A Winsome Strategy: Surveying the Abundance and Distribution of the Winsome Fly, *Istocheta aldrichi,* in Southern Ontario

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Introduction

- Japanese beetle (JB), *Popillia japonica*, is an invasive and regulated pest in Canada that causes economic damage to numerous agriculturally important crops such as nursery stock [1].
- Current management strategies mostly rely on biological or chemical treatments in spring or fall to target the soil dwelling grubs and foliar insecticide sprays to control adults from July to September.
- The winsome fly, *Istocheta aldrichi*, is a specialist parasitoid of adult Japanese beetles, native to Japan.
- Female *I. aldrichi* lay 1 or multiple eggs on the pronotum of JB. The eggs hatch into larva that drill down into the JB exoskeleton and slowly consume the contents of the thorax and abdomen causing death of the host.
- *I. aldrichi* was introduced as a biological control for JB in the northeastern and midwestern U.S. between 1922-1950. Despite no formal releases occurring in Ontario, it was detected parasitizing Japanese beetles in Ontario in 2013. In Canada, *I. aldrichi* is considered established in Ontario and Quebec [2], but there is a lack of data on abundance and distribution in the Ontario.
- Effective biological control from *I. aldrichi* to supress JB adults could contribute to reducing populations of this invasive pest in the long-term, including reducing their economic impact on horticultural crops, and reducing the need for insecticide-focused management practices.

Objectives

The purpose of this survey is to monitor *I. aldrichi* parasitism in southern Ontario to:

1. **Understand current distribution and period of activity**
2. **Document parasitism rates from pheromone traps**

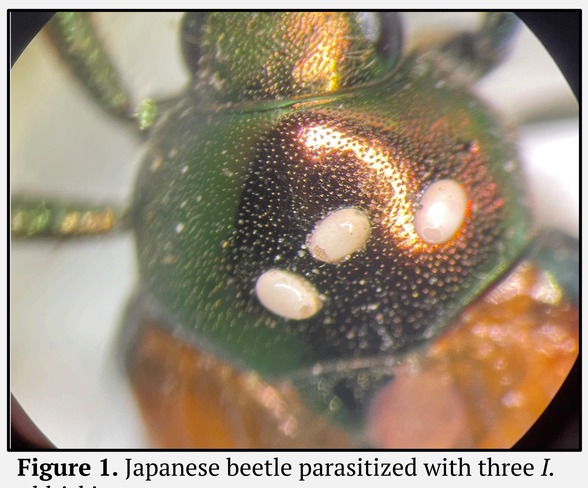


Figure 1. Japanese beetle parasitized with three *I. aldrichi* eggs.

Materials and Methods

- A single PHEROCON Japanese beetle trap was placed at each of the nine survey sites throughout Southern Ontario.
- Traps were baited with a JB specific sex pheromone lure and floral volatile (Trécé Inc.) and were placed in grassy areas that were exposed to full-sun conditions.
- The contents of each trap were collected weekly starting June 8 until August 24, 2026.
- Individual JB captures from each site were counted and assessed for the presence of *I. aldrichi* eggs on the pronotum, indicating parasitism.
- The number of parasitized beetles was divided by the total number of beetles present in the trap that week and multiplied by 100 to obtain the parasitism rate as a percent.



Figure 2. Japanese beetle PHEROCON trap.

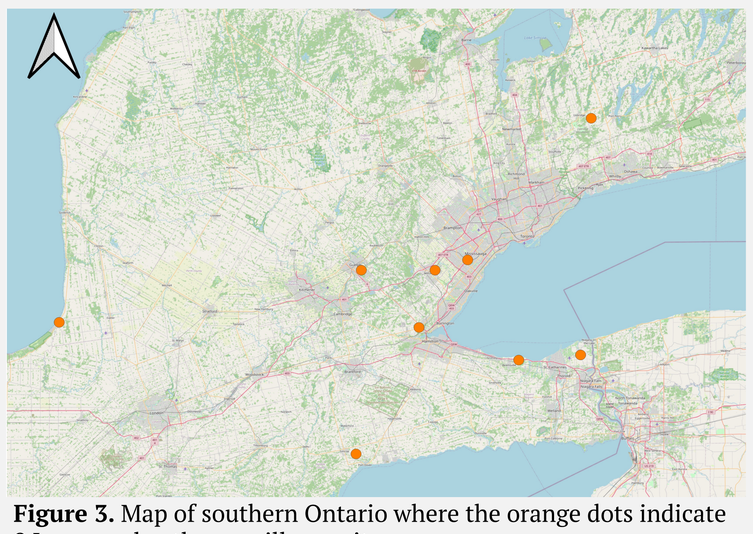


Figure 3. Map of southern Ontario where the orange dots indicate 9 Japanese beetle surveillance sites.

Results

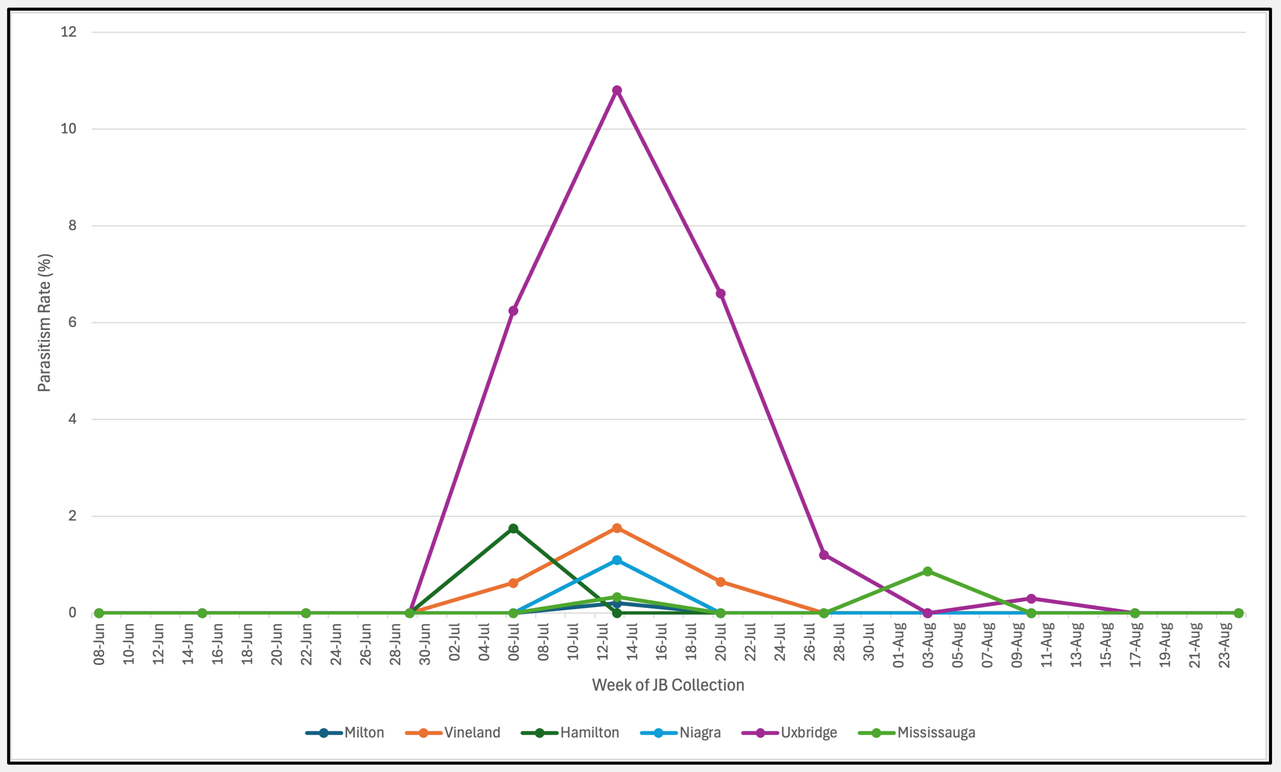


Figure 4. *I. aldrichi* parasitism rates on Japanese beetle as a percent across 6 surveillance sites in southern Ontario between the weeks of June 8, 2026, to August 24, 2026. Sites where *I. aldrichi* were not detected are not included.

Distribution

- *I. aldrichi* presence varied across surveillance sites.
- No parasitized JB were found in pheromone traps at the Guelph, Simcoe, and Grand Bend sites.
- Uxbridge, Mississauga, Milton, Hamilton, Vineland, and Niagara presented signs of parasitism for at least 1 week throughout the season.

Seasonal Occurrence

- Parasitized JB were first observed the week of July 6 and last observed the week of August 10.
- Parasitism rates peaked during the weeks of July 6 to July 27.
- The week of July 13 had the highest overall rates of parasitism: 5 of 9 sites positive for *I. aldrichi*

Parasitism Rates

- The highest rates of parasitism were observed in Uxbridge between the weeks of July 6 and July 27.
- The highest rate of parasitism observed was 11%, which occurred in Uxbridge was during the week of July 13.
- The Uxbridge trap captured the least number of JB of all surveillance sites yet had the highest rates of parasitism.

Discussion

- The inverse relationship between JB density and *I. aldrichi* parasitism in Uxbridge raises questions about the local factors that are driving the high parasitism rates. Future research should investigate microclimatic conditions in the region that could favour *I. aldrichi* establishment.
- The winsome fly's presence in the southern Ontario is a positive indicator that with time, natural populations might be able to grow, reduce populations of JB in the landscape, and eventually contribute to lower crop damage from JB.
- Long-term population dynamics studies of the *I. aldrichi* in the context of Ontario's climate and environment are needed to better understand the parasitoid's lifecycle.
- There should be continued monitoring of the parasitoid across Ontario to determine if parasitism rates are rising and track its distribution.

Acknowledgments

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References

[1] Fleming, W. E. (1972). *Biology of the Japanese Beetle*. U.S. Dept. of Agriculture.
[2] Gagnon, M.-E., Doyon, J., Legault, S., & Brodeur, J. (2023). The establishment of the association between the Japanese Beetle (Coleoptera: Scarabaeidae) and the parasitoid Istocheta aldrichi (Diptera: Tachinidae) in Québec, Canada. *The Canadian Entomologist*, *155*. https://doi.org/10.4039/tce.2023.22