



Population survey of *Drosophila* species in the Philadelphia area, Pennsylvania, U.S.A.

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In 1986, a survey of the *Drosophila* community was conducted in an area just west of Philadelphia, Pennsylvania. In this survey, nine different species were found, with *D. affinis* and *D. melanogaster* being the most prevalent species in the spring and summer, and *D. immigrans* being the most prevalent species in the fall (McRobert and Tompkins, 1986).

Since the 1986 survey, a new invasive species indigenous to Southeast Asia, *D. suzukii*, has entered the U.S. and has been found in the Philadelphia area (Bolda, 2010; Freda, 2013). *D. suzukii* was introduced to Hawaii in the 1980s and spread to California and Florida by 2008 (Carvajal, 2010). The invasion of *D. suzukii* is of concern as this species acts as a true fruit fly, laying eggs in fruit that is still on the vine or tree (Cini, 2012). *D. suzukii* females have large, serrated ovipositors that allow them to cut into soft-skinned fruits to lay their eggs (Walsh, 2011). Thus, oviposition from this species damages fruit and exposes plants to microbial pathogens, ruining crops such as cherries, raspberries, blueberries, blackberries, strawberries, and others (Walsh, 2011).

The purpose of this study was to replicate the 1986 survey and describe the *Drosophila* species in the Philadelphia area in 2013. We hope that this project will serve as a foundation to document the movement of *D. suzukii* into this area and the possible effects of this invasion on the diversity of the *Drosophila* community.

Table 1. *Drosophila* species collected in the Philadelphia area in 2013.

Species	No. of Individuals Collected											
	January	February	March	April	May	June	July	August	September	October	November	December
<i>D. affinis</i>	0	5	115	75	48	87	50	8	22	22	5	2
<i>D. algonquin</i>	0	22	68	41	12	38	8	12	21	18	0	0
<i>D. buskii</i>	0	0	0	3	57	109	51	37	5	9	5	0
<i>D. ducani</i>	0	0	0	0	19	3	109	27	34	106	33	15
<i>D. immigrans</i>	0	0	0	0	0	0	118	118	91	126	73	18
<i>D. melanica</i>	0	0	0	0	0	0	0	0	1	2	2	0
<i>D. melanogaster</i>	0	4	4	7	39	6	75	108	87	24	4	0
<i>D. putrida</i>	0	0	10	0	79	85	74	33	19	19	4	0
<i>D. quinaria</i>	0	0	0	0	0	196	323	0	8	9	3	1
<i>D. robusta</i>	0	0	5	6	82	63	31	12	5	9	3	0
<i>D. simulans</i>	0	0	0	0	11	43	245	86	50	95	6	2
<i>D. suzukii</i>	0	0	0	0	0	0	0	11	427	389	208	74
<i>D. tripunctata</i>	0	0	0	0	20	108	83	41	24	20	2	0
Unknown	0	0	2	1	10	21	22	15	35	25	12	3

From January through December 2013, plastic cups, baited with a banana-yeast mixture and suspended horizontally at eye level from trees, were set in several suburban locations within 5 miles of Philadelphia. Collections of flies were performed every Monday, Wednesday, and Friday, and new bait was added to each trap every Monday. Flies were collected by placing a large funnel over the opening of each cup and allowing the flies to enter a vial. In the lab, the collected flies were

anesthetized using CO₂ and identified using a dichotomous key of North American *Drosophilids*. Female flies of species requiring male characteristics for identification were held in vials containing Carolina Instant Media + 5% propionic acid + yeast until they produced offspring; then their male offspring could be identified.

During the 2013 survey, we encountered 13 *Drosophila* species, nine of which were found during the 1986 survey, along with four new species: *D. algonquin*, *D. putrida*, and *D. simulans*, and *D. suzukii* (Table 1). *D. suzukii* did not appear in collections until August, possibly a result of die-off during the preceding winter. Perhaps of some concern, when considering total fly counts during the year, the invasive *D. suzukii* ranked as the most common species in the Philadelphia area in 2013 (Figure 1).

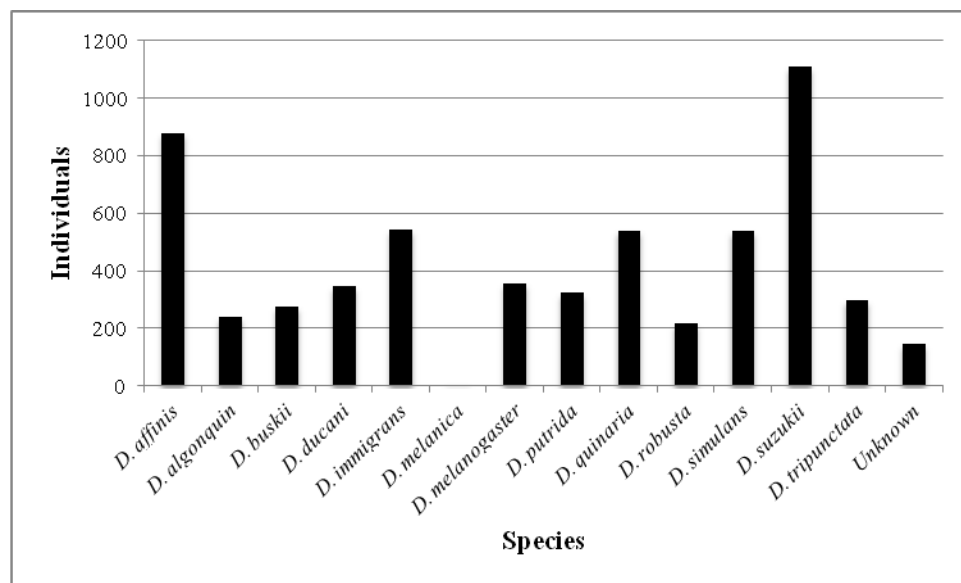


Figure 1. Total individuals/species for 2013.

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Extension of *Drosophila melanogaster* lifespan by *Decalepis hamiltonii* root extract.

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