NEW UNITED STATES RECORDS FOR
SIX NEOTROPICAL MIRIDAE (HEMIPTERA)
IN SOUTHERN FLORIDA

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ABSTRACT

Six species of plant bugs (Heteroptera: Miridae) collected in southern Florida are reported as new United States records: *Hyalopsalis diaphanus* (Reuter) (Phylinae); *Ceratocapsus nigropiceus* Reuter, *Jobertus chrysoleucus* Distant, and *Paramixia carmelitana* (Carvalho) (Orthotylinae); *Paracarnus cubanus* Bruner (Deraeocorinae); and *Proba hyalina* Maldonado (Mirinae). Distribution and host plants in Florida and diagnoses are provided for all 6 species.

RESUMEN

Se registran por primera vez en los Estados Unidos 6 especies de Miridae colectadas en el sur de Florida: *Hyalopsalis diaphanus* (Reuter) (Phylinae); *Ceratocapsus nigropiceus* Reuter, *Jobertus chrysoleucus* Distant, y *Paramixia carmelitana* (Carvalho) (Orthotylinae); *Paracarnus cubanus* Bruner (Deraeocorinae); y *Proba hyalina* Maldonado (Mirinae). Se presentan datos sobre la distribución y las plantas hospederas, y diagnósticos para las 6 especies.

The Miridae of Florida are inadequately known, despite Blatchley's (1926) monumental "Heteroptera of Eastern North America" in which the Floridian fauna was emphasized. Fewer than 300 species have been recorded from Florida and surrounding states, a figure that is low in comparison to the numbers recorded from certain other states. For example, Knight (1928) recorded 296 mirids from New York. Later Knight (1941) raised the number to 316 and listed 300 species from Illinois. Considering the presence of
a rich temperate fauna combined with a strong Neotropical element, well
over 400 species should be expected to occur in Florida.

During trips to Florida in 1980 and 1981, we collected several Neotropical
Miridae not recorded previously from the United States. On the first trip,
one of us (AGW) collected specimens of Jobertus chrysroleucus Distant and
Proka hyalinna Distant. In 1981 we confirmed that breeding populations
of these species are established in Florida and collected 3 additional Neo-
tropical mirids: Ceratocryptus nigropicus Reuter, Parnicia cuneatagrina
(Carvalho), and Paracarnus cubanus Bruner. The 6th species, Hyalopsalus
diaphanus (Reuter), is recognized from specimens sent by Dr. R. I. Sailer,
University of Florida, Gainesville.

In this paper we summarize the distribution records and host plants of
these 6 species in southern Florida and provide diagnoses to facilitate their
recognition. Voucher specimens have been deposited in the insect collections
of the Florida State Collection of Arthropods, Florida Department of Agri-
culture, Gainesville (FSCA); Pennsylvania Department of Agriculture,
Harrisburg (PDA); U.S. National Museum of Natural History, Washing-
ton, D.C. (USNM); and the University of Florida, Agriculture Research and
Education Center, Homestead (UF, AREC).

Hyalopsalus diaphanus (Reuter)

Reuter (1907) described H. diaphanus, a phyline, in the genus Atomoscelis
from a single ♀ collected in Mandeville, Jamaica. Van Duzee (1907) listed
this specimen in his "Notes on Jamaicam Hemiptera." Carvalho and Schaffner
(1978) later erected the monobasic genus Hyalopsalus for diaphanus, il-
lustrated the adult and ♀ genitalia, and reported this species from the
Dominican Republic. No host has been reported.

Our Florida record is based on 8 ♂, 7 ♀, and 3 nymphs collected at
Miami, Dade Co., 6 February 1979 by Paul Choborda on Crotonia incana L.
(Fabaceae) (FSCA, USNM). Specimens identified by J. C. M. Carvalho and
J. C. Schaffner (Texas A & M University, College Station) were examined
and served to confirm our identification.

ADULT ♂: Length 3.12-3.32 mm, width 1.20-1.28 mm. Head: Width 0.68-
0.77 mm, vertex 0.58. Rostrum: Length 0.80 mm, reaching bases of mesocoxae.
Antenna: Segment I, length 0.20-0.22 mm; II, 0.80-0.84 mm; III, 0.56-0.58
mm; IV, 0.36-0.38 mm. Pronotum: Length 0.50 mm, basal width 1.08-1.12
mm.

General coloration pale yellowish green; hemelytra distinctly hyaline,
tinged with pale yellow green, often with a few, small, scattered, fuscous
spots on claval and corium, membrane clear to smoky brown, with 2 small,
dark subapical clouds; antennae testaceous, segment I with ventral aspect
having a narrow, sub-basal, fuscous line (line sometimes forming a complete
band around segment) and a large, subapical, fuscous spot; II with a fuscous
band at base; III and IV uniformly fuscate; venter and legs pale; femora
with numerous, small, fuscous spots; black tibial spines with fuscous spots
at bases; dorsum with numerous long, erect, brown to fuscous, simple setae,
intermixed with shorter, silvery, simple setae.

ADULT ♀: Length 3.12-3.36 mm. Similar to ♂ in color and pubescence.

REMARKS: Hyalopsalus diaphanus will key to the genus Plagiognathus
Fieber and the species chrysanthemi (Wolff) in Blatchley (1926), but
chrysanthemi has the hemelytra opaque (rather than hyaline), the apex of the tyulus fuscous (rather than greenish), 2 rows of large fuscous spots on the metatenoza (rather than a few, small, scattered spots), and has a longer rostrum that reaches beyond the metacoxae (rather than only to the mesocoxae).

**Ceratocapsus nigropiceus** Reuter

*Ceratocapsus nigropiceus* was described from specimens collected by E. P. Van Duzee at Mandeville, Jamaica, in 1906 (Reuter 1907). The only other records for this orthotyline mirid are Balaclava and Montego Bay, Jamaica (Van Duzee 1907).

We collected a single 4th-instar nymph on Upper Key Largo on 17 April 1981. The nymph was beaten from a dense colony of the halophyte *Batis maritima* L., a saltwort of the family Bataceae, and was reared on sprigs of this plant, aphids, and crushed caterpillars. We did not observe *C. nigropiceus* feeding on plant material, but the nymph readily accepted the supplemental animal food. Recent observations of species of *Ceratocapsus* feeding on Homoptera have suggested that they are primarily predacious (Wheeler and Henry 1978). The adult, a ♀ that matured on 29 April, was identified by comparison with a ♀ collected at Mandeville by Van Duzee and borrowed from the O. M. Reuter collection (Mus. Zool., Helsinki).

**Adult ♀:** Length 3.04 mm, width 1.12 mm. Head: width 0.70 mm, vertex 0.24 mm. Rostrum: Length 1.02 mm, reaching mesocoxae. Antenna: Segment I, length 0.24 mm; II, 0.74 mm; III, 0.42 mm; IV, 0.40 mm. Pronotum: Length 0.56 mm, basal width 1.00 mm.

General coloration shiny fuscous, hemelytra a somewhat lighter, dark brown, membrane fumate; venter and metalegs (except for bases of metatenoza) fuscous, pro- and mesolegs, rostrum, and antennae pale testaceous. Head shagreened, weakly rugose; pronotum distinctly punctate; hemelytra thickly set with silvery, sericeous pubescence intermixed with testaceous, pilose setae.

**Remarks:** *Ceratocapsus nigropiceus* keys nearest *C. sericus* Knight in Blatchley (1926). From this species, *nigropiceus* is distinguished by the more shiny dorsal surface and more complex, branched right paramere, which is slender and unbranched in *sericus*. *Ceratocapsus nigropiceus* is more similar to a species not included in Blatchley's key, *C. ballii* Knight and *C. divaricatus* Knight. However, *C. nigropiceus* differs from *ballii* and *divaricatus* in having the antennae and the pro- and mesolegs uniformly pale testaceous, rather than having all the legs fuscous (*divaricatus* sometimes has the pro- and mesolegs somewhat paler than the metalegs), and the 3rd, 4th, and apex of the 2nd antennal segments reddish. The left, 3-pronged paramere in *nigropiceus* has only a short, recurved basal prong; in *ballii* the basal prong is reduced to a sharp spike, and in *divaricatus* it is long and broad. These species will be treated in a forthcoming revision of *Ceratocapsus* (by TJH).

**Jobertus chrysolectrus** Distant

*Jobertus chrysolectrus*, another orthotyline, was described from Mexico (Distant 1893) and later recorded from Cuba ( Bruner 1935, Alayo 1974) and Puerto Rico (Maldonado 1969). Maldonado also redescribed and il-
Illustrated the adult, figured ♀ parameres, and provided a key to the 3 species of the genus. Alayo (1974) also described and illustrated the adult. Brueder (1955) reported this species from beans, and Maldonado (1969) listed specimens from the shrubs Clerodendrum phlippinum Schauer (=fragrans Wild.), Cordia nitida Vahl., and Cordia sp.; eggplant, Solanum melongena L., and squash, Cucurbita moschata (Duchesne) Poir; and mixed grasses.

We collected J. chrysolecutrus at 2 localities in southern Florida. On 21 March 1980 and 10 April 1981 numerous adults were taken in Dade Co. along the Tamiami Trail, Rt. 41, 5 mi. west of Rt. 27; they were beaten from foliage of a morning-glory, Ipomoea alba L., heavily infested with leafhoppers. On 12 April 1981, we took 2 adults from Solanum erianthus D. Don near the Everglades National Park Headquarters and Visitor Center, Rt. 27. The collection of J. chrysolecutrus on plants of diverse families and its abundance on leafhopper-infested foliage suggest that this mirid is at least partially predacious.

Among undetermined material (FSCA) we found additional specimens: Marion Co., near Ocala, 27 August 1925, Drummon and Wiley, and Ilighlands Co., Archbold Biological Station, 13-14 July 1979, H. V. Weems, Jr. and T. A. Webber, in insect flight trap.

Adult ♀: Length 2.88-3.04 mm, width ca. 1.00 mm (wings spread). Head: Width 0.54 mm, vertex 0.20 mm. Rostrum: 1.02-1.06 mm, reaching just beyond metacoxae. Antenna: Segment I, length 0.92-0.94 mm; II, 1.02-1.06 mm; III, 0.54-0.60 mm; IV, 0.54-0.66 mm. Pronotum: Length 0.36-0.38 mm, basal width 0.76-0.78 mm.

General coloration pale green, frons and vertex of head, pronotum (except lateral margins), middle of base on scutellum, and a slender mark connecting apex of clavus and inside angle of coxium black (in some specimens the pronotum lacks much of the fuscous coloration); venter, rostrum, legs, and antennae (except for a fuscous mark on basal 1/2 of 1st antennal segment) pale green. Membrane mostly smoky gray with inside of large areole green, posterior margins of veins sometimes narrowly bordered with darker gray. Dorsum impunctate, sparsely set with fine, erect, simple setae.

Adult ♂: Length 2.80-2.90 mm. Very similar to ♀ in color and form.

Remarks: Jobertus chrysolecutrus will key to the genera Hyalochloria Reuter and Diaphania Uhler in Blatchley (1926) but can be distinguished by the dark markings on the head, pronotum, and hemelytra. Some of the species once placed in Diaphania have been transferred to the genera Brachynocorctis Reuter, Diaphanocoris Kelton, or Paraproboscis Distant. In most cases J. chrysolecutrus can be separated by its dark markings on the dorsum, but in Henry's (1977) key, Jobertus may run to the couplet containing Paraproboscis because of the choice "head black or pale." Paraproboscis, however, has the head uniformly black and the remainder of the body pale greenish; Jobertus has the head predominately pale with black markings, in addition to black markings on the pronotum and hemelytra.

**Paramixia carmelitana** (Carvalho)

Carvalho (1948) described *P. carmelitana* from Brazil, placing it in the phyline genus Rhinoclea Reuter; later, Carvalho (1955a) transferred it to the orthotylinae genus Orthotylus Knight and recorded the species from Ecuador and Puerto Rico. Schuh (1974) has shown that Orthotylus is a
junior synonym of the pilophorine genus *Paramixia* Reuter. Maldonado (1969) redescribed *carmelitana*, figured the adult and the ♀ parameres, and included it in his key to the genera of Puerto Rican Miridae. This mirid has been taken on *Cajanus cajan* (L.) Huth, *Cyperus rotundus* L., grasses, and sedges (Maldonado 1969).

We collected 5 ♂ and 3 ♀ at the Homestead research station (UF, AREC), 13-19 April 1981, by sweeping grasses and weeds, and by black lighting. In sorting undetermined Miridae we found that R. M. Baranowski had taken 14 additional specimens at the same locality on 20 August 1968 and 27 March 1977. We also have examined a ♂ taken at blacklight in Trinidad (Curepe, Santa Margarita, Circular Rd.) by F. D. Bennett on 12 January 1976 (UF, AREC).

**Adult ♂**: Length 2.32-2.60 mm, width 1.00-1.08 mm. **Head**: Width 0.66-0.72 mm, vertex 0.32-0.34 mm. **Rostrum**: Length 1.10-1.18 mm, reaching just beyond metacuxae. **Antenna**: Segment I, length 0.18 mm; II 0.74-0.80 mm; III, 0.32-0.36 mm; IV, 0.30-0.32 mm. **Pronotum**: Length 0.40-0.42 mm, basal width 0.88-0.94 mm.

General color brown to fuscous, legs and antennae (except for fuscous 3rd and 4th antennal segments) uniformly testaceous; thickly clothed with recumbent, pale setae intermixed with more silvery, sericeous setae on dorsum and pleural areas of the pronotum and abdomen.

**Adult ♀**: Length 2.52-2.72 mm. Very similar to ♂ in color, form, and pubescence.

**Remarks**: *Paramixia carmelitana* superficially resembles members of the subfamily Phylinae, especially those of *Chlamydatus* Curtis. The convergent parempodia, however, will place the species in the Orthotylinae. They will key to *Orthotylus* Fieber in Blatchley (1926) but can be separated by the small size, oval form, sericeous pubescence, and dark color with pale appendages.

*Paracarnus cubanus* Bruner

Bruner (1934) described and figured *P. cubanus* from specimens collected in Cuba, and Wolcott (1948) recorded this species from Puerto Rico. Maldonado (1969) redescribed the ♂ and ♀, figured the adult and the ♂ parameres, and included a key to species of the genus.

Bruner (1934) suggested that *P. cubanus*, a *deracorine* of the tribe Hyalidiini, is predacious. He observed that nymphs and adults were abundant in an orange grove infested with citrus blackfly, *Aleurocanthus v墙壁* Ashby. He also noted that nymphs were reared on leaves of *Pothomorpha pertata* L. infested with a yellow aphid. Other host records include *Corvina salcola* DC, *Pariti tilacetum* [=*Pariti tilaceum* A. ?], and *Petilia domingensis* Jacq. (Wolcott 1948); and *Annona* sp., *Fraxinus* spp., *Montezuma speciosissima* Sesse & Moc., and *Solanum fiefolium* Ortega ? [="fearium" Sw.] (Maldonado 1969).

The genus *Paracarnus* is difficult to distinguish from the genera *Hyalories* Reuter and *Hyalidioides* Knight. Neither Carvalho's (1955b) key to the world genera of Miridae nor Maldonado's (1969) key consistently separates these 3 genera, which are in need of revision.

There is confusion regarding the taxonomic status of *P. cubanus* and *P. mexicanus* Distant. After conferring with the British hemipterist W. E.
China, Bruner (1934) maintained both taxa as distinct because China felt that *cubanus* was less punctate and had shorter 2nd antennal segments than Distant's *mexicanus*. In his “Miridae of Puerto Rico,” Maldonado (1969) suggested that *P. cubanus* is a junior synonym of *P. mexicanus* based on China's apparent change of opinion, but he noted that “this point has to be definitely clarified in the future.” Until Distant's specimens of *mexicanus* can be re-examined and compared with *cubanus*, we feel it is best to recognize the distinctness of Bruner's species.

One of us (AGW) and D. R. Whitehead (Systematic Entomology Laboratory, USDA, Washington, D.C.) collected a single ♂ at the Homestead research station (UF, AREC), 11 April 1981; the specimen was beaten from avocado, *Persea americana* Miller. We later found in the USNM a ♂ and a ♀ that had been taken at Homestead by D. O. Wolfenbarger on 23 December 1947, det. R. I. Sailer.

**Adult ♀**: Length 3.60 mm, width 1.36 mm. **Head**: Width 0.64 mm, vertex 0.24 mm. **Rostrum**: Length 0.94 mm, reaching mesocoxae. **Antenna**: Segment I, length 0.38 mm; II, 0.88 mm; III, 0.38 mm; IV, 0.24 mm. **Pronotum**: Length 0.74 mm, basal width 1.12 mm.

General coloration testaceous, head pale yellow, triangular area on frons and tylos reddish; pronotum testaceous with contrasting brown to red punctures, collar and 3 short carinae (1 at each side and at middle) pale yellow; scutellum pale yellow; hemelytra transparent except for narrow, claval margins, apical areas of coria, apices of cunei, and membranal veins; venter and legs pallid; antenna with 1st segment reddish, 2nd pale, 3rd, 4th, and apex of 2nd fuscous.

**Remarks**: *Paracarnus cubanus* will key to *Hyaliodes* in Blatchley (1926) and Knight (1941). It is distinguished from our 3 known species of *Hyaliodes* by having the 1st antennal segment much shorter than the width of the head and by having 3 distinct, pale yellow carinae on the pronotum.

*Proba hyalina* Maldonado

*Proba hyalina* was known only from 3 specimens collected at Jayua (near Cerro de Punta), Puerto Rico, on *Clidium erosum* DC. (Maldonado 1969). Maldonado figured the adult and the ♂ parameres and included *Proba* in his key to the mirid genera of Puerto Rico.

We collected numerous nymphs and adults of this mirine species on the woody composite *Parthenium hysterophorus* L. growing along roadsides and in crop fields. In Dade Co. one adult was collected near Florida City along Rt. 27 on 18 March 1980, and a large series was taken at the same locality on 7 April 1981; another large series was collected near Homestead on 10 April 1981. *Proba hyalina* often was more abundant than the other mirids that we found on *Parthenium*: *Lygaeus lineolaris* (Pallot de Beaufours), *Polymerus* sp., *Reuteroscopes ornatus* (Reuter), *Rhinacloa* sp., and *Taylorellus pallidulus* (Blanchard). We later found 13 specimens that R. M. Baranowski had taken at light, 27 June-30 August 1969, at the Homestead research station (UF, AREC).

**Adult ♀**: Length 3.84-4.28 mm, width 1.64-1.75 mm. **Head**: Width 0.96-1.00 mm, vertex 0.40-0.42 mm. **Rostrum**: Length 1.68-1.76 mm, reaching just beyond metacoxae. **Antenna**: Segment I, length 0.42-0.44 mm; II, 1.22-1.30
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mm; III, 0.76-0.84 mm; IV, 0.46-0.52 mm. Pronotum: Length 0.86-0.90 mm, basal width, 1.50-1.54 mm.

General coloration bright, shiny green, head green, tylus reddish; hemelytra strongly hyaline, devoid of pubescence, inside margin of clavus fuscous, scutellum greenish yellow, base of scutellum sometimes with a fuscous mark at middle; legs uniformly greenish, claws fuscous; antenna green with 3rd, 4th, and apical 1/3-1/2 of 2nd segment fuscous.

Adult ♀: Length 4.20-4.40 mm. Similar to ♂ in coloration but larger and slightly more robust.

Remarks: Proba hyalina could be confused with Tayloriyygoa pallidulae and species of Dugbertus Distant, but hyalina is separated by the shiny, hyaline, glabrous hemelytra and by the complete basal carina on the head. The genus Proba will key to Horcias Distant (U.S. species now are placed in Metriorrhynchos Kirkaldy) in Blatchley (1926). Proba differs in the smaller size, the longer rostrum that reaches just beyond the metaeoxae, the uniformly greenish color, and the distinct basal carina on the head. Proba hyalina is most similar to Proba scutellata (Distant), found in Mexico and Texas, but hyalina lacks the fuscous 1st antennal segments and the fuscous marks or annuli on the metafemora, as noted by Maldonado (1969).

Discussion

Finding 6 Miridae new to Florida is hardly surprising considering the lack of intensive mirid collecting in southern Florida. In addition, the extreme southern areas of Florida are vulnerable to invasion by new taxa from the tropics. Darlington (1938), in his studies on the origin of a Greater Antillean fauna, considered hurricanes of prime importance in dispersal. Mirids have been taken at high altitudes (e.g., see Gaines 1938, Glick 1939) and appear capable of long-range dispersal by self-sustained flight, as well as by passive movement on convective air currents. Our collection of several Neotropical species in the fruit-growing regions near the University of Florida Agricultural and Education Center, Homestead (formerly the Sub-Tropical Experiment Station) suggests that mirids may be introduced with tropical fruits or other products. The 6 species appear to be recently introduced.

Of the 65 species treated by Maldonado (1969) in his "Miridae of Puerto Rico," 27 are known to occur in Florida. Four of the 6 species in this paper are also known from Puerto Rico, which brings the number of species in common to 31. Based on the well-studied distributions of butterflies in the West Indies (Monroe 1948, Riley 1975), we would expect the mirid fauna of southern Florida to show a closer relationship to that of the Bahamas or Cuba than to Puerto Rico. Unfortunately, the Miridae inhabiting the Bahamas and Cuba are inadequately known. We feel that an extensive survey of the Caribbean region is needed to record the movement of mirids into the fruit-growing regions of southern Florida and to elucidate the origin of the West Indian mirid fauna.

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TERRESTRIAL ARTHROPODS OF
NORTHWEST FLORIDA SALT MARSHES:
HEMIPTERA AND HOMOPTERA (INSECTA)

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ABSTRACT

A list of 69 species of Hemiptera and Homoptera collected in northwest Florida salt marshes during a 15-month period is presented. Data on location of capture, as well as qualitative abundances are given for each species. The total number of species collected is comparable with those reported from similar habitats in other North American marshes. *Melanoplus bicolor* Ball (Homoptera: Delphacidae) is reported east of the Mississippi River for the first time.

RESUMEN

Se presenta una lista de 69 especies de Hemíptera y Homóptera procedentes de las marismas del noroeste de la Florida (E.U.A.), obtenidas durante un programa de muestreo de 15 meses de duración. Por cada especie se presentan datos sobre la localidad donde fue capturada, así como sobre sus abundancias cualitativas. El total de las especies fue semejante como el de habitats similares en marismas norteamericanas. *Melanoplus bicolor* (Ball) (Hemiptera: Delphacidae) es reportado por primera vez al este del Río Mississippi.

In a previous contribution (McCoy and Rey 1981b), we described the beetle fauna of salt marshes in the St. Marks area of northwest Florida. Here, we list the species of Hemiptera and Homoptera collected from these marshes during the same period. Various aspects of these arthropod communities have been under study during the last 6 years; the data reported below resulted from a 15-month sampling program designed to investigate the diversity and abundance patterns of arthropods within the various zones of these marshes.