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FIRST RECORD OF *GRAPHODERUS LIBERUS* (COLEOPTERA: DYTISCIDAE) IN NORTH DAKOTA -- *Graphoderus liberus* is a moderate sized (11 to 12 mm) predaceous diving beetle (Coleoptera: Dytiscidae). Two species of *Graphoderus* have been recorded in North Dakota, *G. perplexus*, and *G. occidentalis* (Gordon and Post 1965, Hanson and Swanson 1989). *Graphoderus liberus* is transcontinental from New York to British Columbia, but it is more common along the coasts (Larson 1975). In Canada, *G. liberus* is uncommon; in Alberta only two specimens have been reported from woodland pools (Larson 1975). There have been no records of *G. liberus* occurring in North Dakota. *Graphoderus liberus* is easily distinguished from *G. perplexus* and *G. occidentalis* by the lack of anterior and posterior dark transverse bands on the pronotum (Fig. 1). April 17, 2000, we collected one male *G. liberus* at the Cottonwood Lake Study Area (Swanson 1987), Stutsman County, North Dakota. The specimen is archived in the aquatic invertebrate collection at the U. S. Geological Survey's Northern Prairie Wildlife Research Center in Jamestown, North Dakota. We captured the specimen in a funnel trap (Swanson 1978) set in 64 cm deep water in the shallow marsh zone (open water phase) of a seasonal wetland (Stewart and Kantrud 1971). At the time the specimen was collected, the water temperature was 9°C and the specific conductance was 370 $\mu S\ cm^{-1}$. Aquatic plants in the vicinity of the collection site included coontail (*Ceratophyllum demersum*), star duckweed (*Lemna trisulca* L.), and turion duckweed (*Lemna turionifera*). This wetland cycles between wet and dry phases, as is normal in the prairie pothole region (Euliss et al. 1999), and it was in the lake phase (van der Valk and Davis 1978) with a maximum water depth of 0.94 m when we collected the *G. liberus* specimen. The hydrologic setting, geology, water chemistry, and wetland plant communities of wetlands at the Cottonwood Lake Study Area have been described by Winter and Carr (1980), Swanson (1990), LaBaugh et al. (1996), and Poiani et al. (1996), respectively.

We thank Kelly B. Miller, Department of Entomology, Cornell University, for verification of the specimen.--*Bruce A. Hanson[1], Ned H. Euliss, Jr., and David M. Mushet, U. S. Geological Survey, Northern Prairie Wildlife Research Center, 8711 37th Street SE, Jamestown, ND 58401. [1]E-mail address: bruce_hanson @usgs.gov*

LITERATURE CITED

Euliss, N. H., Jr., D. A. Wrubleski, and D. M. Mushet. 1999. Wetlands of the prairie pothole region: invertebrate species composition, ecology, and management. Pp. 471-514 *in* Invertebrates in freshwater wetlands of North America: ecology and management. (D. P. Batzer, R. B. Rader, and S. A. Wissinger, editors.). John Wiley & Sons, Inc., New York, New York.

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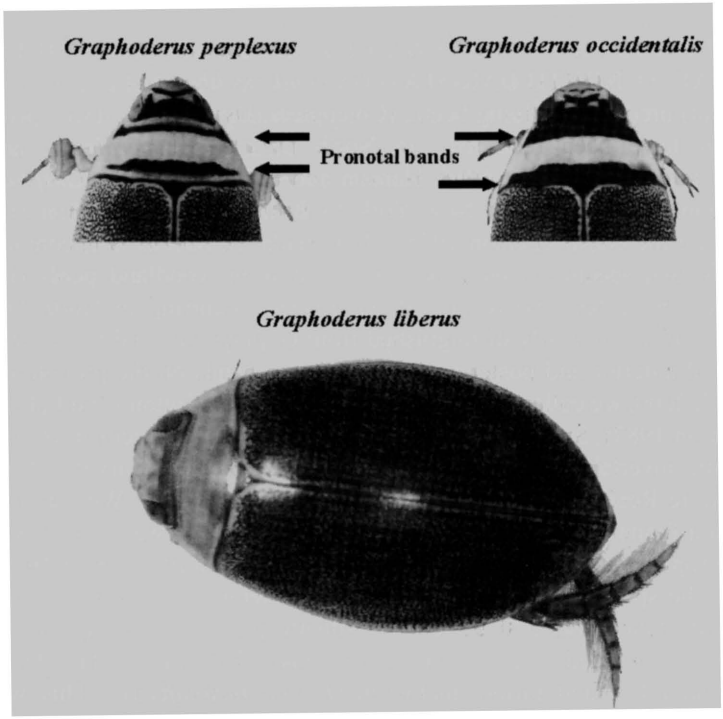

Figure 1. *Graphoderus liberus* collected at the Cottonwood Lake Study Area April 17, 2000. Both *G. perplexus* and *G. occidentalis* are shown for comparison of pronotal markings. Note the absence of pronotal bands on *G. liberus*.

Gordon, R. D., and R. L. Post. 1965. North Dakota water beetles. North Dakota Insects No. 5, North Dakota State University, Fargo, North Dakota.

Hanson, B. A., and G. A. Swanson. 1989. Coleoptera species inhabiting prairie wetlands of the Cottonwood Lake Area, Stutsman County, North Dakota. Prairie Naturalist 21:49-57.

LaBaugh, J. W., T. C. Winter, G. A. Swanson, D. O. Rosenberry, R. D. Nelson, and N. H. Euliss, Jr. 1996. Changes in atmospheric patterns affect midcontinent wetlands sensitive to climate. Limnology and Oceanography 41:864-870.

Larson, D. J. 1975. The predaceous water beetles (Coleoptera, Dytiscidae) of Alberta: systematics, natural history, and distribution. Questions Entomologicae 11:245-498.

Poiani, K. A., W. C. Johnson, G. A. Swanson, and T. C. Winter. 1996. Climate change and northern prairie wetlands. Limnology and Oceanography 41:871-881.

Stewart, R. E., and H. A. Kantrud. 1971. Classification of natural ponds and lakes in the glaciated prairie region. U. S. Fish and Wildlife Service, Resource Publication No. 92, Washington, District of Columbia.

Swanson, G. A. 1978. Funnel trap for collecting littoral aquatic invertebrates. Progressive Fish-Culturist 40:73.

Swanson, G. A. 1987. An introduction to the Cottonwood Lake area. Proceedings of the North Dakota Academy of Science 41:25.

Swanson, K. D. 1990. Chemical evolution of ground water in clay till in a prairie wetland setting in the Cottonwood Lake area, Stutsman County, North Dakota. M.S. Thesis, University of Wisconsin, Madison.

van der Valk, A. G., and C. B. Davis. 1978. The role of seed banks in the vegetation dynamics of prairie glacial marshes. Ecology 59:322-335.

Winter, T. C., and M. R. Carr. 1980. Hydrologic setting of wetlands in the Cottonwood Lake area, Stutsman County, North Dakota. U. S. Geological Survey, Water Resource Investigation Report 88-99, Denver, Colorado.

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