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NEW DISTRIBUTION RECORDS OF GROUND BEETLES FROM THE
NORTH CENTRAL UNITED STATES (COLEOPTERA: CARABIDAE)Foster Forbes Purrington¹, Daniel K. Young², Kirk J. Larsen³ and Jana Chin-Ting Lee⁴

ABSTRACT

We report 39 ground beetles new to five states in the upper midwestern United States. These species records include 19 new to Illinois (all but one from Lake County), 11 from Iowa, three from South Dakota, eight from Wisconsin, and two from Michigan. (Three species are new to more than one state). Enigmatically disjunct collections include the myrmecophile, *Helluomorphoides nigripennis* from western Illinois, known previously only from the Atlantic and Gulf coastal plain and piedmont, and *Chlaenius amoenus*, reported only from southeastern states and now from northeast Iowa.

From habitats that include agricultural zones in south central Michigan and Wisconsin, shortgrass prairie in western South Dakota, tallgrass prairies in Iowa and Wisconsin, and forested wetlands along the Lake Michigan shoreline in northern Illinois we report 39 ground beetle species (Coleoptera: Carabidae) that represent 43 new state distribution records (Bousquet and Laroche 1993, Purrington and Larsen 1997, Purrington and Maxwell 1998).

Many of these records are of species that have been previously reported from one or more adjoining states and Canadian provinces. Other records are of synanthropic European introductions (Bousquet 1992) evidently expanding their ranges, or of native species possibly tracking newly favorable environments, e.g. changing climates or agricultural landscapes. A few records represent enigmatically disjunct collections of uncommon species previously known only from sites distant from the western Great Lakes region.

MATERIALS AND METHODS

All specimens were obtained with standard pitfall or blacklight trapping techniques, or were hand-collected. Vouchers are kept at The Ohio State University-Columbus (FFP), Michigan State University-East Lansing (JC-TL), Luther College-Decorah, Iowa (KJL), and the University of Wisconsin-

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Madison [Department of Entomology (DKY) and Department of Agronomy (Jon Simonsen: JS)]. The disposition of vouchers is noted by custodial initials in the following species account. Species introduced from Europe are noted.

RESULTS

State records for Michigan. *Bembidion obtusum* Audinet-Serville, **Ingham Co.**, East Lansing, Michigan State University, Entomology Farm, 4/22/1998 and 5/7/1998, 2 specimens; 3/31/1999 and 4/5/1999, 3 specimens, *introduced*, pitfall, [FFP].

Harpalus puncticeps (Stephens), **Ingham Co.**, East Lansing: Michigan State University, Entomology Farm, September 1998; March, April and June 1999, numerous specimens, *introduced*, pitfall, [FFP, JC-TL].

State records for Illinois. *Acupalpus pumilus* Lindroth, **Lake Co.**, Libertyville, Grainger Woods Forest Preserve and Elm Road Forest Preserve; Winthrop Harbor, Spring Bluff Forest Preserve, July 1999, numerous specimens, blacklight, [FFP].

Agonum fidele Casey, **Lake Co.**, Libertyville, Grainger Woods Forest Preserve and Elm Road Forest Preserve; Winthrop Harbor, Spring Bluff Forest Preserve, June–August 1999, numerous specimens, pitfall and blacklight, [FFP].

Agonum harrisii LeConte, **Lake Co.**, Libertyville, Grainger Woods Forest Preserve; Winthrop Harbor, Spring Bluff Forest Preserve, July 1999, 16 specimens, blacklight, [FFP].

Amara apricaria (Paykull), **Lake Co.**, Winthrop Harbor, Spring Bluff Forest Preserve, 7/22/1999, 1 specimen, *introduced*, [FFP].

Amara quenseli (Schönherr), **Lake Co.**, Winthrop Harbor, Spring Bluff Forest Preserve, 9/29/1999, 4 specimens, pitfall, [FFP].

Badister grandiceps Casey, **Lake Co.**, Libertyville, Grainger Woods Forest Preserve; Winthrop Harbor, Spring Bluff Forest Preserve, July 1999, numerous specimens, blacklight, [FFP].

Badister transversus Casey, **Lake Co.**, Libertyville, Grainger Woods Forest Preserve and Elm Road Forest Preserve; Winthrop Harbor, Spring Bluff Forest Preserve, June–July 1999, numerous specimens, blacklight, [FFP].

Bembidion pseudocautum Lindroth, **Lake Co.**, Winthrop Harbor, Spring Bluff Forest Preserve, 8/3/1999, 1 specimen, blacklight, [FFP].

Bradycellus congener (LeConte), **Lake Co.**, Libertyville, Grainger Woods Forest Preserve, 7/8/1999, 1 specimen; Winthrop Harbor, Spring Bluff Forest Preserve, July 1999, 2 specimens, blacklight, [FFP].

Dyschirius integer LeConte, **Lake Co.**, Winthrop Harbor, Spring Bluff Forest Preserve, July 1999, 15 specimens, blacklight, [FFP].

Elaphropus tripunctatus (Say), **Lake Co.**, Libertyville, Grainger Woods Forest Preserve and Elm Road Forest Preserve, July 1999, 10 specimens, blacklight, [FFP].

Harpalus puncticeps (Stephens), **Lake Co.**, Libertyville, Grainger Woods Forest Preserve and Elm Road Forest Preserve; Winthrop Harbor, Spring Bluff Forest Preserve, July–August 1999, numerous specimens, *introduced*, blacklight, [FFP].

Helluomorphoides nigripennis (Dejean), **Mason Co.**, Sand Prairie-Scrub Oak State Natural Area, 7/16/1997, 1 specimen, pitfall, [FFP].

Paratachys oblitus (Casey), **Lake Co.**, Winthrop Harbor, Spring Bluff Forest Preserve, July 1999, 8 specimens, blacklight, [FFP].

Platynus opaculus LeConte, **Lake Co.**, Libertyville, Grainger Woods Forest Preserve, 5/28/1999, 3 specimens, blacklight, [FFP].

Plochionus timidus Haldeman, **Lake Co.**, Libertyville, Grainger Woods Forest Preserve, 7/30/1999, 1 specimen, blacklight, [FFP].

Pterostichus melanarius (Illiger), **Lake Co.**, Libertyville, Grainger Woods Forest Preserve; Winthrop Harbor, Spring Bluff Forest Preserve, 7/27-8/18/1999, numerous specimens *introduced*, pitfall, [FFP].

Pterostichus novus Straneo, **Lake Co.**, Winthrop Harbor, Spring Bluff Forest Preserve, 8/30/1999 and 9/29/1999, 9 specimens, pitfall, [FFP].

Pterostichus tenuis (Casey), **Lake Co.**, Winthrop Harbor, Spring Bluff Forest Preserve, 7/22/1999, 1 specimen, blacklight, [FFP].

State records for Wisconsin. *Agonum fidele* Casey, **Sauk Co.**, Hemlock Draw Preserve, The Nature Conservancy, July 1998, several specimens, pitfall, [FFP].

Amara lunicollis Schiødte, **Columbia, Dane, Green, Richland, and Vernon Co.**, June–July 1997, 1998, numerous specimens, pitfall, [FFP, JS].

Badister flavipes laticeps Blatchley, **Green Co.**, 6/30/1998, 1 specimen, blacklight, [JS].

Bembidion praticola Lindroth, **Juneau Co.**, Necedah National Wildlife Refuge, 6/11/1996, 2 specimens, pitfall, [DKY].

Chlaenius pusillus Say, **Columbia Co.**, Arlington Research Station, July–August 1996, 5 specimens; **Walworth Co.**, Lakeland Agricultural Station, 8/26/1996, 1 specimen, [DKY, JS].

Harpalus katiae Battoni, **Sauk Co.**, Spring Green Preserve, 8/24/1995, several specimens, [DKY, FFP].

Harpalus puncticeps (Stephens), 1 specimen, **Walworth Co.**, Lakeland Agricultural Station, *introduced*, 9/1/1995, [DKY].

Selenophorus gagatinus Dejean, **Juneau Co.**, Necedah National Wildlife Refuge, 5/17/1996, 1 specimen, [DKY].

State records for Iowa. *Apenes lucidulus* (Dejean), **Clayton Co.**, Mendon Township, Effigy Mounds National Monument, South Unit Prairie, 6/27/1996, 1 specimen, [KJL].

Badister neopulchellus Lindroth, **Winneshiek Co.**, Decorah, Anderson Prairie (Luther College), 6/16/1998 and 6/26/1998, 2 specimens, blacklight, [KJL].

Bembidion obscurellum (Motschulsky), **Floyd Co.**, 6/27/1978, 1 specimen blacklight, [KJL].

Bembidion praticola Lindroth, **Howard Co.**, Chester Township, Hayden Prairie, 6/14/1994, 1 specimen; 9/8/1995, 1 specimen, 7/22/1996, 2 specimens, [KJL, FFP].

Bradycellus semipubescens Lindroth, **Winneshiek Co.**, Jackson Township, Chipera Prairie, 7/1/1996, 1 specimen, [KJL].

Chlaenius amoenus Dejean, **Clayton Co.**, Mendon Township, Effigy Mounds National Monument, South Unit Prairie, 6/27/1996, 1 specimen, [KJL].

Harpalus affinis (Schrank), **Winneshiek Co.**, Jackson Township, 7/22/1996, 1 specimen, *introduced*, [KJL].

Pterostichus trinarius (Casey), **Allamakee Co.**, Fairview Township, 6/19/1995, 2 specimens, [KJL].

Scaphinotus bilobus (Say), **Winneshiek Co.**, Decorah, Hickory Ridge Woods, 9/7/1998, 1 specimen; Canoe Township, Malanaphy Springs, 10/1/1999, 1 specimen, [KJL].

Trichotichnus autumnalis (Say), **Clayton Co.**, Mendon Township, Effigy Mounds National Monument, South Unit, 6/27/1996, 1 specimen; **Winneshiek Co.**, Canoe Township, Malanaphy Springs, 9/22/1999, 1 specimen, [KJL].

Trichotichnus vulpeculus (Say), **Jasper Co.**, Walnut Creek National

Wildlife Refuge, 10/11/1997, 2 specimens; **Winneshiek Co.**, Decorah, 9/5/1995, 1 specimen, [KJL].

State records for South Dakota. *Bembidion mutatum* Gemminger and Harold, **Pennington Co.**, Wheaton College Science Station (Hisega), 7/10/1994, 1 specimen, [KJL].

Carabus nemoralis Müller, **Pennington Co.**, Wheaton College Science Station (Hisega), 6/12/1996, 1 specimen, *introduced*, [KJL].

Carabus taedatus agassii LeConte, **Pennington Co.**, Wheaton College Science Station (Hisega), 5/23/1995, 1 specimen, [KJL].

DISCUSSION

Harpalus puncticeps was inadvertently introduced from Europe into coastal New York (Long Island), probably in the mid-1900's (Dietrich 1957). Davidson (1975) reported its movement 100 km up the Hudson River to Poughkeepsie (Duchess County) and from northern Vermont (Washington County). By 1989 it had been collected in Nova Scotia, Quebec, Ontario, and Ohio (Larochelle and Lariviere 1989). Here we document its continuing westward range expansion with the first records from Michigan, Illinois and Wisconsin. This species favors ruderal and old field habitats developed on gravelly soil (Lindroth 1968).

Little is known of *Platynus opaculus* ecology although it evidently is extremely hygrophilous. Davidson and Bell (1977) reported many captures in wetland sites of several Vermont counties. They found adults under loose bark of dead trees, stumps and logs protruding from spring floodwaters. Beetles they disturbed often descended quickly below the waterline to depths of 25 cm. where they remained motionless for several minutes before surfacing. It was also found in an abandoned beaver lodge in Quebec (Lindroth 1969).

We found the recent European immigrant, *Bembidion obtusum*, in an agricultural setting in south central Michigan, the westernmost record for this recently introduced (Lindroth 1963) ground beetle.

Our records of *Harpalus katiæ* are the most northern for this species, the subject of a recent taxonomic review by Will (1997), who suggested it is more stenotopic than its closely related congener, *H. caliginosus* (F.). He noted it has moved northward along major river systems, perhaps exploiting sandy alluvial habitats.

From west central Illinois we report by far the most disjunct collection of the rare putative myrmecophile, *Helluomorphoides nigripennis*, known previously from along the Atlantic coast from Massachusetts to Texas (Ball 1956). Several congeners in southwestern states accompany doryline army ants (Hymenoptera: Formicidae: Dorylinae), feeding on immatures (Wilson 1971), but apparently nothing is known of *H. nigripennis* biology (Davidson 1995). Two army ant species are recorded from Illinois: *Neivamyrmex nigrescens* (Cresson) from Adams, Pulaski and Union Counties, and *N. carolinensis* (Emory) from Pope County; a third [*N. opacithorax* (Emory)] probably occurs in the state (DuBois 1988).

Another very anomalous distribution record is that of a male *Chlaenius amoenus* from northeastern Iowa. This species, [in the *emarginatus* group of Bousquet and Larochelle (1993) with produced mandibles], has a less than certain taxonomy. According to Robert L. Davidson (pers. comm.), *amoenus* Dejean may correctly apply to another *emarginatus* group species that more closely resembles *C. pusillus* Say. This implies that the *Chlaenius* we found may be undescribed (the Dejean type needs to be examined). Until now it has

been reported only from Mississippi, Alabama and up the Atlantic coast from Florida to Virginia (Bousquet and Laroche 1993).

We hope this report will encourage field study of ground beetle assemblages at more sites in the upper Midwest, especially in ecologically fragile areas such as small wetlands where building development pressures degrade habitats and erode biodiversity at high rates. For us to uncover 18 new state records for Illinois in two wetland enclaves close to metropolitan Chicago, thereby increasing the known state Carabidae fauna by 4%, should be a strong incentive for further such surveys. Some ground beetles found there (of 139 species) are rarely encountered anywhere, and may represent vulnerable relict populations (Purrington and Davidson 2000).

Additionally, we note that since 1997 the known ground beetle fauna of Iowa has been expanded more than 7.3% by adding 24 new records, all from counties in the northeastern corner of the state (Purrington and Larsen 1997). In Wisconsin, similar efforts have added a total 14 new records, increasing the reported fauna by 3.7% (Purrington and Maxwell 1998).

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