

10-15-2010

# New records of biting and predaceous midges from Florida, including species new to the fauna of the United States (Diptera: Ceratopogonidae)

William L. Grogan Jr.

Florida Department of Agriculture and Consumer Services, groganw@doacs.state.fl.us

Lawrence J. Hribar

Florida Keys Mosquito Control District, lhribar@keysmosquito.org

C. Steven Murphree

Belmont University, steve.murphree@belmont.edu

James E. Cilek

Florida A & M University, cilek\_j@popmail.firm.edu

Follow this and additional works at: <http://digitalcommons.unl.edu/insectamundi>



Part of the [Entomology Commons](#)

Grogan, William L. Jr.; Hribar, Lawrence J.; Murphree, C. Steven; and Cilek, James E., "New records of biting and predaceous midges from Florida, including species new to the fauna of the United States (Diptera: Ceratopogonidae)" (2010). *Insecta Mundi*. 667.  
<http://digitalcommons.unl.edu/insectamundi/667>

This Article is brought to you for free and open access by the Center for Systematic Entomology, Gainesville, Florida at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Insecta Mundi by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

# INSECTA MUNDI

A Journal of World Insect Systematics

---

0147

New records of biting and predaceous midges from Florida,  
including species new to the fauna of the United States  
(Diptera: Ceratopogonidae)

William L. Grogan, Jr.

Florida State Collection of Arthropods  
Florida Department of Agriculture and Consumer Services  
Gainesville, Florida 32614 U.S.A.

Lawrence J. Hribar

Florida Keys Mosquito Control District  
503 107<sup>th</sup> Street  
Marathon, Florida 33050 U.S.A.

C. Steven Murphree

Department of Biology  
Belmont University  
1900 Belmont Boulevard  
Nashville, Tennessee 32712 U.S.A.

James E. Cilek

Public Health Entomology Research and Education Center  
College of Engineering Sciences, Technology, and Agriculture  
Florida A & M University  
4000 Frankford Avenue  
Panama City, Florida 32405 U.S.A.

Date of Issue: October 15, 2010

William L. Grogan, Jr., Lawrence J. Hribar, C. Steven Murphree, and James E. Cilek  
New records of biting and predaceous midges from Florida, including species new to  
the fauna of the United States (Diptera: Ceratopogonidae)  
*Insecta Mundi* 0147: 1-59

**Published in 2010 by**

Center for Systematic Entomology, Inc.  
P. O. Box 141874  
Gainesville, FL 32614-1874 U. S. A.  
<http://www.centerforsystematicentomology.org/>

**Insecta Mundi** is a journal primarily devoted to insect systematics, but articles can be published on any non-marine arthropod taxon. Manuscripts considered for publication include, but are not limited to, systematic or taxonomic studies, revisions, nomenclatural changes, faunal studies, phylogenetic analyses, biological or behavioral studies, etc. **Insecta Mundi** is widely distributed, and referenced or abstracted by several sources including the Zoological Record, CAB Abstracts, etc.

As of 2007, **Insecta Mundi** is published irregularly throughout the year, not as quarterly issues. As manuscripts are completed they are published and given an individual number. Manuscripts must be peer reviewed prior to submission, after which they are again reviewed by the editorial board to insure quality. One author of each submitted manuscript must be a current member of the Center for Systematic Entomology.

**Managing editor:** Paul E. Skelley, e-mail: [insectamundi@gmail.com](mailto:insectamundi@gmail.com)

**Production editor:** Michael C. Thomas, e-mail: [insectamundi@gmail.com](mailto:insectamundi@gmail.com)

**Editorial board:** J. H. Frank, M. J. Paulsen

**Subject editors:** J. Eger, A. Rasmussen, F. Shockley, G. Steck, A. Van Pelt, J. Zaspel

**Printed copies deposited in libraries of:**

CSIRO, Canberra, ACT, Australia  
Museu de Zoologia, São Paulo, Brazil  
Agriculture and Agrifood Canada, Ottawa, ON, Canada  
The Natural History Museum, London, Great Britain  
Muzeum i Instytut Zoologiczny PAN, Warsaw, Poland  
National Taiwan University, Taipei, Taiwan  
California Academy of Sciences, San Francisco, CA, USA  
Florida Department of Agriculture and Consumer Services, Gainesville, FL, USA  
Field Museum of Natural History, Chicago, IL, USA  
National Museum of Natural History, Smithsonian Institution, Washington, DC, USA

**Electronic copies in PDF format:**

Printed CD mailed to all members at end of year.

Florida Center for Library Automation: <http://purl.fcla.edu/fcla/insectamundi>

University of Nebraska-Lincoln, Digital Commons: <http://digitalcommons.unl.edu/insectamundi/>

Goethe-Universität, Frankfurt am Main: <http://edocs.ub.uni-frankfurt.de/volltexte/2010/14363/>

**Author instructions** available on the *Insecta Mundi* page at:

<http://www.centerforsystematicentomology.org/insectamundi/>

Printed Copy	ISSN 0749-6737
On-Line	ISSN 1942-1354
CD-ROM	ISSN 1942-1362

Copyright held by the author(s). This is an open access article distributed under the terms of the Creative Commons, Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited. <http://creativecommons.org/licenses/by-nc/3.0/>

New records of biting and predaceous midges from Florida,  
including species new to the fauna of the United States  
(Diptera: Ceratopogonidae)

William L. Grogan, Jr.

Florida State Collection of Arthropods  
Florida Department of Agriculture and Consumer Services  
Gainesville, Florida 32614 U.S.A.  
groganw@doacs.state.fl.us

Lawrence J. Hribar

Florida Keys Mosquito Control District  
503 107<sup>th</sup> Street  
Marathon, Florida 33050 U.S.A.  
lhribar@keysmosquito.org

C. Steven Murphree

Department of Biology  
Belmont University  
1900 Belmont Boulevard  
Nashville, Tennessee 32712 U.S.A.  
steve.murphree@belmont.edu

James E. Cilek

Public Health Entomology Research and Education Center  
College of Engineering Sciences, Technology, and Agriculture  
Florida A & M University  
4000 Frankford Avenue  
Panama City, Florida 32405 U.S.A.  
cilek\_j@popmail.firn.edu

**Abstract.** We provide new records of biting and predaceous midges (Diptera: Ceratopogonidae) from Florida, including the first documented United States records of *Atrichopogon* (*Atrichopogon*) *caribbeanus* Ewen, *Dasyhelea griseola* Wirth, *D. scissurae* Macfie, and *Brachypogon* (*Brachypogon*) *woodruffi* Spinelli and Grogan. *Atrichopogon* (*Meloehalea*) *downesi* Wirth, *Forcipomyia* (*Thyridomyia*) *monilicornis* (Coquillett), *F. (T.) nodosa* Saunders, *Ceratoculicoides blantoni* Wirth and Ratanaworabhan, *Mallochohelea albibasis* (Malloch), *Bezzia* (*Bezzia*) *imbifida* Dow and Turner and *B. (B.) mallochi* Wirth are recorded for the first time from Florida. *Forcipomyia* (*Thyridomyia*) *johannseni* Thomsen, *Bezzia* (*Bezzia*) *expolita* (Coquillett), and *B. (B.) pulverea* (Coquillett) are deleted from the ceratopogonid fauna of Florida. *Dasyhelea koenigi* Delécolle and Rieb is a junior objective synonym of *Dasyhelea scissurae* Macfie (**NEW SYNONYM**). The total number of Ceratopogonidae recorded from Florida is now 249 species contained within 27 genera.

**Key words.** Biting midges, Diptera, Ceratopogonidae, Florida, new records, distribution

## Introduction

The biting and predaceous midge (Diptera: Ceratopogonidae) fauna of Florida is very diverse and includes mainly Nearctic species, however, several Neotropical species inhabit the tropical and subtropical zones of the state. Johnson (1913) published the first comprehensive list of Florida ceratopogonids (within Chironomidae), which included 20 species assigned to four genera, *Ceratopogon* Meigen, *Culicoides* Latreille, *Bezzia* Kieffer, and *Johannseniella* Williston. The genus *Culicoides* includes several common coastal and inland pest species that bite humans and other vertebrates, and, for this reason, members of this genus have received the greatest systematic attention during the 20<sup>th</sup> century. Blanton and Wirth's (1979) classic "The Sand Flies (*Culicoides*) of Florida" includes illustrations of adult female antennal flagella, palpi, spermathecae and wings and male genitalia as well as descriptions, keys and maps with plotted locality records for the 47 species covered in this excellent work.

Wilkening et al. (1985) provided the first modern review of all ceratopogonids that inhabit Florida, which included 211 species contained in 25 genera. They also provided a list of counties for each species as well as a table of genera and their primary literature sources that contain county records for the state. During the ensuing 25 years, several new species have been described from Florida and others discovered within the state. In addition, Wirth and Grogan (1988) recognized the subgenus *Allohelea* Kieffer of *Monohelea* Kieffer as a distinct genus and proposed the new genus *Downshelea* for another group within *Monohelea* that includes two species that inhabit Florida. These more recent studies have increased the total number of Florida species to 236 contained in 27 genera (Borkent and Grogan 2009).

We provide additional new records of biting and predaceous midges from Florida, including the first documented records of *Atrichopogon* (*Atrichopogon*) *caribbeanus* Ewen, *Dasyhelea* *griseola* Wirth, *D. scissuræ* Macfie and *Brachypogon* (*Brachypogon*) *woodruffi* Spinelli and Grogan, from the United States. We also provide the first Florida records of *Atrichopogon* (*Melohelea*) *downesi* Wirth, *Forcipomyia* (*Thyridomyia*) *monilicornis* (Coquillett), *F. (T.) nodosa* Saunders, *Ceratoculicoides* *blantoni* Wirth and Ratanaworabhan, *Mallochohelea* *albibasis* (Malloch), (*Bezzia* (*Bezzia*) *imbifida* Dow and Turner and *B. (B.) mallochi* Wirth. We provide evidence that indicates that *Dasyhelea* *koenigi* Delécolle and Rieb is a junior objective synonym of *Dasyhelea* *scissuræ* Macfie (**NEW SYNONYM**).

Although Wilkening et al. (1985) included *Bezzia* (*Bezzia*) *expolita* (Coquillett), *B. (B.) pulvereæ* (Coquillett) and *B. (B.) uncistyla* Dow and Turner in their list of 211 Florida species, they noted that no Florida records were available for these species. However, we have provisionally identified several specimens of *B. uncistyla* from Florida that we list herein under that species. We also consider it unlikely that *Forcipomyia* (*Thyridomyia*) *johannseni* Thomsen inhabits Florida, and have deleted this species as well as *B. expolita* and *B. pulvereæ* from the ceratopogonid fauna of Florida. We provide brief accounts of all species described from Florida or discovered in the state since the survey by Wilkening et al. (1985). Finally, we present an updated list of genera and numbers of species included in each genus from Florida that now includes 249 species (Table 1), an increase of 41 species since the survey by Wilkening et al. (1985).

## Materials and methods

Specimens were collected with Malaise or light traps and/or reared from larvae or pupae. Other specimens examined are in the Florida State Collection of Arthropods, Gainesville (FSCA); the United States National Museum of Natural History, Washington, D. C. (USNM); Auburn University, Alabama (AUCI), the Canadian National Collection of Insects, Ottawa (CNCI); and collection of W. L. Grogan, Jr. (WLGJ). Except for a small number of pinned specimens that are indicated (P), all other specimens examined are mounted on microscope slides in phenol-balsam by the methods of Wirth and Marston (1968). Voucher specimens are deposited in the FSCA; Florida Keys Mosquito Control District, Marathon (FLKC); Department of Biology, Belmont University, Nashville, Tennessee (BUTC); Public Health Entomology Research and Education Center, Florida A & M University, Panama City (FAMC).

Terminology of Ceratopogonidae are those in Downes and Wirth (1981); our systematic arrangement of subfamilies, tribes and genera is as presented in the recent Nearctic catalog by Borkent and Grogan (2009) that included 603 species that inhabit North America north of Mexico.

**Table 1.** Genera of Florida Ceratopogonidae with numbers of species in each genus recorded from the state.

<b>Subfamilies, Tribes, Genera</b>	<b>Numbers of species in each genus</b>
<b>Subfamily Leptoconopinae</b>	
<i>Leptoconops</i> Skuse	2
<b>Subfamily Forcipomyiinae</b>	
<i>Atrichopogon</i> Kieffer	13
<i>Forcipomyia</i> Meigen	52
<b>Subfamily Dasyheleinae</b>	
<i>Dasyhelea</i> Kieffer	19
<b>Subfamily Ceratopogoninae</b>	
Tribe Culicoidini	
<i>Culicoides</i> Latreille	49
Tribe Ceratopogonini	
<i>Allohelea</i> Kieffer	5
<i>Alluaudomyia</i> Kieffer	8
<i>Brachypogon</i> Kieffer	3
<i>Ceratoculicoides</i> Wirth and Ratanaworabhan	3
<i>Downeshelea</i> Wirth and Grogan	2
<i>Echinohelea</i> Macfie	1
<i>Monohelea</i> Kieffer	10
<i>Parabezzia</i> Malloch	4
<i>Rhynchohelea</i> Wirth and Blanton	1
<i>Stilobezzia</i> Kieffer	17
Tribe Heteromyiini	
<i>Clinohelea</i> Kieffer	4
<i>Heteromyia</i> Say	2
Tribe Sphaeromiini	
<i>Jenkinshelea</i> Kieffer	3
<i>Johannsenomyia</i> Malloch	2
<i>Macropeza</i> Meigen	1
<i>Mallochohelea</i> Wirth	5
<i>Nilobezzia</i> Kieffer	1
<i>Probezzia</i> Kieffer	10
<i>Sphaeromias</i> Curtis	1
Tribe Palpomyiini	
<i>Bezzia</i> Kieffer	22
<i>Palpomyia</i> Meigen	7
<i>Phaenobezzia</i> Haeselbarth	2
Total number of Florida species	249

## List of Genera and Species

### Family Ceratopogonidae

#### Subfamily Forcipomyiinae

##### *Atrichopogon (Atrichopogon) caribbeanus* Ewen

*Atrichopogon caribbeanus* Ewen, in Ewen and Saunders, 1958: 683 (Tobago).

*Atrichopogon (Atrichopogon) caribbeanus*: Borkent and Wirth 1997: 23 (in World catalog); Borkent and Spinelli 2000: 10 (in Neotropical catalog; distribution).

**Discussion.** This Neotropical species was previously known only from the original Tobago type series that included larvae, pupae and adults reared from wood collected in a stream. We discovered a single female in the FSCA with associated larval and pupal exuviae reared from water lettuce by Kai Lok Chan in Indian River Co., Florida that Wirth mounted on a slide and identified as this species. The unique features of the larva, pupa and adult female agree perfectly with the illustrations and descriptions in Ewen and Saunders (1958) and, therefore, this is the first record of this species from Florida and the United States.

**New records.** Florida, Indian River Co., Chinese Farm, 21-VIII-1987, Kai Lok Chan, ex. *Pistia* leaf, 1 female (FSCA). **New continental US record.**

##### *Atrichopogon (Atrichopogon) geminus* Boesel

*Atrichopogon geminus* Boesel, 1973: 211 (Ohio).

*Atrichopogon (Atrichopogon) geminus*: Wilkening et al. 1985: 514 (Florida records); Hribar and Grogan 2005: 228 (Monroe Co., Florida record); Borkent and Grogan 2009: 5 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) listed this species from Alachua and Levy counties, and subsequently, Hribar and Grogan (2005) provided the first record from Monroe Co. We provide the first records from Gilchrist, Hillsborough and Putnam counties.

**New records.** Gilchrist Co., Suwannee R., V-1961, G. K. Hicks, 1 female (FSCA); (no locality given), 14 June 1960, G. K. Hicks, 1 female (FSCA). Putnam Co., E. Palatka, IX-1961, S. B. H., 2 females (FSCA). Hillsborough Co., Ruskin, Oct-Nov 1961, S. B. H., 1 female (FSCA).

##### *Atrichopogon (Atrichopogon) gilvus* (Coquillett)

*Ceratopogon gilvus* Coquillett, 1905: 62 (Florida).

*Atrichopogon gilvus*: Johannsen 1943: 777 (combination).

*Atrichopogon (Atrichopogon) gilvus*: Wirth 1965: 122 (in Nearctic catalog; distribution); Wilkening et al. 1985: 514 (Florida records); Borkent and Grogan 2009: 5 (in Nearctic catalog).

**Discussion.** This species is only known from Florida, and, Wilkening et al. (1985) listed it from Dade (holotype), Highlands, Monroe and Orange counties. We provide the first records from St. Lucie Co.

**New records.** St. Lucie Co, (no locality given) 6 August 1986, R. L. Escher, 1 female; same data except 17-IX-1986, 1 female (FSCA).

***Atrichopogon (Atrichopogon) levis (Coquillett)***

*Ceratopogon levis* Coquillett, 1901: 604 (Maryland).

*Culicoides levis*: Kieffer 1906: 54 (combination).

*Atrichopogon levis*: Johannsen 1943: 777 (combination).

*Atrichopogon (Atrichopogon) levis*: Wirth 1965: 123 (in Nearctic catalog; distribution); Wilkening et al. 1985: 514 (Florida records); Borkent and Grogan 2009: 5 (in Nearctic catalog; distribution).

*Ceratopogon exilis* Coquillett, 1902: 86 (Washington D. C.).

**Discussion.** Wilkening et al. (1985) listed this common Nearctic species in Florida from Alachua, Dade, Leon and Levy counties. We provide the first records from Charlotte, Dixie, Gilchrist, Hardee, Highlands, Hillsborough, Liberty, Martin, Putnam and St. Lucie counties.

**New records.** Charlotte Co., Englewood Beach, 16 June 1960, W. Jernigan, 1 male (FSCA). Dixie Co., Steinhatchee, Oct 1961, S. B. H., 1 female (FSCA). Gilchrist Co., Trenton, VIII-1961, S. B. H., 1 female (FSCA). Hardee Co., Wauchulla, 17 April 1961, S. B. H., 1 female (FSCA). Highlands Co., Archbold Biological Station, 13-19 April 1989, W. W. Wirth, light trap, 2 females; Lake Placid, Archbold Biological Station, W. W. Wirth, at UV light, 6 females (FSCA). Hillsborough Co., Tampa, Sept. 1961, S. B. H., 1 female (FSCA). Liberty Co., Torreya St. Park, 20-V-1966, H. V. Weems, 2 females (FSCA). Martin Co., Stuart, 25-XI-1961, S. B. H., 1 female (FSCA). Putnam Co., E. Palatka, V-1961, S. B. H., 2 females (FSCA). St. Lucie Co., (no locality given), 20-VIII-1986, R. L. Escher, 1 male, 1 female (WLGC).

***Atrichopogon (Atrichopogon) maculosus Ewen***

*Atrichopogon maculosus* Ewen, in Ewen and Saunders, 1958: 689 (Saskatchewan).

*Atrichopogon (Atrichopogon) maculosus*: Wirth 1965: 123 (in Nearctic catalog; distribution); Wilkening et al. 1985: 515 (Levy Co. Florida record); Borkent and Grogan 2009: 5 (in Nearctic catalog; distribution).

**Discussion.** This Nearctic species is only known from Saskatchewan, Virginia, Maryland and Florida (Borkent and Grogan 2009). Wilkening et al. (1985) only listed it in Florida from Levy Co. We provide the first records from Alachua, Charlotte, Gilchrist, Hardee and Liberty counties.

**New records.** Alachua Co., Gainesville, 22 June 1960, Gerald Hicks, 5 females; same data except V-1963, F. S. Blanton, 1 male; same data except April 1960, Sathena Cabler, bird nest, 2 females (FSCA). Charlotte Co., Englewood Beach, 16-VI-1966, Jernigan, 1 female (FSCA). Gilchrist Co., Suwannee R., V-VI-1962, G. R. Hicks, 7 females, 4 males; (no locality given), 3 July 1960, Gerald Hicks, 1 female (FSCA). Hardee Co., Wauchulla, 6 June 1961, S. B. H., 5 females, 2 males; same data except 13 June 1960, W. Jernigan, 1 male (FSCA). Liberty Co., Torreya St. Park, 4-VII-1965, H. V. Weems, 2 males, same data except: 20-V-1966, 10 females, 7 males, same data except 15-IV-1957, F. S. Blanton, 1 female (FSCA).

***Atrichopogon (Atrichopogon) minutus (Meigen)***

*Ceratopogon minutus* Meigen, 1830: 263 (Europe).



*Atrichopogon minutus*: Kieffer 1919b: 193 (combination); Wirth 1952a: 125 (redescription; USA distribution); Boesel 1973: 206 (redescription).

*Atrichopogon (Atrichopogon) minutus*: Wirth 1965: 123 (in Nearctic catalog; distribution); Borkent and Grogan 2009: 5 (in Nearctic catalog; distribution).

**Discussion.** This Holarctic species ranges from British Columbia, Ontario and Quebec, south to California, Iowa and Florida (Borkent and Grogan 2009). Borkent and Grogan (2009) included Florida within the range of this species based on a study by Porch et al. (1992) who reported five specimens collected on sundews (*Drosera* sp.) in Walton Co. “in a hillside bog along U. S. Highway 331.” These are apparently the first Florida records of this species, and we list these specimens below.

**New records.** Walton Co., Hwy. 331, 20 May 1986, S. S. Porch, ex. *Drosera* sp., 1 female, 1 male (WLGC); same data except 12 April 1987, 1 female, 18 May 1987, 1 female, and 17 June 1987, 1 female (AUCI).

### *Atrichopogon (Atrichopogon) warmkei* Wirth

*Atrichopogon warmkei* Wirth, 1956b: 243 (Puerto Rico).

*Atrichopogon (Atrichopogon) warmkei*: Wirth 1965: 123 (in Nearctic catalog; distribution); Wilkening et al. 1985: 515 (Florida records); Borkent and Grogan 2009: 5 (in Nearctic catalog; distribution).

**Discussion.** This Neotropical species is known only from Puerto Rico where it pollinates *Hevea* (rubber trees) and Florida from Dade Co. (Wilkening et al. 1985). We provide the first records from Highlands Co.

**New records.** Highlands Co., Archbold Biological Station, 13-19-Apr. 1989, W. W. Wirth, light trap, 1 female; same data except 1-VI-1990, 3 females; same data except 11-12-IX-1989, W. W. Wirth, at UV light, 2 females; same data except Lake Placid, 1-IV-1990, at UV light, 2 females; same data except Sept. 1990, 7 females, 1 male; same data except Malaise trap, 8-IX-1989, 1 female; same data except West Bayhead, 13-IX-1989, 1 female; same data except at *Polygonella* flowers, 15-IX-1990, 7 females, 3 males (FSCA).

### *Atrichopogon (Atrichopogon) websteri* (Coquillett)

*Ceratopogon websteri* Coquillett, 1901: 603 (Louisiana).

*Atrichopogon websteri*: Johannsen 1943: 777 (combination).

*Atrichopogon (Atrichopogon) websteri*: Wirth 1965: 123 (in Nearctic catalog; distribution); Wilkening et al. 1985: 515 (Florida records); Borkent and Grogan 2009: 5 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) recorded this moderately common Nearctic species in Florida from Dixie, Levy and Monroe counties. We provide the first records from Hardee, Gilchrist, Highlands, Hillsborough, Liberty, St. Johns, and Wakulla counties.

**New records.** Hardee Co., Wauchulla, June 1961, S. B. H., 1 female (FSCA). Gilchrist Co., Suwannee R., 15-VI-1962, G. K. Hicks, 4 females; (no locality given), 15 June 1960, G. K. Hicks, 1 male (FSCA). Highlands Co., Highlands Hammock State Park (as H. H. S. P.), V-1961, S. B. H., 1 female (FSCA). Hillsborough Co., Ruskin, Oct-Nov 1961, S. B. H., 1 female (FSCA). Liberty Co., Torreya, St. Park, 20-VI-1966, H. V. Weems, 2 females (FSCA). St. Johns Co., Crescent Beach, July 1961, S. B. H., 1 female (FSCA). Wakulla Co., Wakulla Springs State Park, spring 300 m E of Wakulla Spring, 25 May 2004, S. Murphree, NJ light trap, 1 female (BUTC); same data except swamp on Lodge Rd, 25-26-V-2004, CDC LT, 2 females (WLGC).

***Atrichopogon (Atrichopogon) wirthi* Chan and Linley**

*Atrichopogon wirthi* Chan and Linley, 1988: 189 (Florida).

*Atrichopogon (Atrichopogon) wirthi*: Borkent and Grogan 2009: 5 (in Nearctic catalog).

**Discussion.** Soon after Wilkening et al. (1985) summarized the biting midge fauna of Florida, Chan and Linley (1988) described this species from all stages that were collected and/or reared from leaves of water lettuce, *Pistia stratiodes* Linnaeus, in St. Lucie Co. during 1987. We examined five adult females and two males in the FSCA that Wirth mounted on slides that were reared from the type locality by Chan. We also provide data on additional specimens that were collected on water lettuce and reared to adults by R. L. Escher during 1987 that were sent to WLG to identify. We are not certain if these specimens originated from the type locality, regardless, this species is still only known from St. Lucie Co.

**New records.** St. Lucie Co., Ft. Pierce, 27 May 1987, R. L. Escher, ex. *Pistia stratiodes*, 3 females, 2 males (WLG; FLKC).

***Atrichopogon (Lophomyidium) archboldi* Wirth**

*Atrichopogon (Lophomyidium) archboldi* Wirth, 1994a: 27 (Florida); Borkent and Grogan 2009: 5 (in Nearctic catalog; distribution).

**Discussion.** This is apparently a wide ranging species currently known from Florida, Texas and California, south to Argentina (Borkent and Grogan 2009). In his revision of the Nearctic species in the subgenus *Lophomyidium*, Wirth (1994a) listed Florida specimens from Alachua, Dade, Highlands, Lee, Orange and Putnam counties.

***Atrichopogon (Lophomyidium) deyrupi* Wirth**

*Atrichopogon (Lophomyidium) deyrupi* Wirth, 1994a: 26 (Florida); Borkent and Grogan 2009: 5 (in Nearctic catalog; distribution).

**Discussion.** This species is only known from the type series from Florida and Mississippi (Wirth 1994a), which included specimens from Alachua, Charlotte, Highlands and Pasco counties in Florida.

***Atrichopogon (Lophomyidium) fuscus* (Coquillett)**

*Ceratopogon fuscus* Coquillett, 1901: 605 (Maine, New Jersey, New Hampshire, Washington D. C.).

*Atrichopogon fuscus*: Ingram and Macfie 1922: 244 (combination).

*Atrichopogon (Atrichopogon) fuscus*: Wirth 1965: 122 (in Nearctic catalog; distribution); Wilkening et al. 1985: 514 (Florida records).

*Atrichopogon (Lophomyidium) fuscus*: Wirth 1994a: 20 (revision of Nearctic species in subgenus *Lophomyidium* Cordero; distribution); Borkent and Grogan 2009: 6 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) listed this common Holarctic species in Florida from only Alachua and Hillsborough counties. Subsequently, Wirth (1994a) revised the subgenus *Lophomyidium* in the Nearctic region and demonstrated that *A. (L.) fuscus* is a complex composed of five species. Of the four

new species that Wirth described and illustrated, two of these inhabit Florida, *A. archboldi* and *A. deyrupei*, and we provide brief accounts of these species above. Because Wirth's revision of this complex was published nearly a decade after Wilkening et al. (1985), he also provided additional new records of *A. fuscus* from the following Florida counties: Gilchrist, Liberty, Orange, Pasco and Pinellas. We provide the first records from Wakulla Co.

**New records.** Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 male, 1 female (BUTC); same data except swamp on Lodge Rd, 25-26-V-2004, CDC LT, 1 male, 1 female (WLGC).

### *Atrichopogon (Meloehalea) downesi* Wirth

*Atrichopogon (Meloehalea) downesi* Wirth, 1980: 129 (West Virginia); Borkent and Grogan 2009: 6 (in Nearctic catalog; distribution).

**Discussion.** Females in the subgenus *Meloehalea* Wirth of *Atrichopogon* are ectoparasites of blister beetles (Coleoptera: Meloidae) and other closely related beetle families (Wirth 1980). However, Wilkening et al. (1985) noted that "...undescribed species probably occur in Florida. Florida material in this subgenus has not been studied and we have no records." Borkent and Grogan (2009) listed six species in the subgenus *Meloehalea* in North America north of Mexico, including *A. (M.) ladislavi* Tóthová that was recently described from Ontario, Canada (Tóthová et al. 2009). The most common and widespread species of *Meloehalea* in North America, *A. (M.) downesi* Wirth, ranges from Minnesota to Nova Scotia, south to North Carolina and Tennessee (Borkent and Grogan 2009).

We discovered a female from Liberty Co., Florida in the FSCA that we determined as *A. (M.) downesi* in Wirth's (1980) key as well as the updated key to Holarctic species in the subgenus *Meloehalea* by Tóthová et al. (2009). This Florida specimen is virtually identical with four female paratypes of *A. downesi* from Virginia and Maryland as well as three other females from Wicomico Co., Maryland and a female from Hocking Co., Ohio (WLGC). This is the first Florida record of this species, and it suggests that it may be more widely distributed in the southeastern United States than previous records indicate.

**New records.** Liberty Co., Torreya St. Park, 20-V-1966, H. V. Weems, 1 female (FSCA). **New Florida state record.**

### *Forcipomyia (Caloforcipomyia) glauca* Macfie

*Forcipomyia glauca* Macfie, 1934: 144 (England).

*Forcipomyia (Caloforcipomyia) glauca*: Utmar and Wirth 1976: 123 (revision of New World *Caloforcipomyia* Saunders); Wilkening et al. 1985: 515 (Florida records); Borkent and Grogan 2009: 6 (in Nearctic catalog; distribution).

*Forcipomyia splendida* Wirth, 1951: 315 (Virginia).

**Discussion.** Wilkening et al. (1985) listed this very common Holarctic species from 22 counties in Florida including Highlands Co.; we provide another record from Highlands Co. as well as the first records from Lee, Nassau and Wakulla counties.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, Sept. 1990, W. W. Wirth, at UV light, 1 female. Lee Co., Sanibel Island, 30-XII-1962, Frank Blanton, 1 male (FSCA). Nassau Co., Fernandina (*sic* as Ferandino), IV-1961, S. B. H., 1 female (FSCA). Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 female (BUTC).

***Forcipomyia (Euprojoannisia) blantoni* Soria and Bystrak**

*Forcipomyia (Euforcipomyia) blantoni* Soria and Bystrak, 1975: 3 (Brazil).

*Forcipomyia (Euprojoannisia) blantoni*: Bystrak and Wirth 1978: 13 (revision of North American *Euprojoannisia* Bréthes; United States records); Wilkenning et al. 1985: 515 (Florida records); Hribar and Grogan 2005: 228 (Monroe Co., Florida records); Borkent and Grogan 2009: 7 (in Nearctic catalog; distribution).

**Discussion.** This eastern Nearctic species occurs from Virginia to Florida and in the Neotropics to Brazil. Wilkenning et al. (1985) listed it from 16 Florida counties, and Porch et al. (1992) recorded a specimen taken from a sundew in Walton Co., the first record from that county that we relist below. More recently, Hribar and Grogan (2005) provided the first records from Monroe Co.; we provide the first records from Highlands and St. Lucie counties.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, 15-IX-1990, W. W. Wirth, at *Polygonella* flowers, 5 females, 2 males (FSCA). St. Lucie Co., (?Ft. Pierce), 24 Dec 1986, R. L. Escher, 1 female (FSCA). Walton Co., Hwy. 331, 24 Sept. 1986, S. S. Porch, ex. *Drosera*, 1 male (WLGK).

***Forcipomyia (Euprojoannisia) calcarata* (Coquillett)**

*Ceratopogon calcaratus* Coquillett, 1905: 64 (Mexico).

*Forcipomyia (Euforcipomyia) calcarata*: Johannsen 1943: 778 (combination).

*Forcipomyia (Proforcipomyia) calcarata*: Wirth 1965: 124 (in Nearctic catalog).

*Forcipomyia (Euprojoannisia) calcarata*: Bystrak and Wirth 1978: 16 (revision of North American *Euprojoannisia*); Borkent and Grogan 2009: 7 (in Nearctic catalog; distribution).

**Discussion.** Wilkenning et al. (1985) listed this species from 13 Florida counties. We provide the first records from Highlands and Wakulla counties.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, Sept. 1990, W. W. Wirth, at UV light, 1 female (FSCA). Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 female (BUTC).

***Forcipomyia (Euprojoannisia) dowi* Bystrak and Wirth**

*Forcipomyia (Euprojoannisia) dowi* Bystrak and Wirth, 1978: 21 (revision of North American *Euprojoannisia*; Florida); Wilkenning et al. 1985: 515 (Florida records); Borkent and Grogan 2009: 7 (in Nearctic catalog; distribution).

**Discussion.** The type series of this rarely collected species included specimens from Collier and Indian River counties in Florida and Quintana Roo, Mexico; we provide the first records from Monroe Co.

**New records.** Monroe Co., Key Largo, Crocodile Lake NWR, 24 Dec. 2008, D. DeMay, light trap, 3 females; Little Crawl Key, 29 Oct. 2008, CO<sub>2</sub> baited light trap, D. DeMay, 1 female (FSCA; FLKC).

***Forcipomyia (Euprojoannisia) dolichopodida* Chan and Linley**

*Forcipomyia (Euprojoannisia) dolichopodida* Chan and Linley, 1989: 253 (Florida); Borkent and Grogan 2009: 7 (in Nearctic catalog; distribution).

**Discussion.** Chan and Linley (1989) described this species from the same locality as *Atrichopogon (A.) wirthi* in St. Lucie Co, Florida (see above). We provide an additional record from this county.

**New records.** St. Lucie Co. (no locality given), 1 Oct. 1986, R. L. Escher, 1 female (FSCA).

***Forcipomyia (Euprojoannisia) fuscicalcarata* Bystrak and Wirth**

*Forcipomyia (Euprojoannisia) fuscicalcarata* Bystrak and Wirth, 1978: 23 (Florida); Wilkening et al. 1985: 515 (Florida records); Borkent and Grogan 2009: 7 (in Nearctic catalog).

**Discussion.** This species is known only from Florida in Alachua, Dade, Highlands, Lee, Leon, Monroe and Orange counties. We provide the first record from St. Lucie Co.

**New records.** St. Lucie Co. (no locality given), 5-VI-1987, R. L. Escher, CF-LT, 1 female (FSCA).

***Forcipomyia (Euprojoannisia) mortuifolii* Saunders**

*Forcipomyia (Proforcipomyia) mortuifolii* Saunders, 1959: 35 (Trinidad).

*Forcipomyia (Euprojoannisia) mortuifolii*: Bystrak and Wirth 1978: 29 (revision of North America *Euprojoannisia*; Florida records); Wilkening et al. 1985: 515 (Dade Co. Florida record); Borkent and Grogan 2009: 7 (in Nearctic catalog; distribution).

**Discussion.** This Neotropical species occurs in the Caribbean region and was first recorded from Florida in Dade Co. by Bystrak and Wirth (1978). We provide the first record from Monroe Co.

**New records.** Monroe Co., Key Largo, Crocodile Lake NWR, 12 Nov. 2009, D. DeMay, 1 male (FSCA).

***Forcipomyia (Euprojoannisia) navaiae* Bystrak and Wirth**

*Forcipomyia (Euprojoannisia) navaiae* Bystrak and Wirth, 1978: 31 (Florida); Wilkening et al. 1985: 515 (Florida records); Borkent and Grogan 2009: 7 (in Nearctic catalog; distribution).

**Discussion.** This species is known only from Florida, and the type series included specimens from Dade, Hillsborough and Indian River counties. We provide the first records from Highlands, Monroe and St. Lucie counties.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, 15-IX-1990, W. W. Wirth, at *Polygonella* flowers, 2 females, 1 male (FSCA). Monroe Co., Key Largo, 28 Oct. 2008, D. DeMay, CO<sub>2</sub> baited light trap, 1 female. St. Lucie Co., Hwy 614 (N of Ft. Pierce), 29 Oct 1986, R. L. Escher, 1 male (FSCA).

***Forcipomyia (Euprojoannisia) quasiingrami* Macfie**

*Forcipomyia quasi-ingrami* Macfie, 1939: 164 (Brazil).

*Forcipomyia (Euprojoannisia) quasiingrami*: Bystrak and Wirth 1978: 36 (revision of North American *Euprojoannisia*; distribution); Wilkening et al. 1985: 516 (Florida records); Borkent and Grogan 2009: 7 (in Nearctic catalog; distribution).

**Discussion.** Macfie (1939) based his description of this species on the male holotype from Nova Teutonia, Brazil. However, as noted by Bystrak and Wirth (1978), Macfie also described three females as *Forcipomyia* sp. and suggested that they "...may possibly be the female of *F. quasi-ingrami* sp. n." In their revision of North American species of *F. (Euprojoannisia)*, Bystrak and Wirth (1978) recorded this species from Dominica, Jamaica, St. Lucia and from ten counties in Florida. We provide the first record of this primarily Neotropical species from Highlands Co.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, 15-IX-1990, W. W. Wirth, at *Polygonella* flowers, 1 male (FSCA).

***Forcipomyia (Euprojoannisia) unica* Bystrak and Wirth**

*Forcipomyia (Euprojoannisia) unica* Bystrak and Wirth, 1978: 44 (revision of North American *Euprojoannisia*; Florida); Wilkening et al. 1985: 516 (Florida records); Borkent and Grogan 2009: 7 (in Nearctic catalog; distribution).

**Discussion.** As suggested by its specific name, this species is truly unique in that it is the only New World species in the subgenus *Euprojoannisia* that has a single spermatheca. The type series included specimens from the Bahamas and Alachua (Holotype, Allotype), Dade, Orange, Putnam and Sarasota counties in Florida. Swanson and Grogan (2008) recently recorded a single female from South Carolina. We provide the first records from Monroe Co.

**New records.** Monroe Co., Long Point Key, 25 Oct. 2006, D. DeMay, light trap, 1 female; Windley Key, 22 Sept. 2008, D. DeMay, light trap, 1 female; same data except 17 Nov. 2008, D. DeMay, CO<sub>2</sub> baited light trap, 1 female (FSCA; FLKC).

***Forcipomyia (Forcipomyia) bipunctata* (Linnaeus)**

*Tipula bipunctata* Linnaeus, 1767: 978 (Europe).

*Ceratopogon bipunctatus*: Meigen 1818: 74 (combination).

*Forcipomyia bipunctata*: Lundstrom 1910: 31 (combination).

*Forcipomyia (Forcipomyia) bipunctata*: Wirth 1965: 125 (in Nearctic catalog; distribution); Wilkening et al. 1985: 516 (Florida records); Borkent and Grogan 2009: 7 (in Nearctic catalog; distribution).

**Discussion.** This common, widespread Holarctic species was listed by Wilkening et al. (1985) in Florida from Jackson, Jefferson and Putnam counties. We provide the first record from Wakulla Co.

**New records.** Wakulla Co., Wakulla Springs St. Pk., swamp on Lodge Rd., 25-26-V-2004, S. Murphree, CDC LT, 1 female (BUTC).

***Forcipomyia (Forcipomyia) bystraki* Grogan and Wirth**

*Forcipomyia (Forcipomyia) bystraki* Grogan and Wirth, 1975b: 466 (Virginia); Wilkening et al. 1985: 516 (Florida records); Borkent and Grogan 2009: 7 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) recorded this common primarily eastern species from 19 counties in Florida. We provide the first records from Highlands and Wakulla counties as well as additional records from St. Lucie Co.

**New records.** Highlands Co., Archbold Biol. Sta., 13-19 April, 1987, W. W. Wirth, light trap, 1 male; same data except: Lake Placid, Sept. 1990, W. Wirth, at UV light, 1 female. St. Lucie Co., 20-VIII-1986, R. L. Escher, 1 female, 1 male. Wakulla Co., Wakulla Springs State Park, spring 300 m E of Wakulla Spring, 25 May 2004, S. Murphree, NJ light trap, 1 female (BUTC); same data except 25-26-V-2004, NJ Light trap by spring, 1 female (WLGK).

***Forcipomyia (Forcipomyia) genualis* (Loew)**

*Ceratopogon genualis* Loew, 1866: 128 (Cuba).

*Forcipomyia (Forcipomyia) genualis*: Johannsen 1943: 777 (combination); Wirth 1965: 125 (in Nearctic catalog); Wilkening et al. 1985: 516 (Florida records); Borkent and Grogan 2009: 7 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) recorded this primarily Neotropical species from nine counties in Florida. We provide the first records from Alachua and Lake counties.

**New records.** Alachua Co., Gainesville, Oak Crest, 1-X/22-XI-1986, W. W. Wirth, UVLT, 5 females (FSCA). Lake Co., nr. Mt. Dora, 9-VIII-1984, R. E. Woodruff & L. A. Stange, UVLT, 1 female (FSCA).

***Forcipomyia (Forcipomyia) pictoni* Macfie**

*Forcipomyia pictoni* Macfie, 1938: 161 (Trinidad).

*Forcipomyia (Forcipomyia) pictoni*: Wirth 1974: 6 (in New World catalog south of USA; distribution); Wilkening et al. 1985: 516 (Florida records); Borkent and Grogan 2009: 7 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) recorded this widely distributed New World species from 14 Florida counties. We provide the first records from Dade Co.

**New records.** Dade Co., Homestead, 17-X-1984, R. Woodruff & L. Stange, UVLT, 3 males (FSCA).

***Forcipomyia (Forcipomyia) quatei* Wirth**

*Forcipomyia quatei* Wirth, 1952a: 142 (California).

*Forcipomyia (Forcipomyia) quatei*: Wirth 1965: 126 (in Nearctic catalog); Wilkening et al. 1985: 516 (Florida records); Borkent and Grogan 2009: 7 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) recorded this wide ranging New World species from 12 counties in Florida. We discovered a large series of this species in the FSCA from Indian River, Highlands and St. Lucie counties, which are the first records from these counties.

**New records.** Highlands Co., Archbold Biol. Sta., 13-19-April-1989, W. W. Wirth, light trap, 2 females, 1 male; same data except Lake Placid, 1-IV-1990, at UV light, 2 females, 1 male (FSCA). Indian River Co., Fellesmere, 17-III-1956, LT, 1 male; Vero Beach, Ent. Res. Cntr., May 1958-Dec. 1960, light trap, 16 females, 36 males (FSCA). St. Lucie Co. (no locality given), 11-VI-1986, R. L. Escher, C. F. PETA, 1 female; same data except 18 March-27 May 1987, 3 females (FSCA).

### ***Forcipomyia (Forcipomyia) swezeyana* Tokunaga and Murachi**

*Forcipomyia (Forcipomyia) swezeyana* Tokunaga and Murachi, 1959: 145 (Guam, Tinian, Palau); Debenham 1987: 303 (Australia); Wirth and Spinelli 1992c: 599 (Florida records).

**Discussion.** As noted by Wirth and Spinelli (1992c), *F. swezeyana* belongs to an Old World complex that Debenham (1987) termed the “*swezeyana* Group”, several members of which have been reared from tropical plants (bananas, cassava, etc.). Wirth and Spinelli (1992c) suggested that this was probably how this species was introduced into Florida, and listed specimens from Dade, Orange and Palm Beach counties, all but one of which were reared from portions of decaying banana and *Philodendron*.

### ***Forcipomyia (Lasiohelea) fairfaxensis* Wirth**

*Forcipomyia (Euforcipomyia) fairfaxensis* Wirth, 1951: 317 (Virginia).

*Forcipomyia (Lasiohelea) fairfaxensis*: Wirth 1965: 124 (in Nearctic catalog); Wilkening et al. 1985: 516 (Florida records); Borkent and Grogan 2009: 8 (in Nearctic catalog; distribution).

**Discussion.** The only species of the subgenus *Lasiohelea* Kieffer in the Nearctic region, this common eastern species obtains blood meals from frogs. Wilkening et al. (1985) listed it from Alachua, Gulf, Highlands, Monroe and Orange counties in Florida. Porch et al. (1992) recorded a specimen taken from a sundew (*Drosera* sp.) “...in a stream terrace bog along Pittman Creek” in Santa Rosa Co., which is the first record from this county that we list below. We also provide the first records from Highlands and St. Lucie counties.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, 9-11-IX-1989, W. W. Wirth, Malaise trap, 2 females, 2 males (P); same data except Price tract, 1-IV-1990, 4 females (P); same data except IX-1990, 1 female (P) (FSCA). Santa Rosa Co., Pittman Creek, 19 Oct. 1986, S. S. Porch, 1 female (AUCI). St. Lucie Co. (no locality given), 15 Oct. 1986, R. Escher, 1 female; same data except 24 Dec. 1986, 1 female (FSCA).

### ***Forcipomyia (Lepidohelea) acinacis* Wirth and Spinelli**

*Forcipomyia (Lepidohelea) acinacis* Wirth and Spinelli, 1993b: 615 (Maryland); Borkent and Grogan 2009: 8 (in Nearctic catalog; distribution).

**Discussion.** This recently described species inhabits southern Canada and the eastern United States (Borkent and Grogan 2009). It is only known in Florida by a male collected in Alachua Co. (Wirth and Spinelli 1993b).



***Forcipomyia (Lepidohelea) basifemoralis* Wirth and Spinelli**

*Forcipomyia (Lepidohelea) basifemoralis* Wirth and Spinelli, 1993a: 113 (Jamaica); Borkent and Grogan 2009: 8 (in Nearctic catalog; distribution).

**Discussion.** This recently described Neotropical species is only known in Florida by a male collected in Dade Co. (Wirth and Spinelli 1993b).

***Forcipomyia (Lepidohelea) beckae* Wirth**

*Forcipomyia (Forcipomyia) beckae* Wirth, 1976: 82 (Florida); Wilkening et al. 1985: 516 (Florida records).  
*Forcipomyia (Lepidohelea) beckae*: Wirth and Spinelli 1992b: 353; Borkent and Grogan 2009: 8 (in Nearctic catalog; distribution).

**Discussion.** This species is known only from Florida by specimens collected in Dade (holotype) and Indian River (paratype) counties (Wilkening et al. 1985).

***Forcipomyia (Lepidohelea) dubiamima* Wirth and Spinelli**

*Forcipomyia (Lepidohelea) dubiamima* Wirth and Spinelli, 1993b: 620 (Maryland); Borkent and Grogan 2009: 8 (in Nearctic catalog; distribution).

**Discussion.** This recently described species inhabits the southeastern United States, and is distinctive due to its large size, greatly elongated antennal flagella, dark brown body and legs that are covered with numerous long setae. It is currently known from Maryland, Tennessee, Virginia, West Virginia and North Carolina and in Florida from Alachua, Highlands and Indian River counties (Wirth and Spinelli 1993b).

***Forcipomyia (Lepidohelea) eadsi* Wirth and Spinelli**

*Forcipomyia (Lepidohelea) eadsi* Wirth and Spinelli, 1993b: 622 (Texas); Hribar and Grogan 2005: 229 (Monroe Co., Florida record); Borkent and Grogan 2009: 8 (in Nearctic catalog; distribution).

**Discussion.** The type series of this recently described species was from specimens collected in Texas from Cameron (holotype, allotype), Hidalgo, Kerr, Starr and Val Verde counties. Wirth and Spinelli (1993b) also listed several other specimens they identified as this species from Florida in Alachua, Dade, Hardee, Highlands, Indian River, Jackson, Liberty and Orange counties as well as a male from Washington Co., Mississippi, however, they did not designate these paratypes. Hribar and Grogan (2005) provided the first record from Monroe Co., and we have tentatively identified a few more recently collected males from that county as this species.

***Forcipomyia (Lepidohelea) edmistoni* Wirth and Spinelli**

*Forcipomyia (Lepidohelea) edmistoni* Wirth and Spinelli, 1993b: 624 (Maryland); Borkent and Grogan 2009: 8 (in Nearctic catalog; distribution).

**Discussion.** This recently described species ranges from New York, south to Florida, where it is known from Alachua, Highlands, Jefferson and Levy counties (Wirth and Spinelli 1993b).

***Forcipomyia (Lepidohelea) luteigenua* Wirth and Spinelli**

*Forcipomyia (Lepidohelea) luteigenua* Wirth and Spinelli, 1992b: 353 (Costa Rica); Borkent and Grogan 2009: 8 (in Nearctic catalog; distribution).

**Discussion.** Wirth and Spinelli (1992a) provided a list of specimens of this Neotropical species from Florida in Dade, Highlands, Indian River and Polk counties, but, did not designate these paratypes.

***Forcipomyia (Lepidohelea) seminole* Wirth**

*Forcipomyia (Forcipomyia) seminole* Wirth, 1976: 81 (Florida); Wilkening et al. 1985: 516 (Florida records).  
*Forcipomyia (Lepidohelea) seminole*: Wirth and Spinelli 1992b: 351 (Broward Co., Florida records); Borkent and Grogan 2009: 8 (in Nearctic catalog; distribution).

**Discussion.** The type series of this primarily Neotropical species was from Indian River Co., Florida (Wirth 1976). Subsequently, Wirth and Spinelli (1992b) described the immature stages that were collected and/or reared from bromeliads and provided new records from Broward Co., Florida, and, additional records from Costa Rica, Guyana, Jamaica and Puerto Rico.

***Forcipomyia (Lepidohelea) varipennis* Wirth and Williams**

*Forcipomyia varipennis* Wirth and Williams, 1957: 8 (Bermuda).  
*Forcipomyia (Forcipomyia) varipennis*: Wirth 1965: 126 (in Nearctic catalog; distribution).  
*Forcipomyia (Lepidohelea) varipennis*: Wirth and Spinelli 1993b: 630 (Florida records; redescription); Borkent and Grogan 2009: 8 (in Nearctic catalog; distribution).

**Discussion.** The type series of this primarily Neotropical species included specimens from Bermuda, Puerto Rico, Guatemala and Texas, and Wirth and Spinelli (1993b) provided the first records from Florida. However, Wirth and Spinelli (1993b) noted that paratypes from Cameron Co., Texas and Guatemala were misidentified, and, they designated the Cameron Co. female and other specimens from that state as paratypes of their new species, *F. (Lepidohelea) eadsi*.

***Forcipomyia (Lepidohelea) weemsi* Wirth and Spinelli**

*Forcipomyia (Lepidohelea) weemsi* Wirth and Spinelli, 1993a: 123 (Florida); Borkent and Grogan 2009: 8 (in Nearctic catalog; distribution).

**Discussion.** This recently described species is known from North America from Maryland south to Florida, with isolated records in extreme southeastern Arizona and southern Baja California Sur, Mexico (Wirth and Spinelli 1993a). Their holotype, allotype and several paratypes were from Alachua Co., Florida and other paratypes were from Highlands Co. We provide the first records from Monroe Co.

**New records.** Monroe Co., Key Largo, 29 Oct. 2008, D. DeMay, CO<sub>2</sub> baited light trap, 1 male; Long Key State Park, 28 May 2009, D. DeMay, 1 male (FLKC; WLGC).

***Forcipomyia (Metaforcipomyia) fehrrerorum* Grogan and Sigrist**

*Forcipomyia (Metaforcipomyia) fehrrerorum* Grogan and Sigrist, 2007: 531 (Maryland); Swanson and Grogan 2008: 412 (South Carolina); Borkent and Grogan 2009: 8 (in Nearctic catalog; distribution).

**Discussion.** The majority of specimens in the type series of this recently described species were collected in Wicomico Co., Maryland, but, also included were four Florida paratypes, a female from Highlands Co., and two females and a male from Wakulla Co. Swanson and Grogan (2008) recorded a female from South Carolina, Borkent and Grogan (2009) recorded it from North Carolina, and it was also recently collected in extreme southwestern Alabama (D. Swanson, personal communication). We provide additional records from Highlands Co., Florida.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, 1 April 1991, W. W. Wirth, at UV light, 1 female (P); same data except 1-IV-1993, 2 females (P) (FSCA).

***Forcipomyia (Metaforcipomyia) pluvialis* Malloch**

*Forcipomyia pluvialis* Malloch, 1923: 5 (Maryland).

*Forcipomyia (Forcipomyia) pluvialis*: Johannsen 1943: 778; Wirth 1951: 314 (redescription; Virginia, Louisiana, Panama).

*Forcipomyia (Metaforcipomyia) pluvialis*: Wirth 1965: 125 (in Nearctic catalog; distribution); Wilkening et al. 1985: 517 (Florida records); Grogan and Sigrist 2007: 536 (redescription; USNM Nearctic records); Borkent and Grogan 2009: 8 (in Nearctic catalog; distribution).

**Discussion.** This common woodland species occurs from Ontario and New Brunswick, south to Louisiana and Florida (Borkent and Grogan 2009). Wilkening et al. (1985) recorded it in Florida from Alachua, Gulf, Indian River, Levy, and Monroe counties. We provide the first record from Highlands Co.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, 1-IV-1993, W. W. Wirth, at UV light, 1 female (P) (FSCA).

***Forcipomyia (Microhelea) eriophora* (Williston)**

*Ceratopogon eriophorus* Williston, 1896: 279 (St. Vincent).

*Forcipomyia eriophora*: Wolcott 1923: 210 (combination; Puerto Rico; feeding on tobacco hornworms).

*Forcipomyia (Microhelea) eriophora*: Wirth 1972: 571 (revision of New World *Microhelea* Kieffer); Wilkening et al. 1985: 517 (Florida records); Hribar and Grogan 2005: 229 (Big Pine Key, Monroe Co. record); Borkent and Grogan 2009: 8 (in Nearctic catalog; distribution).

**Discussion.** This moderately common species is known in the United States from Maryland and Florida (Borkent and Grogan 2009), throughout the Caribbean, Mexico and Central America south to Brazil (Borkent and Spinelli 2007). Wilkening et al. (1985) listed it in Florida in Collier, Dade, Jackson and Monroe counties. Hribar and Grogan (2005) provided an additional Monroe Co. record from Big Pine Key and we provide additional records from other Keys.

**New records.** Monroe Co., Key Largo, Tavernier, Tavernier Airport, 14 August 2008, D. DeMay, dry ice-baited ABC trap, 1 female; Long Point Key, 28 Sept. 2006, D. DeMay, light trap, 1 male, same data except 25 Oct. 2006, 1 female; Lower Matecumbe Key, 13 Sept. 2006, D. DeMay, light trap, 1 male; Upper Matecumbe Key, 6 Sept. 2006, D. DeMay, light trap, 1 female, same data except 19 December 2006, 2 females, same data except 12 June 2007, 1 female, same data except 21 Aug. 2007, 4 females; Plantation Key, 23 Sept. 2006, D. DeMay, light trap, 2 females; Windley Key, 15 Aug. 2006, D. DeMay, light trap, 3 females, same data except 2 Sept. 2008, dry ice-baited ABC trap, 1 female, same data except 22 Sept. 2008, light trap, 1 female (FSCA; FLKC; WLGC).

***Forcipomyia (Microhelea) fuliginosa (Meigen)***

*Ceratopogon fuliginosus* Meigen, 1818: 86 (Germany).

*Forcipomyia fuliginosa*: Goetghebuer 1933: 130 (combination).

*Forcipomyia (Microhelea) fuliginosa*: Wirth 1972: 567 (revision of New World *Microhelea*; host records); Wilkening et al. 1985: 517 (Florida records); Hribar and Grogan 2005: 229 (Monroe Co., Florida records); Salvato et al. 2008: 237 (adult female feeding on larval Nymphalidae in Miami-Dade Co., Florida); Borkent and Grogan 2009: 8 (in Nearctic catalog; distribution).

*Forcipomyia erucicida* Knab, 1914: 65 (Florida).

*Ceratopogon coquilletti* Kieffer, 1917: 297 (New York).

*Forcipomyia brookmani* Wirth, 1952a: 140 (Washington).

**Discussion.** As noted by Hribar and Grogan (2005), this common cosmopolitan species has 24 specific synonyms (Borkent and Wirth 1997). The adult females are ectoparasitic on larvae of Lepidoptera and sawflies (Hymenoptera). Wilkening et al. (1985) listed this species from 17 Florida counties. We provide the first records from Lake and Levy counties and additional records from Monroe Co.

**New records.** Lake Co., nr. Mt. Dora, 9-VIII-1984, R. E. Woodruff & L. A. Stange, UVLT, 3 females (FSCA). Levy Co., Yankeetown, XI-1981, Alan Wilkening, light trap with CO<sub>2</sub>, 3 females (FSCA). Monroe Co., Big Pine Key, Key Deer Blvd., 10 Mar. 2008, D. DeMay, light trap, 1 male; Key Largo, Crocodile Lake National Wildlife Refuge, 17 June 2009, D. DeMay, CO<sub>2</sub> baited light trap, 1 female, same data except 8 July 2009, light trap, 1 female, Tavernier, Wild Bird Cntr., 27 May 2009, D. DeMay, CO<sub>2</sub> light trap, 1 female; Long Key, 18 May 2009, D. DeMay, 1 female; Long Point Key, 25 Oct. 2006, D. DeMay, light trap, 1 male; Plantation Key, 23 Sept. 2006, D. DeMay, light trap, 1 female, same data except 3 January 2007, 2 males; Windley Key, 3 Dec. 2007, D. DeMay, light trap, 1 female, same data except 17 Nov. 2008, CO<sub>2</sub> baited light trap, 1 male (FSCA; FLKC; WLGC).

***Forcipomyia (Phytohelea) bromelicola (Lutz)***

*Ceratopogon bromelicola* Lutz, 1914: 84 (Brazil).

*Apelma bromelicola*: Saunders 1925: 263 (combination).

*Lasiohelea bromelicola*: Lane 1945: 357 (combination).

*Forcipomyia (Phytohelea) bromelicola*: Remm 1971: 189 (as type species of subgenus *Phytohelea* Remm); de Meillon and Wirth 1979: 201 (review of *Phytohelea*; distribution); Grogan and Hribar 2006: 319 (Florida Keys); Borkent and Grogan 2009: 9 (in Nearctic catalog; distribution).

**Discussion.** Grogan and Hribar (2006) provided the first records of this Neotropical species from the United States in the Florida Keys, Monroe County.

***Forcipomyia (Pterobosca) fusicornis* (Coquillett)**

*Ceratopogon fusicornis* Coquillett, 1905: 63 (Florida).

*Pterobosca fusicornis*: Johannsen 1951: 117 (combination).

*Forcipomyia (Pterobosca) fusicornis*: Wirth 1965: 123 (combination; in Nearctic catalog); Wilkening et al. 1985: 517 (Florida records); Borkent and Grogan 2009: 9 (in Nearctic catalog; distribution).

*Pterobosca floridana* Johannsen, 1950: 143 (Florida).

**Discussion.** Adult females of this southern Nearctic and Caribbean species are ectoparasitic on Odonata. Wilkening et al. (1985) recorded it from eight counties in Florida. We provide the first records from Palm Beach Co., four females that were collected on the dragonfly, *Anax junius* (Drury).

**New records.** Palm Beach Co., Haley Lake, 27-X-1988, H. Nadel, ex. *Anax junius*, 4 females (FSCA).

***Forcipomyia (Saliohelea) leei* Wirth and Ratanaworabhan**

*Forcipomyia (Saliohelea) leei* Wirth and Ratanaworabhan, 1978: 498 (Colombia); Wilkening et al. 1985: 517 (Florida records); Borkent and Grogan 2009: 9 (in Nearctic catalog; distribution).

**Discussion.** This common species occurs in the eastern United States as far north as New York and in the Neotropics in the Caribbean to southern Brazil. Wilkening et al. (1985) listed it from Alachua, Jefferson, Leon, Marion and Orange counties. Subsequently, Porch et al. (1992) documented a specimen collected from a sundew (*Drosera* sp.) "in a hillside bog along U. S. Highway 331" in Walton Co. Porch et al. referred to this individual as a female, but it is actually a male and apparently the only record of this species from Walton Co. We also provide the first records from Highlands Co.

**New records.** Walton Co., Hwy. 331, 19 Oct. 1986, S. S. Porch, ex. *Drosera*, 1 male (WLGC). Highlands Co., Lake Placid, Archbold Biological Station, 4 April 1992, W. W. Wirth, Malaise trap, 1 female, 1 male (FSCA).

***Forcipomyia (Schizoforcipomyia) cinctipes* (Coquillett)**

*Ceratopogon cinctipes* Coquillett, 1905: 64 (Florida).

*Forcipomyia (Forcipomyia) cinctipes*: Johannsen 1943: 777 (combination); Wilkening et al. 1985: 516 (Florida records).

*Forcipomyia (Schizoforcipomyia) cinctipes*: Wirth 1990: 652 (USA records); Borkent and Grogan 2009: 9 (in Nearctic catalog; distribution).

**Discussion.** This species occurs from Maryland and Virginia, south to Florida and is the only member of the subgenus *Schizoforcipomyia* Chan and LeRoux in the Nearctic region (Wirth 1990). Wilkening et al. (1985) and Wirth (1990) recorded it from nine counties in Florida. We provide the first records from Highlands Co.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, 15 April 1989, W. W. Wirth, Malaise trap, 1 female (P); same data except 11-IX-1989, 1 female (P); same data except 26-28-III-1990, 3 females (P); same data except 1 April 1991, at UV light, 1 male (P) (FSCA).

***Forcipomyia (Thyridomyia) johannseni* Thomsen**

*Forcipomyia johannseni* Thomsen, 1935: 286 (New York).

*Forcipomyia (Euforcipomyia) johannseni*: Johannsen 1943: 778.

*Forcipomyia (Synthyridomyia) johannseni*: Wirth 1965: 124.

*Forcipomyia (Thyridomyia) johannseni*: Dow and Wirth 1972: 182 (revision of Nearctic *Thyridomyia* Saunders; distribution); Wilkening et al. 1985: 517 (Florida records); Borkent and Grogan 2009: 10 (in Nearctic catalog; distribution).

**Discussion.** Thomsen (1935) described this species from adults that she reared from larvae collected from a wound on the bark of an elm tree in Ithaca, New York. The holotype female and allotype male are pinned, and, Dow and Wirth (1972) slide-mounted at least three paratypes from which they based their redescriptions and illustrations of this species. Subsequently, Wirth identified several specimens from Florida as this species including a male from Orchid Jungle, Dade Co., Florida. Wilkening et al. (1985) listed *F. johannseni* from Dade Co., based probably on these specimens and noted “This is the first published Florida records of this rare species. It was previously recorded only from New York.” Our examination of this Dade Co. male revealed that it is clearly not an example of *F. johannseni* as it lacks the characteristic palpal pit of this species, and, its genitalia do not match the illustrations by Thomsen (1935) and Dow and Wirth (1972). Furthermore, its wing length is only 0.63 mm, which is considerably smaller than what Dow and Wirth (1972) recorded for two male paratypes (0.82 mm). We discovered two females and two males mounted on slides in the FSCA from Vero Beach, Indian River Co., Florida that Wirth initially identified as *F. johannseni*, but he apparently subsequently crossed out that name and wrote in red pencil “*tenuichela*.” Of these four specimens, only one male is a specimen of *F. tenuichela*, and a female is a specimen of *F. nodosa*, however, the second female is a specimen of *F. monilicornis*. See accounts of these three species for details on these specimens. Because it is now doubtful that *F. johannseni* actually inhabits Florida, we have removed it from the ceratopogonid fauna of the state.

***Forcipomyia (Thyridomyia) monilicornis* (Coquillett)**

*Ceratopogon monilicornis* Coquillett, 1905: 63 (British Columbia).

*Forcipomyia (Euforcipomyia) monilicornis*: Johannsen 1943: 778 (combination).

*Forcipomyia (Thyridomyia) monilicornis*: Wirth 1952a: 145 (distribution); Dow and Wirth 1972: 183 (revision of Nearctic *Thyridomyia*; distribution); Borkent and Grogan 2009: 10 (in Nearctic catalog; distribution).

**Discussion.** This wide ranging Holarctic species has been recorded in North America from Alaska to Quebec, south to California and Arizona, and Maryland and Virginia. As in other subgenera of *Forcipomyia* that are ectoparasitic on other insect orders, adult females of *F. (Thyridomyia)* also have well developed mandibles with numerous fine teeth. And, although it is assumed that species in the subgenus *Thyridomyia* are also ectoparasites, their hosts are as yet unknown. However, both sexes have been frequently collected on flowers from which they obtain nectar (Dow and Wirth 1972). We provide the first records of this tiny midge from Florida.

**New records.** Indian River Co., Vero Beach, Ent. Res. Cntr., March 1958, light trap, 1 female (FSCA). St. Lucie Co., (no locality given), 10 Dec. 1986, R. L. Escher, CF PETA, 1 female (FSCA). **New Florida state record.**

***Forcipomyia (Thyridomyia) nodosa* Saunders**

*Forcipomyia (Thyridomyia) nodosa* Saunders, 1959: 43 (Costa Rica); Wirth 1970: 434 (Colombia, Mexico records); Dow and Wirth 1972: 186 (Arizona, Kansas, Mississippi records); Borkent and Grogan 2009: 10 (in Nearctic catalog; distribution).

**Discussion.** Although this species was originally described by Saunders (1959) from specimens collected in Costa Rica, it was also subsequently recorded from Colombia and Mexico by Wirth (1970), and in Arizona, Kansas and Mississippi by Dow and Wirth (1972). As mentioned in the discussion section of *F. (T.) johannseni*, a female from Vero Beach, St. Lucie Co., FL identified by Wirth (in Dow and Wirth 1972) as that species, is apparently a specimen of *F. (T.) nodosa*. This female lacks a palpal pit, a characteristic of *F. johannseni*, however, its third palpal segment is moderately short and broad with numerous subapical sensilla and the spermatheca has a curved neck, all of which are characteristic of female *F. nodosa*, and it represents the first record of this species from Florida. However, a male from the same site in St. Lucie Co. has genitalia that differ from illustrations of male *F. nodosa* in Wirth (1970) and Dow and Wirth (1972) as well as two males of this species we examined that were collected in Cochise Co., Arizona in 2007 by WLG. The proximal 2/3 of tergite 9, all of sternite 9 and the basal arms of the aedeagus are missing from this St. Lucie Co. male and it has a heavily sclerotized transverse sclerite at the base of the heavily sclerotized lateral sclerites of the aedeagus and very short gonocoxites, and these differences suggests that it may belong to an undescribed species.

**New records.** St. Lucie Co., Vero Beach, April 1957, light trap, 1 female (FSCA). **New Florida state record.**

***Forcipomyia (Thyridomyia) tenuichela* Dow and Wirth**

*Forcipomyia (Thyridomyia) tenuichela* Dow and Wirth, 1972: 191 (California); Wilkening et al. 1985: 517 (Florida records); Borkent and Grogan 2009: 10 (in Nearctic catalog; distribution).

**Discussion.** As mentioned above in the discussion section of *F. (T.) johannseni*, one of the males from Vero Beach, St. Lucie Co., Florida identified by Wirth (in Dow and Wirth 1972) as that species, is actually a specimen of *F. (T.) tenuichela*. Wilkening et al. (1985) recorded *F. tenuichela* from Dade, Indian River, Monroe and St. Lucie counties. We provide additional records from Monroe and St. Lucie counties.

**New records.** Monroe Co., Key Largo, Burton Street, 6 May 2008, D. DeMay, CO<sub>2</sub> baited ABC trap, 1 female; Upper Matecumbe Key, 19 December 2006, D. DeMay, light trap, 1 male; Little Pine Key, 15 July 2008, J. Snell & E. Wirsching, CO<sub>2</sub> baited light trap, 1 male. St. Lucie Co., Vero Beach, Nov. 1957, W. L. Bidlingmayer, 1 male (FLKC; WLGC).

***Forcipomyia (Trichohelea) mcateei* Wirth**

*Forcipomyia mcateei* Wirth, 1956a: 359 (Maryland).

*Forcipomyia (Neoforcipomyia) mcateei*: Wirth 1965: 124 (in Nearctic catalog).

*Forcipomyia (Trichohelea) mcateei*: Wirth and Messersmith 1971: 21 (revision of North American *Trichohelea* Kieffer); Wilkening et al. 1985: 518 (Florida records); Borkent and Grogan 2009: 10 (in Nearctic catalog; distribution).

*Forcipomyia (Trichohelea) saundersi* Chan, in Chan and LeRoux 1965: 87 (Quebec).

**Discussion.** Adult females in the subgenus *Trichohelea* are ectoparasites of several insect orders as well as opilionids. Wilkening et al. (1985) recorded this Nearctic species in Florida from Alachua, Hillsborough, Liberty and Monroe counties. We provide the first records from Highlands Co.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, Sept. 1990, W. W. Wirth, at UV light, 2 females; same data except Price Tract, 1-IV-1990, 3 females (FSCA).

### ***Forcipomyia (Trichohelea) veroensis* Wirth and Messersmith**

*Forcipomyia (Trichohelea) veroensis* Wirth and Messersmith, 1971: 24 (Florida); Wilkening et al. 1985: 518 (Florida records); Borkent and Grogan 2009: 10 (in Nearctic catalog; distribution).

**Discussion.** The type series of this rarely collected species was from Indian River Co., Florida (holotype, allotype), Maryland and Virginia (paratypes). Wilkening et al. (1985) also listed this species in Florida from Alachua Co. We provide the first record from Monroe Co.

**New records.** Monroe Co., Key Largo, Crocodile Lake NWR, 12 Nov. 2009, D. DeMay, 1 male (FSCA).

## **Subfamily Dasyheleinae**

### ***Dasyhelea atlantis* Wirth and Williams**

*Dasyhelea atlantis* Wirth and Williams, 1957: 11 (Bermuda); Waugh and Wirth 1976: 245 (revision of eastern United States *Dasyhelea* Kieffer; distribution); Borkent and Grogan 2009: 11 (in Nearctic catalog; distribution).

**Discussion.** Wirth and Williams (1957) described this species from Bermuda specimens collected by light traps and reared from larvae and pupae, and reported that it was among the most commonly collected species in their study. Williams (1957) published habitat data for a number of Ceratopogonidae from Bermuda and noted that immature stages of *D. atlantis* were collected from strands of seaside purslane, *Sesuvium portulacastrum* (L.). This species has only been recorded in Florida from Indian River Co. (Wilkening et al. 1985). We provide the first records from Monroe Co. that includes a male reared from a pupa collected on seaside purslane.

**New records.** Monroe Co., Long Key, 1-XI-2007, L. Hribar, ex. strand of sea purslane, 1 male with pupal exuviae; Big Pine Key, Driftwood Ct., 1 April 2008, E. Wirsching, light trap, 1 male; No Name Key, 2 Feb. 2009; D. DeMay, 3 males, 2 females (FLKC; WLGC).

### ***Dasyhelea bahamensis* (Johnson)**

*Ceratopogon bahamensis* Johnson, 1908: 71 (Bahamas).

*Dasyhelea bahamensis*: Wirth 1952a: 149 (combination); Wilkening et al. 1985: 518 (Florida records); Borkent and Grogan 2009: 11 (in Nearctic catalog; distribution).

**Discussion.** This Caribbean species has only been recorded in Florida from Collier, Lee and Monroe counties (Wilkening et al. 1985). We provide additional records from Monroe Co.



**New records.** Monroe Co., Little Knockemdown Key, 24 Dec. 2008, E. Wirsching, CO<sub>2</sub> baited light trap, 1 female; Long Key, Long Key State Park, 23 Sept. 2009, D. DeMay, CO<sub>2</sub> baited light trap, 1 male; Long Point Key, 29 Oct. 2008, D. DeMay, CO<sub>2</sub> baited light trap, 1 female; No Name Key, 2 Feb. 2009, D. DeMay, 1 male (FLKC; WLGC).

### *Dasyhelea corinneae* Gosseries

*Ceratopogon scutellata* Meigen, 1830: 262 (Europe; preoccupied by Say, 1829).

*Dasyhelea scutellata*: Kieffer 1919a: 50 (combination); Waugh and Wirth 1976: 236 (revision of eastern United States *Dasyhelea*; distribution); Wilkening et al. 1985: 519 (Florida records).

*Dasyhelea corinneae* Gosseries, 1991: 42 (new name for *C. scutellata* Meigen); Borkent and Grogan 2009: 11 (in Nearctic catalog; distribution).

**Discussion.** This common Holarctic species inhabits the eastern United States, and Wilkening et al. (1985) only recorded it (as *D. scutellata*) in Florida from Liberty Co. and suggested that “Northern Florida apparently represents the southernmost limit of its range in North America.” Porch et al. (1992) recorded several specimens taken from sundews in Santa Rosa and Walton counties, which were the first records from these Florida counties that we relist below.

**New records.** Santa Rosa Co., Pittman Creek, 19 Oct. 1986, S. S. Porch, ex. *Drosera* sp., 2 females (AUCI). Walton Co., 20 May 1986, 13 Aug. 1986, 4 Sept. 1986, 1 female (WLGC), 19 Oct. 1986, 1 female, 12 Apr. 1987, 3 females (AUCI), 19 May 1987 (2 females AUCI; 1 female WLGC), S. S. Porch, ex. *Drosera* sp.

### *Dasyhelea flavifrons* (Guérin-Méneville)

*Ceratopogon flavifrons* Guérin-Méneville, 1833: 165 (France).

*Dasyhelea flavifrons*: Kieffer 1919a: 51 (combination); Borkent and Grogan 2009: 11 (in Nearctic catalog; distribution).

*Dasyhelea oppressa* Thomsen, 1935: 285 (New York); Waugh and Wirth 1976: 230 (revision of eastern United States *Dasyhelea*; distribution); Wilkening et al. 1985: 519 (Florida records); Hribar and Grogan 2005: 231 (Monroe Co., Florida records); Szadziewski and Dominiak 2006: 142 (as synonym of *C. flavifrons* Guérin-Méneville); Borkent and Grogan 2009: 11 (synonym of *D. flavifrons*).

**Discussion.** This common Holarctic species was previously known in North America as *D. oppressa*, but recently, Szadziewski and Dominiak (2006) demonstrated that it was a synonym of *D. flavifrons* (Guérin-Méneville). Wilkening et al. (1985) recorded it in Florida from Alachua and Liberty counties, and Hribar and Grogan (2005) provided the first records from Monroe Co.

### *Dasyhelea grisea* (Coquillett)

*Ceratopogon griseus* Coquillett, 1901: 602 (Washington, D.C.).

*Culicoides griseus*: Kieffer 1906: 54 (combination).

*Dasyhelea grisea*: Thomsen 1935: 283 (combination); Waugh and Wirth 1976: 228 (revision of eastern U.S. *Dasyhelea*; distribution); Wilkening et al. 1985: 518 (Florida records); Borkent and Grogan 2009: 11 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) listed this very common Nearctic species from 13 Florida counties including Monroe Co. Thomsen (1937) and Waugh and Wirth (1976) noted that this species has been reared from algae in freshwater ponds. Hribar and Grogan (2005) provided the first records of this species from Long and Vaca Keys, Monroe Co. Our additional record from this county is a female from Long Key that was reared from a pupa collected from sea purslane, which is apparently a new larval habitat for this species.

**New records.** Monroe Co., Long Key, 1-XI-2007, L. Hribar, ex. strand of sea purslane, 1 female with pupal exuviae (FLKC).

### *Dasyhelea griseola* Wirth

*Dasyhelea griseola* Wirth, 1978: 193 (Mexico, Baja California); Borkent and Spinelli 2000: 25 (in New World catalog south of the USA; distribution).

**Discussion.** Wirth (1978) described this relative of *D. grisea* from Baja California, Mexico (types), Panama and Trinidad. We discovered four males and one female in the FSCA from Levy Co., Florida that Wirth identified as this species, and these are the first records of *D. griseola* from the United States. Males of *D. griseola* are readily distinguished from those of *D. grisea* in that they lack a mesobasal spur on their gonocoxites.

**New records.** Florida, Levy Co., Yankeetown, 23-V-1987, Alan Wilkening, light trap with CO<sub>2</sub>, 4 males, 1 female (FSCA). **New continental US record.**

### *Dasyhelea mutabilis* (Coquillett)

*Ceratopogon mutabilis* Coquillett, 1901: 602 (Washington, D.C.).

*Culicoides mutabilis*: Kieffer 1906: 54 (combination).

*Pseudoculicoides mutabilis*: Malloch 1915a: 310 (combination).

*Dasyhelea mutabilis*: Thomsen 1935: 283 (combination); Waugh and Wirth 1976: 242 (revision of eastern U.S. *Dasyhelea*; distribution); Wilkening et al. 1985: 519 (Florida records); Borkent and Grogan 2009: 11 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) listed this species from Alachua, Duval, Levy and Monroe counties, and Hribar and Grogan (2005) provided additional Monroe Co. records from Long Key. We have tentatively identified a female from St. Lucie Co. that is slightly smaller (wing length 0.66 mm) than reported by Waugh and Wirth (1976) for females of this species (wing length 0.72-0.83 mm). Waugh and Wirth suggested that at least two species may inhabit the eastern United States based on variation of spermatheca size and neck length as well as the pupal respiratory organ. Regardless, this is the first record of this species from St. Lucie Co.

**New records.** St. Lucie Co., 20-VIII-1986, R. L. Escher, 1 female (WLGC).

### *Dasyhelea pollex* Borkent and Forster

*Dasyhelea pollex* Borkent and Forster, 1986: 1286 (Bahamas); Borkent and Grogan 2009: 11 (in Nearctic catalog; distribution).

**Discussion.** This species was described by Borkent and Forster (1986) in their revision of the Nearctic species in the fasciigera group based on four males: the holotype and paratype from San Salvador Island, Bahamas (CNCI); a paratype from Big Pine Key, Monroe Co., Florida (USNM); and, a paratype from Baja California, Mexico (USNM).

### *Dasyhelea scissurae* Macfie

*Dasyhelea scissurae* Macfie, 1937: 15 (Trinidad); Borkent and Spinelli 2000: 26 (in Neotropical catalog; distribution); Borkent and Grogan 2009: 11 (in Nearctic catalog; distribution).

*Dasyhelea koenigi* Delécolle and Rieb, 1994: 267 (Guadeloupe); Borkent and Spinelli 2000: 26 (in Neotropical catalog). **NEW SYNONYM.**

**Discussion.** Borkent and Spinelli (2000) and Borkent and Grogan (2009) listed this Neotropical species from Florida. However, the bases for these inclusions are unknown, and therefore, we provide the first definitive records of *D. scissurae* from Florida and the United States. In addition, the illustrations of the male genitalia of *D. koenigi* Delécolle and Rieb (1994) described from the male holotype and female allotype from Guadeloupe are virtually identical with illustrations of the male genitalia of *D. scissurae* described by Macfie (1937) from Trinidad. We consider them conspecific, and therefore, *Dasyhelea koenigi* Delécolle and Rieb is a junior objective synonym of *Dasyhelea scissurae* Macfie (**NEW SYNONYM**).

**New records.** Dade Co., Homestead, 17-X-1984, R. Woodruff and L. Stange, UVLT, 4 males (FSCA).  
**New continental US record.**

### *Dasyhelea stemlerae* Waugh and Wirth

*Dasyhelea stemlerae* Waugh and Wirth, 1976: 233 (Maryland); Wilkening et al. 1985: 519 (Florida records); Borkent and Grogan 2009: 11 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) only listed this species from Alachua Co. (paratypes). We provide the first record from Wakulla Co.

**New records.** Wakulla Co., Wakulla Springs St. Pk., 25-26-V-2004, S. Murphree, CDC LT, swamp on Lodge Rd., 1 female (WLGC).

### *Dasyhelea traverae* Thomsen

*Dasyhelea traverae* Thomsen, 1935: 285 (New York); Waugh and Wirth 1976: 231 (revision of eastern USA *Dasyhelea*); Borkent and Grogan 2009: 11 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) did not list this eastern species from Florida. Subsequently, Porch et al. (1992) reported two specimens taken from sundews in Santa Rosa and Walton counties, and these are the only records of this species from Florida that we relist below.

**New records.** Santa Rosa Co., 19 Oct. 1987, S. S. Porch, ex. *Drosera* sp., 1 female (AUCI). Walton Co., 13 Aug. 1986, S. S. Porch, ex. *Drosera* sp., 1 male (AUCI).

**Subfamily Ceratopogoninae****Tribe Culicoidini*****Culicoides (Amossovia) arboricola* Root and Hoffman**

*Culicoides arboricola* Root and Hoffman, 1937: 166 (Maryland).

*Culicoides (Glaphiromyia) arboricola*: Vargas 1960: 41.

*Culicoides (Oecacta) arboricola*: Khalaf 1954: 37; Blanton and Wirth 1979: 56 (Florida records); Wilkening et al. 1985: 522 (Florida records).

*Culicoides (Amossovia) arboricola*: Borkent and Grogan 2009: 12 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) listed this common eastern species from 27 Florida counties. We provide the first record for Bay Co.

**New records.** Bay Co., Callaway, Plantation Dr., 24 June 2003, J. Cilek, CO<sub>2</sub> baited CDC light trap, 1 female (FAMC).

***Culicoides (Amossovia) villosipennis* Root and Hoffman**

*Culicoides villosipennis* Root and Hoffman, 1937: 165 (Maryland).

*Culicoides (Oecacta) villosipennis*: Khalaf 1954: 37; Blanton and Wirth 1979: 169 (Florida records); Wilkening et al. 1985: 522 (Florida records).

*Culicoides (Glaphiromyia) villosipennis*: Vargas 1960: 41.

*Culicoides (Amossovia) villosipennis*: Borkent and Grogan 2009: 12 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) listed this eastern species from nine Florida counties. We provide the first records from Wakulla Co.

**New records.** Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 male, 2 females; same data except Swamp on Lodge Rd., 25-26-V-2004, CDC LT, 2 females (BUTC; WLGC).

***Culicoides (Beltranmyia) crepuscularis* Malloch**

*Culicoides crepuscularis* Malloch, 1915a: 303 (Illinois).

*Culicoides (Beltranmyia) crepuscularis*: Vargas 1953: 34; Blanton and Wirth 1979: 75 (Florida records); Wilkening et al. 1985: 520 (Florida records); Borkent and Grogan 2009: 13 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) listed this common Nearctic and northern Neotropical species from 37 Florida counties, including Bay Co. We provide additional records from Bay Co.

**New records.** Bay Co., Callaway, Plantation Drive, 25 March/26 December 2002, C. F. Hallmon, CO<sub>2</sub> baited CDC light trap, 6 females; same data except 28 April-19 July 2002, 5 females (FAMC); same data except 25 March 2002 (WLGC).

***Culicoides (Beltranmyia) mississippiensis* Hoffman**

*Culicoides mississippiensis* Hoffman, 1926: 158 (Mississippi).

*Culicoides (Beltranmyia) mississippiensis*: Vargas 1953: 34; Blanton and Wirth 1979: 119 (Florida records); Wilkening et al. 1985: 520 (Florida records); Borkent and Grogan 2009: 13 (in Nearctic catalog; distribution).

**Discussion.** This species inhabits coastal areas along the Gulf of Mexico from Florida to Texas and was listed by Wilkening et al. (1985) from 22 Florida counties including Wakulla Co. We provide additional records from Wakulla Co.

**New records.** Wakulla Co., Wakulla Springs State Park, spring 300 m E of Wakulla Spring, 25 May 2004, S. Murphree, NJ light trap, 1 female; same data except UV wand, 1 female (BUTC).

***Culicoides (Diphaomyia) edeni* Wirth and Blanton**

*Culicoides edeni* Wirth and Blanton, 1974: 23 (Florida).

*Culicoides (Diphaeomyia) edeni*: Blanton and Wirth 1979: 81 (Florida records; subgenus *sic*); Wilkening et al. 1985: 520 (Florida records).

*Culicoides (Diphaomyia) edeni*: Wirth et al. 1985: 18 (in Nearctic Wing Atlas); Borkent and Grogan 2009: 13 (in Nearctic catalog; distribution).

**Discussion.** This species is known only from Florida, South Carolina and the Bahamas (Borkent and Grogan 2009). Wilkening et al. (1985) listed it from 33 Florida counties, including Wakulla Co. We provide an additional record from Wakulla Co. as well as the first records from Bay and Santa Rosa counties.

**New records.** Bay Co., Callaway, Plantation Dr., 25 November 2002, J. Cilek, CO<sub>2</sub> baited CDC light trap, 1 female; same data except 26 November 2002, C. F. Hallmon, 1 female (FAMC). Santa Rosa Co., 9 September 2003, C. F. Hallmon, CO<sub>2</sub> baited CDC light trap, 1 female (FAMC). Wakulla Co., Wakulla Springs State Park, spring 300 m E of Wakulla Spring, 25 May 2004, S. Murphree, NJ light trap, 1 female (BUTC).

***Culicoides (Diphaomyia) haematopotus* Malloch**

*Culicoides haematopotus* Malloch, 1915a: 302 (Illinois).

*Culicoides (Diphaomyia) haematopotus*: Vargas 1960: 40; Borkent and Grogan 2009: 13 (in Nearctic catalog; distribution).

*Culicoides (Diphaeomyia) haematopotus*: Blanton and Wirth 1979: 95 (subgenus *sic*; Florida records); Wilkening et al. 1985: 520 (Florida records).

**Discussion.** Wilkening et al. (1985) listed this common Nearctic species from 19 Florida counties. We provide the first records from Bay Co.

**New records.** Bay Co., Callaway, Plantation Drive, 25 April-12 December 2001, C. F. Hallmon, 4 females; same data except 25 March-4 November 2002, C. F. Hallmon, CO<sub>2</sub> baited CDC light trap, 12 females (FAMC; WLGC).

***Culicoides (Drymodesmyia) hinmani* Khalaf**

*Culicoides hinmani* Khalaf, 1952: 353 (Oklahoma).

*Culicoides (Drymodesmyia) hinmani*: Wirth 1965: 131 (in Nearctic catalog); Blanton and Wirth 1979: 99 (Florida records); Wilkening et al. 1985: 520 (Florida records); Borkent and Grogan 2009: 14 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) listed this primarily eastern species from 11 Florida counties. We provide the first record from Wakulla Co.

**New records.** Wakulla Co., Wakulla Springs State Park, spring 300 m E of Wakulla Spring, 25 May 2004, S. Murphree, NJ light trap, 1 female (BUTC).

***Culicoides (Haematomyidium) debilipalpis* Lutz**

*Culicoides debilipalpis* Lutz, 1913: 60 (Brazil).

*Culicoides (Haematomyidium) debilipalpis*: Vargas 1960: 42; Borkent and Grogan 2009: 14 (in Nearctic catalog; distribution).

*Culicoides (Oecacta) debilipalpis*: Wirth 1965: 129 (in Nearctic catalog); Blanton and Wirth 1979: 78 (Florida records); Wilkening et al. 1985: 521 (Florida records).

*Culicoides khalafi* Beck, 1957: 104 (Florida).

**Discussion.** Wilkening et al. (1985) listed this species from 12 Florida counties. We provide the first records from Bay and Wakulla counties.

**New records.** Bay Co., Callaway, Plantation Dr., 24 June 2003, J. Cilek, CO<sub>2</sub> baited CDC light trap, 1 female (FAMC). Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV, 1 female (BUTC).

***Culicoides (Haematomyidium) paraensis* (Goeldi)**

*Haematomyidium paraense* Goeldi, 1905: 137 (Brazil).

*Culicoides paraensis*: Lutz 1913: 55 (combination).

*Culicoides (Oecacta) paraensis*: Wirth 1965: 130 (in Nearctic catalog); Blanton and Wirth 1979: 131 (Florida records); Wilkening et al. 1985: 521 (Florida records).

*Culicoides (Haematomyidium) paraensis*: Vargas 1960: 42; Borkent and Grogan 2009: 14 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) listed this widespread New World species from eight Florida counties. We provide the first records from Wakulla and Walton counties.

**New records.** Wakulla Co., Wakulla Springs State Park, spring 300 m E of Wakulla Spring, 25 May 2004, S. Murphree, NJ light trap, 1 male, 1 female (BUTC). Walton Co., 14 July-4 September 2003, C. F. Hallmon, CO<sub>2</sub> baited CDC light trap, 4 females (FAMC)

***Culicoides (Monoculicoides) sonorensis* Wirth and Jones**

*Culicoides variipennis sonorensis* Wirth and Jones, 1957: 18 (Arizona).

*Culicoides sonorensis*: Holbrook et al. 2000: 70 (species status; genetic analysis of *C. variipennis* complex; distribution).

*Culicoides (Monoculicoides) sonorensis*: Borkent and Grogan 2009: 15 (in Nearctic catalog; distribution).

*Culicoides variipennis australis* Wirth and Jones, 1957: 15 (Louisiana); Atchley 1967: 975 (synonym of *C. v. sonorensis*); Holbrook et al. 2000: 70 (synonym of *C. sonorensis*).

*Culicoides variipennis albertensis* Wirth and Jones, 1957: 17 (Alberta); Holbrook et al. 2000: 70 (synonym of *C. sonorensis*).

*Culicoides (Monoculicoides) variipennis*: Blanton and Wirth 1979: 161 (Florida records, in part); Wilkening et al. 1985: 521 (Florida records, in part).

*Culicoides occidentalis albertensis*: Downes 1978: 63.

**Discussion.** Because Blanton and Wirth (1979) and Wilkening et al. (1985) did not specifically distinguish Florida specimens in the *C. variipennis* complex to subspecies, we list here all slide-mounted specimens of *C. sonorensis* from Florida in the USNM that were examined by Holbrook et al. (2000) and labeled by WLG.

**New records.** Escambia Co., Bratt, VI-1968, FS & AJ Blanton, light trap, 5 males, 1 female (USNM); same data except 27 August 1964, Blanton & Broce, 1 female (WLGC). Jackson Co., Marianna, May 1955, L. T. and Truck Trap, 2 females; 15 June 1955, light trap, 2 males, 1 female (USNM). Jefferson Co., Monticello, W. H. Whitcomb, B. L. trap, IV (19)69, 3 females; V-(19)69, 2 females (USNM).

### *Culicoides (Monoculicoides) variipennis* (Coquillett)

*Ceratopogon variipennis* Coquillett, 1901: 602 (Virginia, New Jersey, Mexico).

*Culicoides variipennis*: Kieffer 1906: 55 (combination); Holbrook et al. 2000: 68 (genetic analysis and revision of complex).

*Culicoides variipennis variipennis*: Wirth and Jones 1957: 12 (Virginia syntype designated lectotype).

*Culicoides (Monoculicoides) variipennis*: Khalaf 1954: 40; Blanton and Wirth 1979: 161 (Florida records, in part); Wilkening et al. 1985: 521 (Florida records, in part); Borkent and Grogan 2009: 15 (in Nearctic catalog; distribution).

**Discussion.** Because Blanton and Wirth (1979) and Wilkening et al. (1985) did not distinguish specimens of *C. variipennis* and *C. sonorensis*, we list below Florida records of *C. variipennis* identified and labeled by WLG in the FSCA and USNM. We also provide the first records from Walton Co.

**New records.** Alachua Co., Gainesville, Chantilly Acres, March 1968, F. S. Blanton, light trap, 1 female (FSCA); Hawthorne, 27-IV-1968, F. S. Blanton, 15 females (FSCA); same data, 1 male, 2 females (USNM). Calhoun Co., Blountstown, 28-II-6-IV-1961, S. B. H., 22 females, 6 males (FSCA); same data, 1 male, 5 females (USNM). Escambia Co., Bratt, VI-IX-1968, FS & AJ Blanton, light trap, 20 males, 24 females; same data, 16 males, 22 females (USNM); Cantonment, VII-1961, Tidwell, 1 male (USNM); Innerarity Pt., VIII-1965, Tidwell, 1 female (USNM). Jefferson Co., Monticello, V-VII-1969, W. H. Whitcomb, B. L. Trap, 1 male, 3 females (USNM). Walton Co., Grayton Beach, 26 October 2001, C. F. Hallmon, CO<sub>2</sub> baited CDC light trap, 2 females (FAMC).

### *Culicoides (Oecacta) furens* (Poey)

*Oecacta furens* Poey, 1853: 238 (Cuba).

*Culicoides furens*: Lutz 1912: 16 (combination).

*Culicoides (Oecacta) furens*: Khalaf 1954: 37; Blanton and Wirth 1979: 87 (Florida records); Wilkening et al. 1985: 521 (Florida records); Borkent and Grogan 2009: 15 (in catalog; distribution).  
*Culicoides dovei* Hall, 1932: 88 (Georgia).

**Discussion.** Wilkening et al. (1985) listed *C. furens* from 34 Florida counties, however, their records did not include Lee Co. despite that Blanton and Wirth (1979) listed two records from this county in their monograph of Florida *Culicoides*. We provide additional records from Lee and Wakulla counties.

**New records.** Lee Co., Sanibel Island, Beach at Middle Gulf Drive, 25-IX-2006, W. A. Tanguay, Biting man at dusk, 4 females (WLGC). Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 3 females (BUTC).

### *Culicoides (Oecacta) stellifer* (Coquillett)

*Ceratopogon stellifer* Coquillett, 1901: 604 (Washington, D. C.).  
*Culicoides stellifer*: Kieffer 1906:55 (combination).  
*Culicoides (Oecacta) stellifer*: Khalaf 1954: 37; Blanton and Wirth 1979: 149 (Florida records); Wilkening et al. 1985: 521 (Florida records); Borkent and Grogan 2009: 15 (in Nearctic catalog; distribution).

**Discussion.** This widespread Nearctic species was listed by Wilkening et al. (1985) from 32 Florida counties. We provide the first records from Bay and Okaloosa counties and an additional record from Walton Co.

**New records.** Bay Co., Callaway, Plantation Drive, 12 March-11 November 2002, C. F. Hallmon, CO<sub>2</sub> baited CDC light trap, 17 females (FAMC; WLGC). Okaloosa Co., 5 November 2002, C. F. Hallmon, CO<sub>2</sub> baited CDC light trap, 1 female (FAMC). Walton Co., Grayton Beach, C. F. Hallmon, CO<sub>2</sub> baited CDC light trap, 1 female (FAMC).

### *Culicoides (Silvaticulicoides) mulrennani* Beck

*Culicoides mulrennani* Beck, 1957: 103 (Florida).  
*Culicoides (Drymodesmyia) mulrennani*: Vargas 1960: 40 (*mulrennani* sic).  
*Culicoides (Oecacta) mulrennani*: Wirth 1965: 129 (in Nearctic catalog).  
*Culicoides (Silvaticulicoides) mulrennani*: Borkent and Grogan 2009: 15 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) only listed this eastern species from the Florida panhandle in Escambia, Gulf, Jackson, Liberty and Taylor counties. We provide the first records from Bay Co.

**New records.** Bay Co., Callaway, Plantation Drive, 5-May-3 December 2002, C. F. Hallmon, CO<sub>2</sub> baited CDC light trap, 3 females (FAMC; WLGC).

### *Culicoides (Silvaticulicoides) spinosus* Root and Hoffman

*Culicoides spinosus* Root and Hoffman, 1937: 172 (Maryland).  
*Culicoides (Oecacta) spinosus*: Khalaf 1954: 38; Blanton and Wirth 1979: 146 (Florida records); Wilkening et al. 1985: 521 (Florida records).  
*Culicoides (Silvaticulicoides) spinosus*: Borkent and Grogan 2009: 15 (in Nearctic catalog; distribution).



**Discussion.** Wilkening et al. (1985) listed this eastern species from 16 Florida counties. We provide the first records from Bay Co.

**New records.** Bay Co., Panama City, Frankford Avenue, 17 December 2002, J. Cilek, CO<sub>2</sub> baited CDC light trap, 1 female, same data except 18 March -19 November 2002, C. F. Hallmon, 2 females; Callaway, Plantation Drive, 18 March-19 November 2002, C. F. Hallmon, CO<sub>2</sub> baited CDC light trap, 2 females (FAMC).

### Species Unplaced to Subgenus

#### Piliferus species group

##### *Culicoides scanloni* Wirth and Hubert

*Culicoides (Oecacta) scanloni* Wirth and Hubert, 1962: 187 (Virginia; review of eastern USA piliferus group); Blanton and Wirth 1979: 142 (Florida records); Wilkening et al. 1985: 522 (Florida records). *Culicoides scanloni*: Borkent and Grogan 2009: 17 (in Nearctic catalog; piliferus group; distribution).

**Discussion.** This eastern species was listed by Wilkening et al. (1985) from 13 Florida counties including Wakulla Co. We provide an additional record from that county.

**New records.** Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 male (BUTC).

#### Stonei species group

##### *Culicoides pallidicornis* Kieffer

*Culicoides pallidicornis* Kieffer, 1919a: 46 (Hungary, Romania); Borkent and Grogan 2009: 17 (in Nearctic catalog; stonei group; distribution; *C. niger* as synonym).

*Culicoides (Oecacta) pallidicornis*: Khalaf 1954: 38.

*Culicoides niger* Root and Hoffman, 1937: 168 (Maryland).

*Culicoides (Oecacta) niger*: Khalaf 1954: 38; Blanton and Wirth 1979: 126 (Florida records); Wilkening et al. 1985: 522 (Florida records).

**Discussion.** Wilkening et al. (1985) listed this Holarctic species (as *C. niger*) from 26 Florida counties including Wakulla Co. We provide additional records from Wakulla Co. and the first record from Bay Co.

**New records.** Bay Co., Callaway, Plantation Drive, 25-March-2002, C. F. Hallmon, 1 female (WLGC). Wakulla Co., Wakulla Springs St. Pk., swamp on Lodge Rd., 25-26-V-2004, S. Murphree, CDC LT, 2 males (WLGC).

##### *Culicoides tissoti* Wirth and Blanton

*Culicoides tissoti* Wirth and Blanton, 1966: 279 (Florida); Borkent and Grogan 2009: 17 (in Nearctic catalog; stonei group; distribution).

*Culicoides (Oecacta) tissoti*: Blanton and Wirth 1979: 154 (Florida records); Wilkening et al. 1985: 522 (Florida records).

**Discussion.** This rarely collected species is still only known from the three states it was originally described from: Florida, Maryland and South Carolina. Wilkening et al. (1985) listed it from seven counties in northern Florida and Wakulla Co. in the eastern section of the panhandle. We provide the first records from Bay and Santa Rosa counties in the western portion of the panhandle.

**New records.** Bay Co., Callaway, Plantation Drive, 10 September 2001, C. F. Hallmon, CO<sub>2</sub> baited CDC light trap, 1 female (FAMC); same data except 18 March 2002, 1 female (WLGC). Santa Rosa Co., 16 April 2002, C. F. Hallmon, CO<sub>2</sub> baited CDC light trap, 1 female (FAMC).

### Unplaced to species group

#### *Culicoides travisi* Vargas

*Culicoides simulans* Root and Hoffman, 1937: 167 (Maryland; preoccupied by *Culicoides simulans* Vimmer, 1932).

*Culicoides travisi* Vargas, 1949: 233 (new name for *C. simulans* Root and Hoffman); Beck 1952: 104 (Florida records); Hribar and Grogan 2005: 232 (Monroe Co., Florida records); Borkent and Grogan 2009: 17 (in Nearctic catalog; distribution).

*Culicoides (Oecacta) travisi*: Blanton and Wirth 1979: 159 (Florida records); Wilkening et al. 1985: 522 (Florida records).

*Culicoides horneae* Foote and Pratt, 1954: 25 (New York).

**Discussion.** In her study of 30,000 specimens of *Culicoides* collected in 29 Florida counties from November 1948 to September 1950, Elisabeth Beck (1952) provided the first records of *C. travisi* in the state in Escambia, Lake and Taylor counties. However, Blanton and Wirth (1979) apparently overlooked Beck's (1952) records from these three counties when they only noted that "E. Beck (1956) stated that she had taken *Culicoides travisi* in northern and central Florida counties." In the same paragraph, Blanton and Wirth continued with "Our records are from 5 counties, all in the panhandle:...", but inexplicably, they only provided locality data of specimens from Franklin, Jackson, Taylor and Wakulla counties. Furthermore, their Florida map of this species also included locality records in Dixie and Liberty counties. More recently, Hribar and Grogan (2005) provided the first records from Monroe Co.

### Tribe Ceratopogonini

#### *Allohelea distortifemur* Wirth

*Allohelea distortifemur* Wirth, 1991: 499 (Florida; revision of New World *Allohelea*); Borkent and Grogan 2009: 18 (in Nearctic catalog; distribution).

**Discussion.** This distinctive, recently described species is known only from the type series (15 males, 21 females) collected by Dr. Wirth in St. Joseph State Park, Gulf Co., Florida.

***Allohelea johannseni* (Wirth)**

*Monohelea johannseni* Wirth, 1953b: 153 (Virginia).

*Monohelea (Allohelea) johannseni*: Wilkening et al. 1985: 524 (Florida records).

*Allohelea johannseni*: Wirth and Grogan 1988: 15 (combination); Wirth 1991: 498 (revision of New World *Allohelea* Kieffer); Borkent and Grogan 2009: 18 (in Nearctic catalog; distribution).

**Discussion.** This common eastern species was listed by Wilkening et al. (1985) from 19 Florida counties. However, in his revision of *Allohelea*, Wirth (1991) did not include Jefferson, Leon, Orange and Sarasota counties in his list of specimens he examined of *A. johannseni* but provided the first records from Manatee Co.

***Allohelea nebulosa* (Coquillett)**

*Ceratopogon nebulosus* Coquillett, 1901: 606 (New Jersey).

*Ceratolophus nebulosus*: Kieffer 1906: 60 (combination).

*Johansenniella nebulosa*: Malloch 1914b: 226 (combination).

*Hartomyia nebulosa*: Malloch 1915a: 340 (combination).

*Monohelea nebulosa*: Kieffer 1917: 312 (combination).

*Monohelea (Allohelea) nebulosa*: Wilkening et al. 1985: 524 (Florida records).

*Allohelea nebulosa*: Wirth and Grogan 1988: 15 (combination); Wirth 1991: 494 (revision of New World *Allohelea*); (Borkent and Grogan 2009: 18 (in Nearctic catalog; distribution).

**Discussion.** This common eastern species was listed by Wilkening et al. (1985) from 14 Florida counties including Wakulla Co. We provide additional records from that county. In his revision of *Allohelea*, Wirth (1991) did not include Bay, Escambia, Highlands, Jackson and Leon counties in the list of *A. nebulosa* he examined.

**New records.** Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 2 females (BUTC).

***Allohelea pedicellata* Wirth**

*Allohelea pedicellata* Wirth, 1991: 502 (Florida; revision of New World *Allohelea*); Borkent and Grogan 2009: 18 (in Nearctic catalog; distribution).

**Discussion.** This recently described species is only known from females collected in extreme southern Alabama and Georgia and nearby western Florida. It has only been collected in the panhandle region of Florida from Baker (holotype), Jackson, Jefferson, Leon, Liberty and Santa Rosa counties.

***Allohelea weemsi* Wirth**

*Allohelea weemsi* Wirth, 1991: 501 (Florida; revision of New World *Allohelea*); Borkent and Grogan 2009: 18 (in Nearctic catalog; distribution).

**Discussion.** This recently described species is known only from Florida in Alachua, Highlands (Holotype, Allotype), Liberty and Santa Rosa counties.

***Alluaudomyia bella* (Coquillett)**

*Ceratopogon bellus* Coquillett, 1902: 87 (Washington D.C.).

*Culicoides bellus*: Kieffer 1906: 54 (combination).

*Neoceratopogon bellus*: Malloch 1915b: 310 (combination).

*Alluaudomyia bella*: Wirth 1952b: 425 (revision of Nearctic *Alluaudomyia* Kieffer); Wilkenning et al. 1985: 523 (Florida records); Grogan and Borkent 2009: 18 (in Nearctic catalog; distribution).

*Isoeacta poeyi* Garrett, 1925: 9 (British Columbia).

**Discussion.** This very common Nearctic species was listed by Wilkenning et al. (1985) from 24 Florida counties. We provide the first records from Highlands and Wakulla counties.

**New records.** Highlands Co., Archbold Biol. Stat., 13-19 April 1989, W. W. Wirth, light trap, 1 male (FSCA). Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 2 males, 2 females (BUTC; WLGC).

***Alluaudomyia caribbeana* Spinelli and Wirth**

*Alluaudomyia caribbeana* Spinelli and Wirth, 1984: 678. (Belize); Borkent and Grogan 2009: 18 (in Nearctic catalog; distribution).

**Discussion.** This is a wide ranging primarily Neotropical species that is known from the southern United States in Arizona, California, Florida and Texas, Sinaloa, Mexico south throughout Central America to Colombia and Venezuela, and in the Caribbean region in Haiti, Jamaica and Puerto Rico (Borkent and Spinelli 2007). However, this species was not included in the list of Florida biting midges by Wilkenning et al. (1985), probably because it was published just prior to their review. It is known only in Florida by a female collected in Dade Co. (Spinelli and Wirth 1984).

***Alluaudomyia needhami* Thomsen**

*Alluaudomyia needhami* Thomsen, 1935: 287 (New York); Wilkenning et al. 1985: 523 (Florida records); Borkent and Grogan 2009: 18 (in Nearctic catalog; distribution).

**Discussion.** This widespread Nearctic species was only listed by Wilkenning et al. (1985) in Florida from Alachua and Liberty counties. We provide the first records from Orange and Wakulla counties.

**New records.** Orange Co., Hope, Maitland Lake, 5-VIII-1988, W. W. Wirth, UVLT, 1 female (FSCA). Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 female (BUTC); same data except swamp on Lodge Road, 25-26 May 2004, CDC LT, 2 females, 1 male (WLGC).

***Alluaudomyia paraspina* Wirth**

*Alluaudomyia paraspina* Wirth, 1952b: 429 (Georgia); Wilkenning et al. 1985: 523 (Florida records); Borkent and Grogan 2009: 18 (in Nearctic catalog; distribution).

**Discussion.** This Nearctic species ranges from Alaska and British Columbia to Nova Scotia, south to Florida and Louisiana (Borkent and Grogan 2009). Wilkening et al. (1985) listed it from nine counties in Florida. We provide the first record from Orange Co.

**New records.** Orange Co., Lake Hope, 8-IV-1985, W. W. Wirth, UVLT, 1 male (FSCA).

### *Alluaudomyia parva* Wirth

*Alluaudomyia parva* Wirth, 1952b: 431 (Florida); Wilkening et al. 1985: 523 (Florida records); Borkent and Grogan 2009: 18 (in Nearctic catalog; distribution).

*Alluaudomyia downesi* Wirth, 1952b: 433 (Virginia).

**Discussion.** Wilkening et al. (1985) listed this common Nearctic species from 11 Florida counties. We provide the first records from Wakulla Co.

**New records.** Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 male, 1 female (BUTC; WLGC).

### *Brachypogon (Brachypogon) canadensis* Downes

*Brachypogon canadensis* Downes, 1976: 1147 (Canada); Wilkening et al. 1985: 523 (Florida records).

*Brachypogon (Brachypogon) canadensis*: Wirth and Grogan 1988: 28 (revision of world Ceratopogonini); Borkent and Grogan 2009: 19 (in Nearctic catalog; distribution).

**Discussion.** In his original description, Downes (1976) designated paratypes of this common eastern Nearctic species from Alachua, Bradford, Franklin, Gulf, Liberty, Orange, Putnam and Santa Rosa counties in Florida. Wilkening et al. (1985) also listed this species from Escambia Co. We provide the first records from Highlands and Wakulla counties.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, 3 April 1992, W. W. Wirth, Malaise trap, 1 female; same data except 1-IV-1990, 2 females; same data except Price Tract, IX-1990, 2 females (FSCA). Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 female (WLGC).

### *Brachypogon (Brachypogon) woodruffi* Spinelli and Grogan

*Brachypogon (Brachypogon) woodruffi* Spinelli and Grogan, 1998: 72 (Dominican Republic).

**Discussion.** We examined several specimens of *B. woodruffi* from Levy Co. collected by USDA personnel and USNM specimens from Collier, Dade, Indian River, Monroe and Orange counties that we compared with the holotype and allotype in the FSCA. These Florida specimens represent the first records of this species from the United States [**New continental US record**]. These plus two related undescribed species will be addressed by a study in progress by Swanson and Grogan.

### *Ceratoculicoides blantoni* Wirth and Ratanaworabhan

*Ceratoculicoides blantoni* Wirth and Ratanaworabhan, 1971: 174 (Maryland); Borkent and Grogan 2009: 19 (in Nearctic catalog; distribution).

**Discussion.** Currently, only three species of *Ceratoculicoides* Wirth and Ratanaworabhan are known from the United States and Canada (Borkent and Grogan 2009). The type-species, *C. longipennis* (Wirth), ranges from British Columbia and Quebec, south to California, Utah and Florida, whereas *C. virginianus* (Wirth) occurs from Ontario south to Texas and Florida (Borkent and Grogan 2009). The third Nearctic species, *C. blantoni* Wirth and Ratanaworabhan, is known only from Maryland, Virginia and Ontario (Borkent and Grogan 2009).

Wilkening et al. (1985) recorded two species from northern Florida: *C. longipennis*, from Liberty Co.; and, *C. virginianus* from Alachua, Liberty, Marion and Putnam counties. We discovered a female of *C. blantoni*, in the FSCA that agrees with the original description and illustrations and is similar in size with a female from Maryland (WLG). This specimen is the first record of this rarely collected species from Florida and it suggests that it may be more widely distributed in the eastern United States than current records indicate.

**New records.** Levy Co., Yankeetown, 2-I-1993, Alan Wilkening, light trap with CO<sub>2</sub>, 1 female (FSCA).  
**New Florida state record.**

### *Downshelea multilineata* (Lutz)

*Palpomyia multilineata* Lutz, 1914: 93 (Brazil).

*Monohelea multilineata*: Johannsen 1943: 781 (combination).

*Monohelea (Allohelea) multilineata*: Wilkening et al. 1985: 524 (Florida records).

*Downshelea multilineata*: Wirth and Grogan 1988: 52 (combination); Borkent and Spinelli 2000: 47 (in Neotropical catalog; distribution); Borkent and Grogan 2009: 20 (in Nearctic catalog; distribution).

**Discussion.** This Neotropical species is known from Panama, Guyana, Brazil and Puerto Rico (Borkent and Spinelli 2000). Wilkening et al. (1985) provided the first record of this species from the United States, a female from Lee Co., Sanibel Island, Florida collected during 1963 by G. Quinn (USNM).

### *Downshelea stonei* (Wirth)

*Monohelea (Monohelea) stonei* Wirth, 1953b: 148 (Louisiana); Wirth and Williams 1964: 303 (new state records; distribution)

*Monohelea (Allohelea) stonei*: Wilkening et al. 1985: 524 (Florida records).

*Downshelea stonei*: Wirth and Grogan 1988: 52 (combination); Borkent and Grogan 2009: 20 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) listed this common eastern species from 27 Florida counties. We provide the first records from Brevard, Broward, Charlotte, Dixie, Flagler, Franklin, Gadsden, Gilchrist, Hamilton, Hardee, Hendry, Hillsborough, Holmes, Lafayette, Lake, Manatee, Martin, Nassau, Pinellas, St. Johns, Suwannee and Washington counties.

**New records.** Brevard Co., Alenhurst, Nov. 1957, S. B. D. & Health, 1 female; Grant, X-1961, S. B. H., 1 female. Broward Co., Grant, VI-1961, S. B. H., 1 female. Charlotte Co., Punta Gorda, Aug. 1961, S. B. H., 1 male. Dixie Co., Steinhatchee, Sept. 1961, S. B. H., 38 females, 18 males; Cross City, IX-1965, S. B. H., 2 males. Flagler Co., Flagler Beach, Oct. 1961, S. B. H., 4 females; same data except N. Flagler, X-1961, 1 female. Franklin Co., Appalachicola, X-1961. S. B. H., 6 females, 2 males. Gadsden Co. (no town

given), May 1961, S. B. H., 1 male. Gilchrist Co., Suwannee R., V-1961, G. K. Hicks, 5 females, 2 males; Trenton, IX-1961, S. B. H., 1 female; no town given, 26 May 1960, Gerald Hicks, L. T., 1 female; Gilchrist-Suwannee Co. line, Santa Fe River at SR 129, VII-1981, Paul M. Choate, BLT, 1 male. Hamilton Co., Jasper, IX-1961, S. B. H., 1 male. Hardee Co., Ona, 16-VIII-1967, F. S. Blanton, 1 female, 1 male. Hendry Co., Clewiston, Oct. 1961, S. B. H., 1 female. Hillsborough Co., Plant City, Oct. 1961, S. B. H., 1 female, 1 male; same data except Tampa, Sept. 1961, 1 female; Harris Swamp, 6-IV-1967, 1 female, 2 males. Holmes Co., Bonefay, 14-IV-1961, S. B. H., 1 female. Lafayette Co., Mayo, May-Sept. 1961, S. B. H., 5 females. Lake Co., Leesburg, Oct. 1961, 1 male; Goose Prairie, Oct. 1961, S. B. H., 1 female, 1 male. Manatee Co., Bradenton, Sept. 1961, S. B. H., 2 females; Cortez, Sept. 1960, S. B. H., 6 females. Martin Co., Salerno, VII-VIII-1961, S. B. H., 1 female; same data except V-VI-1966, 1 female; same data except XI-1961, 2 females. Nassau Co., Fernandina, IV-1961, S. B. H., 1 male. Pinellas Co., Largo, April-June 1961, S. B. H., 1 male. St. Johns Co., N. Ponte Vedra, Oct. 1961, S. B. H., 2 females. Suwannee Co., Branford, Oct-Dec. 1965, S. B. H., 1 female. Washington Co., Greenhead, Sept. 1961, S. B. H., 4 females (all in FSCA).

### ***Echinohelea lanei* Wirth**

*Echinohelea lanei* Wirth, 1951: 319 (Virginia); Wilkening et al. 1985: 524 (Florida records); Wirth 1994b: 234 (revision of New World species; distribution); Borkent and Grogan 2009: 20 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) listed this common eastern species from nine Florida counties, and Wirth (1994b) added a single record from Hillsborough Co. that we list below.

**New records.** Hillsborough Co., Harris Swamp, 13-IV-1967, 1 female (Wirth 1994b).

### ***Monohelea bifurcata* Wirth and Williams**

*Monohelea (Monohelea) bifurcata* Wirth and Williams, 1964: 308 (Massachusetts); Wilkening et al. 1985: 524 (Florida records).  
*Monohelea bifurcata*: Borkent and Grogan 2009: 20 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) listed this moderately common eastern species in Florida from Alachua, Calhoun, Liberty, Santa Rosa and Wakulla counties. We provide the first records from Highlands Co.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, 1 April 1991, W. W. Wirth, at UV light, 1 male; same data except Buck Island Ranch, IV-1991, 1 female (FSCA).

### ***Monohelea macfieii* Wirth**

*Monohelea (Monohelea) macfieii* Wirth, 1953b: 143 (Louisiana); Wilkening et al. 1985: 524 (Florida records).  
*Monohelea macfieii*: Borkent and Grogan 2009: 20 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) presented the first record of this wide ranging Nearctic species from Florida (Indian River Co). We provide the first records from Franklin, Jefferson, Highlands and Lee counties.

**New records.** Franklin Co., nr. Sumatra, Rights' Lake, G. B. Fairchild, B. L. trap, 1 female (FSCA). Jefferson Co., Monticello, W. H. Whitcomb, IV-1969, B. L. trap, 2 females; same data except IX-1969, 2 females, 1 male; same data except X-1969, 1 male (FSCA). Highlands Co., Lake Placid, Archbold Biological Station, Sept. 1990, W. W. Wirth, at UV light, 1 female (FSCA). Lee Co., Sanibel Island, 11 May 1973, W. W. Wirth, light trap, 1 female (FSCA).

### ***Monohelea maculipennis* (Coquillett)**

*Ceratopogon maculipennis* Coquillett, 1905: 64 (Florida).

*Monohelea maculipennis*: Kieffer 1917: 312 (combination); Borkent and Grogan 2009: 20 (in Nearctic catalog; distribution).

*Monohelea (Monohelea) maculipennis*: Wirth 1953b: 140 (review of New World *Monohelea* Kieffer; distribution); Wilkening et al. 1985: 525 (Florida records).

**Discussion.** Wilkening et al. (1985) listed this primarily Neotropical species from 19 Florida counties. We provide the first records from Brevard, Broward, Charlotte, Dixie, Gilchrist, Hillsborough, Lake, Martin, Okeechobee, Pasco and St. Johns counties.

**New records.** Brevard Co., Grant, VIII-1961, S. B. H., 1 male. Broward Co., Riverland, V-1961, S. B. H., 1 male (FSCA). Charlotte Co., Punta Gorda, Nov. 1961, S. B. H., 1 female (FSCA). Dixie Co., Cross City, IX-1965, S. B. H., 1 female; 10 miles south of Steinhatchee, CR-361, 24-VII-1982, Paul Choate, 1 female (FSCA). Gilchrist Co., Suwannee R., 15-VI-1962, G. K. Hicks, 1 female; same data except no town given, 3 July 1960, 1 female (FSCA). Hillsborough Co., Harris Swamp, III-13-IV-1967, 3 females (FSCA). Lake Co., Leesburg, June 1961, S. B. H., 1 female, 1 male (FSCA). Martin Co., Port Mayaca, V-VI-1961, S. B. H., 1 female; same data except Salerno, V-VI-1961, 1 female (FSCA). Okeechobee Co., Okeechobee, June 1961, S. B. H., 1 female (FSCA). Pasco, Port Richey, June-July 1961, S. B. H., 1 female (FSCA). St. Johns Co., Crescent Beach, May 1961, S. B. H., 1 male (FSCA).

### ***Monohelea texana* Wirth**

*Monohelea (Monohelea) texana* Wirth, 1953b: 143 (Texas); Wilkening et al. 1985: 525 (Florida records).

*Monohelea texana*: Borkent and Grogan 2009: 20 (in Nearctic catalog; distribution).

**Discussion.** This species inhabits the extreme southern portion of the United States (Borkent and Grogan 2009). Wilkening et al. (1985) listed it in Florida from Alachua, Levy and Orange counties. We provide the first records from Holmes and Manatee counties.

**New records.** Holmes Co., Bonefay, Sept. 1961, S. B. H., 1 female (FSCA). Manatee Co., Bradenton, Sept. 1961, S. B. H., 1 male (FSCA).

### ***Parabezzia bystraki* Grogan and Wirth**

*Parabezzia bystraki* Grogan and Wirth, 1977a: 70 (Maryland); Wilkening et al. 1985: 525 (Florida records);

Borkent and Grogan 2009: 21 (in Nearctic catalog; distribution).

**Discussion.** Grogan and Wirth (1977a) designated paratypes of this rarely collected species from Alachua, Franklin and Liberty counties in Florida, and, it is also known from Maryland. We provide the first record from Wakulla Co.



**New records.** Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 female (BUTC).

### ***Rhynchohelea monilicornis* Wirth and Blanton**

*Rhynchohelea monilicornis* Wirth and Blanton, 1970: 98 (Florida); Wilkening et al. 1985: 525 (Florida records); Borkent and Grogan 2009: 21 (in Nearctic catalog; distribution).

**Discussion.** This minute, very rare New World species was originally described from three females, the holotype and paratype from Liberty Co., Florida and a female paratype from Imperial Co., California (Wirth and Blanton 1970). Wilkening et al. (1985) added another Florida record from Marion Co., and we provide the first records from Highlands Co. Inexplicably, Borkent and Grogan (2009) did not include California in their distribution section of this species, but they also included Costa Rica based on recently collected specimens in the INBio collection in San Jose, Costa Rica.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, 3 April 1992, W. W. Wirth, Malaise trap, 1 female; same data except Price tract, 1-IV-1990, 1 female (FSCA).

### ***Stilobezzia (Acanthohelea) stonei* Wirth**

*Stilobezzia (Neostilobezzia) stonei* Wirth, 1953a: 66 (Virginia); Wilkening et al. 1985: 525 (Florida records). *Stilobezzia (Acanthohelea) stonei*: Borkent and Wirth 1997: 109 (in World catalog); Borkent and Grogan 2009: 22 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) listed this common eastern species from 15 Florida counties including Wakulla Co. We provide additional records from this county.

**New records.** Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 male, 1 female; same data except: spring 300 m E of Wakulla Spring, NJ light trap, 1 female (BUTC).

### ***Stilobezzia (Eukraiohelea) amnigena* (Macfie)**

*Eukraiohelea amnigena* Macfie, 1935: 56 (Brazil).

*Stilobezzia (Eukraiohelea) amnigena*: Lane and Forattini 1958: 203 (combination); Wirth and Spinelli 1992a: 346 (review of New World *Eukraiohelea* Ingram and Macfie; Florida and South Carolina records); Borkent and Grogan 2009: 22 (in Nearctic catalog; distribution).

*Stilobezzia (Eukraiohelea) elegantula* (Johannsen): Johannsen 1907: 109 (in part); Wirth 1953a: 62 (in part; review of North American *Stilobezzia* Kieffer).

**Discussion.** Wirth and Spinelli (1992a) noted that Wirth (1953a) and Wirth and Grogan (1981) identified some males of *S. amnigena* from Florida as *S. elegantula*. Wirth and Spinelli provided illustrations of the male genitalia of both species and noted that in males of *S. amnigena*, sternite 9 is concave caudomedially, the apicolateral processes on tergite 9 are slender, the gonostylus is swollen in mid portion, and the parameres have partially or entirely separated basal apodemes and the slender distal portions with narrow apices that are recurved 90° ventrally. In males of *S. elegantula*, sternite 9 is convex caudomedially, the apicolateral processes on tergite 9 are broader, the parameres have longer attached basal apodemes with the distal portions very broad on their distal halves and their tips are abruptly tapered and ventrally

directed. In their key to American species of *Stilobezzia* (*Eukraiohelea*), Wirth and Spinelli (1992a) stated that females of *S. amnigena* are large, with “wing length about 2.00; costal ratio 0.80.” For females of *S. elegantula*, they gave mean and ranges of wing length of 1.40 (1.36-1.46 mm, n=5) and costal ratio 0.75 (0.75-0.78). As noted in our account of *S. elegantula* below, we measured wing lengths and costal ratios of 35 females of that species from Alachua Co. as well as three females from Alachua and two females from Wakulla counties of *S. amnigena*. Our data confirm that females of *S. amnigena* are indeed large with mean/range of wing length 1.90 (1.79-2.02 mm, n=5), however, their costal ratio was 0.75 (0.74-0.77, n=5), and therefore, we suggest that costal ratio is not a significant distinguishing feature between these two species. Wirth and Spinelli (1992a) examined Florida specimens of *S. amnigena* from Alachua, Dade, Jefferson, Leon, Putnam, Santa Rosa and Wakulla counties. We provide an additional record from Wakulla Co.

**New records.** Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 2 females (WLG).

### *Stilobezzia* (*Eukraiohelea*) *elegantula* (Johannsen)

*Bezzia elegantula* Johannsen, 1907: 109 (Kansas).

*Probezzia elegantula*: Malloch 1914a: 137 (combination).

*Parabezzia elegantula*: Malloch 1915a: 359 (combination).

*Parabezzia* (*Eukraiohelea*) *elegantula*: Johannsen 1934: 345.

*Eukraiohelea elegantula*: Johannsen 1943: 781 (combination).

*Stilobezzia* (*Eukraiohelea*) *elegantula*: Wirth 1953a: 62 (revision of Nearctic *Stilobezzia*); Wilkenning et al. 1985: 525 (Florida records); Wirth and Spinelli 1992a: 343 (review of New World *Eukraiohelea*); Borkent and Grogan 2009: 22 (in Nearctic catalog; distribution).

*Stilobezzia* (*Eukraiohelea*) *maculitibia* Lane and Forattini, 1956: 207 (Panama); Wirth and Spinelli 1992a: 344 (synonym of *S. elegantula*).

**Discussion.** Wirth and Spinelli (1992a) only listed specimens they examined and identified as *S. elegantula* from Alachua, Orange, Putnam and Sarasota counties in Florida. However, Wilkenning et al. (1985) listed this species from Alachua, Bay, Citrus, Dade and Hillsborough counties, but, their records from the latter four counties probably represent specimens of *S. amnigena*. We examined approximately 150 slide-mounted specimens in the FSCA as well as two females and two males in WLG's collection from Alachua Co., Florida and a male from Prince Georges Co., Maryland that were labeled by Wirth as *S. elegantula*, and, all except one female appear to be that species. This female plus the two females and two males from Alachua Co. and the Maryland male are actually examples of *S. amnigena*. As noted by Wirth and Spinelli (1992a), males of both species have distinctive differences in their genitalia, but are otherwise very similar morphologically. Wirth and Spinelli (1992a) provided the wing length of a male *S. elegantula* as 1.25 mm, and we measured 36 males of this species from Alachua Co. with a mean wing length of 1.21 mm and range of 1.15-1.27 mm. However, two males from Alachua Co. and one Maryland male of *S. amnigena* had a mean wing length of 1.62 mm and range of 1.53-1.69 mm. Therefore, it is now apparent that males of *S. amnigena* are considerably larger than those of *S. elegantula*, and this is apparently a distinct morphometric difference between males of these otherwise very similar species.

### *Stilobezzia* (*Stilobezzia*) *beckae* Wirth

*Stilobezzia* (*Stilobezzia*) *beckae* Wirth, 1953a: 69 (Florida); Wilkenning et al. 1985: 526 (Florida records); Borkent and Grogan 2009: 22 (in Nearctic catalog; distribution).

**Discussion.** This moderately common eastern species was listed by Wilkening et al. (1985) from 12 Florida counties including Wakulla Co. We provide an additional record from Wakulla Co. and the first record from Highlands Co.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, 15-IV-1989, W. W. Wirth, at UV light, 1 female (P) (FSCA). Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 female (BUTC).

### ***Stilobezzia (Stilobezzia) bulla* Thomsen**

*Stilobezzia bulla* Thomsen, 1935: 289 (New York).

*Stilobezzia (Stilobezzia) bulla*: Wirth 1953a: 74; Wilkening et al. 1985: 526 (Florida records); Borkent and Grogan 2009: 22 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) recorded this common eastern species from Alachua, Baker, Citrus, Franklin, Gulf, Highlands, Jefferson, Leon, Liberty, Orange and Santa Rosa counties. Among material identified by Wirth as *S. bulla* in the FSCA are a female and male from Alachua Co., that are actually specimens of *S. thomsenae*, and their locality data are listed under that species. Porch et al. (1992) recorded a specimen from Walton Co. that was collected from a sundew, the first record of this species from that county that we include below.

**New records.** Walton Co., 19 May 1987, S. S. Porch, ex. *Drosera* sp., 1 female (AUCI).

### ***Stilobezzia (Stilobezzia) diversa* (Coquillett)**

*Ceratopogon diversus* Coquillett, 1901: 607 (New Jersey).

*Ceratolophus diversus*: Kieffer 1906: 60 (combination).

*Johannseniella diversa*: Malloch 1914b: 227 (combination).

*Hartomyia diversa*: Malloch 1915a: 344 (combination).

*Stilobezzia diversa*: Johannsen 1943: 781 (combination).

*Stilobezzia (Stilobezzia) diversa*: Wirth 1953a: 76 (revision of Nearctic *Stilobezzia*); Wilkening et al. 1985: 526 (Florida records); Borkent and Grogan 2009: 22 (in Nearctic catalog; distribution).

**Discussion.** This rarely collected eastern species was known only in Florida from Alachua Co. (Wilkening et al. 1985). We provide the first records from Liberty Co.

**New records.** Liberty Co., Torreya St. Park, 10-IV-1957, F. S. Blanton, 1 male, 1 female (FSCA).

### ***Stilobezzia (Stilobezzia) glauca* Macfie**

*Stilobezzia glauca* Macfie, 1939: 204 (Brazil).

*Stilobezzia (Stilobezzia) glauca*: Wirth 1953a: 77 (review of North American *Stilobezzia*; distribution); Wilkening et al. 1985: 526 (Florida records); Borkent and Grogan 2009: 22 (in Nearctic catalog; distribution).

**Discussion.** This wide ranging species occurs from Maryland south to Florida and Mississippi (Borkent and Grogan 2009), and Chiapas, Mexico south to Brazil (Borkent and Spinelli 2000). Wilkening et al.

(1985) only recorded it in Florida from Alachua and Gulf counties. We provide the first records from Escambia, Highlands, Leon, Orange and Sarasota counties.

**New records.** Escambia Co., Bratt, Pine Barren Creek, VI-1968, FS & DC Blanton, light trap, 1 male (FSCA). Highlands Co., Lake Placid, Archbold Biological Station, 1-IV-1990, W. W. Wirth, Malaise trap, 2 females (FSCA). Leon Co., 3 mi. N. Tallahassee, V-1970, F. S. Blanton, B. L. Trap, 1 female (FSCA). Orange Co., Rock Springs, 21 April 1970, W. W. Wirth, light trap, 1 female (FSCA). Sarasota Co., Myakka River St. Park, 21-V-1973, W. W. Wirth, light trap, 3 males (FSCA).

### ***Stilobezzia (Stilobezzia) kiefferi* Lane**

*Stilobezzia kiefferi* Lane, 1947: 205 (Brazil).

*Stilobezzia (Stilobezzia) kiefferi*: Das Gupta and Wirth 1968: 140; Wilkenning et al. 1985: 526 (Florida records); Borkent and Grogan 2009: 22 (in Nearctic catalog; distribution).

*Stilobezzia (Stilobezzia) punctipes* Wirth, 1953a: 79 (Florida); Wilkenning et al. 1985: 526 (as synonym of *S. kiefferi*).

**Discussion.** Wilkenning et al. (1985) recorded this primarily Neotropical species in Florida from Alachua, Citrus, Glades, Lake, Levy, Marion and Sarasota counties. We provide the first records from Collier, Hardee, Highlands and Putnam counties.

**New records.** Collier Co., Ochopée, Sept. 1971, F. S. Blanton, light trap, 1 female (FSCA). Hardee Co., Ona, July 1970, E. Irons, 3 females (FSCA). Highlands Co., Lake Placid, Archbold Biological Station, Sept. 1990, W. W. Wirth, at UV light, 2 females, 1 male; same data except Buck Is. Ranch, IV.1991, 1 female; same data except 6-IV-1991, 1 male (all FSCA). Putnam Co., Red Water Lake, Weems Property, 27-28-V-1967, F. S. Blanton, 2 males (FSCA).

### ***Stilobezzia (Stilobezzia) rabelloi* Lane**

*Stilobezzia rabelloi* Lane, 1947: 203 (Brazil).

*Stilobezzia (Stilobezzia) rabelloi*: Wirth 1953a: 81 (review of North American *Stilobezzia*); Wilkenning et al. 1985: 526 (Florida records); Borkent and Grogan 2009: 22 (in Nearctic catalog; distribution).

**Discussion.** This wide ranging, primarily Neotropical species occurs in North America from Maryland south to Louisiana and Florida (Borkent and Grogan 2009). Wilkenning et al. (1985) recorded it from 13 counties in Florida. We provide the first record from Lee Co.

**New records.** Lee Co., Ft. Myers, 7-IX-1961, H. W. Collins, Jr., black light trap, 1 female (P) (FSCA).

### ***Stilobezzia (Stilobezzia) thomsenae* Wirth**

*Stilobezzia (Stilobezzia) thomsenae* Wirth, 1953a: 83 (Florida); Wilkenning et al. 1985: 526 (Florida records); Borkent and Grogan 2009: 22 (in Nearctic catalog; distribution).

**Discussion.** Wirth's (1953a) original description of this species was based on the male holotype from Collier Co. and a female from Citrus Co. about which he stated "...is provisionally referred to *S. (S.) thomsenae*, since it resembles the male in coloration, although it may prove to be a dark specimen of *S. (S.) bulla*." Under "diagnostic characters" for *S. thomsenae*, Wirth (1953a) noted "Very closely related to, and almost indistinguishable from *bulla* Thomsen, except for the very characteristic male genitalia."

During ensuing years, Wirth identified and labeled approximately 30 slide-mounted females in the FSCA as *S. thomsenae* as well as a many more specimens as *S. bulla*. Our examination of these slide-mounted specimens of *S. bulla* and *S. thomsenae* in the FSCA revealed that the wing of both sexes of *S. bulla* have a narrow fringe of macrotrichia on the anterior wing margin past the terminus of the costa-radius and continues beyond the wing tip to at least the terminus of vein  $M_1$  and sometimes beyond  $M_2$ , especially in females. Among the FSCA material were three females and two males of *S. thomsenae* from Jamaica that lack macrotrichia on their anterior wing margins. Based on this fact, we determined that most of the FSCA material identified by Wirth as *S. thomsenae* are actually specimens of *S. bulla*, and therefore, WLG relabeled these "*Stilobezzia bulla* Thomsen, Det. Wm. L. Grogan, Jr."

Wilkening et al. (1985) listed *S. thomsenae* from Alachua, Calhoun, Citrus, Collier (holotype), Dade, Gilchrist, Glades, Gulf, Indian River, Jefferson, Liberty, Orange and Wakulla counties. However, in addition to the holotype male from Collier Co. (USNM), we can only confirm other specimens of *S. thomsenae* in the FSCA from Alachua, Dade, Glades and Indian River counties. We also provide the first records from Levy, Putnam, Sarasota and St. Lucie counties.

**New records.** Levy Co., Yankeetown, IV.1981, Alan Wilkening, light trap with  $CO_2$ , 1 female; same data except XI.1981, 1 female; same data except X.1981, 1 male (FSCA). Putnam Co., Bad Water Lake, Weems Property, 27-28-V-1967, F. S. Blanton, 1 male (FSCA). Sarasota Co., Myakka (*sic* as Miyaka), 16 March 1961, 3 females (FSCA). St. Lucie Co., Ft. Pierce, Chinese Farm, July 1987, Kai Lok Chan, ex. *Pistia (stratiodes)*, 2 females, 1 male; (no town given), 11 June-12 Nov. 1986, R. L. Escher, 2 females, 2 males; same data except HWY 614, 6 August 1986, 1 male (FSCA).

Other FSCA specimens examined: Alachua Co., 25 Feb. 1965-emerged 16 March 1965, reared from larva (soil sample), 1 female; Gainesville, Chantilly Acres, 19-V-1967, F. S. Blanton, 1 male; West Gainesville, VI-1968, Blanton & Fletcher, light trap, 1 male, 2 males same data except IX-1968; Island Grove, 1-VIII-1962, F. S. Blanton, 1 male. Dade Co., Orchid Jungle, May-June 1969, R. M. Baranowski, B. L. Trap, 3 males; Homestead, 17-X-1984, R. Woodruff & L. Stange, UVLT, 1 male. Glades Co., 8 March 1961, S. B. H., 1 female. Indian River Co., Fellesmere, 17-III-1956, LT, 1 female; Vero Beach, Nov. 1957, W. L. Bidlingmayer, 1 male; Vero Beach, Ent. Res. Center, Feb. 1959, light trap, 1 male.

### *Stilobezzia (Stilobezzia) viridis* (Coquillett)

*Ceratopogon viridis* Coquillett, 1901: 607 (New Jersey).

*Ceratolophus viridis*: Kieffer 1906: 61 (combination).

*Johannseniella viridis*: Malloch 1914b: 227 (combination).

*Hartomyia viridis*: Malloch 1915a: 342 (combination).

*Stilobezzia viridis*: Johannsen 1943: 781 (combination).

*Stilobezzia (Stilobezzia) viridis*: Wirth 1953a: 84 (combination; revision of Nearctic *Stilobezzia*); Wilkening et al. 1985: 526 (Florida records); Borkent and Grogan 2009: 22 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) recorded this moderately common eastern species from seven Florida counties, including Wakulla Co. We provide additional records from this county.

**New records.** Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 2 males, 1 female (BUTC).

## Tribe Heteromyiini

### *Clinohalea bimaculata* (Loew)

*Ceratopogon bimaculata* Loew, 1861: 311 (Washington D. C.).

*Johannseniella bimaculata*: Malloch 1914b: 227 (combination).

*Johannsenomyia bimaculata*: Malloch 1915a: 333 (combination).

*Clinohelea bimaculata*: Kieffer 1917: 317 (combination); Grogan and Wirth 1975a: 281 (revision of Nearctic *Clinohelea* Kieffer; distribution); Borkent and Grogan 2009: 23 (in Nearctic catalog; distribution).

**Discussion.** In their revision of the Nearctic species of *Clinohelea*, Grogan and Wirth (1975a) provided records of this very common species from 24 Florida counties including Wakulla Co. Subsequently, Wilkening et al. (1985) also listed this species from Columbia and Levy counties. We provide an additional record from Wakulla Co. In addition, Porch et al. (1992) recorded a specimen taken from a sundew in Santa Rosa Co., the first record from that county that we list below.

**New records.** Santa Rosa Co., 17 June 1987, S. S. Porch, ex. *Drosera* sp., 1 female. Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 female (BUTC).

### ***Heteromyia fasciata* Say**

*Heteromyia fasciata* Say, 1825: pl. 35 (North America); Wirth and Grogan 1977: 179 (review of Nearctic *Heteromyia* Say; distribution); Borkent and Grogan 2009: 23 (in Nearctic catalog; distribution).

*Ceratopogon festiva* Loew, 1861: 314 (Pennsylvania).

**Discussion.** Wilkening et al. (1985) listed this moderately common species from six Florida counties, including Wakulla Co. We provide an additional record from this county.

**New records.** Wakulla Springs St. Pk., swamp on Lodge Rd., 25-26-V-2004, S. Murphree, CDC LT, 1 female (WLGC).

### **Tribe Sphaeromiini**

#### ***Jenskinshalea albaria* (Coquillett)**

*Ceratopogon albaria* Coquillett, in Johnson, 1895: 308 (Florida).

*Johannseniella albaria*: Malloch 1914b: 228 (combination).

*Johannsenomyia albaria*: Malloch 1915a: 335 (combination; as synonym of *J. magnipennis* (Johannsen)).

*Jenskinshalea albaria*: Johannsen 1943: 783 (combination); Wilkening et al. 1985: 527 (Florida records); Borkent and Grogan 2009: 23 (in Nearctic catalog; distribution).

*Johannsenomyia aequalis* Malloch, 1915a: 336 (Illinois).

**Discussion.** This moderately common Nearctic species ranges from Ontario and Illinois, south to Texas and Florida (Grogan and Wirth 1977b). Wilkening et al. (1985) recorded this species in Florida from Alachua, Gilchrist, Glades, Hardee, Highlands, Jefferson, Putnam (holotype), and Sarasota counties. We provide the first record from Orange Co.

**New records.** Orange Co., Orlovista, 29-VI-1961, W. P. Henderson, citrus, 1 female (P) (FSCA).

***Jenskinshalea blantoni* Grogan and Wirth**

*Jenskinshalea blantoni* Grogan and Wirth, 1977b: 139 (Florida); Wilkening et al. 1985: 527 (Florida records); Borkent and Grogan 2009: 23 (in Nearctic catalog; distribution).

**Discussion.** This species is only known from the type series from Florida in Polk, Putnam (holotype, allotype), Santa Rosa and Wakulla counties (Grogan and Wirth 1977b). We provide the first records from Highlands Co.

**New records.** Highlands Co., Archbold Biological Station, Lake Annie, 13-19 April 1989, W. W. Wirth, Malaise trap, 2 females; same data except Lake Placid, 3-IV-1992, emerg. Trap, 1 male (FSCA).

***Johannsenomyia argentata* (Loew)**

*Ceratopogon argentatus* Loew, 1861: 310 (Washington D. C.).

*Sphaeromyias argentatus*: Johannsen 1905: 107 (combination; genus *sic*).

*Johannseniella argentata*: Malloch 1914b: 226 (combination).

*Johannsenomyia argentata*: Malloch 1915a: 334 (combination); Wilkening et al. 1985: 528 (Florida records); Borkent and Grogan 2009: 24 (in Nearctic catalog; distribution).

*Sphaeromyias argentata*: Kieffer 1917: 315 (combination).

*Dicrohelea argentata*: Johannsen 1943: 783 (combination).

*Johannsenomyia halteralis* Malloch, 1915a: 338 (Illinois).

**Discussion.** This species is known in Florida from Calhoun, Jackson, Orange and Santa Rosa counties (Wilkening et al. 1985). We provide the first record from Highlands Co.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, 1-IV-1993, W. W. Wirth, at UV light, 1 female (P) (FSCA).

***Mallochohelea albibasis* (Malloch)**

*Johannsenomyia albibasis* Malloch, 1915b: 315 (Illinois).

*Mallochohelea albibasis*: Wirth 1962: 279 (combination; distribution); Borkent and Grogan 2009: 24 (in Nearctic catalog; distribution).

**Discussion.** This wide ranging Nearctic species was previously known from the Northwest Territories to Quebec, south to California, Kansas and Alabama (Borkent and Grogan 2009). A female from Jefferson Co. is apparently the first record of this species from Florida.

**New records.** Jefferson Co., Monticello, W. H. Whitcomb, B. L. Trap, 1 female (FSCA). **New Florida state record.**

***Mallochohelea atripes* Wirth**

*Mallochohelea atripes* Wirth, 1962: 281 (New Jersey); Wilkening et al. 1985: 528 (Florida records); Borkent and Grogan 2009: 24 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) recorded this common eastern species from seven Florida counties. We provide the first records from Highlands, Orange and Wakulla counties.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, Sept. 1990, W. W. Wirth, at UV light, 1 female (FSCA). Orange Co., Maitland, Lake Hope, 29-IV-1984, W. W. Wirth, ULLT, 4 females; same data except 8-IV-1985, 2 females; same data except 25-VIII-1986, 1 female. Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 2 females (BUTC).

### ***Mallochohelea ?caudellii* (Coquillett)**

*Ceratopogon caudelli* Coquillett, 1905: 63 (British Columbia).

*Ceratolophus caudelli*: Kieffer 1906: 60 (combination).

*Johannseniella caudelli*: Malloch 1914b: 231 (combination).

*Johannsenomyia caudelli*: Malloch 1915a: 337 (combination).

*Sphaeromyias caudellii*: Kieffer 1917: 314 (combination).

*Mallochohelea caudellii*: Wirth 1962: 281 (combination; distribution); Borkent and Grogan 2009: 24 (in Nearctic catalog; distribution).

**Discussion.** Wilkening et al. (1985) noted that this western species was originally described from British Columbia and that their record from Jackson Co. was apparently the first from Florida. Our Wakulla Co. female differs in several aspects from two female *M. caudellii* from British Columbia and Washington that we compared it with, hence our tentative designation of this specimen. Because Wirth (1962) only listed records of *M. caudellii* from British Columbia, California, Arizona and Texas, we are now doubtful that it actually inhabits Florida.

**New records.** Wakulla Co., Wakulla Springs State Park, Lodge Road, S. Murphree, 25 May 2004, CDC light trap with UV wand, 1 female (WLGC).

### ***Probezzia albitibia* Wirth**

*Probezzia albitibia* Wirth, 1971: 732 (Virginia); Wirth 1994c: 140 (Florida records); Borkent and Grogan 2009: 25 (in Nearctic catalog; distribution).

**Discussion.** Borkent and Grogan (2009) gave the distribution of this Nearctic species as "Ontario to Quebec, south to Wisconsin and Virginia." However, Borkent and Grogan overlooked Wirth's (1994c) records from Jackson Co., Florida, who gave its distribution as "Wisconsin to Quebec, south to Alabama and Florida." We provide the first record from Alachua Co., a female that was apparently collected, mounted, identified and labeled as *P. albitibia* by Wirth.

**New records.** Alachua Co., Gainesville, Reclamation Pond (on Univ. of FL campus), 20-VII-1988, (?W. W. Wirth), 1 female (FSCA).

### ***Probezzia fairchildi* Wirth**

*Probezzia fairchildi* Wirth, 1994c: 142 (Florida); Borkent and Grogan 2009: 25 (in Nearctic catalog; distribution).



**Discussion.** Wirth (1994c) described this species from specimens collected in Baker, Jackson (holotype, allotype) and Leon counties in Florida, the only state from which it is known.

### *Probezzia meadi* Wirth

*Probezzia meadi* Wirth, 1994c: 143 (Florida); Borkent and Grogan 2009: 25 (in Nearctic catalog; distribution).

**Discussion.** This recently described species is known only from females collected in Tallapoosa Co., Alabama and the Florida panhandle in Escambia, Jackson (holotype), Leon and Santa Rosa counties (Wirth 1994c). We examined 11 paratypes in the FSCA.

### *Probezzia weemsi* Wirth

*Probezzia weemsi* Wirth, 1994c: 143 (Florida); Borkent and Grogan 2009: 25 (in Nearctic catalog; distribution).

**Discussion.** All 21 females and the single male in the type series of this recently described species were collected by Wirth via light trap at Florida Caverns State Park, Jackson Co. We examined 11 paratypes in the FSCA.

### *Probezzia wirthi* Spinelli and Grogan

*Probezzia wirthi* Spinelli and Grogan, 1997: 230 (Florida); Borkent and Grogan 2009: 25 (in Nearctic catalog; distribution).

**Discussion.** This recently described species is known only from the Blackwater River system in the western panhandle of Florida (holotype female, Blackwater River State Park, Santa Rosa Co.) and adjacent Alabama (allotype male, margin of the Blackwater River, Escambia Co., both in USNM).

### *Sphaeromyias longipennis* (Loew)

*Ceratopogon longipennis* Loew, 1861: 313 (Pennsylvania).

*Palpomyia* (*Sphaeromyias*) *longipennis*: Kieffer 1906: 62 (combination).

*Palpomyia longipennis*: Malloch 1914b: 221.

*Homohoelea longipennis*: Kieffer 1917: 364 (combination).

*Sphaeromyias longipennis*: Johannsen 1943: 784 (combination); Wilkening et al. 1985: 529 (Florida records); Borkent and Grogan 2009: 25 (in Nearctic catalog; distribution).

**Discussion.** This common Nearctic species occurs from Alberta to Quebec, south to California, Texas and Florida (Borkent and Grogan 2009). As noted by Wilkening et al. (1985), there is only one other species in North America, *S. bifidus* Wirth and Grogan (1979), which is known only from the holotype male and allotype female from Maryland. Wilkening et al. (1985) recorded *S. longipennis* from Alachua, Franklin, Highlands, Leon, Orange and Putnam counties in Florida. We provide the first record from Manatee Co.

**New records.** Manatee Co., Bradenton, 23-V-1955, F. W. Mead, at light, 1 female (P) (FSCA).

### Tribe Palpomyiini

#### ***Bezzia (Bezzia) expolita* (Coquillett)**

*Ceratopogon expolitus* Coquillett, 1901: 600 (New Jersey).

*Bezzia expolita*: Kieffer 1906: 58 (combination).

*Pseudobezzia expolita*: Malloch 1915a: 351 (combination).

*Allobezzia expolita*: Kieffer 1917: 328 (combination).

*Bezzia (Pseudobezzia) expolita*: Wirth 1951: 32; Dow and Turner 1976: 32 (revision of Nearctic *Bezzia* Kieffer).

*Bezzia (Bezzia) expolita*: Wilkening et al. 1985: 529; Borkent and Grogan 2009: 26 (in Nearctic catalog; distribution).

*Ceratopogon johnsoni* Coquillett, 1901: 600 (New Jersey).

**Discussion.** In their review of Florida ceratopogonids, Wilkening et al. (1985) listed *B. expolita*, but, they noted that Florida records were not available for this species, and a study in progress by WLG confirms this. Therefore, we are deleting this species from the Florida ceratopogonid fauna. However, specimens collected by WLG and others in the USNM in the *B. expolita* complex include several undescribed species that will be addressed by a study in progress by WLG.

#### ***Bezzia (Bezzia) flavitarsis* Malloch**

*Bezzia flavitarsis* Malloch, 1914c: 283 (Illinois).

*Bezzia (Pseudobezzia) flavitarsis*: Wirth 1951: 323; Dow and Turner 1976: 34 (revision of Nearctic *Bezzia*; distribution).

*Bezzia (Bezzia) flavitarsis*: Wilkening et al. 1985: 529 (Collier Co., Florida record); Borkent and Grogan 2009: 26 (in Nearctic catalog; distribution).

**Discussion.** This species is currently known from Ontario and New Brunswick, Canada and south to California, Montana and Florida (Borkent and Grogan 2009). Wilkening et al. (1985) recorded it only from Collier Co. in Florida. We provide the first records from Alachua, Highlands, Jackson, Leon and Liberty counties.

**New records.** Alachua Co., Gainesville, Chantilly Acres, 3 May-11 June 1967, F. S. Blanton, 7 females, 1 male (USNM); Gainesville, Oak Crest, 15-IV-1985, W. W. Wirth, UVLT, 1 female, same data except 4-IV-1986, 1 female (FSCA). Highlands Co., Sebring, Highlands Hamm. St. Park, 15-IV-1970, W. W. Wirth, light trap, 1 female (USNM). Jackson Co., Fla. Caverns St. Park, 26-V-1973, W. W. Wirth, light trap, 3 females, 6 males; same data except 24 April 1981, 2 females (USNM). Leon Co., Tallahassee, May 1970, F. S. Blanton, LT, 1 female (USNM). Liberty Co., Torreya St. Pk., 20-V-1966, H. V. Weems, 1 female; same data except 22 April 1967, 1 male (USNM).

#### ***Bezzia (Bezzia) imbifida* Dow and Turner**

*Bezzia (Pseudobezzia) imbifida* Dow and Turner, 1976: 38 (Maryland).

*Bezzia (Bezzia) imbifida*: Borkent and Grogan 2009: 26 (in Nearctic catalog; distribution).

**Discussion.** The type series of this species was from Worcester Co., Maryland, but it was also recently recorded from Ontario and Virginia (Borkent and Grogan 2009). We have identified three females of this species from Liberty Co., Florida in the USNM, but no co-associated males which have distinctive male genitalia. These Florida specimens and others from Connecticut and Louisiana (USNM) will be addressed by a study in progress by WLG of the *Bezzia expolita* complex.

**New records.** Liberty Co., Torreya St. Park, 29-V-1966, H. V. Weems, 1 female; same data except 22 Apr. 1967, W. W. Wirth, light trap, 2 females (USNM). **New Florida state record.**

### ***Bezzia (Bezzia) laciniastyla* Dow and Turner**

*Bezzia (Pseudobezzia) laciniastyla* Dow and Turner, 1976: 42 (Florida).

*Bezzia (Bezzia) laciniastyla*: Wilkenning et al. 1985: 529 (Florida records); Borkent and Grogan 2009: 26 (in Nearctic catalog; distribution).

**Discussion.** All specimens in the type series were from Glades Co., Florida and Georgetown Co., South Carolina (Dow and Turner 1976). Wilkenning et al. (1985) also recorded this species from Alachua and Wakulla counties. However, as noted by Dow and Turner (1976), the material they studied included a complex of at least two undescribed species and these will be addressed in a study in progress by WLG.

### ***Bezzia (Bezzia) mallochi* Wirth**

*Bezzia (Pseudobezzia) mallochi* Wirth, 1951: 323 (Virginia); Dow and Turner 1976: 51 (revision of Nearctic *Bezzia*; distribution).

*Bezzia (Bezzia) mallochi*: Borkent and Grogan 2009: 26 (in Nearctic catalog; distribution).

**Discussion.** The following specimens from Liberty and Santa Rosa counties are apparently the first records of this species from Florida (Borkent and Grogan 2009).

**New records.** Liberty Co., Torreya St. Park, 20-V-1966, H. V. Weems, 1 male (USNM). Santa Rosa Co., Jay, May 1962, T. W. Boyd, lt. trap, 1 female (USNM). **New Florida state record.**

### ***Bezzia (Bezzia) nobilis* (Winnertz)**

*Ceratopogon nobilis* Winnertz, 1852: 79 (Europe).

*Bezzia nobilis*: Kieffer 1901: 153 (combination).

*Bezzia (Bezzia) nobilis*: Wirth 1983c: 673 (review of New World *nobilis* group); Wilkenning et al. 1985: 530 (Florida records); Borkent and Grogan 2009: 26 (in Nearctic catalog; distribution).

*Ceratopogon setulosus* Loew, 1861: 312 (Washington D.C.)

*Ceratopogon barberi* Coquillett, 1901: 601 (Maryland).

*Bezzia atlantica* Wirth and Williams, 1957: 13 (Bermuda).

**Discussion.** This very common Holarctic and Neotropical species was listed by Wilkenning et al. (1985) from 15 Florida counties including Wakulla Co. We provide additional records from that county.

**New records.** Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 male, 2 females (BUTC).

***Bezzia (Bezzia) perplexa* Dow and Turner**

*Bezzia (Pseudobezzia) perplexa* Dow and Turner, 1976: 57 (Florida).

*Bezzia (Bezzia) perplexa*: Wilkening et al. 1985: 529 (Florida records); Borkent and Grogan 2009: 26 (in Nearctic catalog; distribution).

**Discussion.** Dow and Turner (1976) designated the holotype and paratypes from Alachua Co. and additional Florida paratypes from Hillsborough, Indian River and Liberty counties as well as three paratypes from Drew Co., Arkansas. We provide the first records from Glades, Gulf, Manatee, Marion, Orange and Wakulla counties.

**New records.** Glades Co., Palmdale, 14 July 1970, E. Irons, light trap, 1 male (USNM). Gulf Co., Wewahitchka, Aug. 1967, Blanton & Boike, light trap, 1 female; same data except Sept. 1967, 1 female (USNM). Manatee Co., Oneco, 23 March 1954, G. E. Ball, 1 male (USNM). Marion Co., Juniper Springs, 28 April 1970, W. W. Wirth, light trap, 1 female (USNM). Orange Co., Rock Springs, 21 April 1970, W. W. Wirth, light trap, 1 female (USNM). Wakulla Co., Ochlockonee Riv. St. Park, 29-IV-1970, W. W. Wirth, light trap, 1 male (USNM); Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 female (WLGC).

***Bezzia (Bezzia) pulverea* (Coquillett)**

*Ceratopogon pulvereus* Coquillett, 1901: 600 (New Jersey).

*Bezzia pulverea*: Kieffer 1906: 58 (combination).

*Bezzia (Pseudobezzia) pulverea*: Dow and Turner 1976: 61 (revision of Nearctic *Bezzia*; distribution).

*Bezzia (Bezzia) pulverea*: Wilkening et al. 1985: 529 (in list of Florida Ceratopogonidae); Borkent and Grogan 2009: 26 (in Nearctic catalog; distribution).

**Discussion.** In their review of Florida ceratopogonids, Wilkening et al. (1985) listed *B. pulverea*, but, they noted that Florida records were not available for this species, and a study in progress by WLGC confirms this. Therefore, we have deleted this species from the ceratopogonid fauna of Florida. However, USNM specimens of the *B. pulverea* complex include three species described prior to the study by Wilkening et al. as well as several other undescribed species (see accounts of *B. laciniastyla*, *B. spicata* and *B. uncistyla*).

***Bezzia (Bezzia) punctipennis* (Williston)**

*Ceratopogon punctipennis* Williston, 1896: 278 (St. Vincent, West Indies).

*Bezzia punctipennis*: Kieffer 1906: 58 (combination); Wirth 1952a: 235 (California; distribution).

*Bezzia (Pseudobezzia) punctipennis*: Dow and Turner 1976: 68 (in revision of Nearctic *Bezzia*; distribution).

*Bezzia (Bezzia) punctipennis*: Wilkening et al. 1985: 529 (Florida records); Borkent and Grogan 2009: 26 (in Nearctic catalog; distribution).

*Probezzia punctipennis*: Johannsen 1943: 785 (combination).

**Discussion.** This primarily Neotropical species is also known from California, Florida, Nevada and Texas and is unusual among New World *Bezzia* in that its wing has large, distinct, dark gray maculations. Wilkening et al. (1985) listed it in Florida from Dade and Palm Beach counties. We provide the first record from Alachua Co.

**New records.** Alachua Co., Gainesville, Oakcrest, 10-IX-1992, W. W. Wirth, Blacklight trap, 1 female (FSCA).

### ***Bezzia (Bezzia) spicata* Dow and Turner**

*Bezzia (Pseudobezzia) spicata* Dow and Turner, 1976: 77 (Florida; revision of Nearctic *Bezzia*; distribution).

*Bezzia (Bezzia) spicata*: Wilkening et al. 1985: 529 (Florida records); Borkent and Grogan 2009: 26 (in Nearctic catalog; distribution).

**Discussion.** Dow and Turner (1976) designated the holotype and paratypes from Wakulla Co. and other paratypes from Alachua and Indian River counties. We provide the first records from Gilchrist, Highlands, Hillsborough and St. Lucie counties.

**New records.** Gilchrist Co., Suwannee County line, Santa Fe River at SR-129, 1-vii-1981, Paul M. Choate, BLT, 2 females (USNM). Highlands Co., Lake Placid, 19 Apr. 1970, J. N. Layne, light trap, 1 female (USNM). Hillsborough Co., Harris Swamp, 13/14-IV-1967, 5 males (USNM). St. Lucie Co., Mar. 1956, light trap, 1 female (USNM).

### ***Bezzia (Bezzia) uncistyla* Dow and Turner**

*Bezzia (Pseudobezzia) uncistyla* Dow and Turner, 1976: 80 (New Mexico; revision of Nearctic *Bezzia*; distribution).

*Bezzia (Bezzia) uncistyla*: Wilkening et al. 1985: 529 (in list of Florida Ceratopogonidae); Borkent and Grogan 2009: 26 (in Nearctic catalog; distribution).

**Discussion.** Dow and Turner (1976) described this primarily western species from the type series from Taos, New Mexico, however, they also listed Florida, Montana, Nebraska, New York and Ontario in their distribution section of this species. Therefore, in their review of Florida biting midges, Wilkening et al. (1985) stated "Records not available for this species." A review of the *B. pulvereae* complex in progress by WLG has revealed the first provisional Florida records of this species from Alachua and Indian River counties.

**New records.** Alachua Co., Gainesville, Chantilly Acres, 3-12-V-1967, F. S. Blanton, 3 males, same data except May 1968, light trap, 1 female (USNM). Indian River Co., Vero Beach, Ent. Res. Cntr., April 1961, light trap, 1 female (USNM). **New Florida state record.**

### ***Bezzia (Homobezzia) circumdata* (Staeger)**

*Ceratopogon circumdata* Staeger, 1839: 596 (Denmark).

*Palpomyia (Palpomyia) circumdata*: Kieffer 1906: 63 (combination).

*Bezzia circumdata*: Borkent and Wirth 1997: 129 (in World Catalog; as synonym of *B. solstitialis* (Staeger)).

*Bezzia (Homobezzia) circumdata*: Borkent and Grogan 2009: 27 (in Nearctic catalog; distribution).

*Ceratopogon solstitialis* Winnertz, 1852: 78 (Europe).

*Bezzia solstitialis*: Kieffer 1901: 153 (combination).

*Bezzia (Homobezzia) solstitialis*: Wirth et al. 1984: 165 (revision of Nearctic annulipes group; distribution); Borkent and Grogan 2009: 27 (in Nearctic catalog; as synonym of *B. circumdata*).

**Discussion.** Wirth et al. (1984) and Wilkening et al. (1985) listed this species (as *B. solstitialis*) from Alachua, Jackson, Levy, Marion, Santa Rosa and Walton counties. We provide the first records from Leon and Wakulla Counties.

**New records.** Leon Co., Tall Timbers Res. Sta., 29-V-1973, W. W. Wirth, light trap, 1 male (FSCA). Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 2 females (BUTC).

### ***Bezzia (Homobezzia) dorsasetula* Dow and Turner**

*Bezzia (Bezzia) dorsasetula* Dow and Turner, 1976: 89 (New York).

*Bezzia (Homobezzia) dorsasetula*: Wirth 1983a: 776 (revision of Nearctic cockerelli and dorsasetula groups; distribution); Wilkening et al. 1985: 530 (Florida records); Borkent and Grogan 2009: 27 (in Nearctic catalog; distribution).

**Discussion.** This eastern species was previously recorded in Florida only from Wakulla Co. (Wilkening et al. 1985). We provide an additional record from this county.

**New records.** Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 female (WLGC).

### ***Bezzia (Homobezzia) glabra* (Coquillett)**

*Ceratopogon glaber* Coquillett, 1902: 85 (Florida).

*Bezzia glabra*: Kieffer 1906: 58 (combination).

*Bezzia (Aspinabezzia) glabra*: Dow and Turner 1976: 145 (revision of Nearctic *Bezzia*; distribution).

*Bezzia (Homobezzia) glabra*: Wirth 1983b: 305 (review of Nearctic species in bicolor group; distribution); Wilkening et al. 1985: 530 (Florida records); Borkent and Grogan 2009: 27 (in Nearctic catalog; distribution).

**Discussion.** This common inhabitant of ponds, lakes and streams was recorded from 23 Florida counties by Wilkening et al. (1985). We provide the first records from St. Lucie and Wakulla counties.

**New records.** St. Lucie Co., Ft. Pierce, Chinese Farm, July 1987, Kai Lok Chan, ex. *Pistia* leaf, 1 male (FSCA); (no town given), 11-VI-1986, R. L. Escher, 1 female, same data except 24-VI-1986, 1 female (FSCA). Wakulla Co., Wakulla Springs State Park, Lodge Road, 25 May 2004, S. Murphree, CDC light trap with UV wand, 1 male, 2 females (BUTC; WLGC).

### ***Palpomyia lineata* (Meigen)**

*Ceratopogon lineatus* Meigen, 1804: 30 (Europe).

*Palpomyia lineata*: Kieffer 1901: 157 (combination); Grogan and Wirth 1975c: 15 (revision of *Palpomyia* Meigen in northeastern North America); Wilkening et al. 1985: 531 (Florida records); Borkent and Grogan 2009: 28 (in Nearctic catalog; distribution).

*Ceratopogon slossonae* Coquillett, 1905: 61 (New Hampshire).

*Palpomyia illinoisensis* Malloch, 1914b: 219 (Illinois).

*Palpomyia pruinescens* Thomsen, 1935: 290 (New York).

**Discussion.** This common Holarctic species occurs in North America from Alaska to New Brunswick, south to California and Florida (Borkent and Grogan 2009). Wilkening et al. (1985) listed it in Florida from Alachua and Jefferson counties. We provide the first record from Highlands Co.

**New records.** Highlands Co., Archbold Biol. Sta., 13-19 April 1989, W. W. Wirth, light trap, 1 female (FSCA).

### *Palpomyia subaspera* (Coquillett)

*Ceratopogon subasper* Coquillett, 1901: 606 (Maryland and New Mexico).

*Palpomyia subasper*: Malloch 1914b: 222 (combination).

*Palpomyia subaspera*: Grogan and Wirth 1975c: 10 (revision of *Palpomyia* in northeastern North America); Wilkening et al. 1985: 531 (Florida records); Borkent and Grogan 2009: 28 (in Nearctic catalog; distribution).

*Palpomyia essigi* Wirth, 1952a: 225 (California).

**Discussion.** This common New World species ranges from Alberta to Ontario, south to California, Florida and Mexico, south to Argentina (Borkent and Grogan 2009). Wilkening et al. (1985) listed it from 18 counties in Florida. We provide the first records from Highlands Co.

**New records.** Highlands Co., Lake Placid, Archbold Biological Station, 8-IX-1989, W. W. Wirth, at UV light, 1 female; same data except 1-IV-1990, 3 females; same data except Sept. 1990, 2 females; same data except Price tract, 1-IV-1990, 1 female; same data except Buck Island Ranch, Sept. 1990; same data except IV-1991, 1 female (FSCA).

### Acknowledgments

We are grateful to Bradley Mullens and Dustin Swanson for their helpful reviews of an earlier draft of the manuscript. We also thank David J. DeMay, Florida Keys Mosquito Control District, for identifying the sea purslane.

### Literature Cited

- Atchley, W. R. 1967.** The *Culicoides* of New Mexico (Diptera: Ceratopogonidae). University of Kansas Science Bulletin 46: 937-1022.
- Beck, E. C. 1952.** Notes on the distribution of *Culicoides* in Florida (Diptera: Ceratopogonidae). Florida Entomologist 35: 101-107.
- Beck, E. C. 1956.** A new species of *Culicoides* from Florida with additional distribution data for the genus (Diptera: Heleidae). Florida Entomologist 39: 133-138.
- Beck, E. C. 1957.** Two new species of *Culicoides* from Florida (Diptera: Heleidae). Florida Entomologist 40: 103-105.

- Blanton, F. S., and W. W. Wirth. 1979.** The sand flies (*Culicoides*) of Florida (Diptera: Ceratopogonidae). *Arthropods of Florida and Neighboring Land Areas* 10: 1-204.
- Boesel, M. W. 1973.** The genus *Atrichopogon* (Diptera: Ceratopogonidae) in Ohio and neighboring states. *Ohio Journal of Science* 73: 202-215.
- Borkent, A., and L. Forster. 1986.** Review of the *Dasyhelea fasciigera* species group (Diptera: Ceratopogonidae) with a revision of the Nearctic species. *Canadian Journal of Zoology* 64: 1280-1287.
- Borkent, A., and W. L. Grogan, Jr. 2009.** Catalog of the New World biting midges north of Mexico (Diptera: Ceratopogonidae). *Zootaxa* 2273: 1-48.
- Borkent, A., and W. W. Wirth. 1997.** World species of biting midges (Diptera: Ceratopogonidae). *Bulletin of the American Museum of Natural History* 233: 1-257.
- Borkent, A., and G. R. Spinelli. 2000.** Catalog of the New World biting midges south of the United States of America (Diptera: Ceratopogonidae). *Contributions on Entomology, International*. Associated Publishers; Gainesville, Florida. 4: 1-107.
- Borkent, A., and G. R. Spinelli. 2007.** Neotropical Ceratopogonidae (Diptera: Insecta). *In: J. Adis, J. R. Arias, G. Rueda-Delgado, and K. M. Wantzen (eds.). Aquatic biodiversity in Latin America (ABLA). Vol. 4. Pensoft; Sofia-Moscow. 198 p.*
- Bystrak, P. G., and W. W. Wirth. 1978.** The North American species of *Forcipomyia*, subgenus *Euprojoannisia* (Diptera: Ceratopogonidae). *United States Department of Agriculture, Technical Bulletin* 1591: 1-51.
- Chan, K. L., and E. J. LeRoux. 1965.** Description of *Forcipomyia* (*Neoforcipomyia*) sp. n. and redescription of *Forcipomyia* (*Neoforcipomyia*) *eques* (Johannsen) (Diptera: Ceratopogonidae), with an account of the digestive and reproductive systems. *Phytoprotection* 46: 74-104.
- Chan, K. L., and J. R. Linley. 1988.** Description of *Atrichopogon wirthi* new species (Diptera: Ceratopogonidae) from leaves of the water lettuce (*Pistia stratiotes*) in Florida. *Florida Entomologist* 71: 186-201.
- Chan, K. L., and J. R. Linley. 1989.** A new Florida species of *Forcipomyia* (*Euprojoannisia*) (Diptera: Ceratopogonidae) from leaves of the water lettuce, *Pistia stratiotes*. *Florida Entomologist* 72: 252-262.
- Coquillett, D. W. 1895.** Descriptions of new genera and species. p. 307-319. *In: C. W. Johnson. Diptera of Florida. Proceedings of the Academy of Natural Sciences of Philadelphia* 1895: 303-340.
- Coquillett, D. W. 1901.** New Diptera in the U.S. National Museum. *Proceedings of the United States National Museum* 23: 593-618.
- Coquillett, D. W. 1902.** New Diptera from North America. *Proceedings of the United States National Museum* 25: 83-126.
- Coquillett, D. W. 1905.** New nematoceros Diptera from North America. *Journal of the New York Entomological Society* 13: 56-69.
- Das Gupta, S. J., and W. W. Wirth. 1968.** Revision of the Oriental species of *Stilobezzia* Kieffer (Diptera, Ceratopogonidae). *United States National Museum Bulletin* 283: 1-149.
- Debenham, M. L. 1987.** The biting midge genus *Forcipomyia* (Diptera: Ceratopogonidae) in the Australasian Region (exclusive of New Zealand) III. The subgenera *Forcipomyia* s. s., and *Lepidohelea*. *Invertebrate Taxonomy* 1: 269-350.
- Delécolle, J.-C., and J.-P. Rieb. 1994.** Contribution à l'étude des Ceratopogonidés de la Guadeloupe. Description de trois espèces nouvelles, appartenant aux genres *Dasyhelea* et *Atrichopogon* (Diptera, Nematocera). *Bulletin de la Société Entomologique de France* 99: 267-279.
- Dow, M. I., and E. C. Turner. 1976.** A revision of the Nearctic species of the genus *Bezzia* (Diptera: Ceratopogonidae). *Occasional Papers from the Department of Entomology, Virginia Polytechnic Institute and State University, Research Division Bulletin* 103: 1-162.
- Dow, M. I., and W. W. Wirth. 1972.** Studies on the genus *Forcipomyia*, 2. The Nearctic species of the subgenera *Thyridomyia* and *Synththyridomyia* (Diptera: Ceratopogonidae). *Annals of the Entomological Society of America* 65: 177-201.
- Downes, J. A. 1976.** A new species of *Brachypogon* (Diptera: Ceratopogonidae), the first record of the genus in Canada. *Canadian Entomologist* 108: 1145-1151.
- Downes, J. A. 1978.** The *Culicoides variipennis* complex: a necessary re-alignment of nomenclature (Diptera: Ceratopogonidae). *Canadian Entomologist* 110: 63- 69.



- Downes, J. A., and W. W. Wirth. 1981.** Chapter 28. Ceratopogonidae. p. 393-421. *In*: J. F. McAlpine, B. V. Peterson, G. E. Shewell, H. J. Teskey, J. R. Vockeroth, and D. M. Wood (coordinators). Manual of Nearctic Diptera. Volume 1. Agriculture Canada Monograph 27: 1-674.
- Ewen, A. B., and L. G. Saunders. 1958.** Contributions toward a revision of the genus *Atrichopogon* based on characters of all stages (Diptera, Heleidae). Canadian Journal of Zoology 36: 671-724.
- Foote, R. H., and H. D Pratt. 1954.** The *Culicoides* of the eastern United States (Diptera, Heleidae). United States Department of Health, Education and Welfare, Public Health Monograph 18: 1-53.
- Garrett, C. B. D. 1925.** Seventy new Diptera. Cranbrook; British Columbia. 16 p.
- Goeldi, E. 1905.** Os mosquitos no Pará. Reunião de quatro trabalhos sobre os mosquitos indígenas, principalmente as espécies que molesta o homem. Memórias do Museu Goeldi (Museu Paraense) de Historia Natural e Ethnographie. Para, Brazil 4: 1-154, 5 pls.
- Goetghebuer, M. 1933.** Ceratopogonidae et Chironomidae du Congo Belge. Revue de Zoologie et de Botanique Africaines 24: 129-151.
- Gosseries, J. 1991.** Ceratopogonidae. p. 41-45. *In*: P. Grootaert, L. de Bruyn, and M. de Meyer. 1991. Catalogue of the Diptera of Belgium. Institut Royal des Sciences Naturelles de Belgique Documents de Travail 70: 1-338.
- Grogan, W. L., Jr., and L. J. Hribar. 2006.** The bromeliad-inhabiting biting midge, *Forcipomyia (Phytohelea) bromelicola* (Lutz), new to the fauna of the United States (Diptera: Ceratopogonidae). Entomological News 117: 319-322.
- Grogan, W. L., Jr., and E. A. Sigrist. 2007.** A new Nearctic species of biting midge in the subgenus *Metaforcipomyia* Saunders of *Forcipomyia* Meigen (Diptera: Ceratopogonidae). Proceedings of the Entomological Society of Washington 109: 530-540.
- Grogan, W. L., Jr., and W. W. Wirth. 1975a.** A revision of the Nearctic species of *Clinohelea* Kieffer (Diptera: Ceratopogonidae). Great Basin Naturalist 35: 275-287.
- Grogan, W. L., Jr., and W. W. Wirth. 1975b.** A new Nearctic species of *Forcipomyia (Forcipomyia)* described in all stages (Diptera: Ceratopogonidae). Proceedings of the Entomological Society of Washington 77: 466-471.
- Grogan, W. L., Jr., and W. W. Wirth. 1975c.** A revision of the genus *Palpomyia* Meigen of northeastern North America (Diptera: Ceratopogonidae). Agricultural Experiment Station, University of Maryland, Miscellaneous Publication 875: v + 49 p.
- Grogan, W. L., Jr., and W. W. Wirth. 1977a.** A revision of the Nearctic species of *Parabezzia* Malloch (Diptera: Ceratopogonidae). Journal of the Kansas Entomological Society 50: 49-83.
- Grogan, W. L., Jr., and W. W. Wirth. 1977b.** A revision of the Nearctic species of *Jenkinshalea* Macfie (Diptera: Ceratopogonidae). Proceedings of the Entomological Society of Washington 79: 126-141.
- Guérin-Méneville, F. E. 1833.** Notice sur les métamorphoses des Cératopogons et description de deux espèces nouvelles de ce genre, découvertes aux environs de Paris. Annales de la Société de Entomologie de France 2: 161-167.
- Hall, D. G. 1932.** A new biting *Culicoides* from saltmarshes in the southeastern states. Proceedings of the Entomological Society of Washington 34: 88-89.
- Hoffmann, W. A. 1926.** Notes on Ceratopogoninae (Diptera). Proceedings of the Entomological Society of Washington 28: 156-159.
- Holbrook, F. R., W. W. Tabachnick, E. T. Schmidtman, C. N. McKinnon, R. J. Bobian, and W. L. Grogan. 2000.** Sympatry in the *Culicoides variipennis* complex (Diptera: Ceratopogonidae): a taxonomic reassessment. Journal of Medical Entomology 37: 65-76.
- Hribar, L. J., and W. L. Grogan, Jr. 2005.** New records of biting midges (Diptera: Ceratopogonidae) and frog-biting midges (Diptera: Corethrellidae) from the Florida Keys. Florida Scientist 68: 227-235.
- Ingram, A., and J. W. S. Macfie. 1922.** West African Ceratopogoninae. II. Annals of Tropical Medicine and Parasitology 16: 243-282.
- Johannsen, O. A. 1905.** Aquatic nematoceros Diptera II. Bulletin of the New York State Museum 86: 76-331.
- Johannsen, O. A. 1907.** Some new species of Kansas Chironomidae. p. 109-112. *In*: E. S. Tucker. Some results of desultory collecting of insects in Kansas and Colorado. Bulletin of the University of Kansas, Science Bulletin 4: 51-112.

- Johannsen, O. A. 1934.** New species of North American Ceratopogonidae and Chironomidae. *Journal of the New York Entomological Society* 42: 343-352.
- Johannsen, O. A. 1943.** A generic synopsis of the Ceratopogonidae (Heleidae) of the Americas, a bibliography, and a list of the North American species. *Annals of the Entomological Society of America* 36: 763-791.
- Johannsen, O. A. 1950.** A new *Pterobosca* from Florida with a key to the American species. *Florida Entomologist* 33: 141-144.
- Johannsen, O. A. 1951.** Notes on North American species of *Pterobosca*. *Florida Entomologist* 34: 116-117.
- Johnson, C. W. 1895.** Diptera of Florida. *Proceedings of the Academy of Natural Sciences of Philadelphia* 1895: 303-340.
- Johnson, C. W. 1908.** The Diptera of the Bahamas, with notes and description of one new species. *Psyche* 15: 69-80.
- Johnson, C. W. 1913.** Insects of Florida. I. Diptera. *Bulletin of the American Museum of Natural History* 32: 37-90.
- Khalaf, K. T. 1952.** The *Culicoides* of the Wichita Refuge, Oklahoma. Taxonomy and seasonal incidence (Diptera, Heleidae). *Annals of the Entomological Society of America* 45: 348-358.
- Khalaf, K. T. 1954.** The speciation of the genus *Culicoides* (Diptera, Heleidae). *Annals of the Entomological Society of America* 47: 34-51.
- Kieffer, J. J. 1901.** Synopse des représentants européens du groupe *Ceratopogon* avec description de quelques espèces nouvelles. *Bulletin de la Naturelle de Metz* 9: 143-165.
- Kieffer, J. J. 1906.** Diptera. Fam. Chironomidae. *In: P. Wytsman (ed.). Genera Insectorum. Fasc. 42: 1-78, 4 pls.*
- Kieffer, J. J. 1917.** Chironomides d'Amérique conservés au Musée National Hongrois de Budapest. *Annales Historico-Naturales Musei Nationalis Hungarici* 15: 292- 364.
- Kieffer, J. J. 1919a.** Chironomides d'Europe conservés au Musée National Hongrois de Budapest. *Annales Historico-Naturales Musei Nationalis Hungarici* 17: 1-160.
- Kieffer, J. J. 1919b.** Observations sur les Chironomides (Dipt.) décrits par J. R. Malloch. *Bulletin de la Société Entomologique de France* 1919: 191-194.
- Knab, F. 1914.** Ceratopogoninae sucking the blood of caterpillars. *Proceedings of the Entomological Society of Washington* 16: 63-66.
- Lane, J. 1945.** Redescrção de Ceratopogonídeos Neotrópicos (Diptera: Ceratopogonidae). *Revista de Entomologia* 16: 357-372.
- Lane, J. 1947.** Espécies Brasileiras de *Stilobezzia* (Dipt. Ceratopogonidae) e *Zygoneura stonei* nov. nom (Dipt. Mycetophilidae). *Revista de Entomologia* 18: 197-214.
- Lane, J., and O. P. Forattini. 1956.** Neotropical *Stilobezzia* Kieffer, 1911. I. Nine new Panamanian species (Diptera, Nematocera, Ceratopogonidae). *Revista Brasileira de Malariologia e Doenças Tropicais* 8: 207-226.
- Lane, J., and O. P. Forattini. 1958.** Neotropical *Stilobezzia* II. Fourteen new species, chiefly from Panama (Diptera, Ceratopogonidae). *Revista Brasileira de Entomologia* 8: 203-224.
- Linnaeus, C. 1767.** *Systema naturae per regna tria naturae. Editio duodecima reformata. Tom. I. Pars II. Salvius; Stockholm. p. 533-1327.*
- Loew, H. 1861.** Diptera Americae septentrionalis indigena. *Berliner Entomologische Zeitschrift* 5: 307-359.
- Loew, H. 1866.** Diptera Americae septentrionalis indigena. *Berliner Entomologische Zeitschrift* 9: 127-186.
- Lundstrom, C. 1910.** Beitrage zur Kenntnis der Dipteren Findlands VI. Chironomidae. *Acta Societatis pro Fauna et Flora Fennica* 33: 1-46.
- Lutz, A. 1912.** Contribuição para o estudo das "Ceratopogoninas" hematofagas contrados do Brazil. *Memorias do Instituto Oswaldo Cruz* 4: 1-33.
- Lutz, A. 1913.** Contribuição para o estudo das Ceratopogoninas hematofagas do Brazil. *Memorias do Instituto Oswaldo Cruz* 5: 45-73, pl. 6-8.
- Lutz, A. 1914.** Contribuição para o conhecimento das "Ceratopogoninas" do Brazil. *Memorias do Instituto Oswaldo Cruz* 6: 81-99, pls. 8-9.

- Macfie, J. W. S. 1934.** A new British *Forcipomyia* (Diptera, Ceratopogonidae). Entomologist's Monthly Magazine 70: 144.
- Macfie, J. W. S. 1935.** Ceratopogonidae (Dipt.) from the river Amazon. Stylops 4: 49-56.
- Macfie, J. W. S. 1937.** Ceratopogonidae from Trinidad. Annals and Magazine of Natural History (Series 10) 20: 1-18.
- Macfie, J. W. S. 1938.** Notes on Ceratopogonidae (Diptera). Proceedings of the Royal Entomological Society of London (B.) 7: 157-166.
- Macfie, J. W. S. 1939.** A report on a collection of Brazilian Ceratopogonidae. Revista de Entomologia 10: 137-219.
- Malloch, J. R. 1914a.** Synopsis of the genus *Probezzia*, with the description of a new species. Proceedings of the Biological Society of Washington 27: 137-139.
- Malloch, J. R. 1914b.** Notes on North American Diptera, with descriptions of new species in the collection of the Illinois State Laboratory of Natural History. Bulletin of the Illinois State Laboratory of Natural History 10: 213-243.
- Malloch, J. R. 1914c.** Synopsis of North American species of the genus *Bezzia* (Chironomidae). Journal of the New York Entomological Society 22: 281-285.
- Malloch, J. R. 1915a.** The Chironomidae, or midges, of Illinois, with particular reference to the species occurring in the Illinois River. Bulletin of the Illinois State Laboratory of Natural History 10: 275-543, 24 pl.
- Malloch, J. R. 1915b.** Some additional records of Chironomidae for Illinois and notes on other Illinois Diptera. Bulletin of the Illinois State Laboratory of Natural History 11: 305-363, pl. 80-84.
- Malloch, J. R. 1923.** A new species of *Forcipomyia* from the eastern United States (Diptera, Ceratopogonidae). Entomological News 34: 4-5.
- Meigen, J. W. 1804.** Klassifikation und Beschreibung der europäischen zweiflügeligen Insekten. (Diptera Linn.) Erster Band, erste Abtheilung, mit VIII Kupfertafeln. I. Karl Reichard; Braunschweig. i-xxviii + 152 p., pl. 1-8.
- Meigen, J. W. 1818.** Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. Erster Theil mit elf Kupfertafeln. Vol. 1. Forstmann; Aachen. xxxvi + 333 p., pl. 1-11.
- Meigen, J. W. 1830.** Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. Sechster Theil mit zwölf Kupfertafeln. Vol. 6. Schulz; Hamm. i-iv + 401 p., pl. 55-66.
- Meillon, B. de, and W. W. Wirth. 1979.** A taxonomic review of the subgenus *Phytohelea* of *Forcipomyia* (Diptera: Ceratopogonidae). Proceedings of the Entomological Society of Washington 81: 178-206.
- Poey, F. 1853.** Memorias sobre la historia natural de la isla de Cuba, acompañadas de sumarios latinos y extractos en francés. Vol. 1 (part 4), Impr. de Barcina; Havana. p. 201-280.
- Porch, S. S., W. L. Grogan, Jr., and L. J. Hribar. 1992.** Biting midges (Diptera: Ceratopogonidae) captured by sundews. Proceedings of the Entomological Society of Washington 94: 172-173.
- Remm, H. 1971.** On the fauna of Ceratopogonidae of southern Maritime Territory (in Russian; English summary). p. 182-220. In: Living Nature of the Far East. Akademiia nauk Estonskoi; SSR. 240 p.
- Root, F. M., and W. A. Hoffman. 1937.** The North American species of *Culicoides*. American Journal of Hygiene 25: 150-176.
- Salvato, M. H., H. L. Salvato, and W. L. Grogan, Jr. 2008.** *Forcipomyia (Microhelea) fuliginosa* (Meigen) (Diptera: Ceratopogonidae), an ectoparasite of larval *Anaea troglodyte floralis* (Nymphalidae). Journal of the Lepidopterists' Society 62: 237-238.
- Saunders, L. G. 1925.** On the life history, morphology and systematic position of *Apelma* Kieff. and *Thyridomyia* n. g. (Diptera, Nemat. Ceratopogoninae). Parasitology 17: 252-277.
- Saunders, L. G. 1959.** Methods for studying *Forcipomyia* midges, with special reference to cacao-pollinating species (Diptera, Ceratopogonidae). Canadian Journal of Zoology 37: 33-51.
- Say, T. 1825.** American entomology, or, descriptions of the insects of North America. Vol. 2. Samuel Augustus Mitchell; Philadelphia. 121 p.
- Say, T. 1829.** Descriptions of North American dipterous insects. Journal of the Academy of Natural Sciences of Philadelphia (1829-1830) 6: 149-178., pl. 19-36.
- Soria, S., and P. G. Bystrak. 1975.** A new species of *Forcipomyia* (Diptera, Ceratopogonidae) described in all stages, with an account of its role as a cacao pollinator. Revista Theobroma 5(2):3-11.

- Spinelli, G. R., and W. L. Grogan, Jr. 1997.** A new species of predaceous midge of the genus *Probezzia* Kieffer (Diptera: Ceratopogonidae). *Memoirs of the Entomological Society of Washington* 18: 230-233.
- Spinelli, G. R., and W. L. Grogan, Jr. 1998.** A revision of the Neotropical predaceous midges of *Brachypogon* (*Brachypogon*) Kieffer (Diptera: Ceratopogonidae). *Insecta Mundi* 12: 59-79.
- Spinelli, G. R., and W. W. Wirth. 1984.** The Neotropical predaceous midges of the genus *Alluaudomyia* (Diptera: Ceratopogonidae). *Proceedings of the Entomological Society of Washington* 86: 673-702.
- Staeger, R.C. 1839.** Systematisk fortegnelse over de i Danmark hidtil fundne Diptera. *Naturhistorisk Tidsskrift* 2: 549-600.
- Swanson, D. A., and W. L. Grogan, Jr. 2008.** New records of Ceratopogonidae (Diptera) from South Carolina, U. S. A. *Entomological News* 119: 411-414.
- Szadziewski, R., and P. Dominiak. 2006.** New synonyms of European Ceratopogonidae (Diptera). *Annales Zoologici (Warszawa)* 56: 139-146.
- Thomsen, L. 1935.** New species of New York State Ceratopogonidae. *Journal of the New York Entomological Society* 43: 283-297.
- Thomsen, L. 1937.** Aquatic Diptera Part V. Ceratopogonidae. *Cornell University Agriculture Experiment Station Memoir* 210: 57-80, pl. 10-18.
- Tokunaga, M., and E. K. Murachi. 1959.** Insects of Micronesia. Diptera: Ceratopogonidae. *Insects of Micronesia* 12: 103-434.
- Tóthová, A., G. R. Spinelli, and P. I. Marino. 2009.** A new Nearctic species of *Atrichopogon* (*Meloehalea*) and a redescription of *Atrichopogon* (*M.*) *chilensis* Ingram & Macfie (Diptera: Ceratopogonidae). *Zootaxa* 2023: 47-54.
- Utmar, J. A., and W. W. Wirth. 1976.** A revision of the new world species of *Forcipomyia*, subgenus *Calofoforcipomyia* (Diptera: Ceratopogonidae). *Florida Entomologist* 59: 109-133.
- Vargas, L. 1949.** *Culicoides travisi* Vargas. n. n. *Revista del Instituto de Salubridad y Enfermedades Tropicales* 10: 233-234.
- Vargas, L. 1953.** *Beltranmyia* n. Subgen. de *Culicoides* (Insecta: Heleidae). *Instituto de Salubridad y Enfermedades Tropicales* 13: 33-36.
- Vargas, L. 1960.** The subgenera of *Culicoides* of the Americas (Diptera, Ceratopogonidae). *Revista de Biología Tropical* 8: 35-47.
- Vimmer, A. 1932.** Nové druhy podceledi Ceratopogoninae (Tendipedidae – Dipt.) ze sberu Bodenheimerova. *Sbornik Entomologickeho Oddeleni pri Zoologických Sbirkách Narodního Musea v Praze* 10: 130-144.
- Waugh, W. T., and W. W. Wirth. 1976.** A revision of the genus *Dasyhelea* Kieffer of the eastern United States north of Florida (Diptera: Ceratopogonidae). *Annals of the Entomological Society of America* 69: 219-247.
- Wilkening, A. J., D. L. Kline, and W. W. Wirth. 1985.** An annotated checklist of the Ceratopogonidae (Diptera) of Florida with a new synonymy. *Florida Entomologist* 68: 511-537.
- Williams, R. W. 1957.** Observations on the breeding habitats of some Heleidae of the Bermuda Islands (Diptera). *Proceedings of the Entomological Society of Washington* 59: 61-66.
- Williston, S. W. 1896.** On the Diptera of St. Vincent (West Indies). *Transactions of the Entomological Society of London* 1896: 253-446, pl. 8-14.
- Winnertz, J. 1852.** Beitrag zur Kenntniss der Gattung *Ceratopogon* Meigen. *Linnaea Entomologica* 6: 1-80.
- Wirth, W. W. 1951.** New species and records of Virginia Heleidae (Diptera). *Proceedings of the Entomological Society of Washington* 53: 313-326.
- Wirth, W. W. 1952a.** The Heleidae of California. *University of California Publications in Entomology* 9: 95-266.
- Wirth, W. W. 1952b.** The genus *Alluaudomyia* Kieffer in North America (Diptera, Heleidae). *Annals of the Entomological Society of America* 45: 423-434.
- Wirth, W. W. 1953a.** Biting midges of the heleid genus *Stilobezzia* in North America. *Proceedings of the United States National Museum* 103: 57-85.
- Wirth, W. W. 1953b.** American biting midges of the heleid genus *Monohelea*. *Proceedings of the United States National Museum* 103: 135-154.
- Wirth, W. W. 1956a.** New species and records of biting midges ectoparasitic on insects (Diptera, Heleidae). *Annals of the Entomological Society of America* 49: 356- 364.

- Wirth, W. W. 1956b.** The heleid midges involved in the pollination of rubber trees in America (Diptera, Ceratopogonidae). *Proceedings of the Entomological Society of Washington* 58: 241-250.
- Wirth, W. W. 1962.** A reclassification of the *Palpomyia-Bezzia-Macropeza* groups, and a revision of the North American Sphaeromiini (Diptera: Ceratopogonidae). *Annals of the Entomological Society of America* 55: 272-287.
- Wirth, W. W. 1965.** Family Ceratopogonidae. p. 121-142. *In*: A. Stone, C. W. Sabrosky, W. W. Wirth, R. H. Foote, J. R. Coulson (eds.). *A catalog of the Diptera of America north of Mexico*. United States Department of Agriculture, Agricultural Research Service, Agriculture Handbook 276: i-iv + 1-1696.
- Wirth, W. W. 1970.** The Neotropical *Forcipomyia* midges of the subgenus *Thyridomyia* Saunders (Diptera, Ceratopogonidae). *Studia Entomologica* 13: 429-440.
- Wirth, W. W. 1971.** Six new North American species of *Probezzia* (Diptera: Ceratopogonidae), with biological notes and a key to species. *Annals of the Entomological Society of America* 64: 729-739.
- Wirth, W. W. 1972.** The Neotropical *Forcipomyia (Microhelea)* species related to the caterpillar parasite *F. fuliginosa* (Diptera: Ceratopogonidae). *Annals of the Entomological Society of America* 65: 564-577.
- Wirth, W. W. 1974.** Family Ceratopogonidae. *In*: *A catalog of the Diptera of the Americas south of the United States*. Fasc. 14: 1-89.
- Wirth, W. W. 1976.** *Forcipomyia pictoni* Macfie and descriptions of two new related species from Florida (Diptera: Ceratopogonidae). *Florida Entomologist* 59: 77-84.
- Wirth, W. W. 1978.** New species and records of intertidal biting midges of the genus *Dasyhelea* Kieffer from the Gulf of California (Diptera: Ceratopogonidae). *Pacific Insects* 18: 191-198. **Wirth, W. W. 1980.** A new species and corrections in the *Atrichopogon* midges of the subgenus *Melohelea* attacking blister beetles (Diptera: Ceratopogonidae). *Proceedings of the Entomological Society of Washington* 82: 124-139.
- Wirth, W. W. 1983a.** The North American species of the *cockerelli* and *dorsasetula* groups of the predaceous midge genus *Bezzia*, subgenus *Homobezzia* (Diptera: Ceratopogonidae). *Proceedings of the Entomological Society of Washington* 85: 762-782.
- Wirth, W. W. 1983b.** The North American predaceous midges of the *Bezzia bicolor* group (Diptera: Ceratopogonidae). *Florida Entomologist* 66: 292-310.
- Wirth, W. W. 1983c.** A review of the American predaceous midges of the *Bezzia nobilis* group (Diptera: Ceratopogonidae). *Proceedings of the Entomological Society of Washington* 85: 670-685.
- Wirth, W. W. 1990.** Biting midges of the subgenus *Schizoforcipomyia* of *Forcipomyia* in North America (Diptera: Ceratopogonidae). *Florida Entomologist* 73: 649-655.
- Wirth, W. W. 1991.** The predaceous midge genus *Allohelea* Kieffer in the western hemisphere (Diptera: Ceratopogonidae). *Florida Entomologist* 74: 491-505.
- Wirth, W. W. 1994a.** The subgenus *Atrichopogon (Lophomyidium)* with a revision of the Nearctic species (Diptera: Ceratopogonidae). *Insecta Mundi* 8: 17-36.
- Wirth, W. W. 1994b.** The western hemisphere species of the predaceous midge genus *Echinohelea*, with descriptions of six new species (Diptera: Ceratopogonidae). *Insecta Mundi* 8: 227-242.
- Wirth, W. W. 1994c.** New species and records of predaceous midges of the genus *Probezzia* from Florida and Alabama (Diptera: Ceratopogonidae). *Florida Entomologist* 77: 136-145.
- Wirth, W. W., and F. S. Blanton. 1966.** A new day-biting sand fly from the southeastern States (Diptera, Ceratopogonidae). *Florida Entomologist* 49: 279-281.
- Wirth, W. W., and F. S. Blanton. 1970.** Notes on *Brachypogon* Kieffer (Diptera, Ceratopogonidae), a new species, and two new Neotropical genera of the tribe Ceratopogonini. *Florida Entomologist* 53: 93-104.
- Wirth, W. W., and F. S. Blanton. 1974.** A new Florida sand fly closely related to *Culicoides haematopotus* Malloch (Diptera: Ceratopogonidae). *Florida Entomologist* 57: 23-26.
- Wirth, W. W., A. L. Dyce, and B. V. Peterson. 1985.** An atlas of wing photographs, with a summary of the numerical characters of the Nearctic species of *Culicoides* (Diptera: Ceratopogonidae). *Contributions of the American Entomological Institute* 22: 1-46.
- Wirth, W. W., and W. L. Grogan, Jr. 1977.** Taxonomic notes on the genus *Heteromyia* Say, and a new species from Nicaragua (Diptera: Ceratopogonidae). *Florida Entomologist* 60: 177-185.
- Wirth, W. W., and W. L. Grogan, Jr. 1979.** Natural History of Plummers Island, Maryland. XXIV. Biting midges (Diptera: Ceratopogonidae). 2. The species of the tribes Heteromyiini and Sphaeromiini.

- Proceedings of the Biological Society of Washington 91: 847-903.
- Wirth, W. W., and W. L. Grogan, Jr. 1981.** Natural History of Plummers Island, Maryland. XXV. Biting midges (Diptera: Ceratopogonidae). 3. The species of the tribe Stilobezziini. Bulletin of the Biological Society of Washington 5: 1-102.
- Wirth, W. W., and W. L. Grogan, Jr. 1988.** The predaceous midges of the world (Diptera: Ceratopogonidae; Tribe Ceratopogonini). Flora and Fauna Handbook. E. J. Brill; New York. 4: i-xv + 1-160.
- Wirth, W. W., and A. A. Hubert. 1962.** The species of *Culicoides* related to *piliferus* Root and Hoffman in eastern North America (Diptera, Ceratopogonidae). Annals of the Entomological Society of America 55: 182-195.
- Wirth, W. W., and R. H. Jones. 1957.** The North American subspecies of *Culicoides variipennis* (Diptera, Heleidae). United States Department of Agriculture Technical Bulletin 1170: 1-35.
- Wirth, W. W., and N. Marston. 1968.** A method for mounting small insects on microscope slides in Canada balsam. Annals of the Entomological Society of America 61: 783-784.
- Wirth, W. W., and D. H. Messersmith. 1971.** Studies on the genus *Forcipomyia*. I. The North American parasitic midges of the subgenus *Trichohelea* (Diptera: Ceratopogonidae). Annals of the Entomological Society of America 64: 15-26.
- Wirth, W. W., S. M. Palchick, and L. Forster. 1984.** The North American predaceous midges of the *Bezzia annulipes* group (Diptera: Ceratopogonidae). Proceedings of the Entomological Society of Washington 86: 155-175.
- Wirth, W. W., and N. C. Ratanaworabhan. 1971.** *Ceratoculicoides*, a new genus related to *Ceratopogon* Meigen (Diptera: Ceratopogonidae). Proceedings of the Entomological Society of Washington 73: 170-177.
- Wirth, W. W., and N. C. Ratanaworabhan. 1978.** Studies on the genus *Forcipomyia*. Key to subgenera and description of a new subgenus related to *Euprojoannisia* Brethes (Diptera: Ceratopogonidae). Proceedings of the Entomological Society of Washington 80: 493-507.
- Wirth, W. W., and G. R. Spinelli. 1992a.** American predaceous midges of the subgenus *Eukraiohelea* of *Stilobezzia* (Diptera: Ceratopogonidae). Florida Entomologist 75: 342-349.
- Wirth, W. W., and G. R. Spinelli. 1992b.** Immature stages of *Forcipomyia seminole* Wirth and a related new Neotropical species (Diptera: Ceratopogonidae). Florida Entomologist 75: 349-356.
- Wirth, W. W., and G. R. Spinelli. 1992c.** Australasian *Forcipomyia* midge new to Florida (Diptera: Ceratopogonidae). Florida Entomologist 75: 599-600.
- Wirth, W. W., and G. R. Spinelli. 1993a.** The American species of the *annulipes* group of the subgenus *Lepidohelea*, genus *Forcipomyia* (Diptera: Ceratopogonidae). Insecta Mundi 6 (1992): 109-125.
- Wirth, W. W., and G. R. Spinelli. 1993b.** The North American species of the *Forcipomyia* (*Lepidohelea*) *bicolor* subgroup (Diptera: Ceratopogonidae). Proceedings of the Entomological Society of Washington 95: 611-634.
- Wirth, W. W., and R. W. Williams. 1957.** The biting midges of the Bermuda Islands, with descriptions of five new species (Diptera, Heleidae). Proceedings of the Entomological Society of Washington 59: 5-14.
- Wirth, W. W., and R. W. Williams. 1964.** New species and records of North American *Monohelea* (Diptera: Ceratopogonidae). Annals of the Entomological Society of America 57: 302-310.
- Wolcott, G. N. 1923.** Insectae Portoricensis. Journal of the Department of Agriculture of Porto Rico 7: 1-312.

Received September 3, 2010; Accepted September 24, 2010.

