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RANGE EXTENSION OF THE GIANT WATER BUG *BELOSTOMA FLUMINEUM* SAY 1832 (HEMIPTERA: BELOSTOMATIDAE) TO SASKATCHEWAN, CANADA

Iain D. Phillips^{1,2,3,6}, Stephen Srayko^{2,3}, Kate S. Prestie^{2,3,5}, Aaron J. Bell³, and Dale Parker⁴

ABSTRACT.—We collected a single specimen of the giant water bug *Belostoma flumineum* Say 1832 (Hemiptera: Belostomatidae) during routine macroinvertebrate biomonitoring in the Souris River, Saskatchewan. This is the first record of *B. flumineum* in the province of Saskatchewan and represents a more northern record than the previously documented locations in Montana, North Dakota, and southeastern Manitoba.

RESUMEN.—Colectamos un único ejemplar de la chinche gigante de agua *Belostoma flumineum* Say 1832 (Hemiptera: Belostomatidae) durante un biomonitoreo de rutina de macroinvertebrados en el río Souris, Saskatchewan. Este es el primer registro de *B. flumineum* en la provincia de Saskatchewan y representa un récord del norte en lugares previamente documentados de Montana, Dakota del Norte y el sureste de Manitoba.

Monitoring programs that study the impacts of anthropogenic inputs and stress on aquatic systems form the basis of most aquatic macroinvertebrate research in Saskatchewan (MoE and SWA 2012). These programs traditionally focus on single-season sampling regimes and are thus limited in the ability to detect some species with distinct seasonality in their life stages (e.g., summer diapause in Hoemsen et al. 2015). Nevertheless, recent monitoring has produced a number of new species records for the province of Saskatchewan (Parker and Phillips 2007, Phillips et al. 2008, 2013, Hoemsen et al. 2015), highlighting understudied regions of biodiversity and strengthening the understanding of biogeographical links between regions (Lehmkuhl 1980, Hoemsen et al. 2015). This new information suggests that the single-season sampling approach to macroinvertebrate sampling may underestimate the overall diversity of aquatic invertebrates in the province.

An adult specimen of the giant water bug *Belostoma flumineum* Say 1832 (Hemiptera: Belostomatidae) was collected on 10 September 2015 in the Souris River (49°4'46.75"N, 102°45'9.69"W; Fig. 1) near the town of Roche Percée, Saskatchewan, Canada. The specimen was collected using a 500- μ m-mesh D-frame net as part of routine biomonitoring of the

Souris River watershed by the Benthic Entomology Lab of the Water Security Agency. The voucher specimen is retained in the collection at the Water Security Agency of Saskatchewan. This specimen represents the first record of this species in the province of Saskatchewan, as well as an extension of the species' previously known distribution (see Fig. 1) in the Northern Great Plains. No previous records of *B. flumineum* exist from Saskatchewan as determined by consultation with the Royal Saskatchewan Museum (Cory Sheffield, personal communication), Agriculture and Agri-Food Canada (Tyler Wist, personal communication), and Aquatax Consulting (Dale Parker, personal communication).

The Souris River in this region passes through a scrubland and forested valley within aspen parkland, and the reach is characterized by sediments of clay and silt with an abundance of woody debris and macrophytes. Abiotic characteristics of the site at the time of collection featured a velocity of approximately $0.13 \text{ m} \cdot \text{s}^{-1}$, specific conductivity of $1715 \text{ } \mu\text{S} \cdot \text{cm}^{-1}$, pH of 7.8, turbidity of 127.5 NTU, and dissolved oxygen concentration of $6.35 \text{ mg} \cdot \text{L}^{-1}$.

Belostoma is one of 4 genera of Belostomatidae recorded in North America. Nine species of *Belostoma* occur in North America, including

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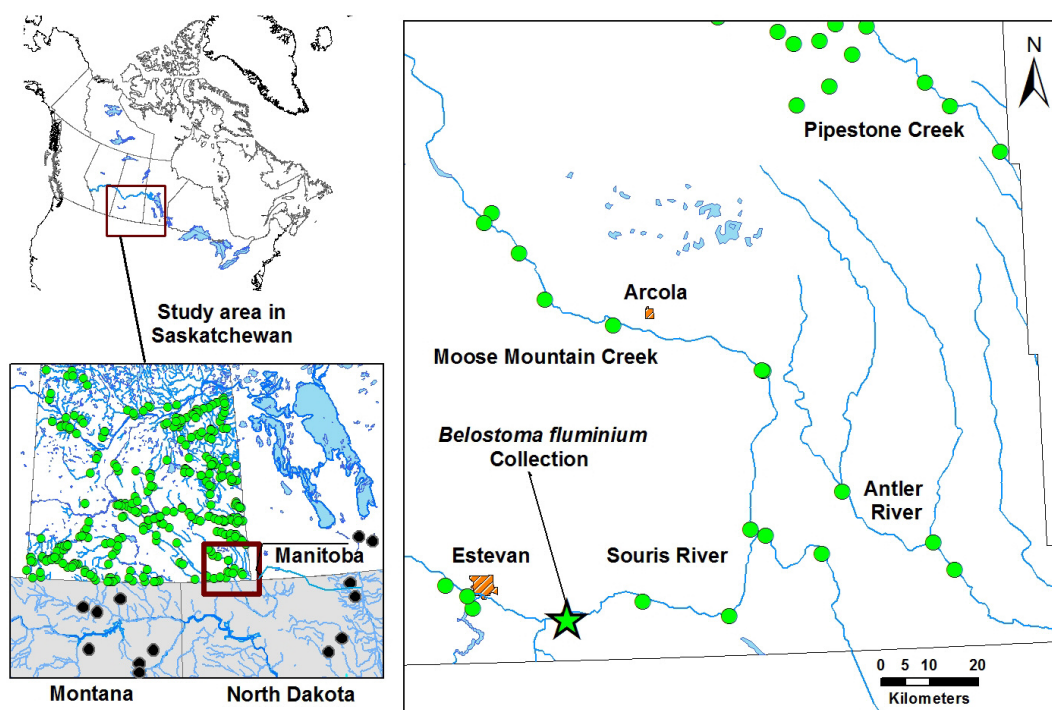


Fig. 1. Known distribution of *Belostoma flumineum* showing the new record of this species in Saskatchewan (green star) and previously documented collection locations in Montana, North Dakota, and Manitoba (black circles). Green circles indicate areas that were sampled as part of a larger biomonitoring program in 2006–2013 during which this species was not detected.



Fig. 2. Belostomatid taxa that occur in Saskatchewan: *Lethocerus americanus* Leidy 1847, 50 mm (above); and the new provincial record, *Belostoma flumineum*, 21 mm (below). Scale bar: 10 mm.

B. bakeri Montandon, *B. confusum* Lauck, *B. ellipticum* Latreille, *B. flumineum*, *B. fusciven-*

tre (Dufour), *B. lutarium* (Stål), *B. saratogae* Menke, *B. subspinosum* (Palisot), and *B. testaceum* (Leidy) (Menke 1979). In the United States, *B. flumineum* occurs from New England to Florida, as well as in Louisiana, Colorado, and California (Brooks and Kelton 1967, Menke 1979). *Belostoma flumineum* has been recorded throughout Canada, from Newfoundland to Manitoba in the east (Brooks and Kelton 1967), and British Columbia in the west (Downes 1934). However, despite significant search efforts, *B. flumineum* has not been documented in the Northern Great Plains west of Manitoba (Brooks and Kelton 1967, Parker and Phillips 2007). In a recent search, Scudder et al. (2010) conducted extensive sampling of Hemiptera in 50 water bodies across the Prairie Provinces, including a variety of lakes and ponds, and found *B. flumineum* in only 5 forested areas in southeastern Manitoba. Similarly, previous monitoring efforts in southeastern Saskatchewan and around the Souris River area (Fig. 1) from 2006 to 2013 failed to detect this species.

The feeding and reproductive habits of belostomatids are well known and summarized in Smith (1975), Menke (1979), and Polhemus (1984). In short, belostomatids occupy shallow areas in bodies of standing water, as well as pools and marginal areas in lotic habitats (Merritt et al. 2008). Due to their relatively large size (Fig. 2), belostomatids can act as top predators in the absence of vertebrates, thereby influencing ecosystem function and shaping trophic structure and energy flow within aquatic food webs (Cooper 1983, Runck and Blinn 1994).

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