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Records for *Bittacus* Hangingflies and *Panorpa* Scorpionflies (Mecoptera: Bittacidae and Panorpidae) in Florida

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Records for *Bittacus* Hangingflies and *Panorpa* Scorpionflies (Mecoptera: Bittacidae and Panorpidae) in Florida

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Abstract. We provide new county records for four species of panorpids (*Panorpa americana* Swederus, *Panorpa lugubris* Swederus, *Panorpa* sp. undetermined, and one undescribed species from the *Panorpa rufescens* Rambur species group) and two species of bittacids (*Bittacus pilicornis* Westwood, *Bittacus punctiger* Westwood), and call attention to a previously published county record for another species, *Panorpa rufa* Gray, in Florida. Additionally, we reject a previously published record for the scorpionfly *Panorpa claripennis* Hine in Florida, which we overlooked in our 2008 preliminary checklist of Florida mecopterans. The record for *P. lugubris* in Miami-Dade County is the southernmost record for any panorpid in the continental United States.

Introduction

Mecoptera is a small, ancestral, and perhaps nonmonophyletic, order of holometabolous insects represented by at least 610 known, extant species arranged in at least 34 genera and 9 families worldwide (Kaltenbach 1978; Willmann 1989; Whiting 2002; Byers 2005; Grimaldi and Engel 2005; Bicha 2006; Dunford and Somma 2008a, b; Penny 2008; Hua and Cai 2009). Previous studies by us and others (Dunford et al. 2007; Somma and Dunford 2008, 2009) have documented at least 12 species of mecopterans occurring in Florida, representing the families Meropeidae (one species), Bittacidae (4 species) and Panorpidae (7 species). Herein, we add new county records for panorpids and bittacids in Florida, and discuss published state records for two species of panorpids that were overlooked by us in Somma and Dunford (2008).

Materials

These data are based on an examination of specimen records obtained from Wesley Bicha (herein designated WBC), the Insect Collection at the University of Michigan, Museum of Zoology (UMMZ), and the Snow Entomology Museum (SEMC), Biodiversity Research Center, University of Kansas (KU); and an examination of specimens from the Florida State Collection of Arthropods (FSCA), and the Bug Closet, University of Central Florida Collection of Arthropods (UCFC; Fullerton 2005). All UCFC specimens have individual accession numbers, and the abbreviation TNC is used for The Nature Conservancy.

Results and Discussion

Bittacus pilicornis Westwood, the hairy-horned hangingfly, is a species distributed throughout eastern and midwestern North America from southeastern Canada as far south as northern, peninsular Florida (Hagen 1861; Hine 1898, 1901a, b; Esben-Petersen 1921; Carpenter 1931, 1932, 1935; Setty 1940; Byers 1954, 1958, 1973; Webb et al. 1975; Byers and Covell 1981; Cheung et al. 2006; Somma and Dunford 2008). Wesley Bicha (WBC) collected three male *B. pilicornis* in Leon County on 19 April 1985;

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one male on 20 April 1985, and one female on 14 April 1990 in Liberty County; and one male in Gadsden County on 21 April 1985. All of these Florida panhandle specimens represent new county records. *Bittacus pilicornis* is now known from eight counties in northern Florida.

Bittacus punctiger Westwood, the spotted hangingfly, is principally a southeastern North American species distributed throughout the state of Florida (Hagen 1861; Hine 1898, 1901a, b; Esben-Petersen 1921; Carpenter 1931, 1935; Byers 1954, 1962; Webb et al. 1975; Somma and Dunford 2008). A male *B. punctiger* was collected in Liberty County, Florida, on 14 April 1990 by W. Bicha (pers. comm. 2009, WBC). Additionally, a female *B. punctiger* was collected from a Malaise trap set in TNC, Apalachicola Bluffs and Ravines Preserve, Liberty County, on 25 May 2006 by C. Porter and L. Stange, and deposited in FSCA. A male *B. punctiger* was collected from Santa Rosa County, Florida, on 23 May 1998 by W. Bicha (pers. comm. 2009, WBC). All of these aforementioned Florida panhandle specimens are county records. *Bittacus punctiger* is the most widespread bittacid in Florida (Somma and Dunford 2008), now known from 12 counties.

Panorpa americana Swederus, the American scorpionfly, is distributed throughout the southeastern United States, including the Florida panhandle (Rambur 1842; Hagen 1861; Hine 1901a, b; Esben-Petersen 1921; Carpenter 1931, 1939; Byers 1954, 1962, 1973, 1993; Somma and Dunford 2008). A male was collected in Santa Rosa County, in the western panhandle of Florida, on 24 October 1985 by W. Bicha (pers. comm. 2009, WBC), and represents a county record. This species is now known from five counties in the Florida panhandle.

Panorpa rufa Gray, the red scorpionfly, is a species sparsely distributed throughout much of the southeastern United States east of the Mississippi River, as far south as Alachua and Bay counties, northern Florida (Hagen 1861; Hine 1901a, b; Esben-Petersen 1921; Carpenter 1931; Byers 1954, 1993; Somma and Dunford 2008). Three *P. rufa*, all now missing abdomens, were collected in Blountstown, Calhoun County in the Florida panhandle, by T. H. Hubbell on 5 November 1938. These specimens reside in UMMZ (M. O'Brien pers. comm. 2009). Additionally, a male *P. rufa* collected at the Chipola River, Calhoun County, by T. H. Hubbell on this same date resides in SEMC (Z. Falin pers. comm. 2009). We believe that at least one of these specimens correspond to a locality dot on Byers's (1993) distribution map for this species, which we had overlooked in Somma and Dunford (2008). In addition to previously reported records (Somma and Dunford 2008), this species is now known from eight counties in Florida.

Panorpa lugubris Swederus, the black scorpionfly, is a species distributed throughout the southeastern United States east of the Mississippi River, previously reported as far south as Manatee County, western peninsular Florida (Rambur 1842; Hagen 1861; Hine 1901a, b; Esben-Petersen 1921; Carpenter 1931, 1935; Byers 1954, 1993; Somma and Dunford 2008). A new county record for the Florida panhandle includes two females collected from an unspecified locality in Madison County, Florida (UCFC 0248490-91), in November 1983; the lattermost collected by Joyce Wade. New county records for northern peninsular Florida include one female *P. lugubris* collected from Putnam County on 17 October 1984, and one male and five females collected from Clay County, on 28 October 1985, by W. Bicha (pers. comm. 2009, WBC). A new county record from central peninsular Florida includes a series of seven *P. lugubris* collected from Malaise traps in Osceola County, Kissimmee, TNC-Disney Wildlife Preserve, Station 2 (28.07º N, 81.26º W elev. 67 ft), by TNC staff in 2001. These include: a female collected 30 October-9 November (UCFC 0167089), a female collected 23-30 November (UCFC 0167158), one female and two males collected 9-16 November (UCFC 0167103-105, respectively), and one male and one female collected 16-23 November (UCFC 0167122-123, respectively). A female *P. lugubris* was collected from an unspecified locality in Miami-Dade County, near the southernmost tip of Florida, by M. Jaber [?] on 28 December 1969, and resides in SEMC (Z. Falin pers. comm. 2009). This is approximately 250 km south-southeast of the Manatee County record, making it the southernmost record for this species in North America, and southernmost record for any panorpid in Florida or the continental United States. *Panorpa lugubris* is Florida's most widespread panorpid (Somma and Dunford 2008), and perhaps distributed statewide; now known from 22 counties.

An undetermined specimen of *Panorpa* (UCFC 0248494), probably a female, was collected from an unspecified locality in Seminole County, central peninsular Florida, in May 1971 by M. H. Keim. This individual remains unidentifiable but a first county record for any panorpid in Seminole County. This specimen potentially could be a representative of the *Panorpa rufescens* Rambur species group but it is missing the distal third of its abdomen, the wing maculation and body pigmentation are severely faded,

and all of the legs are either missing or incomplete. The head had been removed and glued anterior-side down to the specimen label. The only member of the *P. rufescens* species group that has been collected in Florida is the southeastern species *Panorpa pachymera* Byers, the stout-genitaled scorpionfly, from two or three northern counties: Alachua (Gainesville), Leon, and perhaps Santa Rosa counties (Somma and Dunford 2008). An additional female *P. pachymera* is in SEMC, and was collected in LaCrosse, Alachua County, Florida, on 22 March 1977 by J. Hogsette (Z. Falin pers. comm. 2009). Further collecting in Seminole County is required to determine if the undetermined *Panorpa* is a known member of the *P. rufescens* species group, or even an entirely new species. Moreover, W. Bicha has collected an undescribed member of the *P. rufescens* species group from Liberty County, Florida (one male and two females on 9 April 1982; three males and two females on 14 April 1990), but the specimens subsequently have been lost (W. Bicha pers. comm. 2009). This underscores the need to collect more scorpionflies from Liberty County.

Panorpa claripennis Hine, Hine's scorpionfly, is a northeastern and northern-midwestern North American panorpid documented from Ontario, Quebec, Connecticut, Maine, New Hampshire, Vermont, New York, Massachusetts, Pennsylvania, Ohio, West Virginia, Minnesota, Wisconsin, and Michigan (Hine 1901a, b; Esben-Petersen 1921; Carpenter 1931, 1932; Byers 1954, 1973; Frost and Brown 1955; Thornhill and Johnson 1974; Webb et al. 1975; Cheung et al. 2006). Byers (1958) published a record for *P. claripennis* from the eastern panhandle of Florida; a male collected by J. S. Rogers from Gadsden County, "3 mi" [4.83 km] east of Quincy, on 29 March 1954. This single record is greatly disjunct from the nearest southern localities for *P. claripennis* in Ohio and West Virginia more than 960 km to the north, and has been noted by others (Webb et al. 1975; Cheung et al. 2006; Penny 2008). It was collected "along a small, sandy-bottomed stream through hammock vegetation" and according to Byers (1958) resided in the collection of UMMZ. We could not locate this specimen at UMMZ (M. O'Brien pers. comm. 2008), SEMC (Z. Falin pers. comm. 2008), UCFC, or FSCA. Wesley Bicha (pers. comm. 2009) visited this specific site in April 1982 and was unable to find this species. No other specimens of *P. claripennis* have since been reported from Florida. Currently, G. Byers (pers. comm. 2008) believes this specimen was mislabeled and does not think *P. claripennis* occurs in Florida. Given the aforementioned information we do not think *P. claripennis* occurs or has ever occurred in Florida.

The records presented in our study further underscore our earlier contention (Somma and Dunford 2008) that Florida mecopterans remain undercollected, understudied, and may provide future significant discoveries, including undescribed endemic species, for dedicated researchers.

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