

## SCIENTIFIC NOTE

**NEW DISTRIBUTION RECORDS OF GROUND BEETLES  
(COLEOPTERA: CARABIDAE) FROM IOWA AND  
SOUTH DAKOTA, U.S.A.**Kirk J. Larsen<sup>2</sup> and Foster F. Purrington<sup>3</sup>

The ground beetle (Coleoptera: Carabidae) fauna of the Central Plains has been recorded locally in occasional state lists (e.g. Kirk and Balsbaugh, 1975; Jaques and Redlinger, 1945), while additions have been reported mainly as a by-product of other studies (e.g. Esau and Peters, 1975; Ellsbury et al., 1998). Further studies may reveal additional distribution record species and help refine habitat preferences (e.g. Larsen et al., 2003). Previously we have reported new state distribution records for 24 species of ground beetles from Iowa and three species from South Dakota (Purrington and Larsen, 1997; Purrington et al., 2000). During subsequent investigations, we have found an additional 12 species of ground beetles that according to Bousquet and Laroche (1993) represent new state distribution records for either Iowa or South Dakota, and one additional species with a significant range expansion within South Dakota.

All beetles were collected using standard pitfall trapping or light trapping techniques, or collected by hand. Several species were collected by hand after heavily treading moist litter amongst cattails growing on the edge of a marsh near Brookings, SD. Voucher specimens are deposited in the insect collection of the Hoslett Museum of Natural History at Luther College, Decorah, Iowa.

***State Records for Iowa***

*Agonum muelleri* (Herbst), 2 specimens, Allamakee Co., Dorchester, Osterholm Property, 43.481°N, 91.520°W, 29 June 2004, Coll. K. Larsen, \*introduced\*, collected in pitfall trap in riparian reconstructed tallgrass prairie.

*Anisodactylus caenus* (Say), 1 specimen, Boone Co., Iowa State University Marsten Farm, 42.01°N, 93.47°W, 4 June 2004, Coll. M. O'Rourke, collected from soybean field in pitfall trap.

***State records for South Dakota***

*Agonum canadense* Goulet, 1 female specimen, Brookings Co., SDSU Oak Lake Field Station, 44.510°N, 96.53°W, 24 June 2008, Coll. MJ Hatfield.

*Badister obtusus* LeConte, 1 specimen, Pennington Co., Hisega, Wheaton College Science Station, 44.063°N, 103.412°W, 20 July 1999, Coll. K. Larsen in pitfall trap from unmowed dry meadow; 1 female specimen, Brookings

<sup>1</sup> Received on September 8, 2008. Accepted on November 9, 2008.

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- Co., SDSU Oak Lake Field Station, 44.510°N, 96.53°W, 24 June 2008, Coll. K. Larsen by hand in moist cattail litter.
- Bembidion musicola* Hayward, 2 specimens (1 male, 1 female), Brookings Co., SDSU Oak Lake Field Station, 44.510°N, 96.53°W, 24 June 2008, Colls. K. Larsen, F. Purrington by hand in moist cattail litter.
- Calosoma frigidum* Kirby, 2 specimens, Pennington Co., Rockerville, Battle Creek Fire site, 43.895°N, 103.359°W, 15 June 2004, Coll. K. Larsen in pitfall trap in low intensity burned ponderosa pine forest.
- Cymindis interior* Lindroth, 1 specimen, Custer Co., Jasper Fire site, 43.758°N, 103.878°W, 2 July 2002, Coll. K. Larsen in pitfall trap in moderate intensity burned ponderosa pine forest.
- Elaphrus clairvillei* Kirby, 1 female specimen, Brookings Co., SDSU Oak Lake Field Station, 44.510°N, 96.53°W, 23 June 2008, Coll. K. Will by hand in moist cattail litter.
- Elaphrus olivaceus* LeConte, 1 specimen, Lawrence Co., Little Elk Creek Canyon, 44.238°N, 103.461°W, 27 June 2006, Coll. T. Warsavage from dry open logging trail; 1 female specimen, Brookings Co., SDSU Oak Lake Field Station, 44.510°N, 96.53°W, 24 June 2008, Coll. J. Bryant.
- Harpalus providens* Casey, 4 specimens, Pennington Co., Rockerville, Battle Creek Fire site, 43.899°N, 103.21°W, 1 July 2003 and 15 June 2004, Coll. K. Larsen in pitfall traps in high intensity burned ponderosa pine forest.; Pennington Co., Hisega, Wheaton College Science Station, 44.063°N, 103.412°W, 3 July 2003, Coll. K. Larsen in pitfall traps in open dry meadow.
- Notiobia nitidipennis* (LeConte), 1 specimen, Pennington Co., Hisega, Wheaton College Science Station, 44.063°N, 103.412°W, 1 July 2006, Coll. R. Fagan hand collecting in grass meadow.
- Panagaeus fasciatus* Say, 1 specimen, Lawrence Co., Little Elk Creek Canyon, 44.238°N, 103.461°W, 19 June 2003, Coll. K. Larsen hand collecting on dry, open logging trail.
- Pterostichus melanarius* (Illiger), 2 specimens, Pennington Co., Hisega, Wheaton College Science Station, 44.063°N, 103.412°W, 20 July 1999 and 6 July 2005, Coll. K. Larsen, \*introduced\*, pitfall traps in grass meadow along Rapid Creek.

We present 12 new state distribution records for ground beetles in Iowa and South Dakota, and one significant within state distribution record for South Dakota (*P. melanarius*). The ecology of eleven of these species has been summarized by Lindroth (1961-1969), and they generally fit their known habitat associations, while the habitats for the remaining species are described above. Many of these species are known to occur in adjoining states (Bousquet and Laroche, 1993). It appears several of these species may be expanding their ranges or their distribution may be tracking shifting climatic conditions.

Of the two new Iowa state records, *A. muelleri* was found in extreme north-eastern Iowa. This introduced species from Europe (Cardenas and Buddle, 2007) has been previously reported in both Wisconsin and Minnesota. The record from central Iowa, *A. caenus*, has been reported in Missouri and Kansas, and appears to be more southern in its distribution.

Ten new state records, and one significant range extension, were recorded from South Dakota. Most of these species are found in neighboring North Dakota, Wyoming, Nebraska, Minnesota, or Iowa. The distribution of *C. interior* is apparently restricted to the intermountain and western plains region of the United States. *H. providens* and *A. canadense* represent apparent range extensions to the west, since they have been found primarily in the eastern United States and Canada (Bousquet and Laroche, 1993). *N. nitidipennis* also seems to be expanding its range westward, as previous reports put it as far west as Illinois and Wisconsin.

*Pterostichus melanarius*, a species introduced from northern Europe (Lindroth, 1957) to both the east and west coasts (Bousquet and Laroche, 1993), seems to be continuing to expand its range into the Central Plains, as we previously reported it as a state record in Iowa (Purrington and Larsen, 1997). One specimen of this species was reportedly previously in extreme eastern South Dakota near Brookings (Brookings County) in 1993 or 1994 (Ellsbury et al., 1998). However, the only specimen of *P. melanarius* found in the South Dakota State University insect collection was collected in Brookings on 6 September 2001, also by M. Ellsbury. Our collection of this species in the Black Hills, over 600 km to the west, represents a significant range expansion for this species.

It is a certainty that additional state record species of ground beetles will be found in both Iowa and South Dakota, due both to the lack of comprehensive taxonomic surveys and to the relative limited geographic focus of previous studies in both Iowa (e.g. Esau and Peters, 1975; Larsen et al., 2003; Larsen and Work, 2003) and South Dakota (e.g. Kirk, 1971; Ellsbury et al., 1998).

#### ACKNOWLEDGMENTS

This study was supported by student/faculty collaborative research grants from Luther College funded by an award from the U.S. EPA (grant X98757301). Assisting with field work were Luther summer research students D. Woods, B. Rouse, J. Givens, and students of entomology classes from both Luther College (Decorah, IA) and the Wheaton College Science Station (Rapid City, SD). The assistance of R. Davidson (Carnegie Museum, Pittsburg, PA) in identifying several of the specimens was appreciated. We thank Jon Lundgren and Kip Will for reviewing earlier drafts of this manuscript, and Yves Bousquet for his assistance in confirming state record status.

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