Annotated checklist of the millipedes of Florida
(Arthropoda: Diplopoda)

Rowland M. Shelley
Research Laboratory
North Carolina State Museum of Natural Sciences
4301 Reedy Creek Rd., Raleigh, North Carolina 27607

Abstract. The milliped fauna of Florida consists of 8 orders, 18 families, 34 genera, and 51 species and subspecies; it comprises six elements: widespread species occurring widely in Florida, northern species reaching their southern limits in north Florida, neotropical species occurring naturally in Florida or adventive there, oriental adventives, Florida endemics, and southeastern endemics. A complete listing of these taxa is provided, with published and new records from the state, synonyms, and type localities. *Georgiulus paynei* Hoffman, *Cleidogona alata* Causey, and *Pseudopolydesmus serratus* (Say) are newly recorded from the state, and *Eurymerodesmus serratus* Shelley is deleted; *Pseudojulus obtectus* (Bollman) is recorded from Alabama.

Key words. milliped, Florida

Introduction

Because of its position at the subtropical corner of the southeastern United States, Florida has a unique milliped fauna. While lacking the diversity of states to the north, which have more physiographic regions, Florida nevertheless harbors endemic taxa and a mixture of adventive species from the Neotropical and Oriental realms. Added to this are a number of local southeastern endemics and northern species that reach their southern limit in north Florida, and one has a surprisingly diverse fauna for a state with only one physiographic province.

Florida millipes have been recorded in a host of publications over the years, but there has never been a consolidated report on the state’s fauna. Causey (1960) stated that 32 genera were known from the state, and Hoffman (1969) estimated that there were 10 families, 15 genera, and 16 species around Gainesville, and 7 families, 8 genera, and 8 species at Miami. These numbers would be higher if any representatives of the family Julidae had been recorded from the state. This adventive family, native to the Palearctic, occurs throughout North America, primarily in urban environments, and Hoffman (1999) counted four genera and nine species from the continent. However, I know of no published records from Florida and I have not searched through the wealth of julid samples in American repositories looking for samples from the state. Consequently, the family Julidae remains unknown from Florida.

With the publication of this checklist, Florida becomes the fifth state whose milliped fauna has been documented, the others being Ohio (Williams and Hefner 1928), Michigan (Johnson 1954, Snider 1991), California (Buckett 1964, Shelley in press), and North Carolina (Shelley 2000a). These regional listings supplement the two national publications (Chamberlin and Hoffman 1958, Hoffman 1999) from which faunal information can be gleaned for any state in the continental United States. This checklist records a fauna of 8 orders, 18 families, 34 genera, and 51 species and subspecies in Florida with one deletion; three species — *Georgiulus paynei* Hoffman, *Cleidogona alata* Causey, and *Pseudopolydesmus serratus* (Say) — are new records for the state. The format for the accounts includes a listing of synonyms relevant to Florida, the type locality (given as a state or country when not in Florida), occurrence in Florida including published and new records, pertinent references, and miscellaneous remarks where appropriate. For the new records, locality details are provided when there are six or fewer new counties, and counties alone are presented when there are more than six. Acronyms of sources of preserved material are as follows:

**FMNH** - Field Museum of Natural History, Chicago, Illinois.
**FSC** - Biology Department, Florida Southern College, Lakeland.
Deletion

Order Polydesmida
Family Eurymerodesmidae

*Eurymerodesmus serratus* Shelley, 1990

The type locality for this species is in Pulaski County, Arkansas, and I (Shelley 1990) discussed an additional sample from, supposedly, Alachua County, Florida. Hoffman (1999) stated that this locality should be held in suspicion until confirmed with fresh material, and I would go this one better by formally deleting *E. serratus* from the state. I now believe this locality is too implausible to warrant further consideration.

The Millipeds of Florida

Subclass Penicillata
Family Polyxenidae

*Genus Polyxenus* Latreille, 1802/1803

*Polyxenus fasciculatus* Say, 1821

**Synonyms.** None.

**Type locality.** Originally just the "Southern States"; Condé (1996) designated a neotype from Georgia.

**Occurrence in Florida. Published records:** Florida in general, Palm Beach County. **New records:** Alachua, Broward, Collier, DeSoto, Escambia, Glades, Highlands, Jackson, Jefferson, Lake, Lee, Leon, Levy, Marion, Martin, Monroe, Osceola, Sarasota, St. Lucie, and Wakulla counties (AMNH, FSCA, FMNH, WAS).

**Reference.** Condé 1996.

Genus *Macroxenodes* Silvestri, 1948

*Macroxenodes bartschi* (Chamberlin, 1923)

**Synonym.** *Polyxenus bartschi.*

**Type locality.** Tortugas Key, Monroe Co.

**Occurrence in Florida. Published records:** Tortugas and Upper Snipe Keys. **New records:** None.


Subclass Chilognatha
Infraclasse Helminthomorpha
Subterclass Colobognatha
Order Polyzoniida
Family Siphonotidae

*Genus Rhinotus* Cook, 1896

*Rhinotus purpureus* (Pocock, 1894)

**Synonym.** *Siphonotus miamiensis.*

**Type locality.** St. Vincent.

**Occurrence in Florida. Published records:** Dade and Pinellas counties. **New records:** Monroe Co., Islamorada, Lower Matcumbe Key, and Stock Island (FSCA, NCSM). Volusia Co., DeLand (FSCA).

**References.** Causey 1953, 1965.

**Remarks.** *Rhinotus purpureus* is an adventive species that should be expected in urban environments throughout south Florida.

Subterclass Eugnatha
Superorder Juliformia
Order Julida
Family Blaniulidae

*Genus Virgoiulus* Enghoff, 1984

*Virgoiulus minutus* (Brandt, 1841)

**Synonym.** *Julus lineatus, Nopoiulus minutus.*

**Type locality.** Virginia.


**Family Nemasomatidae**

*Genus Orinisobates* Lohmander, 1932
Orinisobates nigrior (Chamberlin, 1943)
  Synonyms. None.
  Type locality. Tennessee.
  Occurrence in Florida. Published record: Liberty County. New records: None.

Family Parajulidae
Genus Arvechambus Causey, 1963

Arvechambus australis Causey, 1963
  Synonyms. None.
  Type locality. Gainesville, Alachua County.
  Occurrence in Florida. Published record: Alachua County. New records: None.

Arvechambus hummi Causey, 1963
  Synonyms. None.
  Type locality. Tallahassee, Leon County.
  Occurrence in Florida. Published records: Baker, Leon, and Liberty counties. New records: None.

Genus Georgiulus Hoffman, 1992

Georgiulus paynei Hoffman, 1992
  Synonyms. None.
  Type locality. Georgia.
  Occurrence in Florida. Published records: None. New records: Leon Co., Tallahassee and Tall Timbers Res. Sta. (FSCA). Nassau Co., Amelia I., public beach access area off FL Hwy. A1A ca. 3 mi (4.8 km) N south end of island (NCSM).
  References. None.
  Remarks. Georgiulus paynei is a new record for Florida.

Genus Gyniulus Loomis, 1963

Gyniulus bufonius (Chamberlin, 1938)
  Synonyms. Ethojulus bufonius, Gyniulus lacustrinus.
  Type locality. Gainesville, Alachua County.
  Occurrence in Florida. Published records: Alachua, Clay, Duval, Orange, and Palm Beach counties. New records: None.

Gyniulus myakkensis Loomis, 1963
  Synonyms. Gyniulus domesticus.
  Type locality. Myakka River State Park, Manatee County.
  Occurrence in Florida. Published records: Dade, Highlands, Manatee, and Sarasota counties.

Gyniulus occidentalis Shelley, 2000
  Synonyms. None.
  Type locality. St. Andrews State Park, Bay County.
  Occurrence in Florida. Published records: Bay County. New records: None.

Gyniulus orarius Shelley, 2000
  Synonyms. None.
  Type locality. Dunedin, Pinellas County.
  Occurrence in Florida. Published records: Manatee, Pasco, and Pinellas counties. New records: None.

Genus Pseudojulus Bollman, 1887

Pseudojulus obtectus (Bollman, 1887)
  Synonyms. None.
  Type locality. Pensacola, Escambia County.
  Occurrence in Florida. Published records: Escambia and Santa Rosa counties. New records: Okaloosa Co., Crestview and Valparaiso (FSCA). Walton Co., 8.5 mi (13.6 km) W DeFuniak Springs (FSCA).
  Remarks. I confirm Hoffman's prediction (1992) that P. obtectus must occur in southern Alabama, as the FSCA contains a female from Springhill College, Mobile, Mobile County.

Order Spirobolida
Family Floridobolidae
Genus Floridobolus Causey, 1957

Floridobolus penneri Causey, 1957
  Synonyms. None.
  Type locality. Along Florida highway 70, 10 mi W of Archbold Biological Station, Highlands County.
  Occurrence in Florida. Published records: Highlands and Polk counties. New records: None.
Remarks. According to Deyrup and Franz (1994), this diplopod, commonly known as the Florida Scrub Millipede, is endemic to the Lake Wales Ridge in these counties of Florida.

Family Spirobolidae
Genus Chicobolus Chamberlin, 1947

Chicobolus spinigerus (Wood, 1864)
Synonyms. Spirobolus spinigerus, C. pilsbryi, C. jucundus.
Type locality. Restricted to Everglades National Park, Dade/Monroe counties by Causey (1955), but no neotype was designated.

Genus Narceus Rafinesque, 1820

Narceus americanus (Beauvois, 1805)
Synonyms. Narceus americanus americanus, Spirobolus marginatus.
Type locality. South Carolina.
Remarks. These records show that N. americanus should be expected throughout the state of Florida.

Narceus gordanus (Chamberlin, 1943)
Synonyms. Spirobolus gordanus, Arctobolus keysi, Narceus keysi.
Type locality. Punta Gorda, Charlotte County.
Occurrence in Florida. Published records: Alachua, Broward, Collier, Hernando, Highlands, Hillsborough, Lake, Marion, Palm Beach, Polk, and St. Johns counties. New records: None.
Remarks. Narceus gordanus is endemic to peninsular Florida, from Alachua County southward.

Records from Carter County, Tennessee, and Charleston County, South Carolina (Keeton 1960), were deleted by Shelley and Bauer (1997).

Order Spirostreptida
Family Cambalidae
Genus Cambala Gray, 1832

Cambala annulata (Say, 1821)
Synonyms. Cambala cristula.
Type locality. “Southern states.”

Superorder Nematophora
Order Chordeumatida
Family Branneriidae
Genus Branneria Bollman, 1893

Branneria carinata (Bollman, 1888)
Synonyms. None.
Type locality. Tennessee

Family Cleidogonidae
Genus Cleidogona Cook, 1895

Cleidogona alata Causey, 1961
Synonyms. None.
Type locality. Georgia.
Occurrence in Florida. Published records: None. New record: Clay Co., Spring Cr. along FL hwy. 21 S jct. FL hwy. 16 (NCSM).
References. None.
Remarks. Cleidogona alata is a new record for Florida.

Cleidogona australis Loomis, 1966
Synonyms. None.
Type locality. Highlands Hammock State Park, Highlands County.
Occurrence in Florida. Published record: Highlands County. New records: None.
Remarks. The types of this species were not at the Smithsonian Institution in 1972, and C. australis could not be treated by Shear. They are now there.

*Cleidogona hadena* Causey, 1961

**Synonyms.** None.

**Type locality.** Juniper Springs, Marion County.

**Occurrence in Florida.** Published record: Marion County. **New record:** Columbia Co., 12 mi (19.2 km) N Lake City (AMNH).


*Cleidogona* sp.

**Occurrence in Florida:** Volusia Co., Orange City (NCSM).

**Remarks.** For completion, I list here an additional county from which unidentifiable females of *Cleidogona* have been collected.

**Order Callipodida**

**Family Caspiopetalidae**

**Genus *Abacion*** Rafinesque, 1820

*Abacion lactarium* (Say, 1821)

**Synonyms.**

**Type locality.** Pennsylvania.

**Occurrence in Florida.** Published records: Peninsular Florida south to southernmost extremity of Everglades National Park. No specific localities have been recorded, but Sheley (1984a) published a map showing occurrence throughout Florida except for the Keys. **New records:** Alachua, Baker, Bay, Broward, Clay, Collier, Dade, DeSoto, Duval, Hamilton, Highlands, Hillsborough, Indian River, Jackson, Jefferson, Lake, Lee, Leon, Levy, Liberty, Manatee, Marion, Martin, Monroe, Orange, Palm Beach, Pasco, Polk, Putnam, Santa Rosa, Seminole, St. Johns, and Walton counties (AMNH, FMNH, FSCA, MCZ, NCSM, NMNH, VMNH).

**References.** Sheley 1984a.

*Abacion tesselatum* Rafinesque, 1820

**Synonyms.** None.

**Type locality.** Kentucky.

**Occurrence in Florida.** Published records: Escambia, Jackson, and Liberty counties. **New records:** Escambia Co., Pensacola (FSCA), Jackson Co., Florida Caverns St. Pk. (NCSM), Liberty Co., Bristol (FSCA).


**Genus *Delophon*** Chamberlin, 1943

*Delophon serrulatum* Causey, 1954

**Synonyms.** None.

**Type locality.** Alabama.

**Occurrence in Florida.** Published record: Liberty County. **New records:** None.


**Superorder Merocheta**

**Order Polydesmida**

**Family Eurymerodesmidae**

**Genus *Eurymerodesmus*** Brölemann, 1900

*Eurymerodesmus varius varius* (McNeill, 1887).

**Synonyms.** Polydesmus varius, Leptodesmus varius, Eurymerodesmus minimus.

**Type locality.** Pensacola, Escambia County.

**Occurrence in Florida.** Published records: Duval, Escambia, Gilchrist, Hernando, Jackson, Jefferson, Leon, and Okaloosa counties. **New record:** Bay Co., along FL hwy. 20 at Ecofina Cr. (NCSM).

**References.** McNeill 1887, Loomis 1943b, Sheley 1990.

**Family Euryuridae**

**Genus *Auturus*** Chamberlin, 1942

*Auturus erythropygos becki* Chamberlin, 1951

**Synonym.** *Auturus becki*.

**Type locality.** An unspecified locality along the Suwannee River.


**References.** Chamberlin 1951, Shelley 1982.

**Genus *Euryurus*** C. L. Koch, 1847

*Euryurus maculatus* C. L. Koch, 1847

**Synonyms.** *E. falcipes*.

**Type locality.** Unknown.

**Occurrence in Florida.** Published records: Jackson and Liberty counties. **New records:** Jefferson Co., Monticello, Big Bend Hort. Lab. (FSCA). Leon Co., Tallahassee, Florida State Univ. campus (FSCA).

Family Haplodesmidae
Genus Prosopodesmus Silvestri, 1910

Prosopodesmus jacobsoni Silvestri, 1910
Synonyms. None.
Type locality. Indonesia.
Occurrence in Florida. Published records: Citrus, Dade, Pasco, and Volusia counties. New records: None.

Family Paradoxosomatidae
Genus Asiomorpha Verhoeff, 1939

Asiomorpha coarctata (Saussure, 1860)
Synonym. Orthomorpha coarctata.
Type locality. French Guyana.

Genus Helicorthomorpha Attems, 1914

Helicorthomorpha holstii (Pocock, 1895)
Synonyms. None.
Type locality. Japan (Okinawa).
Occurrence in Florida. Published record: Orange County. New records: None.
Remarks. This millipede is known only from a nursery that is shipping plants across Florida, causing Shelley and Edwards to believe that it will eventually be found elsewhere and should be included in the state’s fauna.

Genus Oxidus Cook, 1911

Oxidus gracilis (C. L. Koch, 1847)
Synonym. Orthomorpha gracilis.
Type locality. Austria (adventive population).
Occurrence in Florida. Published records: Said to be statewide. New records: Alachua, Collier, Dade, Duval, Martin, Monroe, Polk, and Volusia counties (AMNH, FSC, FSCA, INHS, NCSM, NMNH).
Remarks. An adventive, synanthropic diplopod, O. gracilis, the hothouse or greenhouse miliped, unquestionably occurs in urban environments in all counties of Florida.

Family Polydesmidae
Genus Pseudopolydesmus Attems, 1899

Pseudopolydesmus canadenensis (Newport, 1814)
Synonyms. Dixidesmus phanus, Dixidesmus branneri.
Type locality. Ontario, Canada.

Pseudopolydesmus serratus (Say, 1821)
Synonyms. None.
Type locality. Virginia.
References. None.
Remarks. Pseudopolydesmus serratus is a new record for Florida.

Family Pyrgodesmidae
Genus Calyptodesmus Schubart, 1944

Calyptodesmus sanctus Schubart, 1944
Synonym. Calyptodesmus schubarti
Type locality. Brazil

Genus Lophodesmus Pocock, 1894

Lophodesmus caraibianus (Chamberlin, 1918)
Synonyms. None.
Type locality. Haiti.
Occurrence in Florida. Published record: Dade County. New records: None.
Genus *Myrmecodesmus* Silvestri, 1910

*Myrmecodesmus digitatus* (Loomis, 1959)

**Synonyms.** None.

**Type locality.** Louisiana.

**Occurrence in Florida. Published record:** Calhoun County. **New records:** None.


*Myrmecodesmus formicarius* Silvestri, 1910

**Synonyms.** None.

**Type locality.** Mexico.

**Occurrence in Florida. Published record:** Calhoun County. **New records:** None.


Genus *Poratia* Cook and Cook, 1894

*Poratia digitata* (Porat, 1889)

**Synonym.** *Poratioides disparatus*.

**Type locality.** Sweden (from a greenhouse).

**Occurrence in Florida. Published record:** Dade County. **New records:** None.


**Remarks.** Though described from a thelytokous population in Sweden, this species is presumably native to Central America.

Genus *Psocodesmus* Cook, 1896

*Psocodesmus crescentis* Cook, 1896

**Synonyms.** None.

**Type locality.** Crescent City, Putnam County.

**Occurrence in Florida. Published records:** Dade, Indian River, and Putnam counties. **New records:** None.


Family Xystodesmidae

Genus *Caralinda* Hoffman, 1978

*Caralinda causeyae* Shelley, 1983

**Synonym.** *Caralinda causeyi*.

**Type locality.** Tall Timbers Res. Sta., ca. 22 mi (35.2 km) N Tallahassee, Leon County.

**Occurrence in Florida. Published records:** Jefferson and Leon counties. **New records:** None.


*Caralinda dactylifera* Shelley, 1983

**Synonyms.** None.

**Type locality.** Panama City, Bay County.

**Occurrence in Florida. Published records:** Bay, Okaloosa, and Walton counties. **New records:** None.


*Caralinda pulchriteca* Shelley, 1979

**Synonyms.** None.

**Type locality.** Welcome Center on US hwy. 231, ca. 3 mi (4.8 km) N Campbellton, Jackson County.

**Occurrence in Florida. Published record:** Jackson County. **New records:** None.

**References.** Shelley 1979, 1983.

Genus *Dicellarius* Chamberlin, 1920

*Dicellarius bimaculatus bimaculatus* (McNeill, 1887)

**Synonyms.** *Polydesmus bimaculatus, Fontaria bimaculata, Spathoria bimaculata, Dicellarius bimaculatus*.

**Type locality.** Pensacola, Escambia County.

**Occurrence in Florida. Published record:** Escambia County. **New records:** None.


*Dicellarius bimaculatus fictus* (Chamberlin, 1943)

**Synonyms.** None.

**Type locality.** Georgia.


*Dicellarius okefenokensis* (Chamberlin, 1918)

**Synonyms.** *Epeloria nannoides*.

**Type locality.** Georgia.

**Occurrence in Florida. Published records:** Alachua, Baker, Clay, Columbia, Hamilton, Hernando, Marion, Nassau, Pasco, Putnam, Seminole, and Suwannee counties. **New records:** Duval Co., Jacksonville (FSCA), Orange Co., Orlando (UCF).

Genus *Pleuroloma* Rafinesque, 1820

*Pleuroloma cala* (Chamberlin, 1939)

**Synonyms.** *Zinaria cala.*

**Type locality.** East of Deer Park, Osceola/Brevard counties.

**Occurrence in Florida.** Published records: Alachua, Brevard, Broward, Clay, Dade, Highlands, Indian River, Lake, Levy, Marion, Monroe, Osceola, Palm Beach, Polk, Putnam, and Seminole counties.

**New records:** Collier, Flagler, Hernando, Hillsborough, St. Johns, Sumter, and Volusia counties (FSC, FSCA, NCSM, NMNH).


*Pleuroloma plana* Shelley, 1980

**Synonyms.** None.

**Type locality.** Wakulla Springs Resort, Wakulla County.

**Occurrence in Florida.** Published records: Gadsden, Hamilton, Jackson, Leon, Liberty, Taylor, Wakulla, and Walton counties. **New record:** Jefferson Co., Monticello, Big Bend Hort. Lab (FSCA).


Genus *Sigmoria* Chamberlin, 1939

*Sigmoria* (*Cheiropus*) *australis* Shelley, 1986

**Synonym.** None.

**Type locality.** Torreya State Park, Liberty County.

**Occurrence in Florida.** Published records: Jackson and Liberty counties. **New records:** Gadsden Co., landing on Apalachicola R. S.of I-10 (NCSM); and along FL hwy. 12, 12 mi (19.2 km) E Havana (NCSM). Leon Co., Tallahassee, Lake Jackson Mounds St. Pk. (NCSM). Suwannee Co., Live Oak (FSCA).


*Sigmoria* (*Cheiropus*) *plana* (Loomis, 1944)

**Synonym.** *Cheiropus planus.*

**Occurrence in Florida.** Published records: Alachua, Bradford, Columbia, Hamilton, Hernando, Jefferson, and Leon counties. **New records:** None.


*Sigmoria* (*Cheiropus*) *serrata* (Shelley, 1984)

**Synonym.** *Cheiropus serratus.*

**Type locality.** Georgia.

**Occurrence in Florida.** Published record: Duval County. **New record:** Nassau Co., Fernandina Beach (NCSM).


**Discussion**

The 51 species and subspecies in Florida comprise six elements. The panhandle and the northern part of the state are largely inhabited by species occurring in states to the north; some occur only in the adjacent states and are classified as southeastern endemics, but six occur well to the north and are truly northern species that reach their southern distributional limits here. As one moves southward into the peninsula, species that are endemic to Florida are encountered, and these are mixed with southeastern endemics and neotropical species that either occur naturally in the state or have arrived here. Most of these species have arrived in Florida, examples being *Rhinotus purpureus* and *Prosopodesmus jacobsoni,* but *Macroxenodes bartschi* appears to occur naturally in the Tortugas and Monroe County. The fauna of the southern part of the peninsula is primarily neotropical, although there are widespread species (*Narceus americanus* and *Abacion lactarium*) and one Florida endemic, *Pleuroloma cala.* The six elements of the Florida fauna and the component species are listed below:

**Widespread species occurring widely in Florida (3 species):** *Polyxenus fasciculatus, Narceus americanus, Abacion lactarium.*

**Northern species reaching their southern limit in north Florida (6 species):** *Virgiulus minutus, Orinisobates niger, Cambala annulata, Abacion tesselatum, Pseudopolydesmus canadensis, P. serratus.*

**Neotropical species occurring naturally in Florida or adventive there (9 species):** *Macroxenodes bartschi, Rhinotus purpureus, Prosopodesmus jacobsoni, Calyptodesmus sanctus, Lophodesmus caraibianus, Myrmecodesmus digitatus, M. formicarius, Poratia digitata, Pschoodesmus crescentis.*

**Oriental adventives (3 species):** *Asiomorpha coarctata, Oxidus gracilis, Helicorthomorpha holstii.*
Florida Endemics or species known only from this state (13 species/subspecies): Arvechambus australis, A. hummi, Gyniulus bufonius, G. myakkensis, G. occidentalis, G. orarius, Floridobolus penneri, Narceus gordanus, Cleidogona australis, C. hadena, Auturus erythropygosbecki (may also occur in southern Georgia), Caralinda dactylifera, Pleurolopa cala.


Acknowledgements

I thank the following curators and collection managers for loans from or access to the indicated collections: N. I. Platnick (AMNH), P. Sierwald (FMNH), G. B. Edwards (FSCA), K. Zeiders (INHS), J. A. Coddington (NMNH), D. G. Corey (UCF), M. F. O'Brien (UMMZ), and R. L. Hoffman (VMNH). My colleague W. A. Shear kindly loaned material in his private holdings.

References cited


