

1143	wg	FBgn0004009	HMS00844	No
1144	Wnt4	FBgn0010453	JF03378	No
1145	wrapper	FBgn0025878	JF03240	No
1146	wry	FBgn0051665	JF03393	No
1147	wun2	FBgn0041087	HMS00372	No
1148	X11L	FBgn0026313	JF02449	No
1149	XNP	FBgn0039338	HMS00683	No
1150	Xrp1	FBgn0261113	HMS00053	No
1151	yki	FBgn0034970	HMS00041	No
1152	YT521-B	FBgn0027616	HMS01302	No
1153	Zasp52	FBgn0265991	JF01133	No
1154	zen2	FBgn0004054	HMS01124	No
1155	zormin	FBgn0052311	HMS01014	No
1156	zyd	FBgn0265767	JF01872	No

¹ no previous female sterile alleles reported



Cataloging biodiversity of cactophilic *Drosophila*.

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Information required for students of evolutionary biology interested in cataloging biodiversity includes accurate field annotation of natural populations to be subjected to comparative, experimental or observational analyses. Knowledge of the natural history of populations and species, as well as reliable field data on the locations of source populations is essential for new and experienced workers alike. Here, I describe collecting records for *Drosophila* species from 1985 to 2009, mostly from collecting trips to the deserts and arid lands of northwestern Mexico and the southwestern United States.

Most of these records have collection numbers that were part of William B. Heed's laboratory stock lists at the University of Arizona, but in more recent years after his retirement and then death in 2007, other collection labels were used. Some of these species are available at the San Diego Stock Center, some from the Ambrose Monell Cryo Collection (AMCC) at the American Museum of Natural History (https://figshare.com/articles/new_fileset/913592), and many of these stocks are still in culture or available frozen in ethanol from the author. All site locations are easily identified on good road maps or Google Earth. This report also acknowledges all colleagues, collaborators, and students who helped in the field - without them, these collections would not have been possible.

Colleagues/collaborators.

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Elizabeth S. Etges, Fayetteville, Arkansas
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Allen Gibbs, University of Nevada-Las Vegas
Arthur C. Gibson, UCLA (retired)
Richard Halliburton, Western Connecticut State University (retired)
William B. Heed, University of Arizona (deceased)

Conrad Istock, University of Arizona (retired)
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 Eric Larsen, University of Chicago
 Francisco Molina Freañer, UNAM, Hermosillo
 Christopher Nicholson, Cincinnati, Ohio
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 Brian Newby, University of Arkansas
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 Deodoro Oliveira, American Museum of Natural History, New York
 Sandra Perez, University of Kansas
 Luke Rochette, University of Arkansas
 Gil Smith, University of St. Andrews
 Pupulio S. N. A. Ssekimpi, University of Arizona
 Melissa Stennett, University of Arkansas
 David Stiers, University of Arkansas

1. A895 San Matias Pass, BC, Rte. 3, ca 32 miles after right turn from Rte 5 (before Valle Trinidad)
 May 24, 1985, w/Chris Nicholson. South facing slope covered in yellow-spined *Ferocactus cylindraceus*.

Ferocactus rot – no flies emerged

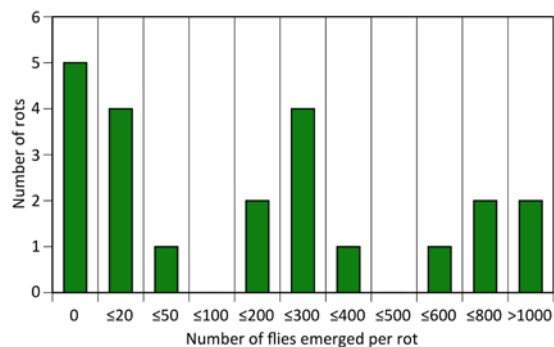
2. A896 Punta Prieta, BC, May 25-29, 1985, w/Chris Nicholson.

- 868 ♀ + 522 ♂ *D. mojavensis* aspirated from field agria rots, *Stenocereus gummosus*
- 8753 *D. mojavensis* ex-22 agria rots

3. A900 Santa Rosa Mountains, AZ, May 1985.

w/WB Heed, WJ Etges, P. Ssekimpi

1 organ pipe rot, *Stenocereus thurberi*, produced
200-300 adult *D. mojavensis*



4. Los Gatos, CA, October 3, 1985, Marc Fey's backyard (former orchard)

ex-fermenting pears (12)

379 *D. mel/sim*

22 *D. pseudoobscura*

5. A907 Punta Onah, Sonora, October 1985, w/WB Heed, Stuart Barker, Andy & Karen Beckenbach

2 agria rots returned to the lab produced:

- 3246 *D. mojavensis*
- 200 *D. arizonae*
- 2 *D. nigrospiracula*

6. A911 Santa Rosa Mountains, AZ, January 25, 1986, w/WJE, WB Heed, T. Markow

- 74 ♀ + 81 ♂ *D. mojavensis* ex-organ pipe rots (3)

7. 11411 E. Sundance Dr., Tucson, AZ, February 1986.

ex-*Ferocactus wislizeni* rot in Etges front yard

- 79 *D. longicornis*
- 6 *D. hamatofila*
- 2 *D. nigrospiracula*

8. Organ Pipe National Monument, AZ, Ajo Mtn. loop drive, March 8, 1986. WJE

ex-organ pipe cactus rots (2)

- 659 ♀ + 415 ♂ *D. mojavensis*
- 2 *D. nigrospiracula*

9. Baja California trip, April 17-29, 1985, w/Phil Ganter and Ed Waltz.

A915 Rancho Santa Catarina, April 19, 1985

- 1 *Ferocactus gracilis* rot - no flies
- 3 *Myrtillocactus cochal* rots - no flies

A916 Punta Prieta, BC

- 103 ♀ + 130 ♂ *D. mojavensis* aspirated from agria rots
- 3685 *D. mojavensis* ex-11 agria rots (another 11 rots produced no flies)

A917 South of Vizcaino, BC on road up to Sierra San Francisco

- 5 ♀ + 32 ♂ aspirated from agria rots
- 1675 *D. mojavensis* ex-4 agria rots (another 6 rots produced no flies)
- 14 *D. mojavensis* ex-3 organ pipe rots (1 very large)

ex-2 *Opuntia* rots (on rocky hillside)

- 61 *D. aldrichi* (Beckenbach et al. 2008)
- 10 *D. mojavenensis*
- 3 *D. melanogaster*

A918 South of Bahia de Concepcion, BCS, south of road to San Isidro

- 207 *D. mojavenensis* ex-3 agria rots

A919 near San Lucas, BCS

1 cardon, *Pachycereus pringlei*, rot - no flies emerged

A920 San Lucas, BCS

- 217 *D. mojavenensis* ex-2 of 5 agria rots

A921 km 90, south of El Rosario, BC

- 28 *D. mojavenensis* ex-3 *Myrtillocactus cochal* rots

10. A922 Palm Canyon, Kofa Mtns., AZ with Tom Starmer and Bob Krebs (all baited)

- 19 ♀ + 18 ♂ *D. pseudoobscura*
- 47 ♀ + 38 ♂ *D. nigrospiracula*
- 2 ♀ + 2 ♂ *D. mettleri*
- 3 ♀ *D. repleta* group?
- 1 ♀ *D. mojavenensis* (immature)

Ferocactus cylindraceus rot #1 - no flies emerged

F. cylindraceus rot #2

- 2 ♀ + 2 ♂ *D. nigrospiracula*
- 1 ♂ *D. pseudoobscura*

11. A923 Punta Onah, Sonora, March 7-8, 1987. w/WJE, Betsy Etges, Henar Alonso-Pimentel, and Cathlyn Klassen

- 135 ♀ + 146 ♂ *D. mojavenensis* aspirated from agria rots
 - 88 *D. nigrospiracula* aspirated from a cardon and a saguaro rot
 - 53 *D. mettleri*, *ibid*
- 1 organ pipe rot from Noche Buena Rd. produced 8 *D. mojavenensis*

12. A924 Santa Rosa Mtns., AZ, March 26, 1987.

- ~100 *D. mojavenensis* aspirated from 2 organ pipe rots
- 3 ♀ + 1 ♂ *D. mettleri*, *ibid*

13. Trip to Tuxtla Gutierrez, Chiapas, April 6-13, 1987, w/Phil Ganter and Andre LeChance.

TG-2, north from Ocozocuahtla, off road to Mal Paso, Rancho El Lider

- 124 *D. aldrichi* ex-6 *Nopalía* rots and fruits
- 144 *D. ??*. yellow testes, *D. mojavenensis*-like, *D. longicornis*?
- 69 *Gitona americana*
- ~30 *D. simulans* (from *Nopalía* fruits)

TG-3 (A929), ~25 km down road to Cupia, many *S. pruinosus* as fence posts? Ejido Col. Libre.

- 1356 *D. arizonae* ex-4 *S. pruinosus* rots
- 1 *D. aldrichi* *ibid*
- 19 *D. repleta*?, smaller, darker, less pattern, orange testes

- 1 *D. nigrospiracula*-like
- 6 *D. wassermani*

SW-1, near screw worm plant

- 56 *D. arizonae* ex-*S. stellatus*(?) or *pruinus*
- 8 ♀ + 3 ♂ *D. arizonae* aspirated
- 1 *mel/sim* aspirated

14. A925 Tucson, AZ, August 1987, w/Jim Fogleman
Off Speedway Blvd, east past town - aspirated from saguaro

- 36 *D. nigrospiracula*
- 9 *D. mettleri*

15. A926 Tucson, AZ, near Ft. Lowell and Wentworth, *ibid.*

- 235 *D. nigrospiracula* ex-saguaro rot #1
- 1 *D. longicornis* *ibid*
- 39 *D. nigrospiracula* ex-saguaro rot #2
- 1 *D. mettleri* *ibid*

16. Punta Prieta, Dec. 27, 1987-Jan. 2, 1988, and Punta Onah, Jan. 4-7, 1988, w/WJE, Tom Tobin, Liz Pennisi, George Ferguson, and Karen ? (TAM's graduate student).

PP88 (A931)

- 67 ♀ + 51 ♂ *D. mojavensis* aspirated from agria rots
- 330 ♀ + 386 ♂ *D. mojavensis* ex-7 agria rots

PO88 (drove from Punta Prieta, BC to Mexicali, Caborca, to Punta Onah, Sonora)

- 79 ♀ + 79 ♂ *D. mojavensis* aspirated from agria rots
- 1168 ♀ + 1103 ♂ *D. mojavensis* ex-10 agria rots

17. PP89 Punta Prieta, BC, March 21-23, 1989, w/WJE, Richard Halliburton and Greg Huckins.

- 541 ♀ + 259 ♂ *D. mojavensis* aspirated from agria rots
- 5239 *D. mojavensis* ex-15 agria rots
- 1 *D. arizonae* (?) *ibid*

18. PO91(A946) Punta Onah, Sonora, March 14-15, 1991, collected by WB Heed. All flies aspirated from rots.

- 224 ♀ + 278 ♂ *D. mojavensis*
- 4 *D. nigrospiracula*
- 3 *D. pachea*
- 23 *D. longicornis*-like

19. PP91 Punta Prieta, BC, March 16-20, 1991. Tracy Dunn, Phil Ganter, and Henar Alonso-Pimentel (WJE had to cancel at the last minute). Flies were aspirated and baited. Weather was rainy and cold.

- 176 ♀ + 99 ♂ *D. mojavensis* (+ 1913 *D. mojavensis* ex-8 agria rots)
- 1 ♀ + 2 ♂ *D. pseudoobscura*
- 2 ♀ *D. nigrospiracula*

20. PO92 Punta Onah, Sonora, May 15-18, 1992, w/WJE and Greg Huckins.

- 217 ♀ + 176 ♂ *D. mojavensis* aspirated from rots

- 4210 *D. mojavensis* ex-4 agria rots
2 organ pipe rots produced no flies

21. Cerro Colorado and Punta Onah, Sonora, March 21-25, 1994, with WJE, Greg Huckins, Seth Isenberg, and Brian Newby.

CC94 Cerro Colorado

- 23 ♀ + 21 ♂ aspirated from 2 organ pipe rots
- 92 ♀ + 89 ♂ ex-organ pipe rot

PO94 Punta Onah

- 682 ♀ + 571 ♂ *D. mojavensis* aspirated from agria rots (1 ♂ tan body)
- 1 ♀ + 1 ♂ *D. melanopalpa* or *hamatofila*
- 1 ♀ + 2 ♂ *D. nigrospiracula*
- 2 ♂ *D. pachea*
- 1 ♀ *D. mettleri*

22. PSR94 Punta Santa Rosalillita (~20 miles NW of Rosarito, BC), April 4, 1994, collected by Pat O'Grady. All baited.

- 12 ♀ + 18 ♂ *D. mojavensis*

23. MSB94 Mission San Borja, BC, April 6-7, 1994, collected by Pat O'Grady. All baited.

- 17 ♀ + 26 ♂ *D. mojavensis*

24. MSF94 Mission San Fernando, BC, (76 miles south of El Rosario), April 8, 1994, collected by Pat O'Grady. All baited.

- undetermined # *D. mojavensis*

25. AB95 Anza-Borrego Desert trip, north side of Vallecito Mtns., March 16-25, 1995, w/WJE, Brian Newby, Melissa Stennett, and Peter Etges. baited.

- 21 ♀ + 25 ♂ *D. mojavensis*
- 41 *D. melanogaster*
- 87 *D. pseudoobscura*
- 7 *D. immigrans*
- 30 *D. hydei*
- 11 *D. hamatofila*

26. Baja California collecting trip, March 19-27, 1996, baited, w/Bill Etges, Conrad Istock, Chris Babcock. Species Identification: WB Heed, Pat O'Grady.

A975 Bahia Concepcion, BCS

- 15 *D. mojavensis*

A976 Santiago, BCS

- 43 *D. mojavensis* (+ 1 ♀ + 1 ♂ ex-agria rot)
- 6 *D. mel/sim*
- 4 *D. mainlandi*
- 3 *D. aldrichi*
- 1 *D. spenceri* ♂
- 1 *D. arizonae* ♂
- 1 *Gitona americana*

- A977 Todos Santos, BCS
- 31 *D. mojavensis*
 - 26 *D. mel/sim*
 - 1 *Gitona bivisualis*
- A978 Punta Agua Verde, BCS
- 11 *D. mojavensis*
 - 6 *D. mainlandi*
 - 4 *D. nigrospiracula*
 - 3 *G. americana*
 - 2 *D. aldrichi*
 - 1 *D. mel/sim* ♂
- A979 Punta Prieta, BC
- 65 *D. mojavensis* (+ 255 ♀ + 243 ♂ ex-4 agria rots)
 - 19 *D. pseudoobscura*
 - 5 *D. nigrospiracula*
 - 1 *D. mel/sim*
- A980 Observatory Road (San Pedro de Martir)
- 15 *D. pseudoobscura*
 - 14 *D. tenebrosa?*
 - 3 *D. busckii*
 - 1 *D. hydei*
 - 1 *D. mel/sim*
 - 1 *D. hamatofila?*
- A981 San Ignacio (near the date palm springs, during breakfast at La Pinta)
- 12 *D. pseudoobscura*
 - 11 *D. mel/sim*
- A982 East of Ciudad Insurgentes, BCS, 2 agria rots produced no flies
- A983 South of San Agustin, BCS, 1 roadside agria rot
- 205 ♀ + 223 ♂ *D. mojavensis* ex-agria rot
- A984 ~ 30 km South of Santa Rosalia, BCS, on road to San Jose de Magdalena
- 359 ♀ + 309 ♂ *D. mojavensis* ex-2 agria rots
- A985 North of El Cien, north of Cabo San Lucas
- 1 agria rot produced no flies
27. Sonora/Sinaloa Collecting trip, April 15-23, 1996, w/Miguel Armella, Celeste Durando, Bill Etges, Greg Huckins, Francisco Molina.
- A988 El Cardonal, Sonora (29° 29.27' N, 111° 39.09' W)
- 2 vials full *D. pachea* (ex-senita rot)
- A989 Ejido Puerto Arturo, Sonora (28° 25.53' N, 111° 25.04' W) (baited and aspirated)
- 328 *D. mojavensis* (+ 407 ex-organ pipe rot)
 - 3 *D. arizonae*

- 150 *D. nigrospiracula* (netted from cardon rot)
- 5 *D. mettleri* (ibid)
- 5 *D. pachea* (ibid)
- 1 *D. mel/sim* (ibid)

A990 Las Bocas, Sonora (26° 40.07' N, 109° 19.81' W) (baited and aspirated)

- 2359 *D. mojavenensis* (+81 ex-organ pipe rot)
- 7 *D. arizonae*
- 957 *D. aldrichi*
- 15 *D. mettleri*
- 3 *D. mel/sim*

Cactus rots collected: O.P. rot # 1, no flies; O.P. rot # 2, 5 vials of flies, prob. *D. mojavenensis*; cina rot, no flies; *Opuntia* rots (2 jars) about 30 flies, prob. *D. aldrichi*.

A991 El Fuerte, Sinaloa (26° 22.90' N, 108° 42.91' W) (baited and aspirated)

- 185 *D. mojavenensis* (+49 ♀ + 35 ♂ ex-organ pipe rot)
- 7 *D. arizonae*
- 2 *D. aldrichi*
- 3 *D. simulans*
- 1 *D. subsigmoides*

(Note: many more flies were collected, but didn't survive for unknown reasons).

Cactus rots collected: O.P. rots # 1 and # 2, no flies; cina rot, no flies; *Opuntia* rots (2 jars), 10 flies, prob. *D. aldrichi*.

A992 27 km East of Navojoa, Sonora (27° 06.66' N, 109° 10.22' W) (no baits used)

Cactus rots collected: *Opuntia* rots (3 jars), 8 flies, prob. *D. aldrichi*.

A993 Rancho El Diamante, Sonora, km 82 on Rte 16, East of Hermosillo (28° 41.62' N, 110° 18.13' W) (baited and aspirated)

- 1550 *D. mojavenensis* (+ 34 ex-organ pipe rot)
- 1 *D. arizonae*
- 39 *D. mettleri*
- 6 *D. pachea*
- 1 *D. nigrospiracula*
- 1 *D. nigrohydei*

Cactus rots collected: Organ pipe rot # 1, 2 1/2 vials of flies; O.P. rot # 2, no flies; cina rots # 1 and # 2, no flies.

A994 Punta Onah, Sonora (baited and aspirated)

- 1406 *D. mojavenensis* (+296 ♀ + 232 ♂ ex-2 agria rots)
- 3 *D. pachea*
- 1 *D. mel/sim*
- 1 *Scaptomyza* spp.

27. Anza-Borrego SP and Eastern Mojave trip, November 13-21, 1996, w/WJE, Greg Huckins, Pat O'Grady. all baited.

A996: Mountain Palm Springs campground, Anza-Borrego State Park 11/13-11/14, few barrels

- 4 *D. hydei*
- 2 ♀ *D. pseudoobscura*
- 15 ♀ + 11 ♂ *D. mel/sim*

Vallecito, Anza-Borrego St. Park, very stormy, no flies, 11/14-11/15
Joshua Tree NP, Cottonwood campground, nothing. 11/16

A997 Providence Mtns. State Recreation Area, below visitor center near caves, elevation 1230 m. 11/17-19.

- 62♀ + 45♂ *D. mojavensis*
- 3 *D. mettleri*
- 4♀ *D. pseudoobscura*

A998: W. of Havasu City, N. of Whipple Mtns along power line road. 11/19-20

- 5♀ + 5♂ *D. mojavensis*
- 1 *Gitona americana*
- 2 *D. pseudoobscura*
- 2 *D. mettleri*
- 1 *D. nigrospiracula*

A999: Kofa Mts., AZ, off rt. 95 going W., King of Arizona Mine, Rte 21, barrels present, 11/20-21

- 203 *D. nigrospiracula*
- 87 *D. mettleri*
- 1 *D. hamatofila*
- 1♀ *D. pseudoobscura*

28. Western Mexico trip, March 16-24, 1997, to Tomatlan, Chamela, Jalisco, and Playa Azul, Infiernillo, Michoacan. w/WJE, Miguel Armella, Greg Huckins, Sandra Perez.

A1008 7 km west of Tomatlan, Jalisco

- 8 ♀ + 10 ♂ *D. navojoa*
- 3 *mel/sim*
- 8 *D. ananassae* (yellow flies, not dark abdominal banding, keys out to *Hirtodrosophila*)
- 2 *Scaptodrosophila latifasciaeformis* (small yellow flies, abdominal bands fuller than *mel/sim*, fully extend to lateral margin as blocks)

A1009 Estacion de Biologia Chamela, Jalisco

- 34 ♀ + 29 ♂ *D. navojoa*
- 31 *D. aldrichi*
- 8 *D. wassermani*
- 49 *mel/sim*
- 69 *D. eremophila*
- 5 *D. meridiana* (light body, cloudy crossveins)
- 3 *D. paranaensis* (light body, clear crossveins)
- 9 *D. spenceri* (dark body, clear crossveins)
- 12 *D. prosaltans* or *D. sturtevanti* ("very dark" flies - not *repleta*)
- 1 *D. hydei*
- 1 *D. ananassae*
- 2 *S. latifasciaeformis*
- 1 *D. cardini* (*cardini*-NOT)
- 2 diptera, not *Drosophila*

A1010 Playa Azul, Michoacan (baits set out overnight in coconut and banana plantations). 3/22/97.

- 170 *mel/sim*

- 7 *D. aldrichi*
- 9 *D. ananassae*
- 3 *D. cardini* (yellow flies, slightly clouded cross-veins, bright eyes, distinct abdominal bands)
- 1 large yellow fly, keys out to testacea group, distinctive abdominal bands.
- 3 *D. nebulosa*
- 12 *D. hydei*
- 1 ♂ *D. canapalpa*
- 3 *D. spenceri*
- 13 *D. prosaltans* or *D. sturtevanti*
- 24 *S. latifasciaeformis*
- 1 *D. meridiana rioensis*
- 1 *D. paranaensis*

A1011 near road to Infernillo, km 192 on HW 37, March 23, 1997.

- 24 *D. wassermani*
- 3 *D. mel/sim*
- 3 *D. eremophila*
- 2 *D. hydei*
- 1 *D. ananassae*
- 2 *Scaptodrosophila latifasciaeformis*

29. Tehuacan, Puebla, Oaxaca, and Metztitlan, Hidalgo Trip, August 3-15, 1997, w/Miguel Armella, Bill Etges, Greg Huckins. baited.

A1013 Zapotitlan des Salinas, Jardin Botanico and 6 km on road to Los Reyes Metzontla

- 18 *D. melanogaster*
- 6 *D. ananassae*
- 9 *D. aldrichi*
- 1 *D. cardini*
- 32 ♀ + 34 ♂ *D. hexastigma*
- 153 *D. pegasa*
- 1 *D. mulleri*
- 48 *D. eremophila*
- 7 *D. nanoptera* + 34 ex-*Myrtillocactus geometrizans*
- 1 *D. bifurca*
- 1 *D. pseudoobscura*
- 12 *D. hydei*
- 3 *D. saltans* group
- 1 big repleta, dark complete bands
- 55 ?? repleta group species
- 17 *Gitona americana*
- 17 *S. latifasciaeformis*

A1014 Oaxaca, pine forest on road to Tuxtapepec.

- 6 *D. leonis* aspirated + 22 ex-*Opuntia*

A1015 Valley Site near Metztitlan.

- 50 *D. melanogaster*
- 134 *D. aldrichi* + 24 ex-*Opuntia*

- 7 *D. pseudoobscura*
- 72 *D. pegasa*
- 15 *D. hydei*
- 8 *D. hexastigma*
- 17 *D. longicornis* (all ex-*Opuntia*)
- 23 *D. arizonae*
- 2 *D. paranaensis*
- 1 *D. immigrans*
- 1 black repleta
- 1 big repleta, dull abdominal bands
- 5 muscids
- 523 ?? repletas
- 3 *Gitona americana*
- 2 *Rhinoleucophenga obesa*
- 1 *S. latifasciaeformis*

A1016 Upper Site, 1.5 km along road to Ganaderia Las Vaquerias, Metztitlan

- 32 *D. melanogaster*
- 6 *D. aldrichi* + 33 ex- 2 *M. geometrizzans* rots
- 41 *D. arizonae*
- 32 *D. hexastigma*
- 8 *D. pseudoobscura*
- 2 *D. hydei*
- 1 *D. nanoptera* + 21 ex- 3 *Stenocereus dumortieri* rots
- 2 *D. bifurca*
- 288 ?? repletas

30. Valle de Infiernillo, Michoacan and Cañon Zopilote, Guerrero, January 1-16, 1998, w/Miguel Armella, Bill Etges, Greg Huckins, and Pat O'Grady.

A1017 Infiernillo: along side-road 5 km from town and at km marker 12.

- 1303 *D. wassermani* (baited)
+ aspirated 77 from *Stenocereus fricii* rot (rot #1)
120 from *S. fricii* rot (rot #17)
185 from *S. quevedonis* rot (rot # 14)
119 from *S. marginatus* rot (rot # 4)
+ 8 ex- *S. quevedonis* rots (rots #11, 13, 17)
- 1 *D. nanoptera*
- 2041 *D. eremophila* (+2 aspirated from *S. quevedonis* rot; rot # 14)
- 473 *D. aldrichi*
- 9 *D. paranaensis*
- 2 *D. hydei*
- 98 *D. spenceri* +1 adult emerged from *S. quevedonis* rot #11
- 168 *D. anceps*
- 2544 *D. ananassae*
- 5 *D. busckii*
- 123 *D. nebulosa*
- 152 *D. mel/sim* +1 female ex- *S. quevedonis* rot #17
- 23 *D. cardini*
- 2 *D. gibberosa*

- 3 *D. sturtevantii*
- 1 *D. gigas?*
- 5 *D. funebris* +1 adult ex- *S. fricii* rot #15)
- 4 *D. saltans* group.
- 8 *S. latifasciaeformis*
- 6 *Gitona americana*

A1018 Cañon del Zopilote near Chilpancingo, Guerrero, 2 sites: at km 197 and one at km 176.

- 652 *D. aldrichi* (baited)
+ aspirated 36 from *P. weberi* rot (rot #6)
104 ex- *Pachycereus weberi* rot (rot #6)
13 ex- *Escontria chiotilla* (rot #7)
- 45 *D. wassermani* (baited)
+ aspirated 4 from *P. weberi* rot (rot #3)
30 ex-*E. chiotilla* (rot #7)
- 156 *D. nanoptera* (baited)
+ aspirated 4 from *P. weberi* rots (rots # 3, 6)
3 ex-*P. weberi* rots (rots # 5,6)
40 ex- *E. chiotilla* (rot #7)
- 809 *D. eremophila* +206 aspirated from *P. weberi* rots
- 1041 *D. spenceri*
+ aspirated 13 from *P. weberi* rots
3 ex- *P. weberi* rot (rots # 6)
- 4 *D. anceps* + 52 ex-*P. weberi* rots (rots # 5, 6)
9 ex- *E. chiotilla* (rot #7)
- 7 *D. paranaensis*
- 1 *D. leonis*
- 1 *D. nigricurria*
- 1 *D. fasciola* group sp.
- 76 *D. hydei*
- 521 *D. mel/sim*
- 24 *S. latifasciaeformis*
- 29 *D. cardini*
- 51 *D. busckii*
- 14 *Gitona americana*
- 12 *D. nebulosa*
- 5 *D. subsigmoides* ?
- 1 *D. sturtevantii*
- 1 *D. pseudooobscura* (sex combs confirmed)
- 1 *D. tripunctata?*
- 5 *quinaria* group ?
- 5 big brown drosophilids - *D. gigas?*
- 1 *D. parthenogenetica*

31. Cuitcatlán, Puebla, Oaxaca City, and Acatlan, Puebla, July 3-11, 1998, w/Miguel Armella, Bill Etges, Eric Larsen, Barbara Gautschi, Luke Rochette, and Amaury Díaz Solís.

Cuitcatlán, Puebla, July 3-5, 1998.

- 2150 *D. melanogaster*
- 7 *D. aldrichi*
- 2 *D. nanoptera* + 140 ex- 2 *Escontria chiotilla* rots

- 2 *D. cardini*
2 other *Escontria* and 1 *Stenocereus pruinosus* rots produced no flies

Oaxaca City, 29 km south on road to Mitla, July 7-8, 1998.

- 102 *D. melanogaster*
- 4 *D. hydei*
- 2 *D. cardini*
- 38 *D. ritae*
- 2 *D. pegasa*
- 5 *D. hexastigma*
2 *Opuntia* and 1 *Stenocereus* rots produced no flies

Acatlán, July 9-11, 1998.

- 428 *D. melanogaster*
- 81 *D. nanoptera* +10 aspirated from *E. chiotilla* + 4 ex- 3 *E. chiotilla* rots
- 5 *D. aldrichi* + 1 aspirated from *E. chiotilla*
- 5 *D. nigrohydei*
- 2 *D. leonis*
- 1 *D. wassermani*
- 1 *D. pegasa*
- 5 *D. cardini*
- 3 *D. nebulosa*
- 1 *D. quinaria*

32. Metztitlán, Hidalgo, and El Infiernillo, Michoacan, March 15-29, 1999, w/Miguel Armella, Bill Etges, Art Gibson (Infiernillo) and students of Miguel.

Meztitlán, Road to Ganaderia Vaquerias, Marzo 16-19, 1999.

- 273 *D. hexastigma*
- 60 *D. longicornis* complex
- 12 *D. melanogaster*
- 6 *D. arizonae*
- 6 *D. pseudobscura*
- 4 *D. hydei*
- 2 *D. anceps*
- 1 *D. bifurca*
- 1 *D. pegasa*
- 11 *Gitona americana*

Rots: 3 *Stenocereus dumortieri*, 3 *M. geometrizers*, 2 *Opuntia* pads produced no flies

Meztitlán valley

- 137 *D. hexastigma*
- 91 *D. longicornis*
- 6 *D. melanogaster*
- 1 *D. aldrichi*
- 2 *D. pegasa*
- 2 *D. arizonae* (+2 ex-*Myrtillocactus geometrizers*)
- 2 *D. eremophila*
- 2 *D. nanoptera*
- 1 *D. longicornis* ??
- 3 *Gitona americana*

El Infiernillo, 5 km site, Marzo 21-25, 1999

- 3363 *D. wassermani*
- 67 *D. eremophila*
- 1 *D. aldrichi*
- 3 *D. mel/sim*
- 1 *Gitona americana*

El Infiernillo, 12 km site.

- 350 *D. wassermani* (+ 5 ex-*S. fricii*)
- 35 *D. eremophila*
- 19 *D. mel/sim*
- 8 *D. paranaensis*
- 3 *D. aldrichi*
- 1 *D. nebulosa*
- 1 *D. spenceri*

Rots: 5 *S. fricii*, 1 *Backebergia militaris*, and 2 *S. quevedonis* rots produced no flies

33. Near Zapotitlan, Valle de Tehuacan, Puebla, July 16-28, 1999, w/Miguel Armella, Miguel's nephew Jaime, Bill Etges, and Isaac Jones.

Zapotitlan de Salinas, July 18-25, ca. 5 km along road across the river, east of town.

- 1632 *D. melanogaster*[‡]
- 604 *D. eremophila* +13 aspirated from *M. geometrizzans* rot
- 50 *D. hexastigma*
- 35 *D. longicornis*
- 26 *D. aldrichi*
- 19 *D. hydei*
- 13 *D. nigricruria*
- 4 *D. paranaensis*
- 3 *D. pegasa*
- 2 *D. ritae*
- 1 *D. bifurca*
- 1 *D. leonis*
- 4 *D. pseudoobscura*
- 15 *D. cardini*
- 1 *D. nannoptera* aspirated from *M. geometrizzans* rot
- 15 *D. nebulosa*
- 13 *D. saltans* group
- 8 *D. anassasae*
- 1 *D. carbonaria* ?
- 6 *Gitona americana*
- 1 *D. ?? repleta* female, heavy clouding of crossveins, abdominal banding like *D. hydei*.

[‡] Does not include the thousands of *D. melanogaster* released in the field.

Rots: 5 *M. geometrizzans*, 1 *Stenocereus stellatus*, 2 *Pachycereus hollianus*, 1 *Neobuxbaumia tzetzo*, and 6 *Opuntia* pads produced no flies

34. San Francisco del Rincon, Guanajuato and Ixtlan del Rio, Nayarit, January 5-17, 2000, w/Miguel Armella, Bill Etges, Robin Gray, Raphael and Alejandro.

Stateline; South of San Francisco del Rincon on old road to Guadalajara (Jalisco 24), January 8-12.

- 1600 *D. longicornis* complex

- 325 *D. huckinsi* sp. nov. (Etges et al. 2001)
- 29 *D. huichole* (all males) sp. nov.
- 28 *D. eremophila*
- 1 *D. ritae*
- 4 *D. pseudoobscura*
- 1 *D. melanogaster*

ca. 4 km south of San Francisco del Rincon on road to Manuel Doblado, January 8-12.

- 1742 *D. longicornis* complex + 9 ex- 2 *Opuntia* rots
- 356 *D. huckinsi* sp. nov.
- 20 *D. huichole* (all males) sp. nov.
- 8 *D. eremophila*
- 1 *D. ritae*
- 1 *D. aldrichi*

Ca. 2-3 km west of town on old highway, next to a squash plantation, Ixtlan del Rio, Nayarit, January 12-14.

- 700 *D. longicornis* complex
- 632 *D. huckinsi* sp. nov.
- 437 *D. aldrichi*
- 150 *D. eremophila*
- 36 *D. hydei*
- 25 *D. melanogaster*
- 7 *D. ritae*
- 4 *D. busckii*
- 1 *D. paraenensis*
- 1 *D. leonis*
- 1 *D. pseudoobscura* (4-5 teeth in sex combs)
- 1 *D. repleta* ? (light bar tergite)
- 1 *D. very black, -virilis-like*
- 1 *D. nannoptera-like*

35. Los Tuxtlas Biological Station, Veracruz, March 21-24, 2000, Bill Etges, all baited. (Unfortunately, I did not have the time to identify all species returned to the lab)

- 945 *D. "big yellow"* (several species)
- 190 *D. cardini*
- 339 *D. sturtevantii*-like (brown)
- 214 *D. sturtevantii*-like (black)
- 5 *D. ellisoni*
- 14 *D. fulvimacula*
- 104 *D. mel/sim*
- 32 *S. latifasciaeformis*
- 31 *D. yellow body/dark legs*
- 1 *D. green leg bands*
- 1 *D. repleta*, big black, hunch back

36. Joluxtla, Oaxaca and San Luis Potosí, SLP, August 1-12, 2000, w/Miguel Armella, Bill Etges, Carolyn Lewis, and Adolfo Alvarado.

Joluxtla, Oaxaca on the rancho owned by Jaime Torres and family, Aug. 3-6.

- 523 *D. hexastigma*

- 315 *D. nanoptera* + ca 25 adults aspirated from *Escontria* rot
- 55 *D. longicornis* complex
- 95 *D. eremophila*
- 14 *D. racemova*
- 4 *D. hydei*
- 1 *D. ritae*
- 54 *D. pseudoobscura*
- 40 *D. melanogaster*
- 8 *D. cardini*
- 1 *D. willistoni*-like

Rots: 4 *E. chiotilla*, 1 *S. stellatus* produced 2 *D. pseudoobscura*, rest *D. mel/sim*

Punta El Tecolote, km 54 on Rt. 49 from SLP to Zacatecas, Aug. 7-10.

- 169 *D. bifurca*
- 162 *D. ritae*
- 97 *D. racemova*
- 95 *D. eremophila*
- 21 *D. longicornis* complex
- 6 *D. hamatofila*
- 15 *D. huichole*
- 2 *D. melanogaster*
- 2 *D. pseudoobscura* – like (both females)
- 1 *D. saltans* group
- 1 *D. very black*, -virilis-like

Rots: 1 *Opuntia robusta* produced 2 *D. repleta* group adults, rest *D. mel/sim*

La Parada, km 33 on Rt. 49 from SLP to Zacatecas, Aug. 9-10.

- 5 *D. bifurca*
- 9 *D. hexastigma*
- 21 *D. longicornis* complex
- 4 *D. hamatofila*
- 1 *D. melanogaster*
- 3 *D. pseudoobscura* (4-5 bristles on sex combs, both tarsi)
- 1 *D. hydei*
- 2 large yellow dipterans

37. Punta Prieta, Baja California and Punta Onah, Sonora, 2001, March 17-24, 2001, w/Miguel Armella, Bill Etges, and David Stiers

PP01 Punta Prieta, Baja California

- 15 ♀ + 20 ♂ *D. mojavenensis* + 12 ex-agria rot (dry)
- 24 *D. pseudoobscura*
- 1 *D. nigrospiracula*

PO01 Punta Onah, Sonora

- 501 *D. mojavenensis*
- 70 *D. arizonae*
- 774 *D. hydei*
- 143 *D. mettleri*
- 57 *D. nigrospiracula*

- 8 *D. pseudoobscura*
- 4 *D. pachea*
- 7 *D. mel/sim*

38. Oaxaca Pacific coast and Zapotitlan des Salinas, Puebla, January 2-12, 2002, w/Miguel Armella, Bill Etges, Pat O'Grady, Deodoro Oliveira, Harry Wistrand. all baited.

Penotepa National, Oaxaca

- 3 *D. melanogaster*
- 1 *D. aldrichi*
- 2 *D. malerkotliana*

Bahias de Huatulco, Oaxaca

- 3 *D. melanogaster*
- 34 *D. aldrichi*
- 35 *D. eremophila*
- 2 *D. spenceri*
- 18 *D. wassermani*
- 1♀ *D. acanthoptera*
- 1 *D. saltans group*
- 2 *D. malerkotliana*
- 1 *D. aldrichi??*

Zapotitlan des Salinas, Puebla (6 km on road to Los Reyes Metzontla)

- 56 *D. melanogaster*
- 23 *D. nanoptera*
- 9 *D. aldrichi*
- 10 *D. hydei*
- 131 *D. eremophila*
- 245 *D. longicornis*
- 288 *D. hexastigma*
- 42 *D. huckinsi*
- 9 *D. pegasa*
- 7 *D. spenceri*
- 15 *D. ritae*
- 2 *D. busckii*
- 16 *D. pseudoobscura*
- 1 *D. cardini group*
- 1 *D. brooksi ?*
- 3 *Gitona americana*

39. Valle San Quintin, Baja California, January 3-12, 2003, w/Bill Etges, Josh Mutic, Harry Wistrand

SQ03 Hillside agria patch, 2 km east main highway across from the road to the Old Mill Motel, (30°30'40.84"N, 115°53'30.58"W) and at km 36 south of Arroyo Hondo (30°10'14.32"N., 115°47'26.12"W)

- 3630 *D. melanogaster*
- 544 *D. mojavensis*
- 711 *D. hydei*
- 6 *D. longicornis ?*
- 65 *D. pseudoobscura*
- 131 *D. busckii*

- 2 *D. immigrans*
- 2 *D. floricola*
- 1 *S. latifasciaeformis*
- 2 *Gitona americana*

40. Punta Onah, Sonora, November 12-14, 2003, Collectors: Bill Etges and Luciano Jaureguy

PO03 Heed Camp, Punta Onah (baited).

- 819 ♀ + 1187 ♂ *D. mojavenensis** + 36 ♀ + 26 ♂ aspirated from agria rots
- 198 *D. arizonae*
- 325 *D. nigrospiracula*
- 97 *D. mettleri*
- 53 *D. pseudoobscura*
- 107 *D. melanogaster*
- 24 *D. hydei*
- 1 *D. spenceri* male (?) dead
- 1 *D. pachea*
- 1 *D. cardini* group
- 1 *Gitona americana*

* 1 male was a yellow body mutant, all flies very polymorphic for body coloration, brown versus black.

41. Santa Catalina Island, December 22-23, 2004, collector: Brian Counterman.

SC05 Little Harbor (baited).

- 252 *D. mainlandi*
- 50 *D. mojavenensis* + 63 ex-*Opuntia*
- 7 *D. wheeleri* + 8 ex-*Opuntia*
- 4 *D. mettleri* + 1 ex-*Opuntia*
- 22 *D. pseudoobscura*
- 17 *D. simulans*

42. Big Bend National Park, Texas, March 12 -20, 2004, Collector: Bill Etges. baited.

Chisos Basin (3/14-3/15).

- 207 *D. longicornis*
- 134 *D. pseudoobscura*
- 8 ♂ *D. desertorum*
- 2 *D. hydei*

Cottonwood Campground (3/18).

- 34 *D. pseudoobscura*
- 27 *D. longicornis*
- 1 *D. hydei*
- 1 *D. melanogaster*

Boquillas Canyon Road (3/19-3/20)

- 146 *D. pegasa*
- 91 *D. longicornis* and *D. hamatofila*
- 21 *D. melanogaster*
- 1 *D. hydei*

Trail SE of Rio Grande Village campground

- 15 *Notogramma purpuratum* Cole (Diptera: Otitidae) ex-*Echinocactus horizonthalonius* (Turk's head cactus)

43. Big Bend National Park, Texas, March 18 -26, 2005, Collector: WJ Etges. baited.

Where are the *D. desertorum* females? (Etges and Heed 2005)

Chisos Basin Campground (3/20-3/23).

- 625 *D. longicornis* (est. number)*
- 512 *D. hamatofila* (est. number)
- 463 *D. pseudoobscura* ⁺
- 9 ♂ *D. desertorum*
- 9 *D. ritae*
- 1 *D. hydei*

Chisos Basin Hillside (3/20-3/23).

- 1201 *D. longicornis* (est. number)
- 605 *D. hamatofila* (est. number)
- 300 *D. pseudoobscura*
- 76 *D. desertorum* (mostly males)

Rio Grande Village Campground (3/23-3/25). A mesquite forest next to the rio.

- 290 *D. longicornis* (est. number)
- 145 *D. hamatofila* (est. number)
- 981 *D. pseudoobscura*
- 9 *D. hydei*
- 1 *D. pegasa*
- 2 *D. repleta* dark abdominal bands (1 female laid many eggs, none hatched)
- 46 *D. mel/sim*
- 15 *D. carbonaria*
- 2 *D. cardini* group
- 2 *D. funebris*
- 1 *D. macrospina limpiensis* (?)
- 23 *Notogramma* sp.

est. number – *D. longicornis* and *D. hamatofila* were initially sorted into one group, and then separated. Some had died, so I estimated the original numbers using the ratio of *long/ham* in the survivors.

⁺ I did not check for the presence of *D. azteca*.

44. Punta Onah, Sonora, November 14 -18, 2007, w/Bill Etges, Allen Gibbs, Jackson Jennings, and Michael Brewer

PO07 Heed Camp, Punta Onah (baited).

- 472 *D. mojavensis* (includes many aspirated from agria rots)
- 825 *D. arizonae* (ibid)
- 937 *D. nigrospiracula/mettleri* *
- 28 *D. pseudoobscura*
- 33 *D. melanogaster/simulans*
- 37 *D. hydei*
- 15 *D. pachea*
- 2 *D. spenceri* male (?)

- 3 *D. wheeleri*
 - 11 *D. "light repleta"*
 - 2 *D. carbonaria* (?)
 - 1 *Gitona americana*
 - 5 *Zaprionus indianus*
- * didn't sort all, probably also includes *D. ritae*.

45. Punta Prieta and San Quintin, Baja California, January 13 -17, 2008, w/Bill Etges, Allen Gibbs, Julie Havens

PP08 Punta Prieta (baited).

- 456 *D. mojavenensis*
- 45 *D. nigrospiracula*
- 106 *D. pseudoobscura*
- 2 *D. hydei*

SQ08 San Quintin, same hillside as 2003 (baited).

- 17 *D. mojavenensis* (+ 355 ex-3 agria rots)
- 11 *D. arizonae*
- 190 *D. hydei*
- 60 *D. pseudoobscura* (+2 ex-agria)
- 328 *D. melanogaster/simulans* (+ 9 ex-agria)
- 2 *D. repleta* dark

46. Brazil collecting trip, August 5-14, 2008, w/C. de Oliveira, F. de Faria Franco, and A. Esguícero. Most flies baited, some reared from cactus rots, no other data provided (Franco 2009).

N36 Petrolina, Pernambuco (9.1° S, 40.6° W)

D. gouveai, *D. serido*, *D. borborema*

N47 Juazeiro, Bahia (9.5° S, 40.5° W)

D. gouveai, *D. serido*, *D. borborema*

N37 Morro da Bahiarinha, Bahia (9.9° S, 40.3° W)

D. gouveai, *D. serido*, *D. borborema*

N39 Morro do Chapéu, Bahia (11.6° S, 41.2° W)

D. serido, *D. seriema*

N40 10 km S de Morro do Chapéu, Bahia (11.65° S, 41.29° W)

D. borborema, *D. seriema*, *D. serido*

N42 Cach. Ferro Doido, Bahia (11.63° S, 41.00° W)

D. serido, *D. seriema*

N43 Irecê, Bahia (11.22° S, 41.95° W)

D. serido

N44 Xique-Xique, Bahia (10.90° S, 42.54° W)

D. gouveai

N45 Mucugê, Bahia (13.0° S, 41.4° W)

D. serido, *D. seriema*

47. Sonora Trip, March 3 -10, 2009, w/Bill Etges, Alfredo Ruiz, Deodoro Oliveira, and Gil Smith. baited

CH09 El Choyudo, Sonora (east of the road to the playa)

- 315 *D. mojavensis*
- 32 *D. arizonae*
- 841 *D. hydei*
- 1 *D. mettleri*
- 32 *D. mel/sim*

LB09 Las Bocas, Sonora

- 1264 *D. mojavensis* + 9 ex- 3 cina, *S. alamosensis*, rots
 - 446 *D. arizonae* + 6 ex-3 cina rots
 - 16 *D. navojoa*
 - 211 *D. aldrichi*
 - 12 *D. pachea*
 - 118 *D. hydei*
 - 70 *D. spenceri*
 - 39 *D. huckinsi*
 - 24 *D. longicornis* (?*)
 - 1 *D. nigricruria*
 - 5 *D. eremophila*
 - 815 *D. mel/sim*
 - 1 *D. busckii*
 - 3 *Zaprionus indianus*
 - 3 *neriids* (*Odontoloxozus longicornis*?)
 - 23 small black dipterans (drosophilid-like)
- * probably also includes *D. ritae*.

Alamos, Sonora

- 1 *D. hydei*
- 42 *D. mel/sim*

PO09 Heed Camp, Punta Onah

- 641 *D. mojavensis* + some aspirated + 1070 ex-agria rot
- 11 *D. arizonae* + 4 ex-agria rot
- 70 *D. nigrospiracula*
- 7 *D. pseudoobscura*
- 29 *D. melanogaster/simulans*
- 30 *D. hydei*
- 6 *D. pachea*
- 1 *D. aldrichi*
- 2 small dark dipterans
- 4 large dipterans with wing spots ex-agria rot

Conclusions

Despite habitat loss and increasing human population pressures in the arid lands of northwestern Mexico and elsewhere, there remains a diverse fauna of drosophilids easily obtained from nature. Cataloging

this biodiversity is challenging - both the diverse numbers of drosophilid and cactus species throughout the New World demands familiarization with fly identification and preparation of male genitalia (Vilela, 1983) as well as field cactus identification (Gibson and Horak, 1978; Gibson, 1982; Gibson and Nobel, 1986; Gibson *et al.*, 1986; Gibson, 1991; Zappi, 1994; Turner *et al.*, 1995; Manfrin and Sene, 2006). Certainly there remain species difficult to identify as evident from the many questionable or unidentified species listed above. The often described numbers of *D. repleta* group species as “ca. > 100 species” (Oliveira *et al.*, 2012) has increased as we know there are undescribed, cryptic species present (Beckenbach *et al.*, 2008; Heed and Castrezana, 2008), and more new species uncovered through continuing field studies (Stensmyr *et al.*, 2008; Acurio and Rafael, 2010; Acurio *et al.*, 2013).

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New collection of drosophilids from Font Gropa site (Barcelona, Spain).

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On 4th October 2016, a new sample of drosophilids was obtained from Font Gropa (Barcelona). This is a well-described site, characterized by a vegetation composed of pinewoods (*Pinus pinea*) with some ilexes (*Quercus ilex*) and Mediterranean brushwood (Araúz *et al.*, 2009). Flies were trapped from 16:30 to 19:40 pm using 12 baits containing fermenting bananas placed along a trail. Individuals were classified according to species and sex (Table 1).

It is worth observing that *melanogaster* group (*D. melanogaster* and *D. simulans*) is the dominant, as was also reported in the 2015 collection (Rosselló *et al.*, 2016). *D. subobscura*, the following species in abundance, scarcely reached 12%. The sex imbalance in this species is also interesting, being females more common than males. In comparison with previous collections, the invasive species *D. sukuii* presented a drastic reduction in percentage: 8.97% in 2015 (Rosselló *et al.*, 2016), 20.35% in 2014 (Esteve and Mestres, 2015), 7.98% in 2013 (Pineda *et al.*, 2014), and 9.20% in 2012 (Canals *et al.*, 2013). Furthermore, only females of this species were trapped. The remaining species sampled presented percentages under 1%. With this drosophilid distribution the values of *H'* (Shannon diversity index) and *J* (Shannon uniformity index) were