
Carl J. Rothfels
crothfels@rbg.ca
Contribution of Royal Botanical Gardens #119

Abstract
Six new 2003 records of *Arigomphus villosipes* are presented, including new regional records for Halton and York. These new records, combined with new records from 2002, represent an approximate doubling of the known extant or historical records of this rare species in Ontario. These observations are of interest because *A. villosipes* has been considered extremely rare in Ontario and a recent evaluation suggested that it had declined. All known Ontario records are summarized, as are the identification issues and habitat preferences of this *Arigomphus*. Possible explanations for the influx of new records are discussed.

Description and General Habitat

*Arigomphus villosipes*, the Unicorn Clubtail, shares with its Ontario congeners a preference (unusual among clubtails) for still water. It is also similar in possessing a greenish thorax, slender club, and its light-coloured cerci. The three Ontario *Arigomphus* species (*A. villosipes; A. furcifer* – the Lilypad Clubtail; *A. cornutus* – the Horned Clubtail) are difficult to distinguish without a close inspection. Aside from clear differences in their reproductive structures (see Walker 1958), they may be identified using the rough features in Table 1.

The three species also appear to be differentiated by habitat. *Arigomphus furcifer* tends to be found on slow streams and lake shores where there is an abundance of floating vegetation such as Watershield (*Brasenia schreberi*), White Waterlily (*Nymphaea odorata*), Bulhead Lily (*Nuphar variegatum*), etc. It often perches on these plants, far from shore, to the considerable frustration of any would-be collector. *Arigomphus villosipes*, in contrast, prefers areas with few floating or submerged aquatic plants, and with soft muddy bottoms. It often lands on muddy shores, and is less likely to land on vegetation. *Arigomphus cornutus* is apparently somewhat intermediate in its preferences. Dunkle (2000) lists it as frequenting “ponds, sluggish streams ... permanent and often with marshy or boggy edges,” and Catling and Brownell (2000) say that it prefers “ponds, marshy bays and sluggish streams, the adults often in places where there is a thick layer of organic muck and [an] abundance of emergent and floating aquatics.”

<table>
<thead>
<tr>
<th></th>
<th>Eye Colour</th>
<th>Shoulder Stripes</th>
<th>Top-spot on Segment 8</th>
<th>Top-spot on Segment 10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. cornutus</strong></td>
<td>Blue</td>
<td>Contiguous</td>
<td>Yes</td>
<td>Weakly defined</td>
</tr>
<tr>
<td><strong>A. furcifer</strong></td>
<td>Blue</td>
<td>Usually not contiguous</td>
<td>No</td>
<td>Sharply defined</td>
</tr>
<tr>
<td><strong>A. villosipes</strong></td>
<td>Greenish-blue</td>
<td>Contiguous</td>
<td>No</td>
<td>None: segment nearly all yellow on top</td>
</tr>
</tbody>
</table>
Status in nearby jurisdictions

The centre of *A. villosipes* distribution is southeast of Ontario (Dunkle 2000). It is reported from four counties in the southern half of the Lower Peninsula of Michigan (O’Brien 2004, C.D. Jones pers. comm.), but appears rare there. In Ohio it is common (Glotzhober pers. comm.) and widespread, with populations consistently reaching the northern edge of the state, at Lake Ontario (Ohio Odonata Survey 2004). It is also widespread through southern and western New York State, but does not extend northeast of Lake Ontario, in that state (Northern Prairie Wildlife Research Centre 2004). It has apparently not yet been discovered in Quebec; Pilon and Lagacé (1998) list it as “hypothétique.”

Historic status in Ontario

All three *Arigomphus* species are provincially rare and tracked by the Natural Heritage Information Centre (NHIC). Up to 2000, *A. furcifer* had been encountered at 36 locations followed by *A. cornutus* with 15 locations, and *A. villosipes* with eight (Catling and Brownell 2000). The NHIC has given *A. villosipes* a provincial rarity-ranking of S1S2 (Oldham et al. 2000a; http://www.mnr.gov.on.ca/MNR/nhic/elements/el_report.cfm?eid=181269 - accessed in January 2004), suggesting that it is very rare in Ontario, although globally common (G5). In a preliminary assessment of status changes in Ontario Odonata, Catling & Brownell (2002) found *A. villosipes* to have declined since Walker’s published survey of 1941. The historic records (historic being interpreted here, somewhat ambitiously, as anything pre-2002), are centred around the western end of Lake Ontario (Fig. 1), with records from Toronto, Peel, Niagara, and Haldimand/Norfolk, and “disjunct” records in Essex County and southern Simcoe County.

2002 Records

There were four new records in 2002, compared with three new records from 1980-2000, and approximately 10 records from 1900-1950 (Fig. 1). The 2002 records came from Hamilton (three records, from two major watersheds) and Toronto (one record). The Hamilton records were first for the City of Hamilton; the Toronto record represented the rediscovery of a species that hadn’t been reported in METR for a century, and whose original location is no longer extant. Two of the records are from small muddy ponds (known or presumed to be artificial), and two are from natural slow muddy streams.

2003 records

*Arigomphus villosipes* was found at a further seven new locations in 2003 (Fig. 1), including new regional records for Halton and York (previous “York” records are actually from what is now Metro Toronto). A tentative location from the Calcium Pits in Halton Co. (Table 2, not mapped) is also notable. The York records (one from a sewage pond, the other from a natural slow muddy river) are in close proximity to Walker’s historic Simcoe records; these records represent the northern limit of the species’ known range. There are now five records from Hamilton (making *A. villosipes* the most common clubtail in the area) and three from Halton. The Hamilton and Halton records fill the gap between the old Niagara records and the records from Peel and Toronto, and strengthen the “western Lake Ontario” distribution pattern of this species in Ontario.

Habitat and Flight Time in Ontario

Based on the recent records, *A. villosipes* appears to be the most common clubtail in some areas of southern Ontario; it certainly is the most common clubtail in the Hamilton area. Presumably, its ability to colonize new ponds, and flourish in heavily eutrophic waters with limited vegetation, allows it to persist in areas which cannot support other gomphids. Field workers searching for these species should concentrate on rich mucky waters with muddy margins, including farm ponds, sewage ponds, and eutrophic wetlands.

It flies mostly from mid-June through July, with the earliest Ontario record being a specimen from Whitefish Point in Simcoe County collected on June 2nd by Walker, and the latest record being two individuals seen by A. Wormington at the Calcium Pits in Halton Region on August 6th, and tentatively identified as this species, or, baring that, the female netted by C.J. Rothfels and G. Lewer on August 5th at Carlisle.
Table 2. Ontario *Arigomphus villosipes* locations. Records to 2001 from OOD (2004) courtesy of C.D. Jones; 2002 records courtesy of P.M. Catling; 2003 records from J. Dwyer at the Halton Natural Areas Inventory, R. Curry, and the author.

<table>
<thead>
<tr>
<th>County</th>
<th>Location</th>
<th>First Reported/Last Reported</th>
<th>Observers</th>
<th>Coll. Status</th>
<th>Habitat</th>
<th>Notes</th>
<th>East</th>
<th>North</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESSE</td>
<td>Point Pelee</td>
<td>1920/1920</td>
<td>E.M. Walker</td>
<td>1fc</td>
<td></td>
<td></td>
<td>374500</td>
<td>464500</td>
</tr>
<tr>
<td>ESSE</td>
<td>Cedar Creek</td>
<td>1988/1997</td>
<td>P.D. Pratt, P.M. Catling</td>
<td>At least 4; 3c</td>
<td>Sluggish stream with extensive mudflats.</td>
<td>This record is not listed in Walker’s publications, and may be an error (C.D. Jones, pers. comm.)</td>
<td>348900</td>
<td>4653100</td>
</tr>
<tr>
<td>HALD</td>
<td>Simcoe St. Williams Forestry Station</td>
<td>1939/1939</td>
<td>Freedman, King, Catling, V.R. Brownell</td>
<td>1c</td>
<td>Pond and fast stream.</td>
<td>Two stations slightly over 1km apart. Low, rapid, undulating flight.</td>
<td>556400</td>
<td>4742000</td>
</tr>
<tr>
<td>HALT</td>
<td>Bronte Creek Ravine, off of creek n. of Dundas St.</td>
<td>2003/2003</td>
<td>C.J. Rothfels, P.O. O’Hara</td>
<td>4m; 1m c</td>
<td>Landed on a 15 foot section of wet mud on beaver dam holding back large pond.</td>
<td>With <em>Libellula lydia</em>, <em>Anax junius</em>, and <em>Enallagma cyathigerum boveale</em></td>
<td>596900</td>
<td>4808200</td>
</tr>
<tr>
<td>HALT</td>
<td>Blue Springs Creek</td>
<td>2003/2003</td>
<td>R. Curry</td>
<td>1</td>
<td>A cold water creek</td>
<td></td>
<td>573400</td>
<td>4826811</td>
</tr>
<tr>
<td>HALT</td>
<td>Calcium Pits</td>
<td>2003/2003</td>
<td>A. Worthington</td>
<td>2</td>
<td>Shallow regenerating artificial ponds in a cool swamp setting</td>
<td></td>
<td>584788</td>
<td>4811007</td>
</tr>
<tr>
<td>HAMI</td>
<td>Spencer Creek, Beverly Swamp</td>
<td>2002/2002</td>
<td>C.J. Rothfels, J.L. Reader</td>
<td>2m; 1m c</td>
<td>Clean slow stream over deep soft mud.</td>
<td></td>
<td>573300</td>
<td>4801700</td>
</tr>
<tr>
<td>HAMI</td>
<td>Carlisle; 12-Mile Cr.</td>
<td>2002/2002</td>
<td>C.J. Rothfels, G. Lower</td>
<td>1fn</td>
<td>Slow, muddy-bottomed creek with limited veg. flowing through meadow.</td>
<td>Often perched on exposed mud or sticks low to the water.</td>
<td>581709</td>
<td>4806737</td>
</tr>
</tbody>
</table>
### Comments on Range in Ontario

The Ontario distribution of this species, with most records clustered around the western end of Lake Ontario, is odd. This distribution could reflect the overall range of this species (which has a northwestern range limit that approximately follows Lake Ontario), or it could be an artifact of collecting effort (unlikely considered the intense recent surveys in southern Ontario). Further Ontario records are most likely to originate from southwestern Ontario (proximity to the Michigan populations), or from the Kingston or Cornwall areas (proximity to the northern New York populations). However, its range is apparently expanding, and it could appear elsewhere (for example, it is listed, somewhat optimistically, as "to be expected" in Renfrew County by Jones et al 2000a).
The number of new records of this species over the past two years is surprising, considering the relatively intense observer effort across Ontario lately. These new records may be a result of: 1) increased observer effort over a specific area of Ontario; 2) a northern range expansion of this species as a result climatic change; 3) habitat alterations which favour this species. The second hypothesis seems weakest. Neighboring jurisdictions have not noted a northerly expansion – the first Ohio record, from the 1800s, was from the northern edge of the state (Glazhober pers. comm.) – and Walker had this species as far north as Lake Simcoe in the first half of this century. The first hypothesis is supported by the fact that the western end of Lake Ontario, which appears to be the centre of this species' Ontario range, was highly under-surveyed until recently: in 2000, the list for "Hamilton-Wentworth County" was 37 species and Halton had 49, in contrast to neighboring Peel Region with 71 species, Toronto with 81, and Essex with 89 (Catling and Brownell 2000). The third hypothesis is also consistent with observations. Southern Ontario is becoming increasingly developed and its surface water increasingly eutrophic, and thus a species which likes sewage ponds and slow rich creeks with muddy banks could be expected to increase in population.

The range expansion of this anisopteran is especially interesting in conjunction with the recently reported range expansions of damselflies.
in Ontario, including *Enallagma basidens* (Catling et al 2001c), *Enallagma anna* (Catling et al 2001a, Jones 2002), *Archilestes grandis* (Pratt 2004), and *Argia tibialis* (Catling et al 2001c). More data are needed to tease-out the roles of habitat modification, observer effort, climatic change, and other factors on the range limits of Odonata.

Acknowledgments:

Thanks to J. Dwyer of the Halton Natural Areas Inventory, R. Curry, C.D. Jones and P.M. Catling for providing records, to K. Clute for hunting out Pilon and Lagace (1998) for me, to C.D. Jones and P.M. Catling for helpful reviews of earlier versions of this document, and to P.M. Catling for generously generating the map. Information on the species in Ohio was provided by B. Glotzhober (email 10 Dec. 2003). Special thanks, of course, to all those who make searching for odonates in the Hamilton area such a fun time!

Literature Cited:


