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SCIENTIFIC NOTE

Helochares punctatus (Sharp) (Coleoptera: Hydrophilidae: Acidocerinae) Established in the Nearctic

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The hydrophilid subfamily Acidocerinae is currently represented by over 540 species globally, but only four of those species are considered native to the Nearctic; all four species occur in the United States but no species have yet been recorded in Canada (Girón and Short 2021). In the southeastern United States, *Helobata larvalis* (Horn, 1973) occurs across the southeastern coastal plain and *Novochares sallaei* (Sharp, 1882) occurs in peninsular Florida (Short and Girón 2023). The genus *Helochares* Mulsant is currently represented by two species in the United States, and both may be complexes of multiple cryptic species (Short and Girón 2018). *Helochares maculicollis* (Mulsant, 1844) occurs in much of the eastern United States while *Helochares normatus* (LeConte, 1861) occurs from central Texas west to California and north to southwestern Oregon (Short and Girón 2018).

During activities in August 2023, TJL collected insects from Pitt-Addington Marsh in metropolitan Vancouver, British Columbia, Canada. Fourteen specimens of a hydrophilid species that was not immediately apparent were collected. One specimen was later posted to iNaturalist and identified as the European species *Helochares punctatus* Sharp, 1869 (Fig. 1) based on dissection of males using Hansen (1982) and Hansen and Hebauer (1988). Globally, this is the first known record of an introduced species of *Helochares* and therefore a **new country record** for Canada and a **new provincial record** for British Columbia.

Specimens were also discovered at two additional metropolitan Vancouver localities from specimens collected during July 2023: a human-made pond at Settlers Park in Port Coquitlam (three specimens) and Whonnock Lake (six specimens) in Maple Ridge. Twenty-five more specimens were collected from Pitt-Addington Marsh in January 2024. In late March 2024, two male specimens were collected in the wetland area off the Stave River in the Fraser Valley near the city of Mission, BC. This locality is ~21 km southeast of Pitt Addington Marsh. Since the start of April 2024, subsequent collections were made at additional localities (see Specimens Examined below) in the region in a variety of lentic freshwater habitats including sedge bogs, ponds, and roadside ditches.

We reviewed all iNaturalist observations of hydrophilids from British Columbia, Alberta, Washington, Oregon, and Idaho; this uncovered a record from Burns Bog Ecological Conservancy Area observed during July 2021 and a second from Minnekhada Regional Park in May 2024. While external characteristics support these iNaturalist observations being *H. punctatus*, we did not examine specimens and therefore assume they are *H. punctatus* versus other Palearctic species based on its prevalence at other sites in the region. The Burns Bog observation was from a habitat similar to that typical in Europe for this species, which has often been found in acidic conditions (Cuppen 1986). Both Pitt Addington Marsh and Whonnock Lake are also considered traditional habitats for *H. punctatus*. The former consists of primarily sedge bog and the latter a muskeg lake with extensive sphagnum and sedge bogs. However, recent collections from non-traditional habitats for this species, such as human-made ponds and roadside ditches, suggest that

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Fig. 1. Adult male *Helochares punctatus* from Pitt-Addington Marsh in southwestern British Columbia, Canada. A) Aedeagus, ventral view, B) Dorsal habitus.

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the species may be more adaptable than previously thought, explaining its introduction and widespread occurrence in the region. Collections of specimens in January suggest an adult overwintering phase, at least in southwest British Columbia. Additionally, TJL observed gravid females in the field in both April and June, indicating a breeding season from spring to at least early summer.

A search for additional specimens in the Spencer Entomological Collection, University of British Columbia, Vancouver, BC, Canada (UBCZ) did not produce any specimens. Specimens collected from Pitt-Addington Marsh have been deposited at UBCZ, the Museum of Texas Tech University – Invertebrate Zoology Collection, Lubbock, TX, USA (TTU-Z); National Museum of Natural History, Smithsonian Institution, Washington, DC, USA (USNM); and University of Texas Insect Collection, Austin, TX, USA (UTIC).

Helochares punctatus is the second species of aquatic Hydrophilidae found to be introduced to Canada since 2015 (Pentinsaari *et al*. 2019; Pintar 2023). Given its abundance at Pitt-Addington Marsh and Whonnock Lake, as well as the earlier record at Burns Bog, we expect that this species has been established in the Vancouver area for several years. Furthermore, the abundance and proximity to the international border suggest this species is already present in Washington state. The native range of *H. punctatus* reported by Hansen (1982) was northwestern Europe from northern Spain to Denmark and southern Britain. More recently, it has been reported as far as Morocco (Benamar *et al*. 2021) and Iran (Gentili *et al*. 2018). The occurrence of *H. punctatus* in southwestern Canada is so disjunct from its native range that it is certainly not a natural range expansion. We do not know how *H. punctatus* may have been introduced to the Nearctic, but the most likely explanation is it was a hitchhiker through one of the traditional non-native species introduction pathways such as the live plant and animal trade or the shipping industry.

Despite having outdated taxonomy, Smetana (1988) remains the primary source for identifying Hydrophilidae from Canada. *Helochares* was excluded from Smetana's keys because it was not known from the country at the time. In Smetana (1988), *Helochares* will key to page 88 (tribe "Helocharini") and then *Enochrus* Thomson based on the similar 5-5-5 tarsal formula. *Helochares* can then be distinguished from *Enochrus* by the shape of the first apparent (pseudobasal) maxillary palpomere. With this palpomere extended, *Enochrus* has the outer edge concave towards the head, whereas in *Helochares*, the concavity faces away from the head (Fig. 1B).

Helochares punctatus can be most readily distinguished from the two native Nearctic species of *Helochares* by patterns of elytral punctation. Both *H. maculicollis* and *H. normatus* have large elytral punctures arranged in definite series that are separated by mostly smooth, shining intervals (Short and Girón 2018). *Helochares punctatus* has fine, dense punctation across the entire elytra, and this punctation is not arranged in definite series (Fig. 1B; Hansen 1982). However, *H. punctatus* is very similar to other species of Palearctic *Helochares* and anyone examining specimens should carefully identify them using Hansen (1982) and Hansen and Hebauer (1988). Important characters for consideration include the shape of the male genitalia (Fig. 1A), a distal antennomere that is at least twice as long as wide, and a clypeus that is dark medially.

In addition to the repositories above, abbreviations for sources of material examined are: iNaturalist (INAT), Timothy Loh personal collection (TLPC), and Matthew R. Pintar personal collection (MRPC).

Specimens Examined. CANADA: British Columbia: Burns Bog Ecological Conservancy Area (49.1331°N, 122.9753°W), 26 vii 2021, B. Spencer (INAT: 1). Port Coquitlam, Settlers Park Pond (49.23765°N, 122.78234°W), 18 vii 2023, T. J. Loh (TLPC: 1♂, 2♀). Maple Ridge, Whonnock Lake (49.20947°N, 122.44798°W), 22 vii 2023, T. J. Loh (UBCZ: 1♂, 1♀, TLPC: 1♂, 3♀). Pitt Meadows, Pitt-Addington Marsh, ponds off Homiik'um Marsh Loop Trail (49.3962°N, 122.6219°W), 19 viii 2023, T. J. Loh (TTU-Z: 1♂; USNM: 1♂, 1♀; UTIC: 1♀; MRPC: 1♂, 1♀; UBCZ: 1♂, 1♀; TLPC: 1♂, 4♀). Mission, Stave River, backchannel wetland (49.18675°N, 122.40587°W), 30 iii 2024, T. J. Loh (TLPC: 2♂). Pitt Meadows, Pitt Addington Marsh, Marsh off Nature Dyke Trail (49.34525°N, 122.61216°W), 20 iv 2024, T. J. Loh (TLPC: 1♀). Port Coquitlam, Prairie Ave. roadside ditch (49.27135°N, 122.71604°W), 28 iv 2024, T. J. Loh (TLPC: 1♀). Port Coquitlam, Minnekhada Regional Park, south side of Mid Marsh Trail (49.3013°N, 122.6984°W), 14 v 2024, Quinlan Wu (INAT: 1). Pitt Meadows, marsh off Rannie Rd., ~3 km sw. of Pitt Lake Boat Launch (49.33252°N, 122.64419°W), 22 vi 2024, T. J. Loh (TLPC: 1♂, 1♀).

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References Cited

Benamar, L., A. Millán, C. E. Sáinz-Cantero, A. Belhaj, and N. Bennas. 2021. Annotated checklist of

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water scavenger beetles (Coleoptera: Polyphaga: Hydrophilidae) of Morocco. Aquatic Insects 42: 91–159.

Cuppen, J. G. M. 1986. On the habitats, distribution and life-cycles of the Western European species of the genus *Helochares* Mulsant (Coleoptera: Hydrophilidae). Hydrobiologia 131: 169–183.

Gentili, E., H. Ostovan, H. Ghahari, and A. Komarek. 2018. Annotated checklist of Iranian Hydrophilidae (Coleoptera: Polyphaga: Hydrophiloidea). Aquatic Insects 39: 55–88.

Girón, J. C., and A. E. Z. Short. 2021. The Acidocerinae (Coleoptera, Hydrophilidae): Taxonomy, classification, and catalog of species. ZooKeys 1045: 1–236.

Hansen, M. 1982. Revisional notes on some European *Helochares* Muls. (Coleoptera: Hydrophilidae). Insect Systematics & Evolution 13: 201–211.

Hansen, M., and F. Hebauer. 1988. A new species of *Helochares* from Israel, with a key to the European and some Near East species (Coleoptera: Hydrophilidae). Insect Systematics & Evolution 19: 27–30.

Pentinsaari, M., R. Anderson, L. Borowiec, P. Bouchard, A. Brunke, H. Douglas, A. Smith, and P. Hebert. 2019. DNA barcodes reveal 63 overlooked species of Canadian beetles (Insecta, Coleoptera). ZooKeys 894: 53–150.

Pintar, M. R. 2023. *Coelostoma orbiculare* (Fabricius) (Coleoptera: Hydrophilidae: Sphaeridiinae): New records and distribution in North America. The Coleopterists Bulletin 77: 382–385.

Short, A. E. Z., and J. C. Girón. 2018. Review of the *Helochares* (*Hydrobaticus*) MacLeay of the New World (Coleoptera: Hydrophilidae: Acidocerinae). Zootaxa 4407: 29–50.

Short, A. E. Z., and J. C. Girón. 2023. Revision of the Neotropical water scavenger beetle genus *Novochares* Girón & Short (Coleoptera, Hydrophilidae, Acidocerinae). ZooKeys 1171: 1–112.

Smetana, A. 1988. Review of the family Hydrophilidae of Canada and Alaska (Coleoptera). Memoirs of the Entomological Society of Canada 120: 3–316.

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