

**NOTE****First occurrences of the *Celithemis eponina* (Halloween Pennant) in Maritime Canada (Odonata: Libellulidae) and *Ischnura hastata* (Citrine Forktail) (Odonata: Coenagrionidae) in New Brunswick**

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The largest member of its genus, *Celithemis eponina* Drury 1773 (Halloween Pennant) (Odonata: Libellulidae), is a strikingly coloured dragonfly with orange or yellow-suffused wings augmented by dark brown markings. The fluttering flight of this species is reported to be suggestive of a butterfly (Paulson 2011; Needham et al. 2014). *Celithemis eponina* has a wide distribution in North America, extending from the Florida Keys and the Dry Tortugas west to New Mexico, north through Colorado and Nebraska to South Dakota and east through Ontario to Maine (Glotzhofer and McShaffrey 2002). It is also known from Mexico, the Bahamas, the Antilles, and Cuba (Paulson, 2011; Needham et al. 2014). The species is more common in the southern portion of its range and there are apparently no previous reports of *Celithemis eponina* from Maritime Canada. In contrast, *Ischnura hastata* Say 1839 (Citrine Forktail) (Odonata: Coenagrionidae), is among North America's smallest damselflies; yellow males with their unique positioning of the forewing stigma are readily recognized (Westfall and May 2006). The species has an exceedingly wide range for an odonate, extending from the northeastern United States and Ontario south to Venezuela, Caribbean Islands and west to southern California, with isolated populations in the Galapagos and the Azores (Dunkle 1990, Paulson 2011). This wide range has been ascribed to both the species adaptability and to transport on winds, with numbers not infrequently appearing north of the usual range (Dunkle 1990, Paulson 2011). The only previous report for *Ischnura hastata* in the Maritimes is that of Catling et al. (2009): three males from Sable Island, Nova Scotia, 160 km offshore of the mainland. Here we document the first occurrence for *Celithemis eponina* in the Canadian Maritimes and the first occurrence for *Ischnura hastata* in New Brunswick.

During the late evening of 21 August 2013, HSM captured an adult female *Celithemis eponina* at Tennants Cove, Kings County, New Brunswick (45.5857° -65.9864°). This specimen is now deposited in the insect collection of the New Brunswick Museum (NBM 52802). The capture site was an old field dominated by Poaceae, Cyperaceae, and *Solidago* spp. (Asteraceae) adjacent to a marshy inlet in the Saint John River. Single *Celithemis eponina* were subsequently also observed, but not captured, on the 13 August 2016 by HSM at Fidele Lake, Charlotte County, New Brunswick (45.2117° -66.6309°) and on 19 August 2016 by HSM and DLS at Woodard Lake, Charlotte County, 8.5 km southwest (45.1483° -66.6930°; Figure 1).

On 16 September 2015, JHL encountered a single adult male of *Ischnura hastata* on roadside vegetation at Black Beach, Saint John County, New Brunswick (45.1445° -66.2365°). The specimen was captured and is now deposited in the New Brunswick Museum insect collection (NBM 47709). The site is typical Maritime coastal old-field habitat, dominated by *Symphotrichum* spp. (Asteraceae) and *Solidago* spp., and is adjacent to the Bay of Fundy (Figure 2).

In Canada, *Celithemis eponina* is uncommon in southern Ontario and Quebec (Pilon and Lagacé 1998, Carmichael et al. 2002). Borror (1957) reported the first record for Maine on 27 August 1955. The species remains uncommon in Maine but has been recorded in Washington County, about 8 km from the Maine-New Brunswick border

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Figure 1. Woodard Lake, Charlotte County, showing habitat for *Celithemis eponina* in New Brunswick (Photo credit: D.L. Sabine).



Figure 2. Black Beach, Saint John County showing New Brunswick collection site for *Ischnura hastata* (Photo credit: J.H. Lewis).



(unpublished Maine Damselfly and Dragonfly Survey data) and is therefore not unexpected in New Brunswick. Although *Celithemis eponina* is known to make substantial unidirectional flights across country similar to some well-known migratory dragonfly species (Catling et al. 2017), Jones et al. (2013) suggest this species may be expanding its range northward in response to climate change. If the latter is indeed the case, additional occurrences of *Celithemis eponina* in the Maritimes region are to be expected.

The known distribution of *Ischnura hastata* in the Maritime Provinces and Maine is entirely coastal,

supporting long-shore migration or transport by wind. However, examination of Environment Canada weather records for the two weeks preceding the New Brunswick *Ischnura hastata* capture (2-15 September 2016) document no particularly unsettled weather systems tracking northward (Historical data- Climate- Environment and Climate Change Canada, accessed on-line at climate.weather.gc.ca/historical_data/search_historic_data_e.html). Weather from 10-14 September was generally clear with winds variable, but did include extended periods with winds blowing from the south and southwest with maximum wind speeds of 27–37 km/hr (well below the 63–118 km/h that characterize tropical storms). Winds in the 24 hours immediately prior to collection were mostly from the north. It would, therefore, appear that noticeably unsettled weather is not a prerequisite for the movement of *Ischnura hastata* northward.

While there is currently no evidence of reproduction by *Ischnura hastata* in the Maritimes, recently emerged teneral have been reported from York County in southwest Maine (unpublished MDDS data). Catling (2008) assembled information to support the hypothesis that *Ischnura hastata* is currently undergoing a northward range expansion, perhaps also in response to climate warming, and suggested that the first stages of establishment in southern Ontario are now underway. It would seem that future occurrences of *Ischnura hastata*, and eventual reproduction, in the Maritimes region should be expected.

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