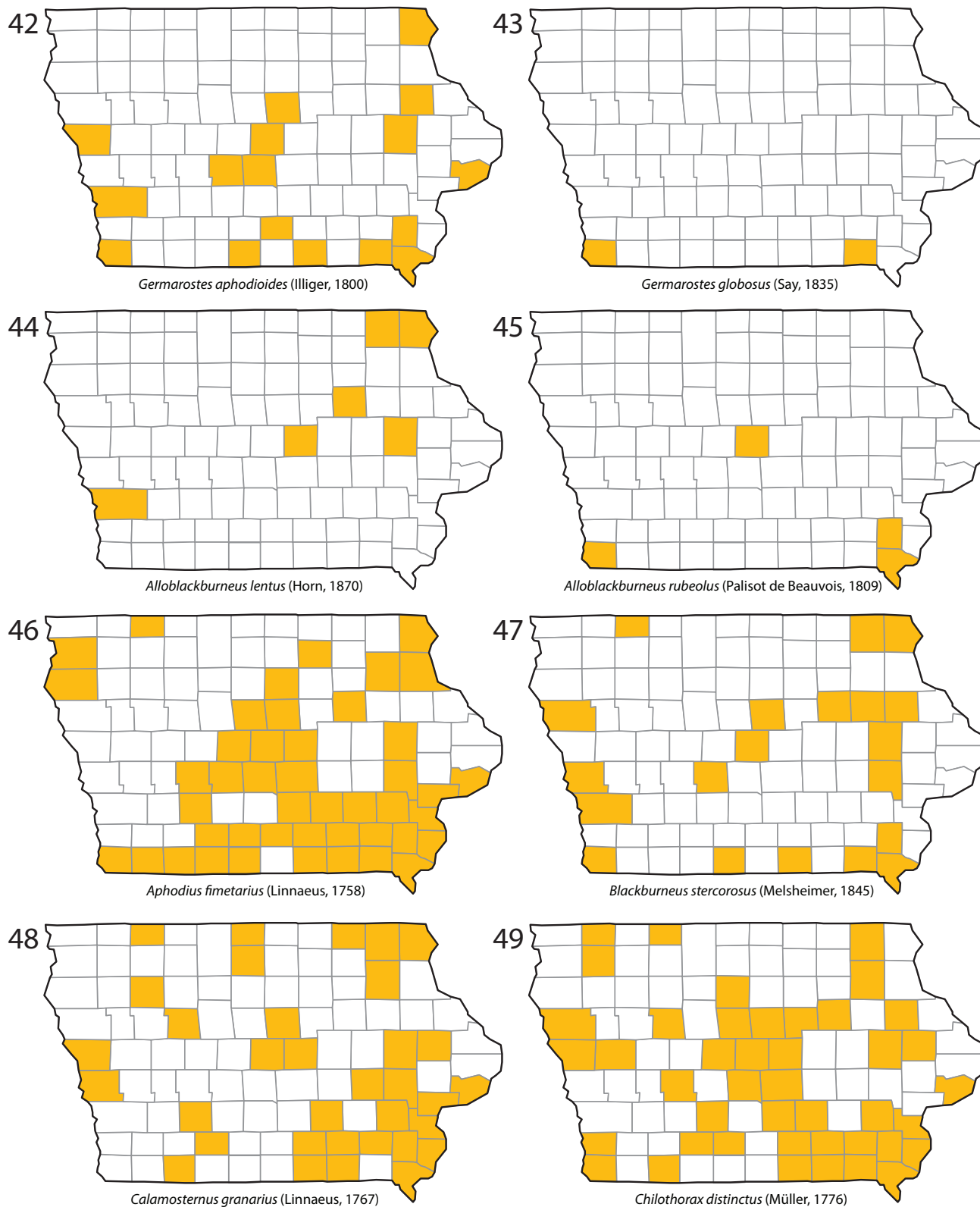
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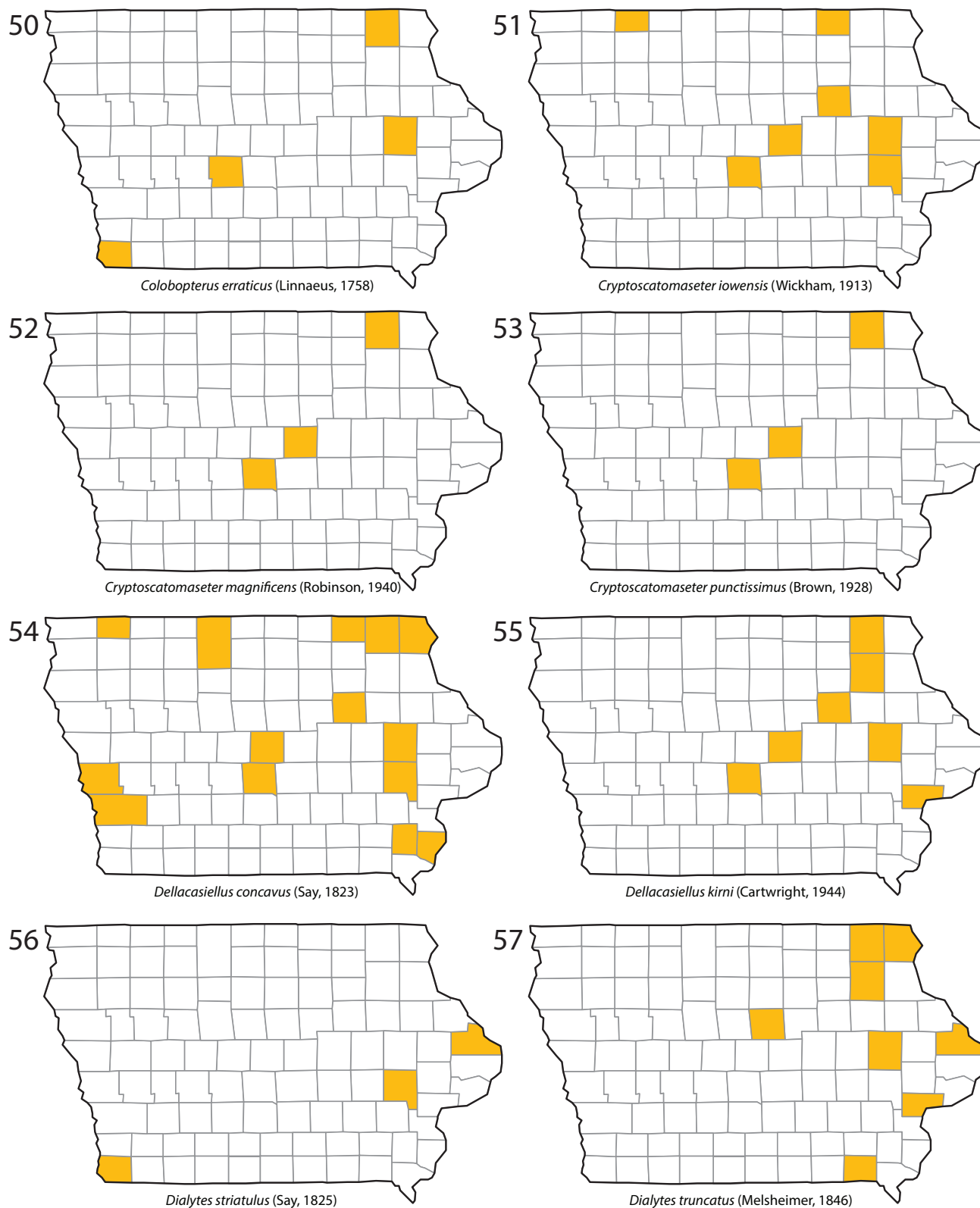
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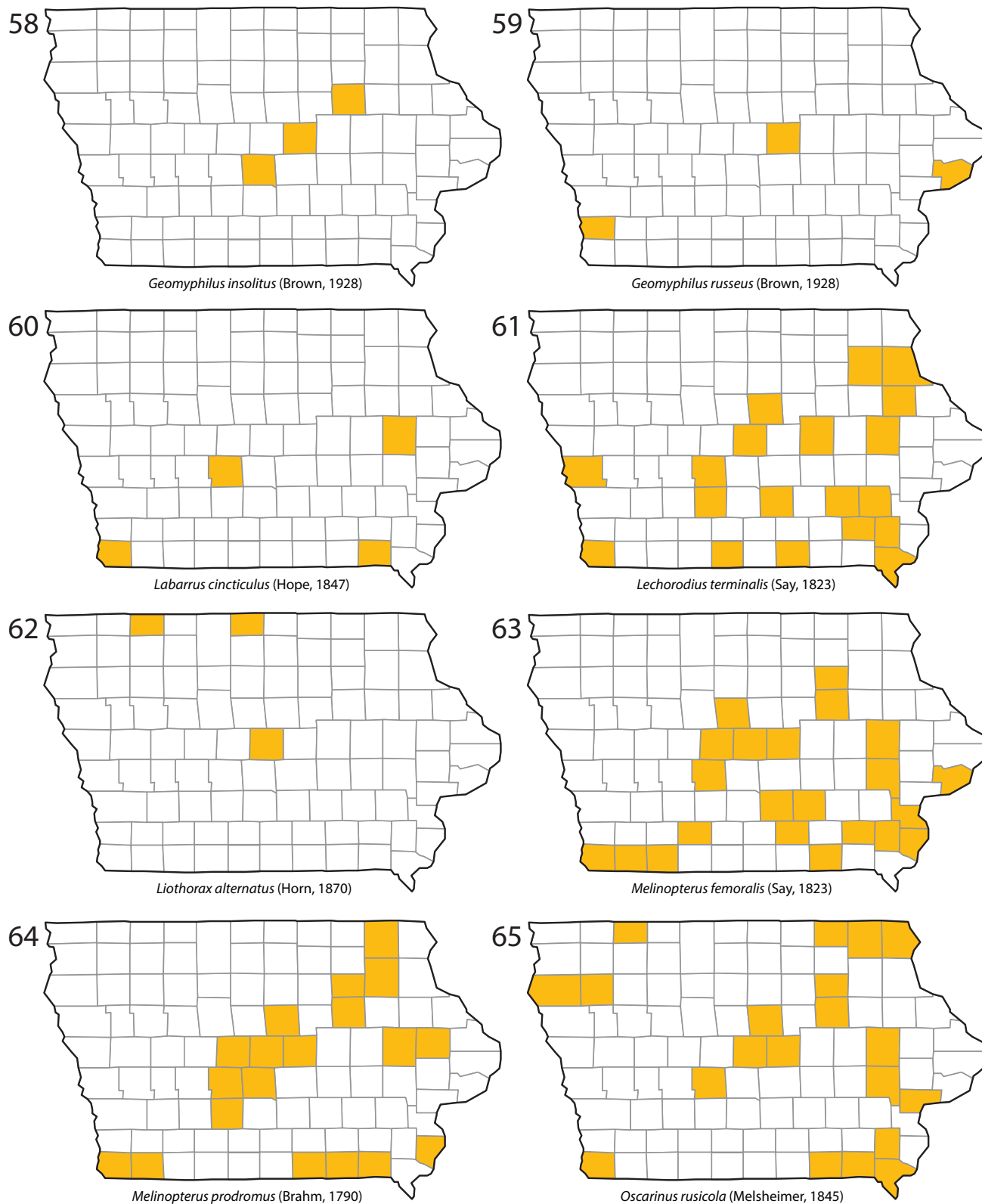
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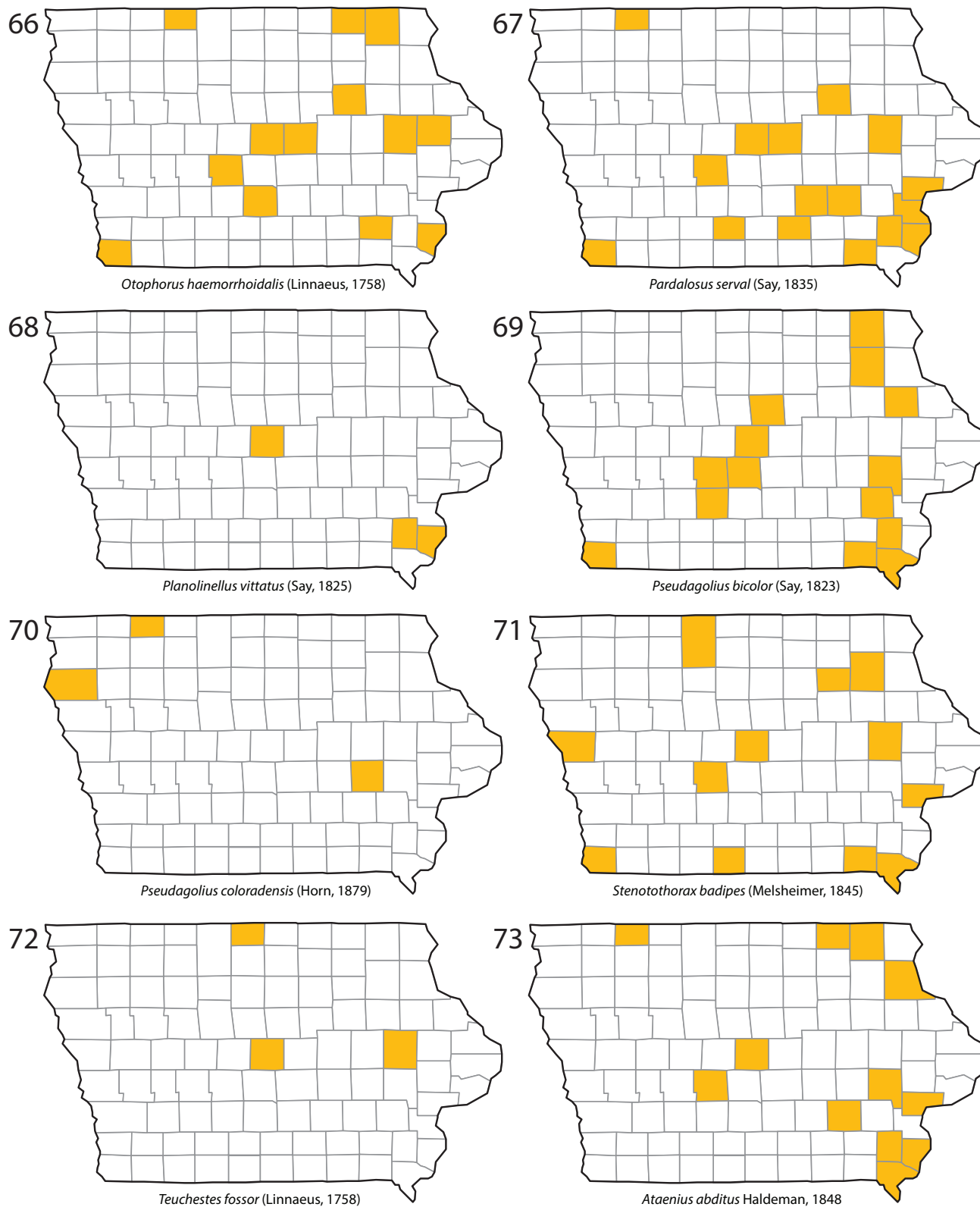
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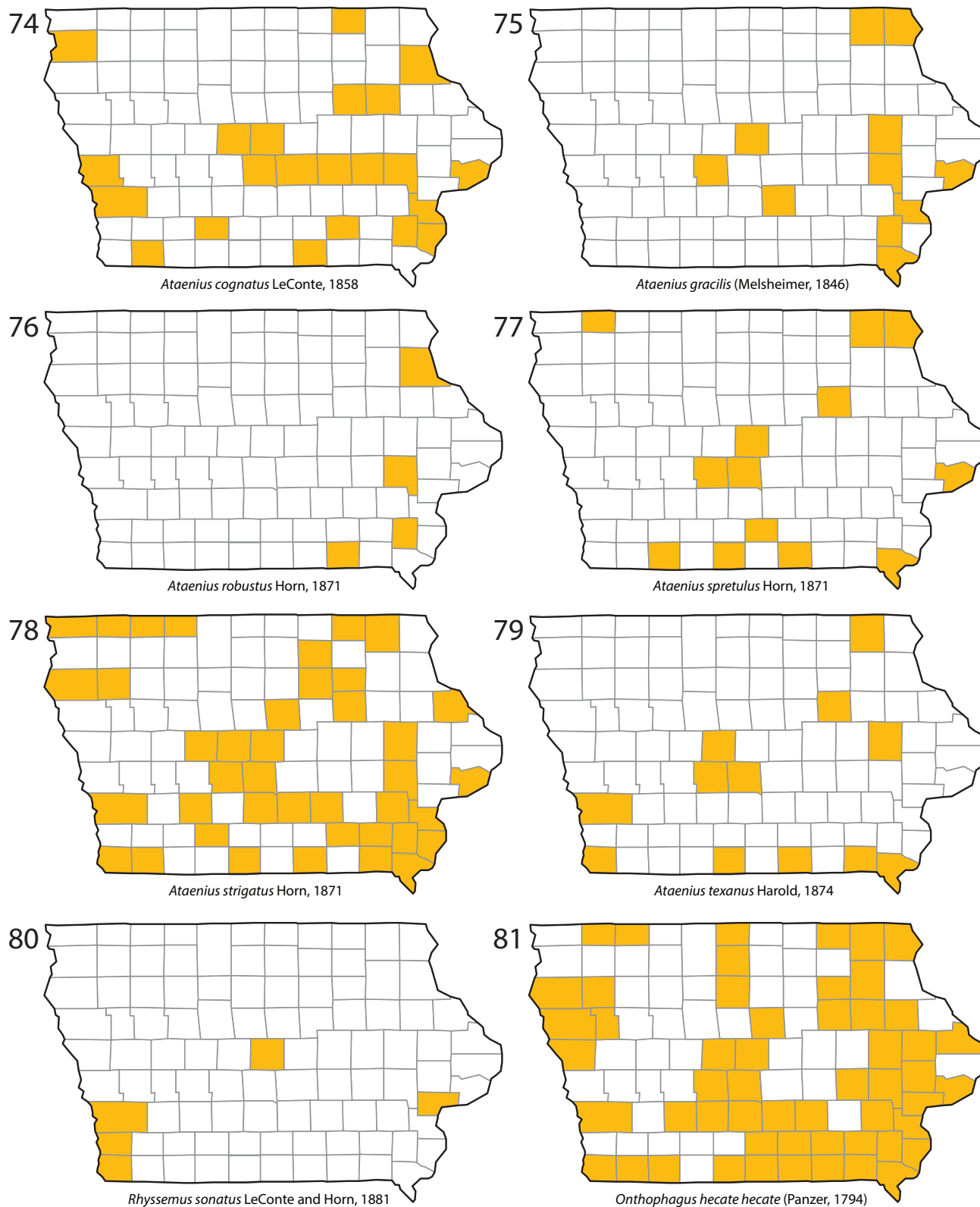
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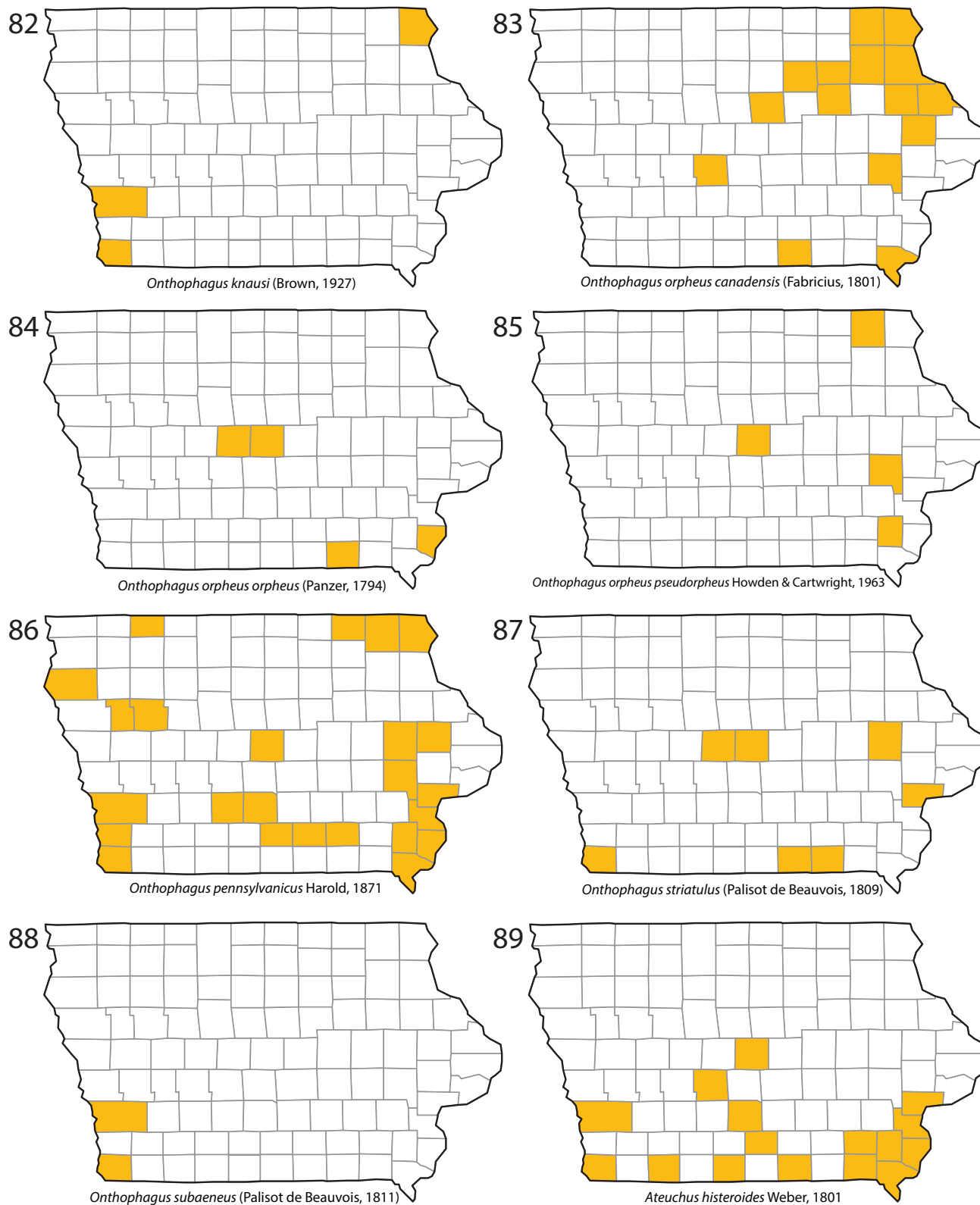
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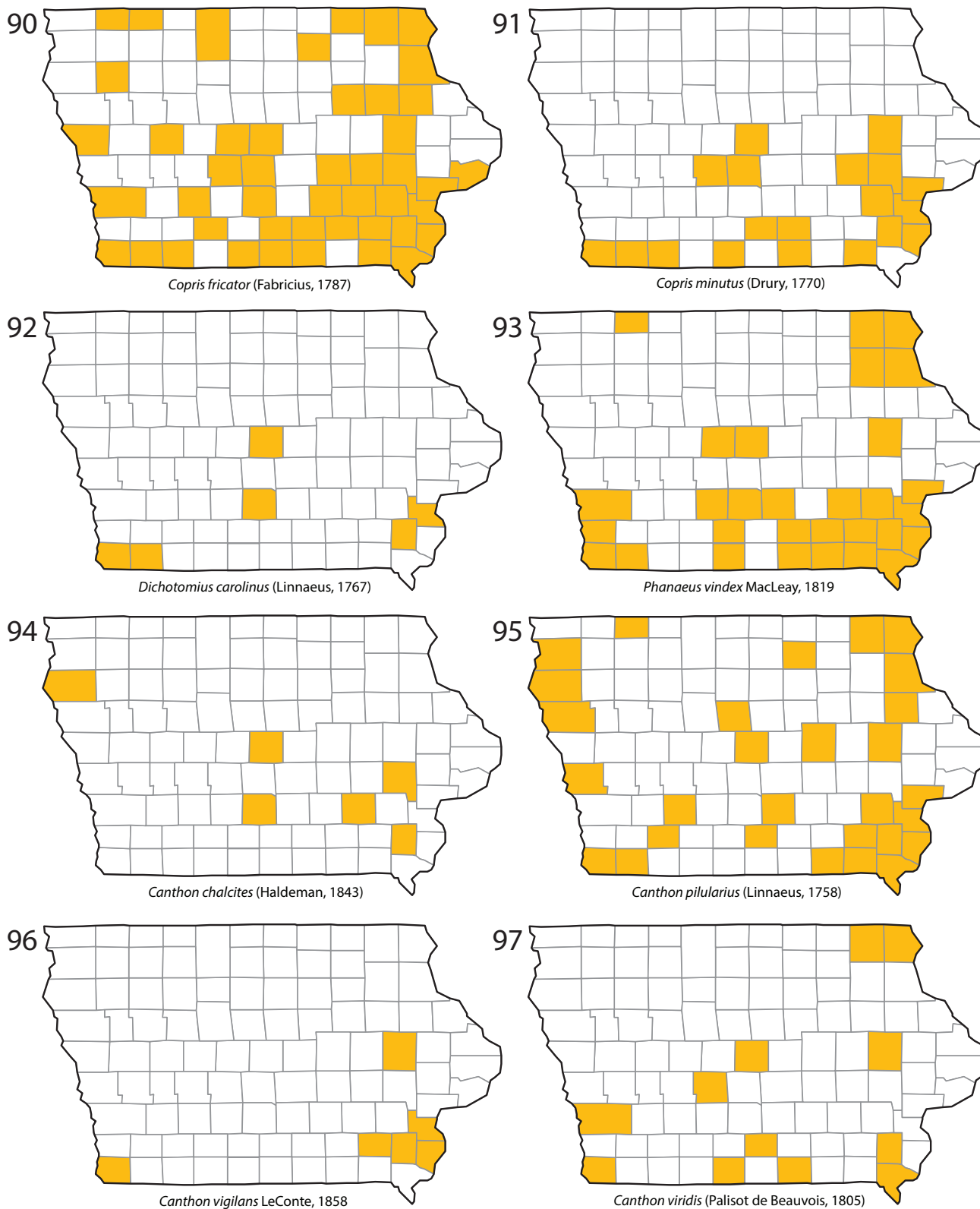
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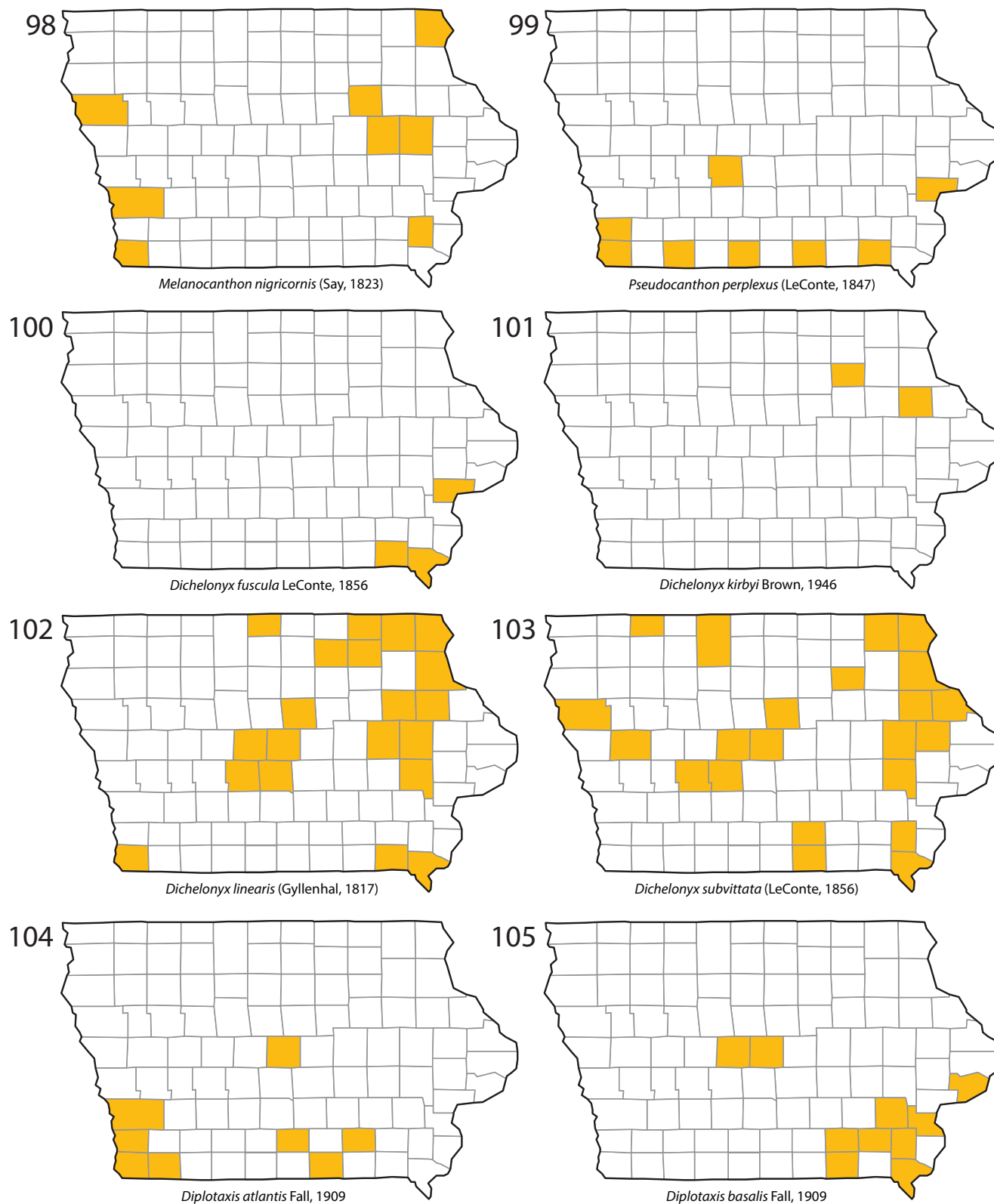
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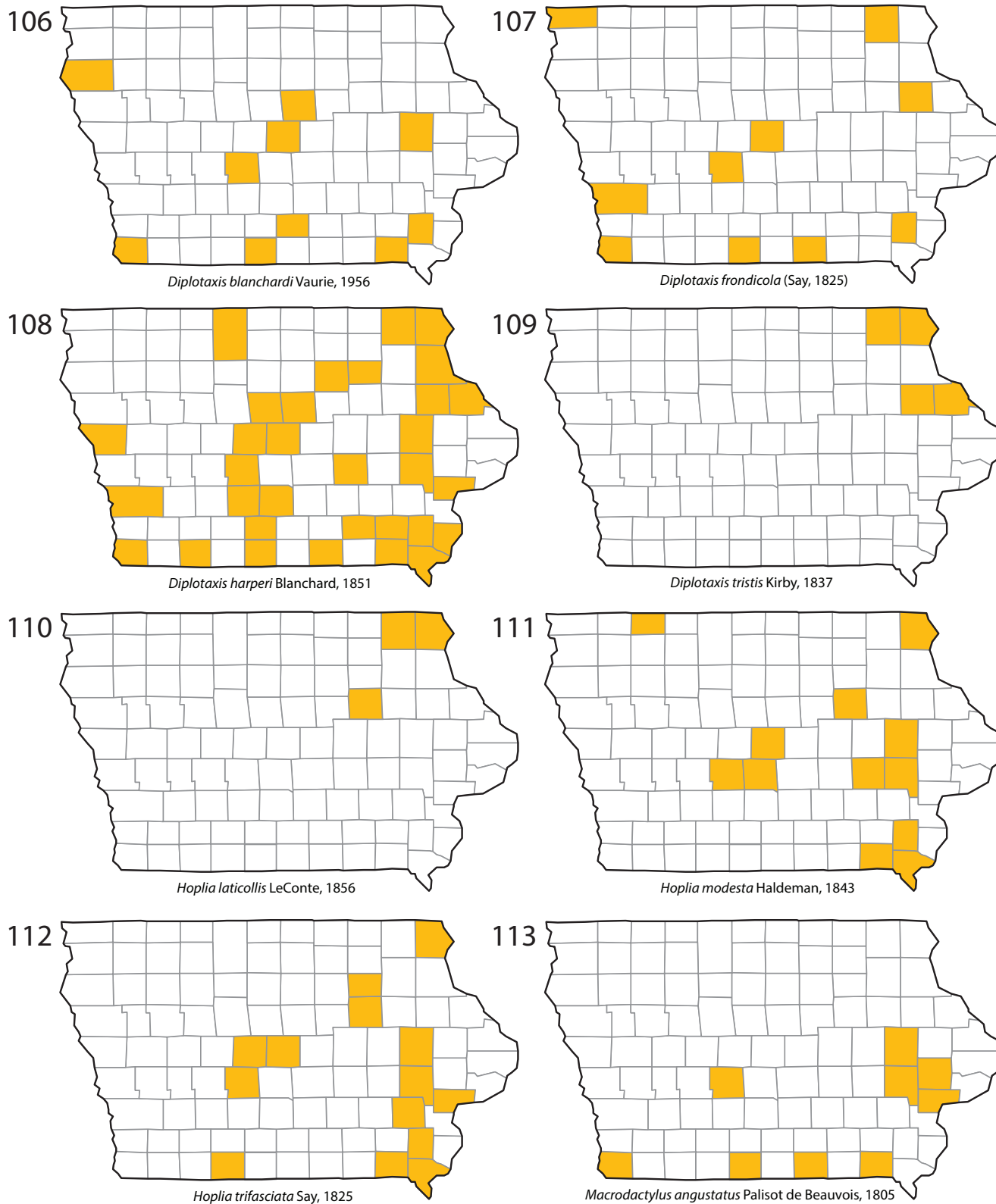
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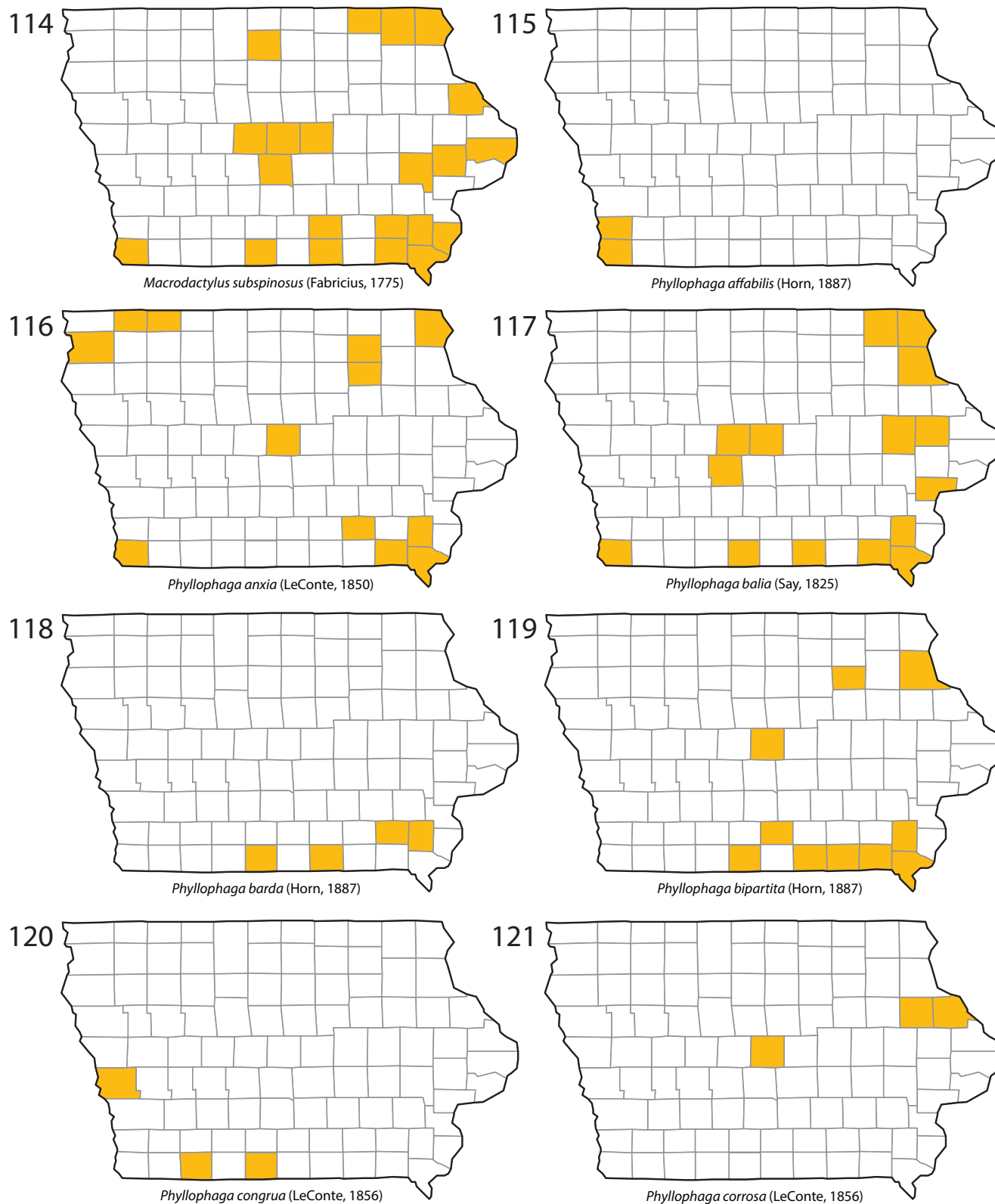
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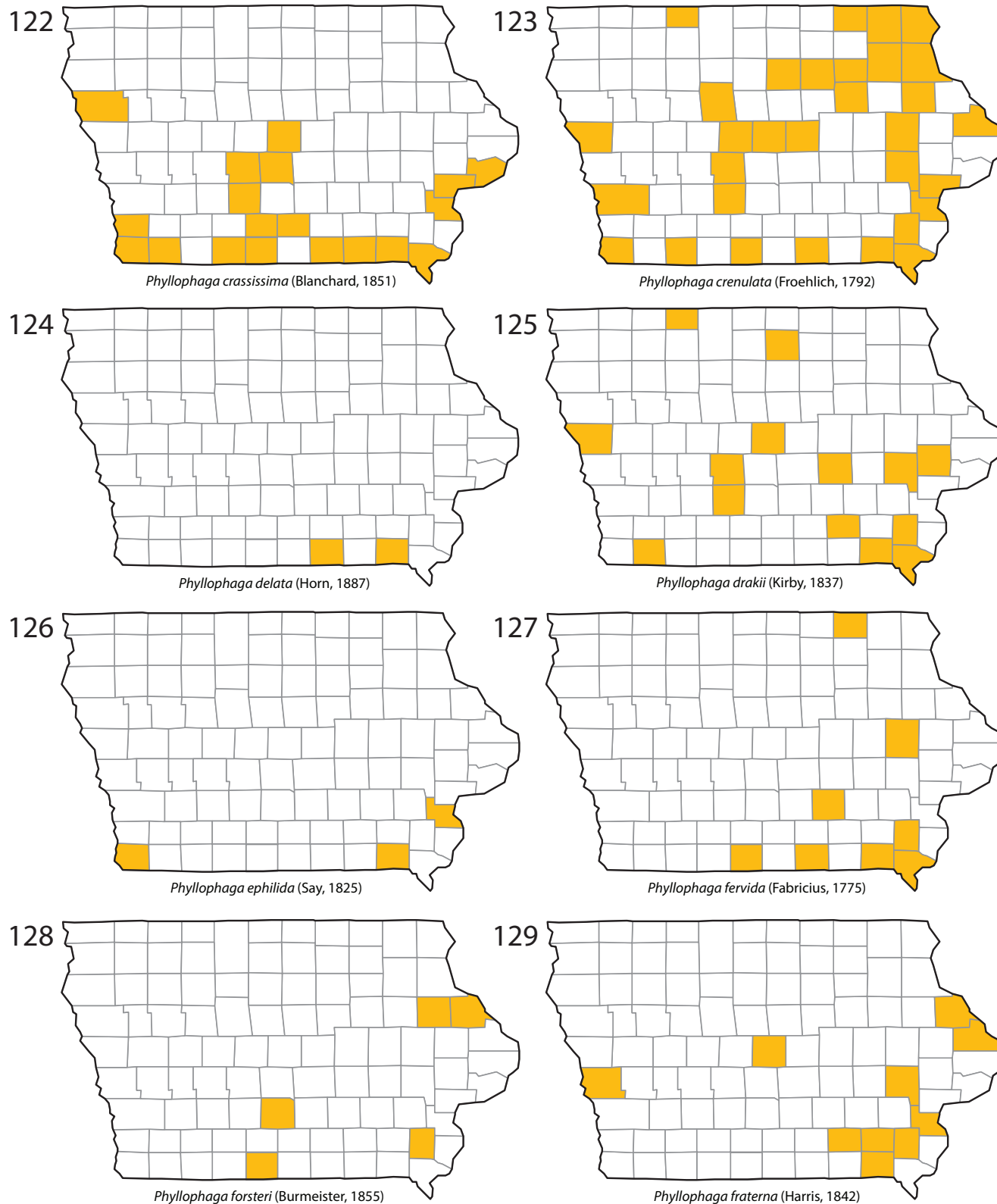
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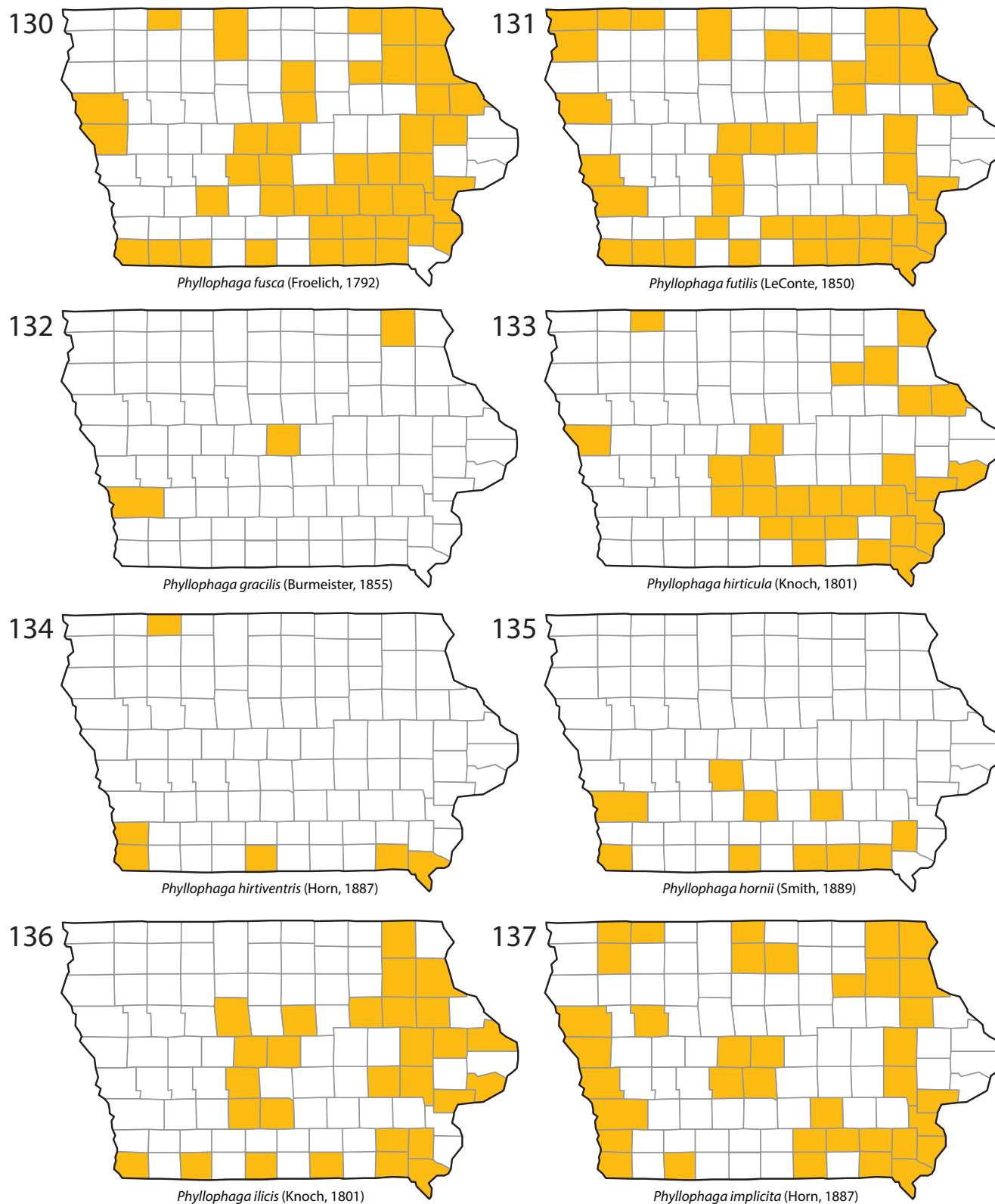
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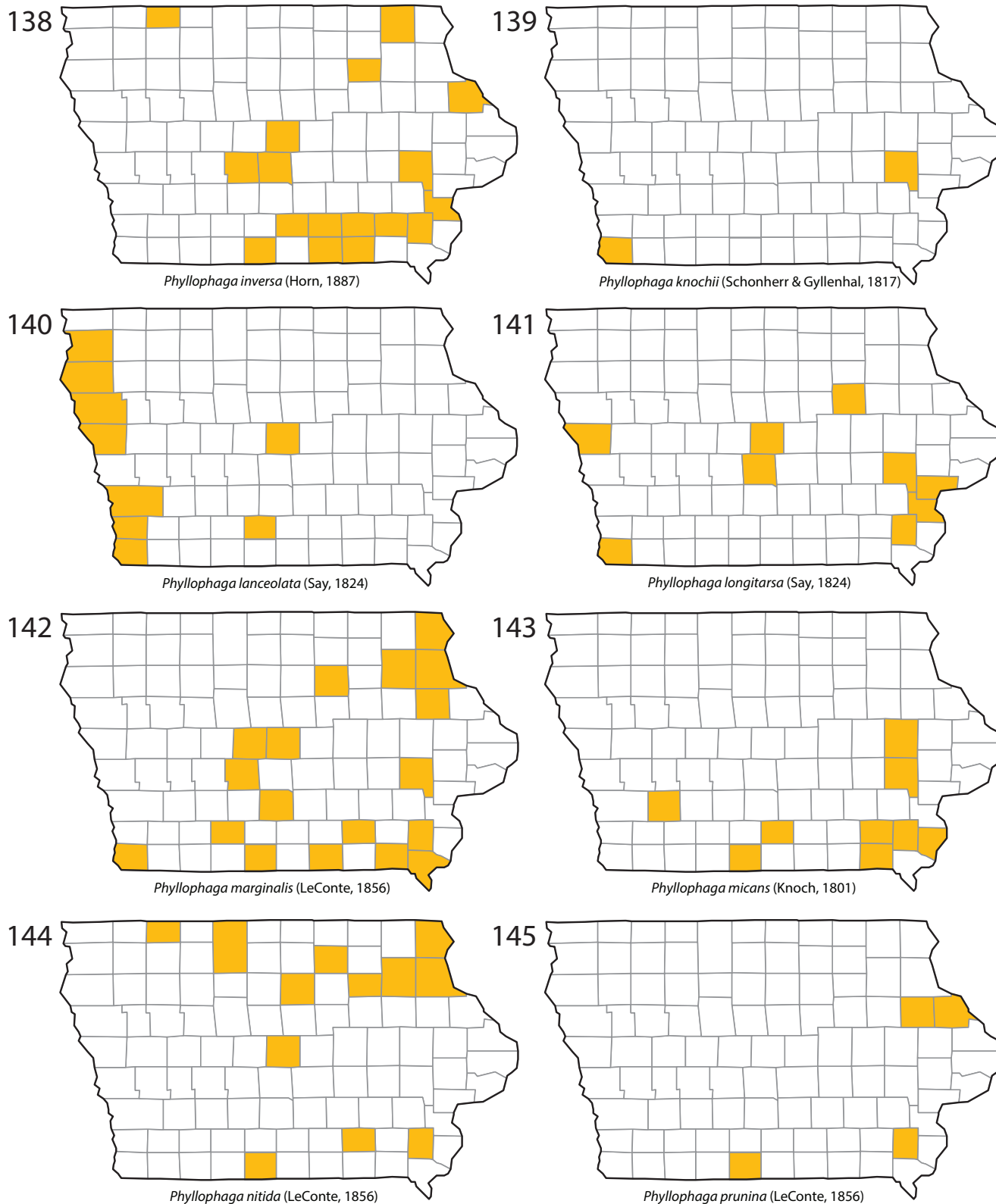
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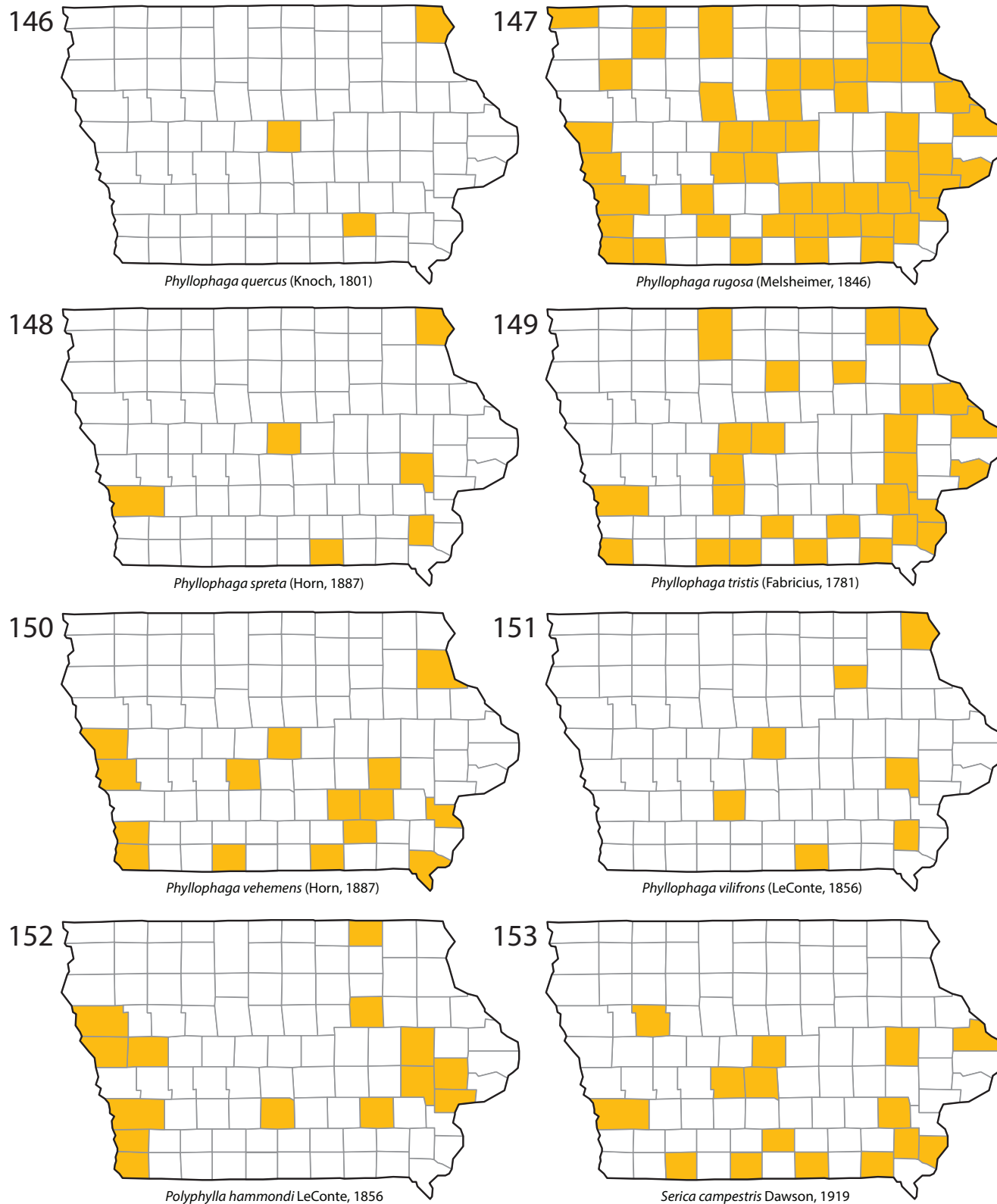
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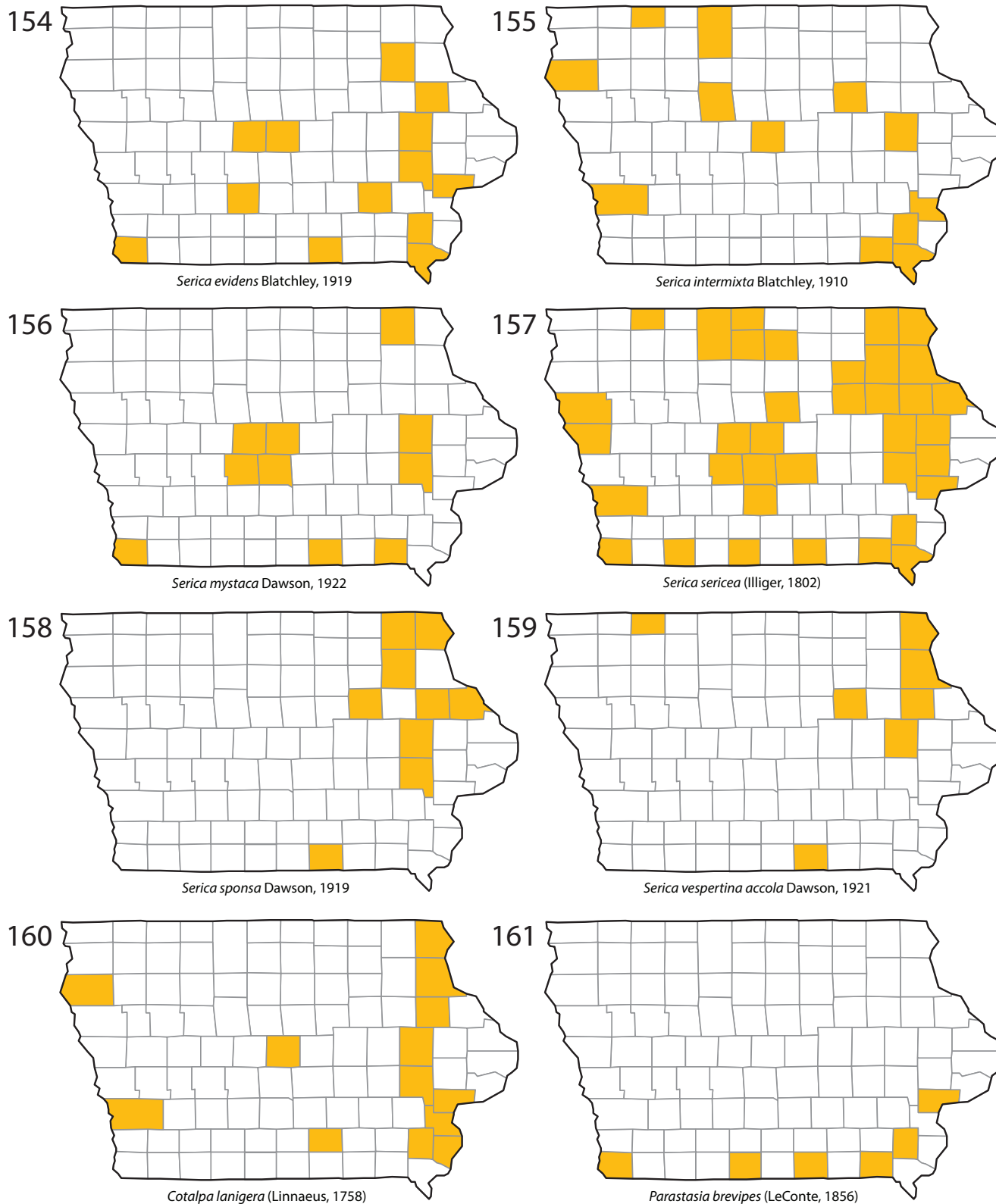
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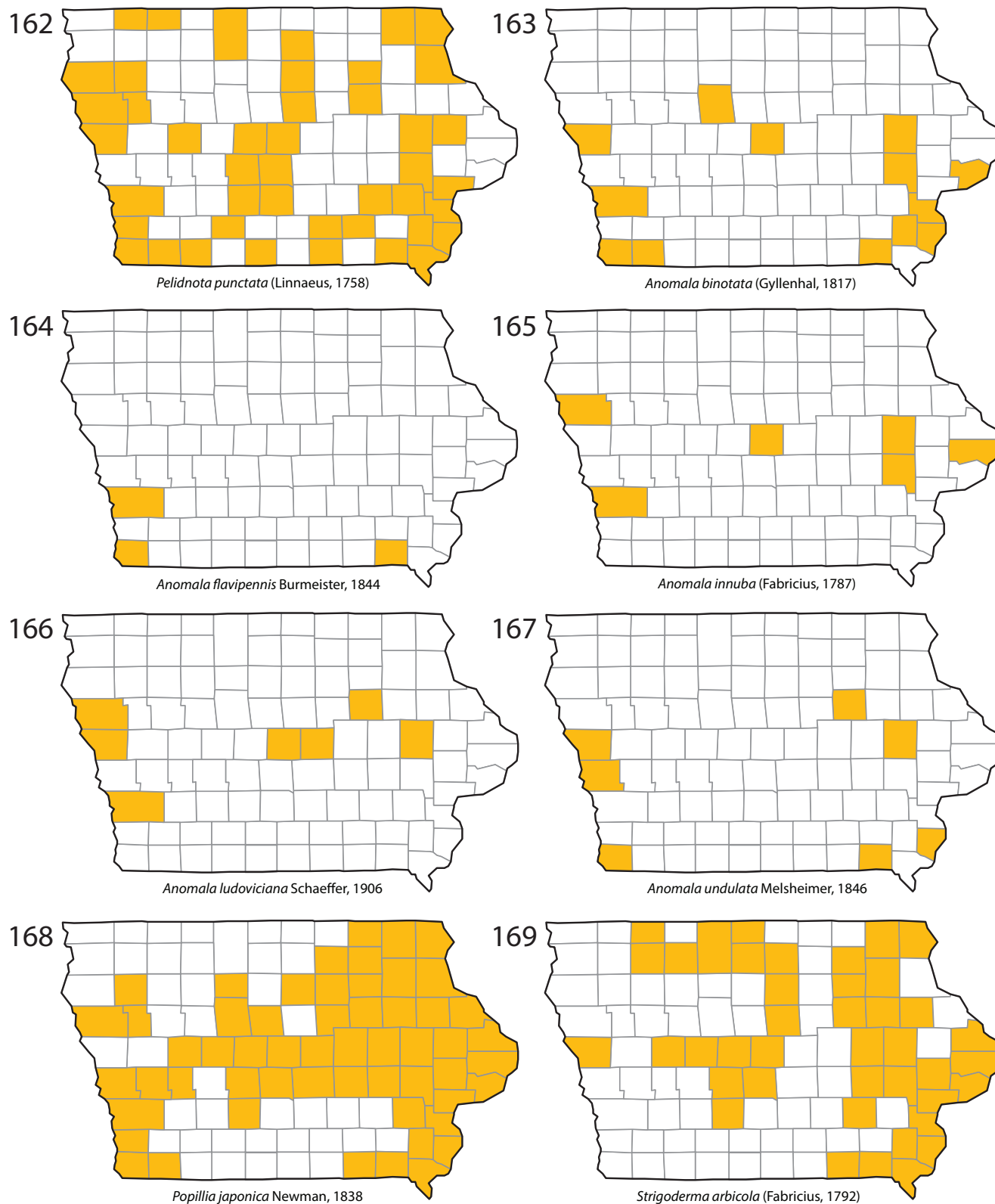
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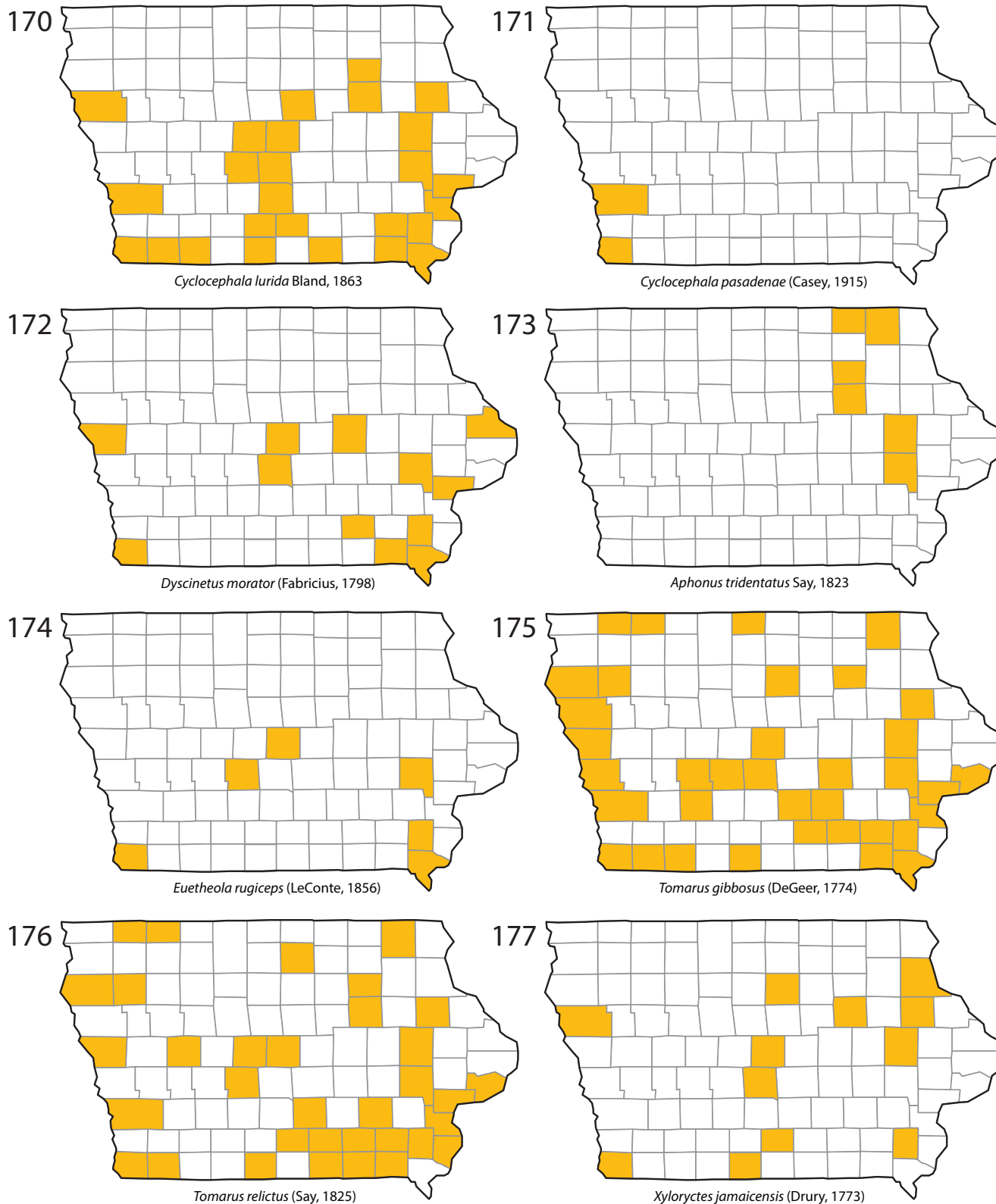
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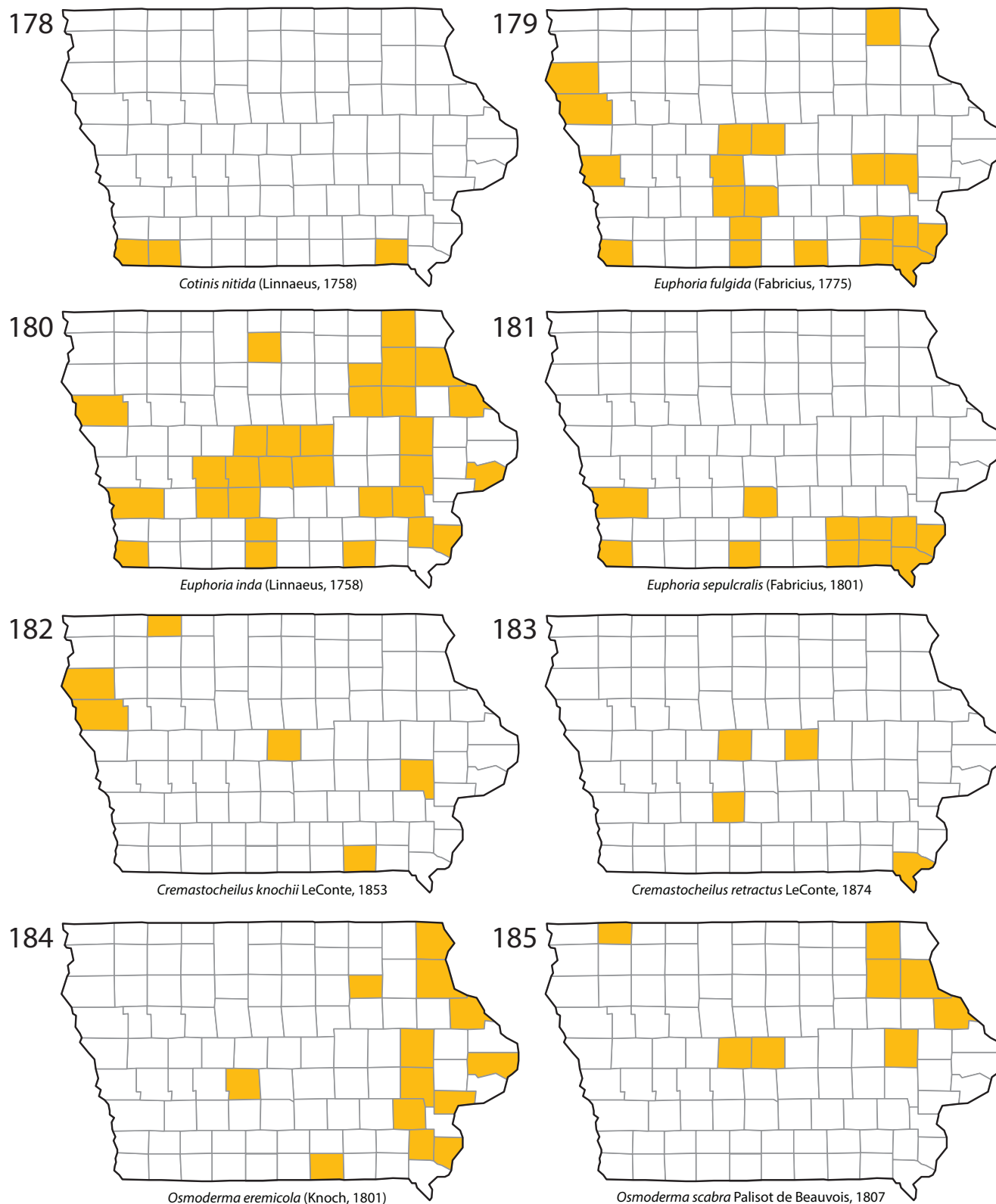
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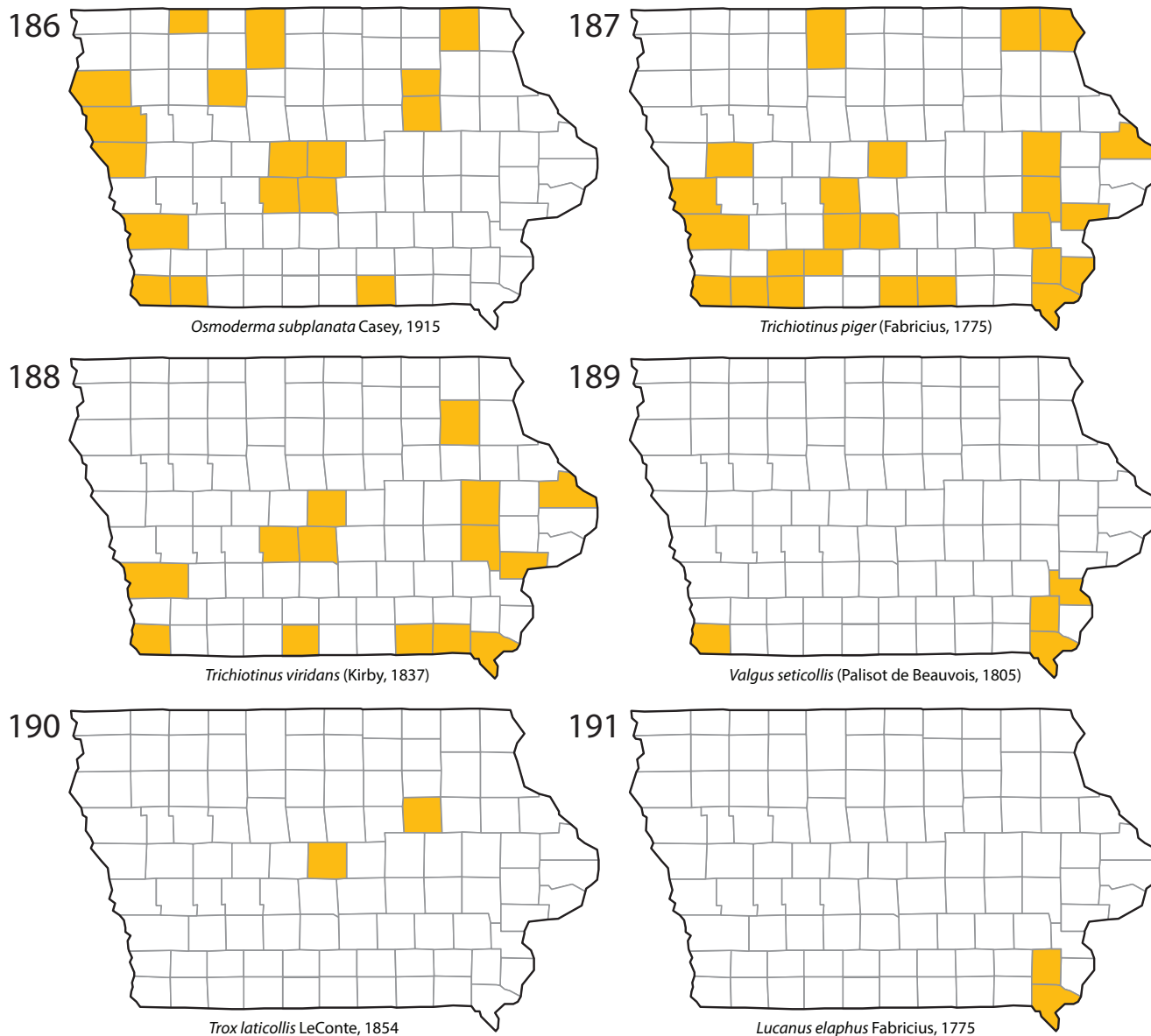
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