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# NOTES and LETTERS

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## AN ICONIC INSECT OF EASTERN NORTH AMERICA, THE FIREFLY IS LIGHTING UP THE PRAIRIE SKY.

JEFF BOONE *City of Saskatoon, Saskatoon, SK, S7L 7K6*  
email: [boone.jeff@gmail.com](mailto:boone.jeff@gmail.com)

Based on a number of inquiries, more people were observing fireflies in 2013. There were a half dozen requests regarding fireflies and attention from local media. It is unclear why fireflies were suddenly seen with such frequency, but it may be related to the rising water table in Saskatchewan creating more habitat for fireflies. Several of the species in Saskatchewan prefer palustrine environments including wet meadows, marshes, creeks and sloughs.<sup>1</sup>

Fireflies are a family of beetles, called the Lampyridae. There are over 2000 species worldwide including nine species in Saskatchewan (Royal Saskatchewan Museum records). Five of the nine species have been found in aspen parkland,<sup>1</sup> the ecoregion surrounding Saskatoon, although these records are likely biased by the fact that more collecting has occurred in this region (Larson personal communication). According to records at the Royal Saskatchewan Museum one species of firefly, the winter firefly (*Ellychnia corrusca*), has been found as far north as Lake Athabasca.

Fireflies are similar in appearance to their close relatives the soldier, net-winged and click beetles.<sup>2</sup> The signature feature is their flash, which is produced through oxidation of a group of proteins called luciferases.<sup>3</sup> This reaction takes place in their abdomen and produces the characteristic glow or bioluminescence.<sup>2,3</sup> In many species the larvae, pupae and adults are bioluminescent. In larvae and pupae, bioluminescence is aposematic,<sup>4</sup> signalling to predators the presence of distasteful compounds. There are several colours of flashes in Saskatchewan.<sup>1</sup> It is common to see amber flashes produced by *Pyroactomena* or green or yellow flashes produced by *Photinus*.

Adults in many species use signalling to attract mates. Typically males will produce flashes and then wait for a female to respond, creating a chorus of flashes. In an unusual twist on this behaviour, some species of firefly mimic the flashing pattern of another species in order to lure an unsuspecting male.<sup>5</sup> They then capture and eat them. This occurs in the genus



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*Figure 1. A Pennsylvania firefly (Photuris pennsylvanica) resting on a lily petal.*

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*Photuris*, nicknamed the *femme fatale* fireflies. In Saskatchewan we have one *femme fatale* species that has been found in the eastern aspen parkland (Figure 1).

There are several species of firefly where the adults are not bioluminescent and consequently are seen less identified.<sup>2</sup> Saskatchewan is home to four of these non-luminous species including the winter firefly, so named because of its activity in the early spring.<sup>2</sup>

Much is still unknown about the biology of many species of firefly. However some are known to feed on soft bodied invertebrates.<sup>6</sup> One species in Saskatchewan, *Pyractomena dispersa*, is possibly a specialist predator of snails similar to close relatives *Pyractomena borealis*.<sup>6</sup> It is the most frequently collected species in the Royal Saskatchewan collection and has been collected from May to August (Royal Saskatchewan Museum records).

Are you interested in spotting fireflies or adding them to your collection? They are often easy to observe in riparian areas next to streams, rivers, or lakes lighting up the night sky. In the daytime they often go unnoticed. Try sweep netting in grassy areas. You may catch lightning in a bottle.

1. Hooper RR, Larson DJ. Checklist of Beetles (Coleoptera: Insecta) of Saskatchewan.

2. Luk SPL, Marshall SA, Branham MA (2011) The fireflies on Ontario (Coleoptera Lampyridae). *Journal of Arthropod Identification* No. 16.

3. Fraga H (2008) Firefly luminescence: A historical perspective and recent developments. *Photochemical & Photobiological Sciences* 7:146-158.

4. de Cock R, Matthysen E (1999) Aposematism and Bioluminescence: Experimental evidence from Glow-worm Larvae (Coleoptera: Lampyridae). *Evolutionary Ecology* 13:619-639.

5. Lloyd JE (1965) Aggressive mimicry in *Photuris*: firefly femmes fatales. *Science* 149:653-654.

6. Hummel JD (2004) Digital Collection, E.H. Strickland Entomological Museum, University of Alberta. [http://entomology.museums.ualberta.ca/searching\\_species\\_details.php?s=5431](http://entomology.museums.ualberta.ca/searching_species_details.php?s=5431)

