

Fact sheet – Larval parasitoids of SWD in B.C.

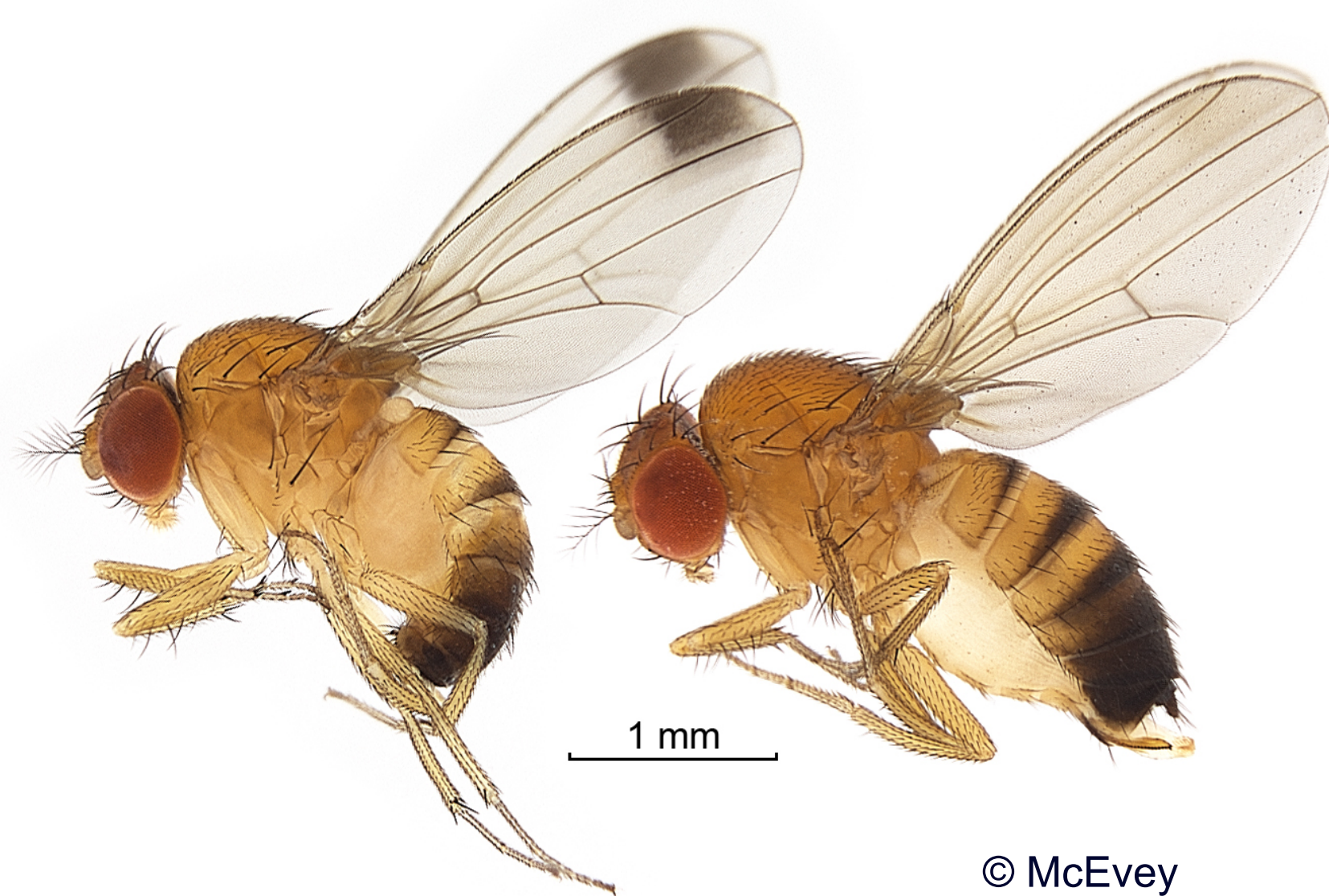
Pierre Girod, Martina Clausen, Matt Tsuruda, Chandra Moffat, Paul Abram and Juli Carrillo

Overview

Since 2009, the invasive spotted-wing drosophila (SWD), known as *Drosophila suzukii*, has been identified in the berry fields of the Fraser Valley and cherry orchards of the Okanagan Valley. Over the past decade, researchers in BC have been monitoring its spread and have been evaluating management methods. In 2016 and 2019, new developments occurred in the research and will help to control SWD population density in the berry production area, cherry orchards and wild habitat.

Identifying *Drosophila suzukii*

Adult SWD are 2-3mm long, brown and light yellow with large red eyes, which is very similar to the more common vinegar fly. Male SWD have a very distinctive single black spot on the end of their wings. Females do not have spots, but instead have a specific, highly effective saw-like egg laying apparatus (ovipositor), which helps to cut the skin of soft fruit in order to deposit their eggs.



© McEvey

Morphology of the spotted-wing drosophila

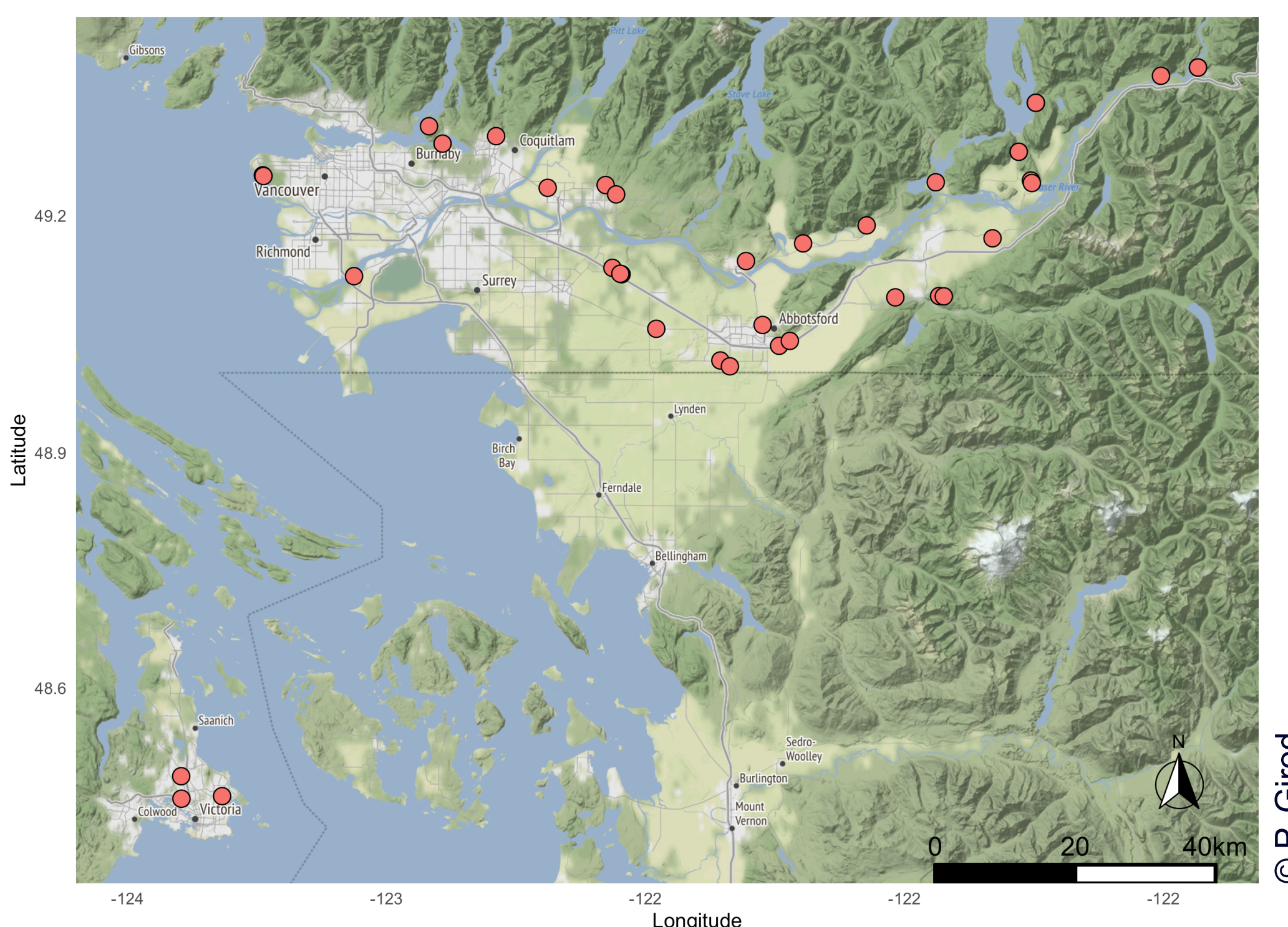
Left male SWD and right female SWD

Biological Control

Scientists rely on natural enemies to manage numerous pests around the world. In the case of SWD, research was conducted with parasitoids coming from the same geographical origin to assess their control of SWD. A parasitoid is an organism that lives on or in a host organism and ultimately kills the host. Most parasitoids are very specific to their insect host. Parasitoids of SWD are intended to be used to reduce population density of the fly in their wild habitat, which would lead to an overall population reduction.

New parasitoids arrive in BC

In 2016, during berry harvest in the Fraser Valley, the first parasitoid, *Leptopilina japonica* – The Ronin wasp, was discovered. The parasitoid has since been widely observed in the berry production areas of the lower mainland, on UBC Campus, and in the Southern part of Vancouver Island. Additionally, from 2019-2020, another parasitoid, *Ganaspis brasiliensis* – the Samba wasp, has been spotted all around the Fraser Valley. This parasitoid is the most promising as determined by scientists around the world. The percentage of flies killed by this wasp is frequently around 20% with sometimes rates as high as 80% here in BC.

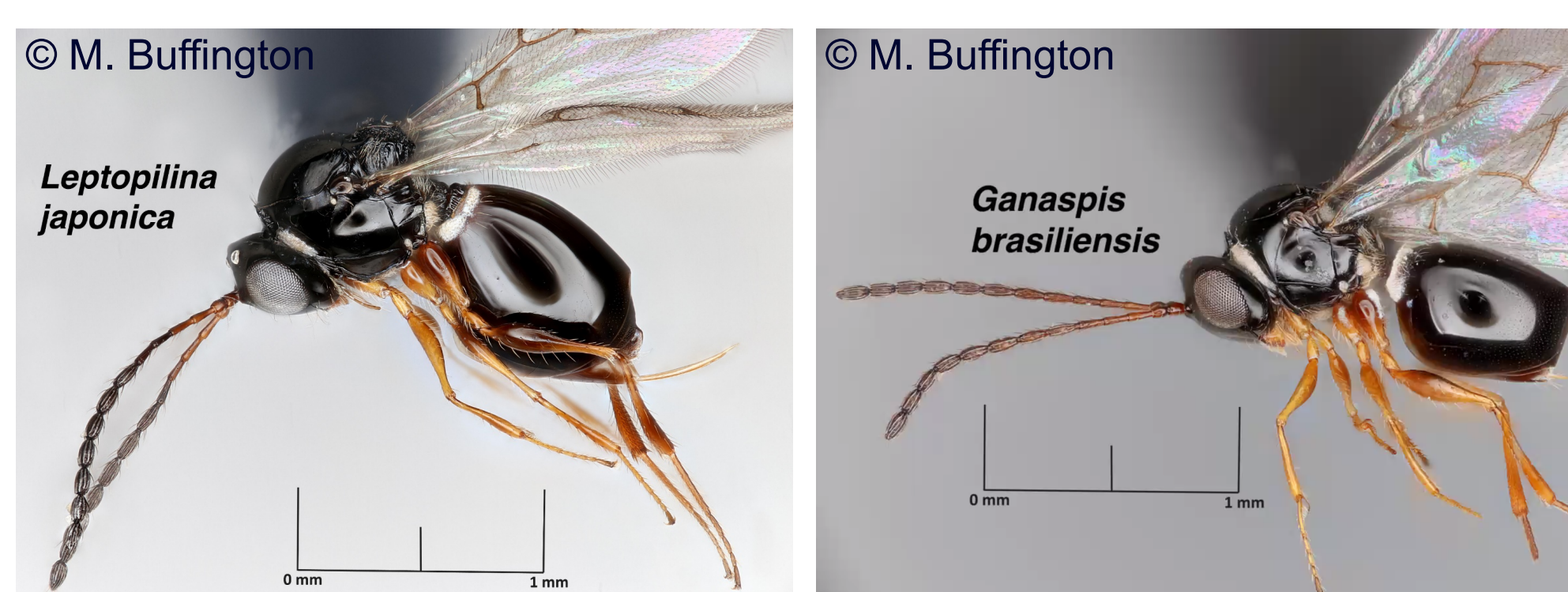


Map of the spread of the parasitoids

Surveys from 2016-2020 in the lower mainland and Vancouver island, of British Columbia. Red points show current distribution of observed Samba or Ronin wasps or both.

Parasitoid identification

If you wish to check for the presence of the two SWD parasitoids, the first step will be to collect fresh ripe berries from the plant. Next, in a well ventilated box with a fine mesh, add some paper towel to the bottom to absorb any excess fruit juice. Then, store the box for 40 days at room temperature and observe any emerging insects. The two parasitoids are very similar looking - they are less than 2mm long, with metallic black bodies and yellow legs. If you would like, you can preserve them in alcohol and bring them to UBC-PIEE or AAFC for identification by an expert.

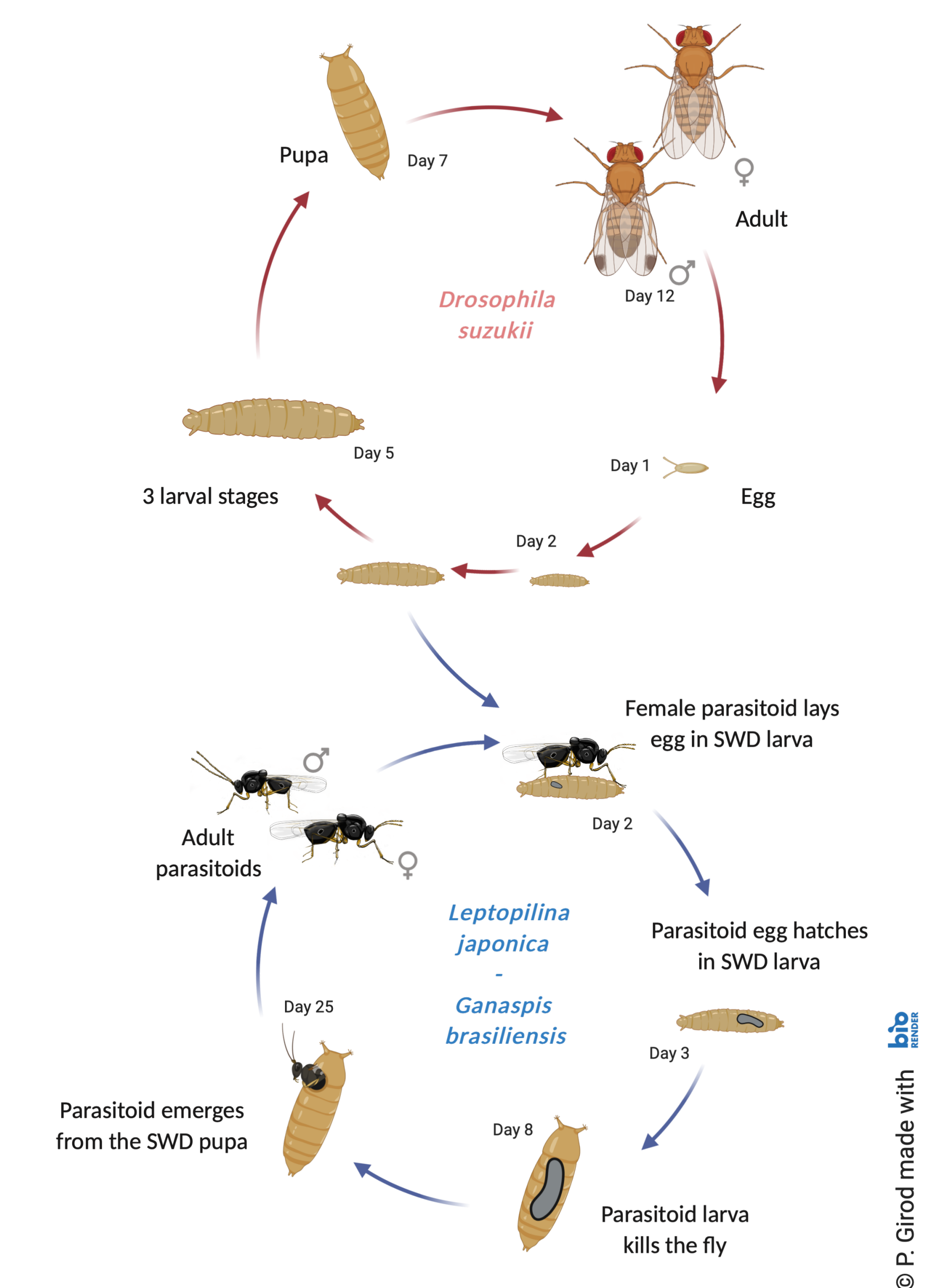


Morphology of the two the SWD parasitoids

Left female Ronin wasp and right female Samba wasp

How it works

The diagram below shows the life cycles of the SWD and its associated parasitoids. Parasitoids target the larval stages of the fly. The female parasitoid will deposit an egg in the fly larvae, keeping it alive until the fly larvae turns into a pupae (cocoon). If parasitism is successful, a new wasp will emerge from the fly pupae and no fly will hatch. Finally, both the fly and parasitoids complete multiple generations per year, with the length of the generations depending on temperature.



Life cycles diagram of SWD and its parasitoids

Further information

- [BC Ministry of Agriculture](#)
- [AAFC](#)
- [UBC](#)

Bibliography

1. Abram, P. K., et al. (2020). New records of *Leptopilina*, *Ganaspis*, and *Asobara* species associated with *Drosophila suzukii* in North America, including detections of *L. japonica* and *G. brasiliensis*. *Journal of Hymenoptera Research*, 78, 1.
2. Girod, P., et al. (2018). Host specificity of Asian parasitoids for potential classical biological control of *Drosophila suzukii*. *Journal of Pest Science*, 91(4), 1241–1250.
3. Wang, X., et al. (2020). Biological control of *Drosophila suzukii*. *CAB Reviews*.

Acknowledgement

This publication has been produced by the PIEE lab at UBC. Funding for this publication was provided by a grant from the Organic Science Cluster 3 with the participation of Agriculture and Agri-Food Canada, BC Ministry of Agriculture, Terramera, and the Strawberry, Blueberry and Raspberry BC Grower Associations.