

## REPRODUCTIVE READINESS OF SPOTTED WING DROSOPHILA

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Reproductive readiness of *Drosophila suzukii* (Matsumura) is currently based solely on their presence in traps. However appearance of females in traps does not necessarily correspond to oviposition capability (Gerdeman 2012 unpublished data). We have begun to analyze the ovarian condition of female spotted wing drosophila from trap samples to better understand their phenology and life history in the Pacific Northwest cropping cycles. While *D. melanogaster* is closely related and a perfect reference animal for SWD with voluminous literature, the bulk of its' research focuses on genetics. Literature on drosophila internal morphology is primarily limited to early-mid 20<sup>th</sup> century scientists including R. C. King and M. Demerec. Therefore understanding of internal anatomy of SWD and skill in micro-dissection was painstakingly acquired through hands-on experience. Approximately 200 spotted wing drosophila from trap samples representing 3 localities (two in Washington state and a localized cluster in British Columbia, Canada) and every month of the year, were dissected to determine their reproductive condition. Select specimens were slide mounted in Hoyer's medium and further studied using light microscopy (phase contrast and dark field) at magnifications from 100x-200x. Photographs were made using a Canon EOS 7D and microscope adapter. Female reproductive condition was categorized as follows:

1. No distinguishable ovarioles.
2. With distinguishable ovarioles.
3. Eggs large but no filaments.
4. Mature eggs with filaments.
5. Ovaries with few mature eggs often wrinkled, without developing eggs.

Observations thus far include:

- Presence of spotted wing drosophila in the field did not always coincide with egg-laying capacity.
- Viable eggs were found in dissected female SWD from mid-May-Oct (Figs. 2-3).
- Wrinkled eggs (non-viable) were found in dissected females from May and Sep (Fig. 3).
- Overwintering flies - mix of different ages.
- Some overwintering females were mated (spermatozoa observed in spermathecae or seminal vesicle) (Fig. 1).
- Some overwintering females (Nov-Apr) severely starved-remaining eggs incorporated into a thin fat layer lining a hollow abdomen.

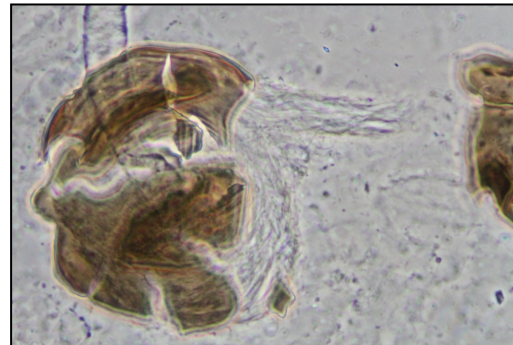


Fig. 1. A toroidal mass of sperm evident in spermathecal squash from 20-28 Oct. BC, Canada.

Variation in SWD activity and economic damage in 2012 was reported in west coast states from California, Oregon and southern Washington which experienced high SWD pressure, to northwestern Washington where economic damage from SWD was not reported until the end of the red raspberry season. SWD clinal variation occurs along the west coast, therefore seasonality of some but not all of the observations mentioned above may vary according to location.

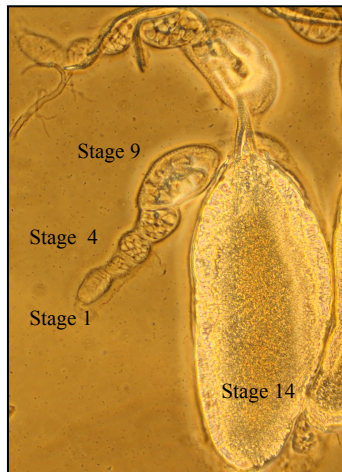


Fig. 2. Ovariole from a 15-18 day NWREC culture SWD shows a mature egg (stage 14) ready for oviposition with eggs representing stages 9, 4 and 1 seen advancing in another ovariole (behind) within the same ovary.



Fig. 3. A mix of both viable and older eggs can be seen in this 13-20 Sep SWD from BC, Canada. Viable eggs were observed in dissected SWD from mid-May through September. Older eggs were observed from late May - early June and again in September.