

## NEW RECORDS OF CORIXIDAE AND MICRONECTIDAE (INSECTA: HETEROPTERA: CORIXOIDEA) FROM FLORIDA, WITH A CHECKLIST OF ALL SPECIES KNOWN FROM THE STATE<sup>1</sup>

J. H. Epler<sup>2</sup> and D. R. Denson<sup>3</sup>

**ABSTRACT:** Five new state records for Florida Corixidae are given. Two introduced species of Micronectidae are discussed. A checklist of all Florida Corixidae and Micronectidae is presented.

**KEYWORDS:** Heteroptera, Corixidae, Micronectidae, *Micronecta*, *Synaptonecta*, distribution, Florida, Nearctic

Epler (2006) provided a long needed update for the aquatic/semi-aquatic Heteroptera of Florida, providing keys for all species from 14 families of "water bugs" known from the state. He also included several species not yet recorded from Florida, but were expected to occur because of the proximity of other records for those species from adjacent states.

Here we report five Corixidae species that are new records for Florida. Four of these were among those included in keys by Epler (2006) as expected to occur in the state. One of these five species, *Hesperocorixa obliqua* (Hungerford), had not been included. Specimens are in the collection of the senior author, with the exception of the *Trichocorixa macroceps*, which is in the reference collection of the Florida Department of Environmental Protection in Tallahassee, FL.

### New Species Records

***Hesperocorixa georgiensis* (Egbert).** FL: Walton Co., Natural Bridge Creek at Highway 181, north side; N30.98861, W-86.20466; UV blacklight; 2-vi-2016; leg. Dana and Edie Denson; 1 ♂.

This Florida specimen is apparently the only example of this species collected since the species' original description from a single male by Egbert (1946) from Baker County, Georgia. The southern boundary of Baker County is about 50 km north of the Florida/Georgia line. This species has a very long strigil, rivaled in Florida only by the slightly smaller strigil of *H. interrupta* (Say).

Natural Bridge Creek is a sand-bottom headwater seepage stream within the Choctawhatchee River basin. This site is about 0.6 km south of the Florida/Alabama state line, which at this point is about 9 km south of the border of Baker County, Georgia (if it was extended to the west).

<sup>1</sup> Received on August 8, 2016. Accepted on November 9, 2016.

<sup>2</sup> 461 Tiger Hammock Road, Crawfordville, FL 32327, USA. Corresponding author Email: john.epler3@comcast.net

<sup>3</sup> Reedy Creek Environmental Services Lab, 2191 South Service Lane, Lake Buena Vista, FL 32830, USA. Email: ddenson@rcid.org

***H. minor* (Abbott).** FL: Walton Co., Natural Bridge Creek at Highway 181, north side; N 30.98861, W -86.20466; UV blacklight; 2-vi-2016; leg. Dana and Edie Denson; 1 ♂, 1 ♀.

The closest records for this species given by Hungerford (1948) are for south-central Alabama and central and northern Georgia.

***H. obliqua* (Hungerford).** FL: Escambia Co., Pine Barren Creek below US Highway 29; N30°46'33", W87°20'20"; UV blacklight pan trap; 28-iv-2009; leg. D. Ray, R. Abad; 1 ♂, 2 ♀♀; and FL: Holmes Co., Holmes Creek at Reddick Mill Road; N 30°53'22.13", W 85°34'44.83"; UV blacklight; 7-v-2015; leg. D. R. Denson; 2 ♂♂.

This species was not included in the keys in Epler (2006); the closest record known to Epler was from central Mississippi (Hungerford, 1948: 545). It will key to couplet 8 in Epler (2006); it can be separated from *H. martini* (Hungerford) and *H. interrupta* (Say) by the more acutely produced male pala, hemelytra not heavily rastrate and distinctive male right paramere (longer and more arcuate than that of *H. martini*; thicker than that of *H. interrupta*. See Hungerford (1948) for figures or go to <[johneppler.com/WatBugUp.html](http://johneppler.com/WatBugUp.html)> for photos of *H. obliqua*.

Pine Barren Creek is a sand-bottomed third-order tributary of the Escambia River.

***Sigara mississippiensis* Hungerford.** FL: Escambia Co., Pine Barren Creek below US Highway 29; N30°46'33", W-87°20'20"; UV blacklight pan trap; 28-iv-2009; leg. D. Ray, R. Abad; 1 ♂.

The previous closest records to Florida were from coastal Alabama and southern Georgia (Hungerford, 1948).

***Trichocorixa macroceps* (Kirkaldy).** FL: Santa Rosa Co., Manning Creek at Whitfield Road; N 30°52'53.69", W 87°1'48.911"; 18-i-2000; leg. R. Payne; 1 ♂.

The previous closest record to Florida was from the Okefenokee Swamp in southern Georgia (Sailer, 1948). The collecting site, Manning Creek, is near the headwaters of this second-order tributary of the West Fork of Big Coldwater Creek, which flows into the Blackwater River.

## Notes on the Corixoidea of Florida

Epler (2006) listed 29 corixid species in nine genera for Florida, and considered the Micronectinae a subfamily of Corixidae. However, Nieser (2002) elevated the subfamily to full family status, a move that has been followed by subsequent workers (Tinerella, 2008; Chen et al., 2015). After reorganizing the taxa, Florida now has seven genera with a total of 32 species of Corixidae ("water

boatmen"), and two genera, each with one species, of Micronectidae ("pygmy water boatmen").

The majority of Florida's corixoid fauna is shared with most of the states in the southeastern United States, with three exceptions:

*Centrocorisa nigripennis* (Fabricius) is a Neotropical species that reaches its northern limit in Florida (Collier and Highlands counties). In the United States the species is also known from southern Texas.

*Micronecta ludibunda* Breddin and *Synaptonecta issa* (Distant) are introduced species. Both are members of the family Micronectidae; all other Florida corixids belong in the family Corixidae. The two species were likely introduced via the aquarium plant trade from southeast Asia, where both species are very common. *Micronecta* and *Synaptonecta* appear to be expanding their range in Florida.

*Micronecta ludibunda* was first reported in Florida by Polhemus and Golia (2006) from material first collected in 2001 in Highlands and Palm Beach counties; Epler (2006) added Collier, Hendry and Lee counties to its distribution. Ten years later, *M. ludibunda* is found in at least twice as many counties. Its range now includes the following Florida counties: Collier, Hardy, Hendry, Highlands, Hillsborough, Lee, Manatee, Orange, Palm Beach and Volusia (northernmost record).

Polhemus and Rutter (1997) first reported *S. issa* from Florida, from material collected in 1993 in St. Lucie County. It is now known from the following counties in Florida: DeSoto, Hardee, Highlands, Lake, Okeechobee, Orange and St. Lucie. The senior author has seen both brachypterous and macropterous forms.

The possibility exists that another micronectid genus, *Tenagobia* Bergroth, 1899, may eventually be found in southern Florida. *Tenagobia* is native to the Neotropics with about 28 described species; one species, *T. mexicana* Deay, 1930, is known from northern Mexico. Hungerford (1948: 80) gave an uncertain record of *T. mexicana* from California; Konopko et al. (2010) noted that the records needed confirmation. Epler (2006: 3.3) included the genus in a key, but noted it was not recorded from Florida. Polhemus (2008: 420) listed *Tenagobia* as "Southwest, Florida (primarily tropical)" in a table under "North American Distribution."

The senior author has never seen a specimen of *Tenagobia* from Florida. Riviauz et al. (2010) and Naranjo et al. (2010) did not record *Tenagobia* from Cuba.

## CHECKLIST OF THE CORIXOIDEA OF FLORIDA

## CORIXIDAE Leach, 1815

- Centrocorisa* Lundblad, 1928  
*nigripennis* (Fabricius, 1803)  
*Corisella* Lundblad, 1928  
*edulis* (Champion, 1901)  
*Hesperocorixa* Kirkaldy, 1908  
*brimleyi* (Kirkaldy, 1908)  
*georgiensis* (Egbert, 1946)  
*interrupta* (Say, 1825)  
*lucida* (Abbott, 1916)  
*martini* (Hungerford, 1928)  
*minor* (Abbott, 1913)  
*nitida* (Fieber, 1851)  
*obliqua* (Hungerford, 1925)  
*semilucida* (Walley, 1930)  
*Palmacorixa* Abbott, 1912  
*buenoi* Abbott, 1913  
*Ramphocorixa* Abbott, 1912  
*acuminata* (Uhler, 1897)  
*Sigara* Fabricius, 1775  
*berneri* Hungerford & Hussey, 1957  
*bradleyi* (Abbott, 1913)  
*hubbelli* (Hungerford, 1928)  
*macrocephoidea* Hungerford, 1942  
*macropala* (Hungerford, 1926)  
*mississippiensis* Hungerford, 1942  
*paludata* Hungerford, 1942  
*scabra* (Abbott, 1913)  
*sigmoidea* (Abbott, 1913)  
*signata* (Fieber, 1851)  
*zimmermanni* (Fieber, 1851)  
*Trichocorixa* Kirkaldy, 1908  
*calva* (Say, 1832)  
*kanza* Sailer, 1928  
*louisianae* Jaczewski, 1931  
*macrocephs* (Kirkaldy, 1908)  
*minima* (Abbott, 1913)  
*reticulata* (Guérin-Méneville, 1857)  
*sexcincta* (Champion, 1901)  
*verticalis* (Fieber, 1851)

## MICRONECTIDAE Jaczewski, 1924

- Micronecta* Kirkaldy, 1897  
*ludibunda* Breddin, 1905  
*Synaptonecta* Lundblad, 1933  
*issa* (Distant, 1910)

## ACKNOWLEDGMENTS

We thank Florida Department of Environmental Protection biologists Rick Abad, Mike Heyn and Donald Ray for making specimens available for examination. We also thank Broughton Caldwell and Bob Rutter for their comments on a draft of this paper.

## LITERATURE CITED

- Chen, P.-p., N. Nieser, and J. Lapidin. 2015. A review of Bornean Micronectidae (Hemiptera, Heteroptera, Nepomorpha) with descriptions of two new species from Sabah, Malaysia. *ZooKeys* 501: 27-62.
- Egbert, A. M. 1946. A new corixid from Georgia (Hemiptera, Corixidae). *Journal of the Kansas Entomological Society* 19: 133-135.
- Epler, J. H. 2006. Identification Manual for the Aquatic and Semi-aquatic Heteroptera of Florida (Belostomatidae, Corixidae, Gelastocoridae, Gerridae, Hebridae, Hydrometridae, Mesoveliidae, Naucoridae, Nepidae, Notonectidae, Ochteridae, Pleidae, Saldidae, Veliidae). Florida Department of Environmental Protection, Tallahassee, FL. 186 pp.
- Hungerford, H. B. 1948. The Corixidae of the Western Hemisphere (Hemiptera). University of Kansas Science Bulletin 32: 1-827.
- Konopko, S. A., S. A. Mazzuconni, and A. O. Bachmann. 2010. Description of the nymphs of *Tenagobia (Incertagobia) incerta* Lundblad 1929 and *Tenagobia (Schadeogobia) schadei* Lundblad 1929 (Hemiptera: Heteroptera: Micronectidae), with emphasis on morphometry and chaetotaxy. *Zootaxa* 2511: 39-58.
- Naranjo, C., S. M. Riviaux, F. F. F. Moreira, and R. C. Court. 2010. Taxonomy and distribution of aquatic and semiaquatic Heteroptera (Insecta) from Cuba. *Revista de Biología Tropical* 58: 897-907.
- Nieser, N. 2002. Guide to aquatic Heteroptera of Singapore and peninsular Malaysia. IV. Corixoidae. *The Raffles Bulletin of Zoology* 50: 263-274.
- Polhemus, J. T. 2008. Aquatic and semiaquatic Heteroptera, pp. 385-423. In Merritt, R. W., K. W. Cummins, and M. B. Berg. 2008. *An Introduction to the Aquatic Insects of North America*. Kendall/Hunt Publishing Co., Dubuque, Iowa. 1158 pp.
- Polhemus, J. T. and V. Golia. 2006. *Micronecta ludibunda* Breddin (Heteroptera: Corixidae: Micronectinae), the second Asian water bug introduced into Florida, U.S.A. *Entomological News* 117: 531-534.
- Polhemus, J. T. and R. P. Rutter. 1997. *Synaptonecta issa* (Heteroptera: Corixidae), first new world record of an Asian water bug in Florida. *Entomological News* 108: 300-304.
- Riviaux, S. N., F. F. F. Moreira, and C. N. López. 2010. Checklist, distribution, and habitat of the semiaquatic and aquatic bugs from Cuba (Hemiptera: Heteroptera: Dipsocoromorpha, Leptopodomorpha, Gerromorpha and Nepomorpha). *Zootaxa* 2562: 1-23.
- Sailer, R. I. 1948. The genus *Trichocorixa* (Corixidae, Hemiptera), pp. 289-407. In Hungerford, H. B. 1948. The Corixidae of the Western Hemisphere (Hemiptera). University of Kansas Science Bulletin 32: 1-827.
- Tinerella, P. P. 2008. Taxonomic revision and systematics of New Guinea and Oceania pygmy water boatmen (Hemiptera: Heteroptera: Corixoidae: Micronectidae). *Zootaxa* 1797: 1-66.