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## Opportunity in our Ignorance: Urban Biodiversity Study Reveals 30 New Species and One New Nearctic Record for *Megaselia* (Diptera: Phoridae) in Los Angeles (California, USA)

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### Abstract

An urban biodiversity study sampling primarily from private backyards in Los Angeles, California (USA), reveals the presence of fifty-six species of *Megaselia* within the first few months of sampling. Thirty of these are described as new to science: *M. armstrongorum*, *M. bradyi*, *M. brejchaorum*, *M. carthayensis*, *M. ciancii*, *M. creasoni*, *M. defibaughorum*, *M. donahuei*, *M. francoae*, *M. fujiokai*, *M. hardingorum*, *M. heini*, *M. hentschkeae*, *M. hoffmanorum*, *M. hoggorum*, *M. hoguei*, *M. isaacmajorum*, *M. kelleri*, *M. lombardorum*, *M. marquezii*, *M. mikejohnsoni*, *M. oxboroughae*, *M. pisanoi*, *M. renwickorum*, *M. rodriguezorum*, *M. sacatelensis*, *M. seaverorum*, *M. sidneyae*, *M. steptoeae*, and *M. wiegmanae*. *M. largifrontalis* is newly reported from the Nearctic Region. The implications these findings have for future taxonomic work in *Megaselia*, particularly in urban areas, are discussed.

**Key words:** Diptera, Phoridae, urban biodiversity

### Introduction

Urban areas are usually not considered to be richly biodiverse environments. They consist of highly degraded remnants of original habitats alongside of greatly modified areas planted with non-native species that are watered, fertilized and manipulated to fulfill new purposes. These environments are often neglected by researchers (who leave their homes in search of greener, richer environs to study), leaving the biodiversity of most cities un- or under-studied. In recent years this has been changing; studies of urban ecosystems in Baltimore and Phoenix in the United States (Grimm *et al.* 2000), as well as large projects in the United Kingdom (*e.g.*, Loram *et al.* 2007), Switzerland (Sattler *et al.* 2010), and elsewhere (*e.g.*, Bolger *et al.* 2000; Alberti *et al.* 2003; Crooks *et al.* 2004) have helped to raise the profile of urban ecology (*e.g.*, Shochat *et al.* 2006). In Los Angeles, ignorance of the urban environment has turned into an exciting research opportunity. The BioSCAN Project (Brown *et al.* 2014, Hartop 2014) has uncovered thirty fly species in a single genus that are new to science, and an additional species until now unknown from the Nearctic Region. These discoveries came after just three months of project sampling, which yielded over 10,000 specimens for examination. This is our first glimpse into the unknown richness of urban biodiversity in Los Angeles, and points to the tremendous deficiency of taxonomic knowledge about the fauna immediately surrounding the homes and workspaces of researchers. Apparently, we need not travel far to have plentiful opportunities for studying biodiversity.

Our main study group is the fly family Phoridae (Diptera), which is an extremely diverse family (Disney & Durska 2008) and are abundant in Malaise trap samples (Disney *et al.* 1982). In particular, we have focused on the large and species-rich genus *Megaselia* Rondani, from which we already have collected tens of thousands of specimens for examination. Although studies on urban *Megaselia* are few, some pre-existing information does exist from England. A limited survey of a large garden in London (UK) recorded 56 species of *Megaselia* and noted the recording (then) of 53 species from a suburban garden in Cambridge (UK) (Disney 2001); more have been added since, and the current total for it, and other gardens in Cambridge, is 57 species. We are turning up

similar results in Los Angeles (California, USA), where we have already documented 56 species in this genus from urban backyards. We expect that number to grow as the study continues. One of the first species found during preliminary trials for the project was a new record for the Nearctic Region, which hinted at the discoveries that lay ahead (Disney & Brown 2009).

This project has forced us to delve into both type material and non-type historic collections of North American phorid flies. Errors and misidentifications are common, due in part to the identification of material in a dried state. Many details of *Megaselia* are only readily observable after specimens have been slide mounted. For example, four species were reported in the type series of a “species” mounted on pins when remounted on slides (Disney 1983). Descriptions of species from the females only, and males “identified” as that species based only on venational or superficial character sets is a problem that will likely take decades to sort out completely. Work on *Megaselia* must be made a priority despite these setbacks. The diversity of life histories for this largely cosmopolitan genus is tremendous and future study on the group is paramount for understanding their role in both our ecosystems and our lives.

## Materials and Methods

Specimens were collected by Malaise traps set up at thirty sites in Los Angeles (CA: USA) (Table 1). Specimens were captured and preserved in 95% ethanol, dissected and slide mounted either by first clearing in clove oil and then mounting in Canada Balsam, or mounting directly in Berlese’s fluid (D. J. & D. Henshaw, Waltham Abbey, England) and then sealed with dammar varnish (a commercially available product used for preserving artwork). A subset of specimens were softened in lactic acid and their hypandria were dissected out and photographed. Specimens were examined using a Leica M205C stereo microscope and photographed on this microscope using a Nikon D600 digital SLR camera. Photograph stacking was done with Helicon Focus software. Specimens are deposited in the Natural History Museum of Los Angeles County, USA (LACM), the Cambridge University Museum of Zoology, UK (CUMZ), the Smithsonian Institution (USNM), and the Museum of Comparative Zoology Collection (MCZC). Methods for dissection and specific mounting protocol followed those recommended for this genus (Disney 2009).

TABLE 1. BioSCAN site locations.

Name	Latitude	Longitude	Name	Latitude	Longitude
Atwater Village	34.114	-118.251	Hollywood	34.095	-118.334
Burbank	34.170	-118.308	Jefferson Park	34.030	-118.327
Carthay	34.059	-118.369	Koreatown	34.072	-118.291
Eagle Rock	34.136	-118.194	Larchmont	34.077	-118.320
Eagle Rock	34.129	-118.215	Leimert Park	34.014	-118.321
Echo Park	34.074	-118.264	Los Feliz	34.118	-118.284
Elysian Park	34.078	-118.234	Los Feliz	34.116	-118.279
Elysian Valley	34.103	-118.243	Los Feliz	34.112	-118.293
Exposition Park	34.018	-118.288	Mid-City	34.047	-118.334
Gardena	33.876	-118.288	Mid-Wilshire	34.058	-118.328
Glassell Park	34.111	-118.230	Mount Washington	34.103	-118.216
Glendale	34.149	-118.218	Pico-Union	34.046	-118.275
Glendale	34.159	-118.247	Silverlake	34.093	-118.274
Highland Park	34.125	-118.189	Silverlake	34.102	-118.257
Highland Park	34.123	-118.193	University Park	34.034	-118.281

Following the authors' previously established system, descriptions are presented as tables supplemented by habitus, wing and hypandrium photographs, genitalia drawings, and additional images of any salient features (Hartop & Brown 2014). Clarification of some of the characters from Hartop & Brown (2014) may prove useful: regarding labellum spinosity, the short, blunt spinose setulae on the labellum can be distinguished from other short setae that would *not* be determined as setulae by their characteristic bluntly rounded tips. The differentiated "curved" setae found on the basal part of the hind femur of some species differ from undifferentiated setae by being thick along most of their length and tapering abruptly to a fine point only near the curved tip of the seta. This compares to undifferentiated setae which taper uniformly along their length to a fine tip. Other differentiated setae on the basal half of the hind femur may instead be in characteristic arrangement or found in raised sockets. Future work on this description system is to include an online keying system for North American *Megaselia*.

Twenty nine of the new species herein described were named in honor of the hosts of BioSCAN sites. Each of the species was collected in the backyard of the site host for whom it is now named, although type material may come from other sites of occurrence, depending on availability. The thirtieth species is named in honor of the Seaver family of the Seaver Foundation.

## Systematics

### Taxon Discussion

In order to obtain a definitive diagnosis for any potentially new species of *Megaselia*, the entire body of world literature must be consulted. Although world literature was used here for a final diagnosis, the authors only make reference to species and literature outside the Nearctic fauna when a comparison is deemed necessary. Primary keys used for the Nearctic *Megaselia* are those of Borgmeier (1964, 1966) in his revisions of the North American fauna. These keys include two species of *Pericyclocera*, which are now considered *Megaselia*. Species formerly in *Plastophora* are covered by Colyer & Elberg (1969). The subgenus *Kerophora* is keyed by Brown (1988), with name changes by Disney (1994d, p. 280). Important revisions and additions are given by Robinson (1977, 1978, 1981). Further additions are covered by Robinson & Wisseman (1983), Disney (1981, 2004, 2008), Brown (1990), Barnes (1991), Hanson & Disney (2008), Disney, Copeland & Murrell (2009), Disney, Taylor, Slay & Kreica (2011), Stoepler & Disney (2013).

As work on Nearctic Region *Megaselia* progresses, keys to the fauna will be created. Currently, with the fauna only known from scattered sampling across the region, a key would be premature and largely incomplete.

### Taxon Treatments

#### *Megaselia armstrongorum* new species (Figs. 1, 33, 63, 93)

**Diagnosis.** Male. The costa of this species can be 0.42–0.44 wing length, allowing specimens to key to either group VII or group VIII in the keys of Borgmeier (1966). It keys to couplet 38 in the group VII key but differs from the two species there, *M. rotundula* Borgmeier and *M. piccola* Borgmeier by having 3 notopleural bristles. It runs to *M. polyporicola* Borgmeier in the group VIII key, from which it differs most noticeably in wing characteristics. *M. polyporicola* has dark veins, whereas *M. armstrongorum* has especially light veins, so much so that they are difficult to photograph well. Additionally, in *M. polyporicola* costal segment two (C2) is twice the length of costal segment three (C3), but in *M. armstrongorum* the sections are subequal.

**Description.** See Table 2.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of the Armstrong family, hosts of BioSCAN site 17.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Eagle Rock, 3–7.V.2014, Keller, Malaise Trap (LACM 329753).

**TABLE 2.** Species descriptions, *M. armstrongorum*–*M. ciancii*. Character remarks in parentheses, general remarks in last row.

	<i>M. armstrongorum</i>	<i>M. bradyi</i>	<i>M. brejchaorum</i>	<i>M. carthayensis</i>	<i>M. ciancii</i>
	Fig 1	Fig 2	Fig 3	Fig 4	Fig 5
<b>Head</b>					
SA ratio	0.74-0.83	0.74-0.80	0.74-0.77	0.80-0.85	0.45-0.56
VIF position	normal	normal	normal	normal	normal
SPS vesicles	absent	absent	absent	absent	absent
Palpal setae length	long	long	long	long	long
Labellum spinosity	spinose	spinose (very dense)	not	not	not
<b>Thorax</b>					
Anepisternum	bare	hairs only (few, <10)	hairs only (few, <10)	bare	bare
Relative halter color	same	lighter	same	same	lighter
# NP setae	3	3	3	3	3
NP cleft	absent	absent	absent	absent	absent
Scutellar setae	2+2	2+2	2+2	2+2	2+2
<b>Leg</b>					
t1 palisade	1-4	1-4	unable to determine	1-4	1-4
t2 palisade	0.4	0.67	0.67	0.5	0.67
t3 comb bifurcate	absent	absent	absent	absent	absent
t3 setulae	PD	PD	PD	PD	PD
f3 basal setae	B>AV	B>AV	B>AV	B>AV (10+ setae)	B>AV
f3 basal setae differentiation	absent	present (12+ robust, curved)	absent	absent	absent (but long)
<b>Wing</b>					
Wing Length (mm)	0.95-1.40	1.55	1.22-1.38	1.18-1.45	1.44-1.63
Subcosta	incomplete	incomplete	incomplete	incomplete	incomplete
R seta	absent	strong	small	absent	small
R2+3	present	present	present	present	present
Costal index	0.42-0.44	0.49	0.33-0.36	0.40-0.43	0.35
Costal ratios	3.29-3.75: 0.86-1: 1	3.20-2.10: 1	5: 1-1.25: 1	3.42-4.00: 1.28-1.53: 1	4.00-4.20: 1.07-1.15: 1
Costal setae length (mm)	0.04-0.05	0.13-0.14	0.08-0.09	0.05-0.06	0.08-0.10
Number alular setae	2	3	2	2	2
Alular setae length (mm)	0.06-0.09	0.11	0.10-0.11	0.11-0.12	0.11-0.12
Wing color	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear
<b>Genitalia</b>					
AT length	AT<E	AT<E	AT<E	AT+/-E	AT>E
E setation	hairs only	hairs only (strong)	hairs + bristles	hairs only	hairs only
Relative posterior setation	H<T6<C<E	H<C<T6=E	C<T6<E<H	T6<E=C<H	E<T6<C<H
General Remarks	penis complex often extruded, prominent (Fig 63)		forebasitarsus swollen, with rows of spinules		

**Paratype.** 4 ♂, USA: CALIFORNIA: Los Angeles, Eagle Rock, 3–7.V.2014, Keller, Malaise Trap (LACM 329754, LACM 329755, 2 CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Exposition Park, University Park, Los Feliz, Silverlake, Elysian Valley, Leimert Park, Koreatown, Mid-City, Glendale, Gardena, Hollywood, Larchmont, Carthay, Burbank, Echo Park, Atwater Village, Eagle Rock, Pico-Union, Mid-Wilshire, Highland Park, Mount Washington, 1273 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).

### *Megaselia bradyi* new species (Figs. 2, 34, 64, 94)

**Diagnosis.** Male. In the group IV key of Borgmeier (1964), *M. bradyi* keys to couplet 17 but differs from both *M. difcilis* Malloch or *M. cribella* Borgmeier by having a characteristic basal fringe of 12+ robust, curved setae on the hind femur (F3), which those species lack.

**Description.** See Table 2.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Brady Louie, the youngest host of BioSCAN site 20.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Elysian Park, 22.II.2014–1.III.2014, Harding, Malaise Trap (LACM 329756).

**Paratype.** ♂, USA: CALIFORNIA: Los Angeles, Los Feliz, 1–7.II.2014, Louie, Malaise trap (LACM 329757).



**FIGURES 1–9.** Habitus images (lateral). 1. *Megaselia armstrongorum*. 2. *Megaselia bradyi*. 3. *Megaselia brejchaorum*. 4. *Megaselia carthayensis*. 5. *Megaselia ciancii*. 6. *Megaselia creasoni*. 7. *Megaselia defibaughorum*. 8. *Megaselia donahuei*. 9. *Megaselia francoae*.

### ***Megaselia brejchaorum* new species (Figs. 3, 35, 65, 95)**

**Diagnosis.** Male. In the group V key of Borgmeier (1964), *M. brejchaorum* keys to couplet 4 where it differs from both *M. pressicauda* Borgmeier and *M. divergens* Malloch in details of the genitalia (Fig. 65). The epandrium of *M. brejchaorum* lacks the foveolate impression of *M. pressicauda* and has long, robust bristles in contrast to the short hairs found on *M. divergens*.

**Description.** See Table 2.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of the Brejcha family, hosts of BioSCAN site 29.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 1–8.II.2014, Brejcha, Malaise trap (LACM 329758).

**Paratypes.** ♂, USA: CALIFORNIA: Los Angeles, Eagle Rock, 1–8.III.2014, Hogue, Malaise trap (LACM 329759). ♂, USA: CALIFORNIA: Los Angeles, Eagle Rock, 1–8.II.2014, Hogue, Malaise trap (LACM 329760).

### ***Megaselia carthayensis*, new species (Figs. 4, 36, 66, 96)**

**Diagnosis:** Male. In the group VIII key of Borgmeier (1966), *M. carthayensis* keys to *M. polyporicola* Borgmeier. In contrast to the epandrium with longish hairs on both sides and dark wing veins of *M. polyporicola*, *M. carthayensis* has an epandrium with short hairs only (Fig. 66), and very light wing veins (Fig. 36).

**Description.** See Table 2.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Carthay Elementary School, site of BioSCAN site 19.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Glendale, 31.V.2014–7.VI.2014, Armstrong, Malaise Trap (LACM 329761)

**Paratypes.** 4 ♂, USA: CALIFORNIA: Los Angeles, Los Feliz, 31.V.2014–7.VI.2014, Koch, Malaise Trap (LACM 329762, LACM 329763, 2 CUMZ)

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Los Feliz, Larchmont, Carthay, Highland Park, Mount Washington, 11 ♂, II–V.2014, Malaise traps (LACM, MCZC, USNM).

### ***Megaselia ciancii* new species (Figs. 5, 37, 67, 97)**

**Diagnosis.** Male. In group VIII key of Borgmeier (1966), *M. ciancii* keys out to *M. pygmaeoides* [now considered to be *M. berndseni* (Schmitz 1919)] from which it differs immediately by the presence of 3 notopleural setae compared to the 2 found on *M. berndseni*.

**Description.** See Table 2.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Chris Cianci, host of BioSCAN site 21.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 1–8.III.2014, Franco, Malaise Trap (LACM 329764).

**Paratype.** ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 31.V.2014–7.VI.2014, Franco, Malaise Trap (LACM 329765).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Los Feliz, Silverlake, Burbank, Highland Park. 9 ♂, III.20014, V.2014, Malaise Traps (LACM, MCZC, USNM).

***Megaselia creasoni* new species (Figs. 6, 38, 68, 98)**

**Diagnosis.** Male. In the group VII key of Borgmeier (1966), *M. creasoni* fails the key at couplet 12 where it matches *M. minuta* Aldrich in costal index (CI) but differs in having very lightly colored legs (Fig. 6) compared to the dark mid and hing legs of *M. minuta*.

**Description.** See Table 3.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Glen Creason, host of BioSCAN site 27.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Elysian Park, 3–10.V.2014, Harding, Malaise trap (LACM 329766).

**Paratypes.** 4 ♂, USA: CALIFORNIA: Los Angeles, Glassell Park, 3–10.V.2014, Creason, Malaise trap (LACM 329767, LACM 329768, 2 CUMZ)

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Exposition Park, University Park, Los Feliz, Silverlake, Elysian Valley, Leimert Park, Koreatown, Mid-City, Glendale, Gardena, Hollywood, Larchmont, Carthay, Burbank, Echo Park, Atwater Village, Eagle Rock, Pico-Union, Mid-Wilshire, Glassell Park, Mount Washington, 206 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).

**TABLE 3.** Species descriptions, *M. creasoni*–*M. fujikoi*. Character remarks in parentheses, general remarks in last row.

	<i>M. creasoni</i>	<i>M. defibaughorum</i>	<i>M. donahuei</i>	<i>M. francoe</i>	<i>M. fujikoi</i>
	Fig 6	Fig 7	Fig 8	Fig 9	Fig 10
<b>Head</b>					
SA ratio	0.55-0.69	0.83-0.88	0.49-0.60	0.84-0.90	0.82-0.85
VIF position	normal	normal	normal	normal	normal
SPS vesicles	absent	absent	absent	absent	absent
Palpal setae length	long	long	long	long	long
Labellum spinosity	not	not	not	not	not
<b>Thorax</b>					
Anepisternum	bare	bare	bare	bare	bare
Relative halter color	lighter	lighter	same	same	same
# NP setae	3	3	3	3	3
NP cleft	absent	absent	absent	absent	absent
Scutellar setae	2+2	2+2	4 not = (0.73)	2+2	2+2
<b>Leg</b>					
ts1 pallsade	1-5	1-4	1-5	1-4	1-4
t2 pallsade	0.67	0.67	0.67	0.5	0.67
t3 comb bifurcate	absent	absent	absent	absent	absent
t3 setulae	PD only	PD only	PD	PD only	PD only
f3 basal setae	B>AV	B=AV	B>AV	B>AV	B>AV
f3 basal setae differentiation	present (>10 robust, curved)	absent	present (+/-10 long, curved)	absent	absent
<b>Wing</b>	Fig 38	Fig 39	Fig 40	Fig 41	Fig 42
Wing Length (mm)	1.25-1.79	1.41-1.50	1.56-1.75	1.36-1.47	1.84-1.86
Subcosta	incomplete	incomplete	incomplete	incomplete	complete (barely)
R seta	absent	small	absent	absent	small
R2+3	present	present	present	present	present
Costal index	0.46-0.48	0.36-0.38	0.45-0.47	0.39-0.42	0.39-0.42
Costal ratios	3.14-4.44: 2.00-2.92: 1	3.00: 1.19-1.54: 1	3.50-4.06: 2.50-3.31: 1	3.49-3.75: 1.25-1.47-1	3.75-4.00: 1.88-1.90: 1
Costal setae length (mm)	0.06-0.08	0.09-0.10	0.06-0.07	0.06-0.07	0.08-0.09
Number alular setae	2-3 (normally 2)	3	3-4	2	4
Alular setae length (mm)	0.08-0.13	0.11-0.13	0.10-0.11	0.10-0.11	0.11-0.13
Wing color	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear
<b>Genitalia</b>	Fig 68, 98	Fig 69, 99	Fig 70, 100	Fig 71, 101	Fig 72, 102
AT length	AT<E	AT<E	AT>E	AT<E	AT<E
E setation	hairs only	hairs only	hairs only	hairs only	hairs + bristles
Relative posterior setation	E<T6<C<H	E<T6=C<H	T6=E<C<H	T6<E=C<H	T6<C=H<E
General Remarks	2 lobes w/small setae on venter, segment six (Fig 68)		2-4 large setae on anterior face of F3 apically		

***Megaselia defibaughorum* new species (Figs. 7, 39, 69, 99)**

**Diagnosis.** Male. In the group VIII key of Borgmeier (1966), *M. defibaughorum* keys to couplet 9, where its CI of 0.36–0.38 makes it too long to be *M. pygmaeoides* [now considered to be *M. berndseni* (Schmitz 1919)], but not long enough to continue in the key. Taking the upper end of the CI range and continuing to couplet 10, *M.*

*defibaughorum* keys to *M. bovista* Gimmersthal [now considered to be *M. agarici* (Lintner 1895)] from which it can immediately be distinguished by its lack of the clear posterior epandrial processes that make *M. agarici* so easily identifiable. *M. defibaughorum* superficially appears quite similar to *M. folliculorum* Disney (Disney, Taylor et al. 2011), but in addition to differences in the structure and setation of the epandrium (the epandrium of *M. defibaughorum* is more pronounced behind, under the anal tube and has longer and more plentiful setae), *M. defibaughorum* lacks the 1–1.5 rows of reduced, spinose rows of setae on the fore basitarsus (foretarsomere 1).

**Description.** See Table 3.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of the Defibaugh family, hosts of BioSCAN site 15.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Mid-City, 28.XII.2013–4.I.2014, Oxborough, Malaise trap (LACM 329769).

**Paratypes.** 1 ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 1–8.II.2014, Franco, Malaise Trap (LACM 329770), 3 ♂, USA: CALIFORNIA: Los Angeles, Mid-City, 28.XII.2013–4.I.2014, Oxborough, Malaise trap (LACM 329771, 2 CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Glendale, Gardena, 3 ♂, II–III.2014, Malaise traps (LACM, MCZC, USNM).

### ***Megaselia donahuei* new species (Figs. 8, 40, 70, 100)**

**Diagnosis.** Male. In the group VI key of Borgmeier (1966), *M. donahuei* keys to *M. orestes* Borgmeier, from which it differs by being a largely yellow species (Fig. 8) compared to the dark coloration throughout on *M. orestes*.

**Description.** See Table 3.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Julian Donahue, host of BioSCAN site 31.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 31.V.2014–7.VI.2014, Franco, Malaise trap (LACM 329772).

**Paratypes.** 2 ♂, USA: CALIFORNIA: Los Angeles, Hollywood, 4–18.VI.2014, Hein, Malaise trap (LACM 329773, LACM 329774). 2 ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 31.V.2014–7.VI.2014, Brejcha, Malaise trap (CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: University Park, Los Feliz, Silverlake, Koreatown, Mid-City, Elysian Park, Hollywood, Echo Park, Atwater Village, Pico-Union, Glassell Park, Eagle Rock, Highland Park, Mount Washington, 46 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).

### ***Megaselia francoae* new species (Figs. 9, 41, 71, 101)**

**Diagnosis.** Male. In the group VIII key of Borgmeier (1966), *M. francoae* keys to *M. polyporicola* Borgmeier from which it differs in a number of details. Most apparently, *M. francoae* has all dark legs (Fig. 9) compared to the light forelegs of *M. polyporicola*. The two species also have substantially different costal ratios: *M. polyporicola* 4.3:2.0:1, *M. francoae* 3.75:1.25:1, 3.49:1.26:1, 3.67:1.47:1.

**Description.** See Table 3.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Candace Franco, host of BioSCAN site 30.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Atwater Village, 2–10.IV.2014, Higgins, Malaise trap (LACM 329775).

**Paratypes.** 2 ♂, USA: CALIFORNIA: Los Angeles, Koreatown, 5–12.IV.2014, Ralph, Malaise trap (LACM 329776, LACM 329777).





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**FIGURES 10–18.** Habitus images (lateral). 10. *Megaselia fujiokai*. 11. *Megaselia hardingorum*. 12. *Megaselia heini*. 13. *Megaselia hentschkeae*. 14. *Megaselia hoffmanorum*. 15. *Megaselia hoggorum*. 16. *Megaselia hoguei*. 17. *Megaselia isaacmajorum*. 18. *Megaselia kelleri*.

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: University Park, Los Feliz, Silverlake, Elysian Valley, Koreatown, Glendale, Elysian Park, Hollywood, Larchmont, Carthay, Burbank, Echo Park, Atwater Village, Eagle Rock, Pico-Union, Glassell Park, Highland Park, Mount Washington, 108 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).

### *Megaselia fujiokai* new species (Figs. 10, 42, 72, 102)

**Diagnosis.** Male. In the group VIII key of Borgmeier (1966), *M. fujiokai* keys to *M. seticerca* Borgmeier from which it differs in numerous ways. Most easily, *M. fujiokai* has a large, spheroid epandrium with medium hypoproct hairs (Fig. 72) in contrast to the medium sized epandrium with minute hypoproct hairs of *M. seticerca*. Additionally, *M. fujiokai* has 4 alular setae compared to the 3 on *M. seticerca* (Fig. 42).

**Description.** See Table 3.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Ray Fujioka, host of BioSCAN site 8.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Elysian Park, 3–10.V.2014, Harding, Malaise trap (LACM 329778)

**Paratypes.** 2 ♂, USA: CALIFORNIA: Los Angeles, Eagle Rock, 3–10.V.2014, Keller, Malaise trap (LACM 329779, LACM 329780), 2 ♂, USA: CALIFORNIA: Los Angeles, Atwater Village, 2–10.IV.2014, Higgins, Malaise trap (CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Exposition Park, University Park, Los Feliz, Silverlake, Jefferson Park, Koreatown, Glendale, Elysian Park, Gardena, Hollywood, Glendale, Larchmont, Carthay, Burbank, Echo Park, Atwater Village, Eagle Rock, Pico-Union, Mid-Wilshire, Glassell Park, Highland Park, Mount Washington, 230 ♂, I–V.2014, Malaise trap (LACM, MCZC, USNM).

### *Megaselia hardingorum* new species (Figs. 11, 43, 73, 103)

**Diagnosis.** Male. In the group VIII key of Borgmeier (1966), *M. hardingorum* keys to couplet 11 where it differs from both *M. globipyga* Borgmeier and *M. brevicostalis* Wood by having long costal setae (0.13–0.16 mm) and 5 alular setae.

**Description.** See Table 4.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of the Harding family, hosts of BioSCAN site 14.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 1–8.III.2014, Brejcha, Malaise trap (LACM 329781).

**Paratypes.** ♂, USA: CALIFORNIA: Los Angeles, Glendale, 1–8.III.2014, Hoffman, Malaise trap (LACM 329782). ♂, USA: CALIFORNIA: Los Angeles, Mount Washington, 28.XII.2013–4.I.2014, Donahue, Malaise trap (LACM 329783). ♂, USA: CALIFORNIA: Los Angeles, Mount Washington, 1–8.III.2014, Donahue, Malaise trap (CUMZ). ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 1–8.III.2014, Franco, Malaise trap (CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Silverlake, Elysian Park, Eagle Rock, 3 ♂, Malaise traps (LACM, MCZC, USNM).

### *Megaselia heini* new species (Figs. 12, 44, 74, 104)

**Diagnosis.** Male. Due to observed costal indices ranging from 0.41–0.44, *M. heini* could key in either the group VII or group VIII keys of Borgmeier (1966). In the group VII key, *M. heini* keys to *M. latipennis* Borgmeier from which it differs by having extremely strong hypoproct hairs (Fig. 74) compared to the “small” apical hairs of *M. latipennis*. In the group VIII key, *M. heini* keys to *M. polyporicola* Borgmeier. Comparison to the description was

inconclusive; upon examination of the type material it was found that the two species differ in details of the genitalia (Fig. 74). The terminal hairs on the hypoproct of *M. polyporicola*, although “long”, do not compare to the long, curved, strong setae found on *M. heini*. Additionally, *M. polyporicola* has more numerous, but finer, hairs on the epandrium than the *M. heini*, which has sparse, stout setation.

**Description.** See Table 4.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Tony Hein, host of BioSCAN site 16.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Los Feliz, 4–11.IV.2014, Louie, Malaise trap (LACM 329784).

**Paratypes.** ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 1–8.III.2014, Franco, Malaise trap (LACM 329785). ♂, USA: CALIFORNIA: Los Angeles, Koreatown, 5–12.IV.2014, Ralph, Malaise trap (LACM 329786). 2 ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 31.V.2014–7.VI.2014, Franco, Malaise trap (CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Exposition Park, University Park, Los Feliz, Silverlake, Mid-City, Glendale, Elysian Park, Hollywood, Carthay, Glassell Park, Eagle Rock, Highland Park, Mount Washington, 46 ♂, Malaise traps (LACM, MCZC, USNM).

**TABLE 4.** Species descriptions, *M. hardingorum*–*M. hoggorum*. Character remarks in parentheses, general remarks in last row.

	<i>M. hardingorum</i>	<i>M. heini</i>	<i>M. hentschkeae</i>	<i>M. hoffmanorum</i>	<i>M. hoggorum</i>
	Fig 11	Fig 12	Fig 13	Fig 14	Fig 15
<b>Head</b>					
SA ratio	0.72-0.78	0.89-0.97	0.76-0.83	0.75	0.83-0.94
VIF position	normal	VFO adjacent	normal	normal	normal
SPS vesicles	absent	absent	absent	absent	absent
Palpal setae length	long	long	long	long	long
Labellum spinosity	not	sparse	not	not	not
<b>Thorax</b>					
Anepisternum	bare	bare	h+b (12+ H, 2 medium B)	hairs only	H+B (<10 H, 1 long B)
Relative halter color	lighter	same	same	lighter	same
# NP setae	2	3	3	3	3
NP cleft	absent	absent	absent	absent	absent
Scutellar setae	2+2	2+2	2+2	2+2	2+2
<b>Leg</b>					
t1 palisade	1-5	1-4	1-4 (unable to tell if on 5)	1-5	1-4
t2 palisade	0.67	0.67	0.67	0.67	0.5
t3 comb bifurcate	absent	absent	absent	absent	absent
t3 setulae	PD	PD	PD	PD	PD
f3 basal setae	B<AV	B>AV	B<AV	B=AV	BAS>AV
f3 basal setae differentiation	absent	present (+/-12, long curved)	absent	absent	absent
<b>Wing</b>	Fig 43	Fig 44	Fig 45	Fig 46	Fig 47
Wing Length (mm)	1.50-1.88	1.22-1.75	1.10-1.31	2.09-2.15	1.05-1.30
Subcosta	complete	incomplete	incomplete	incomplete	incomplete
R seta	short	absent	absent	small	absent
R2+3	present	present	present	present	present
Costal index	0.40-0.43	0.41-0.44	0.35-0.38	0.46-0.47	0.35-0.38
Costal ratios	3.00-3.63: 1.40-2.00: 1	3.23-4.29: 1.50-2.17: 1	3.43-3.46: 1.43-1.54: 1	3.85-5.1: 1.77-2.70: 1	3.33-4.18: 0.83-1.00: 1
Costal setae length (mm)	0.13-0.16	0.05-0.07	0.07-0.09	0.14-0.17	0.05-0.06
Number alular setae	5	2	2	4	2
Alular setae length (mm)	0.11-0.14	0.09-0.13	0.08-0.10	0.12-0.15	0.07-0.08
Wing color	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear
<b>Genitalia</b>	Fig 73, 103	Fig 74, 104	Fig 75, 105, 106	Fig 76, 107	Fig 77, 108
AT length	AT<E	AT+/-=E	AT+/-=E	AT>E	AT+/-=E
E setation	hairs only	hairs only	hairs only (but very strong)	hairs only (strong, bristlelike)	hairs only
Relative posterior setation	E<C<T6<H	T6<E<C<H	T6<C<H<E	T6=C<E=H	T6<C<H<E
General Remarks			forebasitarsus swollen with four rows spinules	forebasitarsus slightly swollen, with spinules	

### *Megaselia hentschkeae* new species (Figs. 13, 45, 75, 105, 106)

**Diagnosis.** Male. In the group III key of Borgmeier (1964), *M. hentschkeae* keys to *M. dilatata* Brues from which it differs by most often having 2 moderately strong anipisternal bristles (compared to *M. dilatata*'s one) and an

elongate genitalia with ventrally projecting anal tube (Fig. 75) compared to the large, deeply emarginate epandrium of *M. dilatata*.

**Description.** See Table 4.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Peggy Hentschke, host of BioSCAN site 3.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Burbank, 24–31.V.2014, Cianci, Malaise trap (LACM 329787).

**Paratypes.** 3 ♂, USA: CALIFORNIA: Los Angeles, Carthay, 31.XII.2013–7.I.2014, Dahl, Malaise trap (LACM 329788, LACM 329789, CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Exposition Park, University Park, Los Feliz, Koreatown, Hollywood, Larchmont, Pico-Union, Highland, Mount Washington, 8 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).

### ***Megaselia hoffmanorum* new species (Figs. 14, 46, 76, 107)**

**Diagnosis.** Male. In the group IV key of Borgmeier (1964), keys to *M. pulla* Brues from which it differs substantially in the structure of the genitalia (Fig. 76). Whereas *M. pulla* has an oblique ascending row of delicate bristles on the left side of the epandrium and 4 marginal bristles on the right, *M. hoffmanorum* has a nearly vertical arrangement of strong hairs on either side. Additionally, *M. hoffmanorum* lacks the moderate bristles described on the epandrium of *M. pulla*.

**Description.** See Table 4.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of the Hoffman Family, hosts of BioSCAN site 14.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Glendale, 1–8.III.2014, Hoffman, Malaise trap (LACM 329790).

**Paratypes.** ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 1–8.II.2014, Franco, Malaise trap (LACM 329791). ♂, USA: CALIFORNIA: Los Angeles, Glendale, 1–8.III.2014, Hoffman, Malaise trap (LACM 329792).

### ***Megaselia hoggorum* new species (Figs. 15, 47, 77, 108)**

**Diagnosis.** Male. In the group III key of Borgmeier (1964), *M. hoggorum* keys to *M. spiniclasper* Borgmeier which it differs from noticeably and immediately in the structure of the genitalia. *M. spiniclasper* has on the left side of the epandrium a single, long, curved projection bearing a terminal bristle. *M. hoggorum* bears two much more subtle, rounded ventral projections off corners of the epandrium (Fig. 77), which are similar to those of *M. dilatata* Brues (which comes out later in the key). Upon examination of type material, it was found that although the external structures of the genitalia of *M. hoggorum* and *M. dilatata* were similarly shaped, *M. hoggorum* lacked the prominent and largely protruding phallus complex visible on all specimens of *M. dilatata*. Additionally, *M. hoggorum* has much stronger epandrial setation.

**Description.** See Table 4.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of the Hogg family, hosts of BioSCAN site 7.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 31.V.2014–7.VI.2014, Franco, Malaise trap (LACM 329793).

**Paratypes.** 4 ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 31.V.2014–7.VI.2014, Franco, Malaise trap (LACM 329794, LACM 329795, 2 CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Los Feliz, Silverlake, Glendale, Highland Park, Mount Washington, 252 ♂, Malaise traps (LACM, MCZC, USNM).



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**FIGURES 19–27.** Habitus images (lateral). 19. *Megaselia lombardorum*. 20. *Megaselia marquezii*. 21. *Megaselia mikejohnsoni*. 22. *Megaselia oxboroughae*. 23. *Megaselia pisanoi*. 24. *Megaselia renwickorum*. 25. *Megaselia rodriguezorum*. 26. *Megaselia sacatelensis*. 27. *Megaselia seaverorum*.

## *Megaselia hoguei* new species (Figs. 16, 48, 78, 109)

**Diagnosis.** Male. In the group VIII key of Borgmeier (1966), *M. hoguei* keys to *M. polyporicola* Borgmeier, from which it differs greatly in overall appearance. *M. hoguei* is a much lighter colored species, with a lightly pigmented venter and legs and light brown halteres. *M. polyporicola* is a dark species, with black venter, halteres, and hind/mid legs being brown to black.

**Description.** See Table 5.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Jim Hogue, host of BioSCAN site 24.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 31.V.2014–7.VI.2014, Franco, Malaise trap (LACM 329796)

**Paratypes.** 4 ♂, USA: CALIFORNIA: Los Angeles, Glendale, 28.VI.2014–5.VII.2014 (LACM 329797, LACM 329798, 2 CUMZ)

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Los Feliz, Glendale, Eagle Rock, Highland Park, Mount Washington, 28 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).

**TABLE 5.** Species descriptions, *M. hoguei*–*M. marquezii*. Character remarks in parentheses, general remarks in last row.

	<i>M. hoguei</i>	<i>M. isaacmajorum</i>	<i>M. kelleri</i>	<i>M. lombardorum</i>	<i>M. marquezii</i>
	Fig 16	Fig 17	Fig 18	Fig 19	Fig 20
<b>Head</b>					
SA ratio	0.69-0.74	0.88	0.53-0.60	0.82-0.91	0.45-0.56
VIF position	normal	normal	VFO adjacent	normal	normal
SPS vesicles	absent	absent	absent	absent	absent
Palpal setae length	long	long	long	long	long
Labellum spinosity	not	not	not	sparse	not
<b>Thorax</b>					
Anepistemum	bare	hairs (20+)	bare	bare	bare
Relative halter color	same	lighter	same	lighter	same
# NP setae	3	3	3	2	3
NP cleft	absent	absent	absent	absent	absent
Scutellar setae	2+2	2+2	2+2	2+2	2+2
<b>Leg</b>					
t1 palisade	1-4	1-4	1-5	1-4	1-5
t2 palisade	0.75	0.67	0.75	0.67	0.67
t3 comb bifurcate	absent	absent	absent	absent	absent
t3 setulae	PD	PD	PD	PD	PD
t3 basal setae	B=AV	B=AV	B>AV	B>AV	B>AV
t3 basal setae differentiation	absent	absent	present (long, curved)*	absent (but strong)	present (<10, long, thin)
<b>Wing</b>	Fig 48	Fig 49	Fig 50	Fig 51	Fig 52
Wing Length (mm)	1.31-1.65	2.09-2.39	1.53-1.59	1.03-1.20	1.22-1.41
Subcosta	incomplete	incomplete	incomplete	incomplete	incomplete
R seta	minute	none	absent	short	absent
R2+3	present	present	present	present	present
Costal index	0.40-0.43	0.44-0.47	0.44-0.47	0.33-0.37*	0.44
Costal ratios	2.71-3.83: 1.76-2.73: 1	4.00-5.51: 1.33-1.89: 1	3.00-3.42: 2.25-2.38: 1	3.31-4.10: 1.00-1.25: 1	3.12-4.23: 1.65-2.31: 1
Costal setae length (mm)	0.05-0.07	0.19-0.24	0.08	0.05-0.07	0.06-0.08
Number alular setae	2-3	6	2	2	2-3 (mostly 2)
Alular setae length (mm)	0.08-0.11	0.16-0.19	0.11-0.12	0.08-0.11	0.09-0.11
Wing color	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear
<b>Genitalia</b>	Fig 78, 109	Fig 79, 110	Fig 80, 111	Fig 81, 112	Fig 82, 113
AT length	AT<E	AT+≈E	AT+≈E	AT<E	AT<E
E setation	hairs only	hairs (strong)	hairs only	hairs only	hairs only
Relative posterior setation	E<T6<C<H	T6<E<C<H	E<C<H<T6	T6<E<C<H	H<C=E=T6
General Remarks			*F3 fringe > 1/2 femur	*Cl usually on upper end of range, 0.36-0.37	

## *Megaselia isaacmajorum* new species (Figs. 17, 49, 79, 110)

**Diagnosis.** Male. In the group IV key of Borgmeier (1964), *M. isaacmajorum* keys to couplet 15 where it can be easily eliminated from continuing in the key by its dark palpi, but lacks the single conspicuous bristle found on each side of the epandrium of *M. alaskensis* Malloch (Fig. 79).

**Description.** See Table 5.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of the sons of the Koch family: Isaac, Miguel, Aaron and Jacob, hosts of BioSCAN site 6.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Glendale, 1–8.III.2014, Hoffman, Malaise trap (LACM 329799).

**Paratypes.** 2 ♂, USA: CALIFORNIA: Los Angeles, Glendale, 1–8.III.2014, Hoffman, Malaise trap (LACM 329800, CUMZ). 2 ♂, USA: CALIFORNIA: Los Angeles, Glendale, 28.XII.2013–4.I.2014, Hoffman, Malaise trap (LACM 329801, CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Los Feliz, Glendale, Mount Washington, 54 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).

### ***Megaselia kelleri* new species (Figs. 18, 50, 80, 111)**

**Diagnosis.** Male. In the group VII key of Borgmeier (1966), *M. kelleri* keys to *M. rotundula* Borgmeier, from which it differs by the lack of a hair at the base of the R vein (*M. rotundula* has a long, conspicuous hair) and having 3 notopleural setae (2 on *M. rotundula*).

**Description.** See Table 5.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Eric Keller, host of BioSCAN site 28.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Carthay, 29.IV.2014–6.V.2014, Dahl, Malaise trap (LACM 329802).

**Paratypes.** ♂, USA: CALIFORNIA: Los Angeles, Eagle Rock, 3–10.V.2014, Keller, Malaise trap (LACM 329803). 2 ♂, USA: CALIFORNIA: Los Angeles, Atwater Village, 30.IV.2014–7.V.2014, Higgins, Malaise trap (LACM 329804, CUMZ). ♂, USA: CALIFORNIA: Los Angeles, Los Feliz, 30.IV.2014–7.V.2014, Louie, Malaise trap (CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Exposition Park, Los Feliz, Koreatown, Hollywood, Carthay, Atwater Village, Eagle Rock, 11 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).

### ***Megaselia largifrontalis* Schmitz**

*Megaselia largifrontalis* Schmitz 1939: 189, Fig. 4, Textfig. 15; Disney 1999 Figs. 121–122

**Type series.** Described by Schmitz (1939), likely in the Zoological Research Museum in Bonn, Germany (not examined).

**Distribution.** We now report this species from Los Angeles, California (USA). Its confirmed distribution is: British Isles, mainland Europe, St. Helena, Yemen, California (USA).

**Material Examined.** USA: CALIFORNIA: Los Angeles: Exposition Park, Los Feliz, Silverlake, Jefferson Park, Koreatown, Mid-City, Glendale, Elysian Park, Hollywood, Burbank, Echo Park, Atwater Village, Eagle Rock, Pico Union, Mid-Wilshire, Glassell Park, Highland Park, Mount Washington, 826 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).

### ***Megaselia lombardorum* new species (Figs. 19, 51, 81, 112)**

**Diagnosis.** Male. In the group VIII key of Borgmeier (1966), keys to *M. pygmaeoides* [now considered to be *M. berndseni* (Schmitz 1919)] which has a shorter costa (CI 0.30–0.33 compared to *M. lombardorum* at 0.33–0.37, usually being at the upper end of that range) than this new species and more than twice as many spinuli on the labellum.

**Description.** See Table 5.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of the Lombard family, hosts of BioSCAN site 26.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Eagle Rock, 3–10.V.2014, Keller, Malaise trap (LACM 329805)

**Paratypes.** 4 ♂, USA: CALIFORNIA: Los Angeles, Eagle Rock, 3–10.V.2014, Keller, Malaise trap (LACM 329806, LACM 329807, CUMZ)

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Exposition Park, University Park, Los Feliz, Silverlake, Elysian Valley, Leimert Park, Koreatown, Mid-City, Glendale, Elysian Park, Gardena, Hollywood, Glendale, Larchmont, Carthay, Burbank, Echo Park, Atwater Village, Eagle Rock, Pico-Union, Mid-Wilshire, Glassell Park, Highland Park, Mount Washington, 1911 ♂, 1-V.2014, Malaise traps (LACM, MCZC, USNM).

### ***Megaselia marquezii* new species (Figs. 20, 52, 82, 113)**

**Diagnosis.** Male. In the group VII key of Borgmeier (1966), *M. marquezii* keys to *M. rotundula* Borgmeier, from which it differs by having 3 notopleural setae rather than the 2 found on *M. rotundula*, and by the lack of a hair at the base of R (*M. rotundula* has a long, conspicuous hair).

**Description.** See Table 5.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Humberto Marquez, caretaker of the Cesar Chavez Community Garden, site of BioSCAN site 25.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Atwater Village, 30.IV.2014–7.V.2014, Higgins, Malaise trap (LACM 329808)

**Paratypes.** 3 ♂, USA: CALIFORNIA: Los Angeles, Eagle Rock, 3–10.V.2014, Keller, Malaise trap (LACM 329809, 2 CUMZ). ♂, USA: CALIFORNIA: Los Angeles, Elysian Park, 3–10.V.2014, Harding, Malaise trap (LACM 329810).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Exposition Park, University Park, Los Feliz, Silverlake, Elysian Valley, Leimert Park, Koreatown, Mid-City, Glendale, Elysian Park, Gardena, Hollywood, Glendale, Larchmont, Carthay, Echo Park, Atwater Village, Eagle Rock, Pico-Union, Mid-Wilshire, Glassell Park, Highland Park, Mount Washington, 643 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).

### ***Megaselia mikejohnsoni* new species (Figs. 21, 53, 83, 114)**

**Diagnosis.** Male. In the group VIII key of Borgmeier (1966), *M. mikejohnsoni* keys to *M. globipyga* Borgmeier but lacks the globose genitalia of that species.

**Description.** See Table 6.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Mike Johnson, relation to the Johnson family, hosts of BioSCAN site 22.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Carthay, 29.IV.2014–6.V.2014, Dahl, Malaise trap (LACM 329811).

**Paratypes.** ♂, USA: CALIFORNIA: Los Angeles, Atwater Village, 2–10.IV.2014, Higgins, Malaise trap (LACM 329812). ♂, USA: CALIFORNIA: Los Angeles, Koreatown, 5–12.IV.2014, Ralph, Malaise trap (LACM 329813). 2 ♂, USA: CALIFORNIA: Los Angeles, Eagle Rock, 3–10.V.2014, Keller, Malaise trap (CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Exposition Park, University Park, Los Feliz, Silverlake, Koreatown, Mid-City, Glendale, Elysian Park, Gardena, Hollywood, Larchmonth, Carthay, Burbank, Echo Park, Atwater Village, Eagle Rock, Pico-Union, Mid-Wilshire, Highland Park, Mount Washington, 268 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).





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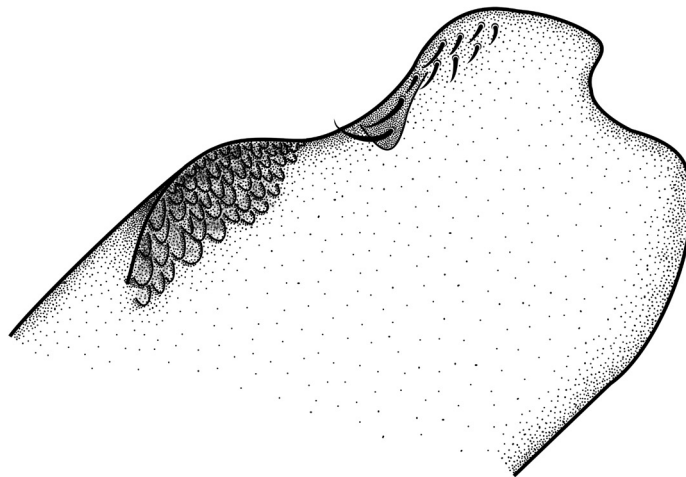
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**FIGURES 28–30.** Habitus images (lateral). 28. *Megaselia sidneyae*. 29. *Megaselia steptoeae*. 30. *Megaselia wiegmanae*.  
**FIGURE 31.** Midfemur. *Megaselia pisanoi*.  
**FIGURE 32.** Detail of basal hind femur. *Megaselia sidneyae*.



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**FIGURES 33–42.** Right wing, dorsal. 33. *Megaselia armstrongorum*. 34. *Megaselia bradyi*. 35. *Megaselia brejchaorum*. 36. *Megaselia carthayensis*. 37. *Megaselia ciancii*. 38. *Megaselia creasoni*. 39. *Megaselia defibaughorum*. 40. *Megaselia donahuei*. 41. *Megaselia francoae*. 42. *Megaselia fujiokai*.

***Megaselia oxboroughae* new species (Figs. 22, 54, 84, 115)**

**Diagnosis.** Male. In the group VIII key of Borgmeier (1966), *M. oxboroughae* keys to *M. polyporicola* Borgmeier which it differs from by having incredibly short, truncate genitalia (Fig. 84) and much shorter wings (0.88–1.05 mm compared to 1.59 mm).

**Description.** See Table 6.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Sharon Oxborough, host of BioSCAN site 12.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Eagle Rock, 3–10.V.2014, Keller, Malaise trap (LACM 329814).

**Paratypes.** 4 ♂, USA: CALIFORNIA: Los Angeles, Eagle Rock, 3–10.V.2014, Keller, Malaise trap (LACM 329815, LACM 329816, 2 CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Los Feliz, Silverlake, Mid-City, Elysian Park, Hollywood, Glendale, Larchmont, Carthay, Atwater Village, Eagle Rock, Highland Park, 152 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).

**TABLE 6.** Species descriptions, *M. mikejohnsoni*–*M. rodriguezorum*. Character remarks in parentheses, general remarks in last row.

	<i>M. mikejohnsoni</i>	<i>M. oxboroughae</i>	<i>M. pisanoi</i>	<i>M. renwickorum</i>	<i>M. rodriguezorum</i>
	Fig 21	Fig 22	Fig 23	Fig 24	Fig 25
<b>Head</b>					
SA ratio	0.54-0.61	0.86-1.00	0.94-1.00	0.88-0.90	broken in type series; +/- 0.5
VIF position	normal	normal	normal	normal	normal
SPS vesicles	absent	present	absent	absent	absent
Palpal setae length	long	long	long	long	long
Labellum spinosity	spinose	not	not	not	not
<b>Thorax</b>					
Anepisternum	bare	bare	H + B (1 medium B, <10 H)	hairs only (+/-3)	bare
Relative halter color	lighter	same	same	same	lighter
# NP setae	2	3	3	3	3
NP cleft	absent	absent	absent	absent	absent
Scutellar setae	2+2	2+2	2+2	2+2	2+2
<b>Leg</b>					
ts1 palisade	1-4	indistinct	1-4	1-4	1-4
t2 palisade	0.75	0.75	0.6	0.5	0.67
t3 comb bifurcate	absent	absent	absent	absent	absent
t3 setulae	PD	PD	PD	PD	PD
t3 basal setae	B>AV	B>AV	B>AV	B<AV	B>AV
t3 basal setae differentiation	absent (some curved)	absent (some curved)	absent (but +/- 10 strong)	absent	absent (but setae very long)
<b>Wing</b>	Fig 53	Fig 54	Fig 55	Fig 56	Fig 57
Wing Length (mm)	1.41-1.56	0.88-1.05	1.16-1.19	1.16-1.56	1.69-1.96
Subcosta	incomplete	incomplete	incomplete	incomplete	incomplete
R seta	short	absent	absent	absent	short
R2+3	present	present	present	present	present
Costal index	0.40-0.43	0.39-0.43	0.36-0.37	0.36-0.40	0.38-0.39
Costal ratios	3.00-3.80: 1.50-2.47: 1	2.67-3.50: 0.92-1.60: 1	3.83-4.70: 1.04-1.70: 1	4.09-6.50: 1.33-1.75: 1	3.50-5.50: 1.00-1.67: 1
Costal setae length (mm)	0.08-0.09	0.04-0.06	0.06-0.07	0.11-0.12	0.09-0.12
Number alular setae	2	2 (basal seta 1/3 size)	2	2	3
Alular setae length (mm)	0.11-0.13	0.07-0.09	0.1	0.10-0.14	0.11-0.14
Wing color	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear
<b>Genitalia</b>	Fig 83, 114	Fig 84, 115	Fig 85, 116	Fig 86, 117	Fig 87, 118
AT length	E+/-=AT	AT<E	AT+/-=E	AT<E	AT<E
E setation	hairs only	hairs only	hairs only	hairs only	hairs + bristles
Relative posterior setation	E<T6<C<H	C<T6<H<E	T6<H<C<E	H<T6<C<E (cerci with 10+ hairs)	C=T6<H<E
General Remarks			midfemur dilated near base (Fig 31)		membranous projection on epandrium posteriorly (Fig 87)

***Megaselia pisanoi* new species (Figs. 23, 31, 55, 85, 116)**

**Diagnosis.** Male. In the group III key of Borgmeier (1964), *M. pisanoi* keys to *M. goniata* Borgmeier. These two species are remarkably similar but differ in a number of details. *M. pisanoi* has all legs brown, forelegs only slightly lighter (Fig. 23), while *M. goniata* has legs yellowish, hind legs darker. The hind femur fringe of *M.*

*pisanoi* has 10+ setae, while *M. goniata* has 7. The ratio of costal segments for *M. goniata* is such that C1 is 3.6x C3, but *M. pisanoi* has C1 typically 4.5x C3 or longer. The palpal setae for *M. goniata* are said to be 3 apically with one shorter laterally; *M. pisanoi* has at least 6 palpal setae. Lastly, the small size of *M. goniata* (1mm) is mentioned by Borgmeier; the slide mounted holotype of *M. pisanoi* measures over 1mm just from the front of the thorax to the end of T6 (not including the head which was dissected and mounted separately). Unfortunately, the holotype of *M. goniata* is almost completely destroyed and a complete comparison to type material was not possible. The midfemur of the holotype of *M. goniata* was examined, and does not appear as denticulate as *M. pisanoi*; the widest part of the expansion on *M. goniata* is 0.11mm, while *M. pisanoi* is 0.16mm. *M. goniata* does appear to have a brushlike process on the left lobe of the hypandrium as seen in *M. pisanoi* (Fig. 116); further specimens are needed to confirm the status of these apparent sibling species.

**Description.** See Table 6.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Mark Pisano, host of BioSCAN site 4.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Mount Washington, 3–10.V.2014, Donahue, Malaise trap (LACM 329817)

**Paratypes.** 3 ♂, USA: CALIFORNIA: Los Angeles, Glendale, 28.VI.2014–5.VII.2014, Hoffman, Malaise trap (LACM 329818, LACM 329819, CUMZ). ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 31.V.2014–7.VI.2014, Brejcha, Malaise trap (CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Los Feliz, Glendale, Glassell Park, Highland Park, Mount Washington, 8 ♂, I–V.2014, Malaise trap (LACM, MCZC, USNM).

### *Megaselia renwickorum* new species (Figs. 24, 56, 86, 117)

**Diagnosis.** Male. In the group V key of Borgmeier (1964) *M. renwickorum* keys to couplet 6, where the distinctive shape of the left side of the epandrium (Fig. 86) and 10+ hairs on the ventrally directed cerci immediately distinguish it from both *M. monochaeta* Borgmeier and *M. subnudifemur* Borgmeier.

**Description.** See Table 6.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of the Renwick family, hosts of BioSCAN site 5.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Highland Park, 1–8.II.2014, Franco, Malaise trap (LACM 329820).

**Paratypes.** ♂, USA: CALIFORNIA: Los Angeles, Los Feliz, 1–8.II.2014, Koch, Malaise trap (LACM 329821). ♂, USA: CALIFORNIA: Los Angeles, Gardena, 28.VI.2014–5.VII.2014, Defibaugh, Malaise trap (LACM 329822). ♂, USA: CALIFORNIA: Los Angeles, Mid-City, 28.XII.2013–4.I.2014, Oxborough, Malaise trap (CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Silverlake, Los Feliz, Mid-City, Glendale, Gardena, Eagle Rock, Highland Park, Mount Washington, 17 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).

### *Megaselia rodriguezorum* new species (Figs. 25, 57, 87, 118)

**Diagnosis.** Male. In the group VIII key of Borgmeier (1966), *M. rodriguezorum* keys to to *M. dakotensis* Borgmeier [now considered to be *M. halterata* (Wood)] from which it differs by lacking the light coloration and dense setation of *M. halterata*'s venter and the spinelike left process of the hypandrium (Fig 25, 87).

**Description.** See Table 6.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of the Rodriguez family, hosts of BioSCAN site 9.

**Biology.** Unknown.



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**FIGURES 43–52.** Right wing, dorsal. 43. *Megaselia hardingorum*. 44. *Megaselia heini*. 45. *Megaselia hentschkeae*. 46. *Megaselia hoffmanorum*. 47. *Megaselia hoggorum*. 48. *Megaselia hoguei*. 49. *Megaselia isaacmajorum*. 50. *Megaselia kelleri*. 51. *Megaselia lombardorum*. 52. *Megaselia marquezii*

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Koreatown, 2–9.III.2014, Ralph, Malaise trap (LACM 329823).

**Paratypes.** ♂, USA: CALIFORNIA: Los Angeles, Larchmont, 1–8.III.2014, Wiegman, Malaise trap (LACM 329824). ♂, USA: CALIFORNIA: Los Angeles, Koreatown, 2–9.III.2014, Ralph, Malaise trap (LACM 329825).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Exposition Park, Elysian Valley, Koreatown, Mid-City, Glendale, Elysian Park, Gardena, Hollywood, Larchmont, Burbank, Eagle Rock, Pico-Union, Highland Park, 27 ♂, I–III.2014, Malaise traps (LACM, MCZC, USNM).

**TABLE 7.** Species descriptions, *M. sacatensis*–*M. wiegmanae*. Character remarks in parentheses, general remarks in last row.

	<i>M. sacatensis</i>	<i>M. seaverorum</i>	<i>M. sidneyae</i>	<i>M. steploae</i>	<i>M. wiegmanae</i>
	Fig 26	Fig 27	Fig 28	Fig 29	Fig 30
<b>Head</b>					
SA ratio	0.46-0.55	unknown, not equal	0.81-0.82	0.75-0.90	0.84-0.85
VIF position	normal	normal	normal	normal	normal
SPS vesicles	present	absent	absent	absent	absent
Palpal setae length	long	long	long	long	long
Labellum spinosity	not	not	not	not	not
<b>Thorax</b>					
Anepisternum	bare	hairs (12+)	hairs (15+)	H+ B (variable, moderate B)	bare
Relative halter color	same	same	same	same	lighter
# NP setae	2	3	3	3	2
NP cleft	absent	absent	absent	absent	present
Scutellar setae	2+2	2+2	2+2	2+2	2+2
<b>Leg</b>					
t1 palisade	1-4	1-4	1-4	1-4	1-4
t2 palisade	0.88	0.6	0.67	0.67	0.67
t3 comb bifurcate	absent	absent	absent	absent	absent
t3 setulae	PD	PD	PD	PD	PD
f3 basal setae	B>AV	B<AV	B=AV	B>AV	B>AV
f3 basal setae differentiation	absent (+/- 10 long)	absent	absent	present (10+ long, curved)	absent
<b>Wing</b>	Fig 58	Fig 59	Fig 60	Fig 61	Fig 62
Wing Length (mm)	1.64-1.66	1.41	1.13-1.37	1.06-1.28	1.04-1.23
Subcosta	incomplete	incomplete	incomplete	incomplete	incomplete
R seta	long	small	small	absent	strong
R2+3	present	present	present	present	present
Costal index	0.42-0.43	0.4	0.33-0.36	0.37-0.41	0.42-0.44
Costal ratios	2.85-3.90: 2.00-2.60: 1	3.11: 1.56: 1	3.76: 1.10: 1	3.53-4.60-1.00-1.28: 1	2.63-3.08: 1.57-1.77: 1
Costal setae length (mm)	0.09-0.10	0.10-0.11	0.05-0.06	0.06-0.07	0.07-0.08
Number alular setae	3	3	2 (basal 1/2)	2	2
Alular setae length (mm)	0.09-0.11	0.11-0.13	0.08	0.07-0.09	0.08-0.09
Wing color	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear	lightly infuscated/clear
<b>Genitalia</b>	Fig 88, 119	Fig 89, 120	Fig 90, 121, 122	Fig 91, 123	Fig 92, 124
AT length	AT>E	AT<E	AT>E	AT<E	AT+=E
E setation	hairs only	hairs only	hairs only	hairs + bristles	hairs only
Relative posterior setation	E<T6<C<H	E<T6=H<C	T6=E<C<H	T6<E<H=C	E<C<H=T6
General Remarks		forebasitarsus + ts1 seg2 with spinules	forebasitarsus with spinules F3 with basal sculpturing (Fig 32)		

### *Megaselia sacatensis* new species (Figs. 26, 58, 88, 119)

**Diagnosis.** Male. In the group VIII key of Borgmeier (1966), *M. sacatensis* keys to *M. longipennis* Malloch which was described from females only (1912). Borgmeier examined many specimens of both sexes that he designated as *M. longipennis*. Closer examination reveals that it is almost certain this material contains multiple species. *M. sacatensis* has a characteristic coloration (Fig. 26), which does exhibit variation but is recognizable in pattern in over 100 specimens observed, unlike the generally varied coloration Borgmeier noted for *M. longipennis*. Additionally, the halteres on *M. sacatensis* are dusky yellow, almost a light brown, in contrast to the “pale yellow” halteres described by Borgmeier (1966). Lastly, *M. sacatensis* has a characteristic hypandrium with two darkened and elongate processes (Fig. 119) that fold over each other when the genitalia are withdrawn (Fig 88). Again, slide mounting of specimens is absolutely essential with *Megaselia* to eliminate errors and redundancy.

**Description.** See Table 7.

**Distribution.** Los Angeles, California (USA).



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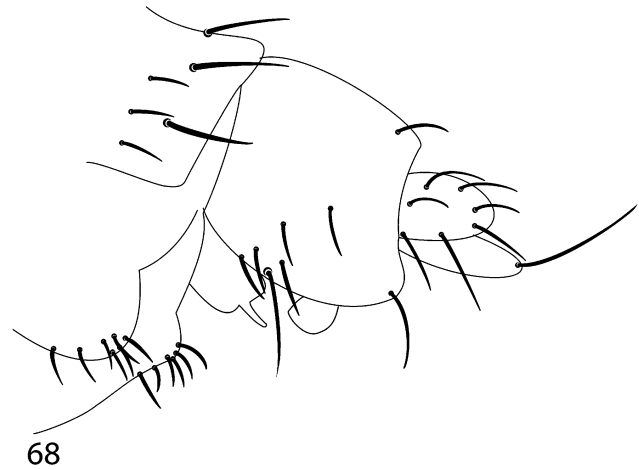
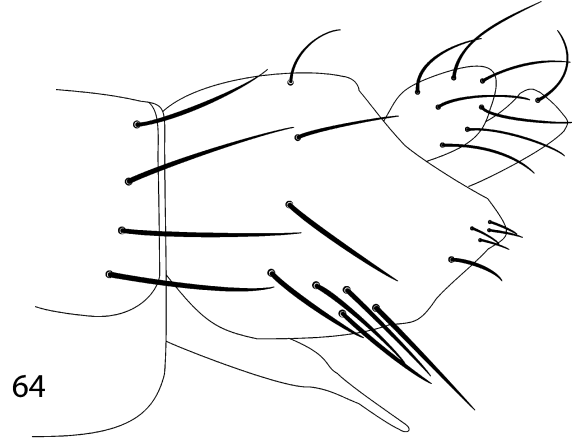


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**FIGURES 53–62.** Right wing, dorsal. 53. *Megaselia mikejohnsoni*. 54. *Megaselia oxboroughae*. 55. *Megaselia pisanoi*. 56. *Megaselia remwickorum*. 57. *Megaselia rodriguezorum*. 58. *Megaselia sacatelensis*. 59. *Megaselia seaverorum*. 60. *Megaselia sidneyae*. 61. *Megaselia steptoeae*. 62. *Megaselia wiegmanae*.



**FIGURES 63–68.** Male genitalia, left lateral. 63. *Megaselia armstrongorum*. 64. *Megaselia bradyi*. 65. *Megaselia brejchaorum*. 66. *Megaselia carthayensis*. 67. *Megaselia ciancii*. 68. *Megaselia creasoni*.

**Etymology.** Named in honor of Sacatela Creek that historically ran by the Los Angeles Ecovillage, home of BioSCAN site 11.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Los Feliz, 31.V.2014–14.VI.2014, Pisano, Malaise trap (LACM 329826).



**Paratypes.** ♂, USA: CALIFORNIA: Los Angeles, Koreatown, 5–12.IV.2014, Ralph, Malaise trap (LACM 329827). 3 ♂, USA: CALIFORNIA: Los Angeles, Gardena, 28.VI.2014–5.VII.2014, Defibaugh, Malaise trap (LACM 329828, 2 CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Exposition Park, Los Feliz, Silverlake, Elysian Valley, Koreatown, Mid-City, Glendale, Gardena, Hollywood, Larchmont, Burbank, Atwater Village, Eagle Rock, Mid-Wilshire, 80 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).

### ***Megaselia seaverorum* new species (Figs. 27, 59, 89, 120)**

**Diagnosis.** Male. In the group V key of Borgmeier (1964), *M. seaverorum* keys to *M. subnudifemur* Borgmeier. *M. seaverorum* can be distinguished from this species (and a majority of other species in the genus) by the unique, wedge shaped structure of its cerci, which each have 10+ setae (Fig. 89).

**Description.** See Table 7.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of the Seaver family, whose gracious donations from the Seaver Foundation make BioSCAN possible.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Glendale, 1–8.II.2014, Hoffman, Malaise trap (LACM 329829).

**Paratype.** ♂, USA: CALIFORNIA: Los Angeles, Glendale, 28.XII.2013–4.I.2014, Hoffman, Malaise trap (LACM 329830).

### ***Megaselia sidneyae* new species (Figs. 28, 32, 60, 90, 121, 122)**

**Diagnosis.** Male. In the group V key of Borgmeier (1964), *M. sidneyae* keys to *M. divergens* Malloch, which in the description (1912) lacks the characteristic femoral sculpturing (Fig. 32) and curved, spinelike left process of the hypandrium (Figs. 90, 121, 122). *M. divergens* is also a smaller species (1 mm compared to *M. sidneyae* at >1 mm measuring only the thorax through tergite 6). Examination of type material was inconclusive; the male and female from Plummers Island, Maryland designated in the original description are both female, and the male from Washington, District of Columbia from 30 September 1912 is not to be found. This leads us to believe that it is possible this species was mistakenly identified from females only, as the “male” from Maryland is clearly female with withdrawn genitalia. Of the material mentioned by Malloch from Williams, Arizona, only three of the four specimens were found. Two are females, and the third needs to be slide mounted but is almost certainly a different species based on the long, heavy setation visible on the tergites (*M. sidneyae* has short setation throughout, and *M. divergens* is noted by Borgmeier as having bare tergites). Of the males in the non-type collection material of *M. divergens* (that can be positively identified as mounted), there are some that clearly belong to *M. sidneyae* and are listed in additional material examined. These were obviously designated as this species post-description according to mostly venational characteristics. At this time, with no way to assuredly match males and females, we here describe *M. sidneyae* as a new species, distinct from *M. divergens* as above, easily recognized by the basal femoral sculpturing and curved, spinelike left hypandrial process.

**Description.** See Table 7.

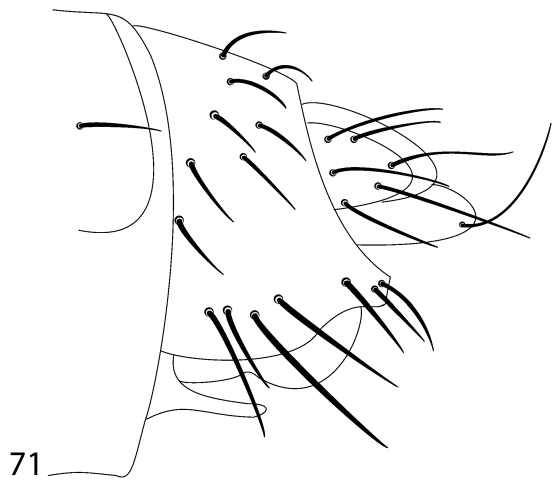
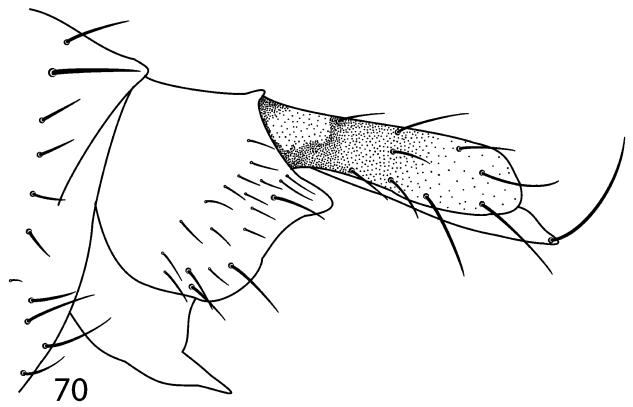
**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of Sidney Higgins, host of BioSCAN site 23.

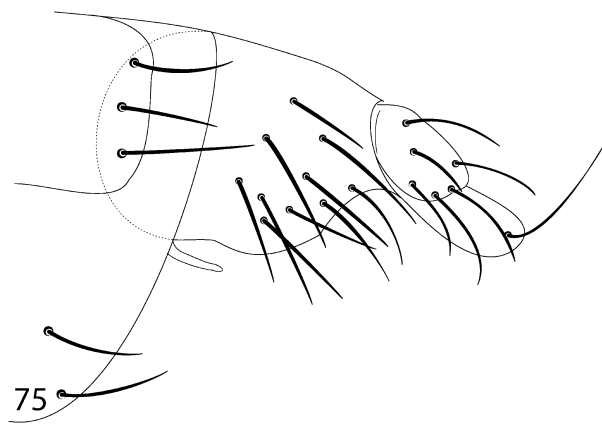
**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Eagle Rock, 3–10.V.2014, Keller, Malaise trap (LACM 329831).

**Paratypes.** 4 ♂, USA: CALIFORNIA: Los Angeles, Elysian Park, 3–10.V.2014, Harding, Malaise trap (LACM 329832, LACM 329833, 2 CUMZ).

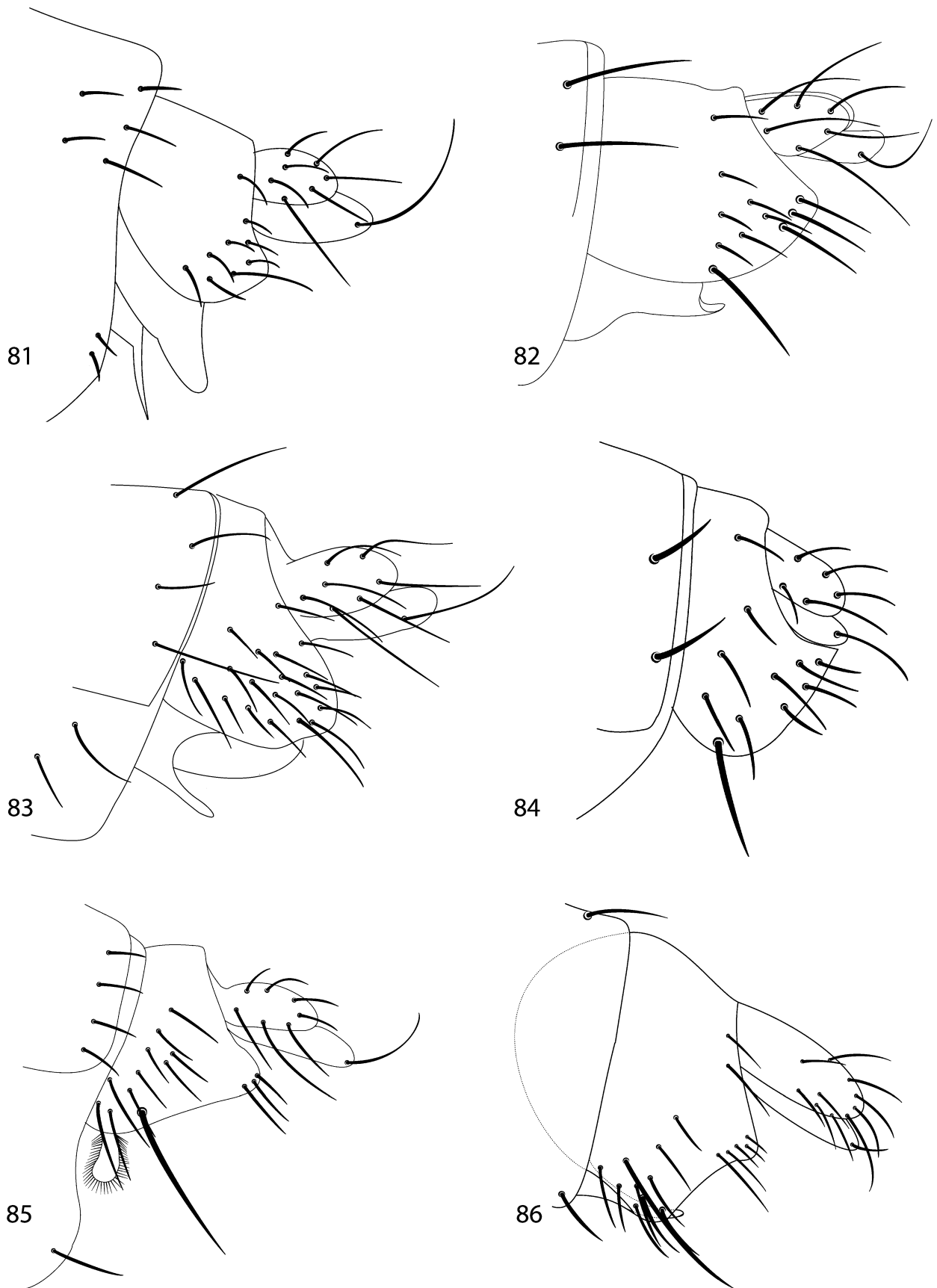


**FIGURES 69–74.** Male genitalia, left lateral. 69. *Megaselia defibaughorum*. 70. *Megaselia donahuei*. 71. *Megaselia francoae*. 72. *Megaselia fujiokai*. 73. *Megaselia hardingorum*. 74. *Megaselia heini*.

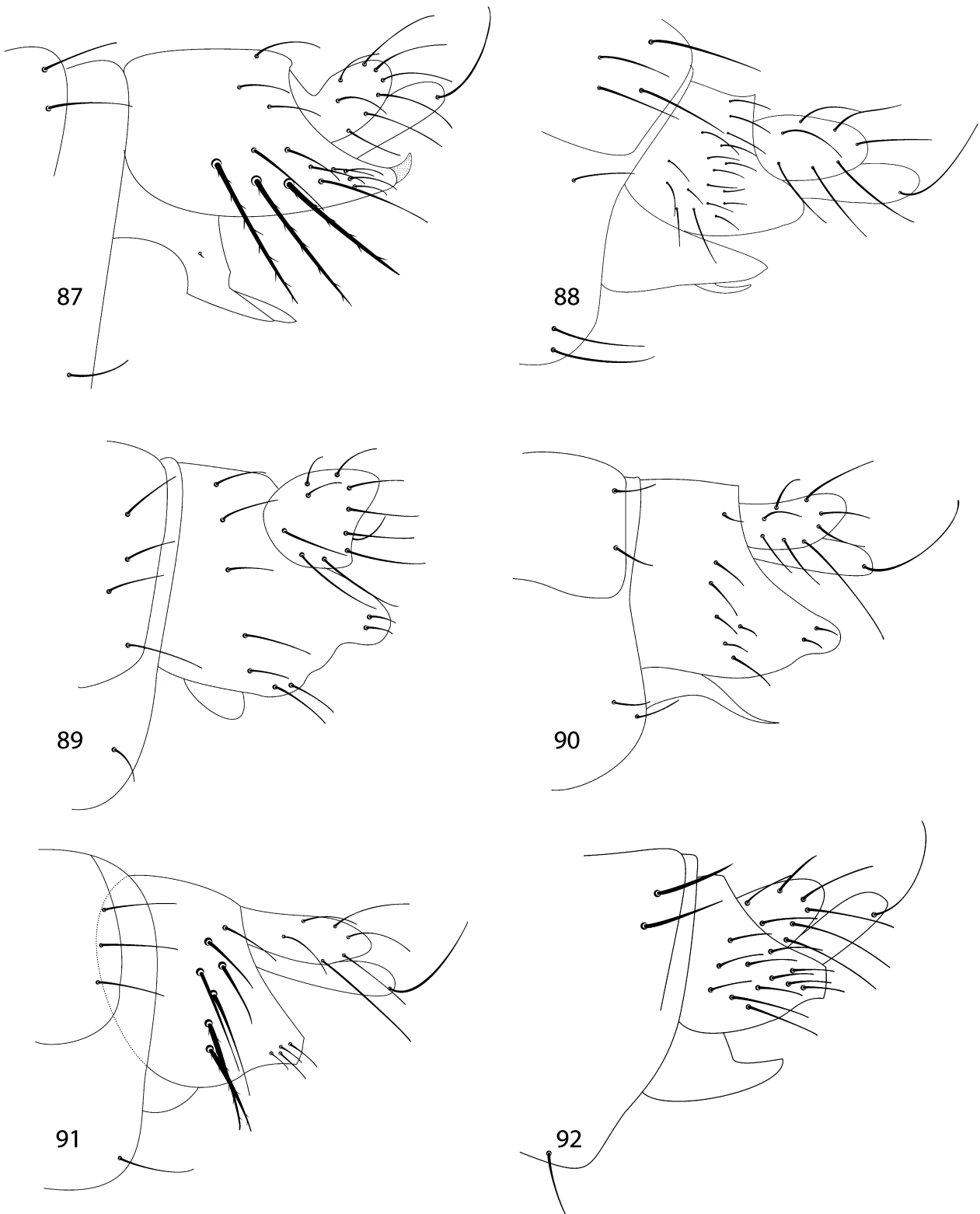


**FIGURES 75–80.** Male genitalia, left lateral. 75. *Megaselia hentschkeae*. 76. *Megaselia hoffmanorum*. 77. *Megaselia hoggorum*. 78. *Megaselia hoguei*. 79. *Megaselia isaacmajorum*. 80. *Megaselia kelleri*

**Additional Material Examined.** USA: CALIFORNIA: El Dorado County: Lake Tahoe, 2 ♂, 8–12.VI.1916 (USNM); Los Angeles County: Exposition Park, University Park, Los Feliz, Silverlake, Leimert Park, Glendale, Elysian Park, Larchmont, Burbank, Atwater Village, Eagle Rock, Pico-Union, Mid-Wilshire, Glassell Park, Highland Park, Mount Washington, 205 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM); San Mateo County, 2 ♂, 23.VIII.1951 (USNM). NEW MEXICO: Jemez Springs, 2 ♂, 4.VII.1953 (USNM). WASHINGTON DC: 2 ♂, 28–29.I.1912 (USNM).



**FIGURES 81–86.** Male genitalia, left lateral. 81. *Megaselia lombardorum*. 82. *Megaselia marquezii*. 83. *Megaselia mikejohnsoni*. 84. *Megaselia oxboroughae*. 85. *Megaselia pisanoi*. 86. *Megaselia renwickorum*.



**FIGURES 87–92.** Male genitalia, left lateral. 87. *Megaselia rodriguezorum*. 88. *Megaselia sacatelensis*. 89. *Megaselia seaverorum*. 90. *Megaselia sidneyae*. 91. *Megaselia steptoeae*. 92. *Megaselia wiegmanae*.

### ***Megaselia steptoeae* new species (Figs. 29, 61, 91, 123)**

**Diagnosis.** Male. In the group III key of Borgmeier (1964), *M. steptoeae* keys to couplet 13 where it can readily be distinguished from both *M. scopalis* Brues and *M. renata* Borgmeier. *M. steptoeae* lacks the forceps-like epandrial process and strong anipisternal bristle of *M. scopalis*. *M. steptoeae* is differentiated easily from *M. renata* by the structure of the genitalia. In *M. renata*, the epandrium has a triangular notch near the rear margin and numerous stout bristles near the lower margin of the epandrium; *M. steptoeae* lacks such a notch and has few bristles arranged in a more-or-less vertical row on the epandrium (Fig. 91).

**Description.** See Table 7.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of LaChristian Steptoe, host of BioSCAN site 10.

**Biology.** Unknown.

**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Los Feliz, 4–11.IV.2014, Louie, Malaise trap (LACM 329834).

**Paratypes.** 4 ♂, USA: CALIFORNIA: Los Angeles, Koreatown, 5–12.IV.2014, Ralph, Malaise trap (LACM 329835, LACM 329836, 2 CUMZ)

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Exposition Park, Los Feliz, Silverlake, Leimert Park, Koreatown, Mid-City, Elysian Park, Gardena, Hollywood, Glendale, Larchmont, Carthay, Echo Park, Eagle Rock, Pico-Union, Highland Park, 45 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).

### ***Megaselia wiegmanae* new species (Figs. 30, 62, 92, 124)**

**Diagnosis.** Male. In the group VIII key of Borgmeier (1966), *M. wiegmanae* fails the key at couplet 11 where it lacks either the enlarged genitalia of *M. globipyga* Borgmeier or the large hypandrium of *M. brevicostalis* Wood. *M. wiegmanae*, like *M. brevicostalis*, is part of the *M. curtineura* complex of *Megaselia*, and the two species are similar. In addition to the aforementioned large hypandrium of *M. brevicostalis*, *M. wiegmanae* has a slightly longer costal index (0.42–0.44 compared to 0.40–0.43), and only 2 alular setae (3 in *M. brevicostalis*) (Fig. 92).

**Description.** See Table 7.

**Distribution.** Los Angeles, California (USA).

**Etymology.** Named in honor of K.T. Wiegman, host of BioSCAN site 18.

**Biology.** Unknown.

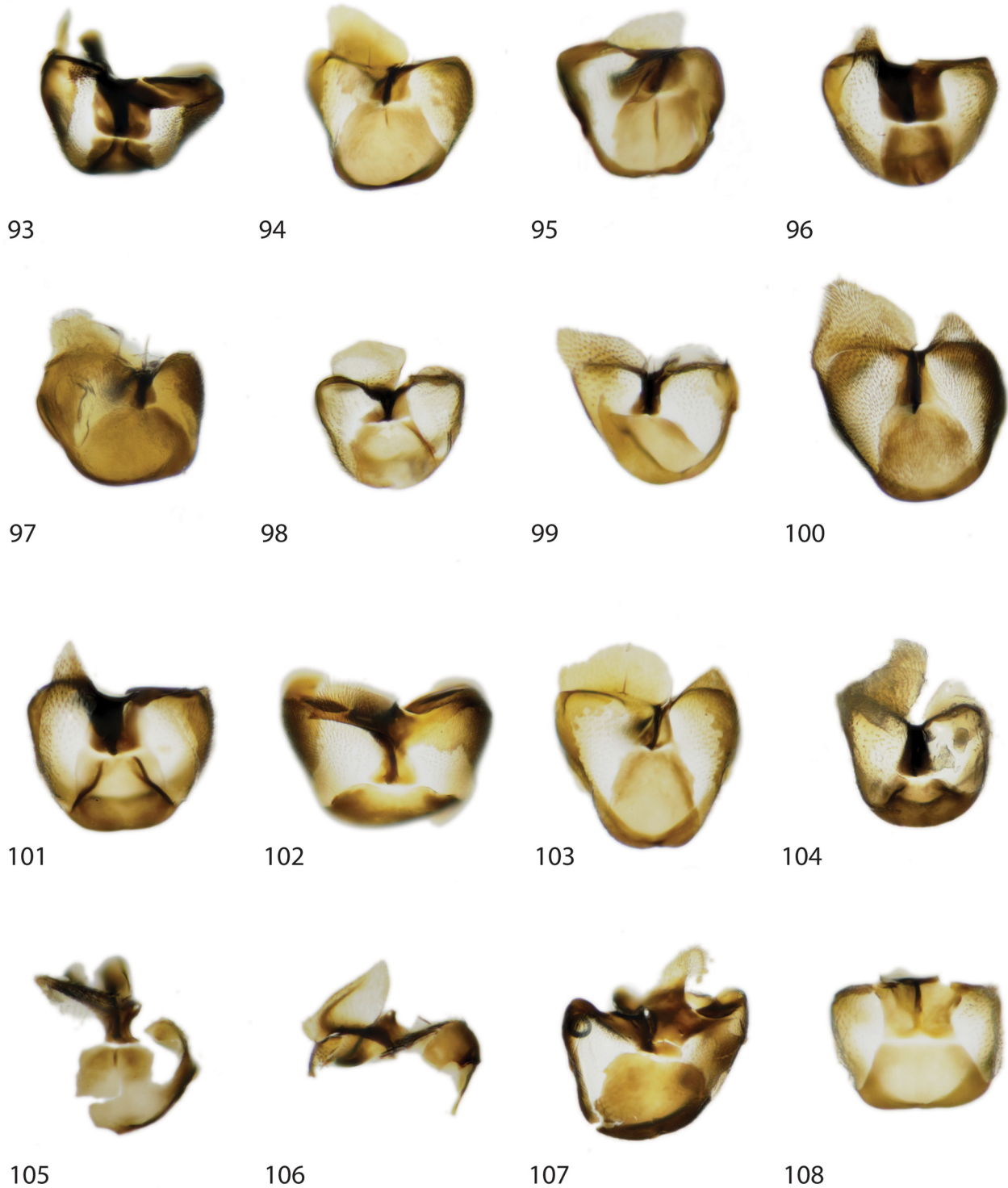
**Holotype.** ♂, USA: CALIFORNIA: Los Angeles, Eagle Rock, 3–10.V.2014, Keller, Malaise trap (LACM 329837).

**Paratypes.** 4 ♂, USA: CALIFORNIA: Los Angeles, Eagle Rock, 3–10.V.2014, Keller, Malaise trap (LACM 329838, LACM 329839, 2 CUMZ).

**Additional Material Examined.** USA: CALIFORNIA: Los Angeles: Exposition Park, University Park, Los Feliz, Silverlake, Jefferson Park, Elysian Valley, Leimert Park, Koreatown, Mid-City, Glendale, Elysian Park, Gardena, Hollywood, Larchmont, Carthay, Burbank, Atwater Village, Eagle Rock, Pico-Union, Mid-Wilshire, Glassell Park, Highland Park, 335 ♂, I–V.2014, Malaise traps (LACM, MCZC, USNM).

### **Discussion**

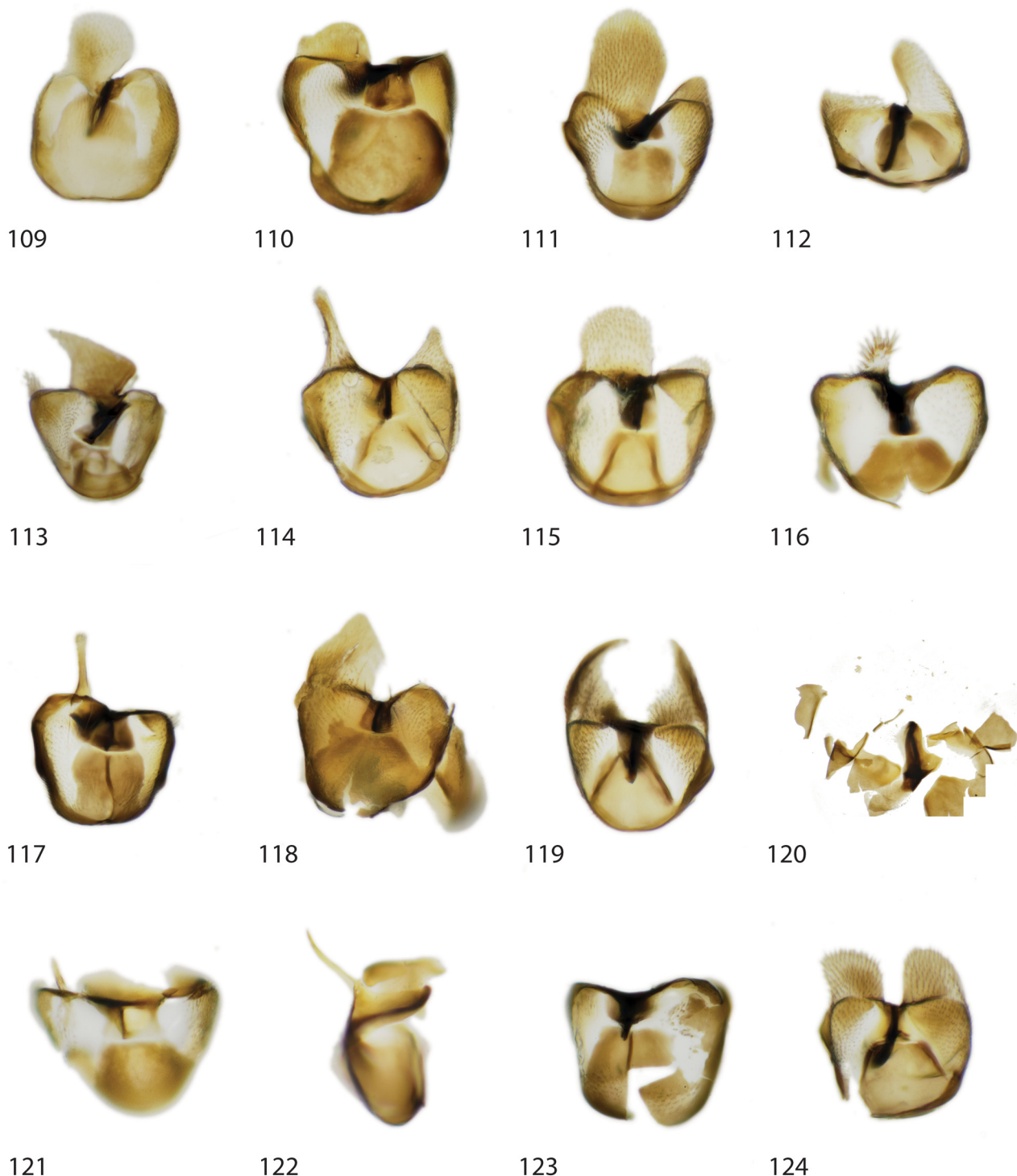
The authors again stress the importance of species-level taxonomy in urban environments (as elsewhere). In our rapidly changing world, the fauna of cities remains poorly known. It may be true that Los Angeles has higher diversity than many cities with its diverse geography and warm-temperate climate. Additionally, the two large container ports of the area mean importations are likely often and numerous, and the abundance of non-native flora makes Los Angeles an excellent settling place for insect invaders from around the world. No matter what factors may be at play, however, dozens of new species in a single genus described from one of the world's largest cities is remarkable. These findings hint at the tremendous amount of work taxonomists have before them in urban environments.



**FIGURES 93–108.** Hypandria (ventral unless noted otherwise) 92. *Megaselia armstrongorum*. 93. *Megaselia bradyi*. 94. *Megaselia brejchaorum*. 95. *Megaselia carthayensis*. 96. *Megaselia ciancii*. 97. *Megaselia creasoni*. 98. *Megaselia defibaughorum*. 99. *Megaselia donahuei*. 100. *Megaselia francoae*. 101. *Megaselia fujiokai*. 102. *Megaselia hardingorum*. 103. *Megaselia heini*. 104. *Megaselia hentschkeae*. 105. *Megaselia hentschkeae* (detail left process). 106. *Megaselia hoffmanorum*. 107. *Megaselia hoggorum*. 108. *Megaselia hoguei*.

We report on the results of a single collecting method, Malaise traps. These flight interception traps will obtain a large proportion of the species present in a given area, however, some species will require other collecting methods to demonstrate their presence (e.g. Disney *et al.* 1982).

The importance of adequately prepared type material and visual documentation of species has become especially apparent during the preparation of this manuscript. It is the hope of the authors that with continued work using the streamlined, heavily visual and table-based description of Hartop and Brown (2014), many of the discrepancies of the Nearctic fauna of *Megaselia* will be resolved, and many more new species will be described in the decades to come.



**FIGURES 109–124.** Hypandria (ventral unless noted otherwise) 109. *Megaselia isaacmajorum*. 110. *Megaselia kelleri*. 111. *Megaselia lombardorum*. 112. *Megaselia marquezii*. 113. *Megaselia mikejohnsoni*. 114. *Megaselia oxboroughae*. 115. *Megaselia pisanoi*. 116. *Megaselia renwickorum*. 117. *Megaselia rodriguezorum*. 118. *Megaselia sacatensis*. 119. *Megaselia seaverorum*. 120. *Megaselia sidneyae*. 121. *Megaselia sidneyae* (detail left process). 122. *Megaselia steptoeae*. 123. *Megaselia wiegmanae*.



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