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RESEARCH NOTE

Records of Thirteen Ground Beetles (Coleoptera: Carabidae) New to Iowa

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A long-term ecological research initiative in northeast Iowa tallgrass prairies to evaluate the effects of prescribed burning on prairie insects was begun in 1993. During the course of this work we discovered 13 ground beetle species (Coleoptera: Carabidae) (Table 1) not previously reported from Iowa (Bousquet and Laroche 1993).

We focused on ground beetles because this large taxon is among the most numerous and important insect families (Harris and Whitcomb 1974), primarily as predators of other invertebrates (Whitcomb and Bell 1964; Loreau 1990). The range of habitats colonized by carabids is wide, but most north temperate zone species are epigeal and not found far from stable, open water. Many species of carabids are highly selective and often restricted to a particular habitat (Thiele 1977; Evans 1983). This selectivity makes carabids well suited to be used as bioindicators of changes within terrestrial communities (Freitag 1979; Evans 1983; Dufrêne et al. 1990; Paoletti et al. 1991).

Pitfall traps were the primary method utilized to obtain baseline information on the ground beetle fauna. We conducted surveys at five different tallgrass prairie sites and neighboring agricultural, old field, and wooded habitats in Clayton, Howard, and Winneshiek Counties. At each site, 12 pitfall traps were set out for weekly exposures on a monthly basis. Pitfall traps were constructed from 473 mL (16 oz) plastic 9 cm dia cups dug 12 cm into the ground so the

lip of each cup was level or slightly below the surface of the ground. Each cup was filled with approximately 50 mL of propylene glycol diluted 1:1 with water and a few drops of liquid dish detergent added to reduce surface tension. A small funnel constructed from a 207 mL (7 oz) plastic casual cup insert was then set into each trap. One record species was collected while blacklighting.

This trapping effort has resulted in the capture of more than 95 species of ground beetles, 12 of which are new records for Iowa (Table 1). In addition, we report one new Iowa species collected in 1973 located in the Luther College (Decorah, Winneshiek County, Iowa) insect collection. The collecting method and habitat for that species is unknown. Voucher specimens of all species are held in the research insect collection of the Sherman Hoslett Museum of Natural History at Luther College.

Most of the state record species we found generally fit the habitat associations described by Lindroth (1961-1969), Purrington et al. (1989), and Will et al. (1995). One species, *Stenolophus rotundicollis*, is recorded for the first time west of the Mississippi River. Two other beetles, *Bembidion postremum* and *Agonum fidele*, species typically found along river banks, were found in a wooded habitat within 100 m of the Upper Iowa River. *Agonum fidele* is relatively common in Northeastern Iowa, found in large numbers at many of our research sites. The one beetle found in the Luther insect collection, for which we

Table 1. Thirteen ground beetle (Coleoptera: Carabidae) species newly recorded from Iowa with location, habitat and method of collection information. Taxa are arranged according to their phylogenetic position, from basal grade to most derived.

SPECIES	DATE	SITE & LOCATION	HABITAT TYPE	COLLECTING METHOD
<i>Loricera pilicornis</i> (F.)	23 June 1994	Chipera Prairie, Winneshiek Co.	tallgrass prairie	pitfall trap
<i>Bembidion postremum</i> Say	2 August 1994	Decorah, Winneshiek Co.	riparian woods	pitfall trap
<i>Pterostichus melanarius</i> (Illiger)	16 August 1993	Anderson Prairie, Winneshiek Co.	tallgrass prairie	pitfall trap
<i>Pterostichus adstrictus</i> Eschscholtz	17 June 1994	Effigy Mounds, Clayton Co.	woods	pitfall trap
<i>Pterostichus corvinus</i> (Dejean)	6 August 1994	Chipera Prairie, Winneshiek Co.	tallgrass prairie	pitfall trap
<i>Myas cyanescens</i> Dejean	3 August 1994	Hickory Ridge, Winneshiek Co.	woods	pitfall trap
<i>Pentagonica picticornis</i> Bates	6 October 1993	Decorah, Winneshiek Co.	tallgrass prairie	blacklight
<i>Stenolophus fuliginosus</i> Dejean	16 April 1996	Anderson Prairie, Winneshiek Co.	tallgrass prairie	pitfall trap
<i>Stenolophus rotundicollis</i> (Haldeman)	13 June 1994	Decorah, Winneshiek Co.	old field	pitfall trap
<i>Synuchus impunctatus</i> (Say)	17 June 1994	Effigy Mounds, Clayton Co.	woods	pitfall trap
<i>Agonum fidele</i> Casey	2 August 1994	Decorah, Winneshiek Co.	riparian woods	pitfall trap
<i>Agonum palustre</i> Goulet	6 August 1994	Hayden Prairie, Howard Co.	tallgrass prairie	pitfall trap
<i>Agonum retractum</i> LeConte	15 September 1973	Decorah, Winneshiek Co.	unknown	unknown

do not have habitat or collecting method data, *Agonum retractum*, is typically found in mature forests and is not hygrophilous (Lindroth 1961–1969).

Flight capability in some taxa of Carabidae is under genetic control and selected by certain habitat attributes (flight dimorphic species); others are invariably flightless or always flightworthy (Darlington 1943; Liebherr 1988). This has implications for the colonization of isolated habitats such as tallgrass prairie remnants and distributional dynamics at the margins of faunal ranges; our new records may portend large scale environmental shifts in the upper Midwest. However, it is premature to identify definitive habitat preferences and other ecological preferences for most of these species as capture rates were in some cases only a single specimen. Continuing ecological research at these Northeastern Iowa prairie sites will document population trends and allow more robust discussion of local community interactions involving the entire ground beetle complement.

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