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GAMPSOCORIS DECORUS (UHLER) AND *METACANTHUS TENELLUS* STÅL (HEMIPTERA: BERYTIDAE): NEOTROPICAL STILT BUGS AS COLONISTS OF AN AFRICAN GRASS, *UROCHLOA MUTICA* (POACEAE), IN FLORIDA, WITH A REVIEW OF BERYTID-GRASS ASSOCIATIONS

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Abstract.—Host plants of the Neotropical stilt bugs *Gampsocoris decorus* (Uhler) (subfamily Gampsocorinae) and *Metacanthus tenellus* Stål (subfamily Metacanthinae), whose U.S. distributions are limited to southern Texas and peninsular Florida, have been unknown or little known. In Florida, both berytids have colonized Pará grass (*Urochloa mutica* (Forssk.) T. Q. Nguyen; Poaceae), an invasive plant native to Africa. We collected *G. decorus* on Pará grass in 20 counties and *M. tenellus* in 17 counties. Pará grass is the first host plant recorded for *G. decorus* and first grass documented as a host for *M. tenellus*. Grass-feeding habits have evolved in three berytid clades and have been demonstrated for certain gampsocorines and metacanthines; grass feeding needs to be verified for berytine stilt bugs.

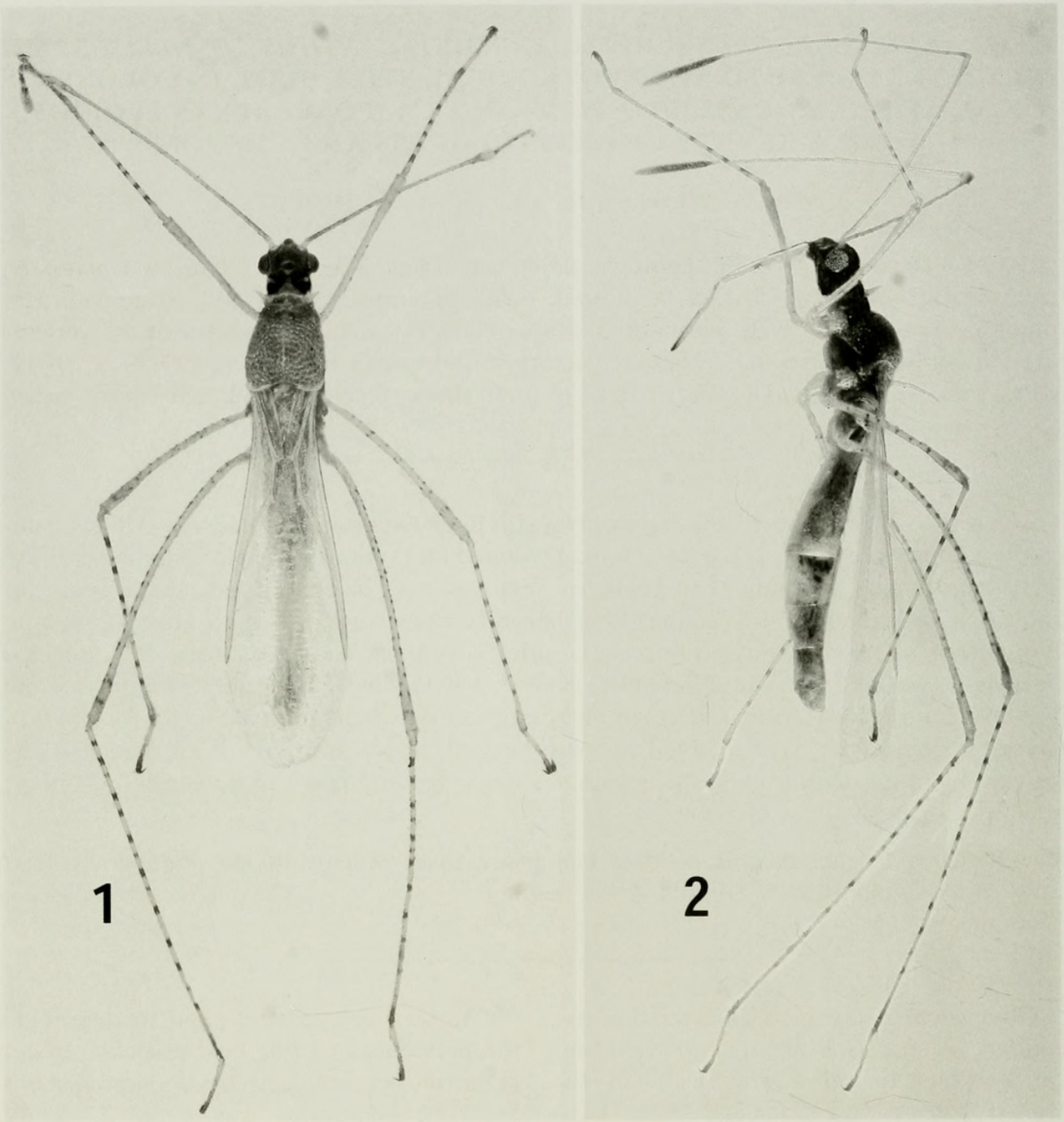
Key Words: Lygaeoidea, Berytidae, Gampsocorinae, Metacanthinae, Pará grass, host plants, new records, grass feeding

Gampsocoris decorus (Uhler) and *Metacanthus tenellus* Stål are mainly Neotropical berytids recorded previously in the United States from Florida and Texas (Henry 1997a, Henry and Froeschner 1998). Host plants previously were unknown for *G. decorus,* and nymphs of *M. tenellus* were reported only from a euphorbiaceous plant in Bermuda (Henry and Hilburn 1990). Here we give additional Florida records of both stilt bugs and discuss their colonization of Pará grass, *Urochloa mutica* (Forssk.) T. Q. Nguyen, which is native to Africa. We also review the worldwide use of grasses as hosts of the Berytidae.

Methods

After we first found *G. decorus* and *M. tenellus* on Pará grass in Florida in May 2003, we surveyed the plant to determine the prevalence of this host association and better understand the Florida range of both berytids. Pará grass was sampled mainly along highways but also along canals and rivers and in marshes. We collected stilt bugs by beating the stems of Pará grass over a shallow, short-handled net or white enamel pan and aspirating or hand picking with plastic vials the dislodged adults. When fifth instars, but not adults, were observed, we collected one or more nymphs and held them on a sprig of Pará grass in a small plastic box to obtain adults. Specimens from each locality are deposited in the National Museum of Natural History, Smithsonian Institution, Washington, DC.

Specimens from May 2003 were collect-



Figs. 1–2. Adult female of *Gampsocoris decorus*. 1, Dorsal aspect. 2, Lateral aspect.

ed by both authors; A.G.W. and Thomas Dobbs collected *M. tenellus* in Miami-Dade Co. in April 2004. All other collections were made by A.G.W. The host plant in all cases was Pará grass, *U. mutica*.

Gampsocoris decorus (Uhler)

Uhler (1893) described *G. decorus* (Figs. 1–2) in the genus *Protacanthus* from St. Vincent, West Indies. Henry (1997a) redescribed and illustrated the adult, provided scanning electron photomicrographs of selected structures, and listed it from Belize, Colombia, Costa Rica, Cuba, Dominica, El Salvador, Grenada, Guatemala, Haiti, Jamaica, Mexico, Panama, Peru, St. Croix, Trinidad, United States, and Venezuela. The first U.S. record was from Estero, Florida (Van Duzee 1909; as *P. decorus*). Harris (1941) reported it (as *P. decorus*) from Texas (Cameron Co. and Brownsville) based on specimens taken in 1928 and 1938, respec-

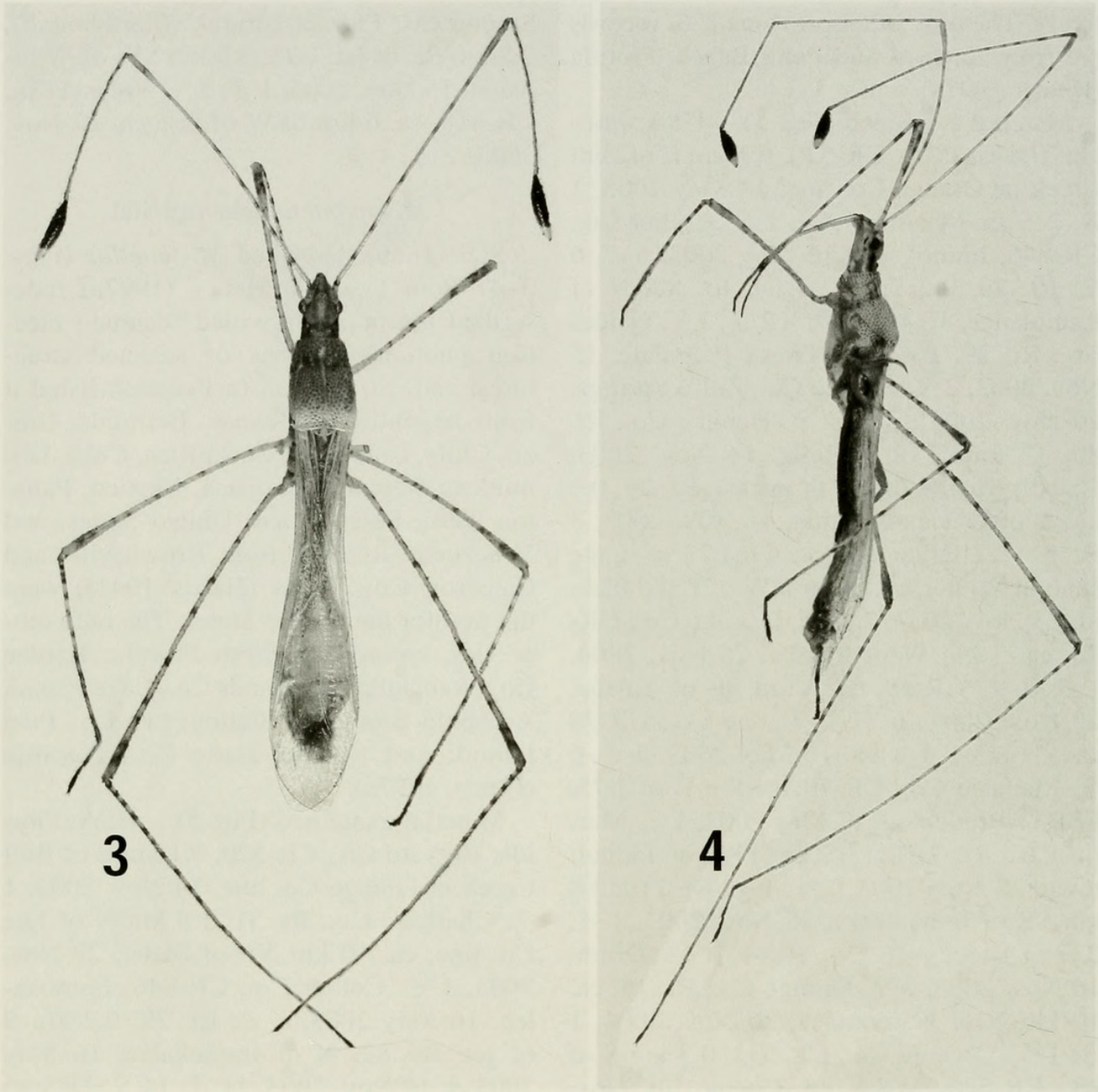
tively. The only other previous U.S. records are from Sanford and Palm Beach, Florida (Henry 1997a).

Material examined (Fig. 5).—USA: Florida: Brevard Co., CR-520, 0.1 km E of Bull Creek nr Orange Co. line, 13 May 2003, 1 ♂, 2 ♀ & 14 Nov. 2003, 1 ♀. Collier Co., CR-846, Immokalee, 16 May 2003, 6 ♂, 6 ♀; Rt. 29, 0.2 km S of jct. Rt. 82, N of Immokalee, 16 May 2003, 2 ♂, 3 ♀. Glades Co., Rt. 29, 13.5 km SW of Palmdale, 15 Nov. 2003, 2 ♀. Hardee Co., Zolfo Springs, 29 Nov. 2003, 5 ♂, 4 ♀. Hendry Co., Rt. 80, 17 km E of LaBelle, 14 Nov. 2003, 1(sex?) (reared from 5th instar); Rt. 29, 0.6 km S of Glades Co. line, 14 Nov. 2003, 3 ♂, 5 ♀. Highlands Co., CR-621 nr Lake June in Winter, ca. 6 km NW of Lake Placid, 15 Nov. 2003, 2 ♂, 5 ♀. Lake Co., CR-48, ca. 3 km W of Yalaha, 26 Nov. 2004, 1 ♂, 1 ♀; CR-48, ca. 3 km SE of Yalaha, 26 Nov. 2004, 1 ♂, 1 ♀. Lee Co., CR-78 ca. 8 km W of Alva, 16 May 2003, 2 ♂, 6 ♀. Manatee Co., CR-70, 14 km E of I-75, ESE of Bradenton, 17 May 2003, 1 ♀. Martin Co., Rt. 710, 13.5 km NW of Indiantown, 28 Nov. 2003, 1 ♂, 1 ♀; Rt. 710, 3.8 km SE of Indiantown, 28 Nov. 2003, 1 ♂, 2 ♀. Okeechobee Co., Rt. 441, Ft. Drum, 14 Nov. 2003, 3 ♀. Orange Co., Rt. 15, ca. 10 km N of Narcoossee, 26 Nov. 2004, 1 ♂, 1 ♀. Osceola Co., CR-532, 0.3 km S of jct. CR-520, WSW of Cocoa, 14 Nov. 2003, 1 ♂, 1 ♀; CR-419, 3 km N of Deer Park, 14 Nov. 2003, 1 ♂, 1 ♀. Palm Beach Co., CR-706, ca. 10.5 km W of Jupiter, 12 Apr. 2004, 1 ♀. Polk Co., Rt. 27, 1 km N of jct. Rt. 17, 7 km SSW of Frostproof, 15 Nov. 2003, 1 ♀; Lake Hamilton, 28 Feb. 2004, 4 ♀; Lake Wales, 29 Feb. 2004 1 ♂, 1 ♀; Rt. 98, 0.5 km SE of Rock Ridge Rd., NW of Providence, 29 Feb. 2004, 1 ♂, 1 ♀. St. Lucie Co., Rt. 70, 13 km NE of Okeechobee Co. line, ca. 27 km W of Port Saint Lucie, 28 Nov. 2003, 3 ♀. Sarasota Co., Crowley Museum & Nature Center, S of Lake Myakka, E of Sarasota, 17 May 2003, 3 ♀. Seminole Co., Celery Ave., ca. 2 km NE of Midway, 27 Nov. 2003, 1 ♂. Sumter Co., Florida Turnpike (northbound), 2.7 km SE of jct. I-75, 3.5 km SW of Wildwood, 15 Nov. 2003, 1 ♂, 3 ♀. Volusia Co., CR-415, ca. 6 km SSW of Osteen, 27 Nov. 2003, 2 ♂, 1 ♀.

Metacanthus tenellus Stål

Stål (1860) described *M. tenellus* (Figs. 3–4) from Ecuador. Henry (1997a) redescribed the adult, provided scanning electron photomicrographs of selected structures, and, in addition to Ecuador, listed it from Argentina, Bahamas, Bermuda, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Jamaica, Mexico, Panama, Peru, Puerto Rico, United States, and Venezuela. Records from Brownsville and Cameron Co., Texas (Harris 1941), were the first for the United States. The only other U.S. records are from Florida: Hardee Co., Wauchula; Highlands Co., Lake Placid, Archbold Biological Station; Lee Co., Pine Island; and [Miami-Dade Co.] Naranja (Henry 1997a).

Material examined (Fig. 5).—USA: Florida: Brevard Co., CR-520, 0.1 km E of Bull Creek nr Orange Co. line, 14 Nov. 2003, 1 ♀. Charlotte Co., Rt. 31, 1.5 km N of Lee Co. line, ca. 10 km NE of Slater, 29 Nov. 2003, 1 ♂. Collier Co., CR-846, Immokalee, 16 May 2003, 1 ♂; Rt. 29, 0.2 km S of jct. Rt. 82, N of Immokalee, 16 May 2003 & 14 Nov. 2003, 11 ♂, 14 ♀. DeSoto Co., Rt. 31, 3.7 km N of Charlotte Co. line, ca. 32 km S of Arcadia, 29 Nov. 2003, 2 ♂. Hardee Co., Zolfo Springs, 29 Nov. 2003, 4 ♂, 2 ♀; Jct. CR-636 & Rt. 64, 12 km E of Wauchula, 14 Apr. 2004, 1 ♀. Highlands Co., Rt. 27, 2 km SE of Venus, 15 Nov. 2003, 2 ♀; CR-621, nr Lake June in Winter, ca. 6 km NW of Lake Placid, 15 Nov. 2003, 4 ♀. Hillsborough Co., Rt. 39, 7 km N of Plant City, 29 Nov. 2003, 1 ♀. Indian River Co., CR-512, ca. 4 km E of Fellmere, 12 Apr. 2004, 7 ♂, 3 ♀. Lee Co., CR-78, ca. 8 km W of Alva, 16 May 2003, 3 ♀. Manatee Co., CR-70, 14 km E of I-75, ESE of Bradenton, 17 May 2003, 1 (sex ?) (reared from 5th instar). Miami-Dade



Figs. 3–4. Adult male of *Metacanthus tenellus*. 3, Dorsal aspect. 4, Lateral aspect.

Co., CR-997, 16 km N of Homestead, 13 Apr. 2004, 11 ♂, 9 ♀; CR-997, 1.5 km S of Homestead, 13 Apr. 2004, 3 ♀. Okeechobee Co., Rt. 441, Ft. Drum, 14 Nov. 2003, 1 ♂. Osceola Co., Rt. 441, 1 km S of Yeehaw Junction, 14 Nov. 2003, 1 ♂. Palm Beach Co., CR-706, ca. 10.5 km W of Jupiter, 12 Apr. 2004, 1 ♀. Polk Co., Rt. 17, 7 km SSW of Frostproof, 15 Nov. 2003, 3 ♂; Rt. 60, 2 km W of Hesperides, 28 Nov. 2003, 1 ♂; Lake Hamilton, 28 Feb. 2004, 1 ♂, 3 ♀; Lake Wales, 29 Feb. 2004, 3 ♂, 2 ♀. St. Lucie Co., CR-609A, 2 km S of jct. Rt. 68, ca. 13 km SW of Ft. Pierce, 28 Nov. 2003, 2 ♂. Sumter Co., Florida Turnpike (northbound), 2.7 km SE of jct. I-75, 3.5 km SW of Wildwood, 15 Nov. 2003, 1♂, 1 ♀.

Stilt Bugs as Grass Feeders

Stilt bugs are mainly phytophagous, but certain species, such as *Chinoneides tasmaniensis* (Gross) (Hickman 1976), *Jalysus wickhami* Van Duzee (Wheeler and Henry 1981), and *Neoneides muticus* (Say) (Wheeler 1978), also feed on thrips and

other small arthropods and, thus, are omnivorous. Berytid hosts, often pubescent or viscid-hairy plants, can be dicots or grasses and other monocots, but are mostly dicots (Wheeler and Schaefer 1982, Henry 1997a, Henry and Froeschner 1998).

Among the world Berytidae, a family comprising 170 species, host-plant associations have been recorded for nearly 40% of the species. Grass associations are known for 19 species in all three subfamilies: Berytinae, Gampsocorinae, and Metacanthinae (Henry 1997a; Henry and Froeschner 1998; Henry 2002a, b). Collections from grasses of stilt bugs known otherwise from nongraminoid plants likely represent incidental occurrences or resting records, whereas collections from grasses of berytids known to develop only on Poaceae likely represent those of grass specialists.

More stilt bugs in the Berytinae have been recorded from grasses than from the other two subfamilies: two species in the nominate tribe Berytini and eight species in Berytinini. In nearly all cases among the Berytinae, however, grasses have not been demonstrated to serve as hosts—that is, plants on which oviposition and nymphal development take place (e.g., Oman 1949). Known hosts of the eight berytinines (*Berytus* spp.) and the berytine *Neides tipularius* (L.) generally are legumes (Fabaceae) and other dicots. Host relationships for the berytine *Bezu wakefieldi* (White), which has been taken on "grasses," are little known (Henry 1997a, Henry and Froeschner 1998).

Within the Gampsocorinae, tribe Gampsocorini, *G. nexus* (Harris) is known from Pará grass and *Panicum* sp. (Henry 1997a, Henry and Froeschner 1998); like *G. decorus,* it might be a grass specialist. Grasses are the only plants with which two other gampsocorines have been associated: *Gampsoacantha beroni* Josifov and Štusák with "halophilous grasses" and *G. pumilio* Josifov and Štusák with "grasses" (Henry and Froeschner 1998). Within the Gampsocorinae, tribe Hoplinini, the collections of *Hoplinus echinatus* (Uhler) from "grasses" and *Pronotacantha annulata* Uhler from *Bromus* sp. probably are resting records; both stilt bugs develop on glandular-hairy dicots (Henry 1997a, Henry and Froeschner 1998).

Within the Metacanthinae, tribe Metacanthini, *J. macer* (Stål) has been collected on one grass (*Coix mayuen* Romanet) but is known from several species in dicotyledonous families (Cucurbitaceae, Fabaceae, and Geraniaceae) that frequently serve as hosts of berytids (Wheeler and Schaefer 1982, Henry 1997a, Henry and Froeschner 1998). Grasses and other monocots, as well as dicots, serve as hosts of *J. spinosus* (Wheeler and Henry 1981; Wheeler 1986, 1994). *Metacanthus multispinus* Ashmead likely is a grass specialist (Henry 1997a, Henry and Froeschner 1998). As shown herein, *M. tenellus* develops on Pará grass, but in Bermuda, nymphs have been found on a dicot, *Acalypha alopecurioides* Jacq. (Euphorbiaceae) (Henry and Hilburn 1990). Grass associations are unknown in the small metacanthine tribe Metatropini (Henry 1997a, Henry and Froeschner 1998).

Discussion

In peninsular Florida, we found *G. decorus, M. tenellus* (Fig. 5), or both species in most colonies of Pará grass (90%; n = 60). One of the negative sites was the northernmost planting that we sampled (St. Johns Co., Tocoi), which is north of the recorded range of the plant in Florida (Institute for Systematic Botany 2002). The two berytids co-occurred on *U. mutica* at 14 sites. Nymphs of one or both stilt bugs were present at 26 sites. Mating pairs of *G. decorus* were observed in late February, mid-May, and late November, whereas those of *M. tenellus* were observed in late February.

Colonization of Pará grass in Florida by the two berytids has been a relatively recent event. This African plant might have been introduced into Florida as early as the 1870s (Austin 1978). Although Austin (1978) noted that Small (1933) did not in-

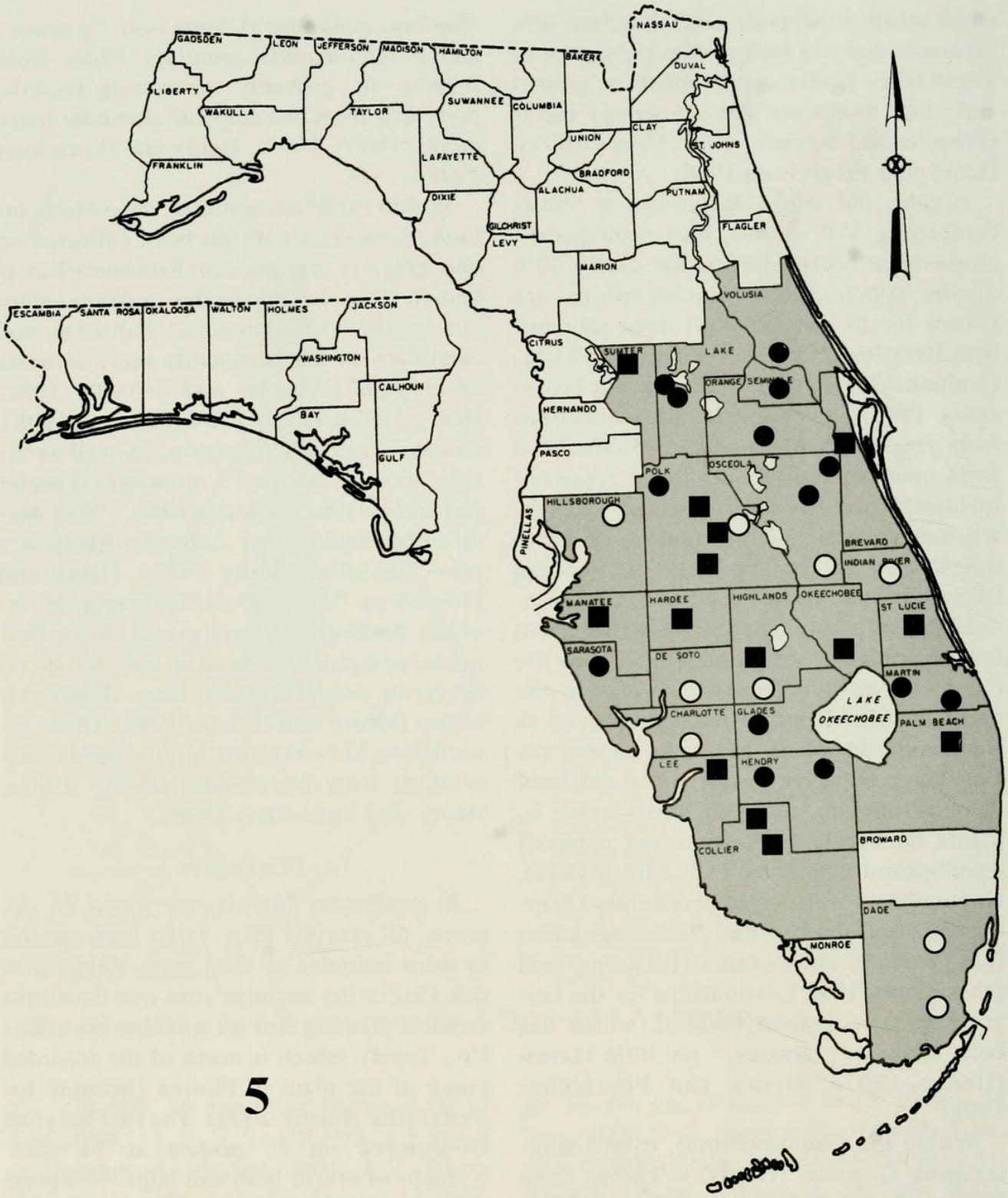


Fig. 5. Distribution of stilt bugs in Florida: ● = records of *Gampsocoris decorus* only; ○ = records of *Metacanthus tenellus* only; ■ = records of *G. decorus* and *M. tenellus* collected together.

clude Pará grass in his manual of southeastern plants, he listed it from Florida under the synonymic name *Panicum barbinode* Trin. Apparently before the plant had become invasive in Florida, it was recommended for pasturage or hay (Thompson 1919). It was planted to camouflage certain military installations in southeastern Florida during World War II, and might have been introduced later (Austin 1978).

Urochloa mutica is the first host plant known for *G. decorus* and the first grass

shown to serve as a host for *M. tenellus*. Nymphs of *M. tenellus* previously were known only from a euphorbiaceous plant; adults collected from grasses, including *U. mutica* (as *Panicum barbinode*) in Puerto Rico, therefore, were assumed to represent accidental or resting records (Henry 1997a). *Metacanthus tenellus* can be added to the extensive list of insects associated with Pará grass in Puerto Rico (Martorell 1976).

Both berytids were first reported from Florida after Pará grass was introduced into the state. Either or both species, however, could have been present in Florida prior to the introduction of the grass, living on one or more native grasses. Alternatively, the bugs could have dispersed to southern Florida from the West Indies (both are known from Cuba) and colonized an already-naturalized *U. mutica*. In either case, naturalization of *U. mutica,* a pubescent grass (Langeland and Craddock Burks 1998) similar to many other hosts favored by berytids–that is, hairy and/or viscid (Wheeler and Schaefer1982)—would have provided a suitable host and might have facilitated northward spread of the bugs in Florida. Neither berytid has been observed to develop on grasses native to Florida. Phytophagous insects sometimes become so specialized on novel plants that they no longer can be found on their original hosts (e.g., Valley and Wheeler 1976, Thompson 1994).

Grass feeding has developed in at least three clades of the Berytidae (Henry 1997b, fig. 3). Certain other narrow-elongate heteropterans also feed on grasses, for example, leptocorisine and micrelytrine alydids, chorosomine rhopalids, and stenodemine mirids (Wheeler and Schaefer 1982, Wheeler 2001). The only berytid subfamily for which grasses might not be used for nymphal development by at least one species is the Berytinae. Although several berytinine species have been collected from grasses, the use of grasses as host plants by *Berytinus hirticornis* (Brullé) and several other species of the genus requires confirmation.

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