Haliplidae of Eastern Canada

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Abstract

The 23 species of Haliplidae (crawling water beetles) now known from eastern Canada are reviewed and keyed. *H. falli* Mank is recorded from Ontario for the first time, *H. canadensis* Wallis and *H. fasciatus* Aubé are recorded from New Brunswick for the first time, and *H. connexus* Matheson is recorded from Prince Edward Island for the first time. The recently described species *Haliplus lucigelinae* Vondel and Alarie is included in a key for the first time.

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Introduction

The family Haliplidae (crawling water beetles) is a primarily Holarctic family of small (~2-5 mm) water beetles easily recognized by their greatly enlarged hind coxal plates. Most species occur in lentic habitats rich in the algae on which they develop, although a few species are found in slow moving water, and the endangered Hungerford's Crawling Water Beetle (*Brychius hungerfordi* Spangler) is found in swift rocky streams.

Up until now, the only key to the northeastern species of Haliplidae was in Downie and Arnett (1996), a poorly illustrated key lacking two of the species now known in eastern Canada and containing a number of problematic couplets. We here provide a simpler, more complete and fully illustrated key along with a review of the eastern Canadian species updating the composition and distribution of the fauna. One of species, Hungerford's Crawling Water Beetle (*Brychius hungerfordi*) is recognized as an endangered species under federal and provincial legislation in Canada and Ontario, and has been listed as endangered in the United States, where it occurs in only five swift, clean streams in Michigan, since 1994. Although Hungerford's Crawling Water Beetle has received a great deal of attention and resources, little attention has been paid to the other Haliplidae. One of the incentives for starting this project was the assumption that other Haliplidae had been neglected because there were no accessible user-friendly tools for identification of species other than the easily recognized *B. hungerfordi*. But, as can be seen from the distribution maps provided here, several species (e.g., *Peltodytes lengi* Roberts, *P. litoralis* Matheson, *Haliplus apostolicus* Wallis, *H. leopardus* Roberts and *H. lucigelinae* Vondel and Alarie) have very restricted distributions and are infrequently collected. The baseline distributional data and simple identification tools provided here will hopefully encourage further study of these species.

Materials and Methods

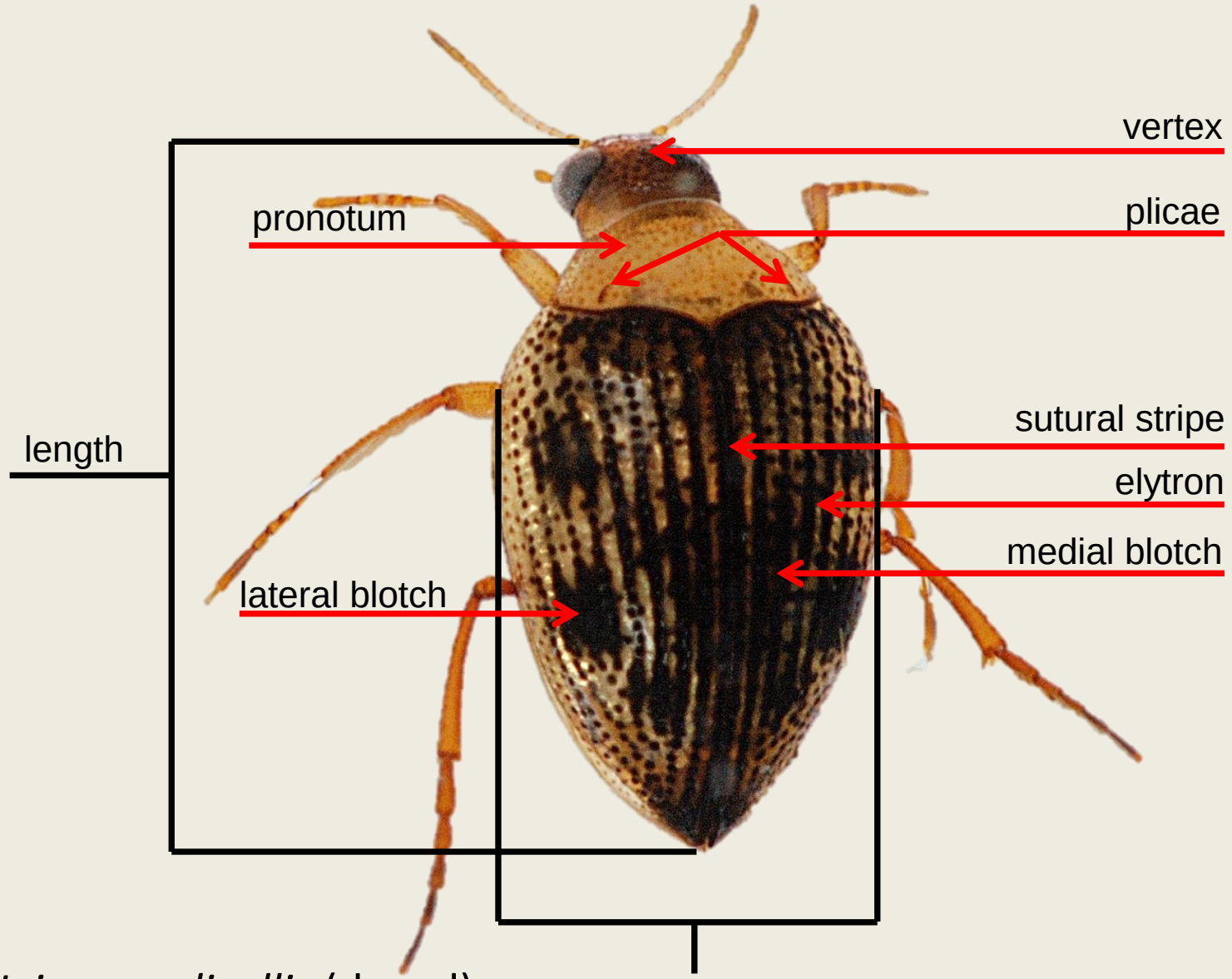
Specimen data were obtained from the University of Guelph Insect Collection (DEBU, Guelph, Canada), the Canadian National Collection of Insects, Arachnids and Nematodes (CNC, Ottawa, Canada), the Royal Ontario Museum (ROM, Toronto, Ontario, Canada), the Wallis-Roughley Museum (JBWM, University of Manitoba, Winnipeg, Canada), and the personal database of Yves Alarie (Laurentian University, Sudbury, Canada).

Distribution maps were created using Simplemappr (Shorthouse, 2010). They include both broad provincial distributions (demarcated by diagonal lines) and specific localities (demarcated by dots). Provincial distributions were obtained from Bousquet (1991), Downie and Arnett (1996), Majka et al. (2009) and Vondel (2013), while specific localities were obtained from specimen data labels and published literature (LeConte, 1950; Vondel, 2005; Majka et al., 2009). In some cases only provincial records were available, mostly from Downie and Arnett (1996) and Vondel (2013).

Checklist

Table 1. Checklist of Haliplidae of eastern Canada. ON, Ontario; QC, Quebec; NB, New Brunswick; NS, Nova Scotia; PE, Prince Edward Island; LB, Labrador; NF, Newfoundland.

Brychius C.G. Thompson							
B. hungerfordi Spangler	ON						
Haliplus Latreille							
H. apostolicus Wallis		QC		NS			
H. blanchardi Roberts	ON	QC					
H. borealis LeConte	ON	QC	NB	NS			
H. canadensis Wallis	ON	QC	NB	NS	PE		
H. connexus Matheson	ON	QC	NB	NS	PE	LB	
H. cribarius LeConte	ON	QC	NB	NS	PE	LB	NF
H. falli Mank	ON	QC					
H. fasciatus Aubé	ON	QC	NB	NS			
H. fulvus Fabricius	ON	QC	NB	NS			NF
H. immaculicollis Harris	ON	QC	NB	NS	PE	LB	NF
H. leopardus Roberts	ON	QC	NB	NS			
H. longulus LeConte	ON	QC	NB	NS	PE		
H. lucigelinae Vondel and Alarie	ON	QC					
H. nitens LeConte	ON						
H. pantherinus Aubé	ON	QC	NB	NS			
H. triopsis Say	ON	QC					
Peltodytes Régimbart							
P. duodecimpunctatus Say	ON	QC	NB				
P. edentulus LeConte	ON	QC	NB	NS	PE		
P. lengi Roberts	ON	QC	NB				
P. litoralis Matheson			NB				
P. muticus LeConte	ON	QC					
P. tortulosus Roberts	ON	QC	NB	NS	PE		



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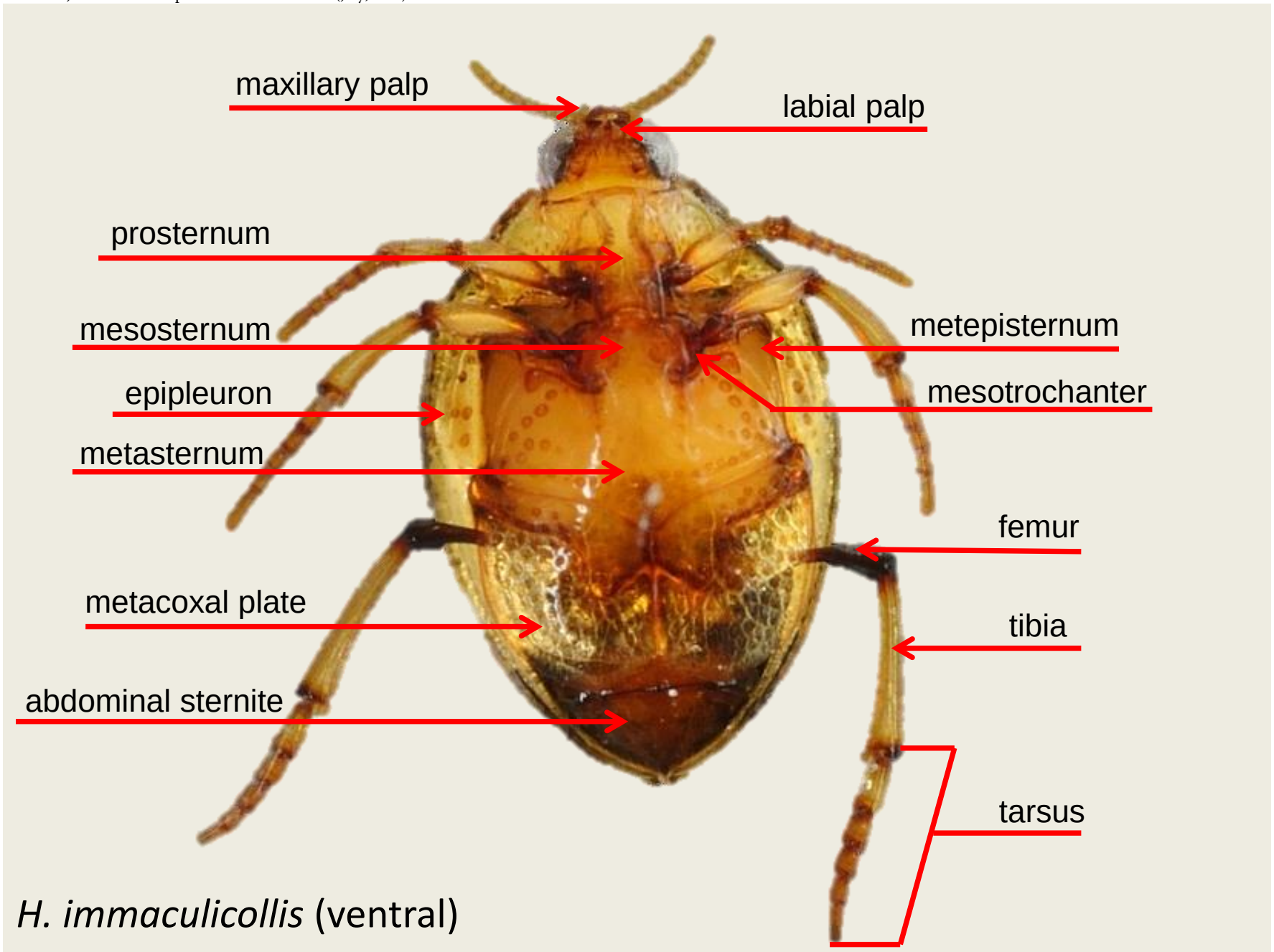

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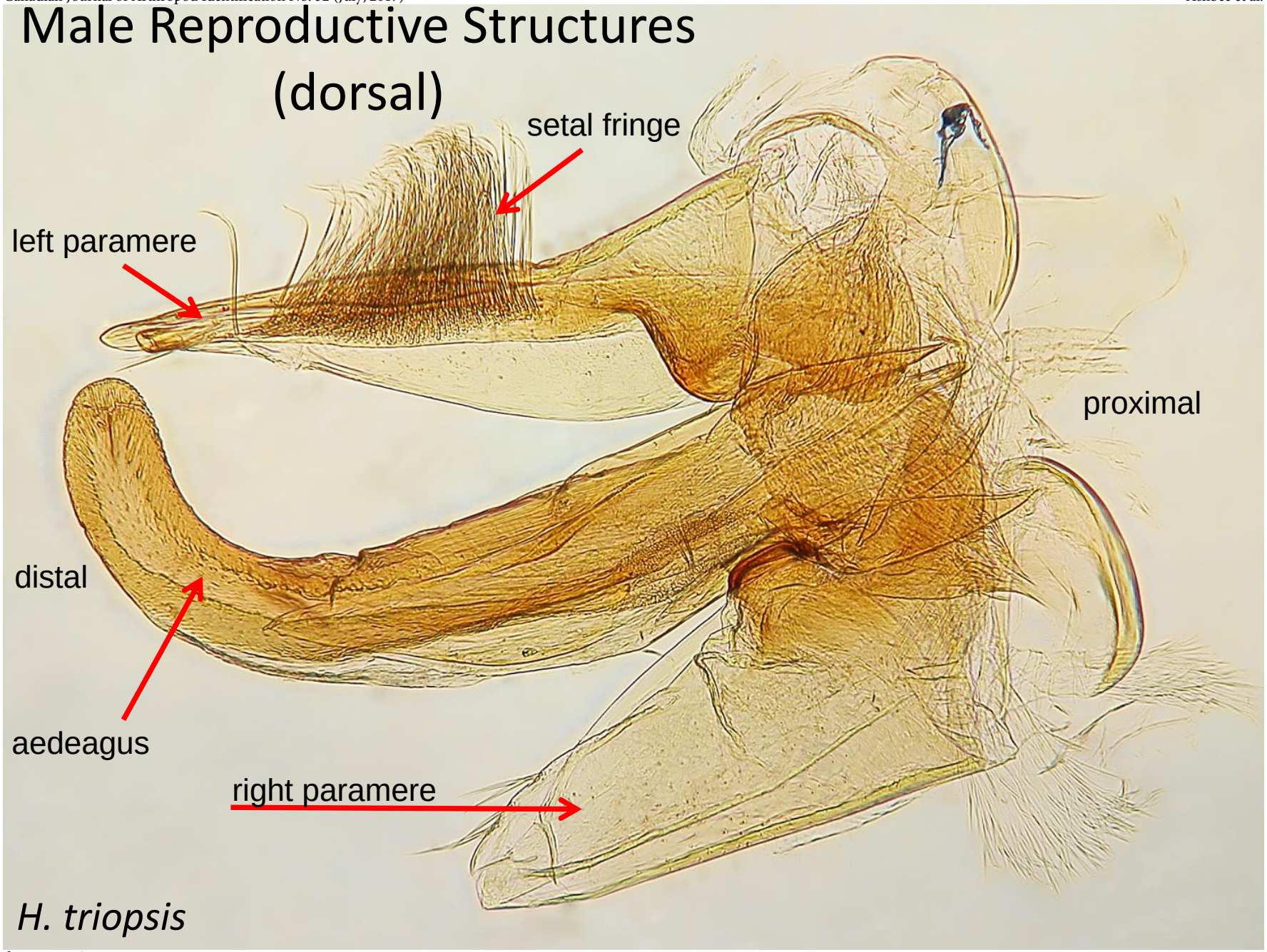
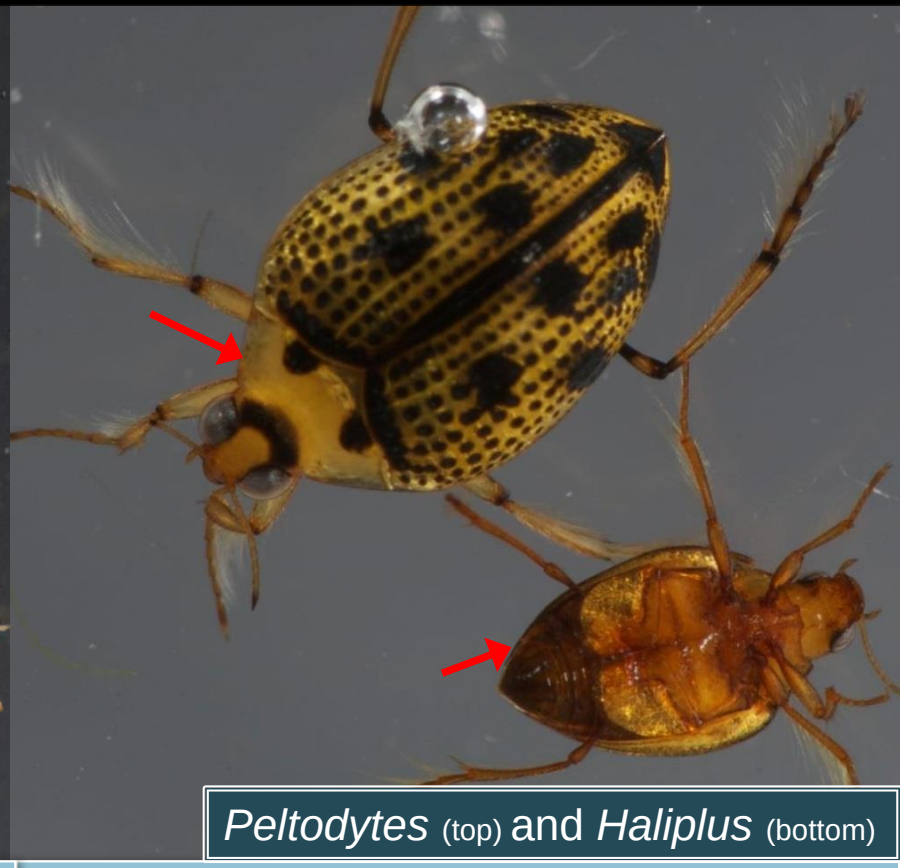

Male Reproductive Structures
(dorsal)
setal fringe
left paramere
proximal
distal
aedeagus
right paramere
H. triopsis

GENERA OF HALIPLIDAE OF EASTERN CANADA

Brychius hungerfordi



Peltodytes (top) and *Haliplus* (bottom)

1 Pronotum almost parallel-sided; epipleuron broad, extending almost to apex of abdomen ……..*Brychius*

One species in region, *B. hungerfordi*

1’ Pronotum widest at base; epipleuron evenly narrowed, ending near base of last abdominal sternum……2

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GENERA OF HALIPLIDAE OF EASTERN CANADA

Peltodytes lengi

Haliplus immaculicollis

2(1) Posterior margin of pronotum with two dark spots; metacoxal plates large, only last abdominal sternite completely exposed. Apical segment of maxillary and labial palpi longer than penultimate segment ……..*Peltodytes.* **3**

2’ Posterior margin of pronotum lacking dark spots; metacoxal plates smaller, leaving last three abdominal sternites exposed. Apical segment of maxillary and labial palpi shorter than penultimate segment ……..... *Haliplus.* **9**

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GENERA OF HALIPLIDAE OF EASTERN CANADA

Peltodytes

Apical segment of maxillary and labial palpi longer than penultimate segment.

Haliplus

Apical segment of maxillary and labial palpi shorter than penultimate segment.

Back

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PELTODYTES OF EASTERN CANADA

Peltodytes edentulus

Peltodytes tortulosus

3(2) Metafemur with distinct subapical pale band..... 4

3’ Metafemur entirely black or tan, lacking subapical band..... 6

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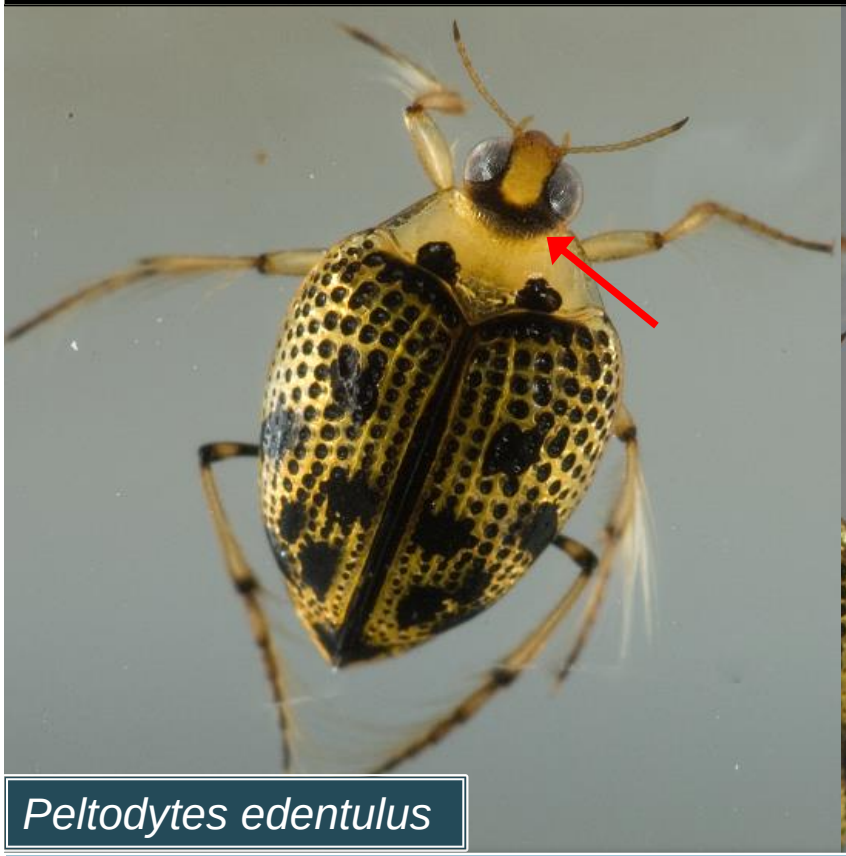
PELTODYTES OF EASTERN CANADA



Peltodytes edentulus

Peltodytes duodecimpunctatus

4(3) Vertex with a dark crescent-shaped macula.....*Peltodytes edentulus*

4’ Vertex pale, without macula……**5**

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PELTODYTES OF EASTERN CANADA

Peltodytes lengi

Peltodytes duodecimpunctatus

5(4) Metafemur with preapical pale band as wide or wider than the dark middle band; metacoxal plate only slightly pointed posteriorly. Aedeagus broadly blunted apically……*Peltodytes lengi*

5’ Metafemur with preapical pale band narrower than the dark middle band; metacoxal plate sharply pointed posteriorly. Aedeagus narrowly blunted apically…….....*Peltodytes duodecimpunctatus*

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PELTODYTES OF EASTERN CANADA

Aedeagus broadly blunted apically. (lateral view)

Peltodytes lengi

Aedeagus narrowly blunted apically. (lateral view)

Peltodytes duodecimpunctatus

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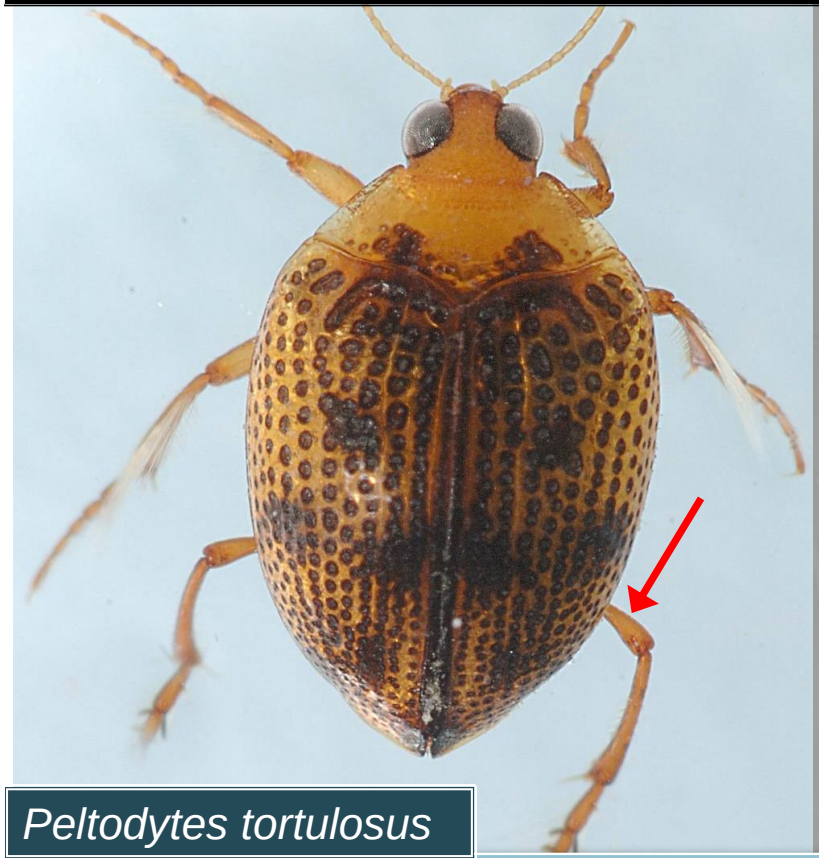
PELTODYTES OF EASTERN CANADA



Peltodytes tortulosus

Peltodytes muticus

6(3) Metafemur pale tan to yellow..... 7

6’ Metafemur dark brown to black..... .....*Peltodytes muticus*

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PELTODYTES OF EASTERN CANADA

Peltodytes tortulosus

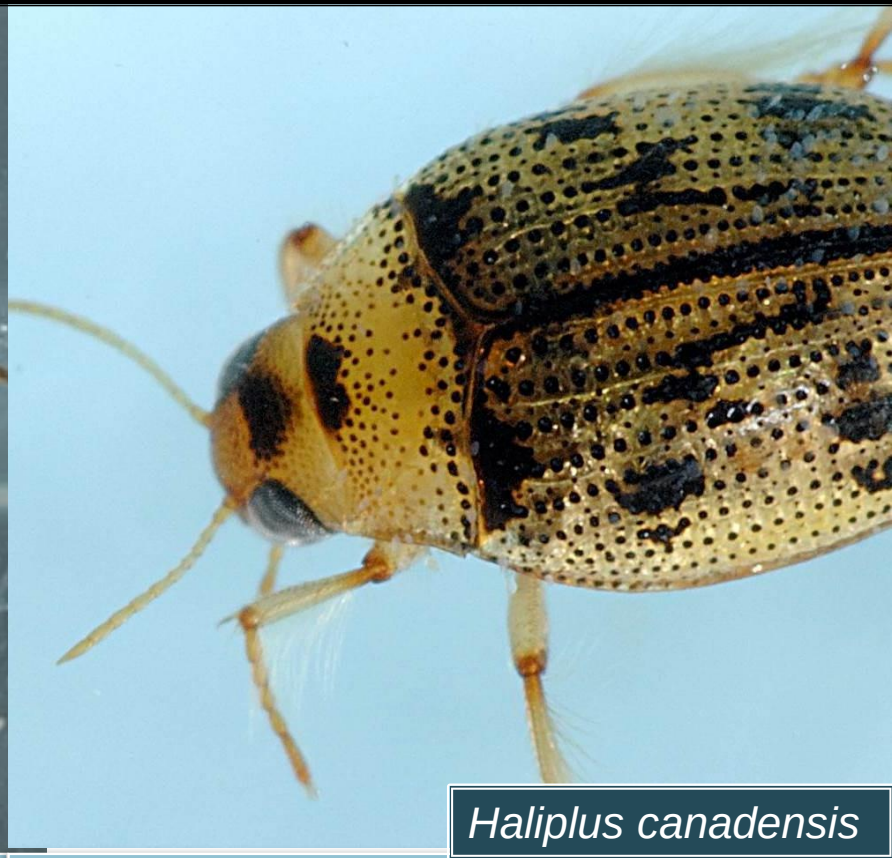
Peltodytes litoralis

7(6) Length over 4.2 mm. Anterior elytral margin with several coalescent punctures; posterior margin of pronotum densely punctate; elytron with six indistinct, poorly-defined maculae……..*Peltodytes tortulosus*

7’ Length less than 3.8 mm. Anterior elytral margin lacking coalescent punctures; posterior margin of pronotum at most sparsely punctate; elytron with seven distinct maculae……..*Peltodytes litoralis*

HALIPLUS OF EASTERN CANADA

Haliplus longulus



Haliplus canadensis

9(2) Pronotum with basal longitudinal plica on each side.....10

9’ Pronotum without basal longitudinal plica.....13

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HALIPLUS OF EASTERN CANADA

Haliplus immaculicollis

Haliplus longulus

10(9) Elytral maculations present and composed of several spots……11

10’ Elytral maculation absent or reduced to one large, ill-defined, central darkened spot ……..12

HALIPLUS OF EASTERN CANADA

Haliplus immaculicollis

Haliplus blanchardi

11(10) Apical margin of elytra rounded or slightly sinuate (best seen from posterolateral angle)…….. ……*Haliplus immaculicollis*

11’ Apical margin of elytra strongly sinuate (best seen from posterolateral angle)…….. ……*Haliplus blanchardi*

HALIPLUS OF EASTERN CANADA

Haliplus immaculicollis

Apical margin of elytra rounded or slightly sinuate.

Haliplus blanchardi

Apical margin of elytra strongly sinuate.

Back

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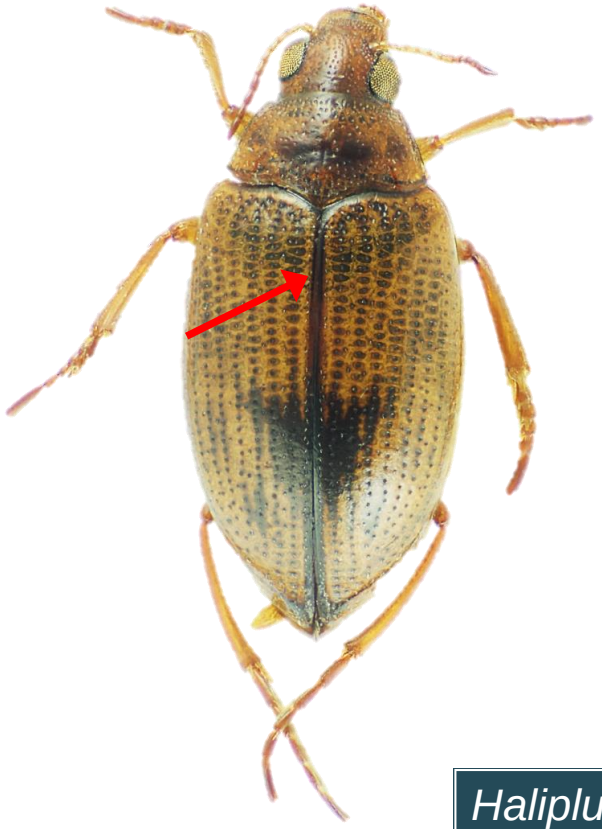
HALIPLUS OF EASTERN CANADA

Haliplus longulus



Haliplus falli

12(10) Elytron metallic gold, with sutural stripe absent above medial blotch. Body teardrop-shaped, strongly tapered posteriorly……..*Haliplus longulus*

12’ Elytron dull yellow-brown, with sutural stripe present along entire length. Body roughly parallel-sided, not strongly tapered……...……...*Haliplus falli*

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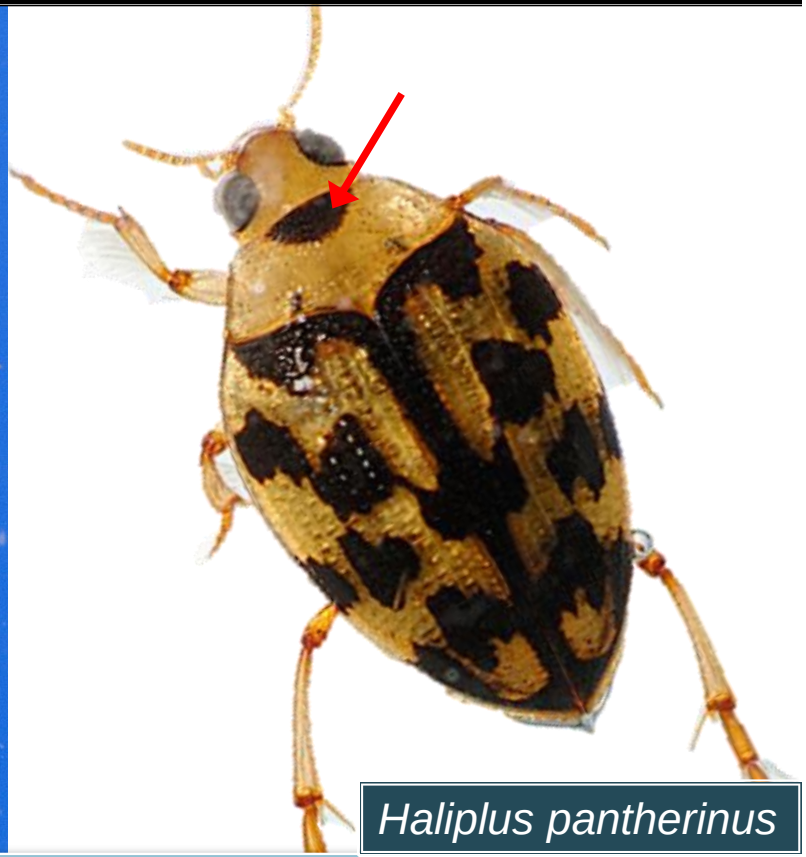
HALIPLUS OF EASTERN CANADA

Haliplus connexus



Haliplus pantherinus

13(9) Pronotum without anterior black macula.....14

13’ Pronotum with anterior black macula….
.....17

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HALIPLUS OF EASTERN CANADA

Haliplus borealis

Haliplus connexus

14(13) Length 2.5-3.0 mm. Apical margin of elytra strongly sinuate...*Haliplus borealis*

14’ Length greater than 3.5 mm. Apical margin of elytra at most feebly sinuate....**15**

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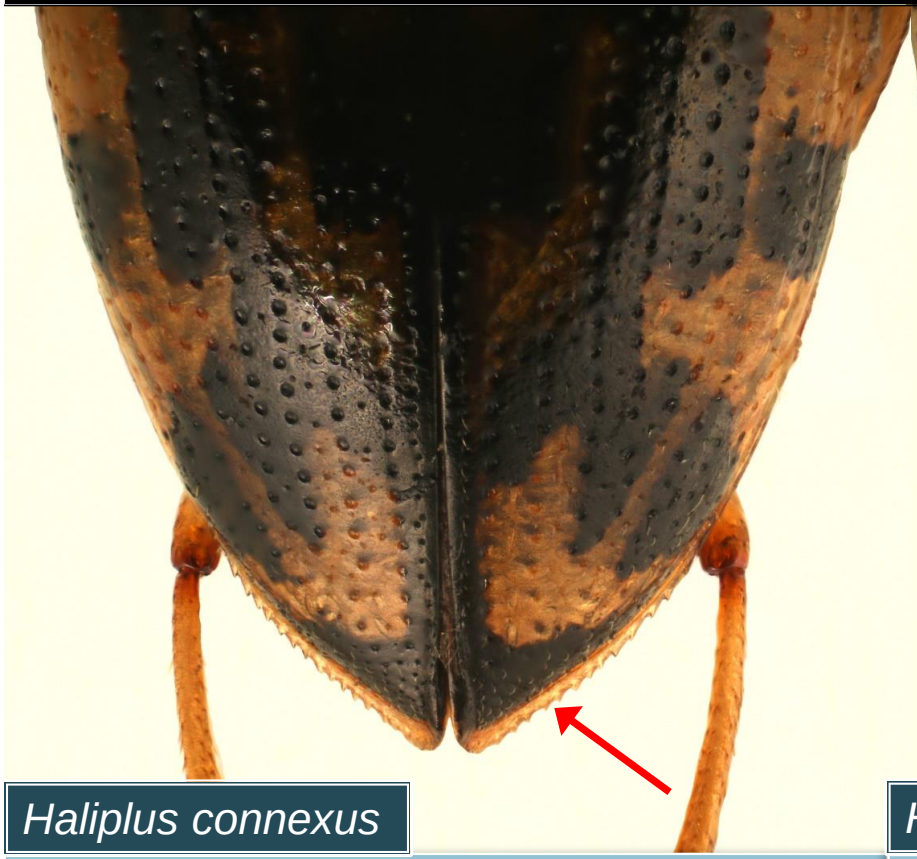
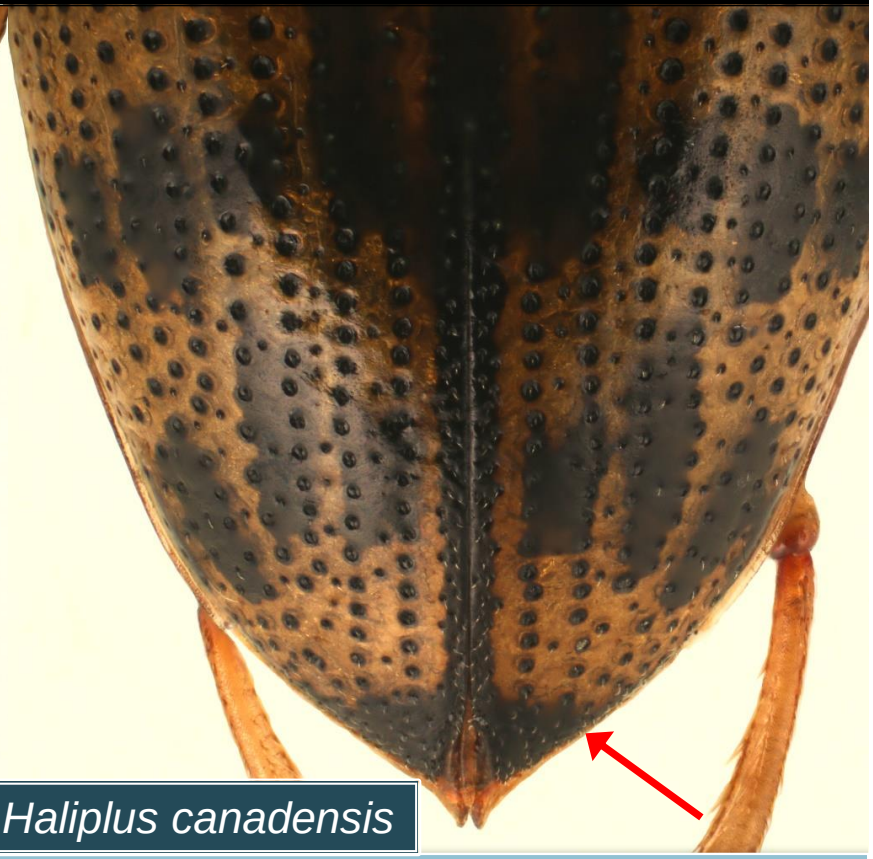
HALIPLUS OF EASTERN CANADA



Haliplus connexus



Haliplus canadensis

15(14) Apical margin of elytra denticulate… ……*Haliplus connexus*

15’ Apical margin of elytra not denticulate... ……**16**

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HALIPLUS OF EASTERN CANADA

Haliplus fasciatus

Haliplus fulvus

16(15) Elytral markings dark and bold, usually with more black than yellow overall, punctures in pale areas also pale; sutural stripe thick, confluent with medial markings…… *Haliplus fasciatus*

16’ Elytral markings thin with more yellow than black overall, punctures black; sutural stripe thin, separate from medial markings... ……..*Haliplus fulvus*

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HALIPLUS OF EASTERN CANADA

Haliplus canadensis

Haliplus pantherinus

17(13) Vertex with black macula……...18

17’ Vertex immaculate……21

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HALIPLUS OF EASTERN CANADA

Haliplus nitens

Haliplus canadensis

18(17) Elytral markings faint, almost absent in some specimens...*Haliplus nitens*

18’ Elytral markings well defined……..**19**

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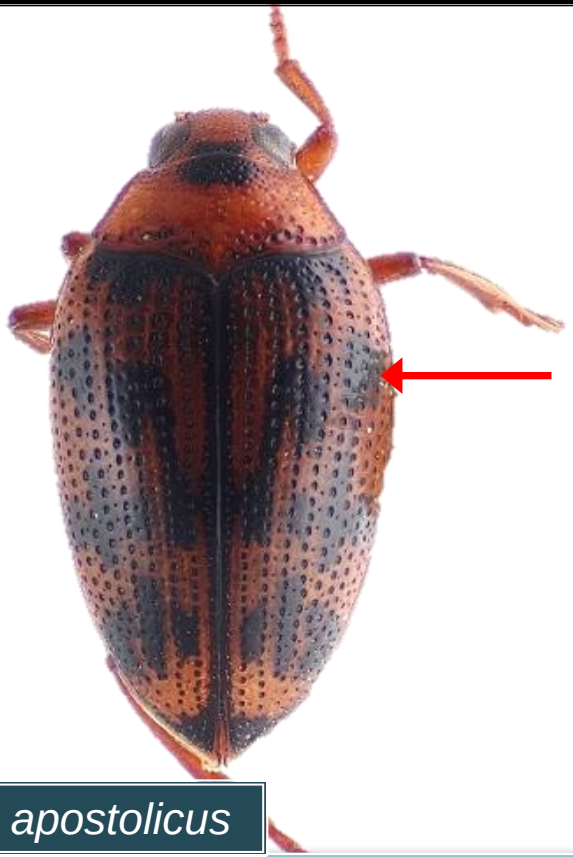
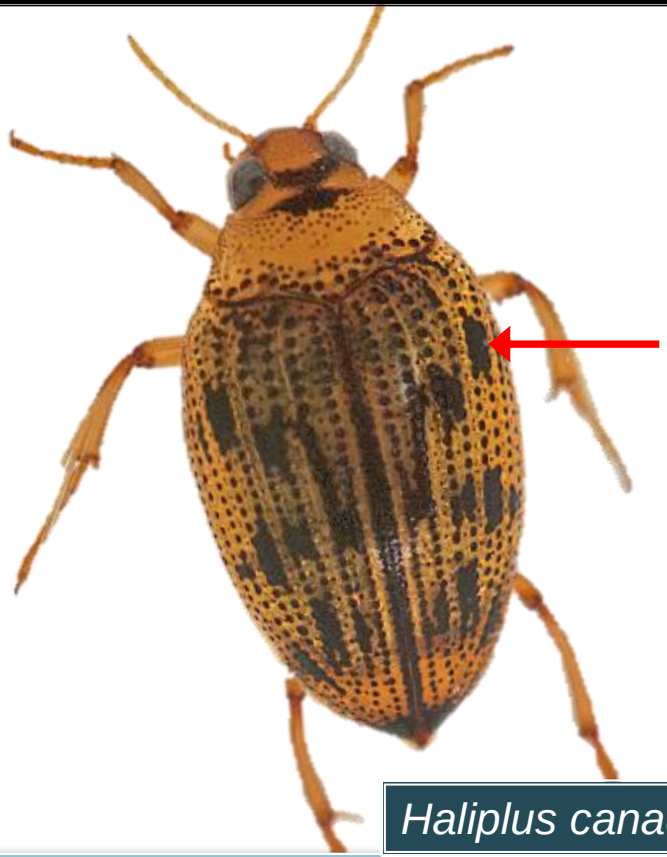
HALIPLUS OF EASTERN CANADA



Haliplus apostolicus



Haliplus canadensis

19(18) Sternal plate margined. Anterior elytral maculation extending over three striae……*Haliplus apostolicus*

19’ Sternal plate not margined. Anterior elytral maculation confined between two striae……**20**

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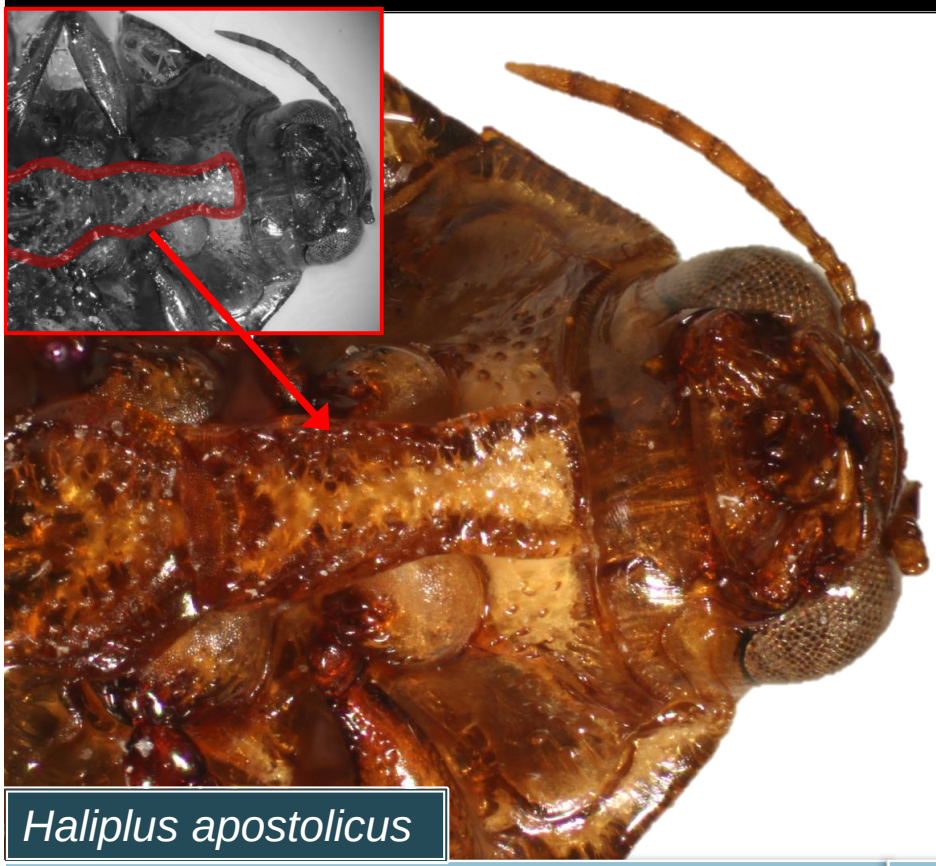
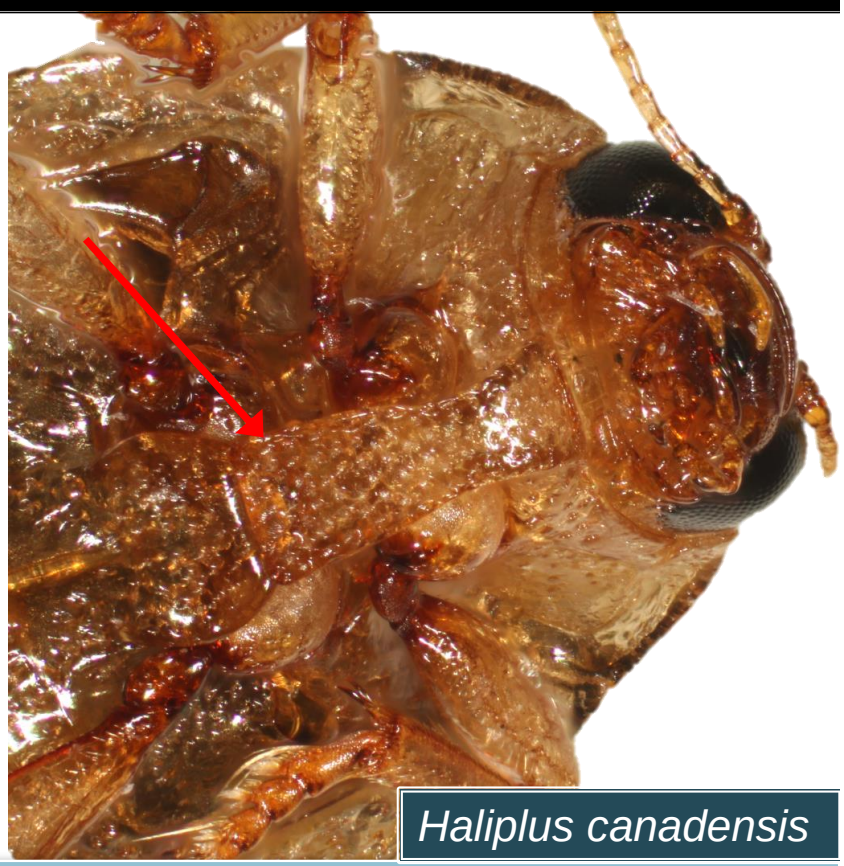
HALIPLUS OF EASTERN CANADA



Haliplus apostolicus

Sternal plate margined.

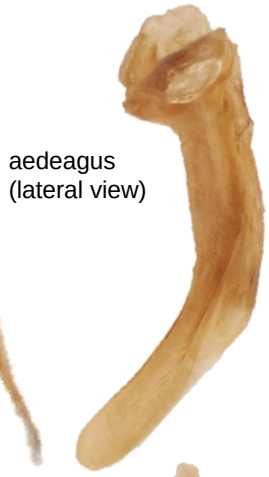


Haliplus canadensis

Sternal plate not margined.

Back

HALIPLUS OF EASTERN CANADA



Haliplus canadensis

Haliplus cribrarius

20(19) Length 3.5-4.1 mm. Aedeagus sharply bent at midpoint; left paramere with setal fringe extending almost to apex……..
……..…….....*Haliplus canadensis*

20’ Length 4.5-5.0 mm. Aedeagus evenly curved; left paramere with setal fringe not extending to apex……*Haliplus cribrarius*

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HALIPLUS OF EASTERN CANADA

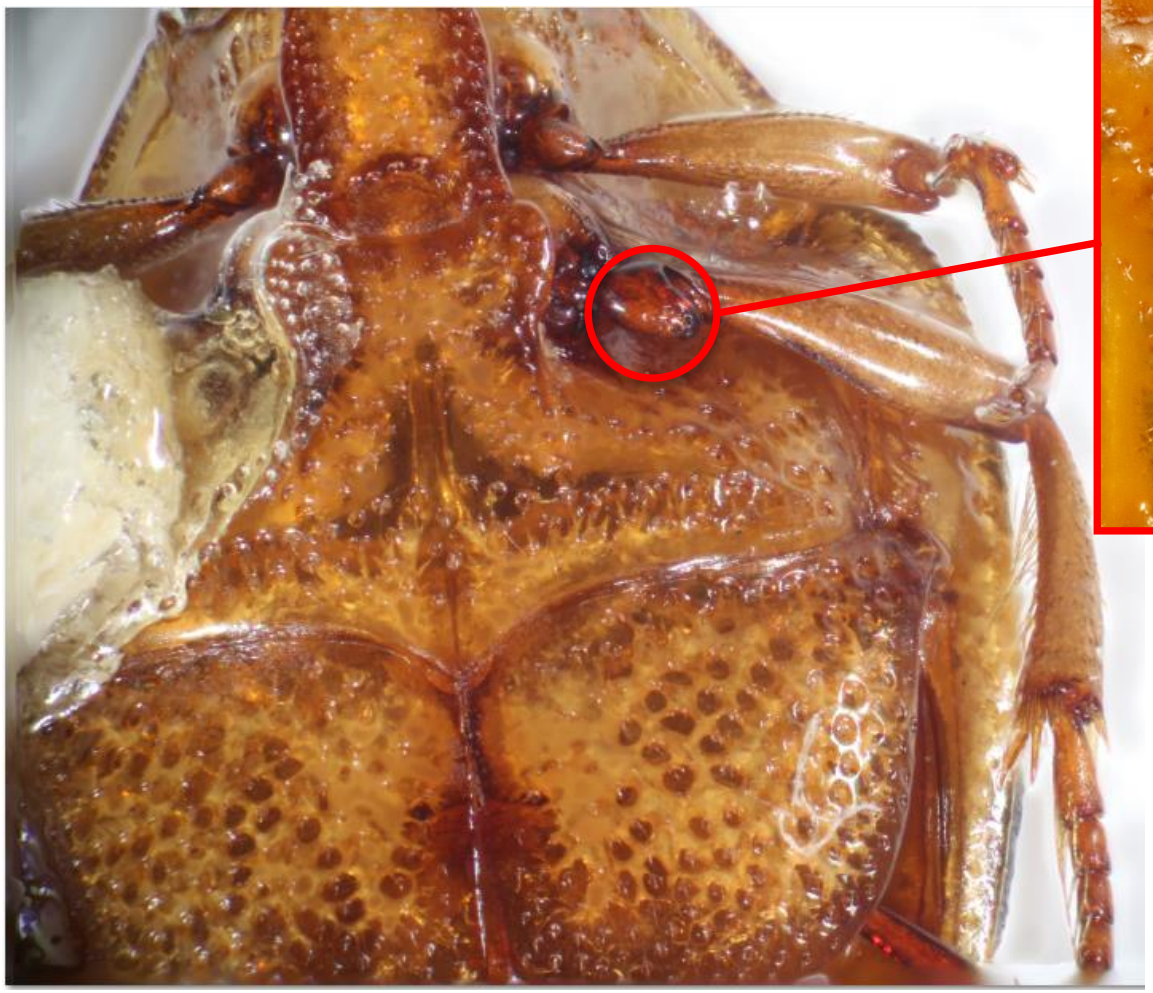
Haliplus leopardus

Haliplus pantherinus

21(17) Mesotrochanter with deep punctures. Male left paramere with setal fringe extending over entire inner margin. ……...*Haliplus leopardus*

21’ Mesotrochanter punctures absent. Male left paramere with setal fringe extending at most one half of inner margin.. ……..**22**

HALIPLUS OF EASTERN CANADA



Mesotrochanter with deep punctures

Back

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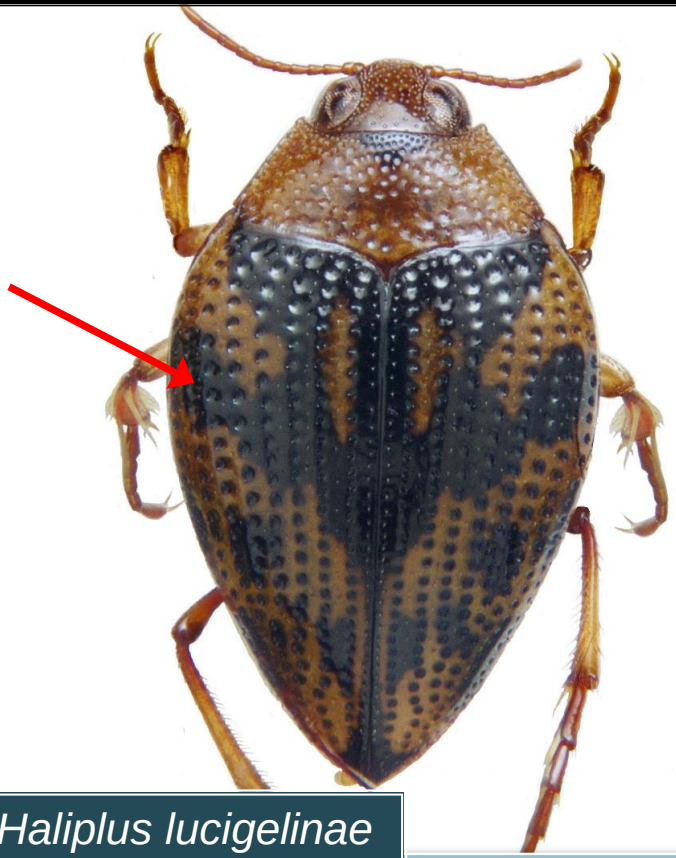
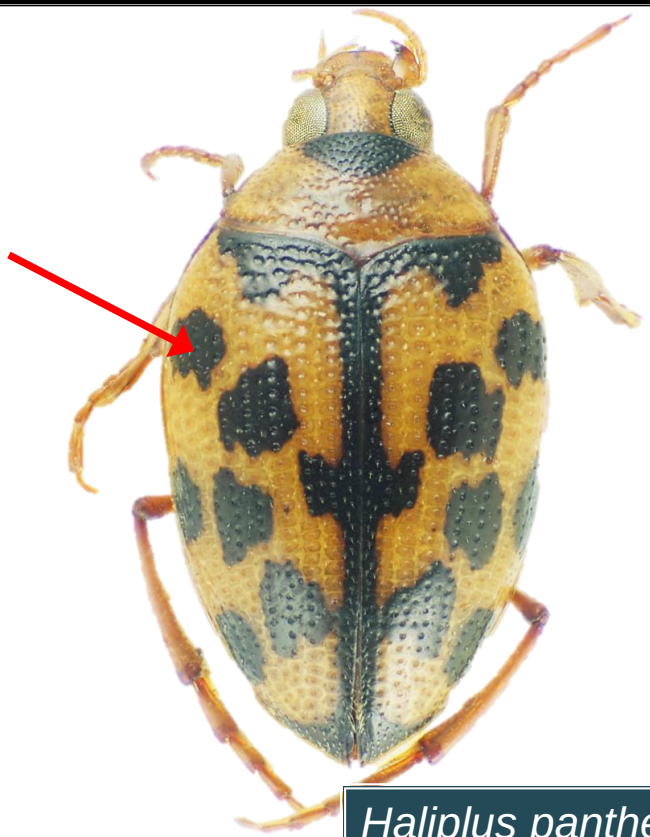
HALIPLUS OF EASTERN CANADA



Haliplus lucigelinae



Haliplus pantherinus

22(21) Length 3.0-3.1mm. Elytron rufotestaceous with subhumeral blotch connected to median blotch……..
……..*Haliplus lucigelinae*

22’ Length at least 3.3 mm. Elytron pale yellow with subhumeral botch separate from median blotch……..**23**

HALIPLUS OF EASTERN CANADA

aedeagus
(lateral view)

left paramere
(lateral view)

Haliplus triopsis

23(22) Carina on anterior edge of metepisternum not or only slightly darkened. Male protarsal claw at most half the length of last tarsomere. Aedeagus with almost 90º bend at apical quarter, apex rounded……*Haliplus triopsis*

aedeagus
(lateral view)

left paramere
(lateral view)

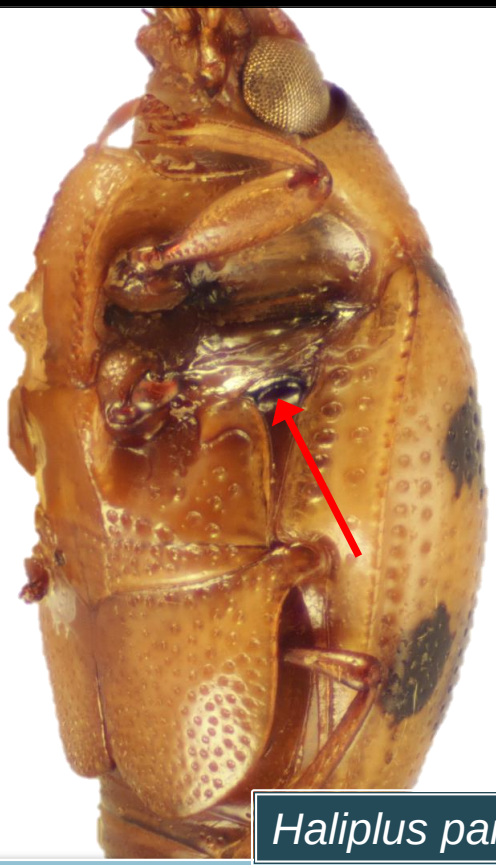
Haliplus pantherinus

23’ Carina on anterior edge of metepisternum distinctly darkened. Male protarsal claw over half the length of last tarsomere. Aedeagus almost evenly curved from base to apex, apex flatly blunted ……*Haliplus pantherinus*

HALIPLUS OF EASTERN CANADA

Haliplus triopsis

Carina on anterior edge of metepisternum not or only slightly darkened.



Haliplus pantherinus

Carina on anterior edge of metepisternum distinctly darkened.

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Length: 3.7-4.4 mm

Brychius hungerfordi Spangler

Brychius hungerfordi is the only species of the genus *Brychius* in eastern Canada. This species is recognized as endangered under Ontario's Endangered Species Act, by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2011), and by the United States Fish and Wildlife Service. In Canada, it is only known from three rivers in Bruce County, Ontario: the Rankin, the Saugeen, and the North Saugeen. It also occurs at four sites in Michigan. Adults and larvae occur in moderate to fast flowing streams, and most records are from short distances downstream from beaver dams or other dams.

Distribution Map

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Brychius hungerfordi

Distribution in eastern Canada

Species Page

doi: 10.3752/cjai.2017.32

Length: 3.5-4.0 mm

Peltodytes edentulus LeConte

Peltodytes edentulus is one of the most commonly collected haliplid species in eastern Canada, and has been found in a variety of lentic habitats. Adults are found in spring, late summer and early fall and differ from other *Peltodytes* species by the presence of a black crescent-shaped marking on the head.

P. edentulus occurs throughout Canada and the northern USA.

Distribution Map

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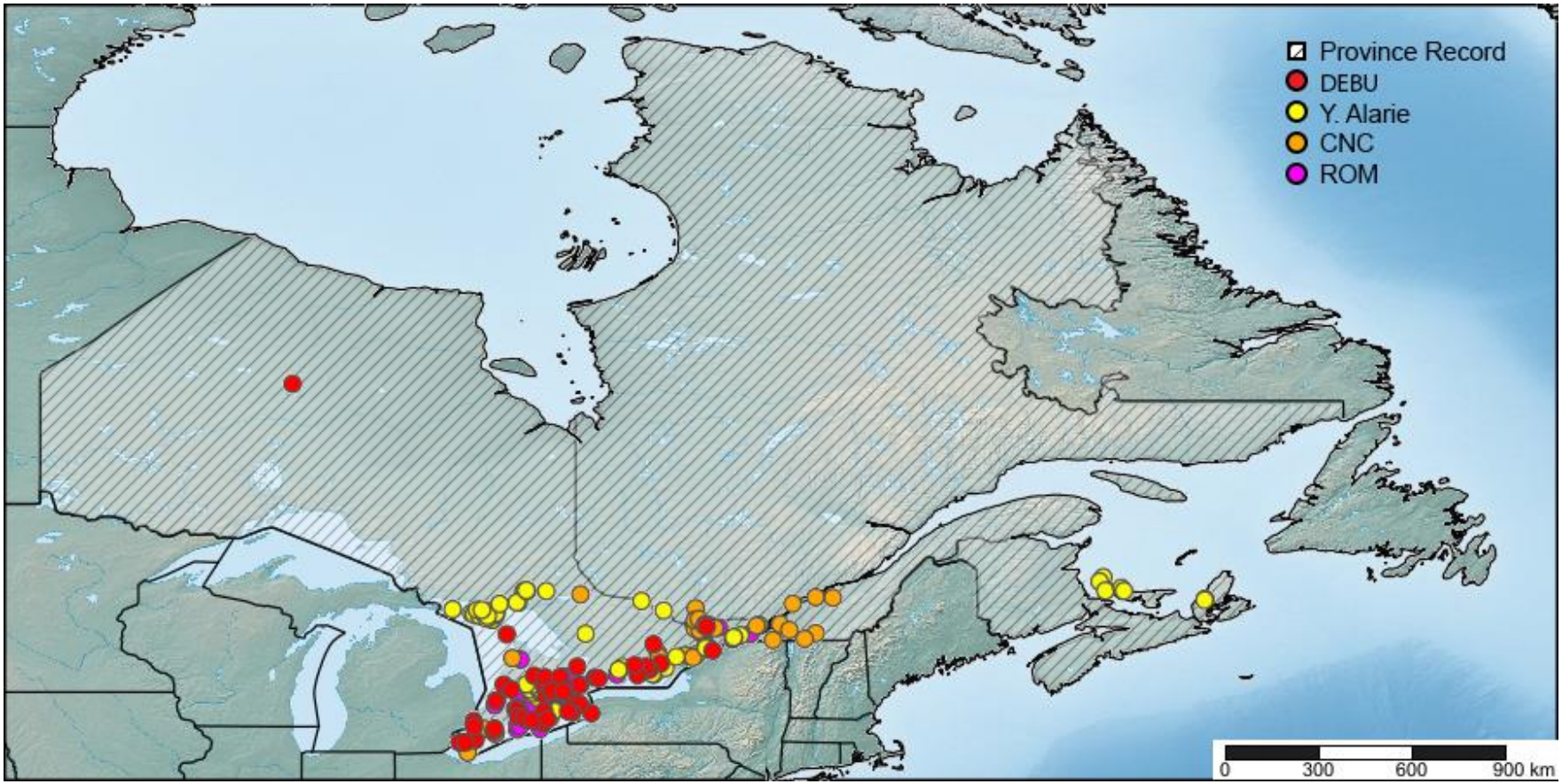
Peltodytes edentulus

Distribution in eastern Canada



Species Page

doi: 10.3752/cjai.2017.32

Length: 4.0 mm*
only one specimen

Peltodytes lengi Roberts

Pelotodytes lengi is similar to *P. duodecimpuntatus*, but the hind coxal plates are more rounded apically and the metafemur has a wider pale preapical band.
P. lengi is relatively uncommon in Canada but is known from Ontario, Québec and New Brunswick. It is also widespread across the eastern USA.

aedeagus
(lateral view)

Distribution Map

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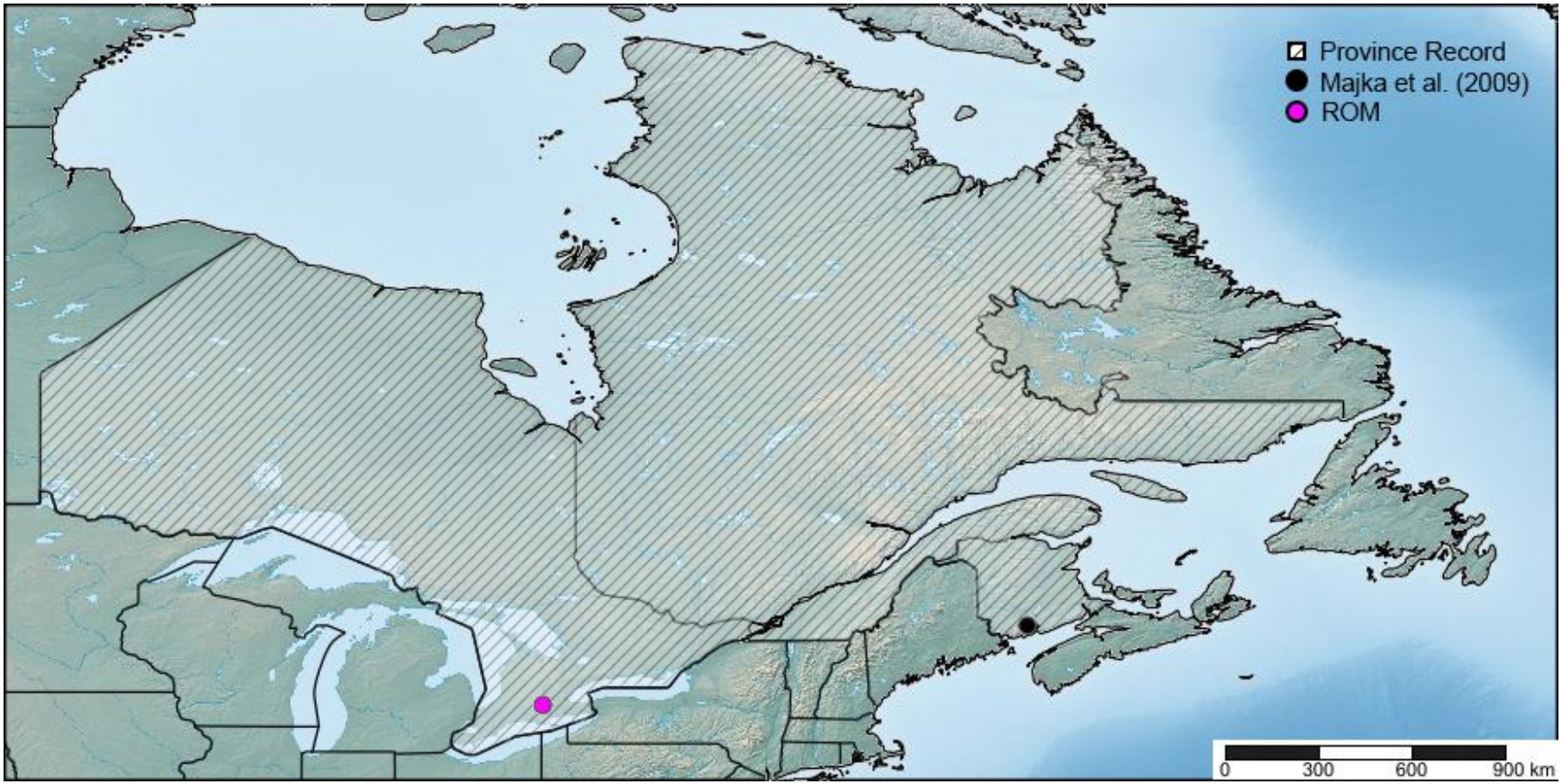
Peltodytes lengi

Distribution in eastern Canada



Species Page

doi: 10.3752/cjai.2017.32

Length: 3.5-4.0 mm

aedeagus
(lateral view)

Peltodytes duodecimpunctatus Say

Peltodytes duodecimpunctatus is very similar in appearance to *P. lengi*, but is far more commonly collected. Adult records, mostly from late summer to early fall, are from a variety of lentic habitats.
P. duodecimpunctatus occurs in New Brunswick, Ontario and Québec, and is widespread throughout the USA.

Distribution Map

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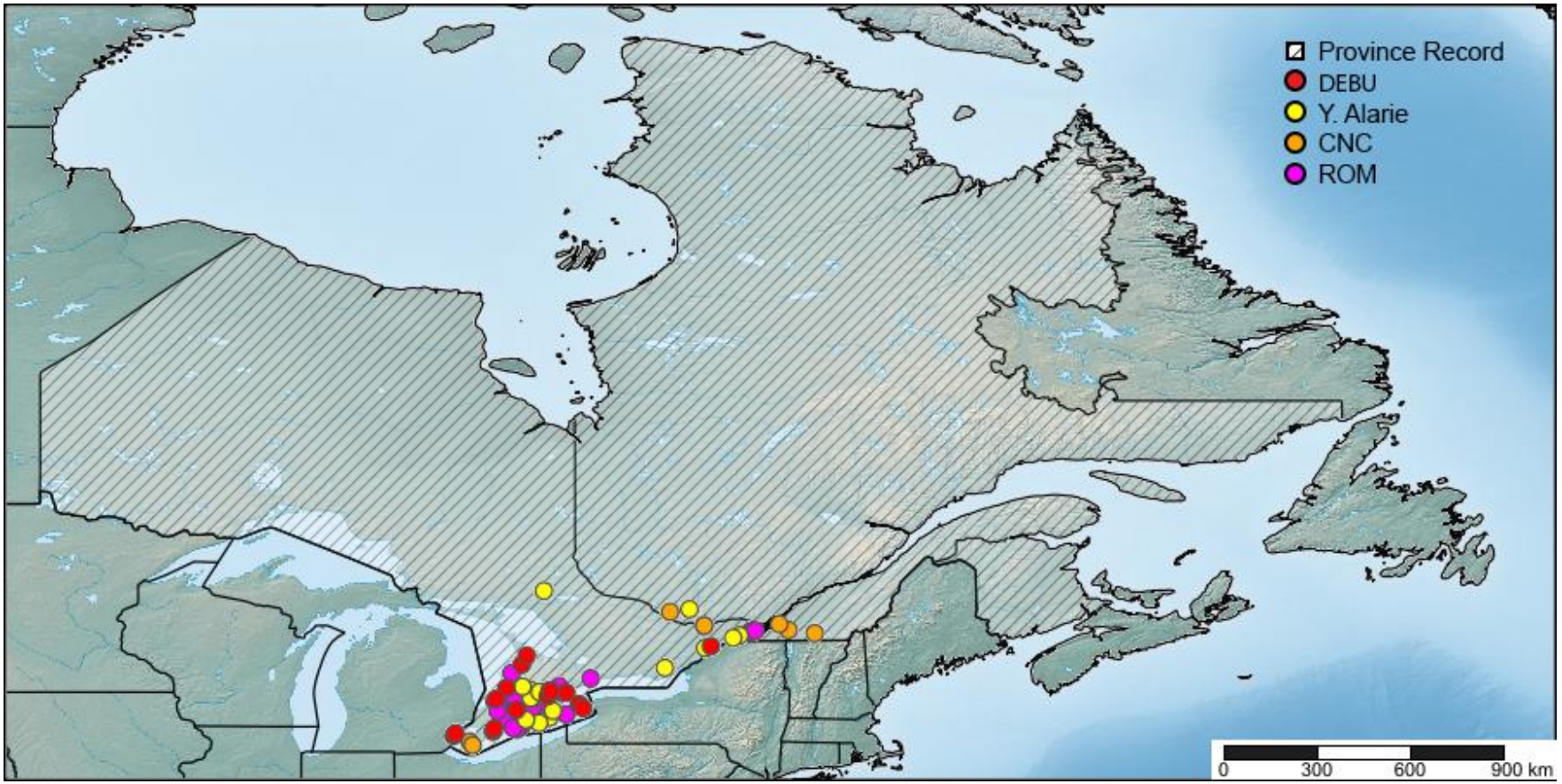
Peltodytes duodecimpunctatus

Distribution in eastern Canada



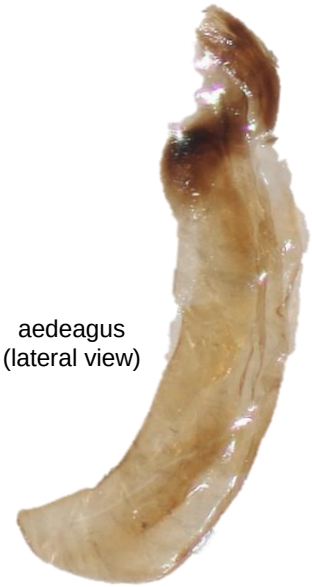
Species Page

doi: 10.3752/cjai.2017.32

Peltodytes muticus LeConte

Peltodytes muticus, the only eastern Canadian *Peltodytes* with an entirely dark metafemur, seems to prefer creeks or ponds with dense vegetation. Adults have been collected in the late spring and summer.

This uncommon species occurs in Ontario and Québec, and is widespread throughout the USA.

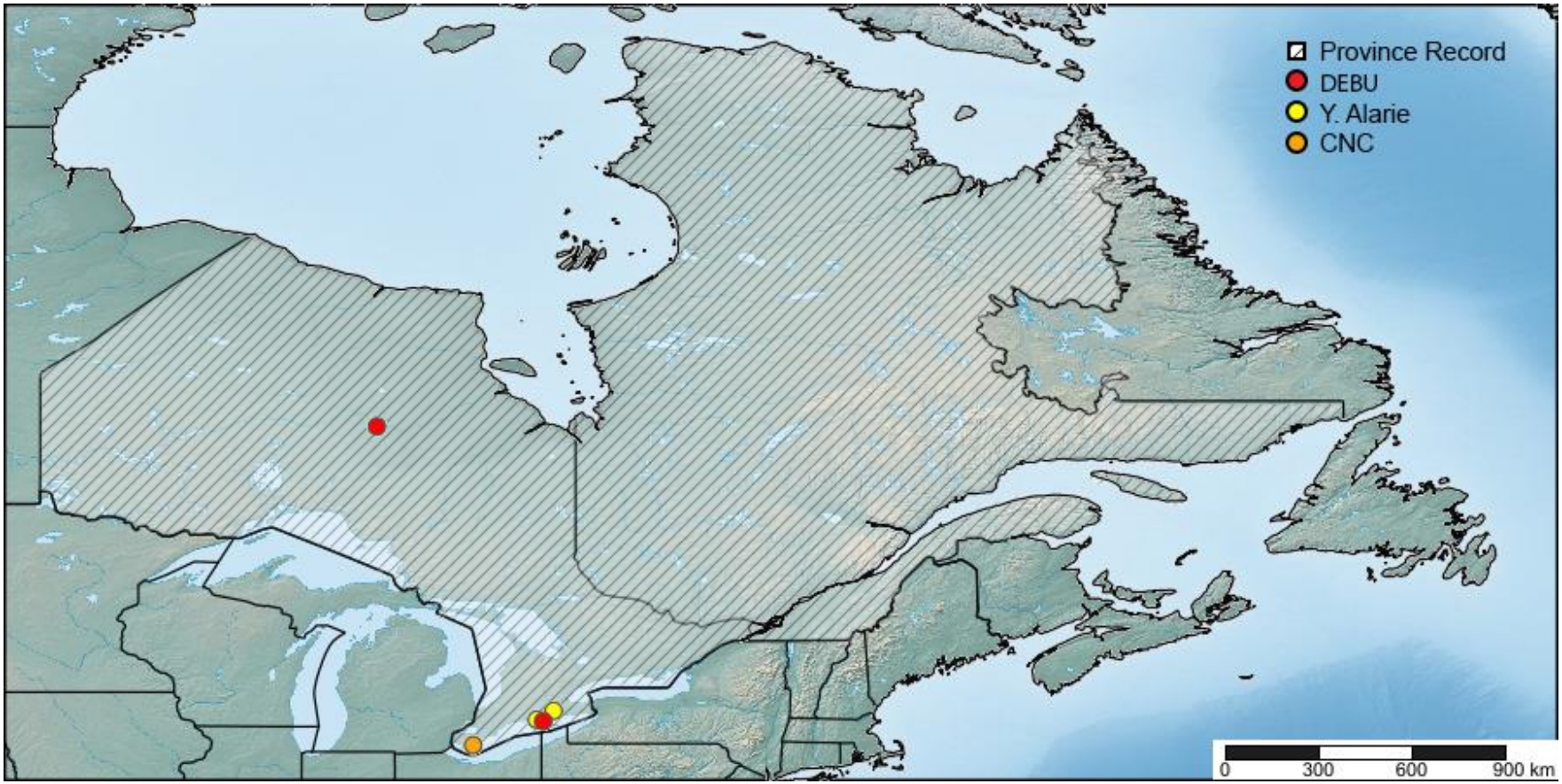


Distribution Map

doi: 10.3752/cjai.2017.32

Peltodytes muticus

Distribution in eastern Canada



Species Page

doi: 10.3752/cjai.2017.32

Peltodytes tortulosus Roberts

Peltodytes tortulosus is the largest haliplid in eastern Canada, and one of two *Peltodytes* species in eastern Canada with a pale metafemur. The elytral punctures are usually large and deep with large black markings over each one. Adults have been collected in a variety of lentic habitats, primarily in spring, late summer and early fall. This species is often collected with the very common, smaller, *P. edentulus* (left beetle in the photo below).
P. tortulosus occurs throughout southeastern Canada and the northeastern USA.

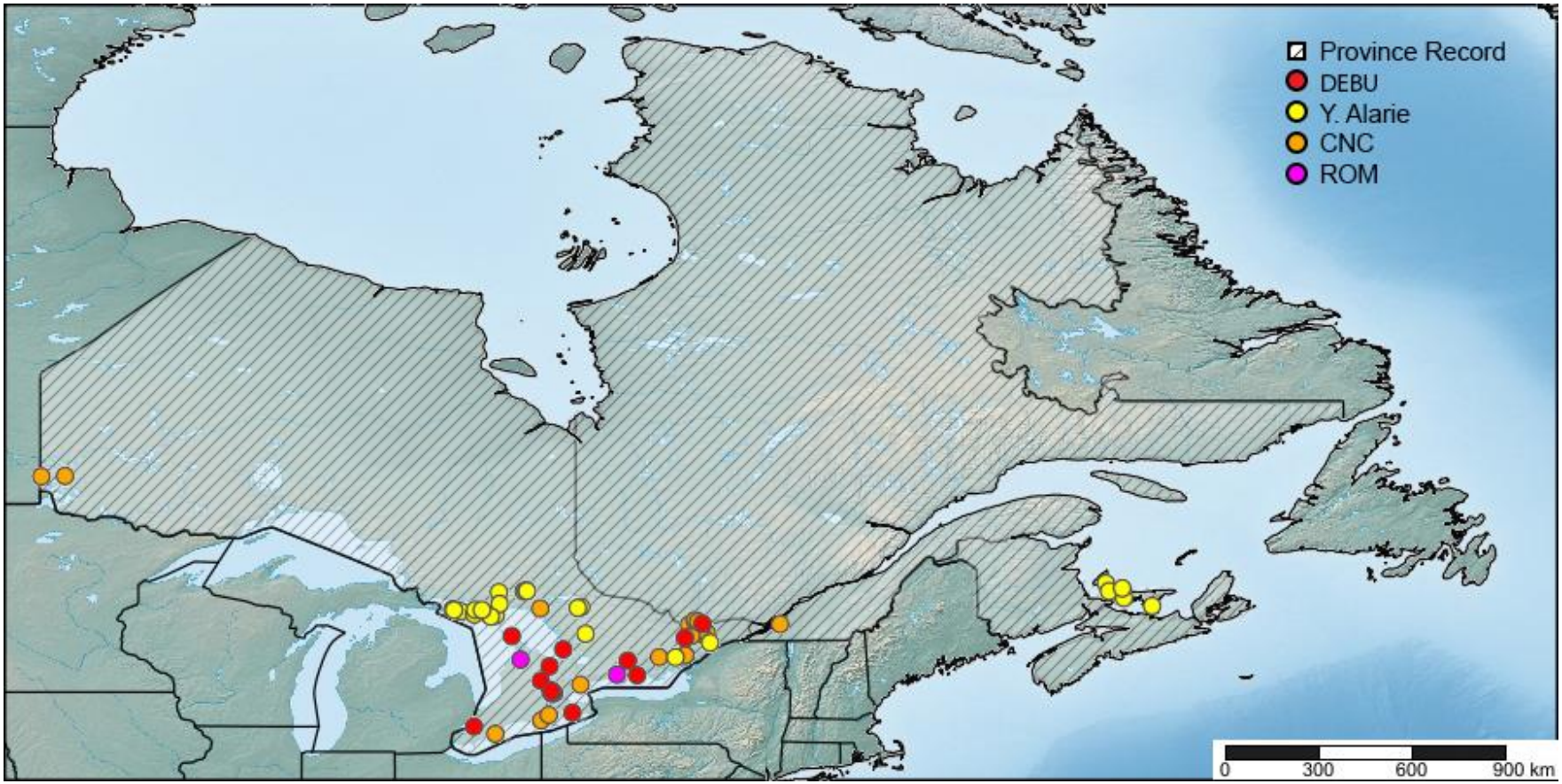
Distribution Map

Length: 4.5-5.0 mm

doi: 10.3752/cjai.2017.32

Peltodytes tortulosus

Distribution in eastern Canada



Species Page

doi: 10.3752/cjai.2017.32

Peltodytes litoralis Matheson

Length: 3.4-3.8 mm

Peltodytes litoralis is one of two *Peltodytes* species in eastern Canada with a pale metafemur, and is significantly smaller (under 4mm) than the other species (*P. tortulosus,* over 4mm*)*. This species is known from a single locality in Canada; a sandy bottomed river in New Brunswick. It also occurs in central and eastern USA.

Photos by Jesse Ray

Distribution Map

doi: 10.3752/cjai.2017.32

Peltodytes litoralis

Distribution in eastern Canada

Species Page

doi: 10.3752/cjai.2017.32

Haliplus immaculicollis Harris

Haliplus immaculicollis is one of the most commonly collected haliplids in eastern Canada. It is very similar in appearance to *H. blanchardi* and *H. borealis*. Adults have been collected in a variety of lentic habitats throughout spring, summer and early fall. *H. immaculicollis* occurs across Canada and the USA.

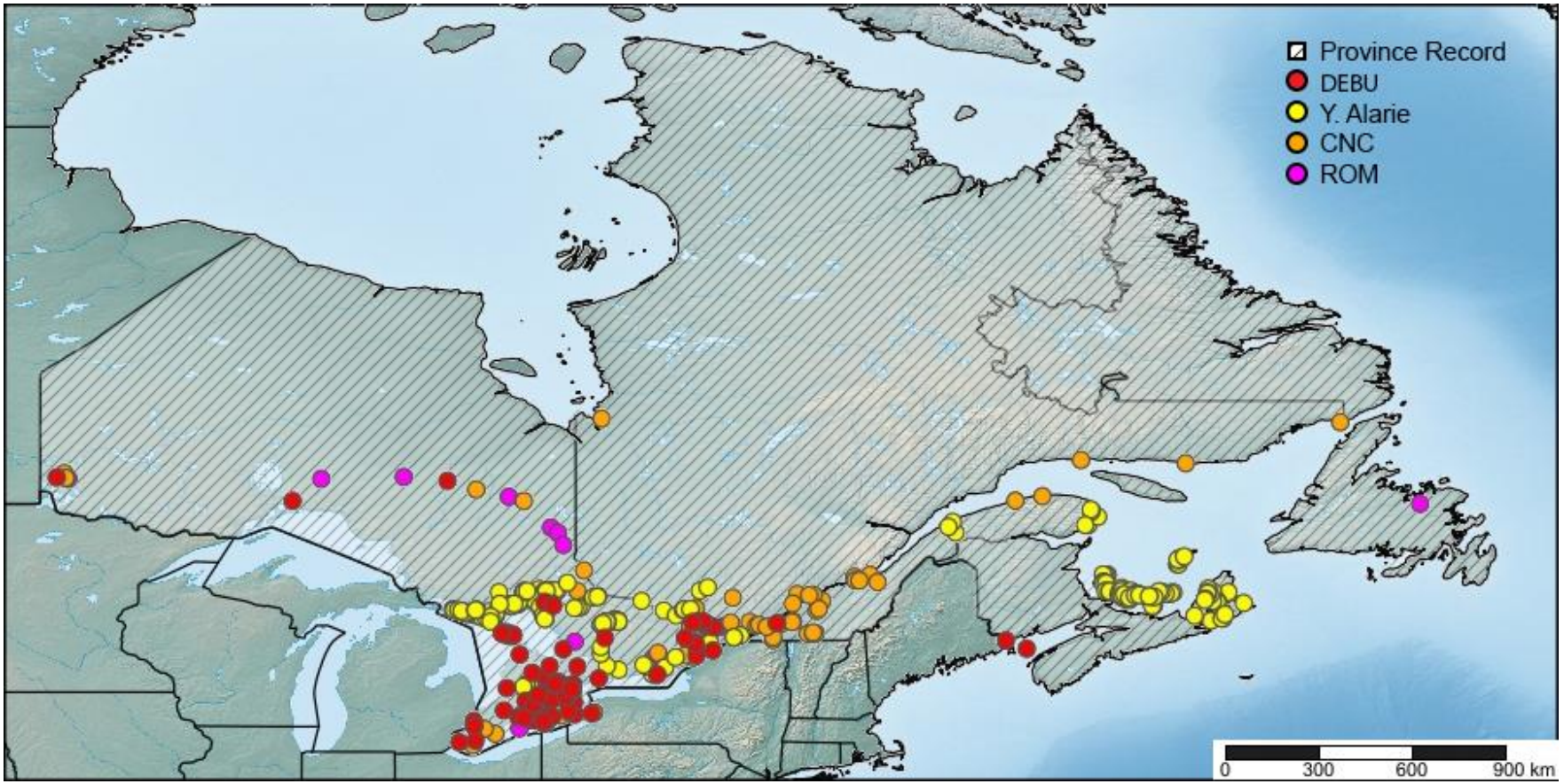
Length: 2.5-3.0 mm

Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus immaculicollis

Distribution in eastern Canada



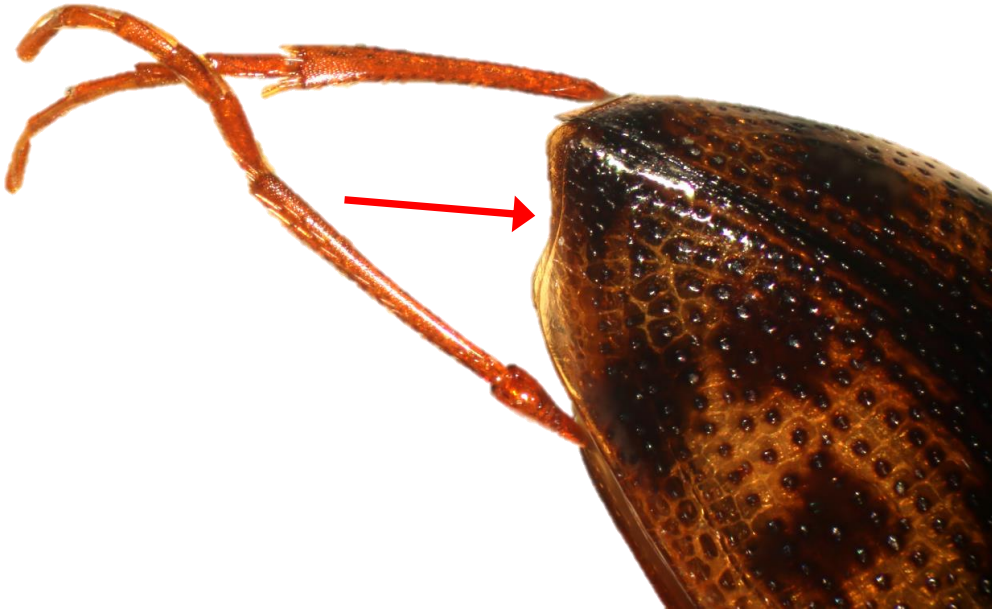
Species Page

doi: 10.3752/cjai.2017.32

Length: 2.8-3.0 mm

Haliplus blanchardi Roberts

Haliplus blanchardi is similar in size and appearance to *H. immaculicollis*, but is far less common than the latter.
H. blanchardi is known to occur in Québec, and is recorded here in Ontario for the first time. *H. blanchardi* also occurs throughout the eastern USA.

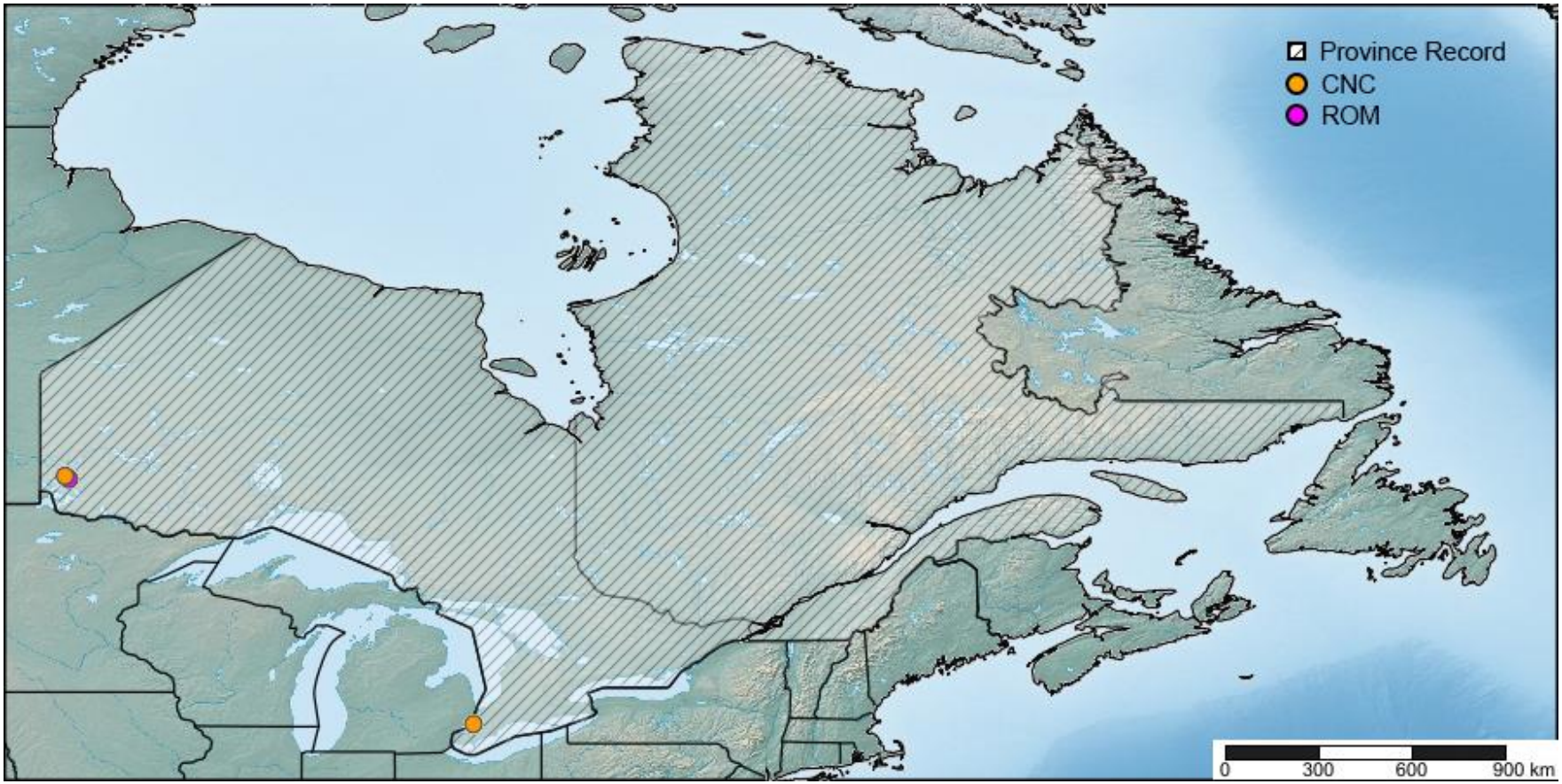


Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus blanchardi

Distribution in eastern Canada



Species Page

doi: 10.3752/cjai.2017.32

Haliplus longulus LeConte

Haliplus longulus is similar in size and markings to the less common and more northern species *H. falli*, but the metallic gold elytra make it easy to identify. Adults have been collected in lentic habitats throughout spring, late summer and early fall.
H. longulus occurs across Canada and the USA.

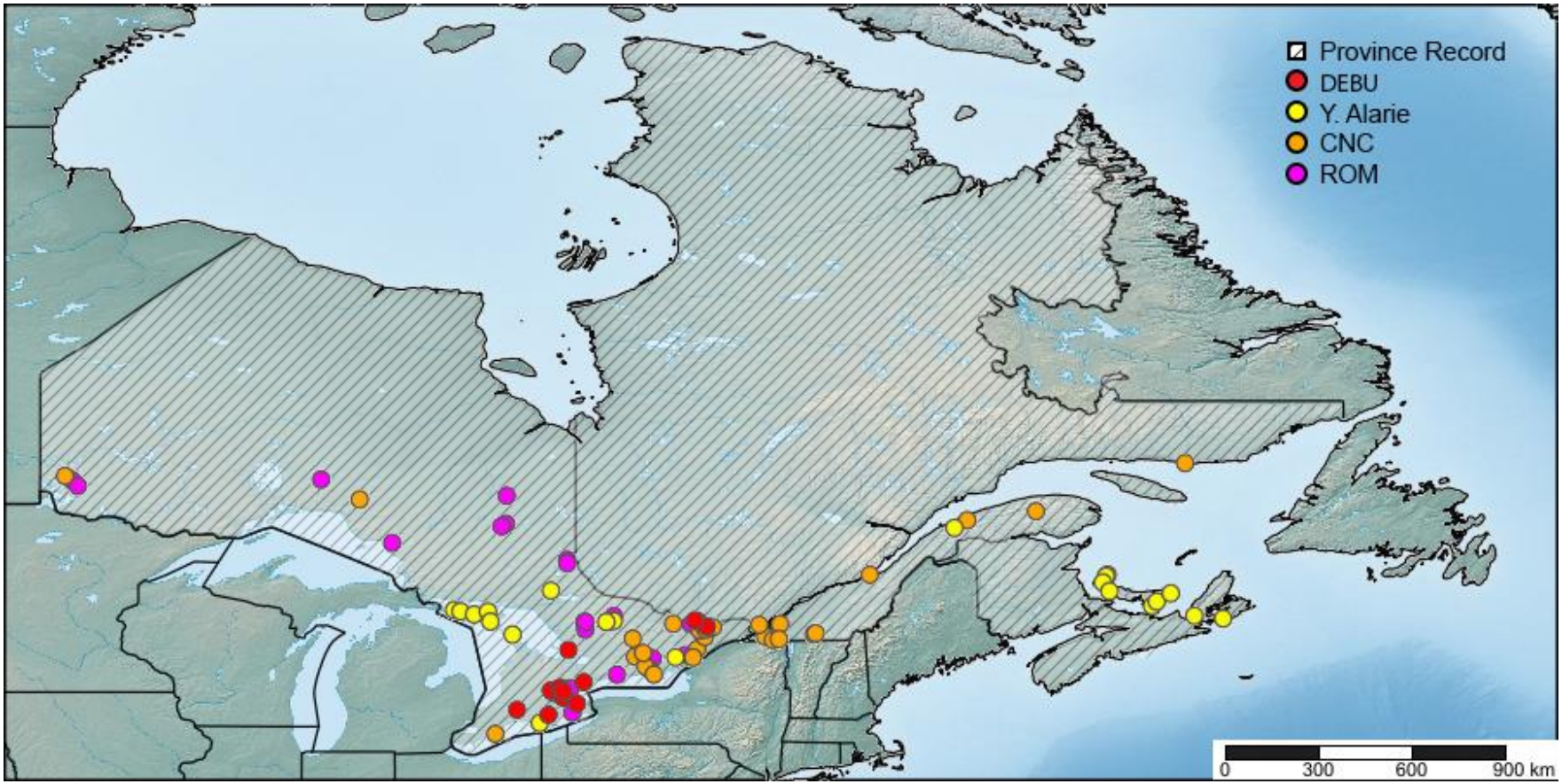
Length: 2.7-3.0 mm

Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus longulus

Distribution in eastern Canada



Species Page

doi: 10.3752/cjai.2017.32

Haliplus falli Mank

Haliplus falli is similar in size and markings to *H. longulus*, but has a more cylindrical body shape. Adults have been collected in shallow pools along lakes in late summer.

This species has a northern distribution, occurring in northern Canada and Alaska. In eastern Canada it was previously thought to be restricted to northern Québec, but is here recorded along the Québec border in Ontario for the first time.

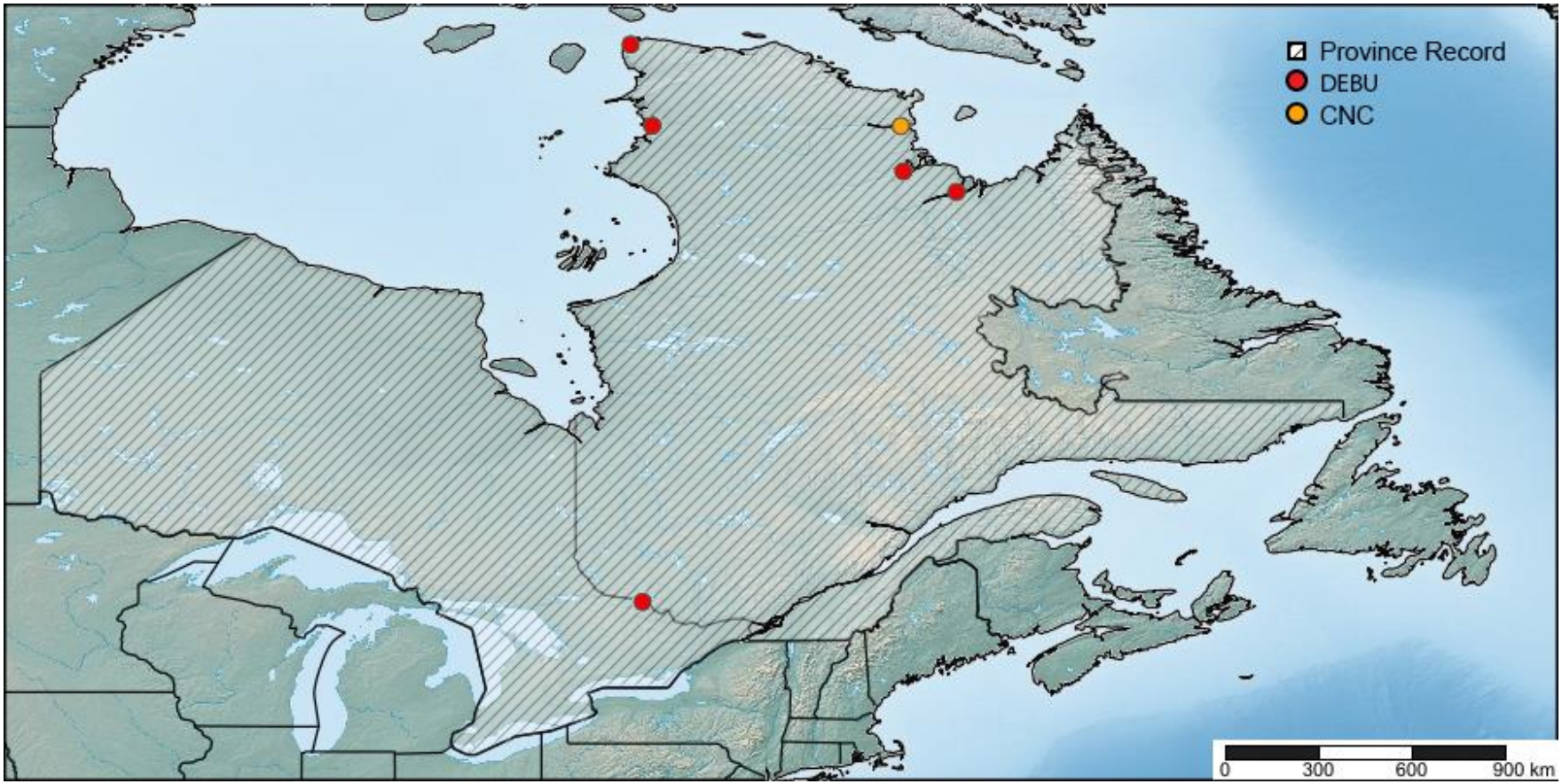
Length: 2.8-3.1 mm

Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus falli

Distribution in eastern Canada



Species Page

doi: 10.3752/cjai.2017.32

Haliplus borealis LeConte

Hailiplus borealis is similar in appearance to *H. blanchardi* and *H. immaculicollis*, from which it differs by the absence of pronotal plicae. The elytral markings tend to form a "figure-8" pattern (seen below).
This species is uncommon, and adults have been collected in eutrophic, lentic habitats during the spring and summer.
In eastern Canada, *H. borealis* occurs in Ontario, Quebec, New Brunswick and Nova Scotia. It also occurs throughout the northern USA.

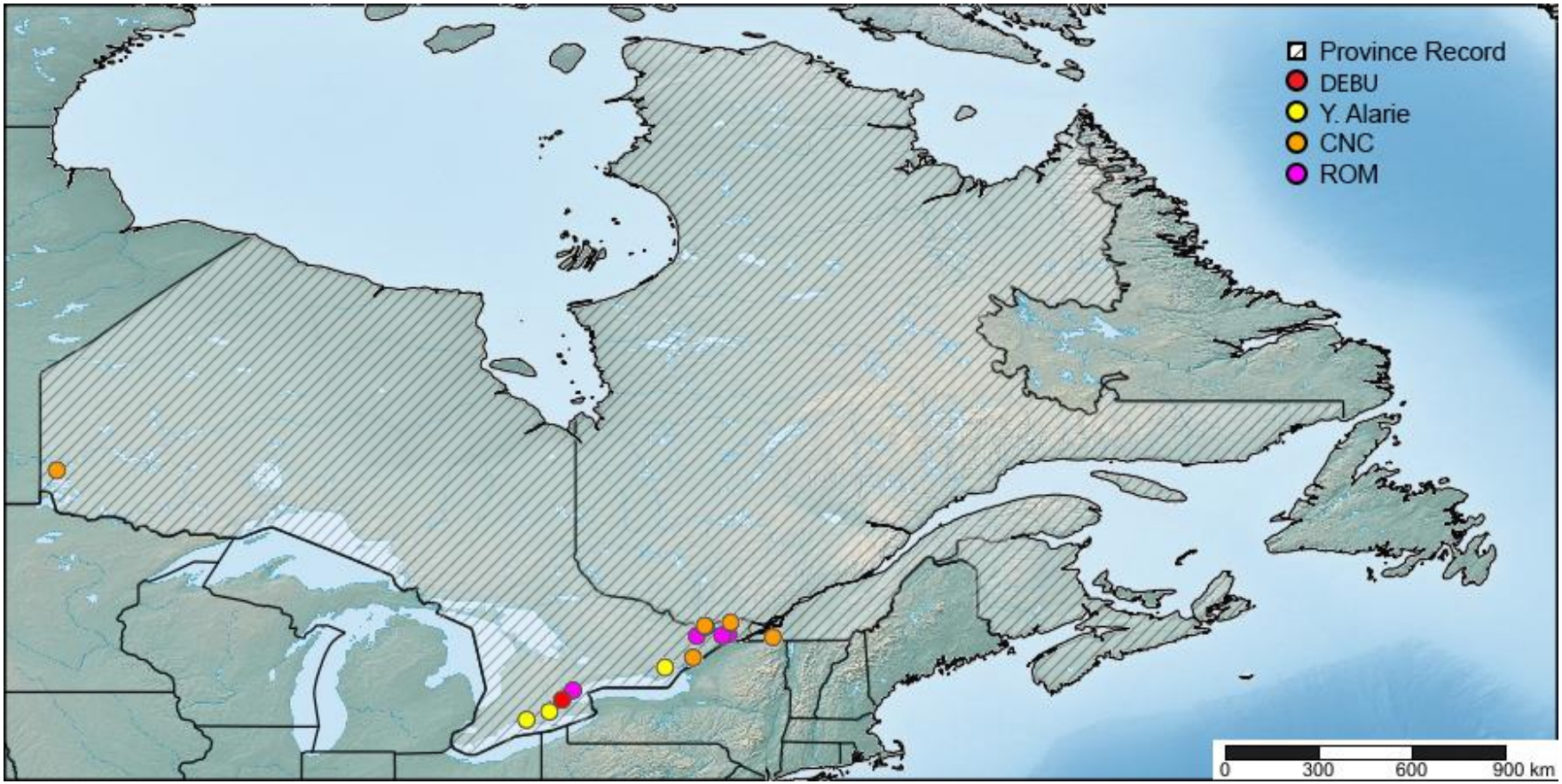
Length: 2.5-3.0 mm

Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus borealis

Distribution in eastern Canada



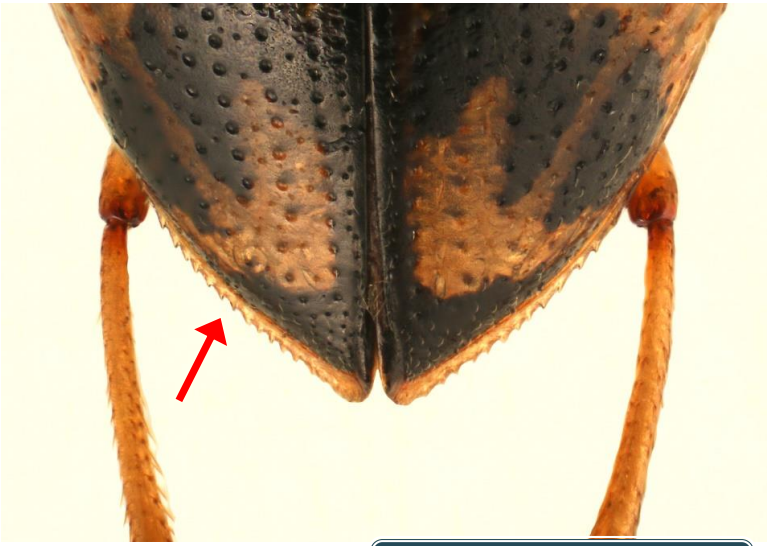
Species Page

doi: 10.3752/cjai.2017.32

Length: 3.8-4.0 mm

Haliplus connexus Matheson

Haliplus connexus is easily identified by the distinctive teeth on the elytral apex. Adults are commonly found in a wide array of lentic habitats, from lakes to roadside ditches. Adult records are mostly from spring, late summer and early fall.
H. connexus occurs in eastern Canada and the northeastern USA. This species is here newly recorded from Prince Edward Island.

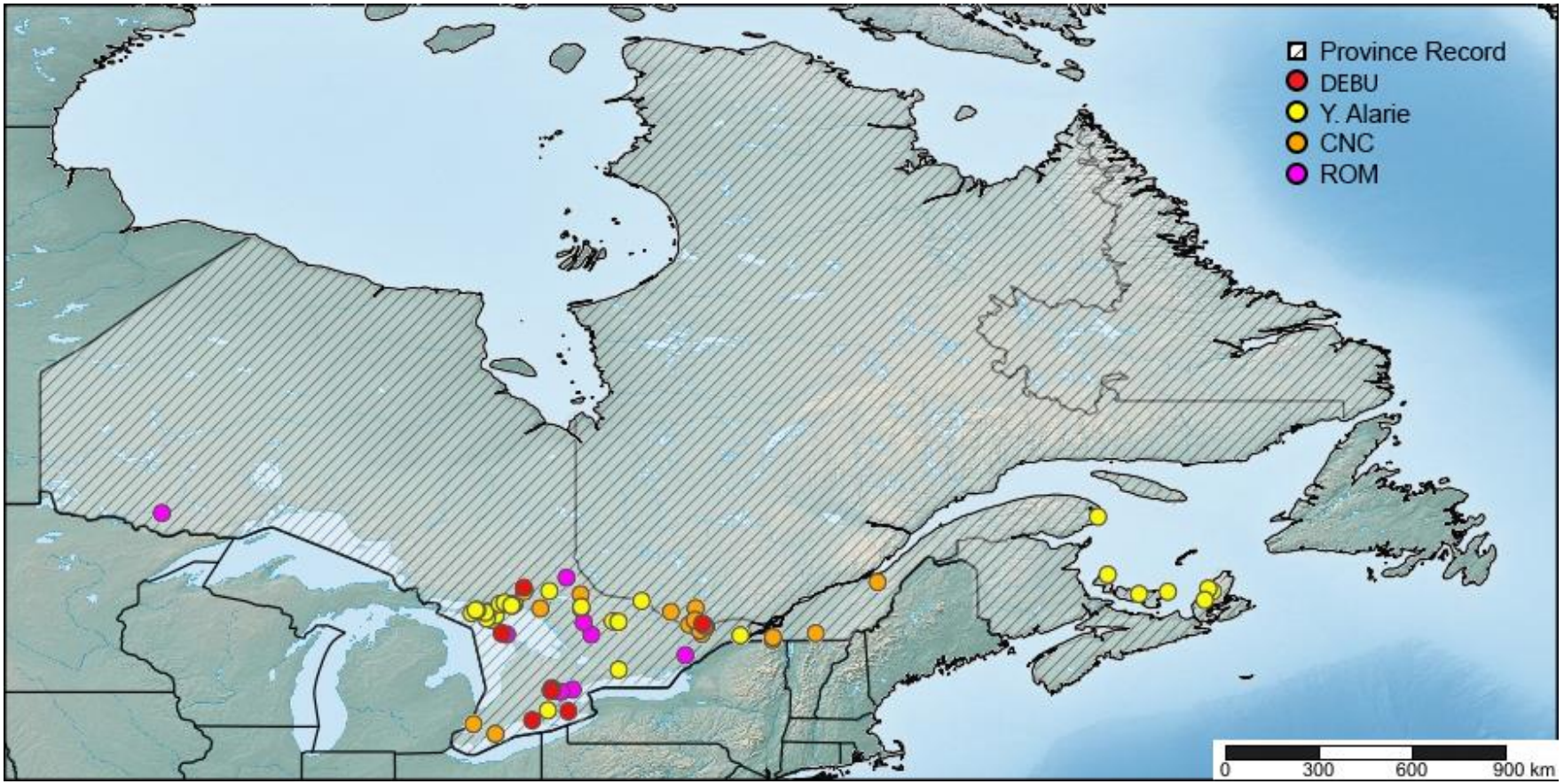


Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus connexus

Distribution in eastern Canada



Species Page

doi: 10.3752/cjai.2017.32

Haliplus fasciatus Aubé

Length: 3.8-4.4 mm

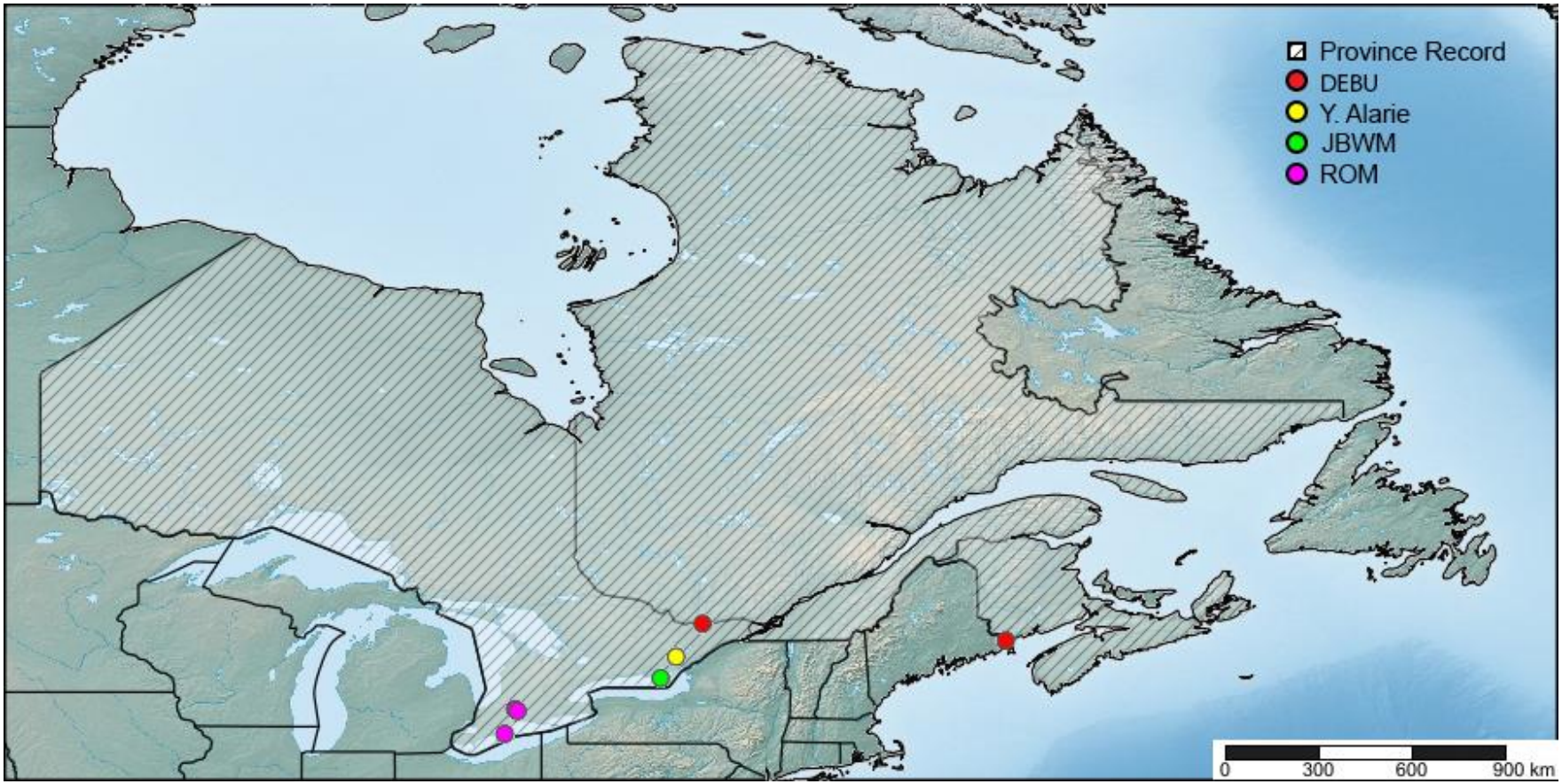
Haliplus fasciatus is similar in size and markings to *H. connexus*. It is rarely collected, and seems to prefer lakes or outlets from lakes.
In Canada, *H. fasciatus* occurs in Ontario and Quebec, and is here newly recorded from New Brunswick. This species also occurs throughout the eastern USA.

Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus fasciatus

Distribution in eastern Canada



Species Page

doi: 10.3752/cjai.2017.32

Length: 3.8-4.2 mm

Haliplus fulvus Fabricius

Haliplus fulvus superficially resembles *H. canadensis* and *H. cribrarius*, but lacks any anterior pronotal markings. Adults seem to favour pools and ponds with dense vegetation.

This somewhat uncommon species occurs across Canada and the northern USA.

This species was once thought to be three separate species; *H. fulvus, H. subguttatus* and *H. salinarius*. Vondel (1991) synonymized these species, and their synonymy is maintained here.

aedeagus
(lateral view)

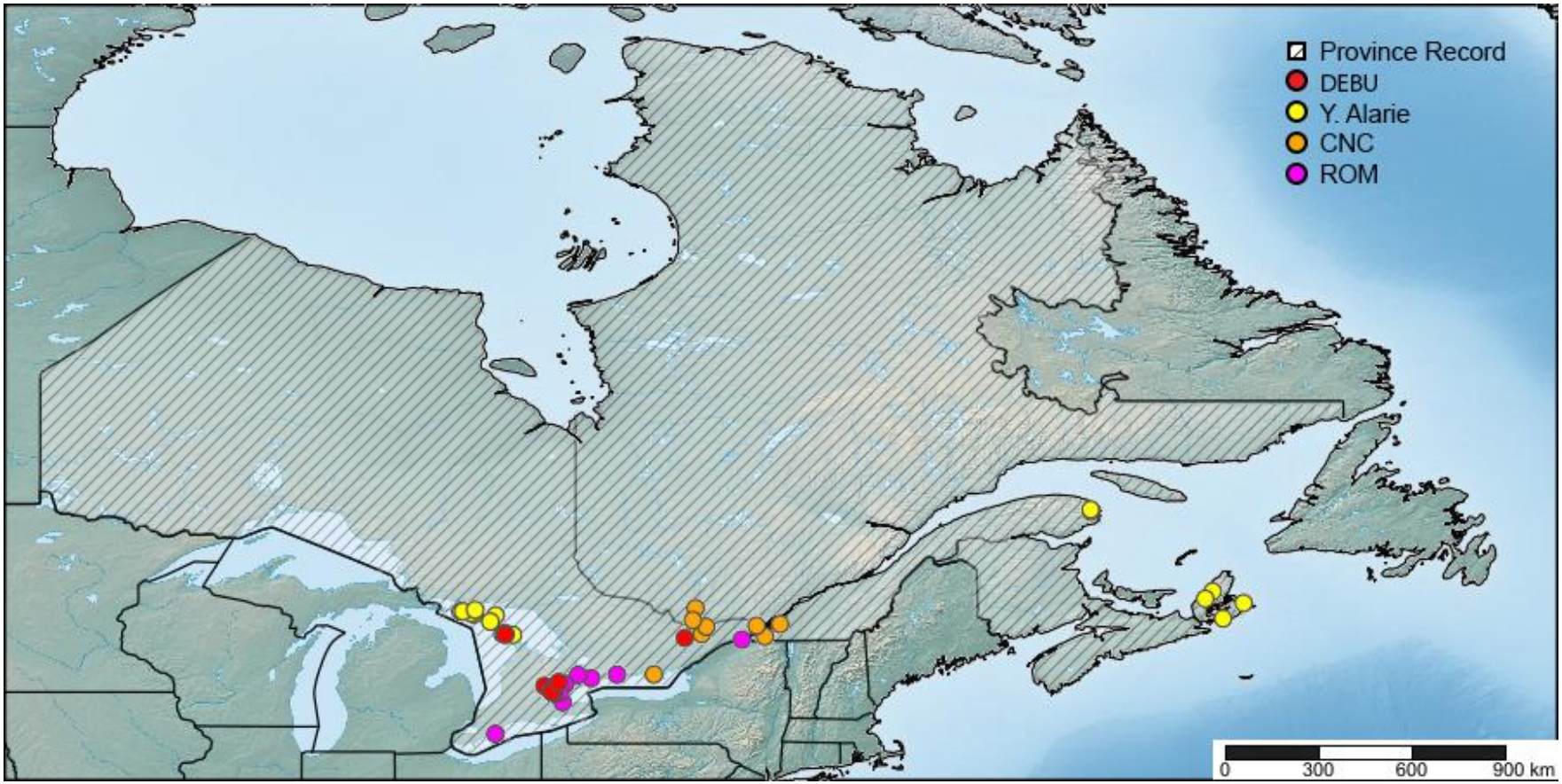
left paramere
(lateral view)

Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus fulvus

Distribution in eastern Canada



Species Page

doi: 10.3752/cjai.2017.32

Length: 3.8-4.2 mm

Haliplus nitens LeConte

Haliplus nitens is very closely resembles both *H. canadensis* and *H. cribrarius*. This close resemblance, combined with the few and widely separated specimen records has left *H. nitens* shrouded in mystery.

Brigham (1983) attempted to solve the mystery by closely examining all available specimens. The only specimens he did not consider to be misidentified *H. canadensis* specimens were the original type series from the north shore of Lake Superior, and two females from Shovel Mt., Texas. Such a broad and scattered distribution is suspect, and Brigham noted that mislabeling of the Texas specimens could not be ruled out. If the Texas specimens are valid then this suggests that either *H. nitens* is widely distributed, and extremely rare, or that it is extirpated from most of its range, and possibly extinct.

A series of University of Manitoba specimens determined to be *H. nitens* by S.O. Swadener were collected in Alklavik, NWT, Canada in 1932. This is the most recent collection record of the species, and the only one since 1913. One of these specimens is pictured here.

Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus nitens

Distribution in eastern Canada

Species Page

doi: 10.3752/cjai.2017.32

Length: 4.1 mm *
only one specimen

Haliplus apostolicus Wallis

Haliplus apostolicus is very similar in size and markings to *H. canadensis* and *H. cribrarius*, but differs in having a margined sternum.
This species is known from only a few specimens from Nova Scotia, Québec and the northeastern USA.

left paramere
(lateral view)

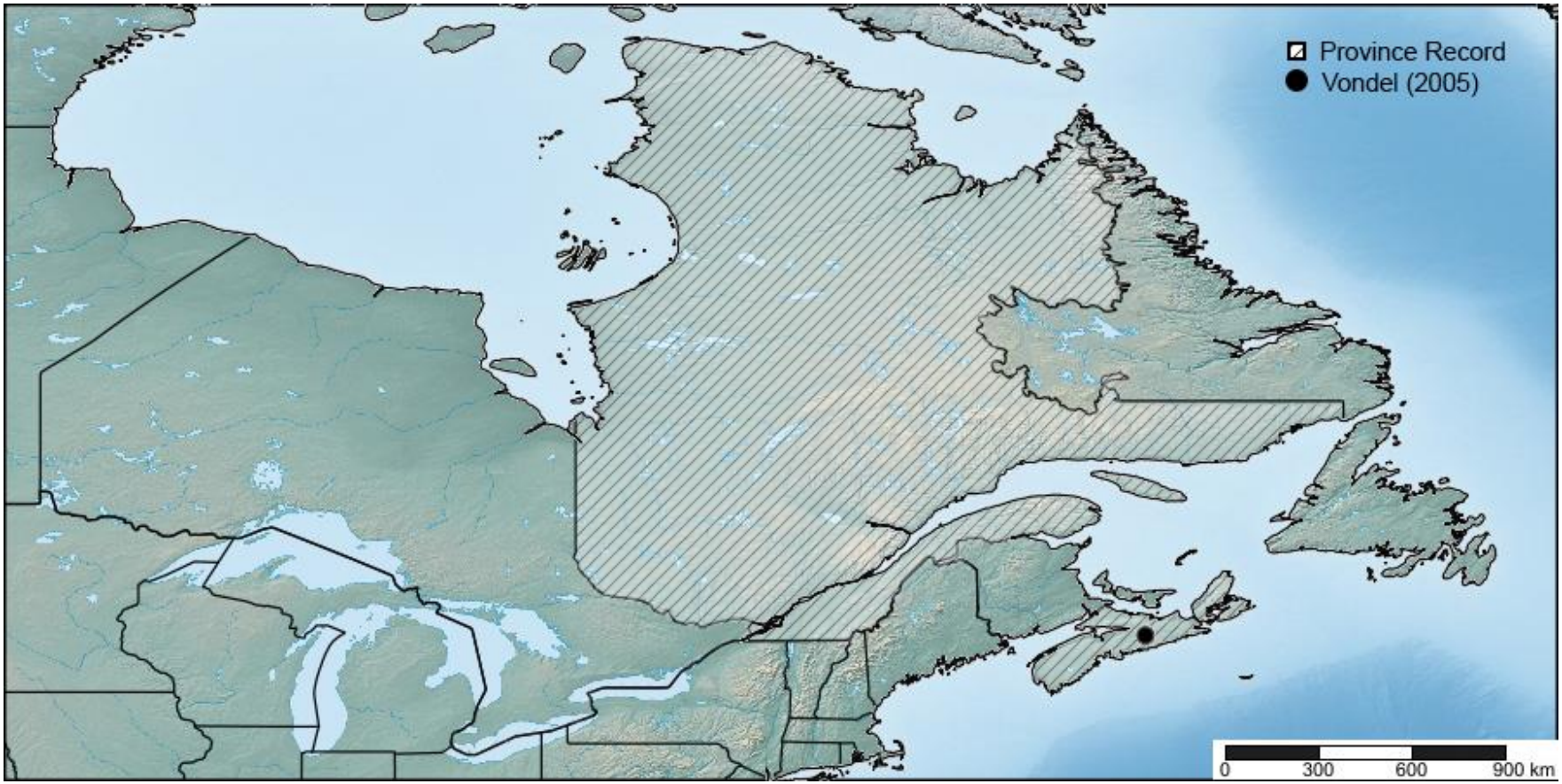
aedeagus
(lateral view)

Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus apostolicus

Distribution in eastern Canada



Species Page

doi: 10.3752/cjai.2017.32

Length: 3.5-4.1 mm

Haliplus canadensis Wallis

Haliplus canadensis is very similar in size and markings to *H. apostolicus* and *H. cribrarius*, but can be discerned by its unique genitalia and lack of sternal margin. Adults have been collected in a variety of lentic habitats throughout spring, late summer and early fall. *H. canadensis* occurs throughout Canada and the north-eastern USA, and is recorded here from New Brunswick for the first time.

left paramere (lateral view)

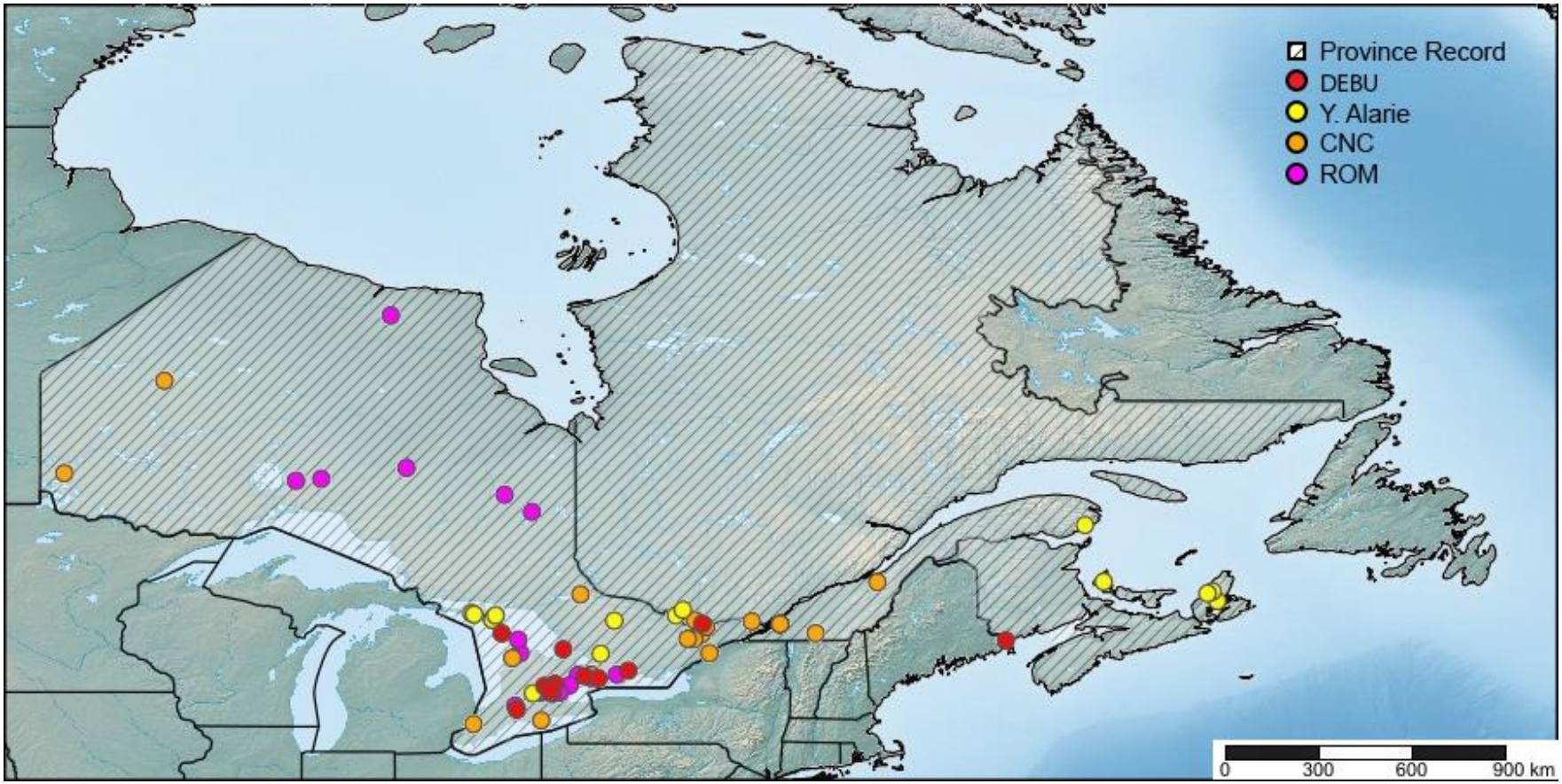
aedeagus (lateral view)

Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus canadensis

Distribution in eastern Canada



Species Page

doi: 10.3752/cjai.2017.32

Length: 4.5-5.0 mm

Haliplus cribrarius LeConte

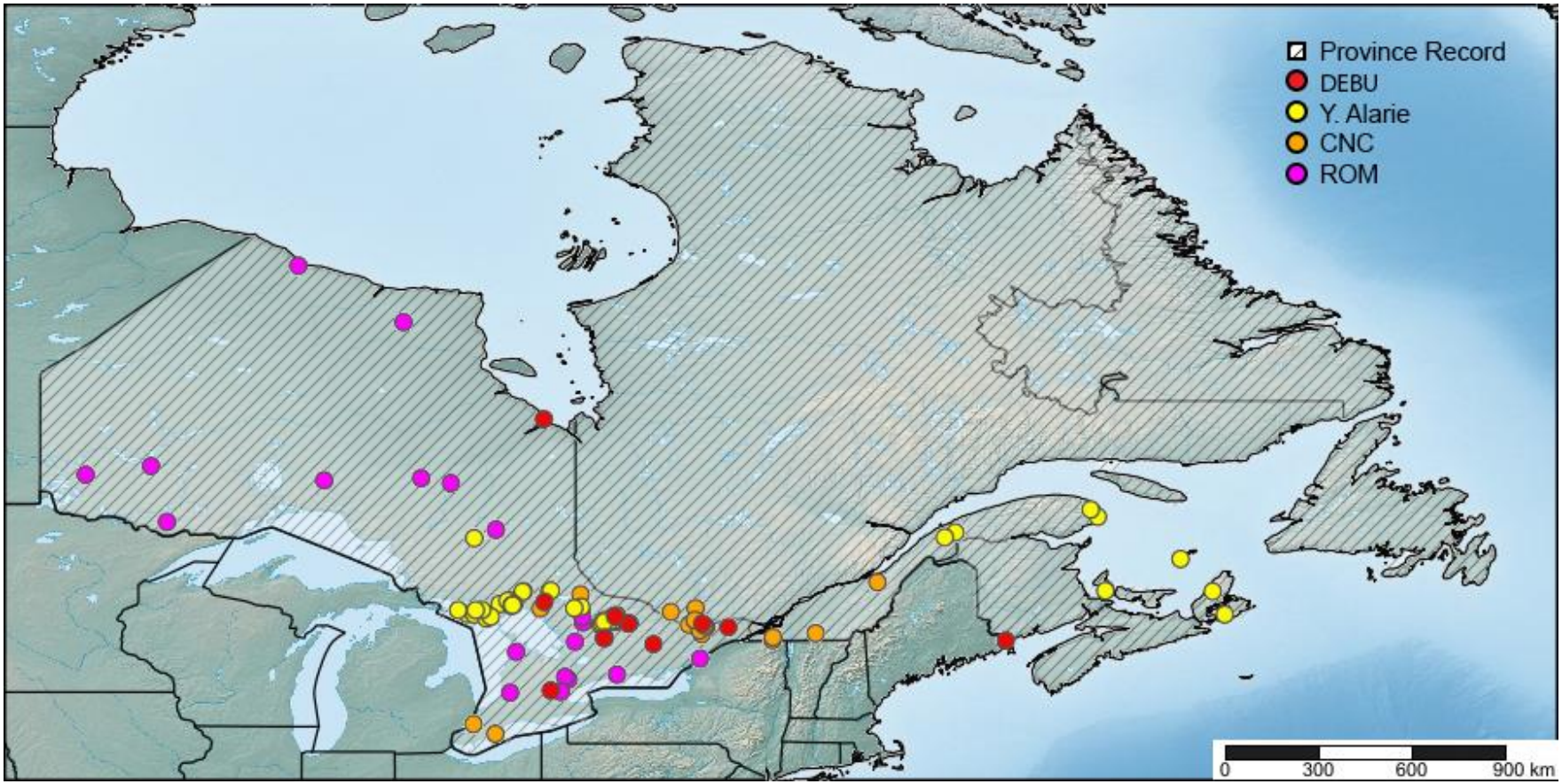
Haliplus cribrarius is the largest *Haliplus* species in the region. It is similar in size and markings to *H. canadensis* and *H. apostolicus*, but can be distinguished by the unique male genitalia.
Adults have been collected in a wide variety of lentic habitats in late spring, summer, and early fall.
H. cribrarius is widespread throughout Canada and the northeastern USA.

Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus cribrarius

Distribution in eastern Canada



Species Page

doi: 10.3752/cjai.2017.32

Length: 4.0-4.2 mm

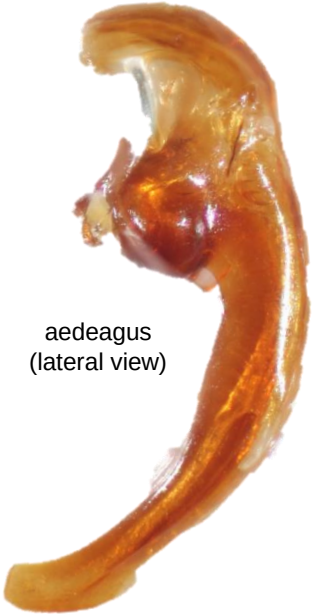
Haliplus leopardus Roberts

Haliplus leopardus is similar in size and markings to *H. pantherinus* and *H. triopsis*, but it is the only species in the region with a setal fringe extending the entire length of the left paramere.

This uncommon species seems to prefer lakes. Adults have been found in late spring, late summer and early fall.

H. leopardus occurs in British Columbia, New Brunswick, Ontario and Québec, and is widespread throughout eastern USA.

left paramere
(lateral view)



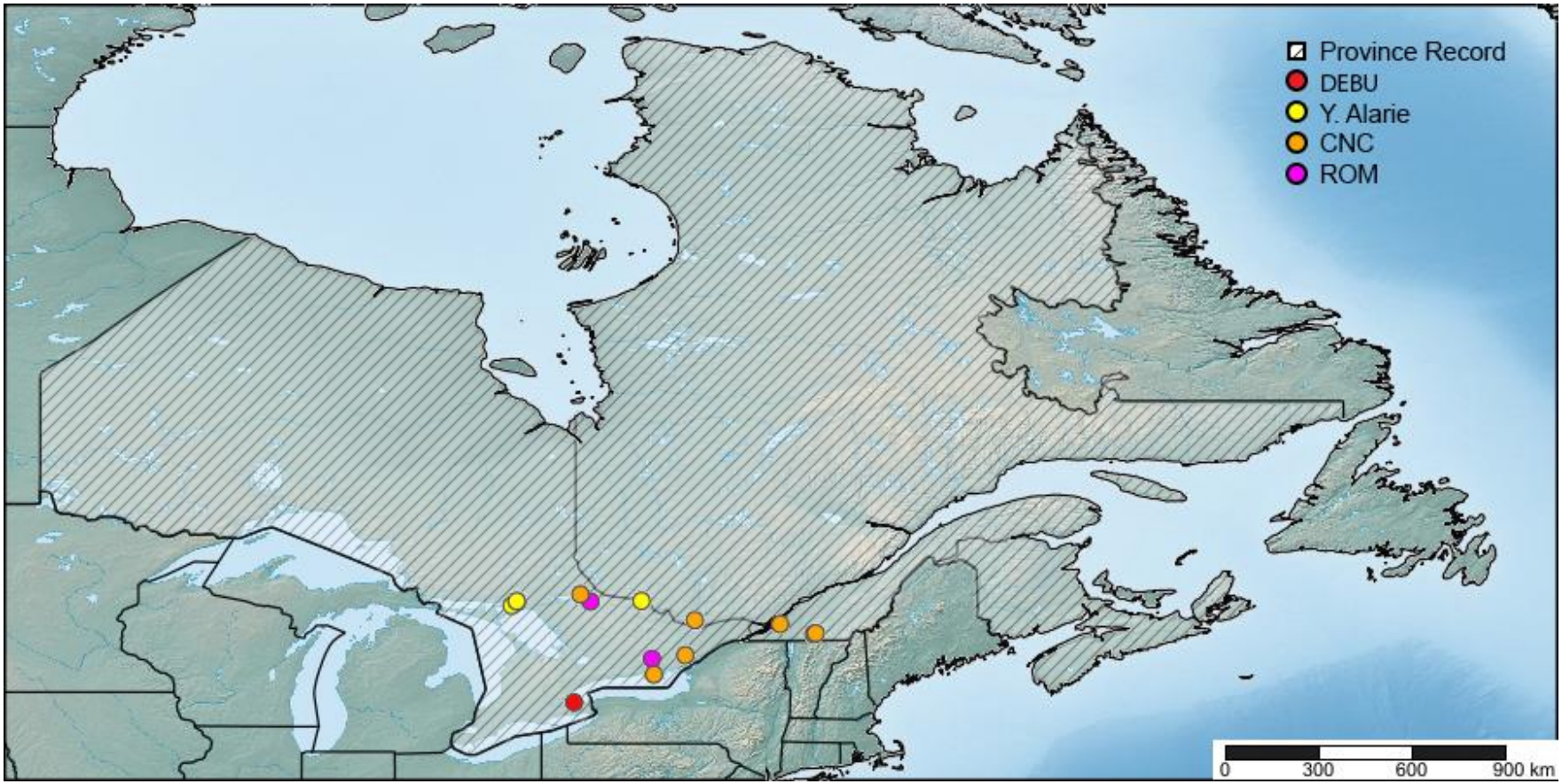
aedeagus
(lateral view)

Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus leopardus

Distribution in eastern Canada



Species Page

doi: 10.3752/cjai.2017.32

Length: 3.0-3.1 mm

Haliplus lucigelinae Vondel & Alarie

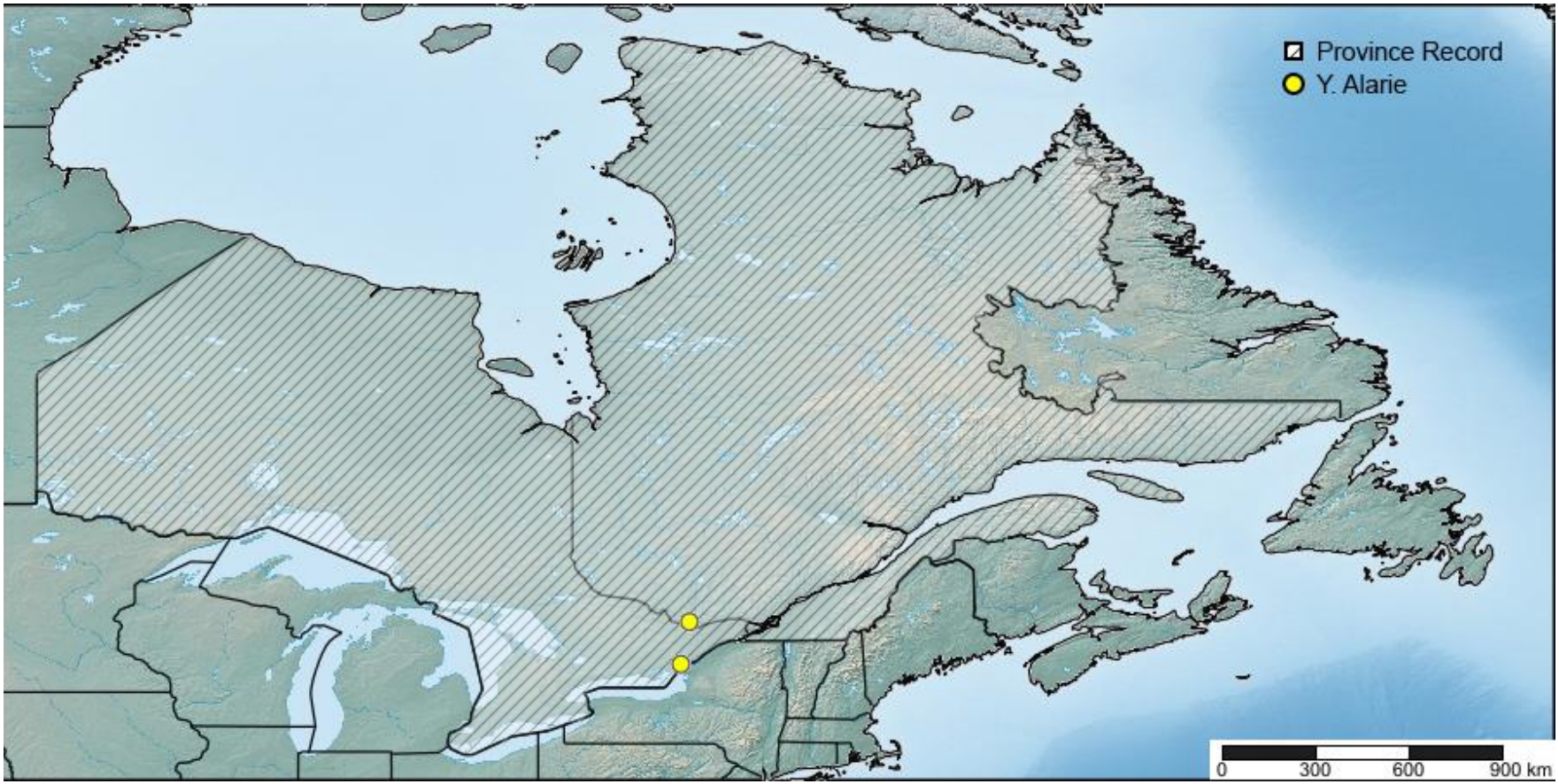
Haliplus lucigelinae is easily identified by the distinctive shape: widest before the middle and strongly tapering posteriorly. This rare species is only known from two localities in eastern Ontario. Adults have been found in late summer in shallow, rocky bottom streams with moderate to fast flowing clear water.

Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus lucigelinae

Distribution in eastern Canada



Species Page

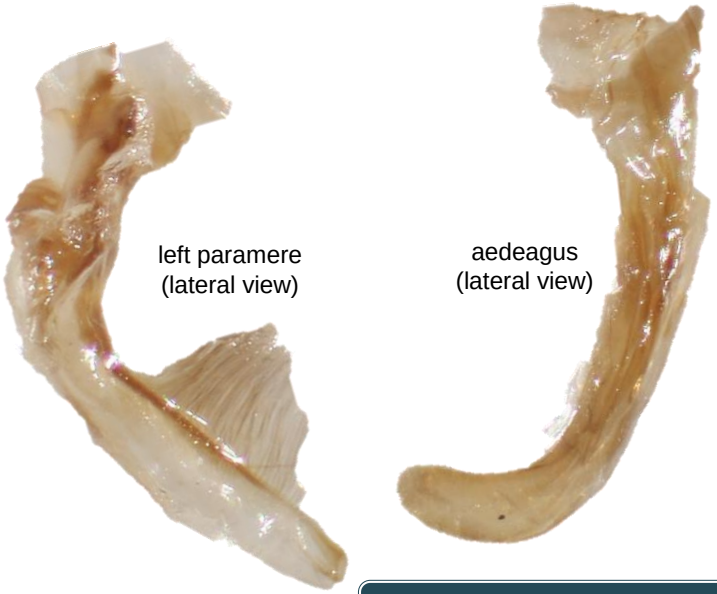
doi: 10.3752/cjai.2017.32

Length: 3.3-4.0 mm

Haliplus triopsis Say

Haliplus triopsis (middle) with *H. immaculicollis* (left and right)

Haliplus triopsis is similar in size and markings to *H. pantherinus* and *H. leopardus*, but can be distinguished by the unique male aedeagus and left paramere. This species is uncommon, and seems to prefer ponds or rivers with sandy bottoms. Adults have been collected during the spring, late summer and fall.
H. triopsis is found in Ontario, Québec and throughout the eastern USA.

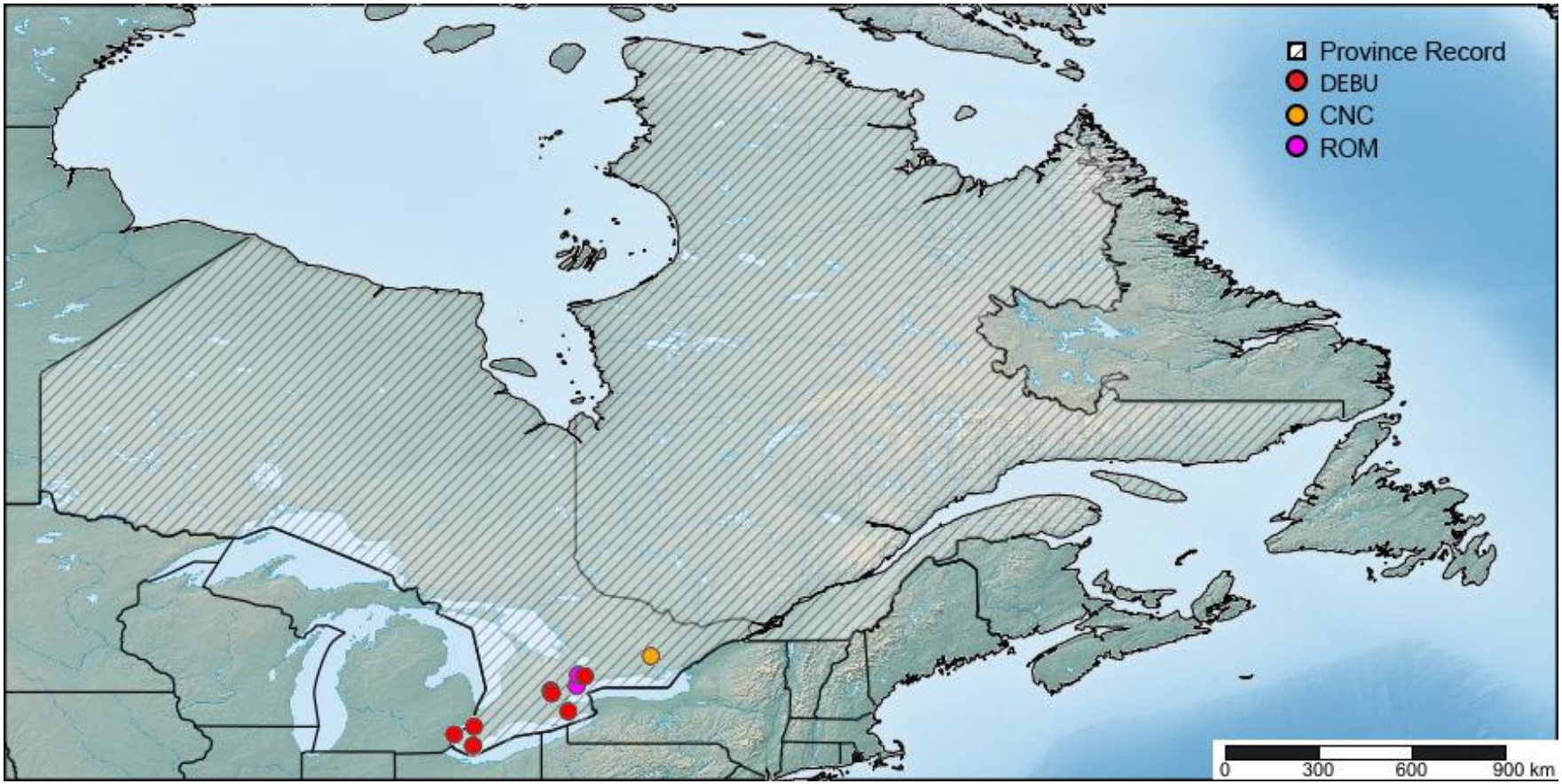


Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus triopsis

Distribution in eastern Canada



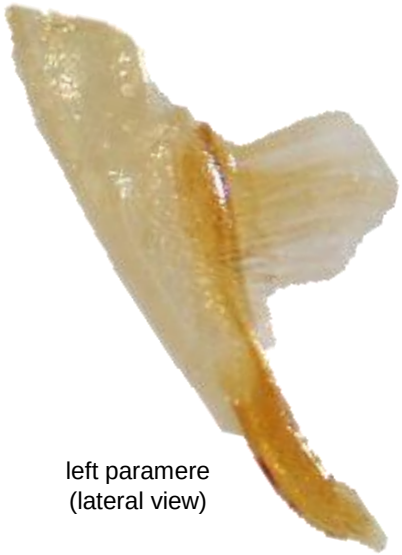
Species Page

doi: 10.3752/cjai.2017.32

Length: 3.3-4.0 mm

Haliplus pantherinus Aubé

Haliplus pantherinus has similar markings to *H. triopsis* and *H. leopardus*, but can be distinguished by the unique male aedeagus and left paramere.
Adults have been collected in a variety of lentic habitats in the late spring, summer and early fall.
H. pantherinus is found in much of eastern Canada and throughout the eastern USA.



left paramere
(lateral view)

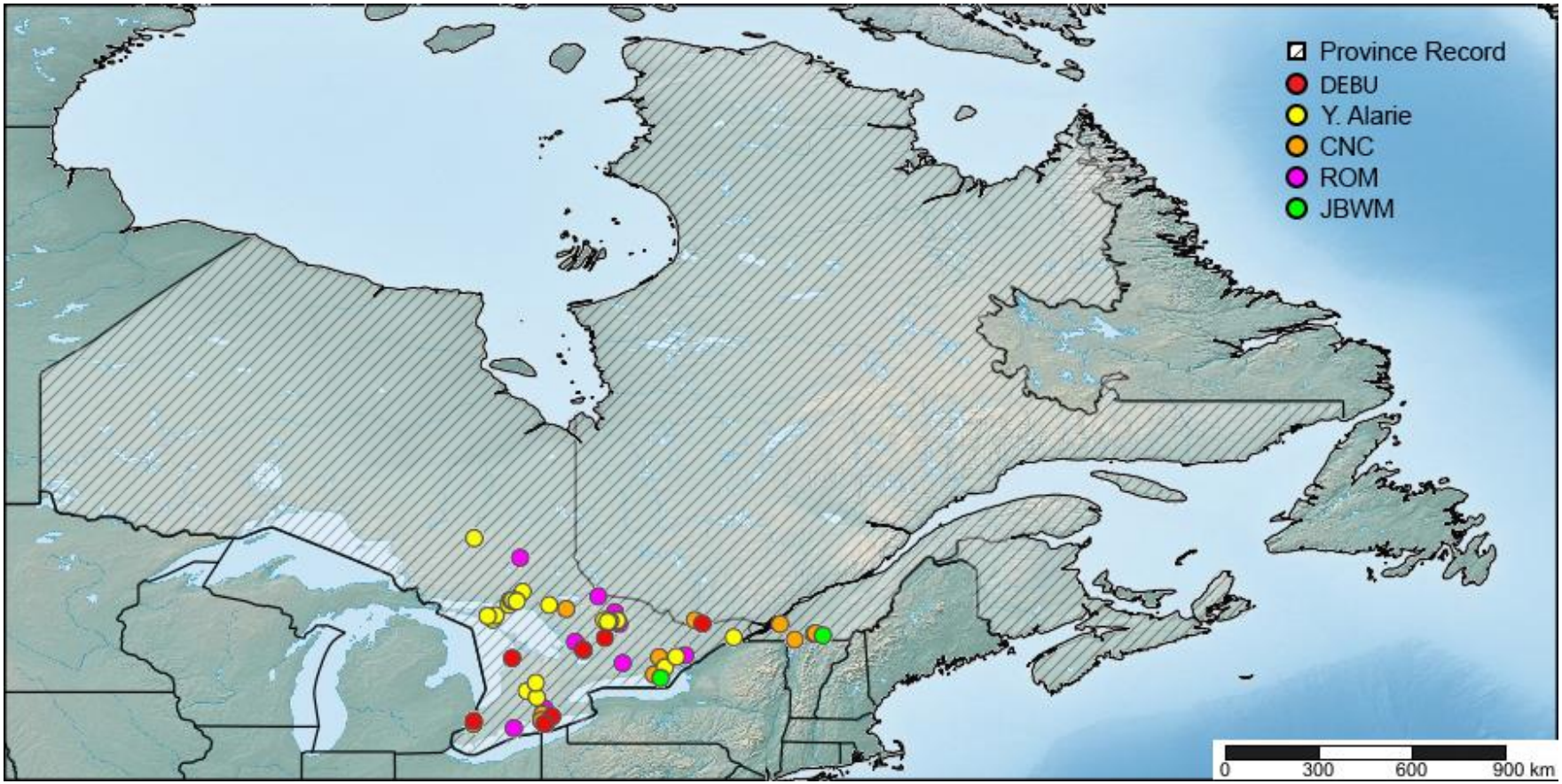
aedeagus
(lateral view)

Distribution Map

doi: 10.3752/cjai.2017.32

Haliplus pantherinus

Distribution in eastern Canada



Species Page

doi: 10.3752/cjai.2017.32

Acknowledgments

All live photos were taken by the second author. All specimen photos were taken by the first author, with the exceptions of *Haliplus lucigelinae* taken by Bernhard Johannes van Vondel (Natural History Museum Rotterdam, The Netherlands), and the species page photos of *Haliplus litoralis* taken by Jesse Ray (bugguide.net contributor).

Hailey Ashbee was partially supported through a NSERC Undergraduate Student Research Award, with supervisor Steve Marshall.

We thank undergraduate student Victoria Hard for helping with the initial stages of the *Peltodytes* key.

This key could not have been made without the past works of the late Warren Brigham (1942-1996), Rob Roughley (1950-2009) and Rex Kenner (1950-2010). Rob Roughley encouraged the project from the very beginning, Rex Kenner identified or confirmed the identity of many of our specimens early in the project, and Warren Brigham's unpublished work was much appreciated. All three of these excellent haliplid workers were taken away too soon, and we dedicate this work to them.

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