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Gambrus wileyi (Hymenoptera: Ichneumonidae), a new Cryptine wasp from Florida

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Abstract: *Gambrus wileyi* is described from north Florida. Additional distributional data are provided for three other Florida species, *G. bituminosus*, *G. polyphemi* and *G. ultimus*. *Gambrus extrematis* is included in this work, even though its presence in Florida is questionable.

Introduction

Gambrus Foerster 1868 (Cryptinae: Cryptini) is a genus of Holarctic distribution with twenty-six species described worldwide and nine described species in the American continent and Cuba, including three in Florida. *Gambrus* is a potentially important genus in agriculture since the following are some of the Lepidoptera families that have been recorded as hosts: Coleophoridae, Gelechiidae, Hesperidae, Lasiocampidae, Lymantriidae, Noctuidae, Oecophoridae, Psychidae, Pyralidae, Saturniidae, and Tortricidae. It has also been reared from Hymenoptera (Cepidae, Cimbicidae, and Tenthredinidae) and from Coleoptera (Curculionidae). All Florida *Gambrus* have head, flagellum, and mesosoma black and abdomen reddish brown, except for *G. bituminosus*, which has the abdomen black. The original and other references of the known species in the continental United States may be found in the Catalog of Hymenoptera of America north of Mexico, section Ichneumonidae (Carlson, 1979) and descriptions and illustrations may be found in Townes and Townes (1962). Material studied is in the following collections: AEIC (American Entomological Institute) in Gainesville, Florida; CMNH (The Carnegie Museum of Natural History) in Pittsburgh, Pennsylvania; FSCA (Florida State Collection of Arthropods) in Gainesville; NMNH (National Museum of Natural History) in Washington, D.C.; Gupta, at the University of Florida in Gainesville; Porter, in Gainesville; and Brambila, at the Tropical Research and Education Center of the University of Florida, in Homestead.

Key to the *Gambrus* species in Florida

Males

- 1a. Propodeum black with a white marking over apical carina; scutellum and postscutellum white ...
..... *G. wileyi*

- 1b. Propodeum entirely black; scutellum and postscutellum black 2
2a. Metasomal tergites 2-4 black; middle coxa black ..
..... *G. bituminosus*
2b. Metasomal tergites 2-4 reddish or yellowish brown;
middle coxa not black 3
3a. Fore, middle, and hind coxae of same color (reddish brown); flagellum without a median white band;
first metasomal tergite not black basally
..... *G. ultimus*
3b. Fore, middle, and hind coxae not of same color;
flagellum with a median white band; first metasomal tergite black basally 4
4a. Flagellum with subapical tyloids linear (Fig. 1a) and brown; fore coxa dark brown; hind basitarsus dark brown *G. extrematis*
4b. Flagellum with subapical tyloids oval (Fig. 1b) and silvery white; fore coxa white; hind basitarsus white *G. polyphemi*

Females

The female of *G. wileyi* is not known.

- 1a. Metasomal tergites 2-3 black; femora black
..... *G. bituminosus*
1b. Metasomal tergites 2-3 reddish brown; femora reddish or yellowish brown 2

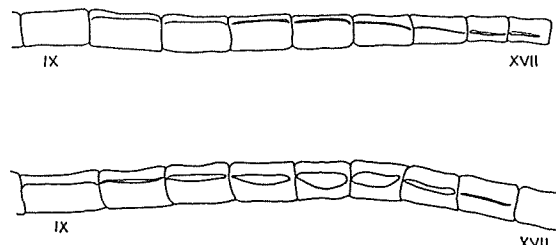


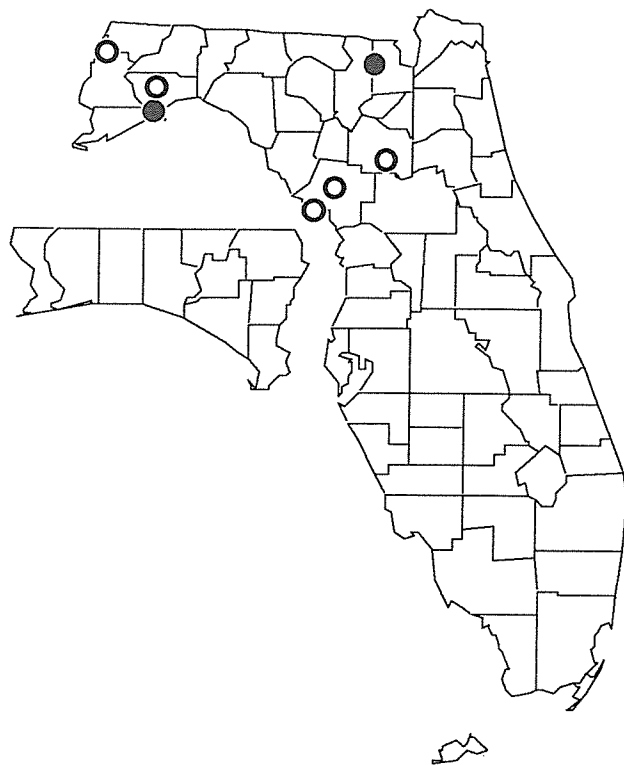
Fig. 1. Antennal segments 9-17 of male a) *Gambrus extrematis* and b) *Gambrus polyphemi* illustrating tyloids.

- 2a. Fore coxa reddish brown; flagellum with a median white band that includes three segments; first metasomal tergite not black basally *G. ultimus*
- 2b. Fore coxa black or dark brown; flagellum with a median white band that includes four or more segments; first metasomal tergite black basally 3
- 3a. Metasomal tergite 4 reddish brown; ovipositor sheath about 0.5 as long as fore wing *G. polyphemi*
- 3b. Metasomal tergite 4 black; ovipositor sheath about 0.9 as long as fore wing *G. extrematis*

***Gambrus wileyi*, new species**

(Figs. 2, 3, map 1)

Diagnosis. *Gambrus wileyi* wasps are easily distinguished from other Florida *Gambrus* by the white clypeus, mandible, tegula, scutellum, and



Map 1. Dots: collection sites in Florida of *Gambrus wileyi*, n. sp. Circles: collection sites in Florida of *G. bituminosus*.

postscutellum and the white marking on the propodeum.

Holotype. Male. Structure. Fore wing 6.1 mm long. Body elongate (Fig. 2a). Head and mesosoma (thorax plus propodeum) punctate, polished, and setose. Clypeus broad with apical margin evenly convex. Mandibles nearly as broad at apex as at base (Fig. 2b). Notaulus weakly impressed and

reaching center of mesoscutum. Apical carina on propodeum not forming sublateral crests. Areolet subpentagonal with intercubiti moderately convergent anteriorly (Fig. 2c). Color. Head black with clypeus, most of mandible, and sides of face except near toruli, creamy white; scape and marking on center of face below toruli reddish brown; and ventral surface of flagellum brown. Mesosoma black with most of anterior margin of pronotum creamy white; tegula, subtegular ridge, scutellum, postscutellum, and irregular marking over apical carina creamy white. Fore and middle legs yellowish brown with coxae and first trochanters partly white. Hind leg reddish brown. Wings slightly brown. Metasoma reddish brown with basal 0.7 of first tergite white, and tergites 1-3 with narrow apical yellowish brown band.

Paratypes. Fore wing 4.3 to 6.6 mm long. Head and mesosoma black, metasoma reddish brown, fore and middle legs yellowish brown, and hind legs reddish brown. The following color variations were observed: Center of face black, white, or reddish brown. Anterior margin of pronotum black to partly white to all white. White marking on propodeum from narrowly present over apical carina to covering the entire area enclosed by apical carina. Fore and middle coxae from almost entirely white to almost entirely yellowish brown. Hind tibia and tarsus reddish brown or dark brown. First metasomal tergite almost entirely reddish brown to basal 0.7 white. Metasomal tergites 1-3 entirely reddish brown or yellowish brown apically.

Specimens. Holotype: 1 ♂ 16-30 March 1977, Columbia & Baker Co. line, junction Route 90, Osceola National Forest, in Malaise trap, coll. J. R. Wiley (FSCA).

Paratypes: 14 ♂, same label data as holotype (12 FSCA, 1 AEIC, 1 Gupta); 1 ♂ 29 March-13 April 77, Columbia & Baker Co. line, Jct. Rt. 90, Osceola Nat. For., Malaise trap, coll. J.R. Wiley (Brambila); 1 ♂ 7-8 Apr. 77, Wakulla Co., in Malaise trap, at Ochlockonee River State Park [near Sopchoppy], coll. H.V. Weems, Jr., & G.B. Fairchild (FSCA); 3 ♂ 1 May, 8 May, and 11 June 87, Lake Co., Greenswamp Water Management District, Nigg (Gupta); and 1 ♂ 2 July 87, Lake Co., Greenswamp W.M. Dist., [Malaise] Tr. 12A, Nigg (Gupta).

Relationships. Although *Gambrus wileyi* n. sp. somewhat resembles species of *Agrothereutes*, it belongs in *Gambrus* because of the presence of a complete apical carina on the propodeum. It is most similar to the males of *G. polyphemi*, from which *G. wileyi* differs by lacking a white band on the flagel-

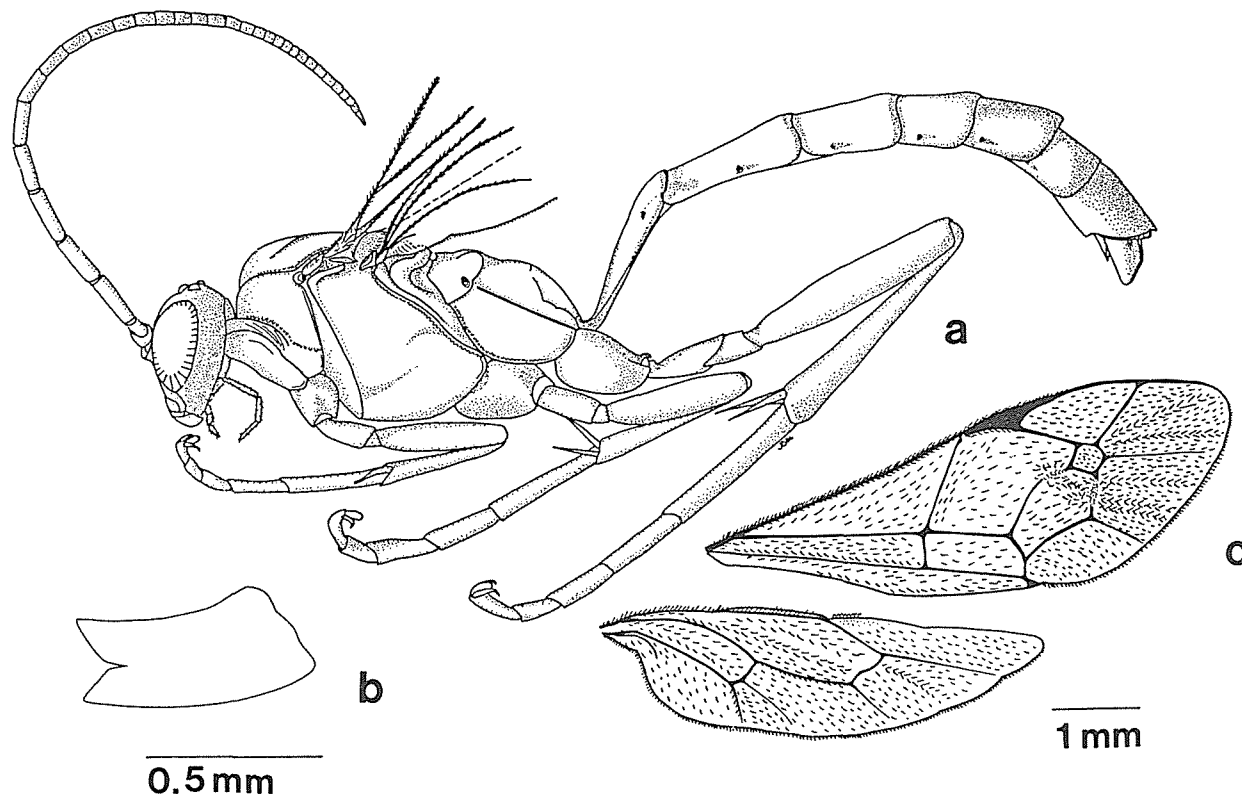


Fig. 2. *Gambrus wileyi*, n. sp., a) lateral view, b) left mandible, and c) fore and hind wing.

lum, having a white scutellum and postscutellum, a white marking on the propodeum, and entirely reddish brown metasomal tergites 5-7.

Etymology. This species is named after Jim Wiley, of the Florida State Collection of Arthropods, who collected 16 of the specimens, including the one designated as holotype.

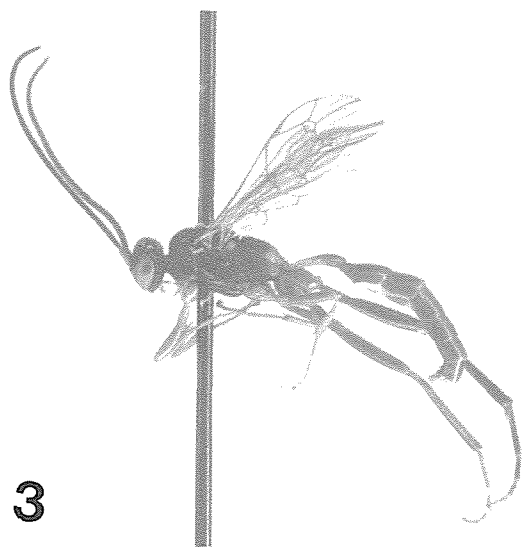


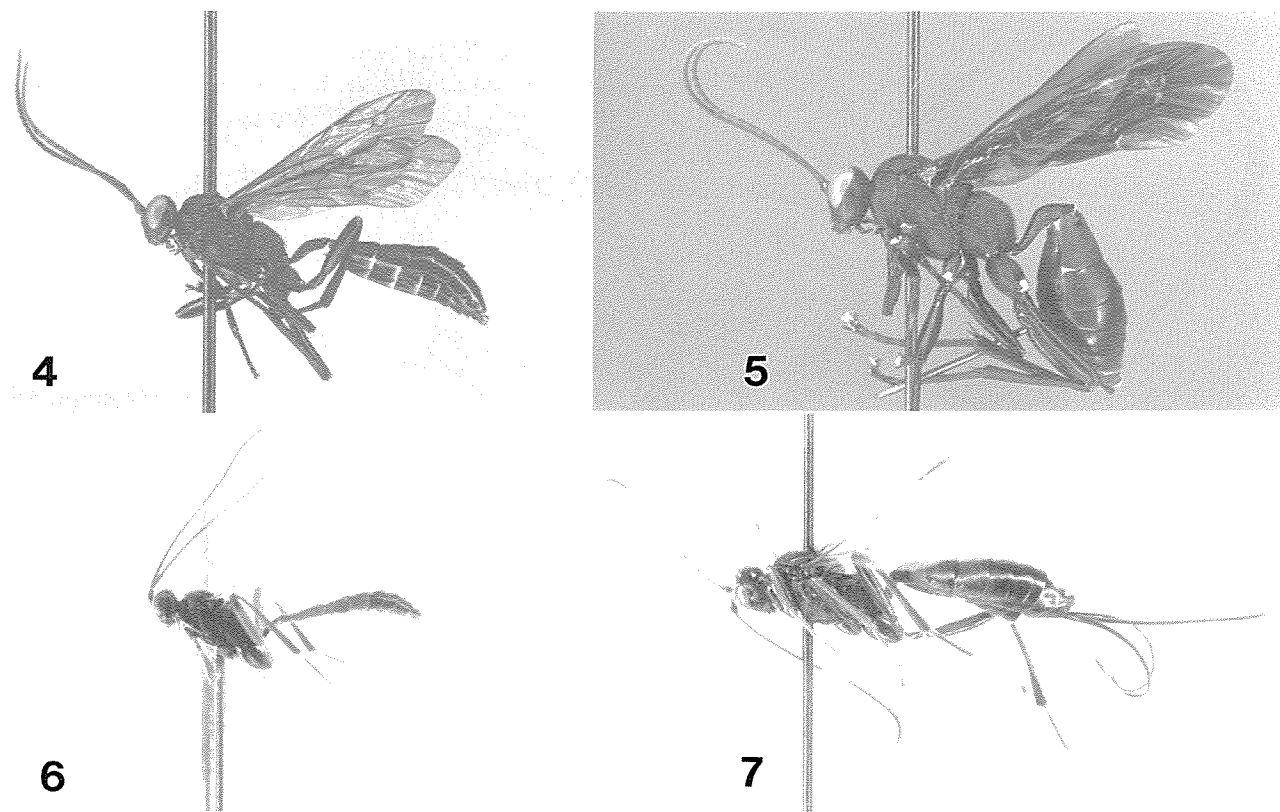
Fig. 3. *Gambrus wileyi*, n. sp.

Gambrus bituminosus (Cushman)

(Figs. 4, 5, map 1)

Diagnosis. *Gambrus bituminosus* are easily distinguished from other Florida *Gambrus* species by their entirely black coloration and brown wings (Figs. 4, 5).

Material examined. 1 ♀ 28 July 64, Levy Co., "1", John D. Spooner (FSCA); 1 ♂ 9-17 May 68, Liberty Co., Torreya State Park [near Bristol], Malaise trap, H.V. Weems, Jr. (FSCA); 1 ♂ 10 Sep. 71, Alachua Co., Gainesville, on *Alternanthera philoxeroides* [alligator weed, Amaranthaceae] at Lake Alice [UF Campus], Neal R. Spencer (NMNH); 1 ♂ 6 Jan. 74, Alachua Co., Gainesville, near Doyle Conner Building, E.E. Grissel (FSCA); 1 ♀ 24 June 79, Levy Co., Cedar Key, "P232", L.A. Wood (FSCA); 1 ♀ 30 Sep. 80, Wakulla Co., on *Spartina alterniflora* [marsh grass, Gramineae] [with cocoon], P.D. Stiling (FSCA); 1 ♀ 30 July 87, Lake Co., Green-swamp W.M. Dist., Tr. 12B, Nigg (Gupta); 1 ♀ 10 June and 2 ♀ 16 Dec 87, Collier Co., Copeland, FSSP [Fakahatchee Strand State Preserve, near Copeland], Tr. 18, Gupta/Burges (Gupta); and 1 ♂ 23 Dec., 1 ♀ 30 Dec. 87, Collier Co., Copeland, FSSP [Fakahatchee Strand State Preserve], Tr. 18, Gupta/Burges (Brambila).



Figs. 4 - 7. 4. *Gambrus bituminosus* (Cushman) male. 5. *Gambrus bituminosus* (Cushman) female. 6. *Gambrus extrematis* (Cresson) male. 7. *Gambrus extrematis* (Cresson) female.

Comments. Carlson (1979) lists *G. bituminosus* from California, Connecticut, Georgia, Illinois, Louisiana, Massachusetts, Minnesota, New Jersey, and New York. This species has also been collected in Texas (Porter, 1977) and in Florida (Stiling and Strong, 1983). It has been reared from *Ostrinia nubilalis* (Lep. Pyralidae) on *Xanthium* (cocklebur, Asteraceae), *Ostrinia obumbratalis*, *O. penitalis*, and *Sphenophorus pertinax* (Col. Curculionidae) (Townes and Townes, 1962). It has also been reared from larvae of *Chilo demotellus* (Lep. Pyralidae) on *Spartina alterniflora*, from salt marshes in north-west Florida (Stiling and Strong, 1983). The cocoon of one of the *G. bituminosus* specimens reared from Florida is 14.0 mm in length, cylindrical with rounded ends, translucent white, with loose silk outside, and with the exit hole subapical.

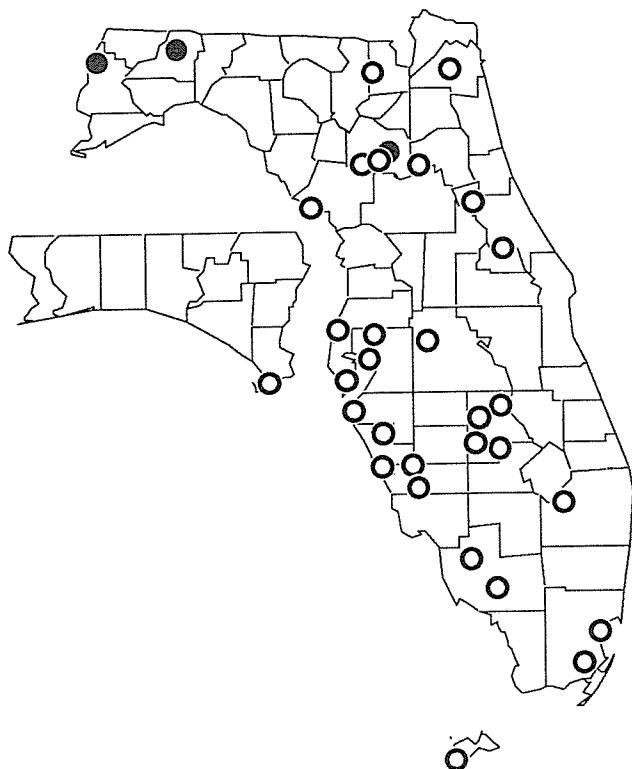
***Gambrus extrematis* (Cresson)**
(Figs. 6, 7)

Diagnosis. *Gambrus extrematis* ichneumonids have a median white band on the flagellum, base of first tergite black, and metasomal tergites 5-7 black; in the female tergite 7 with a broad white mark. They are most similar to *G. polyphemi*, from which they may be distinguished by having metasomal

tergite 4 black, and ovipositor sheath about 0.9 as long as fore wing in females, and all tyloids on the flagellum linear in males.

Material examined. 45 ♂ 12 Apr. 1899, Florida, from cocoon of *S. [Hyalophora] cecropia* (40 in CMNH, 5 Brambila); 3 ♂ 1936, Chicago, Ill. (AEIC); and 4 ♀ 1935, Chicago, Ill. (AEIC).

Comments. *Gambrus extrematis* has been collected in Canada (British Columbia, Nova Scotia, and Ontario) and in California, District of Columbia, Illinois, Kansas, Maine, Massachusetts, Michigan, Minnesota, Missouri, New Jersey, New York, North Dakota, Pennsylvania, South Dakota, Utah, and Wisconsin (Carlson, 1979). Carlson does not report that this species had been reared from a host collected in Florida in 1899 probably because the record is questionable and incomplete, the specimen labels do not include site of collection of host or collector's name and because it has not been collected or reared since then. I was advised to include *G. extrematis* in this work since I do not have the collector's notes to verify whether the host was collected in Florida or not; furthermore, including it in this work can serve as reference in case this *Gambrus* species is collected or reared in Florida. Carlson (1979) reports as hosts of *G. ex-*



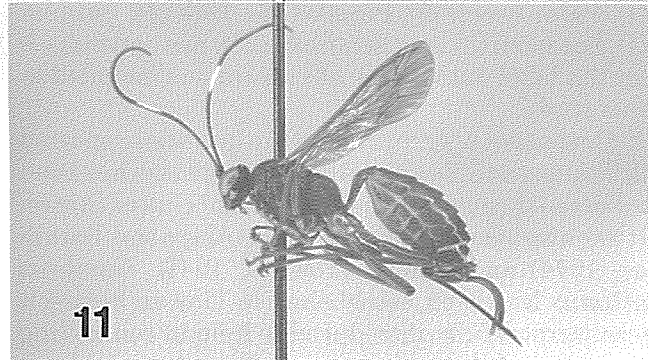
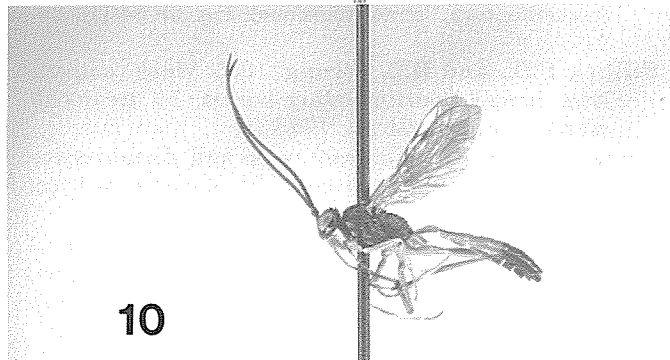
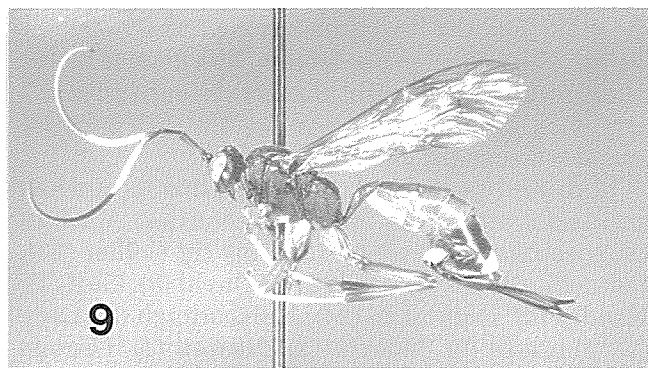
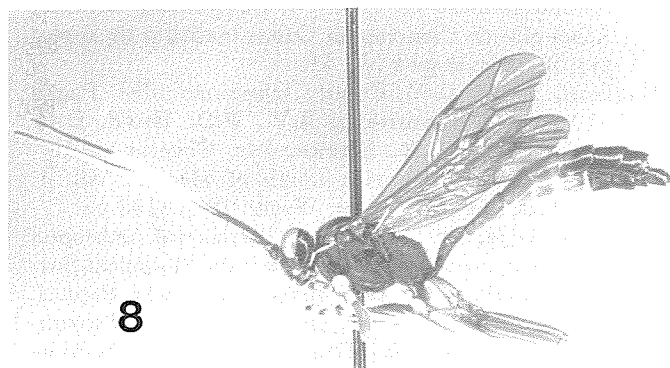
Map 2. Dots: collection sites in Florida of *Gambrus polyphemi*. Circles: collection sites of *G. ultimus*.

trematis the Saturniidae *Hyalophora cecropia*, *H. [columbia] columbia*, *H. euryalus*, and *H. [columbia] gloveri*; he lists several publications on the biology of this cryptine. Tuskes, Tuttle, and Collins (1996) also report it from the saturniids *Antheraea polyphemus* and *Callosamia promethea*; they state that *Gambrus extrematis* has only a narrow window of opportunity in which to locate and oviposit on spinning *Hyalophora columbia gloveri* larvae because once the cocoon has hardened, the ovipositor cannot penetrate it. Townes and Townes (1962) stated that "parasitized host cocoons are filled solid with a mass of cocoons of the parasites."

Gambrus polyphemi Townes

(Figs. 8, 9 map 2)

Diagnosis. *G. polyphemi* has a median white band on the flagellum, base of metasomal tergite 1 black, apex of tergite 5 usually black, and tergites 6 and 7 black, the females with a white mark on metasomal tergite 7. It is most similar to *G. extrematis*, from which it may be distinguished by metasomal segment 4 reddish brown, and ovipositor sheath about 0.5 as long as fore wing in the females, and subapical tyloids somewhat oval and silvery white in the males.



Figs. 8 - 11. 8. *Gambrus polyphemi* Townes male. 9. *Gambrus polyphemi* Townes female. 10. *Gambrus ultimus* (Cresson) male. 11. *Gambrus ultimus* (Cresson) female.

Material examined. In Florida this species has been collected in Alachua (84 specimens), Leon (3), Liberty (1), and Orange (1) counties. See appendix A for the label data of the 89 specimens included in this study.

Comments. According to Carlson (1979) and Townes and Townes (1962), *G. polyphemi* has been reared from *Telea [Antheraea] polyphemus* (Lep. Saturniidae) and possibly also from *Samia [Hyalophora] cecropia* (Lep. Saturniidae). It has been collected in Canada in the Provinces of British Columbia, New Brunswick, Nova Scotia, Ontario, and Quebec, and in the following states in United States: Connecticut, District of Columbia, Florida, Georgia, Illinois, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, Washington, West Virginia, and Wisconsin.

***Gambrus ultimus* (Cresson)**

(Figs. 10, 11 map 2)

Diagnosis. *Gambrus ultimus* is distinguished from other Florida *Gambrus* by having all the coxae and the entire first metasomal tergite reddish brown in both sexes, the flagellum lacking a white band in the male, and the flagellum having a short median dorsal white band in the female. The apex of metasomal tergite 5 is usually black and tergites 6 and 7 are black in both sexes, the female with a broad apical white mark on tergite 7.

Material examined. In Florida this species has been collected in the following counties: Alachua (22 specimens), Charlotte (2), Clay (2), Collier (13), Columbia/Baker (1), Dade (11), Duval (8), Gulf (1), Hendry (4), Highlands (24), Hillsborough (2), Levy (1), Manatee (8), Monroe (2), Nassau (1), Orange (1), Palm Beach (9), Pinellas (6), Polk (1), Putnam (1), Sarasota (3), and Seminole (25). See appendix B for the label data of the 148 specimens included in this study.

Comments. According to the localities reported in Townes and Townes (1962) this species has been collected throughout the continental United States. It has also been collected in Cuba (Alayo and Tzankov, 1974) and Hawaii (Townes, 1947). *Gambrus ultimus* had been established in Hawaii before it was purposefully introduced to help in controlling the tortricid *Amorbia emigratella*; it has also been reared from the larvae of the oecophorid *Agonopterix ulicetella* (personal communications, 1996, from B. Kumashiro and D. Tsuda). It has been

obtained from Kuau and Hawaii (Nishida, 1994). In Florida it has been reared from *Diaphania hyalina* (Lep. Pyralidae), *Mocis* sp. and *M. latipes* (Lep. Noctuidae), *Udea rubigalis* (Lep. Pyralidae), and *Marasmia* sp. (Lep. Pyralidae).

Acknowledgments

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Appendix A: Collection data for *Gambrus polyphemi* in Florida.

ALACHUA CO.: 1 ♂ 17 Apr. 55, H.V. Weems, Jr. (AEIC); 1 ♀ 26 Apr. 59, Gainesville, wooded ravine, H.V. Weems, Jr. (FSCA); 8 ♀ 15-20 May 76, Doyle Conner Building [1911 SW 34th St.], Gainesville, Biological Control Lab., E.E. Grissell (6 FSCA, 2 NMNH); 1 ♀ 16-22 May 83 and 3 ♂ Apr. 84, Rock Creek [housing development, entrance on NW 34th St. at NW 30th Blvd.], Gainesville, M. [Malaise] trap 2, Gupta (Gupta); 1 ♂ 23-30 Apr., 2 ♂ 1-8 May, 3 ♂ 9-15 May, 1 ♂ 16-22 May, and 1 ♂ 20-31 Oct. 83, Rock Cr., Gainesville, M. trap 1, Gupta (Gupta); 6 ♂ 24-30 Apr. and 8 ♂ 1-4 May 86, Gainesville, Malaise, LaSalle (FSCA); 2 ♀ 24-30 Apr. 86, Gainesville, Malaise, John LaSalle (AEIC); 3 ♂ 2 ♀ 8-15 and 2 ♂ 16-23 Apr. 86, Gainesville, LaSalle (AEIC); 2 ♂ 29 Jan., 1 ♂ 18 Apr., 1 ♂ 28 Apr., and 1 ♂ 8 May 86, UF Campus [University of Florida], Gainesville, M. trap 2, Brambila (2 Brambila, 3 FSCA); 2 ♀ 10 Feb., 1 ♂ 8 Apr., and 1 ♂ 8 May 86, SW 34th St. [Doyle Conner Bldg.], Gainesville, M. trap 3, Brambila (2 Brambila, 2 FSCA); 7 ♂ 16-22 Apr. 89, Summer Creek [housing dev. near Sta. Fe Comm. Coll.], Gainesville, Malaise trap, C. Porter, (FSCA); 1 ♂ 15-22 May 89, Summer Creek, Gainesville, wet hardwood hammock, C. Porter, (FSCA); 2 ♂ 2-8 Apr. and 7 ♂ 16-22 Apr. 89, Summer Creek, Gainesville, Malaise trap (Porter); 2 ♂ 6-12 May 89, Summer Creek, Gainesville, Malaise trap, wet hardwood hammock (Porter); 1 ♀ 1 Mar., 1 ♂ 21 Mar., 1 ♀ 26 Apr. 90, and 1 ♀ 15 Apr. 95, Doyle Conner Bldg., Gainesville, C. Porter (FSCA); 1 ♂ 9 Mar. and 1 ♀ 24 Apr. 90, Doyle Conner Bldg., Gainesville, C. Porter (Porter); 1 ♀ 17 Nov. 90, Doyle Conner Bldg., Gainesville, pine & hardwoods, C. Porter (Porter); 1 ♀ 4 May 90 and 1 ♀ 9 May 94, Doyle Conner Bldg., Gainesville, pine and hardwoods, C. Porter (FSCA); 1 ♂ 10 Apr. 95, 610 NW 54 Terr., Gainesville, oak hammock, L. Stange (FSCA); 1 ♂ 20 Apr. 95, 610 NW 54 Terr., Gainesville, mixed oak hammock, L. Stange (FSCA).

LEON CO.: 1 ♀ 18-24 May and 1 ♂ 7-12 Nov. 83, Tall Timbers R. S. [Research Station], M. trap 6, Gupta (Gupta); 1 ♂ 17-22 Oct. 83, Tall Timbers R. S., M. trap 7, Gupta (Gupta).

LIBERTY CO.: 1 ♀ 9-17 May 68, Torreya State Park, Malaise trap, H.V. Weems, Jr. (FSCA).

ORANGE CO.: 1 ♀ 9 Aug. 90, Plymouth, A. Capitano (FSCA).

Appendix B: Collection data for *Gambrus ultimus* in Florida.

ALACHUA CO.: 1 ♂ 22 Apr. 50, [no site or collector] [label says "catalog No."] (FSCA); 1 ♀ 24 Mar. 56, at *Medicago lupulina*, H.V. Weems, Jr. (FSCA); 1 ♂ 7 Apr. 56, at *Melilotus alba*, R.A. Morse (FSCA); 1 ♀ 3 Apr. 57, Gainesville, at *Lupinus luteus*, F.W. Mead (FSCA); 1 ♂ 25 Sep. 73, Pine Hills Estates, Malaise trap, H.V. Weems, Jr. (FSCA); 1 ♂ 31 Dec. 75, 1 ♀ 3 Jan. 76 and 1 ♀ 26-29 Jan. 76, Pierce's Homestead [Gainesville], S9-T10S-R18E, Malaise trap, W.H. Pierce (FSCA); 1 ♂ 7 Oct. 71, Doyle Conner Building, Gainesville, Malaise trap, H.V. Weems, Jr. & C.R. Artaud (FSCA); 1 ♂ 7 Nov. 73, Doyle Conner Bldg., Malaise trap, E.E. Grissell (FSCA); 1 ♂ 9 Mar. and 1 ♀ 10 Mar. 86, Gainesville, Malaise, LaSalle (AEIC); 2 ♂ 30 Mar. and 1 ♀ 3 Apr. 86, Gainesville, John LaSalle (AEIC); 1 ♀ 24 Oct. 85 and 1 ♀ 8 Apr. 86, UF Campus, Gainesville, M. trap 2, Brambila (Brambila); 2 ♀ 16-23 Apr., 1 ♀ 1-8 May, and 1 ♀ 16-30 June 83, and 1 ♀ Apr. 85, Rock Cr., Gainesville, M. trap 2, Gupta (Gupta).

CHARLOTTE CO.: 1 ♂ Charlotte Harbor [det. 59 Townes] [Townes and Townes, 1962 and pers. comm. 1988] (UCDC); 1 ♂ 2 Apr. 53, Punta Gorda, Evans [det. 59 Townes] (CUIC) [Townes and Townes, 1962 and pers. comm. 1988].

CLAY CO.: 1 ♀ 1-16 Dec. 94, Goldhead State Park [Gold Head Branch State Park, near Keystone Heights], rosemary-turkey oak, det. C. Porter, C. Porter & L. Stange (Porter); 1 ♀ 8 Dec. 95, Goldhead State Park, Malaise, scrub, det. C. Porter, C. Porter & L. Stange (Porter).

COLLIER CO.: 1 ♂ 5 Apr. 72, 5 mi. S. of Corkscrew Swamp Sanctuary, on Florida 846, H.V. Weems, Jr. (FSCA); 1 ♀ 6-7 Apr. 72, Corkscrew Swamp Sanctuary, H.V. Weems, Jr. (FSCA); 1 ♀ 10 Apr. 72, Ochopee, H.V. Weems, Jr. (FSCA); 1 ♂ 30 June, 1 ♀ 28 Oct., 1 ♀ 5 Nov., 1 ♂ 9 Dec., and 1 ♂ 16 Dec. 87, and 2 ♀ 9 Mar. 88, Copeland, FSSP [Fakahatchee Strand State Preserve], Tr. 18, Gupta/Burges (6 Gupta, 1 Brambila); 1 ♂ 17 May 87, 1 ♂ 14 Nov. 87, and 1 ♂ 1 Jan. 88, Naples, Tr. 17, Belmont (Gupta).

COLUMBIA CO.: 1 ♂ 8-20 Oct. 76, Osceola N.F. [National Forest], Columbia & Baker Co. line, Rt. 90, Malaise trap, J.R. Wiley (FSCA).

DADE CO.: 1 ♀ March, Larkins [no other data] [det. 59 Townes] (MCZC) [Townes and Townes, 1962 and pers. comm. 1988]; 1 ♂ March, South Miami [no other data] [det. 59 Townes] (MCZC) [Townes and Townes, 1962 and pers. comm. 1988]; 1 ♂ 21 Mar. 51, Florida City, sweeping grasses, H.V. Weems, Jr. (FSCA); 1 ♀ June-Aug. 72, Opa-Locka Airport near NSY, W.H. Pierce (FSCA); 1 ♂ 1-2 Oct.

78, Fuch's Hammock near Homestead, insect flight trap, Terhune Dickel & H.V. Weems, Jr. (FSCA); 1 ♀ 20 Oct. 83, Homestead AREC [TREC], ex. *Diaphania hyalinata*, quarantine [in alcohol with cocoon], J.E. Peña (FSCA); 1 ♂ 19 Nov. and 1 ♂ 4 Dec. 87, and 1 ♂ 7 Jan. and 2 ♂ 15 Jan. 88, Homestead TREC [Tropical Research and Education Center], Tr. 15, Gupta (Gupta).

DUVAL CO.: 1 ♂ 14 Nov. 65; 1 ♀ 30 Dec. 73; 1 ♀ 1 ♂ 3 Feb., and 4 ♂ 8 Feb. 74, Jacksonville, Charles F. Zeiger (FSCA).

GULF CO.: 1 ♂ 19 Apr. 71, 15 miles W. of Apalachicola on US 98, H.V. Weems, Jr. (FSCA).

HENDRY CO.: 1 ♀ 4 Nov. 87, J.R. Brushwein, 1-1, [with cocoon]; 1 ♂ 7 Nov. 87, J.R. Brushwein, 1-4, [with cocoon]; 1 ♀ 6 Nov. 87, D.G. Suitor, 1-2, [with cocoon]; 1 ♀ 15 Nov. 87, D. G. Suitor, ex. female pupa in dead weed stem, 1-3. All of the above from CPI Citrus Groves, SEC6 TWP45 R28, ex. prepupa of *Selenisa monotropa* [sueroides] (Lep. Noctuidae) coll. 30 Oct., [with green label "Voucher Specimen"] (FSCA).

HIGHLANDS CO.: 1 ♂ 24 Mar. 77, 9 miles west of Childs on Fla. 70, sweeping roadside ditch vegetation, H.V. Weems, Jr. (FSCA); 1 ♀ 4 Aug. 78, Archbold Biol. Sta., insect flight trap, H.V. Weems, Jr. & Richard K. Frolich (FSCA); 1 ♀ 20-21 Jan. 79, Archbold Biol. Sta., insect flight trap, H.V. Weems, Jr. & Del Guenther (FSCA); 1 ♀ 6-8 Jan., 1 ♀ 17 Jan., 1 ♀ 14 Mar., 1 ♀ 17 Feb., 1 ♀ 22 Feb., 1 ♀ 15 Mar., 1 ♂ 1 ♀ 20 Mar., 1 ♀ 3 Apr., 1 ♂ 4 Apr., 1 ♀ 23 Apr., and 1 ♀ 12-13 May 79, Archbold Biol. Sta., insect flight trap, H.V. Weems, Jr. & Sylvia Halkin (FSCA); 1 ♀ 7-10 Mar. and 1 ♀ 18 Mar. 80, Archbold Biol. Sta., insect flight trap, H.V. Weems, Jr. & Fred E. Lohrer (FSCA); 1 ♀ 7 Sep. and 1 ♀ 5 Nov. 79, Archbold Biol. Sta., insect flight trap, H.V. Weems, Jr. & Thomas A. Webber (FSCA); 2 ♀ 20 Mar. 50, Sebring, on *Bidens bipinnata*, H.V. Weems, Jr. (FSCA); 1 ♀ 20 Mar. 55, Sebring, H.V. Weems, Jr. (FSCA); 1 ♀ 24 Mar. 57, Highlands Hamm. St. Pk. [near Sebring], H.V. Weems, Jr. (FSCA); and 1 ♀ 14 Apr. 68, Highlands Hamm. State Park, Malaise trap, H.V. Weems, Jr. (FSCA).

HILLSBOROUGH CO.: 1 ♀ Apr. 27, Lutz, Carn. Mus. Acc. 8096, coll. Krautwurm [det. 59 Townes] (CMNH); 1 ♂ 14 Feb. 61, Tampa, J.W. Patton (FSCA).

LEVY CO.: 1 ♀ 6 Mar. 80, Cedar Key, S459/2, L.A. Wood (FSCA).

MANATEE CO.: 1 ♂ 10 Feb. 27, Bradenton, truck crop, bred from *P. rubigalis* [*Udea rubigalis*, Lep. Pyralidae, with cocoon], C.O. Bare (FSCA); 1 ♂ 16 Feb. 27, Bradenton, No. 3514, truck crop, bred from *P. rubigalis*, C.O. Bare (FSCA); 1 ♀ 13 Apr. 29, Bradenton, [with cocoon], C.O. Bare (NMNH); 1 ♂ 14 Apr. 27, Bradenton, [det. Townes 59], C.O. Bare

(SEMC) [Townes and Townes, 1962 and pers. comm. 1988]; 1 ♀ 15 Dec. 70, Bradenton, H.R. Dodge (FSCA); 1 ♀ 17 Apr. and 1 ♀ 1 May 87, Bradenton GCREC [Gulf Coast Research and Education Center], Tr. 16, Schuster (Gupta); 1 ♂ 21 Dec. 87, Bradenton GCREC, Tr. 16, Gupta (Gupta).

MONROE CO.: 1 ♂ 18-20 and 1 ♂ 22 Jan. 80, Fleming Key, insect flight trap, John A. Acree & H.V. Weems, Jr. (FSCA).

NASSAU CO.: 1 ♀ 18 Mar. 92, Ft. Clinch State Park [in Fernandina Beach], Stange (FSCA).

ORANGE CO.: 1 ♀ 19 Dec. 56, Orlando, F.W. Mead (FSCA).

PALM BEACH CO.: 2 ♂ 2 ♀ Sep. 46, Belle Glade, [abdomen of one female in a capsule], "Hyperparasite of *Apanteles* sp. on *Pilocrocis ramentalis*", det. Townes 47, W.D. Wylie, (FSCA); 1 specimen, 20 Oct. 71, Belle Glade, reared from *Marasmia* sp., W.G. Genung [det. Porter 72] [data from FSCA records]; 1 ♀ 10 Feb. 72, Belle Glade, AREC [Agriculture Research and Education Center], insectary screen, C.E. Seiler (FSCA); 1 ♀ 9 Jan. 74, Belle Glade, Everglades Exp. Sta., C.E. Seiler (FSCA); 2 ♀ 8 Aug. 83, both reared from same *Mocis* sp. pupa from sugarcane [cocoon on separate pin and label], D.G. Hall (FSCA).

PINELLAS CO.: 1 ♀ 8 Mar. 13, Pasadena, Det. Townes 60, (NMNH) [Townes and Townes, 1962 and pers. comm. 1988]; and 5 ♂ 21 Mar. 50, Tarpon Springs, Townes [AEIC].

POLK CO.: 1 ♂ 19 Dec. 62, Lakeland, John Hayward (FSCA).

PUTNAM CO.: 1 ♂ 13 Oct.-5 Nov. 75, 2 miles NW Orange Spring, Malaise trap, J.R. Wiley (FSCA).

SARASOTA CO.: 1 ♀ 12 Apr. 52, Englewood, Walley (CNCD) [Townes and Townes, 1962 and pers. comm. 1988]; 1 ♀ 13 Apr. 66, Oscar Scherer State Pk. [near Osprey], sweeping in roadside ditch, H.V. Weems, Jr., (FSCA); 1 ♀ 13-15 Mar. 78, Myakka State Park near Sarasota, flight trap in palmetto-ericaceous scrub, G.B. Fairchild (FSCA).

SEMINOLE CO.: 1 ♀ 10 June 26, Sanford, (NMNH) [Townes and Townes, 1962 and pers. comm. 1988]; 1 ♂ coll. 17 May, em. 27 May 1927, Sanford, from celery, (NMNH) [Townes and Townes, 1962 and pers. comm. 1988]; 1 ♀ em. 23 and 1 ♀ em. 27 May 27, Sanford, from celery, coll. Stone (NMNH) [Townes and Townes, 1962 and pers. comm. 1988]; 1 specimen, Sanford, ex. *P. rubigalis*, [det. Townes 60], coll. Stone (NMNH) [Townes and Townes, 1962 and pers. comm. 1988]; 1 ♀ 25 Feb. 29, Sanford, [with cocoon], Cal. Tyer (FSCA); 2 ♂ 2 ♀ 17 Mar., 3 ♂ 31 Mar., 2 ♂ 14 Apr., 1 ♂ 1 ♀ 28 Apr., 1 ♂ 15 Dec., 1 ♂ 30 Dec. 87, Sanford, CFREC [Central Florida Research and Education Center], Tr. 11, A. Ali (Gupta); and 3 ♂ 1 ♀ 12 Jan., and 1 ♂ 2 ♀ 27 Jan. 88, Sanford, CFREC, Tr. 11, Ali/Gupta (Gupta).