

## Scientific Note

### First Canadian record of *Sigara krafti* Stonedahl, 1984 (Hemiptera: Corixidae)

The water boatman *Sigara krafti* Stonedahl, 1984 (Hemiptera: Corixidae) was first described by Gary M. Stonedahl from specimens collected west of the Cascade Range in Oregon and Washington (Stonedahl 1984). Stonedahl and Lattin (1986) noted that *S. krafti* prefers silty and muddy substrates in still or slow-moving, shallow waters of small, coastal rivers. Existing collection records of *S. krafti* are limited to the holotype and paratype specimens used to describe the species; there have been no additional published records.

I collected four male and one female *S. krafti* from the Salmon River near Falkland, British Columbia (50°28'28.8"N, 119°31'52.1"W) on September 1, 2019. These specimens represent the first record of this species in Canada. As a result, this species is an addition to the current checklist of Hemiptera of Canada and Alaska (Maw et al. 2000) and brings the total number of corixid species recorded from Canada to 80 (Jansson 2002, Maw et al. 2000, Scudder 2018).

The Salmon River is a small, alluvial river with a repeating pool-riffle structure along the reach containing the collection site. The specimens were collected from the calm, shallow margins of a larger (approximately 10 m wide) pool section of the river immediately downstream from a small section of rapids. The substrate was silty, and many juveniles were observed along with the adults. The collection site is east of the northern extent of the Cascade Range, towards the drier interior of British Columbia, and within the Interior Douglas-Fir biogeoclimatic zone (Government of British Columbia 2018).

The Salmon River specimens were identified by comparing their morphological characters to Stonedahl's original description (Stonedahl 1984) and to high-resolution photographs of the holotype and two paratype specimens of *S. krafti* housed in the California Academy of Sciences Entomology Collection. In addition, I examined specimens of the similar, widespread (Polhemus et al. 1988), and often co-occurring (Stonedahl & Lattin 1986) species, *Sigara washingtonensis* Hungerford, 1948, which have been deposited for reference in the invertebrate zoology collection at the Royal Alberta Museum.

Stonedahl (1984) distinguished *S. krafti* by a fuscous anterior third to half of the metepisternum, a preapical thickening in the right clasper of the male, and a triangular posteromedial projection of the seventh abdominal tergite of the male. Compared with *S. washingtonensis* (Fig. 1B), *S. krafti* (Fig. 1A) shows a higher length-to-width ratio of the pronotum, a narrower postocular space, and a smaller abdominal strigil in males (Stonedahl 1984). Stonedahl & Lattin (1986) provide body lengths for both species, stating no overlap between male *S. krafti* (5.3–5.8 mm) and the smaller male *S. washingtonensis* (4.5–5.2 mm).

The Salmon River specimens match the above descriptions, but with some notable exceptions. Firstly, four of the five specimens, which appear to be forms with fully developed thoracic pigmentation (Young 1965a), show a more narrowly fuscous metepisternum, with only the anterior border darkened (Fig. 1B). One male specimen is not fully pigmented, with only the head, pronotum, and hemelytra pigmented. Secondly, the right clasper of the males (Fig. 1D) is not as thickened as Stonedahl



Figure 1. (A, C, D, G) *Sigara krafti* male collected from Salmon River, BC, Canada—(A) dorsum; (C) ventrum with arrow indicating anteriorly fuscous metaepisternum; (D) right clasper (tip broken off); (G) seventh abdominal tergite with arrow indicating posteromedial projection. (B, E, H) *Sigara washingtonensis* male collected from Mahood Lake, BC—(B) dorsum; (E) right clasper; (H) seventh abdominal tergite with arrow indicating posteromedial projection. (F) Seventh abdominal tergite of *Sigara krafti* paratype male with arrow indicating posteromedial projection. Photograph in Figure 1F provided by Rachel Diaz-Bastin; all others provided by the author.

(1984) illustrated but does possess a distinctly more pronounced preapical bend than *S. washingtonensis* (Fig. 1E) and is in best agreement with *S. krafti*. Thirdly, the posteromedial projection of the seventh abdominal tergite of the males (Fig. 1G) does not appear to match that depicted in Stonedahl's (1984) illustration for *S. krafti* and is more produced than that of the *S. krafti* paratype specimen photographed (Fig. 1F), approaching the near-parallel-sided shape of *S. washingtonensis* (Fig. 1H). Intraspecific variation was observed in the *S. washingtonensis* specimens, with the posteromedial projection of a specimen from Alberta bearing a more angulate posterior margin than two British Columbia specimens, which show a broadly rounded edge. These character states also do not appear to agree completely with Lauck's (1979) illustration for *S. washingtonensis*. Finally, the abdominal strigil of the Salmon River specimens is not of a smaller size than that of the *S. washingtonensis* specimens.

Pigmentation in Corixidae has been shown to vary with temperature and flight muscle development, and distinct colour morphs have been shown to occur in some species (Young 1965a, 1965b). I have observed extreme variation in thoracic and abdominal pigmentation in conspecifics that were collected together. The use of thoracic pigmentation as a taxonomic character should rely on fully pigmented normal morphs, and it is unclear if the Salmon River specimens are such. The shape of the posteromedial projection of the male seventh abdominal tergite appears to vary slightly within the species I examined and, thus, may not be a reliable taxonomic character for *S. krafti*. The differences discussed could be geographic, and given the consistency of the Salmon River specimens with Stonedahl's other descriptions, especially when compared with *S. washingtonensis*, the specimens can be identified as *S. krafti* with reasonable confidence. However, the aforementioned character states used to distinguish these two species appear to intergrade based on the newly discovered Canadian specimens, suggesting the potential for *S. krafti* to be a synonym of *S. washingtonensis*. Stonedahl's (1984) note that the two species are occasionally collected together in western Oregon and Washington is an indication that they are syntopic, which may support the specific status of *S. krafti*. Further investigations into intra- and interspecific variability in and interactions between *S. krafti* and *S. washingtonensis* are needed.

All *S. krafti* specimens collected from Salmon River for this study have been deposited into the invertebrate zoology collection at the Royal Alberta Museum in Edmonton, Alberta (PMAE.IZ00046133).

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