

VOLUME 14

ARTHROPODS OF FLORIDA

and Neighboring Land Areas

LYGAEIDAE OF FLORIDA (HEMIPTERA: HETEROPTERA)



by
James A. Slater
and
Richard M. Baranowski

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES
Doyle Conner, Commissioner

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FOREWORD

Lygaeidae of Florida is the second volume by Drs. Richard M. Baranowski and James A. Slater on the Hemiptera of Florida, following *Coreidae of Florida*, which was published in 1986 in *Arthropods of Florida and Neighboring Land Areas*. It provides a reference useful both for field identification of most species and for the accurate identification in the laboratory of all species known to occur or which are likely to be found in Florida. Dr. W. S. Blatchley (1926) treated 29 genera and 105 species that have been recorded for Florida. This volume lists 47 genera and 105 species (plus 3 additional questionable species). An extensive list of plants with which Florida Lygaeidae have been associated and an extensive list of references are included. The keys, illustrations, distributional data, and discussions will be invaluable aids to all of those who are interested in the Lygaeidae.

The authors mention that the *Heteroptera of Eastern North America* by W. S. Blatchley still is the most important source of information on the fauna even though it was published in 1926. Unquestionably, the *Lygaeidae of Florida* will supplant Blatchley and become the baseline on which all further work on the Lygaeidae of the Eastern United States will be based. Whereas their work on other groups such as the Coreidae has resulted in handsome and important volumes, the Lygaeidae offered a challenge - by virtue of the size and diversity of the group - that goes well beyond what they have done heretofore.

Dr. James Alexander Slater, "Jim" to his many friends was born in Belvidere, Illinois, on 10 January 1920, son of Gladys Banks Slater and Ray Alvin Slater. He and Elizabeth Thackston were married on 20 February 1943, and they have 4 children: James Alexander II, Jacquelyn Rae, Samuel Thackston, and Lydia Ann. During 1943-46, he served as an officer in the United States Navy; Deck Officer in the Mediterranean; Malaria Control Officer, North Carolina and Okinawa. Jim received the Bachelor of Arts degree in 1942 from the University of Illinois, graduating with high honors. He received the Master of Science degree in 1947 from the University of Illinois and the Doctor of Philosophy degree in 1950 from Iowa State University with a major in entomology. He served as an Instructor, then Assistant Professor at Iowa State University during 1950-53. At the University of Connecticut he served as an Assistant Professor during 1953-56; Associate Profes-

sor, 1956-61; Professor, 1961-date; Department Head: Systematic and Evolutionary Biology Section, Biological Sciences Group, 1970-80. During 1960-61 he was a Research Fellow at the British Museum (Natural History). He was State Ornithologist in Connecticut during 1962-81; a Research Associate of the National Insect Collection, Pretoria, South Africa, 1967-68; Research Associate, American Museum of Natural History, 1977-date, and Research Associate, Florida State Collection of Arthropods (1986-date). Academic and professional societies of which he is a member are: Entomological Society of America, New York Entomological Society, Kansas Entomological Society, Washington Entomological Society, Entomological Society of South Africa, Royal Entomological Society (London), Society of Systematic Zoology, Florida Entomological Society, Association for Tropical Biology, Connecticut Entomological Society, Connecticut Herpetological Society, Connecticut Academy of Arts and Sciences, Connecticut Academy of Science and Engineering, American Society of Zoologists, Phi Beta Kappa, Sigma Xi, Phi Kappa Phi, Gamma Sigma Delta, Association for Gravestone Studies, and Natchaug Ornithological Society. His biography is included in *American Men and Women of Science* and in *Who's Who in the East*. Dr. Slater received the University of Connecticut Faculty Research Award in 1972. He was the Eastern Branch Nominee for Distinguished Achievement Award in Teaching, Entomological Society of America, in 1977. In 1982 he won the Harriett Merrieffield Forbes Award of the Association for Gravestone Studies. He served on the Selection Committee of Phi Beta Kappa in 1979; President, Phi Beta Kappa, Connecticut Chapter, 1987. University of Connecticut Retirement Committee (Chairman, 1982-85), 1982-1989; Vice President of Connecticut Academy of Arts and Sciences, 1980-date; Connecticut Non-Game Advisory Committee, 1981-1988; Friends of Trail Wood Committee (Edwin Way Teale Sanctuary), 1981-date. His professional activities include: Editor, *Entomologica Americana*, 1957-67; Editorial Board and Archives Board, Connecticut Entomological Society, 1974-81; Editorial Board, *Revue Zoology Africaine*, 1989-date; National Science Foundation Advisory Panel, Systematic Biology, 1963-65; University of Connecticut Research Foundation Advisory Board, 1964-67; Task Force on Establishment of an Environmental

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Dr. Richard Matthew Baranowski, or "Dick" as he is generally called, was born in Utica, New York on 1 March 1928, son of Agnes and

Walter Baranowski. On 16 June 1951 he married Helen B. Venn. They have 3 children: Gena, Alison, and Lisa. Dick was educated in the public schools of Utica, New York. He received the Bachelor of Arts degree in 1951 from Utica College of Syracuse University with a major in biology. In 1953 he received the Master of Science degree and in 1959 the Doctor of Philosophy degree, both from the University of Connecticut with a major in entomology. He served as a Graduate Research Assistant during 1952-54 and as a Graduate Teaching Assistant during 1954-56 at the University of Connecticut. In 1956 Dick joined the staff of the University of Florida's Agricultural Research and Education Center at Homestead (for many years known as the Subtropical Experiment Station) where he served as an Assistant Entomologist until 1963, as an Associate Entomologist from 1963-67, as an Entomologist and Professor from 1967-84. In 1984 he became the Center Director of the University of Florida Center at Homestead, which is now known as the Tropical Research and Education Center, and he continues to serve in this capacity. He also served (half time) during 1979-81 as United States Department of Agriculture, Plant Pest Quarantine Technical Advisor, National Biological Control Program. Dr. Baranowski has been a Research Associate of the Florida State Collection of Arthropods since 1969. He is a member of several academic and professional societies: Florida Entomological Society (President, 1975), Entomological Society of America, International Organization for Biological Control (Secretary/Treasurer, 1980-84; President, 1984-85), Florida State Horticultural Society, American Association for the Advancement of Science, Council on Agricultural Science and Technology, Sigma Xi, and Gamma Sigma Delta. His biography is included in *American Men and Women of Science*. In 1971 he was selected as Outstanding Research Faculty Member at AREC-Homestead, and in 1973 he received the Florida Department of Agriculture's Plant Protection Award of Eminence. He has been the recipient of more than \$1,000,000 in research grants pertaining to the biology, ecology, mass rearing procedures, biological control, and detection of fruit flies; US/Latin American Cooperative Science Program; study of phenological relationships between broad mites, rust mites, and lime trees and between mirids, avocado trees, and alternate hosts; and other investigations. He is the author of a 1964

volume titled *Insects in The Golden Bookshelf of Natural History* series published by Golden Press, coauthor with Dr. J. A. Slater of *How to know the Hemiptera* published in 1978, and author or coauthor of more than 80 other scientific publications, with 3 manuscripts in press. His primary current research areas are the management of subtropical fruit pests including fruit flies and the biology and systematics of the Hemiptera of Florida and the Caribbean. His discipline-oriented work has taken him to Antigua, Austria, Bahamas, Barbados, Brazil, Costa Rica, Dominica, England, France, Guadeloupe, Grand Cayman, Jamaica, Martinique, Puerto Rico, St. Kitts, St. Lucia, St. Vin-

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INTRODUCTION

The Lygaeidae constitute one of the largest and most varied families of Heteroptera. Most species are small, dull colored insects, but included in the family are also numerous brightly colored (often aposematic) red, black and orange species. Even the small, cryptic, litter living species, which superficially appear to be dull in appearance, take on beautiful patterns of stripes, spots and patches of yellow, black, brown and white under the microscope. The family is unusually varied in appearance for Heteroptera, but may be characterized by the 4-segmented antennae located below an imaginary line through the middle of the eye (giving rise to the old classification of "Infericornia"), membrane of the forewing with 4-5 simple veins, 4-segmented labium, geniculate ovipositor, symmetrical male parameres and lateral abdominal trichobothria.

Recent phylogenetic studies indicate that the Lygaeidae may be a "stem group" from whose various ancestral lines other pentatomomorph hemipterans have arisen such as the Pentatomoidea, Coreoidea, Pyrrhocoridae, Largidae, Berytidae etc. If this proves to be the case, the family is thus paraphyletic. Most Lygaeidae are known to feed upon mature seeds which led Sweet (1960) to use the term "seed bug" as a common name for the family. However, species of Blissinae, and some Lygaeinae at least, are sap suckers and many Geocorinae are, at least in part, entomophagous. Members of the tribe Cleradini feed upon vertebrate blood. However, none of the latter is found in Florida.

Many lygaeids have strongly incrassate fore femora with ventral spines, which led early workers to believe that these insects were predaceous. It is instructive to students of anatomy, who believe that morphological examination can ascertain function without corroborative field evidence, to examine the powerful appearing toothed fore legs of rhyparochromine lygaeids, all of which are seed feeders, relative to the frequently slender legs of many actively predaceous Reduviidae.

Lygaeid habitats are at least as varied as is their morphology. Slater (1977) recognizes three major habitats: Arboreal, Geophilic and Laminophilic.

(1.) Arboreals: Many species live on herbs well above the ground level. These species are always fully winged and usually fly readily when disturbed. A few species live in trees where they feed on seeds. Actually both herb and tree feeding species are similar in their habits and can properly be considered ecologically as a single arboreal element.

(2.) Geophiles: The majority of Florida Lygaeidae are ground litter-living species, occurring among seed litter below plants. These habits preadapt them in Florida to live in relatively dry microhabitats where seeds may remain viable without germinating or molding for a period of time. A number of these geophilous species do occasionally climb plants when mature seeds are present but, with rare exceptions, spend most of their lives on the ground. While most geophilous lygaeids belong to the Rhyparochrominae, Floridian Geocorinae are also geophilous as are some species of Lygaeinae, Orsillinae and Blissinae. Species of Rhyparochrominae are usually cryptically colored and frequently have deflective coloration such as white annulations on the fourth antennal segments and white spots distally on the corium which serve to "fool" a potential vertebrate predator into misdirecting its attack.

In long time stable habitats geophilous lygaeids often develop a flightless morph.

(3.) Laminaphiles: These are species that live closely adpressed between the leaves and stems of grasses, sedges and rushes. In Florida they are chiefly species of *Ischnodemus*. They differ from arboreal species in often showing flightless morphs.

Aposematically colored Lygaeidae are commonly those species that feed on milkweeds, senecios and other plants containing toxic substances. Some of these species, such as *Oncopeltus fasciatus* (Dallas), are parts of fascinating Mullerian and Batesian mimicry associations involving other Hemiptera, beetles and moths.

Ant mimicry is common in geophilous Lygaeidae. The Floridian species are not as highly modified morphologically as are many tropical species, but in the field, adults and especially nymphs of several species of *Neopamera*, *Pseudopachybrachius*, *Heraeus* and nymphs of *Paromius longulus* (Dallas) are very ant-like in their movements. *Heraeus triguttatus* (Guerin) is a striking

reddish species that is common in southern Florida and closely resembles a species in Cuba, *Myodocha fulvipes* (DeGeer), where a large red ant also occurs.

Many lygaeid groups have specialized upon certain plant taxa, for example many Lygaeinae on Asclepiadaceae, the Blissinae and Teracrine on Gramineae, and the Pachygronthini and Cyminae on Cyperaceae and Juncaceae. The latter two groups, particularly the Cyminae are highly specialized to feed in the seed heads of sedges, both adults and nymphs closely resembling the seeds.

Lygaeid nymphs live in the same habitat and usually feed in the same way as the adults. Species which tend to be somewhat oligophagous in feeding habits will generally have a wider host range as adults than they do as nymphs. Thus, it is important in establishing "breeding" hosts, to be sure that feeding by nymphs has been ascertained.

Almost all Lygaeidae have 5 nymphal instars with mesothoracic wing pads appearing in the third instar.

Some of the older specimens that we have examined, have "Everglade" listed on the labels as the locality. We have interpreted this to mean Everglades City and accordingly listed these specimens under Collier County. Labels having only Everglades National Park, or Lake Okeechobee, without more precise identification of locality, and those localities not found in the Rand McNally Commercial Reference Map and Guide for Florida are listed under UNKNOWN COUNTY.

ECONOMIC IMPORTANCE

Entomologists in Florida, and in fact the public at large, are usually familiar with the major damage done to lawn and turf grasses by the Southern Chinch Bug, *Blissus insularis* Barber. A large literature has developed concerning the damage and control measures used to reduce the damage caused by this extremely destructive insect.

Species of the genus *Geocoris*, especially *Geocoris punctipes* (Say), are to a large extent predatory. The habits of these big-eyed bugs, of living in early succession type habitats, which of

course are those where many crops are grown, has led to numerous studies of the effect of these predators in controlling populations of a number of serious agricultural pests.

The seed feeding habits of most lygaeids has resulted in several of them damaging cultivated plants. This is particularly true of such oligophagous species as *Neopamera bilobata* (Say), *Pseudopachybrachius vincta* (Say), and their relatives which have been reported as sporadically damaging crops, especially strawberries.

Several species of *Nysius* are agricultural pests, but these seem not to build up sufficiently large populations in Florida to be of more than local importance. This is probably an interesting corollary of Florida being a high summer rainfall region for most destructive *Nysius* species seem generally to cause major problems in the western United States, Australia, and South Africa where they migrate to cultivated crops after their wild host plants dry up and no longer offer an attractive food source.

What the overall ecological effect of most of the lygaeid "seed predators" has on the environment is unknown. In some cases, populations may build up to enormous numbers. In such cases the entire seed crop of a given plant or group of plants may be destroyed. This must have a definite effect on the spread and abundance of both undesirable weeds and desirable wild plants. It offers a most attractive research field for future ecological studies.

One should not leave the subject of economic importance without reference to the widespread use of the Large Milkweed Bug as an experimental laboratory animal. An immense literature has developed through the use of this insect in studies of chemical toxicity, resistance, and a host of physiological and biochemical analyses of general significance for our understanding of how insects really function.

ZOOGEOGRAPHY

COMPOSITION OF THE FLORIDA FAUNA

I. ENDEMIC SPECIES (10%)

At least 9 species of Lygaeidae appear to be endemic in Florida. Of these, *Cnemodus hirtipes* Blatchley, *Myodocha annulicornis* Blatchley and *Carpilis barberi* (Blatchley) represent the Floridian sister species of widespread northern species. *Ligyrocoris slossonae* Barber probably represents a similar phenomenon which is isolation of a Floridian population and subsequent speciation. In contrast to those previously mentioned, *L. slossonae* appears now to be restricted to north Florida. This is a most unusual lygaeid distribution and may be an example of disjunction following a former xeric period which resulted in east-west separation of a number of plant and animal species. In this case, differentiation has reached the specific level from the western *L. barberi* Sweet which apparently is the sister species (see Sweet 1986). *Blissus minutus* (Blatchley) may also represent an east-west disjunction although *minutus* is found in southern Florida. Its apparent closest relative occurs in the southwestern states. The other endemics include two species of *Ozophora* and two of *Ischnodemus*.

II. WIDESPREAD NORTH AMERICAN SPECIES (23%)

Interestingly, this element contains almost the same percentage of lygaeid species as it does of Coreidae (21%).

As in the Coreidae (Baranowski and Slater 1986), two subgroups are distinguishable. One, which contains the majority of the species, consists of taxa that are widespread in the northern states but which become scarce to rare in the southern parts of their ranges, and are sometimes confined to extreme northern Florida. Examples of such species are *Drymus crassus* Van Duzee, *Oedancala dorsalis* (Say) and *Lygaeus kalmii* Stal. A second subgroup has a more southern distributional center. Such species often have a wide range in the central and northern states and become increasingly scarce in the northern parts of their ranges. This group is poorly represented in the Lygaeidae but, *Ischnodemus slossonae* Van Duzee, *Antillocoris pilosulus* (Stal), and *Neacoryphus bicrucis* (Say) are probably examples.

III. SOUTHEASTERN OR GULF COAST (CAROLINEAN) SPECIES (13%)

The ranges of species in this group usually extend from Louisiana or eastern Texas across the gulf coast states, and sometimes into North Carolina along the coastal plain. There is an element of this fauna in the Lygaeidae that is largely, but not entirely, restricted to salt marshes. *Ischnodemus conicus* Van Duzee, and *I. badius* Van Duzee are typical examples. More wide ranging species on the coastal plain appear to be the sedge feeding *Oedancala crassimana* (Fabricius), *Cymus bellus* Van Duzee and *Ischnodemus rufipes* Van Duzee, and perhaps such species as *Antillocoris discretus* Barber, *Ligyrocoris barberi*, *Ochrimnus mimulus* (Stal), and *Geocoris floridanus* Blatchley.

IV. SOUTHERN U. S. SPECIES, INCLUDING THE SOUTHWEST (6%)

Only a relatively few Floridian Lygaeidae have a distribution of this type, but they include some common species such as *Nysius raphanus* Howard, *Phlegyas annulicrus* Stal, *Perigenes similis* Barber, and probably *Geocoris punctipes* (Say), *Ochrimnus lineoloides* (Slater) and *Melacoryphus facetus* (Say).

V. DISJUNCT FLORIDA AND WESTERN U. S. SPECIES (4%)

As noted in the discussion of The Florida Coreidae (Baranowski and Slater, 1986), this is a particularly interesting feature of the distribution of a number of animal groups. However, it is scarcely evident in the lygaeid fauna. *Ligyrocoris litigiousus* (Stal), *Nysius tenellus* Barber and probably *Sisamnes contractus* Distant and *Ischnodemus brunnipennis* (Germar) are the only species that at present appear to have such a distribution, and even in some of these cases, the distributional evi-

dence may be due to lack of collecting as much as to actual disjunction of ranges.

VI. NEOTROPICAL SPECIES (44%)

Slater (1974) has pointed out that a large proportion of the Hemipterous fauna of North America is Neotropical in origin, and more closely resembles the composition of the passerine bird fauna than it does the mammals. Thus, it is not surprising that a considerable proportion of the Lygaeidae of Florida should be derived from Neotropical sources. Indeed, the southern Florida lygaeid fauna is, as stated by Slater (1988), actually in large part an element of the Caribbean fauna. For example, 18% of the lygaeid fauna of Florida is otherwise found only on islands of the West Indies and, as might be expected, these species are largely confined to extreme southern Florida. It is important to realize that 48 West Indian species also occur in Florida. This is 29% of the entire West Indian Fauna. Indeed, Slater (1988) stated that even today there is a slow but steady accumulation of Caribbean species into south Florida that reach the mainland by overwater dispersal. The mimetic association noted earlier is strong evidence that *Heraeus triguttatus* evolved in Cuba and has reached Florida relatively recently by overwater dispersal since the rest of its mimetic associates and the model are not present on the mainland. Slater (1988) states that of the 48 species common to the two areas only 9 can be considered to have reached the West Indies from Florida, whereas approximately 24 appear to have reached Florida from the Islands.

While the south Florida-West Indian relationships are relatively easy to understand, there are other Neotropical elements whose elements are more obscure. These involve species found in Florida and Central America but not in the Caribbean. It is tempting to think of such taxa as representing old elements of the fauna, in fact remnants of a much more widespread tropical North American fauna which we know existed during interglacial periods of the Pleistocene. Examples of such species are *Delochilocoris illuminatus* (Distant) and *Paurocoris punctatus* (Distant).

Far more common are Florida species that also occur in both the West Indies and in Central America. A number of these species also occur in South America. Some ubiquitous species

belong here, such as *Pseudopachybrachius vincta*, *Neopamera bilobata*, *Paromius longulus* (Dallas), *Neortholomus jamaicensis* (Dallas), *Cymoninus notabilis* (Distant), and *Oncopeltus fasciatus*.

Unfortunately, we do not know enough about mainland tropical distributions to clearly establish which of these latter type taxa represent old North American tropical elements and which South American ones, but present indications suggest the former to be the most important component.

WORK ON FLORIDA LYGAEIDAE

Until recently little specialized work has been carried out on Florida Lygaeidae other than on species of direct economic importance. Knowledge of distribution and habits has come from the work of general collectors and those interested in Hemiptera in general.

Florida has always been considered an area of special interest to naturalists because of its unusual flora and fauna, particularly the Neotropical and West Indian components otherwise absent in much of the United States.

Many early entomologists such as Thomas Say collected in the state. In the late 19th century Annie Trumbull Slosson spent considerable time collecting in Florida and her collections of Hemiptera were studied and reported on by E. P. Van Duzee and H. G. Barber in particular. In the 1880's E. A. Schwartz spent a season collecting in southern Florida. The early volumes of the Proceedings of the Washington Entomological Society are filled with comments on the Hemiptera collected, by Uhler, Heidemann, Howard, and Schwartz himself. His comments on chinch bug are of great significance as they indicate where the original populations may have been present. In 1909, E. P. Van Duzee published the results of his trip through Florida devoted to collecting Hemiptera. W. S. Blatchley spent many years in the first quarter of this century collecting and observing Florida Hemiptera and his work still is of fundamental importance. R. F. Hussey lived from 1947 to 1967 in Florida where he taught biology at Florida Southern at Lakeland and the University of Florida in Gainesville. He collected widely and accumulated a large and important collection. In his later years he was joined by Jon Herring who

specialized chiefly on the aquatic and semi-aquatic groups.

In 1953 H. V. Weems, Jr and F. W. Mead joined the Florida Department of Agriculture and Consumer Services, Division of Plant Industry. Collecting was strongly supported and their efforts resulted in a great increase in the Hemiptera material in the Florida State Collection of Arthropods.

In 1956 the junior author located at Homestead, Florida and has collected extensively in southern Florida and has been joined on several occasions by the senior author, who in addition spent a concentrated period with R. T. Schuh and J. Harrington in 1969 devoted largely to observations on, and collecting of, the more cryptic elements in the Florida lygaeid fauna.

C. W. O'Brien joined the staff of Florida A & M. University in 1972 and has contributed a large amount of valuable material.

PUBLICATIONS ON FLORIDA LYGAEIDAE

Early publications on Florida Lygaeidae were limited largely to descriptions of new species and the casual mention of a few species in general notes on collecting Florida insects. P. R. Uhler, the Dean of American Hemipterists, frequently mentioned species of Lygaeidae as occurring in Florida, but usually without specific locality data. The Van Duzee (1909) list of Hemiptera is the first paper devoted specifically to the Florida Hemiptera fauna, wherein 16 genera and 29 species of Lygaeidae are mentioned, 6 of them described as new.

The most important early paper on the Florida Hemiptera is that of H. G. Barber (1914). In this contribution Barber not only gave a list of 25 genera and 54 species of Lygaeidae, but specific locality for most as well. Barber also attempted a quantitative analysis of the origin and composition of the fauna. Since Barber was, for many years, the leading lygaeid authority, his analysis of this fauna was of special importance.

W. S. Blatchley published his monumental "Heteroptera of Eastern North America" in 1926. This work was of uneven quality but despite controversy and later criticism, it remains the only

work to treat with full descriptions, keys, and biological data, all of the Hemiptera of the Eastern United States. You will find to this day that Blatchley's book is usually the most used book on every American Hemipterist's shelf. Blatchley notes that the study had particular reference to the faunas of Indiana and Florida, where he lived and worked. Thus, it is particularly important for students of Florida Hemiptera, and is the base point for all future work.

Blatchley's work, which treated 29 genera and 73 species of Lygaeidae, was the last complete faunal study of the Florida Hemiptera fauna. Subsequently papers dealing with the Floridian lygaeid fauna have been published by Barber, Hussey, Torre Bueno, Baranowski, Slater and Leonard, among others.

Slater (1988) compared the lygaeid fauna of Florida with that of the West Indies. He reported 46 genera and 97 Florida species. In the present paper we list 47 genera and 105 Florida species (plus 3 additional questionable species).

KEY TO SUBFAMILIES OF FLORIDA LYGAEIDAE

1. Suture between abdominal sterna 4 and 5 curving forward laterally and not attaining lateral margins of abdomen (figs. 51-54, 57, 68) RHYPAROCHROMINAE, p. 87
- 1'. Suture between abdominal sterna 4 and 5 straight or nearly so and attaining lateral margins of abdomen (fig. 17) 2
2. Abdominal spiracles on segments 2 through 7 all placed dorsally 3
- 2'. At least one pair of spiracles on segments 2 through 7 located ventrally 5
3. Clavus punctate; posterior pronotal margin not depressed laterad of base of scutellum. ISCHNORYNCHINAE, p. 41
- 3'. Clavus impunctate; posterior pronotal margin depressed laterad of base of scutellum 4
4. Generally with red or orange coloration present; apical corial margin straight; hind wing possessing a subcosta and lacking intervannals LYGAEINAE, p. 5

- 4'. General coloration dull yellowish brown, never with bright red or orange markings; apical corial margin sinuate on mesal half; hind wing lacking a subcosta and possessing intervannals. .ORSILLINAE p. 28
5. Abdominal spiracles of segments 2 to 6 located dorsally, spiracles of segment 7 located ventrally 6
- 5'. Abdominal spiracles on at least segments 6 and 7 located ventrally 7
6. Hemelytra coarsely punctate CYMINAE, p. 44
- 6'. Hemelytra impunctate, or at most with a few scattered inconspicuous punctures. BLISSINAE, p. 52
7. Abdominal spiracles on segments 3 and 4 located dorsally; eyes protruding and reniform; (figs. 42, 43) fore femora not greatly incrassate and not armed below with numerous spines GEOCORINAE, p. 71
- 7'. All abdominal spiracles located ventrally; eyes not unusually large and reniform; fore femora greatly incrassate and armed below with numerous spines. PACHYGRONTHINAE, p. 78

LYGAEINAE Stal

The members of this subfamily are usually moderate sized to very large lygaeids. Most species are easily recognizable by their contrasting red and black or orange and black coloration. All of the abdominal spiracles are located dorsally. The hemelytra are impunctate. The membrane of the front wing usually possesses a distinct cell and the hind wing possesses a hamus and subcostal vein. The nymphs possess two pairs of dorsal abdominal scent gland openings located between terga 4-5 and 5-6.

This is a large subfamily found in all of the major zoogeographic regions of the world. Fifty eight genera are currently recognized; of these 10 are found north of Mexico, 7 of which are represented in Florida.

KEY TO FLORIDA GENERA OF LYGAEINAE

1. Scutellum tumid and swollen with a weak median longitudinal carina (fig. 1), but never with adjacent lateral areas excavated; lacking a subbasal transverse carina *Oncopeltus*, p. 7

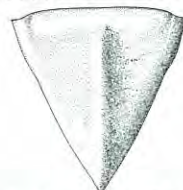


Fig. 1. *Oncopeltus fasciatus*
Scutellum, dorsal view

- 1'. Scutellum not tumid and swollen with a longitudinal median carina, and adjacent areas flat or excavated (fig. 2). A subbasal transverse carina usually present. 2

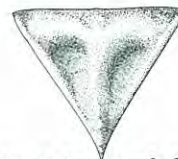


Fig. 2. *Lygaeus kalmii*
Scutellum, dorsal view

2. Pronotum with shining impressed calli lines, near meson with a short branch present extending caudo-laterad from main impressed line (figs. 3, 4) 3
- 2'. Pronotal calli lines unbranched 5
3. Pronotum often punctate behind calli, but without 4 transverse impressions (fig 3). 4

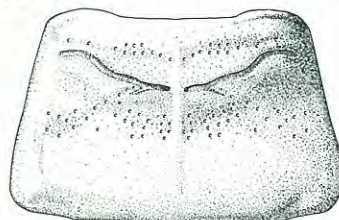


Fig. 3. *Craspeduchus* sp.
Pronotum, dorsal View



Fig. 4. *Ochrimnus* sp.
Pronotum, dorsal view

- 3'. Pronotum with 4 short deep transverse impressions present behind calli (fig. 4). *Ochrimnus*, p. 21
4. Lateral and apical corial margins pale yellow to white; apical corial pale stripe and stripe on clavus forming a distinct X (St. Andrew Cross) when wings folded (Frontis) *Craspeduchus*, p. 28
4. Lateral and apical corial margins either red or black; not forming a distinct pale X when wings folded, although clavus may possess a pale stripe (*formosus*). *Lygaeus*, p. 14
5. Small (5mm or less) heavily pilose, chiefly black or very dark species; membrane with a median white spot. *Lygaeospilus*, p. 20
- 5'. Larger (well over 5mm), not heavily pilose, membrane lacking a white median spot 6
6. Dorsal body surface throughout with a sparse covering of short silvery hairs; Callar impressions oblique throughout not becoming almost transverse mesally (fig. 5); propleuron produced anteriorly below eye; posterior pronotal lobe and corium fuscous or blackish. *Melacoryphus*, 19

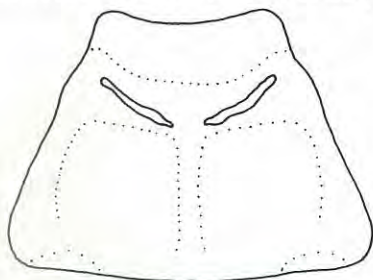


Fig. 5. *Melacoryphus* sp.
Callar impressions

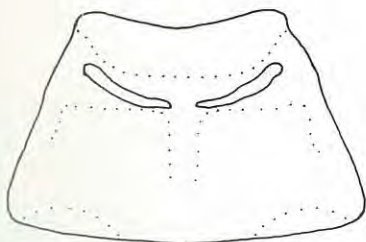


Fig. 6. *Neacoryphus* sp.
Callar impressions

- 6'. Dorsal body surface almost glabrous; callar impressions almost transverse immediately adjacent to coarse post-callar punctures (fig. 6); propleuron not conspicuously produced anteriorly; posterior pronotal lobe and corium red. *Neacoryphus*, p. 17

ONCOPELTUS Stal 1868

Lygaeus sg. *Oncopeltus* Stal 1868: p. 70, 75.

Type Species: *Cimex famelicus* Fabricius 1781.
Fixed by Distant 1904.

This genus includes many species of large to medium size, the majority of which are red or orange and black in color and feed primarily on various species of milkweeds. The genus is recognizable by the convex scutellum which lacks the excavated depressed lateral areas so characteristic of most genera in the subfamily Lygaeinae, by the posteriorly produced lobes along the posterior margin of the pronotum laterad of the base of the scutellum, and generally by a weakly carinate median line on the pronotum.

The genus is widely distributed in the tropical and subtropical areas of both hemispheres, but with diversity centers in the Australian and Neotropical regions. Forty-two species are currently recognized, of which 8 occur north of Mexico, most of them southwestern and southern in distribution. Four or possibly 5 species occur in Florida.

KEY TO FLORIDA SPECIES OF ONCOPELTUS

1. Membrane with a conspicuous white spot or stripe present; if white area reduced, then pronotum red with a very large ovoid black macula covering most of posterior lobe (fig. 7) 2
- 1'. Membrane completely dark; or if with a minute pale spot present on proximal 1/3, then pronotum orange or yellow with or

- without a large black macula occupying most of posterior lobe 3
2. Dorsal surface with conspicuous up-standing hairs present; pronotum chiefly yellow or orange with completely black lateral margins and a black median stripe. *sexmaculatus*, p. 14
- 2'. Dorsal surface almost glabrous, at most with extremely short inconspicuous hairs present; pronotum red with central area of posterior lobe with a large ovoid black macula (fig. 7) *aulicus*, p. 8
3. Posterior 1/2 of lateral pronotal margins black 9 (fig. 8). *cayensis* p. 9
- 3'. Lateral pronotal margins entirely orange or red (figs. 9, 10) 4
4. Smaller species, usually not over 10 mm in length *cingulifer*, p. 10
- 4'. Larger species, over 12 mm in length *fasciatus*, p. 11

ONCOPELTUS AULICUS (Fabricius)
(fig. 7, map I)

Cimex aulicus Fabricius 1775:718.

Lygaeus hamatus Herrich-Schaeffer 1843:22-23.

Oncopeltus (*Erythriscius*) *aulicus* Stal 1874:103.

Diagnosis: Small, red and black easily recognizable by large black macula covering most of posterior pronotal lobe. Usually a conspicuous white bar on forewing membrane.

Biology: O'Rourke (1976) reported collection records on *Cryptostepia grandiflora*, R. Brown, *Nerium oleander* Linnaeus and blossoms of *Pissonia alba*. We have collected breeding populations, together with *cayensis*, on the climbing milkweed vine *Sarcostoma clausa* (Jacq.) R. & S.

Distribution: This species is widespread in the West Indies south at least to Martinique. (Some of O'Rourke's 1976 records, listed as from the Virgin Islands are actually not from those islands ie. Nassau, Abaco Cay, (Bahamas), St. Martin, etc.)

Florida Distribution: O'Rourke (1976) reports a specimen from Lignum Vitae Key. We have examined and verified the identity of this specimen.

MONROE CO.: Key Largo, 31-XII-79, R. M. Baranowski & J. A. Slater, (JAS); Lignum Vitae Key, 12-XI-79, R. M. Baranowski, (RMB); N. Key Largo, 12-X-79, R. M. Baranowski, (NMNH); same, 19-IV-77, (RMB); same, 12-X-79, (RMB).



Fig. 7. *Oncopeltus aulicus*



Map I. Distribution of *Oncopeltus aulicus*

ONCOPELTUS CAYENSIS

Torre-Bueno
(fig. 8, map II)

Oncopeltus cayensis Torre-Bueno 1944:135-136.

Diagnosis: Moderate sized (11-13 mm) with entire lateral corial margins, head and lateral margins of posterior pronotal lobe black. Strongly developed black areas giving appearance of an insect with 3 pairs of orange or bright yellow spots. Closely related to *sexmaculatus* in color and shape of paramere (O'Rourke, 1976). It may eventually prove to be a geographic race of the latter, lacking a white membranal spot.

Biology: We have found this species commonly breeding on the climbing milkweed, *Sarcostemma clausa*, (Jacq.) R. & S. on Key Largo.



Fig. 8. *Oncopeltus cayensis*

Distribution: Known only from Florida and the Bahamas.

Florida Distribution: Originally described by Torre-Bueno (1944) from Matecumbe Key. The Barber (1914) records of *sexmaculatus* from Lake Worth and Miami have been reexamined and are

referred here. The Blatchley (1926) and McGhee & McGhee (1971) records may belong here. The Torre-Bueno (1933) record of *sexmaculatus* from Matecumbe is the type series of *cayensis*. O'Rourke (1976) reports it from Homestead, Fort Meyers, Palm Beach, Royal Palm Park (Paradise Key), Cape Sable, Elliot Key, Long Key and St. Lucie Co. BROWARD CO.: Hollywood, 21-V-80, F. Garry, (FSCA); Parkland, 18-III-80, C. Culbreth, (FSCA); West Hollywood, D. A. Phillips, (FSCA); COLLIER CO.: 14-V -49, (RMB); Copeland Rec. Area, 28-III-73, C. W. O'Brien & Kaplan, (JAS); Everglade, 8-I-46, (AMNH); DADE CO.: Everglades National Park, 13-III-55, H. A. Denmark, (RMB); same, 26-XII-54, H. V. Weems, Jr, (FSCA); Homestead, 23-III-61, J. H. Knowles, (RMB); Naranja, 7-V-61, R. M. Baranowski, (RMB); same, 5-VI-62, (RMB); Paradise Key, (AMNH); DE SOTO CO.:



Map II. Distribution of *Oncopeltus cayensis*

17-II-65, (in a Steiner trap), R. H. Rhodes, (RMB); HARDEE CO.: Wauchula, 29-X-86, G. Johnson, (FSCA); same, 11-VII-67, (blacklight trap), J. H. Knowles, (RMB); LEE CO.: Ft. My-

ers, 16-IV-49, B. W. Cooper, (FSCA); 12 mi E. Webster, Rt. 94 Loop Rd., X-76, A. Wachtell, (JAS); MONROE CO.: Everglades National Park, 5-IV-58, H. V. Weems, Jr., (RMB); same, 10-IV-55, (RMB); Key Largo, 31-XII-79, J. A. Slater, (JAS); Key Vaca, 28-XII-55, H. V. Weems, Jr., (FSCA); Lignum Vitae Key, 8-III-79, R. M. Baranowski, (RMB); same, 13-XI-79, (RMB); Long Key, 26-III-57, H. V. Weems, Jr., (FSCA); same, 28-III-57, (RMB); Lower Matecumbe Key, VI-30, M. Bates, (AMNH); same, 7-VI-48, Rubin Capeluto, (RMB); Marathon Key, 18-XII-77, Robert A. Belmont, (RMB); N. Key Largo, 23-X-79, R. M. Baranowski, (NMNH); same, 20-X-79, R. M. Baranowski, (RMB); same, 14-I-77, (RMB); same, 12-I-76, (RMB); same, 19-IV-77, (RMB); same, 14-I-77, (RMB); OSCEOLA CO.: Kissimmee River, 3-VI-64, Ed Morris, (JAS); PALM BEACH CO.: Lake Worth, A. S. Packard, (AMNH); Lake Worth, A. T. Slossen, (AMNH); West Palm Beach, 8-VIII-67, (in Steiner trap), W. E. Wyles, (FSCA).

ONCOPELTUS CINGULIFER Stal (fig. 9A, map III)

Oncopeltus (Erythriscius) cingulifer Stal 1874:103.

Diagnosis: Florida material, very closely resembling *O. fasciatus*, but smaller (O'Rourke, 1976, separates *cingulifer* from *fasciatus* by the former not exceeding 10 mm. in length, however Florida females often exceed 11 mm.) and with a distinctive paramere. O'Rourke (1976) recognized 2 subspecies, the nominate subspecies characterized by having a relatively narrow dark area on the posterior pronotal lobe which widens along the posterior margin to usually reach the lateral margins. She described a new subspecies *antillensis* (fig. 9B) which is characterized by having a large ovoid dark area on the posterior pronotal lobe, but which leaves the entire lateral pronotal margins broadly pale (as it is in *fasciatus*). O'Rourke's treatment of the species and subspecies presents some difficulties. Her discussion of the subspecies hardly conforms to the generally accepted concept of a subspecies since she states that *antillensis* is a West Indian subspecies that occurs with the nominate form in Yucatan and Trinidad and also occurs in south

Florida. However, she also says that nominal *cingulifer* "occurs to a lesser extent in the Lesser Antilles". She mentions Guadeloupe and St. Vincent specifically. This, in itself, presents distributional questions, but in addition we have examined a series of what appear, to be typical *antillensis* from the state of Nuevo Leon in northern Mexico, suggesting that it maybe widespread in Mexico. Obviously much more study of these populations is required. O'Rourke's distributional data however certainly do not support the idea of a definable geographic entity. The problem is complicated in the Neotropics by O'Rourke's belief that hybridization with *sandarachatus* and *unifasciatellus* is common and that it interbreeds with *aulicus* in Jamaica. As noted in the discussion of *fasciatus*, Leslie & Dingle (1983) were not able to duplicate O'Rourke's finding of gynogenesis, hybridogenesis or androgenesis in the reproductive biology of any of the hybrids produced. They concluded that, despite the relatively high frequency of interspecific matings observed in nature between *cingulifer* and especially *sandarachatus*, introgressive hybridization did not appear to be a significant problem for the maintenance of discrete species in *Oncopeltus*. They noted that although hybrids were occasionally found in nature, there was a strong conspecific mating preference.



Fig. 9A. *Oncopeltus cingulifer*
Fig. 9B. *O. cingulifer antillensis*

There is also the question of whether *antillensis* is a validly established subspecies since it has been only described in a doctoral thesis, although mentioned in the published literature subsequently. Finally, to further complicate the situation, there appear, to be two distinct color morphs of *cingulifer*, one in which the pale color is light yellow and the second in which it is bright orange. The Florida populations that we have examined are all referable to *antillensis*. This subspecies was described by O'Rourke based on a type series only from Jamaica and Cuba. O'Rourke states that *antillensis* occurs in southern Florida, but does not give definite locality data. Since the two "subspecies" occur together in northern Mexico, the Yucatan, the Lesser Antilles and Trinidad, we do not feel that they can be recognized as allopatric populations and thus here formally synonymize *antillensis* if it indeed has been formally described. The recognition of the morph may be important for hybridization and population studies, but does not merit recognition as a subspecies as defined by the International Rules of Zoological Nomenclature. O'Rourke reports the host plant to be *Asclepias curassavica* L., and *A. procera* in Trinidad and Venezuela. In Florida it has been taken breeding only on the former.

O. cingulifer is apparently an obligate milkweed specialist, although like *O. fasciatus* it may breed on other closely related plants.

Root and Chaplin (1976) have studied the biology in Colombia where it coexists, sometimes on the same plants of *Asclepias curassavica*, with the closely related *Oncopeltus unifasciatellus*. The two species remain distinct in nature although viable hybrids can be produced in the laboratory. This is a striking example of differences in food utilization allowing closely related taxa to co-exist sympatrically. *O. cingulifer* is capable of existing on its milkweed host in the absence of seeds whereas *O. unifasciatellus* is an obligatory seed feeder. This results in greater mobility in the latter and allows *O. cingulifer* to continue to exist on plants that in the absence of seeds are unsatisfactory for *O. unifasciatellus*.

In southern Florida McGhee (1972) has taken *O. cingulifer* on its tropical food plant, *A. curassavica*.

Distribution: Widespread in the West Indies, Central America and northern South America. Known

in the United States only from the southeastern states.



Map III. Distribution of *Oncopeltus cingulifer*

Florida Distribution: O'Rourke (1976) records it from south Florida without definite locality. We refer McGhee's (1972) record of *sandarachatus* from the eastern United States, including his Palm Beach, Hendry Co. records, here (we have examined his material). Dade Co. 24-III-69, B. McGhee, (on *A. curassavica* culture), (JAS).

ONCOPELTUS FASCIATUS (Dallas) (fig. 10, map IV)

Lygaeus fasciatus Dallas 1852:538.

Oncopeltus (Erythriscus) fasciatus Stal 1874:103.

Diagnosis: The largest (13-18 mm) species of lygaeid occurring in Florida. Orange-red and black in color. Central area of pronotum, a broad trans-

verse hemelytral fascia, most of membrane and appendages black.



Fig. 10. *Oncopeltus fasciatus*

Biology: This is often a common species on various milkweeds where it feeds on the tissues and mature seeds. It is capable of reproducing on dry milkweed seeds and thus is a commonly used laboratory animal. Consequently there is an extensive literature dealing with aspects of its physiology, morphology, reproduction, behavior, biochemistry, etc. (see Slater, 1964 for literature to that date). Hussey (1952) says that in Florida *fasciatus* is usually found on Oleander upon which it breeds. We have collected breeding populations at Homestead on the introduced *Calotropis procera*. It has also been taken on *Asclepias curassavica*. Klausner, Miller and Dingle (1980) give an interesting summary of its host adaptations in south Florida. It is obvious that this species is capable of feeding successfully on a variety of milkweeds and related plants. O'Rourke (1976) lists 28 species of plants

from which *fasciatus* has been taken. Eight of these are "sitting" records and 14 are species of *Asclepias*. Palmer (1987) reports it on *Baccharis neglecta* Britton in Texas. But, like several other members of the genus, it appears to be chiefly an obligatory phytophage on milkweeds and related plants.

Blakley (1980), studying species of *Oncopeltus* in the West Indies, reported that *fasciatus*, utilizing chiefly *Asclepias curassavica*, is found to a much greater extent on fruiting plants than is its close relative *O. cingulifer*. This he believes indicates greater mobility and better colonizing ability on the part of *fasciatus*.

O'Rourke (1976) indicated wide-spread hybridization in some species of *Oncopeltus* but Leslie & Dingle (1983) found only very limited hybridization with *cingulifer* or with *sandarachatus* and were not able to duplicate O'Rourke's claim that gynogenesis, hybridogenesis or androgenesis occurred in any of these species crosses.

The recent literature on this widely used laboratory animal is immense and much beyond the scope of this volume. The work of Dingle (1968) and subsequently he and his associates is particularly important for an understanding of the life history in the northern United States. Briefly summarized it can be stated that *fasciatus* is not capable of overwintering in the north, but that the populations that occur there in late summer and fall have migrated northward coincident with the growth of seed pods of milkweeds. The species tends to develop flight muscles in response to limited food resources, but when food is abundant the females at least reduce these muscles and become flightless. This phenomenon is discussed further under *Neacoryphus bicrucis* and is an adaptation for dispersal or for increased egg production in situ depending upon time of year and available food resources.

Feir (1974) has reviewed the use of *fasciatus* as an experimental laboratory animal. There is also an extensive subsequent literature.

It is now well established that *Oncopeltus fasciatus* and several other lygaeids that feed on milkweed plants are able to sequester cardenolides produced by the milkweed plants. These cardenolides have both an emetic and toxic effect on vertebrates that ingest them (Duffey and Scudder 1972). The aposematic coloration of many lygaeine Lygaeidae presumably has evolved as a warning to potential vertebrate predators. Berenbaum and

Miliczky (1984) have recently shown that this aposematic coloration is also effective against mantids and thus presumably against other invertebrate predators as well. This finding has important implications for the role that invertebrate predators may play in the development and refinement of Mullerian mimicry associations.

McGhee and McGhee (1971) discuss the role played by *O. fasciatus* in the distribution of *Phytomonas elmassiani* in the eastern United States.

Aller and Caldwell (1979) discuss the significance of a possible aggregation pheromone in nymphs of this species. This pheromone which keeps nymphs close together in groups appears to have the following advantages: it enhances the aposematic effect against potential predators; it may increase the efficiency of food intake by the cumulative action of many insects feeding adjacent to one another; it may afford protection for teneral adults. Since many other lygaeid species show aggregating tendencies (not always obvious in cryptic species except to the experienced field collector), some of these advantages may be present in non-aposematic species. Ralph (1976) also discusses gregariousness in *fasciatus* relative to the natural food requirements of the species.

Reference to the above will lead one to the further extensive and important recent literature on this species.

Distribution: *O. fasciatus* has been reported through most of the Western Hemisphere from southern Canada to Argentina. O'Rourke (1976) however, believed that it does not occur in South America and that records from there are probably referable to *sandarachatus* or *miles*. It does occur over much of the United States east of the Rocky Mountains and south well into Central America and the West Indies.

Florida Distribution: Reported by Dallas (1852), Walker (1872), Uhler (1878), Distant (1882), and Barber (1939) from Florida without definite locality; by Van Duzee (1909) from Sanford and Seven Oaks; by Blatchley (1926) from Dunedin and Live Oak (Feir 1974 amusingly refers to these localities as host plants!); by Hussey (1952) from Lakeland, Gainesville; by Butcher (1957) Miami; Barber (1914) Biscayne Bay, Charlotte Harbor, Jacksonville, Ft. Myers, Key West, Big Pine Key; by McGhee (1972) Dade Co., Hendry Co., Palm

Beach, Highlands Co., Clay Co.; Torre-Bueno (1921) St. Petersburg and (1933) from Matecumbe and by Klausner, Miller and Dingle (1980) from Pennsuco and Century Village. ALACHUA CO.: 10-20-46, (FSCA); 5-V-50, S. R. Young, (FSCA);



Map IV. Distribution of *Oncopeltus fasciatus*

3-IV-48, W. L. Jennings, (FSCA); 7-I-59, H. A. Denmark, (RMB); V-52, H. A. Denmark, (FSCA); Gainesville, 5-14-47, H. V. Weems, Jr., (FSCA); BAKER CO.: Olustee, 10-III-59, E. P. Maple, (RMB); BAY CO.: St. Andrews State Park, 4-IX-78, L. A. Stange, (RMB); BAY CO.: Southport, 77-A East of dam, 27-X-88, (on *Baccharis halimifolia*) L. Smith, (FSCA); COLLIER CO.: Naples, 11-IX-75, V. Yingst, (FSCA); DADE CO.: 24-IV-61, B. K. Dozier, (RMB); Coconut Grove, 17-III-32, (NMNH); Everglades National Park, 2-IV-58, R. E. Woodruff, (RMB); Homestead, 1-III-71, R. M. Baranowski, (RMB); same, 13-XII-70, Baranowski & Slater, (JAS); same, 27-VI-61, R. M. Baranowski, (RMB); same, 13-XII-71, J. A. Slater, (JAS); Miami, 14-XII-79, R. Ramirez, (FSCA); same, 23-XI-17, (NMNH); Naranja, 23-V-60, R. M. Baranowski, (RMB); Subtropical Experiment Station, Waldin Drive, 2-

VI-71, R. M. Baranowski, (RMB); HIGHLANDS CO.: Port Hill, 6-VII-54, R. Goslin, (FSCA); Archbold Biological Station, 27-VI-67, F. W. Mead, (RMB); Sebring, 4-10-48, H. V. Weems, Jr., (FSCA); LEVY CO.: 10-IX-55, H. V. Weems, Jr., (FSCA); Cedar Key, 7-V-55, H. V. Weems, Jr., (FSCA); MONROE CO.: Big Pine Key, 2-V-63, H. V. Weems, Jr., (RMB); Key West, 3-6-06, Fred Knab, (NMNH); North Key Largo Key, 19-IV-77, R. M. Baranowski, (RMB); Stock Island, 12-V-61, H. V. Weems, Jr., (RMB); OKALOOSA CO.: Eglin Air Force Base, 18-X-64, H. O. Hilton, (RMB); Santa Rosa Island, 22-V-66, H. O. Hilton, (RMB); ORANGE CO.: Fairvilla, 14-23-VIII-40, H. Ruckes, (AMNH); PALM BEACH CO.: 27-XII-52, Camilla Weems, (FSCA); PINELLAS CO.: Clearwater, 14-X-54, (FSCA); St. Petersburg, 16-XII-49, C. V. Reichart, (JAS); POLK CO.: Lake Hamilton, 14-XI-74, W. E. Wynn, (FSCA); Dundee, 13-V-63, R. E. Veld, (RMB); Ft. Meade, 29-XII-12, (AMNH); same, 24-IV-12, (AMNH); same, 29-III, (AMNH); same 19-III, (AMNH); Winter Haven, 24-VIII-42, H. T. Fernald, (FSCA); SARASOTA CO.: 11-V-54, F. W. Mead, (FSCA); same, 12-IV-57, F. W. Mead, (RMB); same, 13-IV-54, H. M. Van Pelt, (FSCA); SEMINOLE CO.: 23-III-54, H. V. Weems, Jr., (FSCA); ST. JOHNS CO.: Ponte Vedra Beach, 9-III-45, L. Lacey, (AMNH); ST. LUCIE CO.: Ft. Pierce, 15-VII-60, E. W. Campbell, (FSCA); TAYLOR CO.: 5-X-60, F. W. Mead, (RMB); VOLUSIA CO.: Daytona, 13-IX-42, (FSCA). UNKNOWN COUNTY: Alfred Keys, (NMNH); Near Sharlies, 28-X-35, (FSCA).

ONCOPELTUS SEXMACULATUS Stal

Oncopeltus sexmaculatus Stal 1874:102.

Diagnosis: Smaller than *fasciatus* with head and pronotum conspicuously pilose. Pronotum possessing a pair of subtriangular orange-yellow spots. Hemelytra with anterior and posterior macula on each wing. Length 10-12mm.

Biology: Nothing appears to be known of its biology other than the report of Palmer (1987) who took it on *Baccharis neglecta* in Texas.

Distribution: A Neotropical species found in Mexico, Central America and the West Indies and possibly Texas and Florida. The Barber (1914) records from Lake Worth and Miami, the Torre-Bueno (1933) record from Matecumbe Key and the McGhee & McGhee (1971) records from Clewiston, Palm Beach and the Anhinga Trail belong to *cayensis*. Blatchley (1926) reported it from Moore Haven, Caxambus, Chokoloskee and Cape Sable. We have not examined the Blatchley material, but the records probably also belong to *cayensis*. We have not seen an authentic specimen of *sexmaculatus* from Florida. .

LYGAEUS Fabricius 1794

Lygaeus Fabricius 1794, p. 133.

Type Species: *Cimex equestris* Linnaeus 1758
Fixed by Curtis 1833.

The members of this genus are usually rather large (10 mm), brightly colored, red and black insects with the scutellum deeply excavated on either side of the median longitudinal carina. The posterior margin of the pronotum without posteriorly expanded lobes laterad of the scutellum. The femora are mutic.

This is a large genus containing 24 described species distributed in all of the major zoogeographic regions of the world except the Australian. Six species occur north of Mexico, which two are found in Florida. Six additional species occur in the Neotropical region, 4 in the Ethiopian and 2 in the Oriental.

KEY TO THE FLORIDA SPECIES OF LYGAEUS

1. Clavus with inner margin pale; abdomen and sternum completely black *formosus*, P
- 1'. Clavus completely black; abdominal sternum chiefly red with black spots *kalmii*, P

LYGAEUS FORMOSUS Blanchard
(fig. 11, map V)

Lygaeus formosus Blanchard 1840:130.
Lygaeus elatus Stal 1862:308.

Diagnosis: Brightly colored, 10-11 mm. in length. Posterior pronotal lobe red with dark rays or spots, often in a quadrate pattern. Corium with red or yellowish lateral and inner margins and red band just within black apical margin. Clavus with broad yellow inner stripe. Membrane white or hyaline, but dark anteriorly. Ventral surface and appendages black.

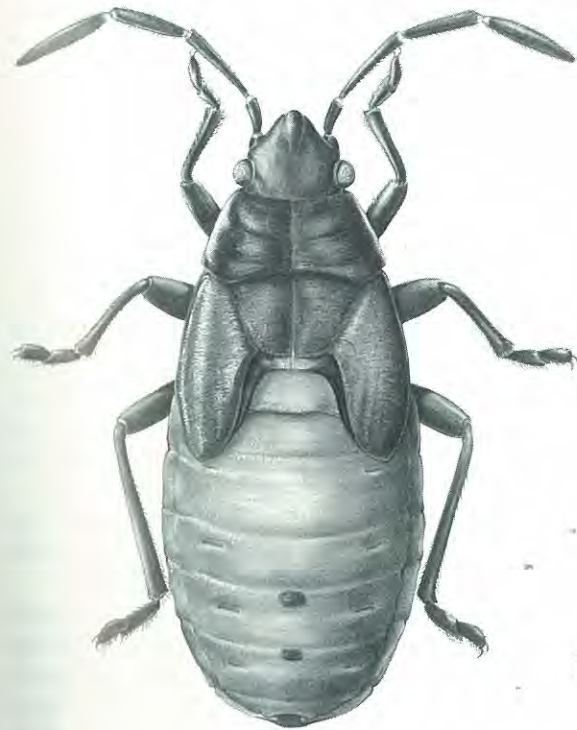


Fig. 11. *Lygaeus formosus*, fifth instar nymph

Biology: Ballou (1937) reports this species on *Canna indica* and *Citrus sinensis* in Costa Rica and Gibson and Carrillo (1959) on maguey in Mexico. We have collected it and observed adults and nymphs (fig. 11) feeding on the seeds of *Ipomea* sp.

Distribution: A Neotropical species found in the West Indies, Mexico and Central America south to

Venezuela. North of Mexico it is known only from Texas, Calif. and Florida.

Florida Distribution: Reported by Barber (1914) from Biscayne Bay and Miami and by Blatchley (1926) from Cape Sable. BROWARD CO.: Ft. Lauderdale, VIII-21, D. M. Bates, (FSCA); DADE CO.: Miami, 27-VII-17, J. C. Lutz collection, (NMNH); MONROE CO.: North Key Largo Key, 16-I-76, R. M. Baranowski, (RMB); same, 5-VIII-77, (RMB); same, 8-VIII-77, (RMB); same, 10-VIII-77, (RMB); same, 13-VIII-77, (RMB); same, 14-I-77, (RMB); same, 13-VIII-77, (NMNH); same, 14-I-77, (NMNH).

UNKNOWN COUNTY: S.W. 8th St. & 5th Ave. 29-III-46, H. Montgomery, (FSCA); Everglades National Park, 20-VII-73, C. W. O'Brien, (JAS).



Map V. Distribution of *Lygaeus formosus*

LYGAEUS KALMII Stal
(fig. 12, map VI)

Lygaeus (Graptolomus) kalmii Stal 1874:107.

Diagnosis: Predominantly black and red. Head spot, postmedian pronotal fascia, broad red band forming an X along apical corial margin and area of corium adjacent to clavus red. Clavus, legs, antennae black.

Two subspecies are recognized, an eastern population extending from the Atlantic coast to the 100th meridian and known as *L. kalmii angustomarginatus* Parshley and the nominal subspecies that extends from the 100th meridian west to California and south into Mexico. Florida material is very scarce but presumably is referable to *angustomarginatus* (See Slater & Knop 1969 for details).

Biology: Until recently *kalmii* has been thought to be an almost obligatory breeder on several species of milkweeds, particularly *Asclepias syriaca* L. However, recent studies have shown this to be only partially true.

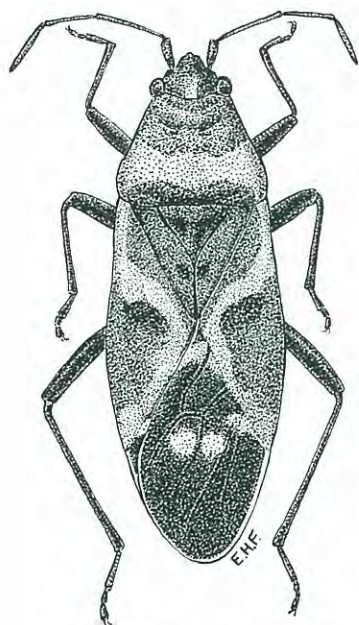


Fig. 12. *Lygaeus kalmii*

Wheeler (1983) has admirably summarized the recent literature. He notes that studies, of adults taken on species of *Asclepias* in California, varied greatly in their cardenolide content suggesting that some of the adults might have developed on hosts lacking these compounds. He notes that Hunt (1979) working in Michigan thought that *kalmii* was actually an "opportunistic"

and fed on various food sources especially when milkweed pods were unavailable. Wheeler cites many examples of nymphs and adults feeding on various composites including yarrow (*Achillea* sp.), *Senecio vulgaris* L. and a number of other species. He also found evidence of breeding (nymphs present on species of several additional plant families). Wheeler states, as Hunt had previously suggested, that *kalmii* thus cannot be considered a milkweed specialist in the same sense as can *Oncopeltus fasciatus*. Our current understanding of the feeding strategies of this insect is that it does appear to prefer milkweeds especially when pods are available, but is capable of breeding successfully upon a number of different hosts and does so particularly when the milkweed plant is not in a suitable condition for maximum utilization. Several authors have noted that during part of its life *kalmii* is more of a ground litter feeder than is *Oncopeltus fasciatus* (see Caldwell 1969). This is supported by Aller, Hirai and Caldwell's (1979) study that demonstrated much greater "correcting behavior" (ie. ability to turn at a choice point) in *L. kalmii* than in *O. fasciatus*.



Map VI. Distribution of *Lygaeus kalmii*

This, they believe, is characteristic of ground dwelling insects where a dispersed food source is important. In the north *kalmii* overwinters in the adult stage, frequently in large aggregations. This feature is interesting in view of Aller and Caldwell (1979) not finding an aggregating pheromone in adults of this species. Hunt (1979) reported it to be non-diapausing and multivoltine. Previously one generation a year had been reported in the early life history by Townsend (1887) under the name *turcicus*. Root (1986) carefully studied a population in California and came to similar conclusions concerning the variability in feeding habits, noting the importance of non-milkweed hosts for the first generation (he found the population there to be bivoltine). Root also noted feeding upon dead insects, cannibalism and attacks on the pupae of the Monarch butterfly and egg masses of the milkweed beetle *Chrysochus cobaltinus*. Root also noted the reduviid *Rhynocoris ventralis* as a predator on *kalmii* adults. Palmer (1987) supports the more generalist feeding habits reporting it on *Baccharis neglecta* Britton in Texas. We know nothing of the life cycle or feeding habits in Florida.

Duarte and Calabrese (1982) note differences in chromosome numbers between Texas and Florida populations and suggest the possibility of sibling species. Unfortunately eastern and northern populations were not considered.

Distribution: Common over much of the United States but rare in Florida.

Florida Distribution: Barber (1914) reports a specimen bearing a "Florida" label from the Ashmead collection. We have examined a single female in the Yale collection from Lake Worth, Palm Beach Co. 3 Dec. 1935 (M. B. Bishop).

NEACORYPHUS Scudder 1965

Neacoryphus Scudder 1965:pp 34-37.

Type Species: *Lygaeus bicrucis* Say 1825. Fixed by original designation.

The members of this genus are generally smaller insects than *Lygaeus* species and lack the post-median red fascia on the pronotum. The head is completely black as is the metathoracic scent gland auricle. The dorsal surface is almost glabrous and the membrane is usually black without a white discal spot. Until recently most of the Western Hemisphere species which had previously been placed in *Melanocoryphus* were placed here by Scudder when he described *Neacoryphus* in 1965. Alex Slater (1988) removed many of these species to his new genus *Melacoryphus* and indicated that a number of other species were not congeneric with the type species of *N. bicrucis*.

NEACORYPHUS BICRUCIS (Say) (fig. 13, map VII)

Lygaeus bicrucis Say 1825:322-323.

Lygaeus rubescens Stal 1858:37-38.

Lygaeus flavomarginellus Stal 1859:241.

Lygaeus bitransversus Signoret 1860:947.

Neacoryphus bicrucis Scudder 1965:37.

Diagnosis: Brightly colored, moderate sized (7.5-9). Posterior pronotal lobe and almost entire corium uniformly dull red. Anterior pronotal margin, clavus and apical corial margins light yellow to nearly white. Anterior pronotal lobe, head, scutellum, membrane, and appendages black.

Biology: The biology, dispersal ability and reproductive strategies of this species have been studied recently by Solbreck (1978,1979), Solbreck & Pehrson (1979) and in a series of papers by McLain, and McLain and Shure (see below). The latter authors summarize earlier literature records. Overwintering is in the adult stage and unlike *Oncopeltus fasciatus*, *N. bicrucis* appears to be able to overwinter in the northern part of its range. It occurs in early succession stages such as weedy fields and roadsides, but also in more permanent habitats such as beaches and sand prairies.

Solbreck and Pehrson (ibid) quote Sullivan's extensive feeding habit studies from Missouri. Sullivan found *bicrucis* developing primarily on *Senecio glabellus* Poir. and considered *Cacalia atriplicifolia* L. and *Erechtites hieraciifolia* (L.) Raf. ex DC as probable breeding hosts. McLain and Shure (1987) believe that *bicrucis* is a host plant

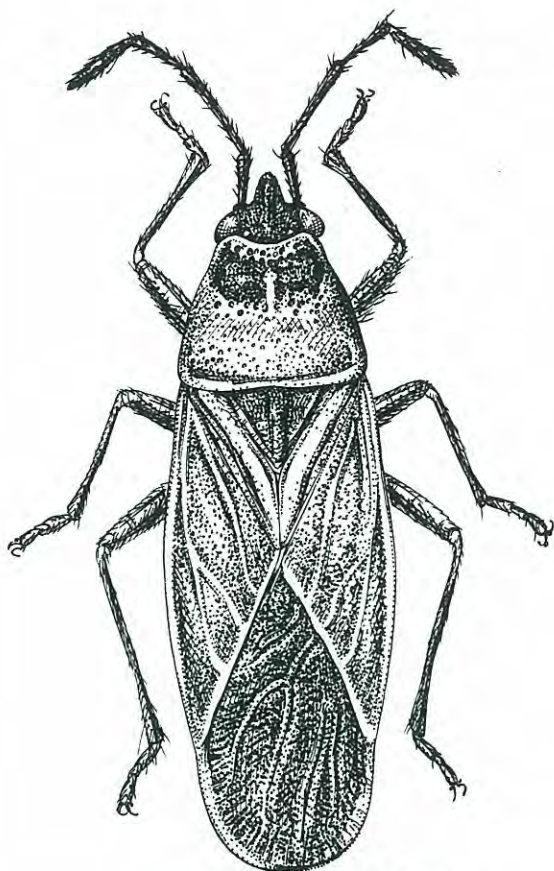


Fig. 13. *Neacoryphus bicrucis*

specialist in the tribe Senecioneae. McLain (1981, 1982) found it to breed in Georgia only on species of *Senecio*, chiefly *S. tomentosus* Michx. He discusses oviposition behavior, territory, mating and unpalatability. Like a number of other lygaeines it is unpalatable to some vertebrates due to its ability to sequester pyrrolizidine alkaloids (McLain and Shure 1985). McLain and Shure (1987) have demonstrated that the aggressive courtship activities of *bicrucis* males extends to other species on the plants and significantly reduces their populations which the authors refer to as "pseudo-competition through misdirected courtship." McLain (1984) has demonstrated effective Mullerian mimicry between *bicrucis* and the mirid *Lopidia instabile*.

Solbreck (1978, 1979) analyzed egg laying and dispersal strategies of *bicrucis*, a species that is partially adapted to temporary habitats. He noted that when food sources were inadequate dispersal occurred in females and egg laying was delayed, whereas when the food supply was abundant the wing muscles histolyzed quickly and egg laying be-

gan soon after mating. A third strategy employed late in the season is a facultative diapause triggered by photoperiod, in which egg laying is delayed until the following season. An interesting adaptation to the fluctuations of food supply in temporary habitats is the ability to redevelop flight muscles and migrate after degeneration of these muscles and the production of eggs has occurred.



Map VII. Distribution of *Neacoryphus bicrucis*

Distribution: From southern Canada, New England and New York south to Florida and west to California, Colorado and Texas. It is also widespread in the Neotropical region. It apparently has recently established itself successfully in Hawaii (Gagne 1972).

Florida Distribution: Walker (1872), Provancher (1886). Barber (1906, 1921a), Uhler (1872, 1877). Distant (1882) report *bicrucis* without definite locality; Barber (1914) from Charlotte Harbor; Atlantic Beach; Torre Bueno (1921) from St. Petersburg and Blatchley (1926) from Ormond and Dunedin. ALACHUA CO.: 3-V-53, H. A. D.

definite locality.. ALACHUA CO.: 27-IX-54, H. V. Weems, Jr., (FSCA); 27-IX-54, H. V. Weems, Jr., (FSCA); Gainesville, 10-VIII-73, F. W. Mead, (FSCA); same, 14-III-59, R. F. Hussey, (FSCA); same, 16-X-36, (FSCA); DADE CO.: Hialeah, 14-VII-27, G. D. Merrill, (FSCA); Homestead, 27-VII-57, R. M. Baranowski, (JAS); ORANGE CO.: Winter Park, 4-VII-41, H. T. Fernald, (FSCA); POLK CO.: Lakeland, 24-IX-48, R. F. Hussey, (FSCA); SEMINOLE CO.: Sanford, 18-VII-27, E. D. Ball, (NMNH); VOLUSIA CO.: New Smyrna Beach, 2-XI-71, Holley and Kipp, (FSCA). UNKNOWN COUNTY: "H", Florida P. R. Uhler collection, (NMNH); Florida without definite locality, "VI", P. R. Uhler collection, (NMNH).



Map VIII. Distribution of *Melanocoryphus facetus*

Melanocoryphus admirabilis (Uhler) was reported by Torre Bueno (1946) from Florida and Maryland without definite locality. All of the other distribution records for this species are from far western states and authentication of these eastern records is necessary.

LYGAEOSPILUS Barber 1921a

Lygaeus sg. *Lygaeospilus* Barber 1921a:65, 68.

Type Species: *Aphanus tripunctatus* Dallas 1852. By original designation.

The members of this genus are small (less than 5), dull black or dark brown insects with strongly pubescent bodies and a conspicuous white membranal spot. The head and metathoracic scent gland auricles are black.

This genus is confined to North and Central America where 3 species are recognized, 2 of which are southern and western in distribution. Two species have been reported from Florida. However, these have been confused in the literature. We are not convinced that 2 distinct species occur in Florida and refer all Florida records to *tripunctatus*.

LYGAEOSPILUS TRIPUNCTATUS (Dallas) (fig. 14, map IX)

Aphanus tripunctatus Dallas 1852:559-560.

Melanocoryphus (*Melanocoryphus*) *obscuripennis* Stal 1874:112.

Lygaeospilus tripunctatus Torre Bueno 1946:18.

Diagnosis: Small (3.5-4.5), dark brown to blackish with short grayish pubescence. Pronotum pale along anterior margin with 3 small pale spots along posterior pronotal margin. Lateral corium margins dull reddish.

Biology: Little is known of its biology other than that, in contrast to many members of the subfamily, it is a ground, litter living species. Specimens from Lake and Alachua Counties were taken from *Erigeron quercifolius*.

Distribution: The range is from New England south to Florida and west to Mexico. The western limits of the range in the north are poorly understood.

Florida Distribution: Originally described by Dallas (1852) from St. Johns Bluff and subsequently reported by Van Duzee (1909) (as *Lygaeus albulus*) from Crescent City, by Blatchley (1926) from Dunedin, and by Barber (1914) (as *Lygaeus albulus*) from Newberry. ALACHUA

CO.: Wakulla Springs, 3-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); Shell Point Beach, 3-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS).



Map IX. Distribution of *Lygaeospilus tripunctatus*

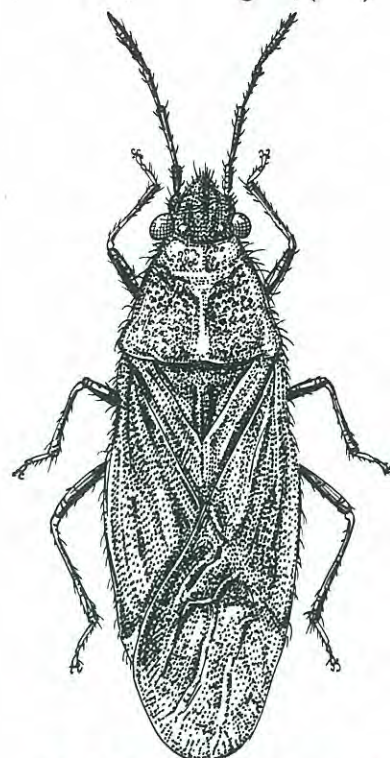


Fig. 14. *Lygaeospilus tripunctatus*

OCHRIMNUS Stal 1874

Melanocoryphus sg. *Ochrimnus* Stal 1874: 114.
Ochrimnus Slater 1964:152.

Type Species: *Lygaeus collaris* Fabricius 1803.
Fixed by Slater, 1964.

This genus contains small to moderate sized species with 4 transverse impressions on the pronotum immediately behind the calli. The shining impressed lines on the calli possess a short branch extending caudo-laterally from the main shining line. The impunctate scutellum is depressed on either side of the median elevation and has a transverse subbasal elevation. This concept brings a number of Neotropical species previously placed in *Ochrostomus* into *Ochrimnus* including 3 species found in Florida.

CO.: 2-VII-56, (at *Erigeron*), R. A. Morse, (RMB); 27-VIII-55, R. A. Morse, (FSCA); Gainesville, 6-VIII-55, R. A. Morse, (RMB); LAKE CO.: 6-IV-56, (at *Erigeron*), R. A. Morse, (RMB); LEVY CO.: 13-IV-55, (at *Erigeron*), H. V. Weems, Jr., (FSCA); Fannin Springs, 1-VI-79, (on *Erigeron*), D. Colbert, (FSCA); LIBERTY CO.: 24-IV-61, H. V. Weems Jr., (JAS); MONROE CO.: North Key Largo Key, 10-5-81, R. M. Baranowski, (RMB); same. 18-VI-81, (RMB); PUTNAM CO.: 18-VI-60, (under bark of *Quercus laevis* Walt.), H. V. Weems, Jr., (RMB); same 6-VI-56, (RMB); Fruitland, 30-VII-63, (on crab grass), A. E. Graham, (RMB); SEMINOLE CO.: Sanford, 4-III-55, J. W. Wilson, (FSCA); VOLUSIA CO.: Edgewater, 20-II-39, C. A. Frost, (NMNH); WAKULLA

KEY TO FLORIDA SPECIES OF *OCHRIMNUS*

1. Pronotal calli red or orange lacking dark coloration (fig. 15); base of vertex lacking a pale spot *mimulus*, p. 24
- 1' Pronotal calli entirely or in large part brown or blackish (fig. 14); base of vertex with a pale spot present 2
2. Membrane of forewing with a conspicuous white margin; lateral margins of corium completely yellow or orange without an enlarged orange macula at apex of corium *lineoloides*, p. 22
- 2' Membrane of forewing including marginal area uniformly black; lateral margins of corium dark brown to black except posteriorly where apical area of corium possesses a large orange macula *triplicatus*, p. 27

Ochrimnus collaris (F.), widespread in the West Indies, has been intercepted in Miami (Oct 1942 C.B. Spencer, USNM). It will key to *lineoloides*, but is a larger species and readily distinguishable in that the anterior pronotal lobe with the exception of the anterior collar is completely dark brown whereas in *lineoloides* the mesal area of the anterior pronotal lobe is pale. Furthermore, in *collaris*, the posterior pronotal lobe is uniformly orange or yellow whereas in *lineoloides* a dark ray (sometimes somewhat reduced) extends longitudinally back from the dark collar midway between the meson and lateral margins.

OCHRIMNUS LINEOLOIDES (Slater) (fig 15, map X)

Lygaeus lineola Dallas 1852:549, (preocc.).
Ochrostomus lineoloides Slater 1964:156.
Ochrimnus lineoloides Ashlock 1975:30.

Diagnosis: Small (4-6), densely, finely pubescent with 2 large dark brown T-shaped stripes on posterior lobe of pronotum (sometimes coalescing on anterior lobe). Calli in large part brown, remainder of pronotum, distal end of scutellum and all corial margins and margin of claval commissure

yellow, often tinged with reddish. Scent gland auricle, bucculae and coxae pale. A small pale mark present on base of head vertex.

Biology: Palmer and Bennett (1988) report breeding in Florida on *Baccharis halimifolia*. Blatchley (1926) found this species in Florida on thistle flowers and grasses and stated that it hibernates in Spanish moss, cabbage palmetto and rubbish. In the Everglades National Park we took nymphs and breeding adults on *Pluchea foetida*. It occasionally is collected at lights.

Distribution: The range is from Virginia to Florida and west to Texas and New Mexico. It has also been reported from Guadeloupe, W. I. by Lethierry (1881), perhaps in error.



Map X. Distribution of *Ochrimnus lineoloides*

Florida Distribution: Originally described by Dallas (1852) from Florida. Reported by Walker (1872), Provancher (1886), Uhler (1876) without

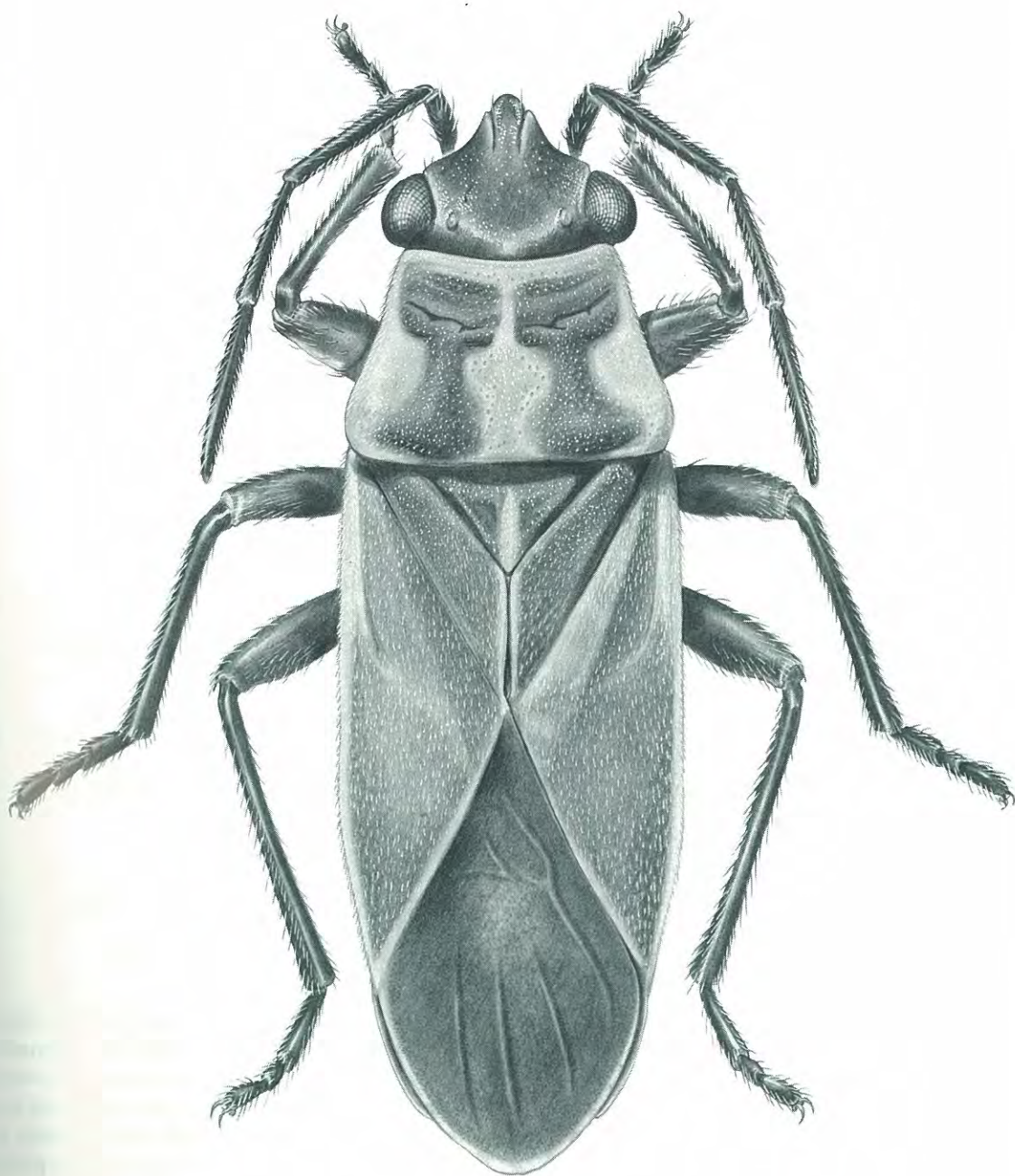


Fig. 15. *Ochromnus lineoloides*

definite locality, by Barber (1914) as *Lygaeus lineola* from Jacksonville, Marco, Everglade, Biscayne Bay, Lake Worth and Ormond, by Van Duzee (1909) as *Lygaeus lineola* from Crescent City, Sanford, St. Petersburg, Clearwater, Ft. Meyers and Estero and by Blatchley (1926) from Sanford, Moore Haven, Royal Palm Park and Ft. Meyers. ALACHUA CO.: 25-III-50, (RMB); 6-VIII-54, H. V. Weems, Jr. (FSCA); Gainesville, 13-VII-55, R. F. Hussey, (FSCA); same, 17-VIII-61, G. O. Plat, (RMB); same, 8-6-37, A. N. Tissot, (FSCA); same, 6-VII-55, R. A. Morse, (FSCA); same, 27-III-27, G. B. Merrill, (FSCA); BROWARD CO.: Andytown, Rt. 84, 5 mi E., 30-III-66, H. V. Weems, Jr., (RMB); CLAY CO.: Gold Head Branch State Park, 19-VIII-79, H. Greenbaum, (RMB); COLLIER CO.: 6 mi E. Ochopee, 21-VII-73, (at night), (C. W. O'Brien), (JAS); Copeland Rec. Area, 28-III-73, C. & L. O'Brien & Kaplan, (JAS); Marco, 17-IV-12, William T. Davis collection, (NMNH); DADE CO.: Everglades Nat. Pk., 25-III-73, O'Brien & Kaplan, (JAS); Florida City, 29-VII-62, F. W. Mead, (RMB); Homestead, 20-VII-62, H. V. Weems, Jr., (RMB); same, 8-IX-30, R. H. Beamer, (NMNH); same, 15-XII-74, J. A. Slater, (JAS); same, 16-XII-74, (JAS); same, 5-V-57, F. W. Mead, (FSCA); same, 28-II-57, R. M. Baranowski, (RMB); same, 28-IX-57, (JAS); same, 28-IX-68, (RMB); same, 5-VIII-68, (RMB); same, 26-VIII-68, (RMB); same, 3-XI-56, (RMB); same, 5-VIII-68, (JAS); same, 26-VIII-68, (JAS); same, 20-VIII-68, (JAS); same, 23-VIII-68, (blacklight trap), R. M. Baranowski, (RMB); same, 22-VIII-68, (RMB); Paradise Key, 24-II-19, H. Barber, (NMNH); Princeton, 4-V-61, J. H. Knowles, (RMB); Royal Palm Park, 17-VII-27, G. B. Merrill, (FSCA); South Miami, 2-VI-28, (NMNH); Everglades Nat. Pk. Nr. Royal Palm Hammock, 10-VI-69, R. M. Baranowski, J. Slater, T. Schuh, J. Harrington, (JAS); DUVAL CO.: St. Johns Bluff, 16-VIII-57, F. W. Mead, (RMB); Jacksonville, 8-XI-11, William T. Davis collection, (NMNH); FLAGLER CO.: Flagler Beach, 23-X-65, F. W. Mead, (RMB); FRANKLIN CO.: Alligator Point, 26-IX-79, C. W. O'Brien, (JAS); HILLSBOROUGH CO.: Tampa, 25-V-44, SS #16115. On *Vigna* sp., (NMNH); INDIAN RIVER CO.: Fellsmere, 27-II-87, G. Johnson, (FSCA); 5 mi S. Vero Beach, 27-III-76, C. W. O'Brien & Marshall, (JAS); LAKE CO.: LEE CO.: Ft. Myers, 3-5-V-08, Van Duzee, (NMNH);

MANATEE CO.: 16-III-63, F. W. Mead, (RMB); MONROE CO.: Big Pine Key, 11-VI-69, R. M. Baranowski, J. Slater, T. Schuh, J. Harrington, (JAS); Everglades Nat. Pk., Flamingo Prairie, 25-III-73, (at night), C. W. & L. B. O'Brien, (JAS); same, 5-XII-74, J. A. Slater, (JAS); North Key Largo Key, Rd. 26, 25-III-70, R. M. Baranowski, (RMB); NASSAU CO.: 20-VIII-54, F. W. Mead, (RMB); ORANGE CO.: Winter Park, 16-VII-38, (FSCA); Apopka, 15-IV-44, (NMNH); PASCO CO.: Elfers, 14-VII-39, Oman, (NMNH); PINELLAS CO.: Dunedin, 1927, W.S.B., (NMNH); POLK CO.: Bartow, 16-IV-49, R. F. Hussey, (FSCA); Lakeland, 23-X-48, R. F. Hussey, (FSCA); PUTNAM CO.: 2 mi NW Orange Springs 27-VIII-10-X-75, (malaise trap), J. Wiley, (RMB); SARASOTA CO.: Myakka River State Park, 24-VII-56, H. V. Weems, Jr., (FSCA); Sarasota, 6-II-58, H. V. Weems, Jr., (FSCA); SEMINOLE CO.: Sanford, IX-XII-25, E. D. Ball, (NMNH); Sanford, 26-IV-08, Van Duzee collection, (NMNH); VOLUSIA CO.: Edgewater, 5-III-39, C. A. Frost, (NMNH); same, 6-III-39, (NMNH); same, 24-II-39, (NMNH). UNKNOWN COUNTY: Lake Naggorie 4-V-23, E. M. Craighead, (NMNH); Everglades Nat. Pk., 20-VII-73, C. W. O'Brien, (JAS); Lake Harris, 20-IV-31, (FSCA).

OCHRIMNUS MIMULUS (Stal) (fig. 16, map XI)

Melanocoryphus (*Ochrimnus*) *mimulus* Stal
1874:114.

Ochrimnus mimulus Slater 1964:153.

Diagnosis: Small (5.5-6.5), dull grayish with grayish yellow pubescence. Calli red, entire pronotum with yellow margins. Central part of posterior pronotal lobe, all corial margins and distal end of scutellum pale yellow. Scent gland auricle pale. Two large dark rays present on posterior pronotal lobe.

Biology: The principal host plants are *Baccharis halimifolia* and *B. neglecta* (Palmer 1986). The latter author studied the feeding habits of this species carefully to determine its suitability for introduction into Australia as a possible control for

Baccharis halimifolia, a serious weed pest in southeastern Queensland and northeastern New South Wales. He found that in Texas adults occurred throughout the year, mating occurring on the plant and eggs laid in the female inflorescences. Overwintering apparently is by both nymphs and adults. Palmer found that while *Baccharis* is the preferred host *mimulus* also breeds in the field on *Solidago altissima* L. and laboratory tests suggested that it might also succeed in breeding on *Conyza canadensis* L. Brailovsky (1982) reported it on *B. halimifolia* and also *Taxodium dictichum* L. Blatchley (1926) reported numerous nymphs and breeding adults on thistles in damp habitats.

Distribution: The range is through the eastern coastal states from Virginia south to Florida and west to Texas.



Map. XI. *Ochrimnus mimulus*

Florida Distribution: Reported by Van Duzee (1909) from Crescent City, St. Petersburg, Estero; by Barber (1914) from Miami, Ft. Meyers, Ormond, Daytona, La Grange and Big Pine Key; by

Torre Bueno (1931a) Royal Palm Park and by Blatchley (1926) Sanford, Ft. Meyers, Royal Palm Park, Sanibel and Dunedin. ALACHUA CO.: Ag. Experiment Station, Gainesville, 6-93, J.R.W., (FSCA); same, 19-IX-67, (blacklight trap), J. W. Perry, (RMB); BREVARD CO.: Merritt Island, 12-III-40, H. V. Weems, Jr., (FSCA); Merritt Island, 12-III-56, H. V. Weems, Jr., (FSCA); same, (RMB); BROWARD CO.: Andytown, Route 184 5 mi E Andytown, 30-III-66, H. V. Weems Jr., (JAS); COLLIER CO.: Ochopee, 26-V-76, C. W. O'Brien & Marshall, (JAS); Seminole St. Pk., 13-XI-72, C. W. & L. B. O'Brien, (JAS); Copeland Rec. Area, 28-III-73, C. & L. B. O'Brien & Kaplan, (JAS); DADE CO.: 12-V-39, D. J. and J. N. Knull, (NMNH); 26-XII-54, H. V. Weems, Jr., (FSCA); V-51, (FSCA); VI-49, (FSCA); 26000 SW 197 Ave., 6-V-77, (blacklight trap), R. M. Baranowski, (RMB); 4 mi S. Homestead, 25-III-73, C. W. O'Brien & R. D. Kaplan, (JAS); Everglades National Park, 20-X-54, H. A. Denmark, (AMNH); same, (FSCA); same, 6-IV-58, R. F. Hussey, (FSCA); same, Long Pine Key Rd., 10-XI-80, (breeding on *Baccharis*), R. M. Baranowski, (RMB); Homestead, 3-II-44, (NMNH); same, 12-XII-74, J. A. Slater, (JAS); same, 8-XII-74, (JAS); same, 8-XII-74, (JAS); same, 16-XII-74, (JAS); same, 26-XI-74, (JAS); same, 24-XI-74, J. A. Slater, (JAS); same, 20-XI-74, (JAS); Matheson Hammock, 8-IV-55, F. W. Mead, (FSCA); same, (RMB); Miami, 1-III-56, C. F. Dowling, (FSCA); same, 5-XI-11, H. T. Barber collection, (NMNH); same, 14-IV-61, B. K. Dozier, (RMB); Paradise Key, 19-III, H. Barber, (NMNH); Tamiami Trail, 5-XI-81, (on *Baccharis*), R. M. Baranowski, (RMB); GULF CO.: Port St. Joe, 25-X-54, G. R. Ferguson, (AMNH); HENDRY CO.: La Belle, 10-11-III-74, (uv in Oak Grove), J. Reynolds, (JAS); same, 16-VII-39, Oman, (NMNH); HIGHLANDS CO.: Lake Placid, Archbold Biological Station, 2-V-83, (u.v. light trap), M. Deyrup, (RMB); same, 1-4-VII-66, L. Penner, (JAS); Sebring, 20-III-55, H. V. Weems, Jr., (FSCA); HILLSBOROUGH CO.: Tampa, 18-X-45, R. C. Froeschner, (JAS); JEFFERSON Co.: 1 mi SW Wacissa, 7-X-73, C. W. O'Brien & G. B. Marshall, (JAS); LEE CO.: Ft. Myers, 29-III-28, F. M. Mueller, (NMNH); LEVY CO.: Bronson, 26-III-76, C. W. O'Brien & Marshall, (JAS); MARION CO.: 9 mi SSW Ocala, 28-V-75, (blacklight trap), P. C. Drummond, (RMB); Sharps Ferry Field Station, 2-X-75, (blacklight

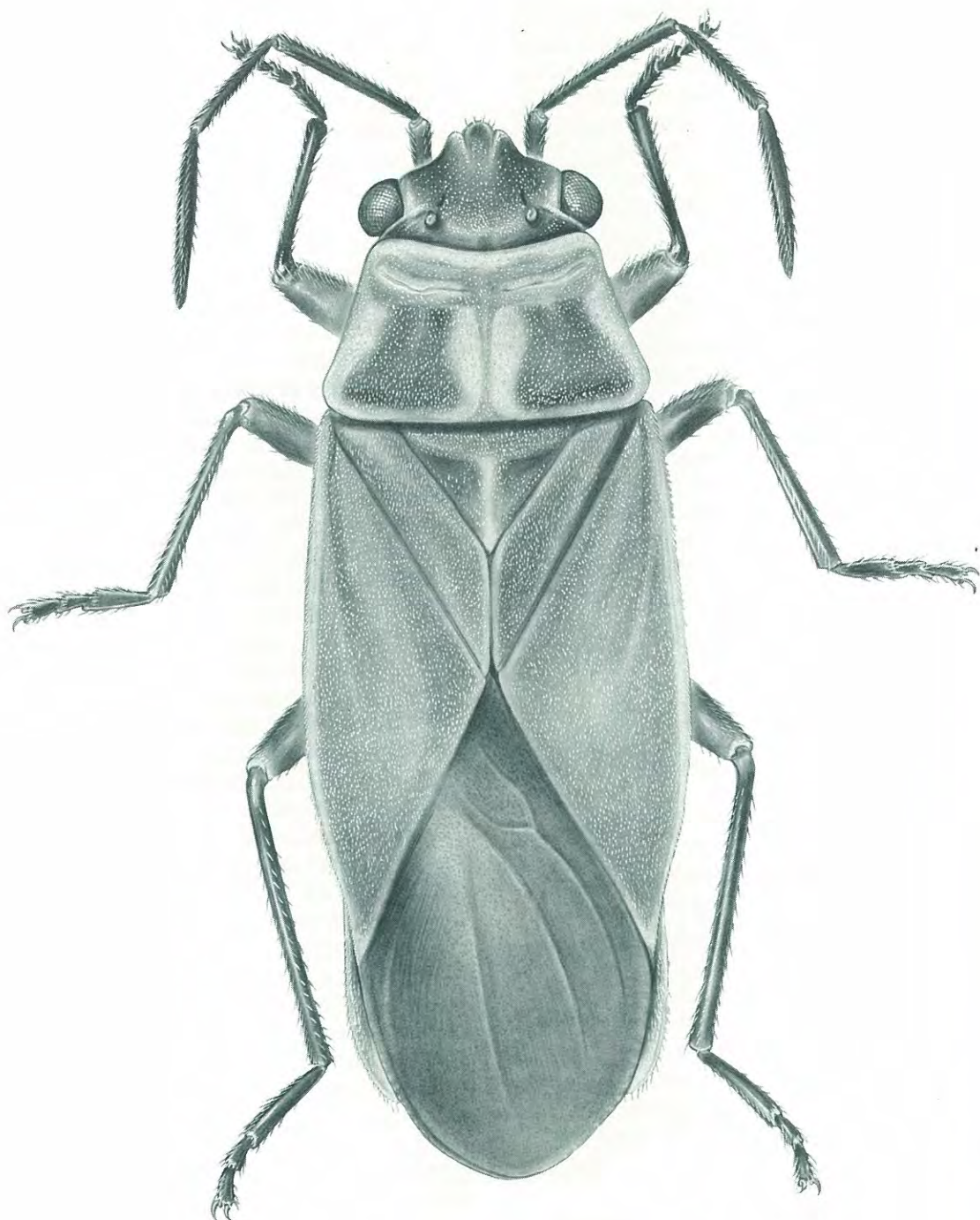


Fig. 16. *Ochrimnus mimulus*

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trap), J. Wiley, (RMB); MONROE CO.: North Key Largo Key, Rd. 26, 25-III-70, R. M. Baranowski, (RMB); Everglades Nat. Pk., Flamingo Prairie, 27-III-73, (night), O'Brien & Kaplan, (JAS); Flamingo Prairie, 10-XI-72, (night), C. W. & L. B. O'Brien, (JAS); same, 25-III-73, (JAS); ORANGE CO.: Winter Park, 27-IX-39, H. T. Fernald, (FSCA); same, 27-VII-39, (at light), (FSCA); same, 22-VII-48, (FSCA); same, 30-VI-45, (FSCA); PALM BEACH CO.: 1 mi SE Canal Point, 16-VII-73, C. W. O'Brien, (JAS); Lake Worth, (NMNH); PINELLAS CO.: Dunedin, 11-III-27, W.S.B.; (NMNH); POLK CO.: Lakeland, 16-VII-38, Oman, (NMNH); Lake Meggiorie, St. Petersburg, 5-IV-29, (NMNH); same, 27-III-23, E. M. Craighead, (NMNH); PUTNAM CO.: 1.7 miles NE Satsuma, 30-VII-36, Hubbell & Friauf, (NMNH); SEMINOLE CO.: Sanford, 21-IV-08, Van Duzee collection, (NMNH); Sanford, IX-XII-1925, E. D. Ball, (NMNH); VOLUSIA CO.: Daytona, 16-XI-11, G.P.E, (NMNH). UNKNOWN COUNTY: Brainard, (NMNH); Buck Key, (NMNH).

Everglades Nat. Pk., Gumbo Limbo Trail, 18-II-75, (at night, beating), C. W. O'Brien, (JAS); Miami 17-IV-18, J. C. Lutz collection, (NMNH); Naranja, 11-II-60, R. M. Baranowski, (RMB); Paradise Key, 9-III-19, E. A. Shorts, (NMNH); Royal Palm Park, 2-IV-27 W. S. B, (NMNH); same, 4-IV, (NMNH); MONROE CO.: 27-XI-55, H. A. Denmark, (FSCA); John Pennekamp St. Pk., 23-V-76, C. W. O'Brien & Marshall, (JAS); Key Largo Key, 7-XII-66, R. E. Woodruff, (RMB); same, 1-I-69, R. M. Baranowski & J. A. Slater, (JAS); same, 26-XI-55, H. A. Denmark, (FSCA); same, 27 XI-55, H. V. Weems, Jr., (FSCA); same, 27-II-57, (FSCA); same, 27-III-57, (FSCA); Marathon, 7-8-III, Shorts, (NMNH); North Key Largo Key, 31-I-59, H. V. Weems, Jr., (RMB); same, 9-X-7?, L. O'Brien, (RMB); same, 19-IV-77, R. M. Baranowski, (RMB); same, 25-VII-68, (in pack-rat nest), (RMB); Upper Key Largo, 11-XI-72, C. W. & L. B. O'Brien, (JAS); PALM BEACH CO.: Lake Worth, 2-7-1887 P. R. Uhler, collection, (NMNH); Palm Beach 19-VII-39, Oman, (NMNH).

OCHRIMNUS TRIPLIGATUS (Barber) (map XII)

Lygaeus (Ohrostomus) tripligatus Barber 1914:510.
Lygaeus (Ochrostomus) moa Barber 1947:59-60.
Ochrostomus tripligatus Slater 1964:162.
Ochrimnus tripligatus Ashlock 1975:30.

Diagnosis: Moderate sized (6-7), dark brown to nearly black, with 3 large spots on posterior pronotal lobe. Large spot near corial apex and spot on head vertex red or yellowish. Distal end of scutellum pale yellow. Membrane uniformly black lacking pale margins.

Biology: Blatchley (1926) reports specimens in clumps of dead air plants and along the borders of hammocks.

Distribution: Known only from Florida.

Florida Distribution: Described by Barber (1914) from Lake Worth and Punta Gorda and reported by Blatchley from Cape Sable, Royal Palm Park and Chokoloskee. DADE CO.: Cotton Key, 5-VIII-58, (at *Solanum*), R. W. Swanson, (FSCA);



Map XII. Distribution of *Ochrimnus tripligatus*

CRASPEDUCHUS Stal 1874

Lygaeus sg. *Craspeduchus* Stal 1874 pp.105,109.
Craspeduchus Slater, 1964 p. 47.

Type Species: *Lygaeus xanthostaurus* Herrich-Schaeffer, 1847. Fixed by Van Duzee 1916.

CRASPEDUCHUS PULCHELLUS (F.) (frontispiece, map XIII)

Lygaeus pulchellus Fabricius 1794, p. 159.
Lygaeus bimarginatus Herrich-Schaeffer 1847, p. 105.
Lygaeus (*Ochrostomus*) *pulchellus* Stal 1874, p. 111.
Lygaeus (*Craspeduchus*) *pulchellus* Barber 1939, pp. 336-337.
Ochrostomus pulchellus Barber and Ashlock 1960, p. 118.
Craspeduchus pulchellus Ashlock 1975, p. 29.

Diagnosis: Strikingly marked with dark brown head having pale basal spot. Pronotal calli and 2 broad rays on posterior pronotal lobe dark brown. Area anterior to calli white, lateral areas red. Inner 1/2 of clavus white, outer 1/2 dark brown. Corium dark brown with lateral and apical margins broadly white, banded with red stripe just within pale margin. Membrane black with white margin.

Biology: Baranowski and Slater (1975) discuss the life history on Key Largo where it feeds exclusively upon the seeds of *Corchorus siliquosus* L., a weed growing in open roadside sites in full sunlight. Eggs are deposited on the ground in loose clusters. Nymphs and egg are described.

Distribution: A widespread Neotropical species that appears to have only recently reached the United States.

Florida Distribution: It is at present known only from Monroe County (Baranowski and Slater, 1975). MONROE CO.: North Key Largo, 3-XII-69, R. M. Baranowski, (RMB); same 19-XII-69, (RMB); same 8-XII-69, (RMB); same 4-XI-69, (RMB); same 7-I-71, (RMB); same, 19-XII-69,

(NMNH); same, 3-XII-69, (JAS); same, 4-XI-69, (NMNH); Tavernier, 2-II-70, R. M. Baranowski, (RMB); Upper Key Largo, 22-I-70, R. M. Baranowski, (RMB); Key Largo, 2-V-61, B. K. Dozier, (RMB).



Map XIII. Distribution of *Craspeduchus pulchellus*

ORSILLINAE Stal

Orsillaria Stal, 1872:43-44.
Nysiina Uhler 1876:304.
Nysiinae Uhler 1877:409.
Orsillinae Scudder 1958:xix.

This subfamily is composed of small medium sized lygaeids generally of a dull brown gray or yellow color and characterized by having all of the abdominal spiracles dorsal and the presence of inner latero-tergites on abdominal segments 2-6. The hind wing lacks a subcostal vein and a hamus is present. The hemelytra are punctate or nearly so. Nymphs have abdominal scent glands present between terga 4-5 and 5-6.

Representatives of the subfamily found nearly throughout the world. There is

markable speciation and radiation in the Hawaiian Islands.

Four tribes are recognized, 3 of which have representatives in Florida. The 4th is confined to Australia.

KEY TO FLORIDA TRIBES OF ORSILLINAE

1. Costal margins of corium straight for greater part of length, at least to level of distal end of claval commissure; connexivum often exposed laterad of corium*Orsillini*, p. 29
- 1'. Costal margin of corium often expanded from base, never straight for distance further than level of posterior end of scutellum; connexivum not exposed laterad of corium2
2. Stridulatory structure consisting of a row of fine grooves and ridges present on lateral corial margins (fig. 17)*Metrargini*, p. 34
- 2'. Lateral margins of corium lacking stridulatory structure*Nysiini*, p. 37

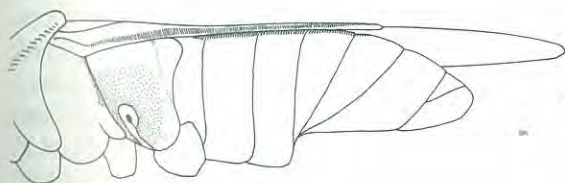


Fig. 17. *Xyonysius californicus*, stridulitrum

ORSILLINI Stal

This distinctive tribe is recognizable by the straight lateral corial margins and exposed connexiva. Most genera possess 1 or 2 spines on the fore femora, carinae on the vertex, and a flattened apical lobe on the vesica of the phallus.

Ten genera are currently recognized of which 1 occurs in the Palearctic, Oriental and

Ethiopian regions, 1 in the Palearctic, Nearctic and Neotropical regions, 2 confined to the Palearctic, 1 Ethiopian, 1 North American, 1 South American, 2 Australian and 1 New Zealand.

KEY TO FLORIDA GENERA OF ORSILLINI

1. Vertex with carina present running from each ocellus, paralleling margin of eye and extending to antenniferous tubercle; propleuron and mesopleuron appearing to butt against one another*Neortholomus*, p. 29
- 1'. Vertex lacking a carina running from each ocellus forward to antenniferous tubercle; mesopleuron appearing to overlap propleuron*Belonochilus*, p. 33

NEORTHOLOMUS Hamilton 1983

Type Species: *Lygaeus scolopax* Say 1831. By original designation.

Diagnosis: The members of this genus are moderately elongate to elongate insects with straight sided lateral corial margins. The body is covered with short, pale, appressed pubescence. The head varies from stout to elongate and tapering. The bucculae are impunctate, high anteriorly tapering to or near base of head. The labium is elongate reaching at least to the hind coxae and sometimes almost attaining the end of the abdomen. The eyes are prominent but sessile. The scutellum has a Y-shaped elevation, with apex acute and slight up-turned.

Nine species are recognized of which three occur in Florida.

The genus is confined to the Western Hemisphere. Most of the North American records are under the genus *Ortholomus* Stal. However, Hamilton (1983) separated the Western Hemisphere species from Old World *Ortholomus* on the basis of synapomorphy in the genitalia. His excellent revision should be consulted for additional details.

KEY TO FLORIDA SPECIES OF *NEORTHOLOMUS*

1. Evaporative area small, height of area from apex of scent gland auricle to margin of evaporative area directly above less than one-half distance from apex of auricle to metapleural callosity (fig. 18) *scolopax*, p. 32

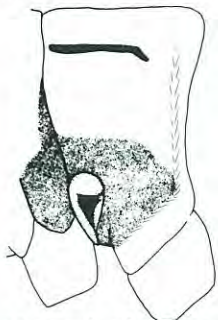


Fig. 18. *N. nevadensis*, evaporative area

- 1' Evaporative area much larger, height of evaporative area from apex of auricle to margin of evaporative area directly above, at least one-half distance from apex of auricle to metapleural callosity (fig. 19) ... 2.



Fig. 19. *N. procerodorus*, evaporative area

2. Third labial segment extending posteriorly beyond metacoxae; head very elongate and tapering (fig. 20), length of head before ocelli subequal to width of head across eyes. *koreshanus*, p. 30

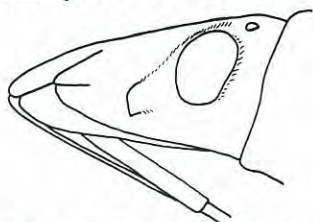


Fig. 20. *N. koreshanus*, head, lateral view

- 2' Third labial segment not extending posteriorly beyond metacoxae; head relatively short, width of head across eyes at least 1.2 times as great as length of head anterior to ocelli (fig. 21) ... *jamaicensis*, p. 31



Fig. 21. *N. jamaicensis*, head, lateral view

NEORTHOLOMUS KORESHANUS (Van Duzee) (fig. 20, map XIV)

Belonchilus koreshanus Van Duzee 1909:165-166.
Neortholomus koreshanus Hamilton 1983:215.

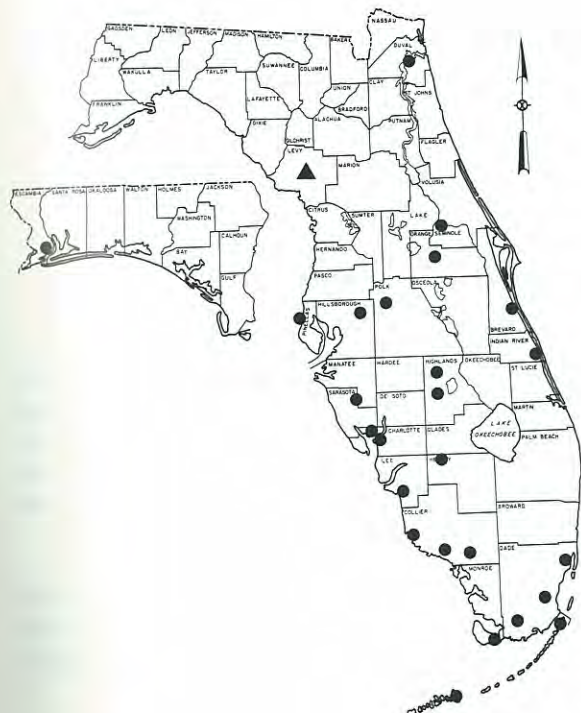
Diagnosis: Elongate slender (4.5-5), reddish brown or grayish brown. Usually a conspicuous white median stripe extending through entire pronotum and scutellum. Fourth antennal segment noticeably darker than preceding segments. Corium usually with reddish blotch near apex. Tylus extremely elongate and strongly tapered. Labium extending posteriorly beyond metacoxae.

Biology: Van Duzee (1909) took the type series as well as many nymphs in the seed heads of pennyroyal (*Piloblephis rigida* (Bart. ex Benth.) Raf. as *Pycnothymus rigidus*) which appears to be the preferred host. Needham (1948) reared it on *Bidens pilosa* and Blatchley (1926) took "small numbers" on *Quercus nigra* L. and associated vegetation.

Distribution: Known only from Florida and the Isle of Pines (Alayo 1973).

Florida Distribution: Originally described by Van Duzee (1909) from Estero. Reported by Barber (1914) from Biscayne Bay, Charlotte Harbor, Lakeland, Jacksonville, Punta Gorda and Miami; by Blatchley (1926) from Sanford, Coxambus, Royal Palm Park and Dunedin and by Hamilton

(1983) from Pensacola and Key Largo. BRE-
VARD CO.: 5 mi N. Eau Gallie, 13-VI-69, J.
Slater, J. Harrington, (JAS); CHARLOTTE CO.:



Map XIV. Distribution of *N. koreshanus*

Punta Gorda, 12-XI-11, (AMNH); COLLIER
CO.: Naples, 12-XII-49, C. W. Sabrosky,
(NMNH); Ochopee, (UV trap), 26-V-76, C. W.
O'Brien & Marshall, (JAS); Seminole St. Pk., 13-
XI-72, C. W. & L. B. O'Brien, (JAS); DADE CO.:
Biscayne Bay, A. T. Slosson, (AMNH); Everglades
Nat. Pk., Palm Vista, 26-XI-63, Slater, Woodward,
& Sweet, (JAS); Everglades Nat. Pk., Pine Glade,
1-XII-61, J. A. Slater, (JAS); Homestead 19-VII-
39, P. B. Lawson, (NMNH); same, 21-X-58, R. M.
Baranowski, (RMB); Miami 10-IX-38, Oman,
(NMNH); same, 5-XI-11, H. G. Barber collection,
(NMNH); Paradise Key, II, Brooks, (AMNH);
DUVAL CO.: Jacksonville, 3-XI-11, (AMNH);
same, 3-XI, H. G. Barber, (NMNH); ESCAMBIA
CO.: Pensacola, 11-14-X-14, (AMNH);

HENDRY CO.: La Belle, 16-VII-39, Oman,
(NMNH); HIGHLANDS CO.: Archbold Bio.
Sta., 7-8-VII-69, J. Slater, T. Schuh, J. Harrington,
(at light), (JAS); same, Sebring, 13-VIII, C. T.
Parsons, (AMNH); same, 14-IV-63, J. G. and B. L.
Rozen, (AMNH); HILLSBOROUGH CO.:
Hillsborough State Park, 13-I-57, F. W. Mead,
(RMB); INDIAN RIVER CO.: 5 mi S. Vero
Beach, 29-XII-77, C. W. & L. O'Brien & J.
Wibmer, (JAS); LEE CO.: Estero, 6-12-V-08,
Van Duzee, (NMNH); LEVY CO.: 14-III-58, R. E.
Woodruff, (JAS); 6-V-65, F. W. Mead, (JAS); 13-
IV-55, R. A. Morse, (FSCA); 14-III-58, R. E.
Woodruff, (JAS); 6-V-55, F. W. Mead, (RMB);
MONROE CO.: N. L. H. Krauss, (NMNH); Big
Pine Key, 1-XII-74, J. A. Slater, R. M. Baranowski,
(JAS); Everglades Nat. Pk., Flamingo Prairie, 5-
XII-74, J. A. Slater, (JAS); ORANGE CO.: Or-
lando, 30-VI-55, H. A. Denmark, (FSCA);
PINELLAS CO.: Dunedin, 21-III-17, W. S. B.
collection, (NMNH); same, 21-XI-25, Blatchley,
(NMNH); POLK CO.: Lakeland, 10-XI-11,
(AMNH); same, 10-XI-11, H. G. Barber,
(NMNH); SARASOTA CO.: Myakka River State
Park, 5-VI-54 H. V. Weems, Jr., (FSCA); same, 5-
VI-54, (RMB); SEMINOLE CO.: Sanford, 1925,
E. D. Ball, (NMNH).
UNKNOWN COUNTY: "C. H. Hbr", A. T. Slos-
son, (AMNH).

NEORTHOLOMUS JAMAICENSIS (Dallas)

(figs. 21, 22A, map XV)

Nysius jamaicensis Dallas 1852:555-556.

Nysius spurcus Stal 1859:243.

Nysius providus Uhler 1894:182-183.

Nysius jamaicensis Hamilton 1983:208.

Diagnosis: Small (4-5), narrow, elongate. Dull
yellowish gray with numerous brown spots on
head, pronotum, and hemelytra. Scutellum dark
anteriorly with a broad pale Y-shaped callosity
(fig. 22) which will distinguish it from the northern
scolopax (fig. 23). Tibiae and tarsi dull yellow.
Color variable.

The short head and large metapleural
evaporative area will distinguish *jamaicensis* from
the other Florida species.

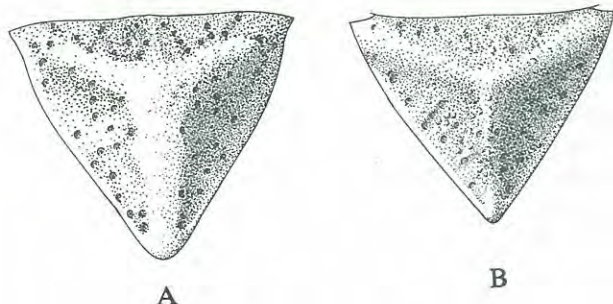


Fig. 22A. *N. jamaicensis*, scutellum
Fig. 22B *N. scolopax*, scutellum

Biology: Nothing other than scattered collecting notes are in the literature.

Distribution: A widespread Neotropical species found in South and Central America and almost throughout the West Indies.



Map XV. Distribution of *N. jamaicensis*

Florida Distribution: Reported by Blatchley (1926) from Key West. DADE CO.: Florida City, 19-VII-73, G. B. Marshall, (JAS); Homestead, 8-

XII-74, J. A. Slater, (JAS); same, 5-X-68, (blacklight trap), R. M. Baranowski, (RMB); Subtropical Experiment Station, Waldin Drive, 10-VIII-68, (blacklight trap), R. M. Baranowski, (RMB); MONROE CO.: Big Pine Key, 8-VI-60, R. E. Woodruff, (RMB).

NEORTHOLOMUS SCOLOPAX (Say) (fig. 22B, map XVI)

Lygaeus scolopax Say 1831: (LeConte Ed.): 330
331

Nysius Saint-Cyri Provancher 1872:77.

Nysius (Ortholomus) longiceps Stal 1874:120.

Ortholomus uhleri Baker 1906:139.

Ortholomus longiceps var. *cookii* Baker 1906:139.

Neortholomus scolopax Hamilton 1983:222.

Diagnosis: Moderate sized (5-6), grayish to grayish brown, sometimes dull yellowish, with short gray pubescence. Apex of corium usually dull reddish. Membrane pale hyaline. Labium variable length, at most extending posteriorly to second abdominal segment.

Biology: Common in weedy fields where it may be a general feeder. Hamilton (1983) discusses host plants and says that plants in 13 families have been listed as hosts.

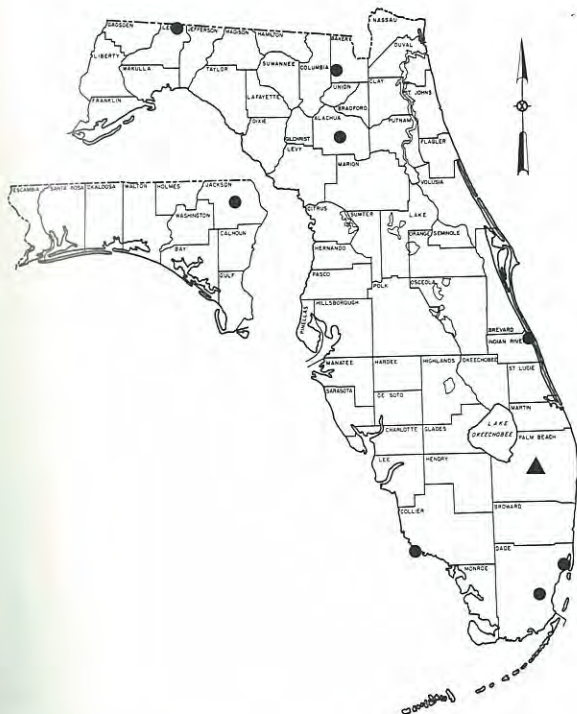
Distribution: Hamilton (1983) states that it ranges throughout the continental United States and southern Canada to Mexico and Guatemala.

Florida Distribution: Although common throughout the northern states, it appears to be a rare species in Florida. The only previous record (which needs confirmation) being that of Blatchley (1914), as *Nysius longiceps*, from Biscayne, ALACHUA CO.: Gainesville, 27-X-38, A. N. Blatchley, (FSCA); BAKER CO.: Olustee, 2-4-VI-68, (blacklight trap), E. P. Merkle, (RMB); BAKER CO.: Marco, Marco Island, 28-VI-68, (blacklight trap), R. M. Baranowski, (RMB); BAKER CO.: Hornby, (FSCA); DADE CO.: 7-VII-54, F. W. Mead, (RMB); Homestead, 12-VI-79, F. W. Mead, (FSCA); same, 9-IX-68, (blacklight trap), R. M. Baranowski, (RMB); INDIAN RIVER CO.: Wabasso, 24-II-87, G. B. Marshall, (FSCA); JACKSON CO.: Florida Caverns State Park, 9-VII-54, F. W. Mead, (FSCA); LEON

Tall Timbers, 5-V-77, M. Altieri, (FSCA); PALM BEACH CO.: 14-III-54, R. A. Long, (RMB).

Lygaeus numenius Say 1831: 775.
Belonochilus numenius Uhler 1871: 104.

Diagnosis: Elongate, parallel-sided; pale yellow-brown over most of body surface with an elevated median yellow stripe running longitudinally through the pronotum and scutellum; corium with a large red or brown apical macula; head very elongate and tapering; labium extremely elongate, reaching well onto and sometimes beyond sixth abdominal sternum.



Map XVI. Distribution of *Neortholomus scolopax*

BELONCHILUS Uhler 1871

Type Species: *Lygaeus numenius* Say 1831.
Monobasic.

This genus has an elongate, slender, parallel-sided body. The head is extremely elongate and tapering, produced anterior to the eyes by a distance more than twice the length of the eye. The vertex lacks carinae. The lateral corial margins are straight. The mesopleuron appears to overlap the propleuron.

Only a single species is known.

BELONCHILUS NUMENIUS Say (map XVII)



Map. XVII. Distribution of *Belonochilus numenius*

Biology: This is one of the few North American orsillines that spends most of the life cycle in trees. As early as 1902 Heidemann reported breeding on sycamore and this was later reported by several other authors. Despite this, little was known of the life cycle until Wheeler (1984) reported the results of his studies on the species in Pennsylvania. Wheeler summarized previous information on host plants, discussed the life cycle in detail and described the egg and nymphs.

B. numenius breeds upon several species of *Platanus*. Heidemann (1902) reported nymphs and adults on the American sycamore or plane tree (*Platanus occidentalis* L.). It was later reported on the western *Platanus racemosa* Nutt. and *P. wrighti* S. Wats. Wheeler (1984) notes records of nymphs on other hosts, but these are probably sitting records or temporary colonies.

Wheeler conducted his work on populations on the London Plane Tree (*Platanus x acerifolia* (Ait.) Willd.) The insect overwinters in the egg stage within fallen fruit heads and the first generation of nymphs occurred in these fallen heads. Adults then fly to the developing fruit heads on the tree and lay eggs over a considerable period of time so that several generations are produced during the season.

Nothing is known of the biology in Florida, but a multivoltine insect with a life cycle of this type might continue to breed throughout most of the year.

Distribution: Although *B. numenius* has not previously been reported from Florida, it has an extensive range in North America from New England south to Louisiana and west to California. It also occurs in Mexico.

Florida Distribution: Orange Co.: Disney World, 23-V-89, (on *Platanus occidentalis*), M. Sconyers, (FSCA).

METRARGINI Kirkaldy

This tribe is very closely related to the Nysiini and separable chiefly by the combination of characters given in the preceding key. The most reliable, but difficult to use character is the absence of a dorsal lobe apically on the conjunctiva of the phallus in the Metrargini. North American representatives of the tribe can be distinguished by the presence of stridulatory structures on the edge of the corium.

The tribe at present contains 11 genera, 6 of which are confined to Hawaii, 2 South America, 1 Juan Fernandez Islands and the Galapagos and 1 widely distributed in North and South America.

XYONYSIUS Ashlock and Lattin 1963

Xyonysius Ashlock & Lattin 1963:708.

Type Species: *Nysius californicus* Stal 1859. By original designation.

The members of this genus closely resemble large specimens of *Nysius*, but may be distinguished by the presence of a series of fine stridulatory grooves on the edge of the corium.

The genus is confined to the Western Hemisphere where it occurs from Chile and the Galapagos north to southern Canada. Nine species are recognized of which 3 occur north of Mexico. Two species occur in Florida.

KEY TO FLORIDA SPECIES OF XYONYSIUS

1. Corium not or scarcely constricted at base; pronotum distinctly longitudinally calloused on each side of midline (fig. 23); color pale testaceous; veins of corium unspotted or at most very faintly spotted *basalis*, p. 37

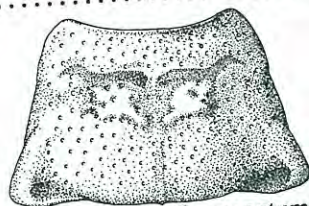


Fig. 23. *X. basalis*, pronotum

- 1'. Corium conspicuously constricted at base; pronotum not distinctly longitudinally calloused on either side of midline (fig. 24); color cinereus or fuscous; veins of corium more or less heavily spotted with fuscous. *californicus*, p. 35

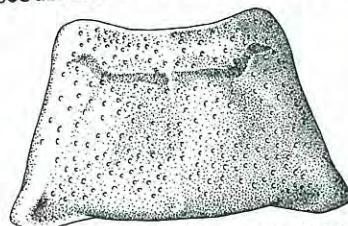


Fig. 24. *X. californicus*, pronotum

***XYONYSIUS CALIFORNICUS* (Stal)**
(figs. 17, 24, 25, map XVIII)

Nysius californicus Stal 1859:242.

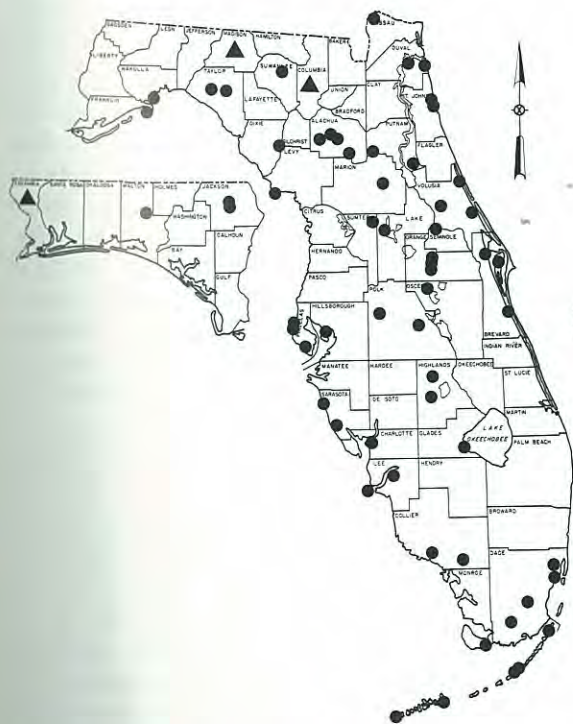
Xyonysius californicus Ashlock & Lattin 1963:702.

Diagnosis: Moderate sized (4.7-7), dull yellowish to brownish gray. Bucculae very short, scarcely extending midway to base of head. Head and pronotum subequal in length. Male genital capsule black with broad pale yellow margin.

Biology: *X. californicus* occurs upon a variety of wild and cultivated plants usually in open fields, but the biology has not been studied in detail. Florida specimens have been taken on *Medicago lupulina* L., *Flaveria linearis* Lag., and *Erigeron quercifolius* Lam.

Distribution: Occurs throughout southern Canada and the United States and in the West Indies and south to Argentina.

Florida Distribution: Florida specimens are referable to the subspecies *alabamensis* Baker.



Map XVIII. Distribution of *Xyonysius californicus*

Reported by Barber (1914) from Sanford, Crescent City, Punta Gorda, Titusville, Key Largo, Lakeland, Biscayne Bay, Jacksonville, Atlantic Beach, Newberry and St. Augustine; by Blatchley (1926) from Lakeland, Moore Haven, Miami, Royal Palm Park, Ft. Meyers and Dunedin. ALACHUA CO.: 12-IV-55, H. V. Weems, Jr. (RMB); same, 24-IX-54, (RMB); same, 4-VII-55, (RMB); 13-V-55, R. A. Morse, (RMB); 25-IV-55, H. A. Denmark, (RMB); 30-X-51, W. C. Sloan, (FSCA); Gainesville 13-V-24, T. H. Hubbell, (NMNH); same, 14-III-59, R. F. Hussey, (FSCA); same, 11-IV-57, F. W. Mead, (RMB); same, 27-V-62, (RMB); same, 9-V-67, (RMB); same, 28-V-64, (FSCA); same, 2-VII-55, R. A. Morse, (RMB); same, 28-VI-55, (RMB); same, 6-VII-55, (RMB); same, 26-V-47, H. V. Weems, Jr., (FSCA); same, Lake Alice, 14-VI-74, F. W. Mead, (RMB); Micanopy, 6-III-27, Leonard, (NMNH); San Felasco Hammock, 29-IV-48, E. D. McRae, (FSCA); BREVARD CO.: Eau Gallie, 5-XII-70, R. M. Baranowski, (RMB); Merritt Island, 12-III-56, H. V. Weems, Jr., (RMB); COLLIER CO.: 1-XII-55, H. V. Weems, Jr., (RMB); same, 29-XI-55, (RMB); 6 mi E. Ochopee, 21-VII-73, C. W. O'Brien & Marshall, (JAS); Ochopee, 26-V-76, (UV trap), C. W. O'Brien & Marshall, (JAS); COLUMBIA CO.: 21-XI-53, R. F. Hussey, (FSCA); DADE CO.: 26000 SW 197 Ave., 6-VI-77, (blacklight trap), R. M. Baranowski, (RMB); Everglades National Park, 10-III-55, H. A. Denmark, (RMB); same, 11-III-55, same, Pine Glade, 1-XII-61, J. A. Slater, (JAS); Grossman Hammock State Park, 24-V-72, (blacklight trap), R. M. Baranowski, (RMB); Homestead, 1-III-56, H. V. Weems, Jr., (RMB); same, 14-I-56, C. O. Esselbaugh, (AMNH); same, 8-XII-74, J. A. Slater, (JAS); same, 21-X-58, R. M. Baranowski, (RMB); same, 23-XII-56, (RMB); same, 28-II-57, (RMB); same, 6-XI-64, (RMB); Paradise Key, H. G. Barber, (NMNH); DIXIE CO.: 2 mi W. Fannin Springs, 4-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); ESCAMBIA CO.: 23-VI-55, F. W. Mead, (RMB); FRANKLIN CO.: Alligator Point, 26-IX-75, C. W. O'Brien, (JAS); GILCHRIST CO.: Blue Spring, 3-IV-55, (taken in Spanish moss), R. F. Hussey, (FSCA); HIGHLANDS CO.: 28-II-29, B. P. Moora, (NMNH); Lake Placid, Archbold Biological Station, 20-III-83, (malaise trap), M. Deyrup, (RMB); Sebring, 20-III-55, H. V. Weems, Jr., (RMB); same, 20-IV-50, (FSCA); HILLSBOROUGH CO.: Tampa, 6-VI-44,

(NMNH); same, 7-IX-38, Oman, (NMNH); JACKSON CO.: Florida Caverns State Park, 9-VII-54, F. W. Mead, (RMB); T5H, R7W, Section 8, 9-VI-53, R. F. Hussey, (FSCA); Marianna, 3-VIII-54, F. W. Mead, (FSCA); LAKE CO.: 14-III-

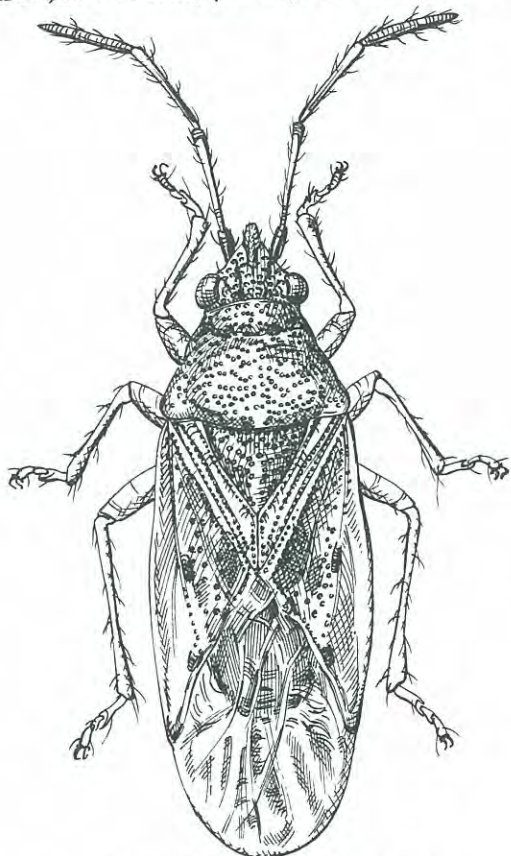


Fig. 25. *Xyonysius californicus*

56, R. A. Morse, (RMB); Leesburg, 8-VI-55, L. H. Stover, (RMB); 14-III-56, R. A. Morse, (AMNH); LEE CO.: Ft. Myers, 3-5-V-08, Van Duzee, (NMNH); Sanibel Is., 9-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); LEVY CO.: 14-IV-55, H. V. Weems, Jr., (RMB); 13-IV-55, H. A. Denmark, (RMB); 13-IV-55, R. A. Morse, (RMB); 14-IV-55, H. V. Weems, Jr., (RMB); 6-V-55, F. W. Mead, (RMB); Cedar Key, 27-VII-25, R. H. Hussey, (RMB); MADISON CO.: 27-VII-54, F. W. Mead, (RMB); 28-VII-54, F. W. Mead, (RMB); MARION CO.: Ocala Nat. Forest, 3 mi N. Hwy. 40 at Zay Prairie, 26-I-74, (at night), G. B. Marshall, (JAS); 22-28-II-30, B. L. Smith, (NMNH); MONROE CO.: Big Pine Key, 1-XII-74, J. A. Slater, R. M. Baranowski, (JAS); same, 11-VI-69, R. M. Baranowski, J. Slater, T. Schuh, J.

Harrington, (JAS); Everglades National Park, Flamingo Prairie, 4-V-70, (blacklight trap), R. M. Baranowski, (RMB); Fiesta Key, 19-VIII-66, R. Allen, (JAS); Key Largo, 10-IV-55, F. W. Mead, (RMB); same, 18-VI-53, O. D. Link, (FSCA); same, 30-XI-61, (JAS); Key West, 27-XII-53, H. V. Weems, Jr., (RMB); Long Key, 1-XII-55, H. A. Denmark, (RMB); N. Key Largo Key, 4-V-77, R. M. Baranowski, (RMB); same, 9-I-82, R. M. Baranowski, (RMB); NASSAU CO.: 7 mi SW Boulogne, 14-VI-69, J. A. Slater, J. Harrington, (JAS); ORANGE CO.: Conway, 9-XI-34, (RMB); Orlando, 6-VI-08, Russell, (NMNH); Winter Park, 12-IX-44, H. T. Fernald, (RMB); same, 12-VIII-44, R. H. Hussey, (RMB); OSCEOLA CO.: Shingle Creek, 2 mi W. Kissimmee, 5-VI-69, T. Schuh, J. Slater, J. Harrington, (JAS); 15-III-56, H. A. Denmark, (RMB); PINELLAS CO.: Clearwater, 7-X-34, Oman, (NMNH); Dunedin Beach, 21-VII-73, C. W. O'Brien, (JAS); Dunedin, 30-III-17, W.S.B. collection, (NMNH); Pasadena, 3-8-23, E. N. Craighead, (NMNH); POLK CO.: 26-IV-54, F. W. Mead, (FSCA); Lake Wales, 24-III-23, E. N. Craighead, (NMNH); Lakeland, 16-IV-51, R. F. Hussey, (FSCA); same, 7-V-12, William T. Davis collection, (NMNH); Winter Haven, 29-VI-56, H. B. Wesson, (RMB); PUTNAM CO.: 6-I-60, H. V. Weems, Jr., (RMB); 2 mi NW of Orange Springs, 13-X-5-XI-75, (malaise trap), J. Wiley, (RMB); same, 27-VIII-10-X-75, (RMB); Crescent City, 22-IV-08, Van Duzee collection, (NMNH); same, IV-08, Van Duzee, (NMNH); SARASOTA CO.: 8-V-60, H. A. Denmark, (RMB); Orange Grove, B Ridge Rd., Sarasota, 17-VII-64, R. Allen, (JAS); Venice, 9-V-60, R. E. Woodruff, (RMB); SEMINOLE CO.: Sanford, XI-25, E. D. Ball, (NMNH); Seminole St. Pk., 13-XI-72, C. W. & L. B. O'Brien, (JAS); ST. JOHNS CO.: Ponte Vedra Beach, 4-VII-61, F. W. Mead, (RMB); SUMPTER CO.: Fruitland Park, 20-VI-69, (at *Helianthus*), A. L. Bentley, (FSCA); SUWANEE CO.: C. H. Webb, (FSCA); Live Oak, 15-I-80, (FSCA); TAYLOR CO.: 15 mi W. Perry, 8-VI-69, Slater, Harrington, Schuh, (JAS); VOLUSIA CO.: 24-VII-54, H. V. Weems, Jr., (FSCA); Deland, 27-III-67, M. A. Dayrup, (AMNH); Edgewater, 5-III-39, C. A. Frost, (NMNH); Ormond Beach, 22-VI-38, Oman, (NMNH); WAKULLA CO.: Shell Point Beach, 3-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); WALTON CO.: Argyle, 31-XII-31, P. W. Oman, (NMNH).

***XYONYSIUS BASALIS* (Dallas)**
(fig. 23, map XIX)

Nysius basalis Dallas 1852:553.
Nysius callifer Stal 1874:120-121.
Nysius? ementitus Distant 1893:385.
Xyonysius basalis Ashlock and Lattin 1963:702.

Diagnosis: Subequal in size to *californicus alabamensis*, but paler ("yellowish testaceous rather than cinereus"). Lateral corial margins scarcely contracted basally, entire lateral corial margins slightly convex rather than straight. Male genital capsule either completely pale yellow or slightly fuscous basally.

The difference in the condition of the pronotal callosities between the two Florida species are very difficult to use in practice.

Distribution: Primarily a Neotropical species known from South and Central America and the West Indies. It is known in this country only from Florida and the Gulf States.

Florida Distribution: Reported from Florida as *Nysius inaequalis* Uhler without definite location by Uhler (1894) and by Barber (1914) from S. Jacksonville. Florida without definite locality, (NMNH); DADE CO.: Miami Beach, 10-IX-39, Oman, (NMNH); BROWARD CO.: Ft. Lauderdale 18-II-19, A. Wetmore, (NMNH); MONROE CO.: Big Pine Key, 20-12-54, H. V. Weems, Jr., (RMB); Everglades National Park, Flamingo Prairie, 4-V-70, (blacklight trap), R. M. Baranowski, (RMB).

NYSIINI Uhler 1876

This tribe is recognizable chiefly by the combination of characters given in the preceding key and by usually having the lateral corial margins straight and paralleling the R+M vein for only a short distance and by having the dorsal lobe present on the conjunctiva of the male phallus.

The tribe contains 5 genera, 1 Palearctic, 1 Ethiopian, 1 Hawaiian, 1 New Zealand and the genus *Nysius* which is nearly cosmopolitan in distribution.

***NYSIUS* Dallas 1852**

Nysius Dallas 1852:551-552.
Macroparius Stal 1872:43.
Anorthus Horvath 1890:190-191.
Anorthuna Strand 1928:46.
Brachynysius Usinger 1942:44.
Tropinysius Wagner 1958:15-16, 45-46, 47-48.

Type Species: *Lygaeus thymi* Wolff 1804. By action of International Commission on Zoological Nomenclature, Opinion 319.

This genus is characterized by having the lateral corial margins constricted basally and distad of the constriction arcuately curved to the corial apex. The pronotum is wider than the head width across the eyes. The bucculae are impunc-



Map XIX. Distribution of *Xyonysius basalis*

Biology: We have examined one specimen that appears to represent this species from the Everglades National Park that was taken on *Flaveria linearis* Lag.

tate. The fore femora are unarmed and there is no stridulatory area along the lateral corial margins.

This is a very large genus with 104 species currently recognized. Members of the genus are found in all of the major faunal areas of the world. Most species live in temporary ruderal habitats and are often extremely abundant, sometimes causing considerable damage to cultivated plants.

Eleven species are known to occur north of Mexico, 2 or 3 of which occur in Florida.

KEY TO MALES OF FLORIDA SPECIES OF *NYSIUS*

1. Bucculae low, gradually tapering posteriorly, fading out gradually near base of head (fig. 26) *raphanus*, p. 38

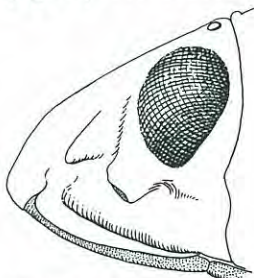


Fig. 26. *Nysius raphanus*, head, lateral view

- 1'. Bucculae high anteriorly, slightly narrowing posteriorly, ending abruptly at or near base of head (fig. 27) 2

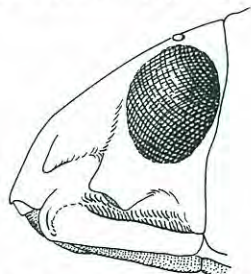


Fig. 27. *Nysius tenellus*, head, lateral view

2. Basal portion of lateral corial margins with prominent hairs *scutellatus*, p. 41
- 2'. Basal portion of lateral corial margins devoid of hairs, or at most, with minute, ex-

tremely small hairs present *tenellus*, p. 40

NYSIUS RAPHANUS Howard (fig. 26, map XX)

Nysius raphanus Howard 1872:507 (see Can. Ent. vol 4, p. 219-220).

Nysius destructor Riley 1873:113.

Nysius strigosus Uhler 1894:238-239.

Nysius minutus Uhler 1895:22.

Diagnosis: Very small (3.1-4), yellowish brown. Scutellum black, except at extreme distal end. Pronotum short, often nearly twice as wide as long. Male genital capsule usually black.

This species resembles the more northern *niger* Baker (*ericae* of American authors) very closely, but the first segment of the antennae barely exceeds the apex of the tylus.

Biology: Like the northern *niger*, this species is often destructive to cultivated crops. The literature is badly confused but presumably most of the southern records of economic injury by *Nysius ericae* are referable to this species. Breeding populations were collected at TREC, Homestead on *Gnaphilium purpureum* L. Palmer (1987) reported it on *Baccharis neglecta* Britton in Texas. Boldt, Woods and Robbins (1988) report it (nymph) in the southwest on *Baccharis sarothroides* (Gray), *B. neglecta* and *B. halimifolia*.

Milliken (1918) considered overwintering to be as eggs and nymphs. However, at least in the midwest, this does not appear to be true as Byers (1973) reports a large aggregation of adults in Kansas in early April. This aggregation phenomenon has been observed in overwintering populations of several species of Lygaeidae. Byers probably correctly believes it to be a mating aggregation. He found 60 to 100 individuals in an approximately 4 inch square area on a fragment of tile whereas no specimens were present in similar habitats in the same area. Lanham (1975) reported amazing numbers of *raphanus* near the summit of Capulin Mountain National Monument in Mexico in April and May. He states "they were so numerous that they pelted one's face like grains in a sandstorm". He also mentions that "a blow

with the net handle on a tree produced a thick gray cloud of insects ---each pass of the net through such a cloud captured a few hundred of the insects". The insects were in these numbers for about 1/2 mile of the trail. Clancy and Pierce. (1966) report parasitization of adults by the tachinid *Hyalomya aldrichii* Townsend in California.



Map XX. Distribution of *Nysius raphanus*

Distribution: The range is throughout the southern states from Virginia west to southern California into Mexico. Ashlock & Slater (1988) list northern locality records for *raphanus* and southern records (including Florida for *niger*). Moreover, they also note that literature records for these two species are irrecoverably confused. We believe *raphanus* has essentially the above distribution and that *niger* does not occur in Florida.

Florida Distribution: Reported by Torre Bueno (1933) (as *strigosus*) from Matecumbe. Presumably the records of *N. ericae* by Barber (1914) from Miami and by Blatchley (1926) from Dunedin,

Sanford and Caxambus belong here. ALACHUA CO.: 13-III-54, H. V. Weems Jr., (FSCA); 30-VII-55, W. P. Hunter, (RMB); 6-VIII-55, H. V. Weems, Jr., (RMB); Gainesville, 1-VII-54, R. F. Hussey, (FSCA); same, 28-VI-55, R. A. Morse, (RMB); same, 6-VII-55, (RMB); same, 9-V-67, F. W. Mead, (RMB); same, Doyle Conner Bldg., 17-VI-74, (blacklight trap), F. W. Mead, (RMB); same, 25-VI-74, (RMB); Gainesville, Lake Alice, 14-VI-74, F. W. Mead, (RMB); Alachua, 6-27-55, (FSCA); High Springs, 7-54, (FSCA); BAKER CO.: Macclenny, 6-VII-55, (FSCA); same, 5-55, (FSCA); Olustee, 12-VII-66, (blacklight trap), E. P. Merkle, (RMB); same, 2-4-VII-66, (RMB); BAY CO.: Panama City, 29-VI-55, J. Brogden, (FSCA); Panama City, 29-VI-55, J. E. Brogdon, (RMB); BROWARD CO.: Pompano Park, 19-IX-73, D. C. Clinton and W. H. Pierce, (RMB); COLLIER CO.: Royal Palm Hammock, Collier-Seminole St. Pk., 15-VI-77, C. W. O'Brien & G. Widmer, (JAS); DADE CO.: 26000 SW 197 Ave. 24-V-77, (blacklight trap), R. M. Baranowski, (RMB); same, 31-V-77, (RMB); Agricultural Research & Education Center, Homestead, 12-IV-69, (blacklight trap), R. M. Baranowski, (RMB); same, 29-VI-69, (RMB); Bernecker's Nursery, 11-14-IX-86, (blacklight trap), H. B. Glenn, (RMB); Homestead, 10-11-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); same, 4-V-56, D. O. Wolfenbarger, (FSCA); same, 12-V-69, R. M. Baranowski, (RMB); same, 9-IX-68, (RMB); same, 4-VI-59, (RMB); same, 9-IV-57, (NMNH); same, 22-IV-57, (RMB); same, 18-V-69, (blacklight trap), R. M. Baranowski, (RMB); same, 11-IV-69, (NMNH); same, 2-VI-69, (RMB); same, 31-VIII-68, (RMB); Miami, 8-VI-70, L. J. Daigle, (FSCA); Naranja, 20-IV-60, R. M. Baranowski, (RMB); same, 3-VI-64, (RMB); same, 6-IV-69, (NMNH); Naranja, V-62, R. M. Baranowski, (RMB); Orchid Jungle Hammock, Newton Rd., 23-III-70, (blacklight trap), R. M. Baranowski, (RMB); Richmond, University of Miami, South Campus, 27-V-62, H. V. Weems, Jr., (RMB); Ross and Castellow Hammock, 27-V-62, H. V. Weems, Jr., (RMB); Subtropical Experiment Station, Waldin Dr., 17-IV-7?, (blacklight trap), R. M. Baranowski, (RMB); DUVAL CO.: St. Johns Bluff, 11-IX-56, F. W. Mead, (FSCA); ESCAMBIA CO.: Station 86, 23-VI-55, F. W. Mead, (RMB); FLAGLER CO.: H. V. Weems, Jr., (NMNH); GADSDEN CO.: 31-VII-56, F. W. Mead, (FSCA); Chattahoochee, 3-VI-55, R. F. Hussey, (FSCA); Quincy, 6-VI-67, W. B. Tappan,

(FSCA); HENDRY CO.: 25-VII-56, H. V. Weems, Jr., (FSCA); HIGHLANDS CO.: Archbold Bio. Sta., 7-8-VI-69, (at light), J. Slater, J. Harrington, T. Schuh, (JAS); Hicotea, 18-V-65, A. C. McCallay, (RMB); JACKSON CO.: Marianna, 10-VI-69, (on *Arachis hypogaea*), C. W. Laughlin, (FSCA); LEE CO.: Sanibel Island, 9-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); MANATEE CO.: Bradenton, 23-V-55, F. W. Mead, (RMB); MARION CO.: 14 SW Ocala, Ross Prairie, 12-VI-75, (blacklight trap), P. C. Drummond, 9 mi SSW Ocala, 27-VIII-75, Drummond & Wiley, (RMB); same, 9 mi SSW Ocala, 28-VI-75, (blacklight trap) P. C. Drummond, (RMB); same, 25-VI-75, (RMB); same, 28-VI-75, (RMB); Sharpes Ferry Field Station, 30-IV-75, (blacklight trap), N. Holler, (RMB); same, 30-X-75, (blacklight trap), J. Wiley, (RMB); MONROE CO.: Everglades Nat. Pk., Snake Bight Trail, 10-VI-69, R. M. Baranowski, J. Slater, T. Schuh, J. Harrington, (JAS); Everglades Nat. Pk., Middle Cape Sable, 8-IV-66, H. V. Weems, Jr., (RMB); Key Largo, 11-VI-69, R. M. Baranowski, J. Slater, T. Schuh, J. Harrington, (JAS); North Key Largo, 11-V-77, R. M. Baranowski, (RMB); same, 5-III-72, J. A. Slater, R. M. Baranowski, (RMB); Plantation Key, 19-X-54, H. A. Denmark, (FSCA); same, 19-X-54, H. V. Weems, Jr., (FSCA); Stock Island, 2-8-VII-84, (blacklight trap), J. Bunch, (RMB); same, 26-29-VI-84, (RMB); same, 8-9-VII-85, (RMB); same 13-17-VII-84, (RMB); same, 2-5-VII-84, (RMB); same, 9-13-VII-84, (RMB); Torch Key, 8-VI-60, H. V. Weems, Jr., (RMB); ORANGE CO.: Winter Park, 15-V-44, H. T. Fernald, (FSCA); OSCEOLA CO.: Kissimmee, 5-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); PALM BEACH CO.: Belle Glade, 26-VII-27, G. B. Merrill, (FSCA); PINELLAS CO.: Cabbage Key, 24-X-63, F. W. Mead, (RMB); POLK CO.: 23-VI-58, W. P. Henderson, (FSCA); 23-VI-58, W. P. Henderson, (FSCA); SANTA ROSA CO.: 12-VIII-55, F. W. Mead, (RMB); SARASOTA CO.: Myakka River State Park, 5-VI-54, H. V. Weems, Jr., (FSCA); Venice, 4-V-61, H. V. Weems, Jr., (RMB); VOLUSIA CO.: 5-VIII-56, H. A. Denmark, (FSCA); WAKULLA CO.: Spring Creek, 31-V-73, C. W. O'Brien & E. F. Riek, (UV trap), (JAS); Wakulla Springs, 3-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); WASHINGTON CO.: 5 mi. E. of Chipley, 31-VIII-60, (blacklight trap), W. C. Rhodes, (RMB).

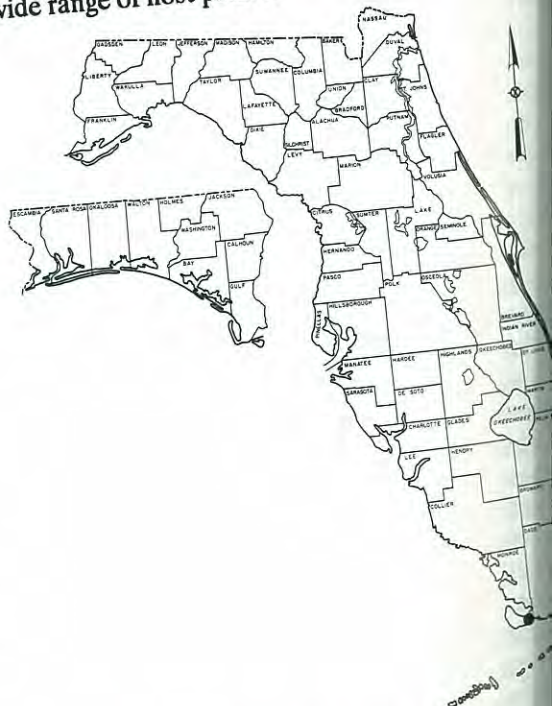
DRY TORTUGAS, Loggerhead Key, 13-VII-63, H. A. Denmark, (RMB); same, 2-IX-61, H. V. Weems, Jr., (RMB).

NYSIUS TENELLUS Barber (fig. 27, map XXI)

Nysius tenellus Barber 1947:361.

Diagnosis: Small (3.6-4), pale yellowish testaceous, bucculae strongly elevated throughout. Pronotum only 1/3 wider than long. Corial veins usually unspotted. Scutellum and male genital capsule either bicolored or entirely black.

Biology: Barber (1947) reported *tenellus* on *Sphaeralcea* sp., peaches, *Chrysothamnus speciosus* Nutt., shasta daisies, chrysanthemums, lilies, *Pluchea purpurea* (Sw.) DC, *Beta vulgaris* L., *Helianthus purascens* (Sw.) DC, *Erigeron canadensis* L., *Artemisia tridentata* Nutt., *Poa leibergii* Scribn., and *Parthenium argentatum* Gray, all from western states. It is apparent that, like many other species of *Nysius*, it has a wide range of host plants.



Map XXI. Distribution of *Nysius tenellus*

Distribution: In western North America *tenellus* ranges from British Columbia south to Arizona, Texas and Mexico. It also is reported by Barber (1947) to occur in Central America, the West Indies and Florida.

Florida Distribution: Although Barber (1947) says that *tenellus* occurs in Florida, he does not list Florida locality records in his long list of paratypes. Blatchley's (1926) record of *N. strigosus* Uhler from Miami may belong here. *N. tenellus* does occur in the Caribbean area as we have examined many specimens of *tenellus* from the West Indies. MONROE CO.: North Key Largo Key, 11-V-77, R. M. Baranowski, (RMB); same, 4-V-77, (RMB); same, 11-V-77, (NMNH); Everglades Nat. Pk., Flamingo Prairie, 25-III-73, C. W. O'Brien, (JAS).

NYSIUS SCUTELLATUS Dallas (map XXII)

Nysius scutellatus Dallas 1852:553.

Diagnosis: Bucculae high anteriorly, ending abruptly at or near base of head. Basal portion of lateral corial margins with prominent hairs.

This species has the high abruptly terminated bucculae of *tenellus* but is generally a darker species. It is very similar in habitus to *ericcae* (Schilling) of which it has sometimes been considered a synonym. The conspicuous hairs basally along the lateral corial margins will readily separate it from *tenellus*.

Biology: Nothing is known of its biology.

Distribution: Widespread in the West Indies, but apparently has not previously been reported from the United States.

Florida Distribution: ALACHUA CO.: High Springs 31-V-51, O. D. Link (on love grass), (NMNH); FRANKLIN CO.: Alligator Point, 26-IX-75, C. W. O'Brien, (JAS); MONROE CO.: Marathon Key, 19-VII-73, C. W. O'Brien, (JAS); OSCEOLA CO.: Kissimmee, 5-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); WAKULLA CO.: Wakulla Springs, 3-VI-69, J. Slater, T. Schuh, J.

Harrington, (JAS). UNKNOWN COUNTY: Everglades Nat. Pk., 26-XI-61, Slater, Woodward, Sweet, (JAS).



Map XXII. Distribution of *Nysius scutellatus*

ISCHNORHYNCHINAE Stal

This subfamily is closely related to the Orsillinae agreeing with the latter in the presence of dorsal spiracles, and usually (except *Kleidocerys*) with 2 nymphal abdominal scent glands between terga 4-5 and 5-6. It is distinguishable by the punctate clavus, non-depressed posterior margin of the pronotum, the symmetrical phallus and generally the translucent nature of the corium.

Representatives are found in all of the major zoogeographic regions. Fourteen genera are currently recognized of which only a single one occurs in North America.

KLEIDOCERYS Stephens 1829

Ischnorhynchus Fieber 1860:51.
Kleidocerys Stephens 1829:342.

Type Species: *Lygaeus resedae* Panzer 1797. Fixed by Barber 1953.

The members of this genus are hyaline rather glassy winged insects of an ovoid form, tapering anteriorly. The head, pronotum and scutellum are deeply punctate. The hemelytra are very large, extending both laterally and posteriorly beyond the abdomen. The apex of the corium generally nearly attains the end of the abdomen. The fore femora are mutic. The clavus has 3 regular rows of punctures. The nymphs are unusual in the subfamily in possessing 3 pairs of dorsal abdominal scent glands.

Distribution: Primarily Holarctic, although 1 species extends into Central America and the West Indies. Seven species are recognized in North America, 2 of which occur in Florida.

KEY TO FLORIDA SPECIES OF *KLEIDOCERYS*

1. Larger (4.5-5); preocular region of head longer than length of eye ... *resedae* p. 42
- 1'. Smaller (<3); preocular region of head subequal to or only very slightly longer than length of eye *virescens*, p. 43

KLEIDOCERYX RESEDAE Panzer
(map XXIII)

Kleidocerys resedae Panzer 1797:20.

Lygaeus didymus Zetterstedt 1819:71.

Phytocoris puncticollis Fallen 1829:37, 95.

Ischnorhynchus privignus Horvath 1894:173.

Diagnosis: Moderate sized (4.5-5.1), bright reddish brown with corium largely hyaline with irregular punctures. Base of head, interocular area, pronotal cicatrices and anterior portion of scutellum, a spot at posterior end of clavus and 4 vague spots along apical corial margin dark brown to

black. Labium reaching onto first abdominal segment.

Biology: *K. resedae* breeds commonly upon such unrelated plants as *Betula*, *Spiraea*, and *Rhododendron*. We have taken a breeding population in Illinois on morning glory and on *Rubus allegheniensis* Porter ex Bailey. Wheeler (1976a, b) has admirably summarized the life history and should be consulted for early literature records. Actually, while the species does show marked host preferences, it also is capable of breeding on many different plants including cattails (*Typha* sp.) alder, willow etc. Wheeler lists 43 species of plants, in 14 different families, upon which this insect has been found, and on many of these with nymphs. There is a definite preference for birch and spirea in our experience. This species merits careful investigation to see if there might be a complex of sibling species involved.

K. resedae has a stridulatory mechanism (Leston 1957) that can be heard when the insect is placed in a tube and the latter held to the ear. Heinrich (in litt.) has discovered a remarkable case in Maine where hundreds of adults of *K. resedae* stridulated in synchrony when disturbed. These insects were apparently ready to hibernate in debris in leaves below birch trees. It seems probable that this is a form of warning to small potential predators.

Distribution: The range is almost throughout North America. It is also widespread in the Palearctic Region. Although a common species in the northern states, it is scarce and local in Florida. Florida material is referable to the subspecies *geminatus* (Say).

Florida Distribution: Reported by Barber (191) as *Ischnorhynchus geminatus* from Jacksonville (true *resedae*) and by Blatchley (1926) from Basinger, Cape Sable and Dunedin. Some, at least of these latter records are questionable.

ALACHUA CO.: 16-X-51, (FSCA); Gainesville 25-IX-2-X-14, (AMNH); same, 3-I-64, D. Habeck, (FSCA); same, 4-IV-47, H. V. Weems, (FSCA); same, 3-IV-79, (adults and nymphs of *Liquidambar styraciflua* L.) D. Culbert, (FSCA); same, Ag. Experiment Station, J.E.W., (NMNH).

CLAY CO.: Goldhead Branch State Park, 10-2-55, F. W. Mead, (FSCA); **DUVAL CO.:** Jacksonville, 3-XI-11, (AMNH); same, 3-XI-11, H. G. Barber collection, (NMNH); **FRANKLIN CO.:** Jacksonville, 3-XI-11, (AMNH); same, 3-XI-11, H. G. Barber collection, (NMNH); **GADSDEN CO.:** Jacksonville, 3-XI-11, (AMNH); same, 3-XI-11, H. G. Barber collection, (NMNH); **HAMILTON CO.:** Jacksonville, 3-XI-11, (AMNH); same, 3-XI-11, H. G. Barber collection, (NMNH); **JACKSONVILLE:** Jacksonville, 3-XI-11, (AMNH); same, 3-XI-11, H. G. Barber collection, (NMNH); **ST. JOHN'S CO.:** Jacksonville, 3-XI-11, (AMNH); same, 3-XI-11, H. G. Barber collection, (NMNH); **TALLAHASSEE CO.:** Jacksonville, 3-XI-11, (AMNH); same, 3-XI-11, H. G. Barber collection, (NMNH); **WALKER CO.:** Jacksonville, 3-XI-11, (AMNH); same, 3-XI-11, H. G. Barber collection, (NMNH); **WASHINGTON CO.:** Jacksonville, 3-XI-11, (AMNH); same, 3-XI-11, H. G. Barber collection, (NMNH); **YALOGUE CO.:** Jacksonville, 3-XI-11, (AMNH); same, 3-XI-11, H. G. Barber collection, (NMNH); **ZIPACON CO.:** Jacksonville, 3-XI-11, (AMNH); same, 3-XI-11, H. G. Barber collection, (NMNH);

CO.: 3 mi NW Alligator Point, 7-III-76, (beating *Lyonia lucida*), G. B. Marshall, (JAS); LAKE CO.: Mascotte, 11-IX-38, Oman, (NMNH); Mascotte, 11-X-28, Andre, (NMNH); LIBERTY CO.: 27-III-54, R. F. Hussey, (FSCA); PASCO CO.: Newport Richy, 7-XI-38, Oman, (NMNH); PINELLAS CO.: Clearwater, 7-XI-38, Oman, (NMNH); Dunedin, 15-XII-20, W.S.B, (NMNH); same, 17-X-38, Oman, (NMNH); same, 7-X-38, Floyd Andre, (NMNH); same, 7-X-38, Oman, (NMNH); WALTON CO: Argyle, 31-XII-31, (on *Hypericum aspalathoides* Willd.), P. W. Oman, (NMNH).



Map XXIII. Distribution of *Kleidocerys resedae*

KLEIDOCERYS VIRESCENS (Fabricius) (fig. 28, map XXIV)

Acanthia virescens Fabricius 1794:70.
Ischnorhynchus pictipes Stal 1874:124-125.
Ischnorhynchus championi Distant 1882:193.
Ischnorhynchus thoracicus Ashlock 1960: 235-236.

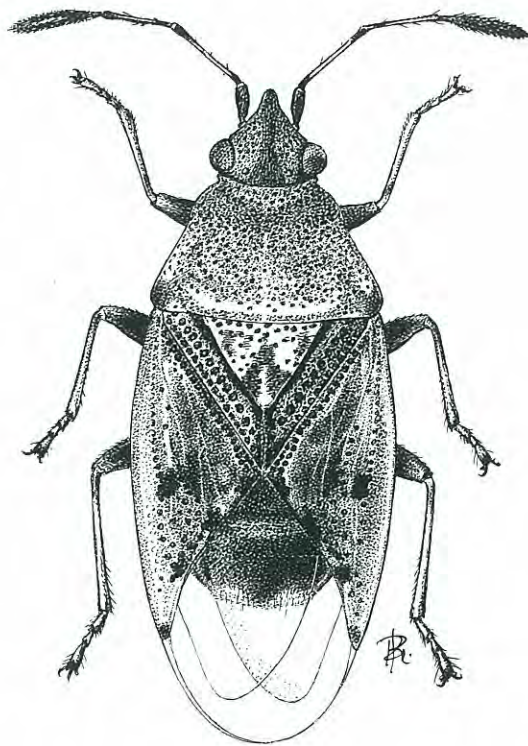


Fig. 28. *Kleidocerys virescens*

Diagnosis: Relatively small, with head, pronotum and scutellum ochraceous with fuscous punctures. Scutellum usually dark anteriorly with distal end pale. Labium exceeding posterior coxae.

Most records are under the name *championi* Dist., a junior synonym.

Biology: Hussey (1952) and Barber (1953) report specimens breeding on *Scoparia dulcis* L., an introduced plant and Barber also says it occurs on eggplant. We took breeding populations on Martinique on *Lobelia viridiflora* McVaugh.

Distribution: Primarily Neotropical, reported in the United States only from Texas, California and Florida. It is widespread in the West Indies.

Florida Distribution: Reported by Blatchley (1926) from Ft. Meyers and Dunedin, by Hussey (1952) from Lakeland and by Barber (1953) from Ft. Pierce, Vero Beach, Sanford, Lakeland and Tampa. DADE CO.: Miami, 7-VI-84, M. Thur-

mond, (FSCA); INDIAN RIVER CO.: Vero Beach, 9-XII-42, (on eggplant), (NMNH); MON-ROE CO.: Bahia Honda Key, 11-VI-69, Slater, Schuh, Harrington, (JAS); Key Largo, 26-II-56, H. V. Weems, Jr., (FSCA); ORANGE CO.: Orlando, 19-XII-56, F. W. Mead, (FSCA); PINELLAS CO.: Dunedin, 19-III-27, W. S. B. collection, (NMNH); same, 19-III, (NMNH); POLK CO.: Lakeland, 10-XI-50, R. F. Hussey, (FSCA); SEMINOLE CO.: Sanford, XI-XII-45, E. D. Ball, (NMNH); ST. LUCIE CO.: Ft. Pierce, 28-VII-83, K. L. Hibbard, (FSCA); Ft. Pierce, 7-XII-43, Tuthill, (NMNH).



Map XXIV. Distribution of *Kleidocerys virescens*

CYMINAE Stal 1862

The members of this subfamily are generally small dull testaceous to reddish brown coarsely punctate insects. Many of our species resemble (= mimic) seeds of the host plants (*Carex*, *Scirpus*, *Juncus*). The abdominal spiracles on segments 2 through 6 are dorsal, but usually ventral

on segment 7, although in some species all spiracles are dorsal (Hamid 1975). The bucculae are small, not extending caudad of the antenniferous tubercles. The posterior margin of the pronotum is usually not depressed.

Hamid's (1975) extensive world study illustrates well the dangers of defining groups on the basis of a few representatives. For example, the nymphal scent glands, which have usually been considered constant for most higher lygaeid taxa (and to be two in number located between abdominal terga 3-4 and 4-5 in the Cyminae), actually vary from three pairs to a single pair!

Actually, the systematic position of the subfamily is one involving not only relationships but systematic philosophy. Those who insist that all taxonomic groups must be monophyletic (holophyletic) probably would consider the Lygaeidae a paraphyletic taxon. In any event, the high chromosome number (20 to 28 autosomes + XY), the side by side method of copulation, and the short uncoiled gonoporal process suggests that the sister taxon may not lie within the Lygaeidae. Indeed, the Cyminae have been recently placed in three separate families vis: Berytidae (Southwood & Leston (1959), Malcidae (Stys 1967) and most closely related to the Piesmatidae (Drake & Davis 1958). All of which suggests isolation from other Lygaeidae and lack of definitive studies on the higher classification of the Pentatomomorpha. For the present the prudent course appears to be to retain the Cyminae within the Lygaeidae as has been done by Hamid (1975), whether or not one ultimately agrees with the recognition of paraphyletic taxa.

The majority of species, including all of those from North America, occur on rushes and sedges in damp areas. The biology of the species has not been carefully studied in Florida. However, Hamid (1971) studied the phenology of three species of *Cymus* in Connecticut and found that while adults occurred and fed upon host plants of three different genera of sedges and rushes, nymphs of a given species developed only upon a single host and where two species developed upon the same host plant there was a difference in the time of year when the developing nymphs were present. Thus, while one may find several species of Cyminae on a single host plant, there nevertheless appears to be a definite partitioning of resources both as breeding populations and in the time of year when development takes place.

Fourteen genera are known, segregated into 3 tribes containing 68 species. The subfamily is represented in all of the major zoogeographic regions of the world. Two of the three tribes occur in the Western Hemisphere, both with Florida representatives.

Three genera representing 2 tribes and 6 species occur in the southeastern states.

KEY TO THE TRIBES OF FLORIDA CYMINAE

1. Head strongly deflexed in front; eyes somewhat stalked and produced away from antero-lateral margins of pronotum; corium chiefly hyaline with only a few mesally located punctures, 3 pairs of nymphal scent glands present (visible as scars in adults), posterior pair sometimes rudimentary; 9th abdominal spiracles present. *Ninini*, p. 50
- 1'. Head not strongly declivent anteriorly; eyes usually in contact with or nearly in contact with antero-lateral pronotal angles; corium not hyaline, densely punctate over almost entire surface; 2 pairs of nymphal scent glands present; 9th abdominal spiracles absent. ... *Cymini*, p. 45

CYMINI Stal 1872

This tribe as defined by Hamid (1975) contains 4 genera. It may readily be recognized by the characters given in the preceding key. Of the 4 genera comprising the tribe, one is confined to islands in the Pacific Ocean and one is Australian and Oriental. The other 2 genera occur in most of the faunal regions of both the new and the old worlds and are represented in Florida.

KEY TO FLORIDA GENERA OF CYMINI

1. Seventh abdominal spiracle dorsal; 1st antennal segment considerably exceeding

apex of tylus; 3rd antennal segment more than twice the length of 2nd.

- 1'. Seventh abdominal spiracle ventral; 1st antennal segment usually not surpassing apex of tylus (surpassing tylus in *bellus*); 3rd antennal segment less than twice the length of segment 2. *Cymus*, p. 45

CYMUS Hahn 1831

Cymus Hahn 1831:76-77.

Arphanus Stal 1874:125.

Type Species: *Lygaeus clavicularis* Fallen 1807.
Fixed by Distant 1904.

The members of this genus are dull yellowish brown, coarsely punctate species of elongate oval shape with sessile eyes and with the tylus usually exceeding the distal end of the first antennal segment. Nymphs have a pair of abdominal scent gland openings, between terga 3-4 and a pair between terga 4-5.

This genus contains 33 species and is represented in all of the major zoogeographic regions of the world, but most species are found in the Holarctic and Ethiopian regions. Nine species occur north of Mexico of which one is northern, 4 western with three of the other 4 species widespread and occurring in the southeastern states. A fourth species is southeast coastal.

KEY TO SOUTHEASTERN SPECIES OF CYMUS

1. Head and 1st antennal segment in large part black; 1st antennal segment distinctly surpassing apex of tylus *bellus*, p. 46
- 1'. Head and 1st antennal segment testaceous brown or reddish, never in large part black; 1st antennal segment not distinctly surpassing apex of tylus 2
2. Third antennal segment 1.5 times length of segment 2. *angustatus*, p. 46

2. Third antennal segment less than 1.5 times length of segment 2, usually shorter than or subequal in length to segment 2. .3
3. Second antennal segment slightly longer than segment 3; size smaller (3.5 or less); scutellar carina usually indistinct *discors*, p. 48
- 3'. Second and 3rd antennal segments subequal in length; size larger (4.0 or greater); scutellar carina usually distinct *luridus*, p. 47

CYMUS BELLUS Van Duzee (map XXV)

Cymus bellus Van Duzee 1909:167.



Map XXV. Distribution of *Cymus bellus*

Diagnosis: Very small (3-3.2), oblong oval, dark brownish yellow with head and proximal three-fourths of first antennal segment and sometimes posterior lobe of pronotum black. Apex of clavus

and apical margins of corium usually fuscous. Membrane hyaline, with fuscous streak near apex. Pronotum distinctly elevated posterior to calli and markedly narrowed anteriorly. Median carina rather low, lateral carinae absent.

Biology: Van Duzee (1909) reports it as occurring apparently on *Juncus* in the pine barrens.

Distribution: Known only from Florida and Louisiana.

Florida Distribution: The Van Duzee types (1909) were from Seven Oaks (near Clearwater) and St. Augustine. It was subsequently reported by Barber (1914) from Jacksonville, and by Blatchley (1926, 1928) from Dunedin and Moore Haven, respectively. DUVAL CO.: Jacksonville, A. T. Slosson, (AMNH); HIGHLANDS CO.: Highlands Hammock State Park, 20 III-54, H. V. Weems, Jr., (FSCA); same, 3-IV-55, R. A. Morse, (FSCA); INDIAN RIVER CO.: Indian River, 6-III-30, J. R. Barass, (NMNH); PINELLAS CO.: Dunedin, 24-IV-27, W.S.B., (NMNH); Seven Oaks, 1-V-08, Van Duzee, (NMNH); ST. JOHNS CO.: St. Augustine, 12-III-01, W. J. Gerhard, (JAS).

CYMUS ANGUSTATUS Stal (fig. 29, map XXVI)

Cymus angustatus Stal 1874:126.

Diagnosis: Slender, elongate, nearly uniform pale testaceous or light brown, with 4th antennal segment, posterior 1/2 of pronotum and scutellum often darker. Pronotum elevated posteriorly, with inconspicuous median and lateral carinae. Scutellum lacking carina.

Biology: A common and widespread species occurring on *Carex*, *Scirpus*, and *Juncus*. Slatkine (1952) described the nymphs and the copulation method. Blatchley (1926) notes hibernation in the adult stage. Hamid (1971) studied the biology in Connecticut where it occurs with *luridus* and *discors*. He found that adults fed upon *Carex verticillata* L., *Scirpus* (L.) and *Juncus brachycephalus* (E.) B. However, nymphs developed only up

Carex vesicaria. Interestingly, although adults that had overwintered were found on the above plant about the same time as adults of *C. luridus* and mating and oviposition of both species occurred contemporaneously, the first instar nymphs of *angustatus* did not appear until early July in contrast to *luridus* whose nymphs were abundant near the end of May. Thus the two species were not in direct competition although development of the nymphs occurred on the same host plant.

Since both species reach the southern limits of their ranges in or just north of Florida, it is not known if this situation exists this far south.

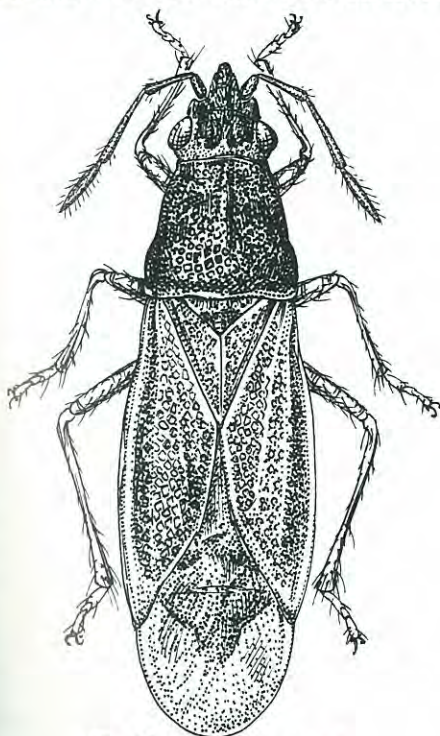


Fig. 29. *Cymus angustatus*

Distribution: Ranges across southern Canada and much of the United States west to Alberta, Colorado and Arizona. It is a very scarce and local species in the southeastern states.

Florida Distribution: Reported by Barber (1914) from Lake Worth. ALACHUA CO.: Waldo Road, 11-XI-27, H. E. Bratley, (FSCA); DUVAL CO.: (NMNH); GADSDEN CO.: 1-VIII-56, F. W. Mead, (FSCA); LEON CO.: Tall Timbers Res. Sta., 25-VII-72, (swept at night), C. W. O'Brien, (JAS); WAKULLA CO.: Wakulla, 20-IV-55, F. W. Mead, (FSCA); Shell Point Beach, 3-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS).



Map XXVI. Distribution of *Cymus angustatus*

CYMUS LURIDUS Stal

Cymus luridus Stal 1874:126.

Diagnosis: Relatively large (4.8-5), yellowish brown color with dark streak on either side of long median carina. Posterior end of clavus and an area near apical corial margin red. Corial apex with dark brown spot. Pronotum with distinct median and lateral carinae.

Biology: Hamid (1971) has studied the biology in Connecticut. As noted above it occurs with *C. angustatus* and breeds on *Carex vesicaria*. Unlike *angustatus*, this species occurs, according to Hamid, both as adults and nymphs only on the above host. Slater (1952) described the fourth and fifth instars and figured the latter. Hamid (1971) described the egg and first three instars.

fifth instars and figured the latter. Hamid (1971) described the egg and first three instars.

Distribution: Chiefly northern across Canada from Nova Scotia west to British Columbia and in the United States from New England to California. It is known to occur as far south as Georgia, Arkansas, and New Mexico.

Florida Distribution: Although not reported, it may occur in the northern part of the state.

CYMUS DISCORS Horvath (map XXVII)

Cymus discors Horvath 1908:559.

Diagnosis: Small (3.4), generally testaceous with head, calli, scutellum, and 4th antennal segment reddish brown. Apices of clavus and corium darker than remainder of hemelytra. Median and lateral pronotal carinae distinct.



Map XXVII. Distribution of *Cymus discors*

Biology: Hamid (1971) studied the life history of this species in Connecticut along with those of *angustatus* and *luridus*. He found adults on all three of the host plants discussed above under *angustatus*. However, in contrast to *angustatus* and *luridus*, this species breeds only late in the season on the seed heads of *Scirpus cyperinus*. Like the other species, it overwinters in the adult stage using *Carex vesicaria* and *Juncus brachycephalus* successively as food plants. Blatchley (1926) had previously reported *discors* on *S. cyperinus* and Torre-Bueno (1921b) reported the food plant as *Scirpus polyphyllus* Vahl. Slater (1952) described and figured the fifth instar nymph. Hamid (1971) described the egg and first four instars.

Distribution: The reported range is northern, but appears to not extend as far west as does that of *luridus*. It has been reported from Nova Scotia, Quebec and Ontario in Canada, west in the United States to Minnesota and Iowa and south to Georgia. Not previously known from Florida.

Florida Distribution: WAKULLA CO.: Shell Point Beach, 3-vi-69, Slater, Schuh, Harrington, (JAS).

CYMODEMA Spinola 1937

Cymodema Spinola 1837:213-215.

Type Species: *Cymodema tabida* Spinola 1837. Monobasic.

The members of this genus are light brown or greenish brown, sometimes with red streaks present. The body form is elongate and the dorsal surface is coarsely punctate. *Cymodema* species are very closely related to species of *Cymus* but differ as indicated in the key by the elongate 1st antennal segment and by the dorsal position of abdominal spiracle seven. The genus contains 5 species, 2 Nearctic; with representation also in the Oriental, Ethiopian, Australian and Neotropical regions. Only a single species has been taken north of Mexico.

CYMODEMA BREVICEPS (Stal) (map XXVIII)

Cymus breviceps Stal 1874:127.
Cymodema exiguum Horvath 1908:559.
Cymodema breviceps Hamid 1975:59-60.

Diagnosis: Moderate sized (3.6), light brown, with 1st 3 antennal segments concolorous, head and 4th segment darker. Pronotum with yellow line mesally on anterior half. Scutellum also with median yellow line. Corium and clavus rather transparent or translucent with apex of clavus and apical margin of corium darker.

This species is very closely related to species of *Cymus* and distinguishable primarily by the characters given in the generic key. Most of the early American literature is under the name *Cymus virescens* (F.).

Biology: Feeds on rushes and sedges in damp areas. Davis and Gray (1966), in a study of the occurrence of insects in the salt marshes of North Carolina, found it to be abundant on *Spartina patens* (Ait.) Muhl. and also to occur on *Distichlis spicata* L. Green and *Juncus roemerianus* Scheele. It seems likely that the grass mentioned is not an actual breeding host.

Distribution: Southern in the United States from New York and Indiana south to Florida and Louisiana. It occurs throughout the Neotropics including the West Indies to Argentina and Chile.

Florida Distribution: Reported by Van Duzee (1909) from Sanford, Crescent City, St. Petersburg, Tampa and Biscayne Bay, by Blatchley (1926) from Pahokee, Dunedin, Canal Point, Royal Palm Park, Istokpoga and Lake Okeechobee and by Hamid (1975) from Everglades National Park, and Palm Vista. ALACHUA CO.: Gainesville, 2-V-56, R. A. Morse, (RMB); DADE CO.: Biscayne Bay, A. T. Slosson, (AMNH); Everglades Nat. Pk., Palm Vista, 26-XI-61, J. A. Slater, (JAS); Homestead, 16-XII-74, J. A. Slater, (JAS); same, 8-XII-74, (JAS); same, 20-XI-74, J. A. Slater, (JAS); same, 24-XI-74, (JAS); Matheson Hammock, 22-X-54, H. V. Weems, Jr., (FSCA); ESCAMBIA CO.: Pensacola, 31-V-78, E. N. Bishop, (FSCA); GULF CO.: 25-III-54, T. H. Hubbell, (RMB); JACKSON CO.: 3 mi. SW Butlers, 12-IV-54, R. F. Hussey, (FSCA); MONROE CO.: Big Pine Key, 18-VII-73, C. W. O'Brien, (JAS); same, 1-XII-74, J. A. Slater,

R. M. Baranowski, (JAS); Stock Island, 31-VII-85, (blacklight trap), J. Bunch, (RMB); SEMINOLE CO.: Sanford, 21-IV-68, Van Duzee collection, (AMNH); WAKULLA CO.: 20-IV-55, F. W. Mead, (FSCA); 1 mi N. Spring Creek, 7-VII-73, (uv trap), G. B. Marshall, R. D. Kaplan, (JAS); Shell Point Beach, 3-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); WASHINGTON CO.: 5 mi east of Chipley, 3-VIII-60, W. C. Rhoads, (RMB).



Map XXVIII. Distribution of *Cymodema breviceps*

NININI Barber 1956

This tribe is quite dissimilar from the Cymini in having rather protrudent, often stalked eyes, a largely hyaline hemelytron, the apex of the scutellum bifid, and with a pair of nymphal scent glands, between abdominal terga 3-4, 4-5 and 5-6.

The tribe contains 5 genera. Of these, 3 occur in the Western Hemisphere, all of which are

primarily Neotropical. One genus has a representative in the southern United States.

CYMONINUS Breddin 1907

Cymoninus Breddin 1907:38.

Type Species: *Cymoninus subunicolor* Breddin 1907 = *Ninus sechellensis* Bergroth 1893. By original designation.

A genus of elongate slender species having a strongly declivent head with the clavus widened posteriorly. The corium is hyaline with a single median row of punctures and the costal margin strongly sinuate or concave and narrowed anteriorly.

The distribution of this genus is interesting as members are tropical or subtropical, but found in both the Eastern and Western Hemispheres. Four species are recognized. A single species occurs in Florida.

CYMONINUS NOTABILIS (Distant) (map XXIX)

Ninus notabilis Distant 1882:191.
Cymoninus notabilis Van Duzee, 1917:163.

Diagnosis: Small (3-3.3), elongate, slender. Head, pronotum and scutellum somewhat pubescent, dark reddish brown. Corium yellowish with extreme apex darkened. Legs dull yellow. Abdomen usually brownish or yellowish, sometimes, particularly in females, green. Apex of labium, distal tarsal segment fuscous. Second antennal segment 1.5 times length of segment 3.

Biology: Breeds upon sedges and rushes, but the degree of possible host plant specificity is unknown.

Distribution: Distinctly southern in this country, occurring only in Florida and probably along the Gulf Coast. It is widespread in the Neotropical Region including the West Indies.



Map XXIX. Distribution of *Cymus notabilis*

Florida Distribution: Reported by Van Duzee (1909) from Belleair; by Barber (1914) from Omond, Biscayne Bay, Lakeland, Titusville and Punta Gorda; by Blatchley (1926) from Duned and by Scudder (1957) from Loughman, Lcoochee, Homestead, Venice, Everglade, Mead, Ft. Pierce, Childs, Davenport, Hibernia, Belle, Palatka, Zolfo Springs, Lake Placid, South Bay, Cocoa, Marianna, Royal Palm St. Pk, and Plant City. ALACHUA CO.: 15-XI-53, H. V. Weems, Jr., (FSCA); 27-VIII-54, H. V. Weems, Jr., (FSCA); same, (RMB); Gainesville, 19-III-54, D. M. DeLong, (NMNH); same, 23-X-67, F. Mead, (RMB); same, 6-III-55, (RMB); same, 2-IV-25, T. H. Hubbell, (FSCA); same, 4-IV-39, B. Merrill, (RMB); Wauberg Lake, 2-III-24, T. Huttie, (NMNH); BREVARD CO.: 24-III-54, V. Weems, Jr., (FSCA); CHARLOTTE CO.: Punta Gorda, 28-III-73, C. & L. O'Brien

Kaplan, (JAS); DADE CO.: Everglades Nat. Pk., Pine Glade, 1-XII-61, J. A. Slater, (JAS); Grossman Hammock State Park, 24-V-72, R. M. Baranowski, (RMB); Homestead, 7-X-68, R. M. Baranowski, (RMB); same, 22-VIII-68, (RMB); same, 5-X-68, (RMB); same, 9-IX-68, (RMB); Paradise Key, 1-III-19, Barber, (NMNH); same, 3-II-19, Schwartzenberger, (NMNH); Royal Palm Park, 9-X-38, Oman, (NMNH); FRANKLIN CO.: Alligator Point, 26-IX-75, C. W. O'Brien, (JAS); GADSDEN CO.: Chattahoochee, 12-VIII-54, (at light), R. F. Hussey, (FSCA); GLADES CO.: 11 mi S.W. Palmdale, 22-VII-73, O'Brien & Marshall, (JAS); HENDRY CO.: La Belle, 1-IV-38, F. N. and D. M. DeLong, (NMNH); HIGHLANDS CO.: Archbold Biological Station, 25-V-57, A. N. Laesale, (FSCA); Highlands Hammock State Park, 20-III-54, H. V. Weems, Jr., (FSCA); Lake Placid, 13-VII-18, B. T. McDermott, (NMNH); Sebring, 11-XII-53, H. V. Weems, Jr., (FSCA); same, 20-III-55, (AMNH); same, 20-III-55, (RMB); same, 8-III-58, (RMB); same, 13 VIII, C. T. Parsons, (AMNH); same, 1-IX 16, (AMNH); HILLSBOROUGH CO.: Plant City, 24-I-44, (NMNH); INDIAN RIVER CO.: Sebastian, IV, G. Nelson, (AMNH); Vero Beach, 21-VII-39, P. W. Oman, (NMNH); JACKSON CO.: 4-VIII-54, F. W. Mead, (RMB); JEFFERSON CO.: 1 mi SW Wacissa, 7-X-73, C. W. O'Brien & G. B. Marshall, (JAS); Monticello, Big Bend Horticultural Laboratory, 19-IX-68, W. H. Whitcomb, (RMB); LAKE CO.: 12 mi N. Minneola, 16-VII-73, C. W. O'Brien & Marshall, (JAS); Astor, 11-VIII-87, F. W. Mead, (FSCA); LEE CO.: Sanibel Island, 9-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); MANATEE CO.: 27-II-54, F. W. Mead, (FSCA); Bradenton 17-III-44, (NMNH); Bradenton Beach, 16-III-63, F. W. Mead, (RMB); Lake Manatee Recreation Area, 14 mi. East Bradenton, Highway 64, 6-IX-87, K. E. Jenkins, (FSCA); Parrish, 8-X-38, Oman, (NMNH); MARION CO.: 9 SSW Ocala, 10-19-IX-75, (malaise trap), Wiley and Holler, (RMB); same, 19-IX-2-X-75, (RMB); Sharpes Ferry Field Station, 2-X-75, J. Wiley, (RMB); same, 27-VII-75, Drummond and Wiley, (RMB); Silver Springs, 4-VI-69, (at light), J. Slater, T. Schuh, J. Harrington, (JAS); MARTIN CO.: 21-VI-65, F. W. Mead, (RMB); 5-XI-54, H. V. Weems, Jr., (RMB); MONROE CO.: Big Pine Key, 1-XII-74, J. A. Slater, R. M. Baranowski, (JAS); same, Key Deer Refuge, 5-XI-82, F. Klett, (RMB); same, Watson Hammock, 4-XI-82, R. M.

Baranowski, (RMB); Key West, 29-XII-54, H. V. Weems, Jr., (RMB); Stock Island, 12-X-66, F. A. Buchanan, (RMB); same, 9-X-63, (blacklight trap), F. A. Buchanan, (RMB); Stock Island, 9-X-63, F. A. Buchanan, (RMB); NASSAU CO.: 20-VIII-54, F. W. Mead, (RMB); Hilliard, 5-X-38, Oman, (NMNH); ORANGE CO.: Orlando, 2-7-18, G. G. Ainslie, (NMNH); PINELLAS CO.: Clearwater, 7-X-38, Oman, (NMNH); Dunedin, 10-III-27, W.S.B., (NMNH); same, 25-II-21, W.S.B collection, (NMNH); same, 7-X-38, Floyd Andre, (NMNH); POLK CO.: Bartow, Kissengen Springs, 24-VII-48, R. F. Hussey, (FSCA); Haines City, 17-IX-54, H. V. Weems, Jr., (RMB); Lake Wales, 24-III-73, O'Brien & Kaplan, (JAS); 26-III-54, F. W. Mead, (FSCA); Lakeland, 10-XI-11, H. G. Barber, (NMNH); PUTNAM CO.: 31-I-57, F. W. Mead, (RMB); 2 mi N.W. Orange Springs 13-X-5-XI-75, (malaise trap), J. Wiley, (RMB); 2 mi NW Orange Springs, 27-VIII-10-X-75, (malaise trap), J. Wiley, (RMB); SARASOTA CO.: Myakka River State Park, 3-IX-54, H. V. Weems, Jr., (FSCA); same, (RMB); Sarasota, 16-I-87, G. Johnson, (FSCA); Sarasota, 21-I-44, (NMNH); Venice, 4-V-61, H. V. Weems, Jr., (RMB); same, 8-X-38, Oman, (NMNH); SEMINOLE CO.: 3 mi W. Sanford, 26-I-74, C. W. O'Brien & Marshall, (JAS); Junct. Hwy. 46, Wekiwa R., 26-I-74, C. W. O'Brien & G. B. Marshall, (JAS); Sanford, 1925, E. D. Ball, (NMNH); same, 7-VII-28, (NMNH); same, IX-XII-25, (NMNH); VOLUSIA CO.: Deland, 27-III-67, M. A. Deyrup, (AMNH); Edgewater, 2-II-39, C. A. Frost, (NMNH); WAKULLA CO. 20-IV-55, F. W. Mead, (AMNH); 20-IV-55, F. W. Mead, (RMB); WASHINGTON CO.: 5 mi E Chipley, 31-VIII-60, W. C. Rhodes, (RMB).
UNKNOWN COUNTY: Hart City, 24-I-44, (NMNH); Everglades National Park, 29-I-59, H. V. Weems, Jr., (RMB).

BLISSINAE Stal

The members of this subfamily, which includes the chinch bugs and their relatives, are unusual in the Lygaeidae in that they feed by sucking sap from plant tissues rather than by feeding primarily on seeds. It is a large subfamily and is represented in all major zoogeographic areas. The

subfamily is characterized by the position of the abdominal spiracles which are located dorsally on segments 2 through 6, and ventrally on segment 7; the abdominal sutures straight and complete to the margins of the abdomen; nymphal dorsal scent gland openings present between terga 4-5 and 5-6; hemelytra impunctate with rounded lateral pronotal margins.

Slater (1979) should be consulted for a world perspective of the systematics, phylogeny and zoogeography of the subfamily.

KEY TO FLORIDA GENERA OF BLISSINAE

1. Fore coxal cavities closed posteriorly (fig. 30); body relatively elongate and slender *Ischnodemus*, p. 57



Fig. 30. *Ischnodemus*, coxal cavities

- 1'. Fore coxal cavities open posteriorly (fig. 31); body relatively short and straight *Blissus*, p. 52

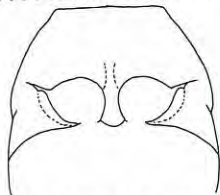


Fig. 31. *Blissus*, coxal cavities

BLISSUS Burmeister 1835

Blissus Burmeister 1835:290.
Neoblissus Bergroth 1903:253.

Type Species: see Slater 1979:73-74. (*Lygaeus leucopterus* Say 1831).

A large genus of pruinose dark gray to black species with strongly contrasting white areas on the hemelytra. Fifteen species are known from north of Mexico and there are 9 additional species distributed widely throughout the Western Hemisphere. Old World species listed as *Blissus* are not congeneric with Western Hemisphere taxa. There probably are a number of undescribed species.

Some of the members of this genus are of great economic importance because of their attacks on corn, wheat, oats and lawn grasses. They are generally called "Chinch Bugs".

The Florida species have been carefully analyzed by Leonard (1966, 1968) whose valuable papers should be studied for details of the biology, cytology and taxonomy of American species of this genus.

KEY TO FLORIDA SPECIES OF BLISSUS

1. Length of abdomen and scutellum more than 4.2 times the median length of pronotum; metasternum without a distinct, median longitudinal groove *minutus*, p.53
- 1'. Length of abdomen and scutellum less than 4 times median length of pronotum; metasternum with a distinct, median longitudinal groove. 2
2. Length of labial segment 2 exceeding width of interocular space; labium usually surpassing mid-portion of metasternum. *insularis*, p. 55
- 2'. Length of labial segment 2 subequal to width of interocular space; labium generally not surpassing middle of metasternum 3
3. Pronotum nearly unicolorous gray, posterior lobe of pronotum not conspicuously black, nor strongly contrasting with gray coloration of anterior lobe *maritimus arenarius*, p. 54
- 3'. Pronotum with posterior lobe black, strongly contrasting with gray color of anterior lobe. *leucopterus*, p. 57

***BLISSUS MINUTUS* (Blatchley)**
(map XXX)

Ischnodemus pusillus Blatchley 1925a:45-46.
(preocc.)

Ischnodemus minutus Blatchley 1925:45.

Blissus minutus Leonard 1966:18-20.

Diagnosis: Small (3.4), slender, parallel sided, superficially resembling a small species of *Ischnodemus* (in which genus it was originally described).

The open front coxal cavities definitely place it as a member of the genus *Blissus*.

Biology: Leonard (1968) reports it as occurring on coastal beaches and dunes where it breeds on sea oats, *Uniola paniculata* L., however it probably is not monophagous as we have taken it on Big Pine Key in Watson Hammock where no sea oats occur. It apparently overwinters in the adult stage.

Distribution: Known only from Florida. This is probably the species that Schwarz (1888) and Heidemann (1889) were referring to. However, it is important to consider the possibility that *B. insularis* may be involved. Schwarz (1888) makes the following interesting statement "in all my travels in central and southern Florida, I do not remember having found the chinch bug in considerable numbers in the interior of the country; in fact, I never found a single specimen in the valley of the St. John's River". Heidemann (1889) quotes Howard as saying that all of Schwarz' chinch bugs were peculiar in having quite sharply pointed elytra and as being always from the seashore in Dade Co.

Florida Distribution: According to Leonard (1966) known only from the Florida Keys and the west coast of Florida. On the east coast it appears to be replaced on the same host by *Blissus arenarius maritimus* Leonard. Originally described by Blatchley (1925a) as *Ischnodemus pusillus* from Dunedin and reported by Blatchley (1926) from Royal Palm Park and by Leonard (1968) from Bahia Honda Key. BROWARD CO.: Pompano Beach, 21-II-84, D. M. Leone, (FSCA); Pompano, 10-IX-38, Oman, (NMNH); DADE CO.: Homestead, 20-VII-48, B. T. McDermott, (JAS); Opa-locka, 13-XI-59, L. J. Daigle, (FSCA);

FRANKLIN CO.: Alligator Point, (on *Sesuvium portulacastrum* (L.) L.), 18-VII-76, G. B. Marshall, (JAS); Alligator Point, 12-III-76, C. W. O'Brien, (JAS); HILLSBOROUGH CO.: South of Picnic, 8-X-38, Oman, (NMNH); LEVY CO.: Cedar Key, 16-V-79, Nell G. Bachus, (FSCA); Cedar Key, 12-VI-39, Oman, (NMNH); MONROE CO.: Big Pine Key, 26-III-73, (at night), O'Briens & Caplan, (JAS); same, 17-II-75, (at night), L. B. O'Brien, (JAS); same, 18-VII-73, (night), O'Brien & Marshall, (JAS); same, 26-III-73, C. W. & L. B. O'Brien, (JAS); same, Watson Hammock, 10-IV-81, R. M. Baranowski, (RMB); same, (NMNH); same, 5-XI-80, (RMB); Key Largo, 19-VII-39, Oman, (NMNH); Long Key, 14-III-47, R. H. Beamer, (NMNH); PALM BEACH CO., Boca Raton, 28-III-84, D. M. Leone, (FSCA); PASCO CO.: Hudson, 13-VII-39, Oman, (NMNH); PINELLAS CO.: Dunedin, 10-III-27 W. S. B., (NMNH); same, 4-XII-25, W. S. B., (NMNH); same, 7-X-38, Floyd Andre, (NMNH); ST. LUCIE CO.: Ft. Pierce, 29-I-79, (on bamboo), E. W. Campbell, (FSCA); Pt. St. Lucie, 23-V-79, E. W. Campbell, (FSCA); VOLUSIA CO.: Edgewater, 14-III-39, C. A. Cross, (NMNH).



Map XXX. Distribution of *Blissus minutus*

BLISSUS ARENARIUS MARITIMUS
Leonard
(map XXXI)

Blissus arenarius maritimus Leonard 1966:18-20.

Diagnosis: Relatively large (3.8). Pronotum almost uniformly gray, not conspicuously black on posterior lobe. Second labial segment longer than interocular space.

Biology: Like *minutus*, this is a coastal dune and beach inhabiting species and breeds only on sea oats, *Uniola paniculata*.



Map XXXI. Distribution of *Blissus arenarius maritimus*

Distribution: Occurs along the coast in the southeastern states from North Carolina south at least to Jupiter, Florida. Within Florida it appears to

be restricted to the northern two thirds of the east coast. Northward it is replaced by the typical subspecies which breeds on *Ammophila breviculata* Fernald, which extends northward into the Canadian Maritime Provinces.

Florida Distribution: Apparently reported by Schwartz (1888) as *leucopterus* from southeastern Florida (record perhaps of *minutus*?). The type series was described by Leonard (1966) from Fernandina Beach, Ft. Clinche Park, Jupiter and Ft. George. COLLIER CO.: 6 mi E. Ochopee, 21-VII-73, (night), C. W. O'Brien, (JAS); LAKE CO.: Leesburg, 25-VIII-61, C. H. Kern, (AMNH); MARTIN CO.: Stuart, 17-19-III-39, F. E. Lutz, (AMNH); MONROE CO.: N. Key Largo, 3-I-69, R. M. Baranowski, (NMNH); PALM BEACH CO.: Jupiter, V-48, M. Cazier, (AMNH); Lake Worth, A. T. Slosson, (AMNH); Riviera Beach, 6-VII-70, C. V. Reichart, (on sea oats), (JAS); PINELLAS CO.: 8-VIII-86, F. W. Mead, (FSCA); VOLUSIA CO.: Ponce City, 11-VI-75, L. W. Holly, (FSCA).

BLISSUS INSULARIS Barber
(fig. 32, map XXXII)

Blissus leucopterus insularis Barber 1918b:38-39.
Blissus insularis Barber 1937:82.

Diagnosis: Posterior pronotal lobe black, strongly contrasting with gray color of anterior lobe. Second labial segment longer than interocular space. Labium frequently extending posteriorly beyond middle of mesosternum.

Biology: Leonard (1966, 1968) described the nymphs and analyzed the biology and taxonomy. In southern Florida breeding appears to continue sporadically throughout the winter whereas further north there is some hibernation and only adults are present. In addition to feeding on *Stenotaphrum secundatum* (Walt.) it has also been reported feeding on *Panicum repens* L., *Digitaria decumbens* Stent., and occasionally on *Eremochola ophiuroides* (Munro Hack), *Cynodon dactylon* (L.) Pers. and *Oryza sativa* L. Slater (1976) believes that the records of *leucopterus* on sugar cane refer to this species.

Reinert and Kerr (1973) reported that *insularis* has 3 and a partial 4th generation in northern Florida while there are 6-7 generations a year in south Florida. Adults and nymphs are usually active the year round in Florida, although in the winter the majority of the population consists of adults.

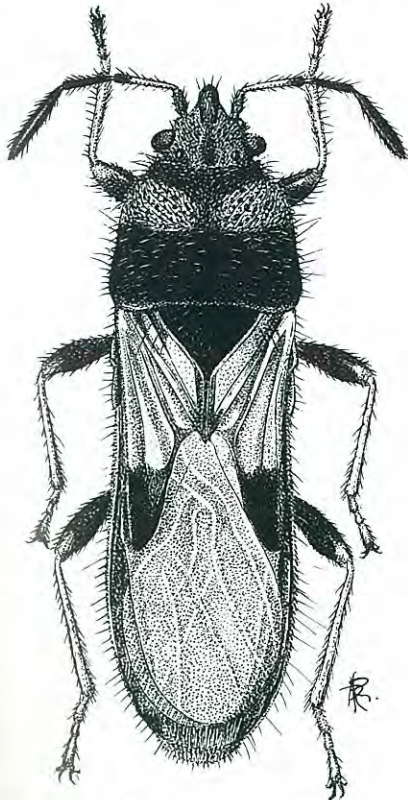
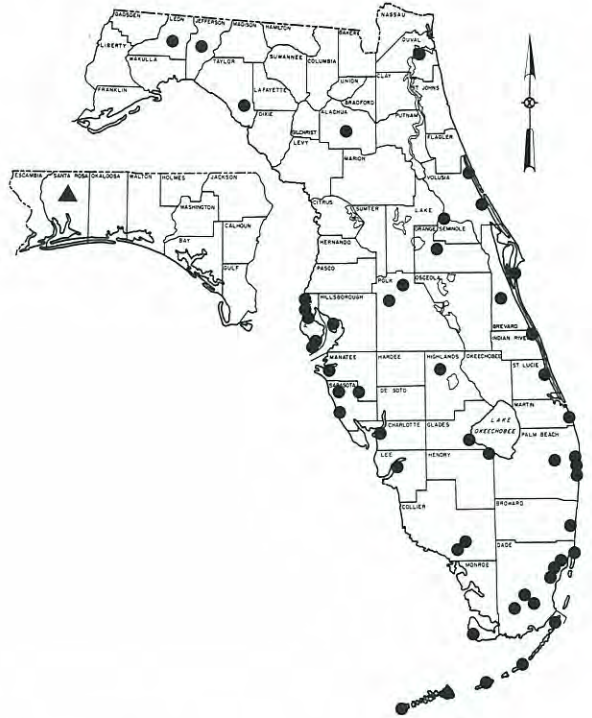


Fig. 32. *Blissus insularis*

and the nodes of the runners. The species is predominantly brachypterous. It is parasitized by the hymenopteran egg parasite, *Eumicrosoma benefica* Gahan. The most important predators appear to be another lygaeid, *Geocoris uliginosus* (Say) and an anthocorid, *Lasiochilus* sp.



Map XXXII. Distribution of *Blissus insularis*

Populations decrease drastically in the winter and damage to grass is reduced. During late March and early April in northern Florida and in February in south Florida, there is first, a large increase in the number of first instar nymphs, then a decline in adults, followed by a rapid increase in overall populations. These authors reported that the chinch bug prefers sunny open areas of lawns where they can be found in concentrations that frequently number 500-1000/ft². As many as 2,300/ft² have been collected. The eggs are inserted into protected places and are often found in crevices at the grass nodes or nearly hidden between overlapping grass blade bases. On St. Augustine grass, the feeding is largely limited to the tender basal growing portion of the grass blades

Distribution: Distributed from southern North Carolina throughout Florida including the Keys (at least to Big Pine) and westward through the Gulf States into Texas and probably Mexico. According to Leonard (ibid.) the West Indian records do not pertain to *insularis*, however further study is indicated as the habits of a chinch bug on many of the islands is very similar. Wolcott (1936) in fact reported *insularis* injuring *Panicum maximum* Jacq. in the Greater Antilles and Slater (1976) reports breeding on *Panicum bartowense* Scribn. & Merr. and occurring on *Axonopus compressus* (Sw.) Beauv. in the Lesser Antilles.

Florida Distribution: Reported as *leucopterus* by Van Duzee (1909) from Ft. Meyers and Sanford;

by Barber (1914) from Miami, Punta Gorda, Lake Worth, Biscayne Bay, Belleair, Ormond, Jacksonville and Everglade; by Blatchley (1926) from Lakeland, Moore Haven and Dunedin and as variety *insularis* from Royal Palm Park and Dunedin and by Leonard (1966) from Miami, Everglades National Park, and (1968) Homestead. ALACHUA CO.: Gainesville, 12-VI-81, M. Luhrman, (FSCA); same, 18-VII-16, R. N. Wilson, (NMNH); same, 19-X-66, F. W. Mead, (FSCA); same, 21-II-79, (FSCA); same, 25-IX-55, (on *Stenotaphrum secundatum* H. A. Denmark, (AMNH); same, 25-IX-55, H. A. Denmark, (RMB); same, 8-VII-16, R. N. Wilson, (NMNH); BREVARD CO.: Cocoa Beach, 5-VI-81, F. A. Smith, (FSCA); Lake Washington, 16-VII-76, R. M. Baranowski, (RMB); same, 5-XII-70, J. A. Slater, R. M. Baranowski, (RMB); BROWARD CO.: Ft. Lauderdale X-51, F. P. Clements, (NMNH); same, 18-IX-86, T. Phillips, (FSCA); same, 26-II-57, J. M. Soowal, (RMB); same, 6-1-53, (NMNH); CHARLOTTE CO.: Punta Gorda, 4-VIII-80, Z. S. Smith, (FSCA); COLLIER CO.: East of Ochopee, 9-X-38, Oman, (NMNH); Ochopee 14-VI-77, (at night), C. W. O'Brien & G. J. Wilmer, (JAS); DADE CO.: Coral Gables, 29-V-53, (NMNH); same, 19-VII-61, J. M. McQuaide, (RMB); Everglades National Park, 17-III-62, R. M. Baranowski, (RMB); same, 22-III-62, (RMB); same, 22-III-62, (RMB); same, Palm Vista, 26-XI-61, Slater, Woodward, Sweet, (JAS); Florida City, 25-V-53, (NMNH); Homestead, 5-X-68, R. M. Baranowski, (RMB); Miami Beach, 10-IX-38, Oman, (NMNH); Miami, 10-X-38, P. W. Oman, (NMNH); same, 29-VII-54, O. D. Link, (FSCA), same, 29-XI-61, D. E. Leonard, (NMNH); same, 5-XI-11, (AMNH); Belleair, A. T. Slosson, (AMNH); Royal Palm Park, 22-VII-48, R. H. Beamer, (NMNH); same, W.S.B. 16-XII-29, H. G. Barber (ex Blatchley collection), (NMNH); S. Miami, 20-XX-52, F. Butcher, (NMNH); DUVAL CO.: Jacksonville, 13-VII-54, H. S. Mayeux, (NMNH); same, 6-VIII-63, T. S. Josie, (RMB); HENDRY CO.: Clewiston, 4-II-44, M. Wright, (NMNH); HIGHLANDS CO.: Sebring, 17-VII-58, H. V. Weems, Jr., (FSCA); same, 8-III-58, (RMB); HILLSBOROUGH CO.: Tampa, 25-V-44, (NMNH); Tampa, 25-V-44, (NMNH); PALM BEACH CO.: West Palm Beach, 18-II-44, (NMNH); INDIAN RIVER CO.: Sebastian, 20-XI-86, R. H. Kendrick, (FSCA); JEFFERSON CO.: 1 mi S. Wacissa, 18-IV-86, C. W. O'Brien,

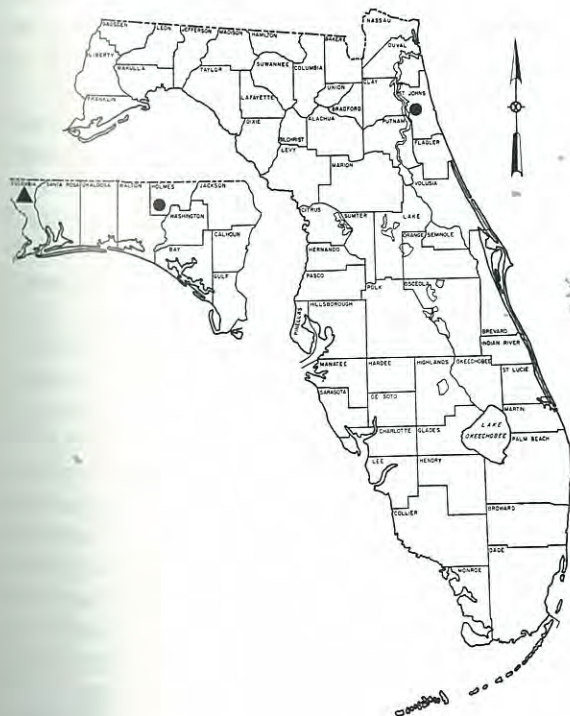
(JAS); 2 mi N. Wacissa, 7-IX-73, C. W. O'Brien, (JAS); LEE CO.: Ft. Meyers, 28-V-88, K. Jenkins, (FSCA); LEON CO.: Tallahassee, 28-VI-76, G. B. Marshall & Justice, (JAS); MANATEE CO.: Bradenton, 22-I-44, (NMNH); Myakka St. Park, 15-VII-66, R. Allen, (JAS); MARTIN CO., 21-VI-65, F. W. Mead, (RMB); 5-XI-54, H. V. Weems, Jr. (AMNH); 25-30-VIII-61, C. H. Kern (AMNH); Hobe Sound, 3-III-44, (NMNH); MONROE CO.: Big Pine Key, 2-XII-61, D. E. Leonard, (NMNH); same, 30-XI-61, (JAS); Key Largo, 19-VII-39, Oman, (NMNH); same, 19-VII-39, R. H. Beamer, (NMNH); same, 2-XII-61, D. E. Leonard, (NMNH); Lower Matecumbe Key, 29-VII-62, F. W. Mead, (RMB); Marathon Shores, 23-VI-62, C. Nafager, (RMB); Middle Cape Sable, Everglades National Park, 8-IV-66, H. V. Weems, Jr., (RMB); North Key Largo Key, 16-V-77, R. M. Baranowski, (RMB); same, 11-V-77, (RMB); Stock Island, 27-XII-54, H. V. Weems, Jr., (RMB); ORANGE CO.: 20-V-54, G. B. Merrill, (RMB); Orlando, 10-V-54, H. A. Denmark, (RMB); PALM BEACH CO.: Boynton Beach Kenlawn R&D Center, 8-X-81, M. K. Kennedy, (NMNH); Boynton Beach, 31-VII-72, W. H. Pierce, (FSCA); Loxahatchee, 1-VIII-72; W. H. Pierce, (FSCA); Palm Beach, (NMNH); PINELLAS CO.: Cabbage Key, 24-X-63, F. W. Mead, (RMB); Tarpon Springs, 22-VII-51, R. F. Hussey, (FSCA); Gulfport, 11-IX-63, W. C. Carroll, (FSCA); POLK CO.: Lakeland, 12-VII-48, R. F. Hussey, (FSCA); same, 25-VII-48, (NMNH); 18-VII-63, B. E. Tyner, (RMB); Polk City, 11-IX-38, Oman, (NMNH); SANTA ROSA CO.: 16-VIII-55, F. W. Mead, (RMB); SARASOTA CO.: 31 mi SE Sarasota, Hwy. 72, 27-VII-76, (at night), C. W. O'Brien, (JAS); Orange Grove B, Ridge Road Sarasota, 17-VII-66, R. Allen, (JAS); Venice, 4-V-61, H. V. Weems, Jr., (RMB); SEMINOLE CO.: Sanford, 1925, E. D. Ball, (NMNH); same, 27-III-26, (NMNH); same, 26-IV-08, Van Duzee collection (AMNH); ST. LUCIE CO.: 22-XI-55, N. C. Hayslip, (RMB); Ft. Pierce, 7-XII-43, (NMNH); same, 11-VIII-71, A. Kretchmer, (FSCA); TAYLOR CO.: 5 mi S. Salem, 26-III-76, G. B. Marshall, (JAS); VOLUSIA CO.: Edgewater, 20-II-39, C. A. Frost, (NMNH).

BLISSUS LEUCOPTERUS (Say)
(map XXXIII)

Blissus leucopterus Stal 1874:133.

Biology: This is the infamous "Chinch Bug" that has frequently caused extensive damage to small grains and corn in the midwestern states. There is an enormous literature on the species, much of which is listed in Slater (1964). Leonard (1966) should be consulted for a summary of the life history, wild and cultivated food plants, parasites, predators, diseases and cytogenetics.

Florida Distribution: Although previously unrecognized in Florida, Leonard's (1966) maps indicates its presence in the southern part of the Gulf States. The records from northern Florida on *Sorghum bicolor* ssp. *drummondii* (as *vulgare*) and *Panicum miliaceum* L. are therefore not unexpected. ESCAMBIA CO.: 3-VIII-55, (on *Zea mays*), F. W. Mead, (FSCA); HOLMES CO.: Westville, 10-VIII-81, (on *Panicum miliaceum*), H. McKeown, (FSCA); ST. JOHNS CO.: Hastings, 26-VII-77, (at *Sorghum vulgare*), R. Workman, (FSCA).



The genus is very large with representation in all of the major zoogeographic regions of the world. Most species occur in the Neotropical and Ethiopian regions with 8 or 9 occurring in Florida.

KEY TO FLORIDA SPECIES OF ISCHNODEMUS

1. Dorsal surface of head and pronotum largely pruinose (fig. 33).....2

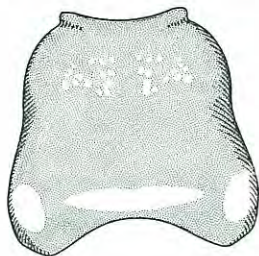


Fig. 33. Pronotum

- 1'. Dorsal surface of head and pronotum with little or no pruinosity (at most a narrow strip present along posterior margin of pronotum (fig. 34).....5

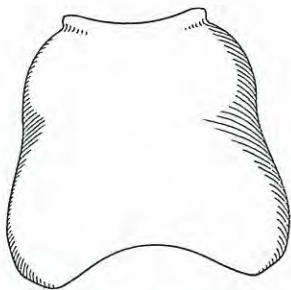


Fig. 34. Pronotum

2. Antennal segment II longer than IV; membrane sordid.....*fulvipes*, p. 69
- 2'. Antennal segment II not longer than IV; membrane pale.....3
3. Sub-basal shining pronotal areas consisting of 3 separate areas, a pair of lateral ovoid spots and a separate median bar (fig. 33); a dark spot present at corial apex; ratio of total length to interocular distance usually less than 10.5.....4
- 3'. Sub-basal band of pronotum unbroken, completely shining from one lateral margin to another (fig. 35); no dark spot present at corial apex; ratio of total length to interocular distance generally greater than 11.0.....*robustus*, p. 67

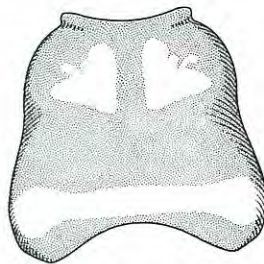


Fig. 35. Pronotum

4. A distinct small dark area present in membrane adjacent to apical corial spot; first 3 antennal segments usually pale sepia to dark chestnut or blackish brown; veins often concolorous with membrane, or only slightly contrasting...*rufipes*, p. 69
- 4'. No dark area present in membrane adjacent to apical corial spot; first 3 antennal segments usually tawny to buffy yellow; veins buffy brown to sepia, noticeably contrasting with pale membrane.....*praecultus*, p. 66
5. A distinct median longitudinal groove present on anterior lobe of pronotum.....6
- 5'. No median groove (at most, an indistinct, broad, shallow, median, longitudinal depression) present on anterior lobe of pronotum.....7
6. Head and quadrate patches on anterior pronotal lobe concolorous (or if pronotal patches lighter than part of head, then vertex of head also lighter); total labial length less than 2.75 times length of second antennal segment; length of second antennal segment usually more than interocular distance; connexivum, if showing yellow, then only along extreme lateral margin.....*conicus*, p. 61
- 6'. Head darker than, and contrasting with, large quadrate patches on anterior pronotal lobe (fig. 38); total labial length more than 2.75 times length of second antennal segment; usually length of second antennal segment subequal to or less than interocular distance; connexivum usually entirely yellow from lateral to median margin.....*badius*, p. 59
7. Total labial length equal to or exceeding total antennal length; a narrow strip of pruinosity present across extreme

posterior margin of pronotum (fig. 35);
ventral prothoracic pruinosity pattern
bordered by sinuous longitudinal lines at
level of lateral margins of coxal cavities
(fig. 36)......*lobatus*, p. 65

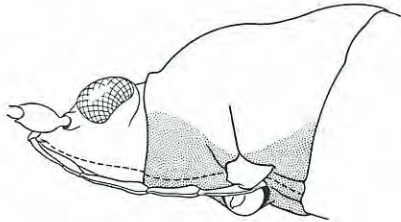


Fig. 36. Prothorax, lateral view

7. Total labial length appreciably less than
total antennal length; no narrow strip of
pruinosity present across pronotal base
(or, if present, then pruinosity also pre-
sent covering most of ventral surface of
prothorax (fig. 37), rather than following
the pattern of fig. 36)..... 8

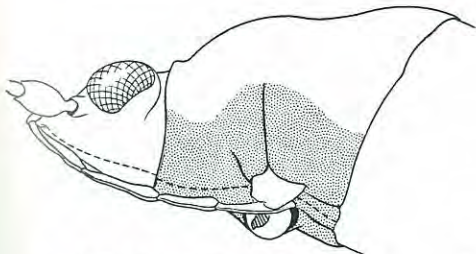


Fig. 37. Prothorax, lateral view

8. Pruinosity covering most of ventral sur-
face of prothorax; a narrow strip of
pruinosity present across posterior margin
of pronotum (fig. 35).
.....*brunnipennis*, p. 62
8'. Ventral prothoracic pruinosity pattern
confined to median portion of prothorax
and bordered by sinuous longitudinal
lines at level of lateral margins of coxal
cavities (fig. 36).*slossonae*, p. 64

ISCHNODEMUS BADIUS Van Duzee
(fig. 38, map XXXIV)

Ischnodemus badius Van Duzee 1909:168-169.

Diagnosis: Large (5-7), elongate, pale yellowish to brown shining species. Head dark, contrasting with largely yellowish brown pronotal calli.

I. badius is almost always micropterous with the wings reduced to minute pads. Although macropterous individuals are known, none is represented among the many specimens we have examined from Florida.

Biology: Davis and Gray (1966) have studied the biology of *badius* which they state is one of the characteristic insects of *Spartina alterniflora* Loisel associations in North Carolina salt marshes. The species only occurs upon *S. alterniflora*. Over wintering is in the adult stage beneath the bases of leaves of the host plant. These authors note that flightless individuals (the bulk of all populations) which cannot escape high water in the marsh by flying are capable of swimming to new host plants. Rey (1981) in an extensive study of *Spartina* islands in northwest Florida also indicates that this is an abundant species on *Spartina alterniflora*. These studies illustrate well the necessity for voucher specimens as there appears to be a possible problem of identification and the above authors may actually have been working with *I. conicus*. Harrington (1972) says that the host plant of *badius* in North Carolina is *Spartina patens*. This statement is based upon collections of *I. conicus* and *I. badius* where *I. conicus* was on *Spartina alterniflora* and *I. badius* adjacent to it, only on *S. patens* (Ait.) Muhl. It would be interesting to know if this is displacement of one species from its natural host plant by the other in view of the findings of Davis and Gray (1966) who do not recognize *I. conicus* in the North Carolina fauna. We took nymphs and adults in Florida on *Spartina bakeri* Merr.

While this species is distributed along the coast throughout most of its range in Florida, it occurs inland along what are possibly old beach terraces.

Distribution: Primarily a coastal species, occurring on the damp margins of sandy beaches as well as in marshy areas. Across central Florida, it is a very common species on its host plant inland as well as along the coast. It is found from southeast-

3-VII-38, Hubbell & Friauf, (NMNH); Sea Horse Key, 7-IX-57, H. V. Weems, Jr., (JAS); same, (RMB).



Map XXXV. Distribution of *Ischnodemus conicus*

ISCHNODEMUS BRUNNIPENNIS
(Germar)
(figs. 37, 39, map XXXVI)

Pachymerus brunnipennis Germar 1837:140-141.
Ischnodemus brunnipennis Walker 1872:129.

Diagnosis: Smaller than preceding two species. Shining black with prominent silvery dorsal pubescence. Recognized by reddish tan to yellowish posterior pronotal lobe contrasting strongly with black anterior lobe.

It may, of course, be recognized by the distinctive pruinosity pattern as noted in the preceding key.

Biology: Harrington (1972) reports it breeding in Florida on *Panicum hemitomon* Schult. and C. W. O'Brien collected a long series of adults and nymphs on *Sacciolepis striata* L. Nash. These host plants appear to be confined largely to the eastern and southern coastal plain. Harrington (1972) states however, that the distribution of *brunnipennis* is much greater than this, so other host plants must be utilized. Slater's (1976) quote of Harrington as questionably breeding on *Spartina pectinata* Link is in error.

While it is primarily found in the brachypterous and micropterous condition, macropters are not rare.



Map XXXVI. Distribution of *I. brunnipennis*

Distribution: *I. brunnipennis* apparently has a disjunct distribution being found in Florida and with scattered populations in Kansas, Texas, Iowa, Oklahoma, Indiana, Nebraska, South Carolina, Arizona, California, Louisiana and Mississippi.

Florida Distribution: The type series of Van Duzee (1909) of *Ischnodemus rufipes* was mixed and paratypes from this series are specimens of

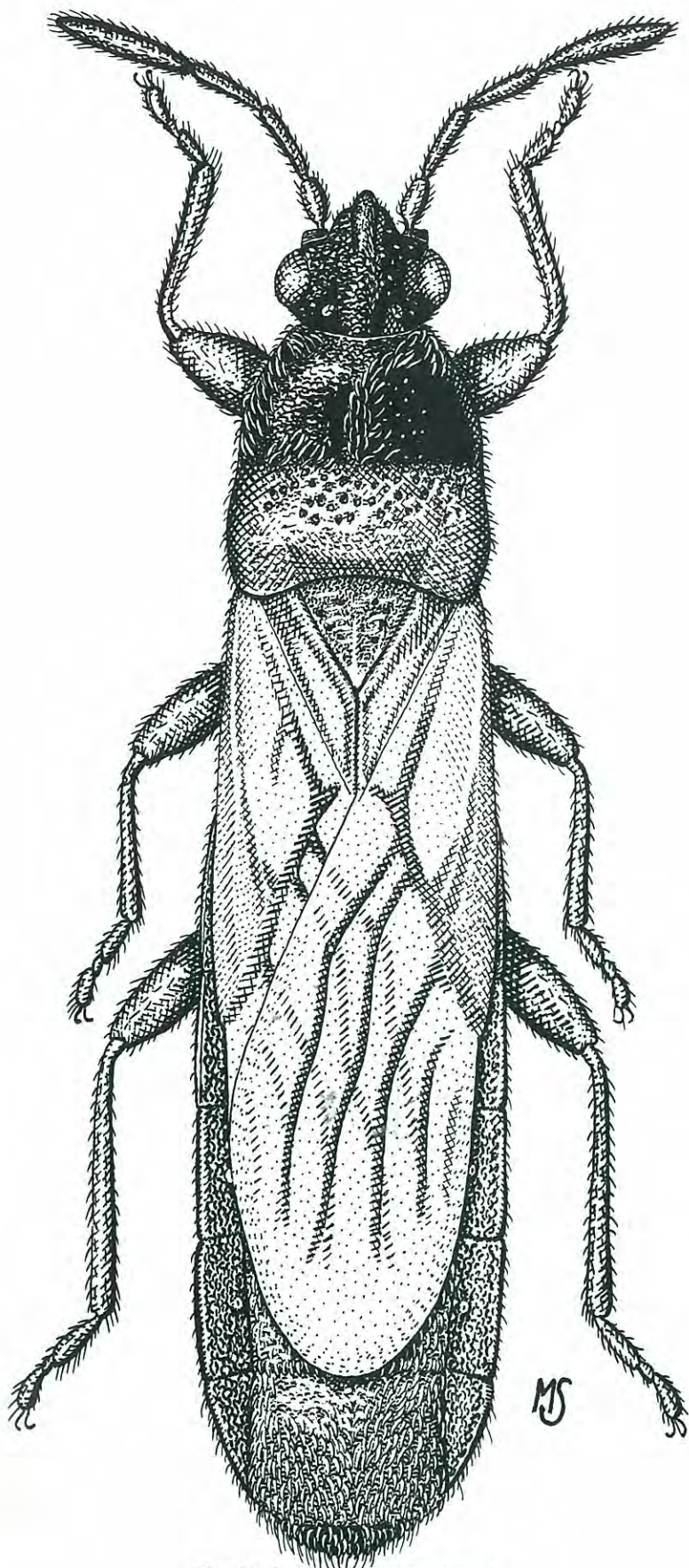


Fig. 39. *Ischnodemus brunnipennis*

brunnipennis. Harrington (1972) reported it from Kenansville. BROWARD CO.: Ft. Lauderdale, 18-II-19, A. Wetmore; (this is a morphotype, J. Harrington), (NMNH); DADE CO.: 20 mi S.W. Hialeah, on Hwy. 27, 17-VII-73, C. W. O'Brien, (JAS); CHARLOTTE CO.: 7 mi S. Punta Gorda, 23-VI-65, C. W. O'Brien, (JAS); COLLIER CO.: 9 mi E. Monroe Station, 21-VII-73, C. W. O'Brien, (JAS); GLADES CO.: 11 mi SW Palmdale, 22-VII-73, O'Brien & Marshall, (JAS); HENDRY CO.: 13 mi S. LaBelle, 23-VII-73, O'Brien & Marshall, (JAS); HERNANDO CO.: 2 mi. S. Spring Hill, 23-VII-73, C. W. O'Brien & Marshall, (JAS); Weekiwachee, 23-VII-73, C. W. O'Brien & Marshall, (JAS); HIGHLANDS CO.: Hammock State Park, 14-IV-66, H. V. Weems, Jr., (RMB); same, 20-III-54, (RMB); same, 19-III-55, F. W. Mead, (RMB); Lake Placid, 12-8-59, A. N. Nadler, (AMNH); same, 13-VII-48, R. H. Beemer, (NMNH); same, Archbold Biological Station, 2-III-83, N. Deyrup, (RMB); same, 18-II-83, (RMB); Sebring, 8-III-58, H. V. Weems, Jr., (RMB); HILLSBOROUGH CO.: Tampa, 9-11-29, E. D. Ball, (NMNH). INDIAN RIVER CO.: Sebastian, Nelson, (JAS); same, XI, G. Nelson, (AMNH); LAKE CO.: 11 mi N. Altoona, 26-III-76, C. W. O'Brien & G. B. Marshall, (JAS); 12 mi N. Minneola, 16-VII-73, C. W. O'Brien & Marshall, (JAS); Leesburg, 1-11-III-54, N. Statham, (JAS); same, 1-II-54, N. Statham, (AMNH); LEE CO.: 19 mi SE Ft. Myers, 23-III-73, C. W. & L. B. O'Brien, (JAS); LEON CO.: Lake Jamonia, 8-VII-76, G. B. Marshall, (JAS); Tall Timbers Res. Sta., 5-VII-72, (swept at night), C. W. O'Brien, (JAS); same, 26-V-73, (bird window on *Heteranthera reniformis* Ruiz & Pavon), C. W. O'Brien, (JAS); same, Sheep Island, 20-II-72, C. W. O'Brien, (damaging *Sacciolepis striata* (L.)), Nask, (JAS); same, Gay's Island, 12-VI-73, C. W. O'Brien, (JAS); Tallahassee, 24-III-74, C. W. O'Brien, (JAS); LEVY CO.: 8 mi SE Chiefland, 23-III-76, C. W. O'Brien & Marshall, (JAS); MANATEE CO.: Myakka St. Park, 15-VII-66, R. Allen, (JAS); Myakka St. Park, 16-VII-66, R. Allen, (JAS); MARION CO.: Ocala Nat. Forest, 3 mi N. Hwy. 40, Zay Prairie, 26-I-74, (at night), G. B. Marshall, (JAS); same, 20-V-76, L. & C. W. O'Brien & Marshall, (JAS); NASSAU CO.: 7 mi SW Boulogne, 14-VI-69, J. A. Slater, J. Harrington, (JAS); ORANGE CO.: Winter Park, 4-I, E. N. Davis, (AMNH); OSCEOLA CO.: 13 mi N. Kennansville, 6-VI-69, J. Slater, T. Schuh, J. Har-

ington, (JAS); 3 mi N. Kennansville, 6-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); 7 mi N. Yeehaw Jct., 29-III-76 C. W. O'Brien & Marshall, (JAS); PASCO CO.: 4 mi N. Land O' Lakes, 23-VII-73, C. W. O'Brien, (JAS); TAYLOR CO.: 14 mi E. Perry, Hwy. 27, 1-VI-77, C. W. O'Brien & Marshall, (JAS); VOLUSIA CO.: Samsula, 21-IX-79, J. N. Pott, (RMB); WAKULLA CO.: 3 mi N. Live Oak Point, 19-VI-73, C. W. O'Brien, (JAS); WASHINGTON CO.: 21-IV-77, G. B. Marshall, (JAS).

ISCHNODEMUS SLOSSONAE Van Duzee

(fig. 36, map XXXVII)

Ischnodemus slossoni Van Duzee 1909:233-234.
Ischnodemus intermedius Blatchley 1926:365.

Diagnosis: Small (4.5-5), head, anterior two thirds of pronotum, scutellum black. Eyes large, protrudent. Calli generally more prominent and swollen than in other small species of *Ischnodemus*. Ventral prothoracic pruinosity confined to center of sternum.

Actually, this represents a very difficult taxonomic problem, for populations of *Ischnodemus* that occur in such widely separated areas as Connecticut and Texas appear to be quite different from the Florida populations, but are connected by intermediates. For the moment one must consider that a single highly variable species is involved.

This species occurs both in macropterous and brachypterous conditions.

Biology: Harrington (1972) studied the biology extensively in Connecticut, where the host plant, *Panicum agrostoides* Spreng, occurs in dry meadow habitats. Overwintering is in the diapausal stage. There is one generation a year in Connecticut, and eggs are deposited within the leaf sheath of the host plant's new growth in June. Females lay from three to seven eggs at a time. The eggs are placed tight against the stems with the long axes parallel to one another. Harrington (1972) notes predation by a syrphid larva. Slater (1972) reports numbers on *Cladium mariscoides* (L.) Torr. and breeding on *Sacciolepis striata* (L.).



Map XXXVII. Distribution of *I. slossonae*

Distribution: As noted above, the species as currently understood, is widespread ranging from southern New England west to Illinois and south to Texas and Florida. However, Florida populations are quite distinct in appearance from those from the periphery of the range.

Florida Distribution: Described by Van Duzee (1909) from Jacksonville and subsequently reported by Barber (1914) from Little River and by Blatchley (1926) from Dunedin and Royal Palm Park. **DADE CO.:** 20 mi SW Hialeah, on Hwy 27, 17-VII-73, C. W. O'Brien, (JAS); **JEFFERSON CO.:** 1 mi SW Wacissa, 16-IX-76, G. B. Marshall, (JAS); 1 mi SW Wacissa, 18-IV-76, C. W. O'Brien, (JAS); **LEE CO.:** 1, 4 mi N. Bonita Springs, U.S. 41, 15-VII-51, R. F. Hussey, (FSCA); 4 mi. N. Bonita Springs, U.S. 41, 15-VII-51, R. F.

Hussey, (NMNH); 4 mi N. Bonita Springs, US 41, 15-VII-51, R. F. Hussey, (JAS); Estero, 21-VII-34, P. McKinstry, (NMNH); **LEON CO.:** Tallahassee, 27-X-76, (Berlese hard wood litter), L. D. Justice, (JAS); **LEVY CO.:** Cedar Key, 14-VI-65, C. W. & L. B. O'Brien, (JAS); **OKEECHOBEE Co.:** 5 mi W. Okeechobee. 16-VII-73, C. W. O'Brien & Marshall, (JAS); **SARASOTA CO.:** Venice, 8-X-38, Oman, (NMNH); **SEMINOLE CO.:** Sanford, 1925, E. D. Ball, (JAS); **WAKULLA CO.:** 1 mi N. Spring Creek, 25-V-73, C. W. O'Brien, (JAS); 1 mi S. Panacea, 29-IV-76, O'Brien & Marshall, (JAS).

ISCHNODEMUS LOBATUS Van Duzee (map XXVIII)

Ischnodenus lobatus Van Duzee 1909:169.

Diagnosis: Similar to *slossonae*, but lacking prominent swollen calli.

It is readily recognizable by the characters given in the key, particularly the long labium, and also by having much more strongly developed pubescence on the dorsal surface.

Biology: Nothing is known of its biology.

Distribution: Known only from southern Florida.

Florida Distribution: Originally described by Van Duzee (1909) from Estero and subsequently reported by Blatchley (1926) from Royal Palm Park and by Harrington (1972) from Homestead and Tims Hammock, Dade Co. **COLLIER CO.:** 6 mi E. Ochopee, 21-VII-73, (night), C. W. O'Brien, (JAS); Collier-Seminole St. Park, 22-VII-73, C. W. O'Brien & Marshall, (JAS); **DADE CO.:** Tims Hammock, 24-II-19, H. S. Barber, (NMNH); Everglades Nat. Park, 19-VII-73, O'Brien & Marshall, (JAS); Homestead, 19-VI-39, Oman, (NMNH); same, 10-VI-39 Oman, (JAS); **WAKULLA CO.:** 1 mi N. Spring Creek, 16-V-73, C. W. O'Brien, (JAS).



Map XXXVIII. Distribution of *I. lobatus*

ISCHNODEMUS PRAECULTUS Distant (fig. 40, map XXXIX)

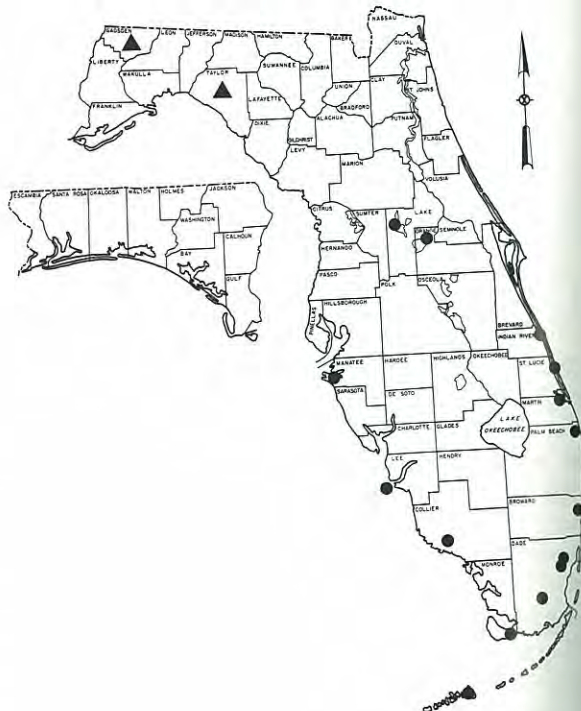
Ischnodemus praecultus Distant 1882:196.
Ischnodemus atramedius Blatchley 1926:366.

Diagnosis: Moderate sized (5-5.5). Hemelytra smoky colored with pale white to dull testaceous membrane. Surface of head, pronotum and scutellum predominantly or entirely dull grayish or reddish brown pruinose.

Slater & Wilcox (1969) treated *rufipes* V.D. as a junior synonym, but Harrington (1972) believes that the two populations in Florida are distinct and we follow her conclusions.

Biology: Harrington (1972) reported this species as breeding in the leaf sheaths of the sedge *Cyperus flavus* (Vahl) Nees that grows in relatively dry places. *I. praecultus* is often found in very large

numbers, with both nymphs and adults clustered close together in the leaf sheaths of the host plant. Anonymous (1982) reports adult "infestation" on leaves of 25 umbrella plants, *Cyperus alternifolius* L., at a nursery in Apopka and scattered adults on Chinese fan palms, *Livistonia chinensis* R. Br. at the same locality. The life history has not been studied in detail.



Map XXXIX. Distribution of *I. praecultus*

Distribution: Primarily Neotropical, distributed from South America through Central America and into the southern United States.

Florida Distribution: A common species in suitable habitats in southern Florida. Reported by Harrington (1972) from Sanibel Island, Big Pine Key, Flamingo Prairie, and Everglades National Park. Some of the earlier records of *rufipes* by Van Duzee (1909), Barber (1914), and Blatchley (1926) probably belong here. BROWARD CO.: Coconut Creek, 20-I-84, D. Leone; COLLIER CO.: Collier-Seminole St. Park, 22-VII-73, C. W. O'Brien & Marshall, (JAS); DADE CO.: 20 mi SW

Hialeah on Hwy 27, 17-VII-73, C. W. O'Brien, (JAS); Homestead, 14-III-47, L. D. Beamer, (NMNH); 35 mi N. Miami Springs, 28-III-73, C. W. & L. B. O'Brien, (JAS); GADSDEN CO.: 1-VIII-56, F. W. Mead, (FSCA); INDIAN RIVER CO.: 2 mi W. Wabasso, Hwy. 510, 28-III-76, C. W. O'Brien & Marshall, (JAS); LAKE CO.: Leesburg, 12-I-56, F. W. Mead, (RMB); MANATEE CO.: Bradenton, Perrico Island, 18-III-72, F. W. Mead, (RMB); MARTIN CO.: Stuart, 11-V-79, (on *Carex*), E. W. Campbell, (FSCA); MONROE CO.: Big Pine Key, 18-VII-73, C. W. O'Brien, (JAS); same, Watson Hammock, 4-XI-82, R. M. Baranowski, (RMB); Everglades National Park, 14-VII-70, R. M. Baranowski, (RMB); same, Snake Bight Trail, 6-X-69, R. M. Baranowski, J. Slater, T. Schuh, J. Harrington, (JAS); same, Flamingo Prairie, 12-VI-69, R. M. Baranowski, (RMB); same, 25-III-70, (RMB); same, 12-VI-69, (RMB); same, 10-VI-69, (RMB); same, 25-III-70, R. M. Baranowski, (RMB); ORANGE CO.: Apopka, 28-IV-82, (on *Cyperus alternifolius*), B. Slongers, (FSCA); ST. LUCIE CO.: Port St. Lucie, 23-II-79, (adults and nymphs on *Cladium*), E. W. Campbell, (FSCA); PALM BEACH CO.: Jupiter, 31-V-88, (on *Cyperus odoratus* L.), K. B. Nicholson, (FSCA); TAYLOR CO.: 20-IV-55, F. W. Mead, (FSCA).

UNKNOWN COUNTY: Everglades National Park, 20-VII-73, C. W. O'Brien, (JAS); same, 29-I-59, H. V. Weems, Jr., (RMB); Oscar Sherrer State Park, 13-IV-66, H. V. Weems, Jr., (RMB).

ISCHNODEMUS ROBUSTUS Blatchley (map XXXX)

Ischnodemus robustus Blatchley 1926 p. 366.

Diagnosis: Closely related to *praecultus*, but somewhat larger (6-8), and distinguished by the characters given in the preceding key. In contrast to *praecultus*, this species is almost always macropterous or submacropterous.

Biology: Harrington (1972) reported this species breeding in numbers on what Slater (1976), subsequent to her paper, determined to be *Echinochloa* sp. in a large marshy area west of Eau Gallie,

where it was also taken on *Panicum geminatum* Forsk. The biology has not been studied in detail.

Distribution: Known only from Florida.

Florida Distribution: Originally described by Blatchley (1926) from Royal Palm Park and subsequently reported by Harrington (1972) from Lake Washington, west of Eau Gallie. BREVARD CO.: Lake Washington, 12-VIII-71, R. M. Baranowski, (RMB); same, 5-XII-70, R. M. Baranowski, J. A. Slater, (RMB); 5 mi W. Eau Gallie 13-VI-69, J. A. Slater, J. Harrington, (JAS); Eau Gallie, 5-XII-70, R. M. Baranowski, (RMB); DADE CO.: Hialeah, 14-VII-27, G. B. Merrill, (FSCA); Paradise Key 21-II-19, T. E. Snyder, (NMNH); same, 5-V-?, J. Know, (NMNH); POLK CO.: Lakeland, 29-III-49, R. F. Hussey, (NMNH); GLADES CO.: Moore Haven, 17-IV-?, J. Know, (NMNH); SEMINOLE CO.: Sanford, 26-I-74, C. W. O'Brien, (JAS).



Map XXXX. Distribution of *Ischnodemus robustus*

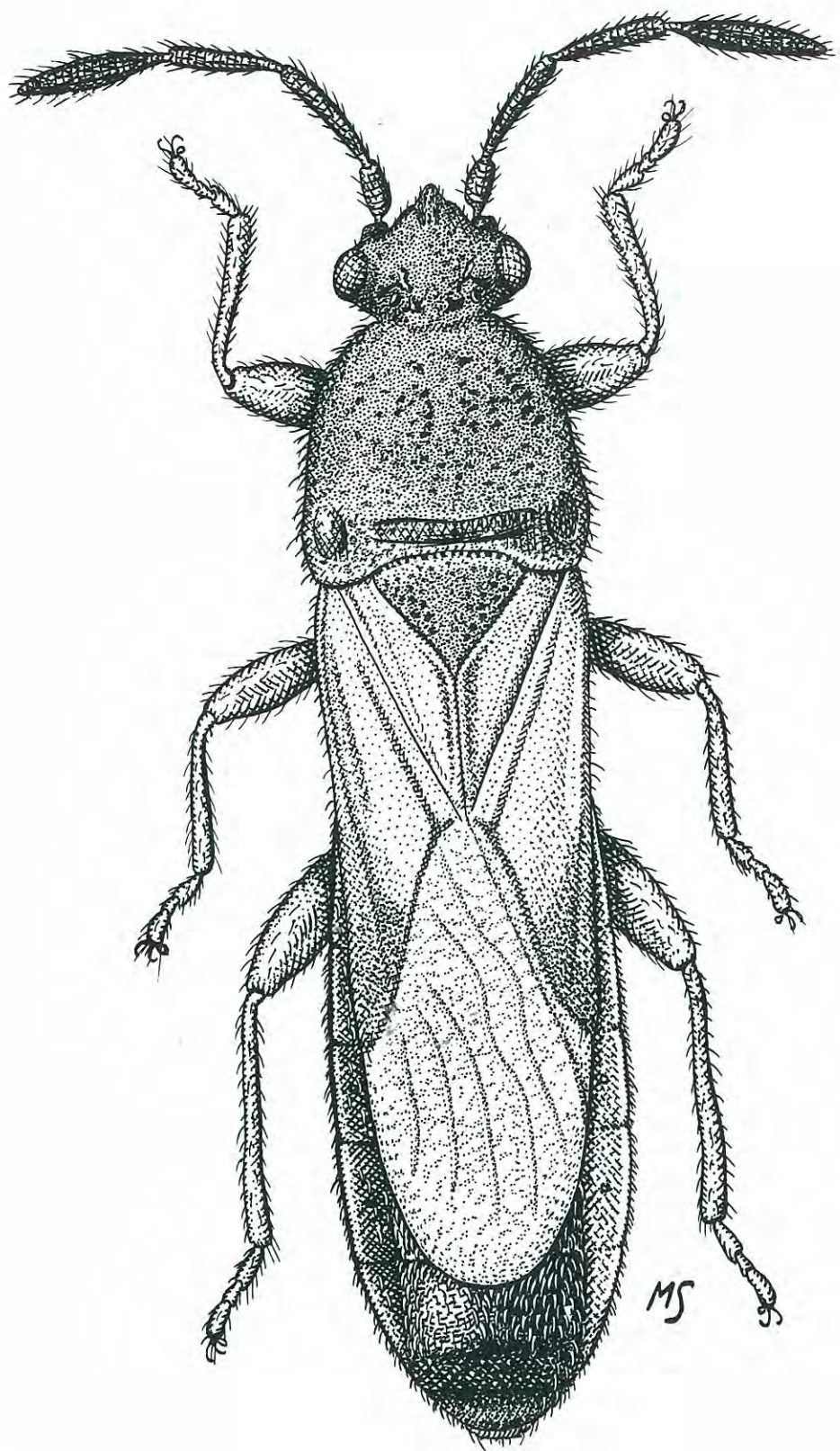


Fig. 40. *Ischnodemus praecultus*

ISCHNODEMUS FULVIPES
(De Geer)
(fig. 41, map XXXXI)

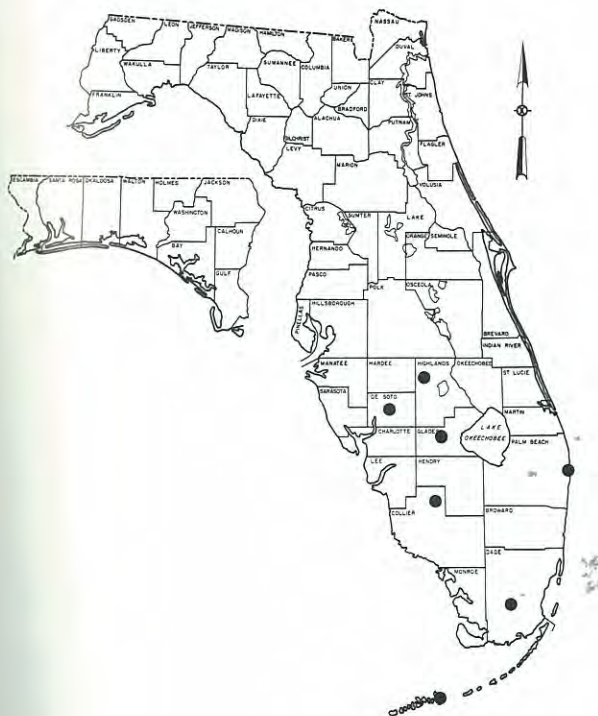
Cimex fulvipes De Geer 1773:355.

Micropes sallei Signoret 1857:25.

Ischnodemus fulvipes Walker 1872:127.

Diagnosis: Large, robust, dorsally pruinose with elongate labium. Usually smoky brown in color.

This species is highly variable. Some of the South American and Mexican specimens have the hemelytra pale testaceous to almost white. Florida material examined also has a smoky brown membrane to the fore wing.



Map XXXXI. Distribution of *Ischnodemus fulvipes*

Biology: Slater and Wilcox (1969) report it on *Canna indica* L. bromeliads, bamboo and *Thalia geniculata* L. and its occurrence on *Musa paradisica* var. *sapientum* L. in the Neotropics. The host plants appear to be quite different from the other Florida species. C. W. & L. B. O'Brien took adults

and nymphs at Highlands Hammock on *Thalia geniculata*.

Distribution: Widely distributed occurring in South America, Central America, the West Indies, Florida and possibly Texas.

Florida Distribution: Reported by Slater and Wilcox (1969) from Highlands Hammock State Park. COLLIER CO.: 4 mi. west of Immokolee, State Road 486, 3-VIII-81, R. M. Baranowski, (RMB); DADE CO.: 10 mi. west of Homestead airport, 4-VII-81, R. M. Baranowski, (RMB); DE SOTO CO.: 6 mi S. Arcadia, Hwy. 31, 22-VII-73, C. W. O'Brien, (JAS); GLADES CO.: Palmdale, 24-IX-80; (on *Thalia geniculata*), D. H. Habeck, (FSCA); S.W. Palmdale, 24-IX-80, D. H. Habeck, (RMB); 11 mi SW Palmdale, 22-VII-73, O'Brien & Marshall, (JAS); HENDRY CO.: 13 mi S. La-Belle, 22-VII-73, O'Brien & Marshall, (JAS); HIGHLANDS CO.: Highlands Hammock, 15-VI-55, H. S. Dybas, (NMNH); Highlands Hammock St. Park, 15-VI-65, L. & C. W. O'Brien, (JAS); MONROE CO.: Big Pine Key, 18-VII-73, C. W. O'Brien, (JAS); PALM BEACH CO.: Lake Worth, 15-X-86, D. M. Leone, (FSCA); Loxahatchee, 7-IX-87, (on *Thalia geniculata*), E. W. Campbell, (FSCA).

ISCHNODEMUS RUFIPES Van Duzee
(map XXXXII)

Ischnodemus rufipes Van Duzee 1909:167-168.

Ischnodemus atramedius Blatchley 1926:365.

Diagnosis: Dorsal surface of head and pronotum largely pruinose. A distinct small dark area in membrane adjacent to apical corial spot. First 3 antennal segments usually pale sepia to dark chestnut or blackish brown. Veins slightly contrasting or concolorous with membrane.

Slater and Wilcox (1969) synonymized this species with *praecultus*, but Harrington (1972) indicated that in Florida there appear to be two populations that are quite distinct in their host plants and in the habitats that they occupy. We accept Harrington's conclusions pending more detailed analysis and treat them here as distinct species.

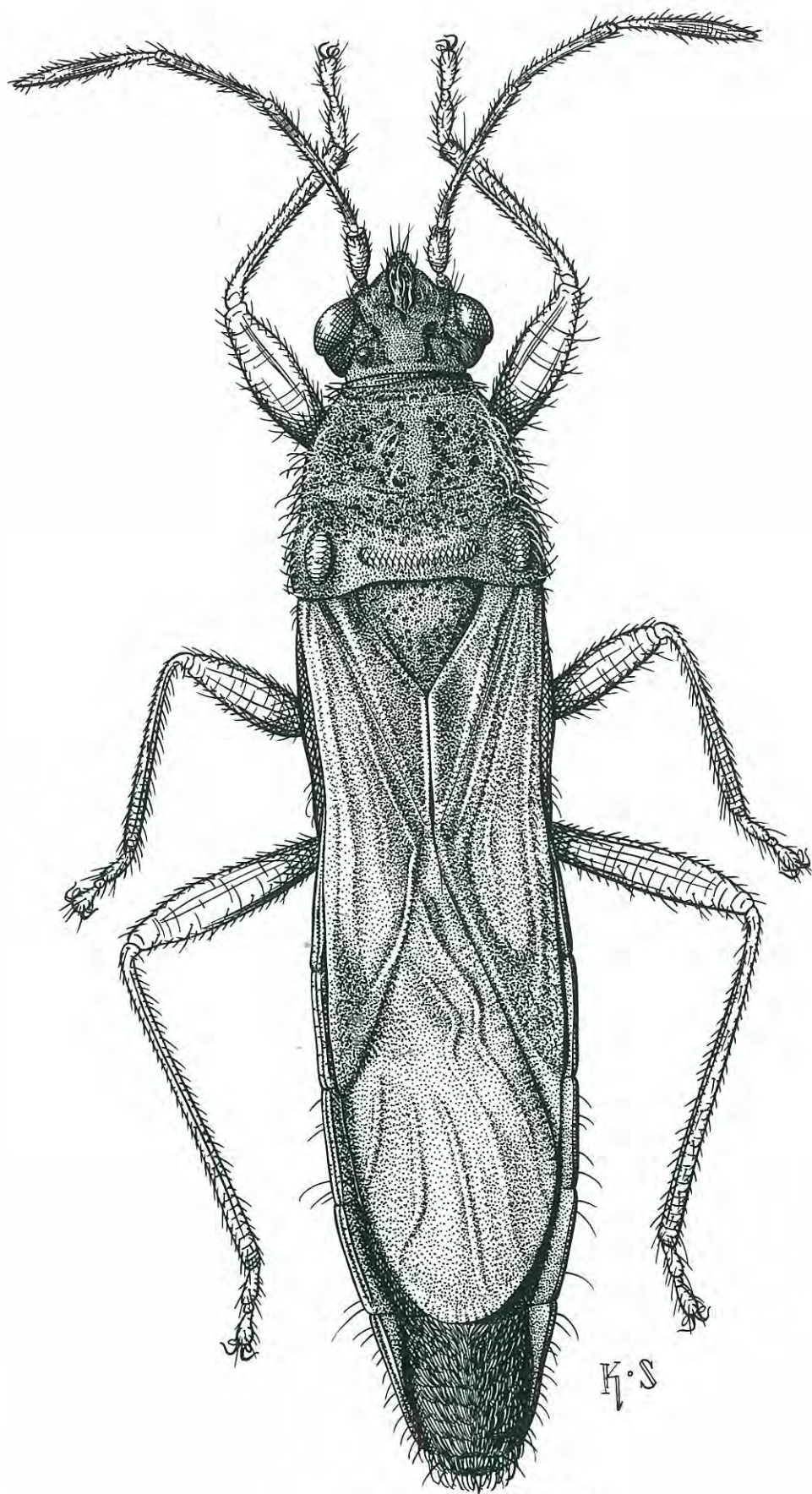


Fig. 41. *Ischnodemus fulvipes*

Biology: Harrington (1972) reported nymphs and adults taken on *Cyperus odoratus* L. at Sebring, Florida in a wet habitat at the edge of a lake.

Distribution: Known from the southeastern states, occurring north to Virginia and southwest to Texas, primarily through the Gulf Coast states and also known from Mexico.



Map XXXXII. Distribution of *Ischnodemus rufipes*

Florida Distribution: Reported by Van Duzee (1909) from Crescent City, Clearwater, Estero and Lake Worth; by Barber (1914) from Lakeland and South Bay; by Blatchley (1926) from Fort Myers, Royal Palm Park, Moore Haven, Istokpoga, Ormond and Dunedin and as *I. atramedius* from Dunedin and by Torre-Bueno (1933) from Matecumbe. Some of these records probably are referable to *praecultus*. **DADE CO.:** Homestead, 22-II-44, (NMNH); same, 28-II-18, A. Wetmore (at light), (NMNH); Little River, 1-XII-12, Fred Knab, (NMNH); Paradise Key, 3-III-19, H. S. Barber, (NMNH); **ORANGE CO.:** Apopka, 1-X-

64, R. E. Woodruff, (RMB); **PALM BEACH CO.:** Boynton Beach, 23-II-44, (NMNH); Lakeworth, (NMNH); **PINELLAS CO.:** Dunedin, 1-III-27, W.S.B. collection, (NMNH); same, 17-I-18, W. S. B. collection, (NMNH); St. Petersburg, 26-III-20, E. Craighead, (NMNH); Seven Oaks, 1-V-08, Van Duzee, (NMNH); **POLK CO.:** 6-V-57, F. W. Mead, (RMB); **WAKULLA CO.:** 20-IV-55, F. W. Mead, (RMB).

GEOCORINAE Stal

The members of this subfamily are readily recognizable by the large kidney shaped protrudent eyes that project backward and usually appear to overlap or nearly overlap the antero-lateral pronotal angles. The body is stout and ovoid, the pronotum broad and without a transverse furrow. In our species the clavus narrows to a point posteriorly so that no claval commissure is developed. The spiracles are dorsal on abdominal segments 2, 3 and 4 and ventral on segments 5, 6 and 7. The sutures between abdominal terga 4-5 and 5-6 curve strongly backward to the meson.

Many, if not all, of the species are in part or entirely predaceous.

This is a large subfamily containing 13 genera. It is represented in all of the major zoogeographic regions of the world. Two genera and 5 species occur in Florida.

KEY TO FLORIDA GENERA OF GEOCORINAE

- 1. Labial segment 2 longer than segment 3; eyes strongly stylate (fig. 42). *Isthmocoris*, p. 72

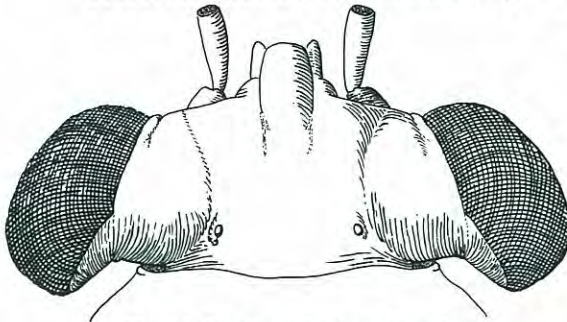


Fig. 42. *Isthmocoris piceus*, head

1. Labial segment 2 shorter than segment 3; eyes usually not strongly stylate but large and reniform (fig. 43).
 *Geocoris*, p. 73

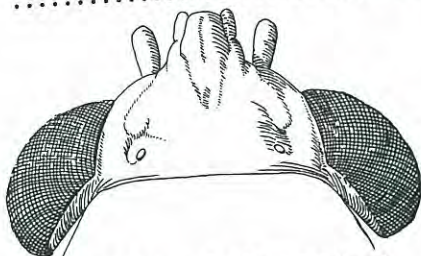


Fig. 43. *Geocoris uliginosus*, head

ISTHMOCORIS McAtee 1914

Isthmocoris McAtee 1914, p.217.

Type Species: *Salda picea* Say 1831. By original designation.

The strongly produced eyes and smooth shining vertex will separate this genus from other members of the subfamily. The genus, as presently considered contains 4 species and occurs in the Nearctic and Neotropical regions.

All four species occur north of Mexico of which 2 are southwestern and 2 occur in Florida.

KEY TO FLORIDA SPECIES OF ISTHMOCORIS

1. Dorsal surface chiefly black or piceus . . .
 *piceus*, p. 72
- 1'. Dorsal surface in large part reddish yellow
 or testaceous *imperialis*, p. 73

ISTHMOCORIS PICEUS (Say) 1831 (figs. 42, 44)

Salda picea Say 1831:336.

Isthmocoris piceus McAtee 1914:127.

Diagnosis: Medium sized (4-4.2), shining black with contrasting reddish or yellowish head. Legs, labium and at least base of 1st and 4th antennal segments reddish, yellowish or pale tan.

Both macropters and brachypters occur but the latter are more abundant and have the hemelytra somewhat coleopteroid.

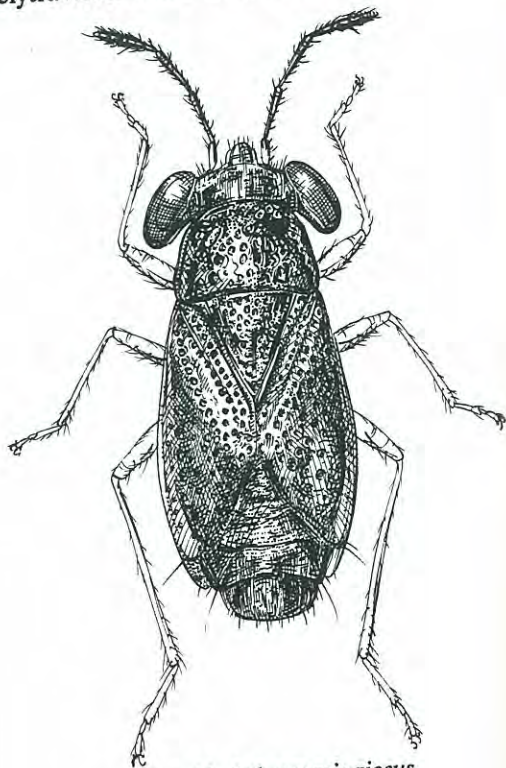


Fig. 44. *Isthmocoris piceus*

Biology: Little is known of the biology. It is chiefly a ground inhabiting species and almost certainly predaceous. Torre-Bueno (1935) took specimens by sweeping *Potentilla canadensis* L. Readio and Sweet (1982) report that in New England it is a typical inhabitant of old fields with dense grass litter between grass clumps.

Distribution: Reported from New England west to Colorado and south to Florida. However, Readio and Sweet (1982) limit the distribution to the northeastern and midwestern states, but do include a record from southern Mississippi; thus, while probably not a member of the Florida fauna, the Barber record cannot be dismissed.

Florida Distribution: Reported by Barber (1914) from Biscayne Bay.

ISTHMOCORIS IMPERIALIS (Distant) (map XXXXIII)

Geocoris imperialis Distant 1882:197-198.
Isthmocoris imperialis McAtee 1914:127, 129.

Diagnosis: Size similar to *piceus*. Chiefly reddish yellow to orange to testaceous in color with 1 or 2 dark spots posteriorly on pronotum. Scutellum, 2nd and 3rd antennal segments, thoracic and abdominal sterna blackish or at least infuscated with contrasting dark brown.

grasslands and old fields. It is not found in the open where other geocorines occur.

Distribution: Readio and Sweet (1982) suggest a disjunct distribution in the southwestern states and Florida, but raise questions concerning the taxonomic status of several of the populations.

Florida Distribution: Reported by Blatchley (1926) from Dunedin and by Readio and Sweet (1982) from Everglades National Park. MON-ROE CO.: Everglades Nat. Pk., Flamingo Prairie, 10-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); same, 8-IV-70, R. M. Baranowski, (RMB).



Map XXXXIII. Distribution of *I. imperialis*

Biology: Blatchley (1926) took specimens from beneath gunny sacks near an orange grove. We took this species in a slightly elevated grassy area together with an assemblage of rhyarochromines near the roadside at the edge of Flamingo Prairie in Everglades National Park. Readio and Sweet (1982) report it in Texas as usually taken in climax

GEOCORIS Fallen 1814

Geocoris Fallen 1814, p. 10.
Ophthalmicus Schilling 1829, pp. 37, 62.

Type Species: *Cimex grylloides* Linnaeus 1761.
Fixed by Oshanin 1912.

The members of this genus are distinguishable from *Isthmocoris* primarily by the non stalked eyes which are nevertheless very large, reniform, and curved backward adjacent to the antero-lateral pronotal angles.

This is a very large genus containing approximately 127 species and distributed in all of the major zoogeographic regions of the world. There are a number of evident subgroups present, some of which will probably ultimately be recognized as genera or subgenera and until these have been carefully segregated, it is premature to attempt detailed geographic interpretation.

Species of *Geocoris* are predators on small arthropods although they do feed upon plants to some extent. Several species have recently been intensively studied as possible biological control factors of destructive insects and there is a very extensive recent literature, particularly of the western species. Crocker (1978) reviews feeding niches, variety of insects attacked and potential value. Readio and Sweet (1982) should be consulted for an extensive survey of the taxonomy, biology and distribution of members of this genus occurring in Florida.

KEY TO FLORIDA SPECIES OF *GEOCORIS*

1. Head smooth, shining, with a distinct median groove extending onto the vertex *punctipes*, p. 74
- 1'. Head pebbled or rugulose, lacking a distinct median sulcus on the vertex 2
2. Scutellum with length and width equal or subequal, usually unicolorous *uliginosus*, p. 77
- 2'. Scutellum distinctly longer than wide, usually bicolored 3
3. General color grayish; antennae reddish brown or dark brown with distal ends of segments not strongly contrasting or appearing banded; corial punctures near center of surface obsolete; larger, females 3.89-4.21 mm., males 3.26-3.68 *bullatus*, p. 77
- 3'. General color ivory to parchment white; antennae of females red with distal ends of segments banded with white; segments 1-3 of antennae of males with dorsal surface white, bluish green or pink, contrasting with red proximal ends; punctures on corium uniformly dark and conspicuous over entire surface; smaller, females 3.26-3.79, males 3.05-3.37. *floridanus*, p. 75

GEOCORIS PUNCTIPES (Say) (fig 45, map XXXIV)

Salda bullata var. *punctipes* Say 1831:336.
Ophthalmicus luniger Fieber 1861:268-269.
Geocoris punctipes Montandon 1913:55.
Geocoris sonoraensis Van Duzee 1923:138.

Diagnosis: Dull yellowish to grayish over most of body with scutellum black with a yellow subbasal lateral spot. First and 2nd antennal segments dark, distal 2 segments pale. Legs yellow with dark spots on femora. Head shining, sulcate.

Biology: Blatchley (1926) reported adults overwintering. Gordh and Coker (1973) noted

Teleonemus reynoldsi G. & C. as an egg parasite in California. Atim and Graham (1983) reported adult parasitization by the tachinid *Hyalomya aldrichii* Townsend in Arizona (see also Clancy and

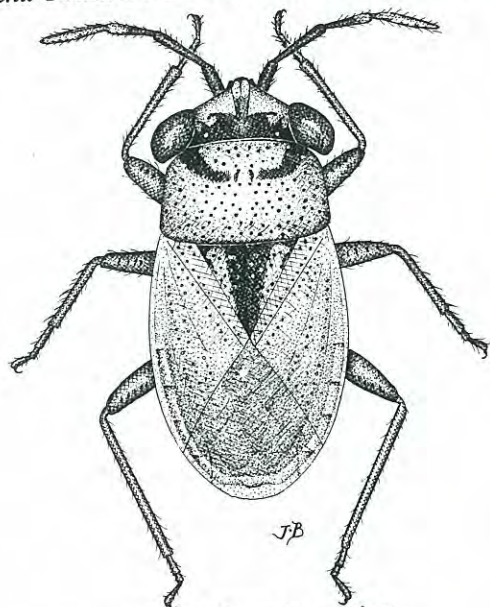


Fig. 45. *Geocoris punctipes*



Map XXXIV Distribution of *Geocoris punctipes*

Pierce 1966) Altieri and Whitcomb (1979,1980) state that it is commonly associated with *Chenopodium amerosoides* L., where it is predaceous on the aphid *Ureleucon* sp. and the cicadellid, *Graphocephala versuta* (Say). Dunbar (1972) described the courtship and mating ritual in detail and noted that light and dark variation did not affect mating and commented upon the frequency of mating and adult longevity.

There is an extensive recent literature that investigates this species as a possible control predator against soybean, sorghum, cotton insects as well as other insects. Readio and Sweet (1982) summarize the general ecological habitat preferences.

Distribution: The range is southern, north to New Jersey and Long Island, New York southern Indiana through Illinois and west to California. It also occurs in Mexico.

Florida Distribution: Reported by Blatchley (1926) from Dunedin and Sarasota; by Barber (1914) from Jacksonville, Crescent City, Clearwater, Tampa, Sanford, Belleair, Biscayne Bay, Punta Gorda and Lakeland, and by Altieri and Whitcomb (1979) from Tall Timbers Research Station. ALACHUA CO.: 5-III-56, R. A. Morse, (RMB); Gainesville, 15-I-47, H. V. Weems, Jr., (FSCA); same, 18-I-64, F. W. Mead, (RMB); same, 21-V-64, (FSCA); same, 24-XII-65, (RMB); same, 30-IV-64, (JAS); same, 9-V-67, (RMB); same, 30-IV-64, (RMB); BROWARD CO.: Pompano Park, 19-IX-73, D. C. Clinton, W. H. Pierce, (RMB); COLLIER CO.: 6 mi E. Ochoppee, 21-VII-73, C. W. O'Brien & Marshall, (JAS); Seminole St. Pk., 13-XI-72, C. W. & L. B. O'Brien, (JAS); DADE CO.: Homestead, 6-XI-59, R. M. Baranowski, (RMB); same, 20-VII-59, (RMB); same, 10-XI-75, O. Corrigan, (JAS); Miami, 20-VIII-62, R. M. Baranowski, (RMB); same, 30-IV-54, O. D. Link, (FSCA); DUVAL CO.: St. Johns Bluff, 11-IX-56, F. W. Mead, (RMB); St. Johns Bluff, 11-IX-56, F. W. Mead, (RMB); FLAGLER CO.: 6-VII-56, H. V. Weems, Jr., (RMB); HIGHLANDS CO.: Sebring, 20-I-58, H. V. Weems, Jr., (FSCA); HILLSBOROUGH CO.: Plant City, 24-XI-41, J. O. Lewis, (RMB); JACKSON CO.: 4.3 mi. N. of Butler, 2-VI-55, R. F. Hussey, (FSCA); Florida Swinging Bridge, 6-VI-54, F. N. Young, (FSCA); LAKE CO.: Leesburg, 8-VI-59, L. H. Stover,

(RMB); LEE CO.: Sanibel Island, 9-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); LEON CO.: Tall Timbers Res Sta., 5-VII-72, (swept at night), C. W. O'Brien, (JAS); same, 19-VIII-68, W. H. Whitcomb, (FSCA); same, 28-VIII-68, (FSCA); same, 24-IX-68, (FSCA); MARION CO.: mi. SSW of Ocala, 18-IX-2-X-75, (malaise trap), J. R. Wiley, (RMB); MONROE CO.: Conch Key, 9-IV-66, F. W. Mead, (JAS); Key Largo, 11-VI-69, R. M. Baranowski, J. Slater, T. Schuh, J. Harrington, (JAS); same, 30-XI-70, J. A. Slater, (JAS); Marathon, Marathon Key, 19-VII-73, C. W. O'Brien, (JAS); North Key Largo Key, 18-VI-81, R. M. Baranowski, (RMB); same, 16-V-77, (RMB); same 19-V-77, (RMB); same, 19-V-77, (RMB); Plantation Key, 14-X-54, H. A. Denmark, (FSCA); NASSAU CO.: 20-VIII-54, F. W. Mead, (RMB); PALM BEACH CO.: 27-VII-53, H. V. Weems, Jr., (FSCA); Belle Glade, 19-VI-39, Oman, (NMNH); POLK CO.: Ft. Mead, 12-II-87, J. Hughes, (FSCA); PINELLAS CO.: Dunedin, Dunedin Beach, 23-VII-73, C. W. O'Brien, (JAS); Cabbage Key, 24-X-63, F. W. Mead, (RMB); Clearwater ; 29-IV-08, Van Duzee collection, (NMNH); SANTA ROSA CO.: 12-VIII-55, F. W. Mead, (RMB); VOLUSIA CO.: 25-VII-54, H. A. Denmark, (FSCA); 26-VII-54, R. F. Hussey, (FSCA); WAKULLA CO.: Shell Point Beach, 3-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS). DRY TORTUGAS, Garden Key, 9-VII-63, H. V. Weems, Jr., (RMB); same, Hospital Key, 7-VI-62, (RMB); same, (JAS). UNKNOWN COUNTY: Dartan, E. G. Kelscheimer, (NMNH); Duval Co., (NMNH). Pomosula, 3-I-41, W. C. Nanney, (RMB).

GEOCORIS FLORIDANUS Blatchley (map XXXXV)

Geocoris bullatus floridanus Blatchley 1926:375-376.

Geocoris floridanus Readio & Sweet 1982:37-40.

Diagnosis: Similar to *bullatus*, but dorsal surface ivory white, corial punctures dark and distinct over entire surface, smaller, narrower and with differently colored antennae, as given in the preceding key.

Until recently *floridanus* has been considered a "variety" of *bullatus*. Readio and Sweet (1982) argue persuasively that it should be accorded specific status. They noted differences in the spermathecal duct in addition to external characters given above. We follow this treatment, but point out that as considered the two taxa are allopatric and the Readio and Sweet (1982) distribution maps (p. 75) indicate a lack of specimens of either species from Tennessee, Kentucky, West Virginia, Arkansas, Missouri, and from southern Illinois, Indiana, and Ohio the very areas were in-tegration might be expected to occur were the two taxa to represent subspecies. For this reason we have retained *bullatus* in the key although Readio and Sweet refer all Florida records of *bullatus* to *floridana*.



Map XXXXV. Distribution of *Geocoris floridanus*

Biology: Readio and Sweet (1982) state that *floridanus* is usually found in sandy areas running among plants and quote Crocker (pers. comm.) as

finding it commonly in Florida in sandy areas under debris, beneath Bermuda grass, sand spurs, on beaches above the high tide lines on *Sesuvium portulacastrum* and *Cakile constricta* Rodman. Readio and Sweet (ibid) describe the nymphs and note that there are dark and light types with dark nymphs being correlated with the winter season.

Distribution: Southern from Florida west to Texas and north to Washington D. C. Readio and Sweet (1982) note that the center of distribution is in Florida and Georgia with very few specimens being known from the extremes of the range. Although many specimens listed below have been identified as *bullatus* we are referring all records to *floridanus*.

Florida Distribution: Reported as *bullatus* by Van Duzee (1909) from Crescent City, Tampa and Estero; by Barber (1914) from Biscayne Bay, Lake Worth and Lakeland and by Blatchley (1926) from Dunedin and Key West. ALACHUA CO.: 6-V-55, R. A. Morse; Gainesville, 23-VIII-55, R. A. Morse; Gainesville, 19-I-19, G. B. Merrill, (RMB); same, 26-VII-56, H. A. Denmark, (RMB); DADE CO.: Miami, 20-VIII-62, R. M. Baranowski, (RMB); Everglades National Park, 16-VIII-62, R. M. Baranowski, (RMB); DIXIE CO.: 2 mi W. Fannin Springs, 4-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); DUVAL CO.: St. Johns Bluff, 11-IX-56, F. W. Mead, (RMB); HIGHLANDS CO.: Sebring, 17-VII-50, H. V. Weems, Jr., (FSCA); LEE CO.: Sanibel Is., 9-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); LEON CO.: Tall Timbers Research Station, 30-VII-69, W. H. Whitcomb, (FSCA); same, 19-VII-69, (FSCA); same, 23-VII-69, (FSCA); same, 31-VII-69, (FSCA); MONROE CO.: Marathon Key, 19-VII-73, C. W. O'Brien, (JAS); Duck Key, 29-VII-62, F. W. Mead, (RMB); Key Largo Key, 4-VII-64, R. E. White, (RMB); North Key Largo Key, 11-VI-69, R. M. Baranowski, (RMB); Stock Island, 7-VII-59, W. W. Warner, (RMB); ORANGE CO.: Winter Park, 26-IX-45, H. T. Fernald, (FSCA); POLK CO.: 23-VI-58, W. P. Henderson, (FSCA); ST. JOHNS CO.: 22-VII-58, F. W. Mead, (FSCA); ST. LUCIE CO.: Port St. Lucie, 18-V-82, K. Hebbard, (FSCA); VOLUSIA CO.: Daytona Beach, 14-IX-87, F. W. Mead, (FSCA); Ormond Beach, 4-XI-60, R. E. Woodruff, (RMB); WAKULLA CO.: Shell Point Beach, 3-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS).

DRY TORTUGAS, Loggerhead Key, 2-IX-61, H. V. Weems, Jr., (RMB).

GEOCORIS BULLATUS (Say)

Salda bullata Say 1831:336.

Ophthalmicus griseus Dallas 1852:585.

Geocoris bullata Uhler 1876:306.

Diagnosis: Small (3-3.5), ovoid, chiefly grayish or yellowish. Vertex, anterior portion of scutellum, a median spot along apical corial margins black. Pronotal calli smooth, yellow or bright fuscous. Antennae usually reddish brown, sometimes black. Readio and Sweet (1982) believe *floridanus*, which has previously been considered a variety of *bullatus*, is the only one of the two species that occurs in Florida. We list *bullatus* in the preceding key pending future study.

Biology: Blatchley (1926) reports overwintering in the adult stage and says it occurs principally in sandy locations along the margins of lakes and ponds. Readio and Sweet (1982) also indicate sandy areas. They characterize it as a species of open disturbed areas such as roadsides, waste lots, etc, but also in more permanent habitats along streams, beaches, dunes and open gravelly alpine areas. Despite the preferences for seemingly relatively temporary habitats, the high percentage of non-macropters (82%) suggests relative permanency of many of the habitats.

Distribution: Prior to Readio and Sweet (1982) *bullatus* was considered to be widely distributed in Florida. These authors refer those records to *floridana* and restrict the distribution of *bullatus* to the northern states. We include it here pending further study.

GEOCORIS ULIGINOSUS (Say) (fig. 43, map XXXXVI)

Salda uliginosus Say 1831:337.

Ophthalmicus niger Dallas 1852:586.

Ophthalmicus lateralis Fieber 1861:270-271.

Geocoris ater Lethierry & Severin (*nec* Fabricius) 1894:169.

Geocoris uliginosus speculater Montandon 1908:227-228.

Geocoris uliginosus lateralis McAtee 1914:135.

Diagnosis: Subequal to *bullatus* in size, extremely variable in color. Distinguishable by relatively shorter uniformly black scutellum.

The typical "variety" is almost uniformly black, at most with very narrow pale costal margins. The legs are black in the female and reddish-yellow in the male. Two "varieties" probably are not of geographic significance. The variety *speculator* Montandon has brownish yellow legs in the female and the pronotum and hemelytra broadly pale laterad; variety *lateralis* (Fieber) has a completely black pronotum but broadly pale hemelytra laterally.

Biology: Blatchley (1926) stated that it overwinters in the adult stage and in the south sometimes comes to lights. Altieri and Whitcomb (1979, 1980) reported it associated with *Chenopodium ambrosioides* L. where it feeds on the cicadellid *Graphocephala versuta* (Say). Wheeler (1981) reports it under mats of *Euphorbia maculata* L. where it fed on other lygaeids. Crocker and Whitcomb (1980) found it feeding on *Neopamera bilobata*. Readio and Sweet (1982) found *uliginosus* to be a species typically found in disturbed habitats, especially in shaded and moist areas. "Thus it is often found in agricultural fields, roadside margins and around homes". It winters as adults entering reproductive diapause in the fall. Readio and Sweet (1982) describe the nymphs.

Distribution: Distributed over almost the entire United States and southern Canada.

Florida Distribution: Reported by Van Duzee (1909) from Crescent City, Sanford, Fort Meyers and Belleair; by Barber (1914) from Charlotte Harbor; Lakeland and LaGrange, by Blatchley (1926) from Ormond, Lakeland, Istokpoga, Ft. Meyers and Dunedin, and by Altieri and Whitcomb (1979, 1980) from Tall Timbers Research Station. ALACHUA CO.: Gainesville, 16-III-56, J. W. Perry, (RMB); Gainesville, 14-VII-55 R. A. Morse, (FSCA); same, 6-VII-66, (FSCA); same, 6-IV-55, (FSCA); same, 27-V-62, F. W. Mead

(RMB); BROWARD CO.: 20 mi SW Hialeah on Hwy. 27, 17-VII-73, C. W. O'Brien, (JAS); Ft. Lauderdale 2-VII-57, J. M. Sewell, (RMB); Pompano Park, 19-IX-73, D. C. Clinton, W. H. Pierce, (RMB); COLLIER CO.: 12 mi SW Immokalee, 22-VII-73, C. W. O'Brien & Marshall, (JAS);

search Station, 30-VII-69, W. H. Whitcomb, (FSCA); MARION CO.: 3 mi NW Blythe, 30-VII-76, C. W. O'Brien, (JAS); Ocala Nat. Forest 3 mi N. Altoon, 5-VI-69, Slater, Schuh, Harrington, (JAS); same, N. Half Moon Lake, 5-VI-69, (JAS); MONROE CO.: Lower Matecumbe Key, 29-VII-62 F. W. Mead, (RMB); North Key Largo Key, 14-I-69, R. M. Baranowski, (RMB); same, 4-V-77, (RMB); same 11-VI-69, (RMB); Upper Matecumbe Key, 16-VI-53, O. D. Link, (RMB); NAS-SAU CO.: 7 mi SW Boulogne, 14-VI-69, J. A. Slater, J. Harrington, (JAS); ORANGE CO.: 14-VIII-54, H. A. Denmark, (FSCA); PASCO CO.: 6 mi N. Land O'Lakes, 23-VII-73, C. W. O'Brien & Marshall, (JAS); SARASOTA CO.: Myakka R. St. Park, 25-VII-76, (at night), O'Brien & Marshall, (JAS); VOLUSIA CO.: Edgewater, 5-III-39, C. A. Frost, (NMNH); same, 28-II-39, (NMNH); same, 24-II-39, (NMNH).
UNKNOWN COUNTY: Everglades National Park, 16-VIII-62, R. M. Baranowski, (RMB).



Map XXXXVI. Distribution of *Geocoris uliginosus*

DADE CO.: 4 mi NW junct. 41 & 98, 21-VII-73, C. W. O'Brien & Marshall, (JAS); Everglades Nat. Pk., Pine Glade, 1-XII-61, J. A. Slater, (JAS); Kendall, 20-VI-67, R. W. Swanson, (RMB); Miami, 20-VIII-62, R. M. Baranowski, (RMB); DUVAL CO.: St. Johns Bluff, 11-IX-56, F. W. Mead, (RMB); GADSDEN CO.: Chattahoochee, 5-X-60, R. E. Woodruff, (RMB); HAMILTON CO.: 21-XI-53, R. F. Hussey, (FSCA); HIGHLANDS CO.: 10 mi. north of Lake Placid, 26-V-62, H. V. Weems, Jr., (RMB); INDIAN RIVER CO.: Wabasso, 12-I-87, K. L. Hibbard, (FSCA); LEE CO.: Sanibel Island, 9-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); LEON CO.: 3 mi S. Tallahassee, 16-X-73, C. W. O'Brien, (JAS); Tallahassee, 11-X-73, C. W. O'Brien, (JAS); Tall Timbers Re-

PACHYGRONTHINAE Stal

The members of this subfamily are stout bodied insects with heavily incrassate multispinose fore femora, ventrally placed abdominal spiracles on all abdominal segments and an elongate tubular vesica.

The subfamily is of moderate size and chiefly tropical and subtropical but with representatives in all major faunal regions.

Two tribes are recognized, one of our two Florida genera belonging to each.

KEY TO FLORIDA TRIBES AND GENERA OF PACHYGRONTHINAE

1. First antennal segment elongate, greatly exceeding apex of tylus (Pachygronthini) *Oedancala*, p. 79
- 1'. First antennal segment short, not or barely attaining apex of tylus and shorter than any other antennal segment (Teraciini) *Phlegyas*, p. 84

PACHYGRONTHINI Stal

OEDANCALA Amyot & Serville 1843

Oedancala Amyot & Serville 1843:258.

Type Species: *Oedancala dorsilinea* Amyot & Serville 1843 = *Lygaeus crassimana* Fabricius 1803. Monobasic.

The members of this genus are rather robust, elongate insects, having the head slightly declivent and the outer margins of the jugs are distinctly raised into an upright carinate ridge. The antennae are relatively stout, but elongate, with the first segment usually as long as or longer than the head. The fore femora are very strongly incrassate and armed below with a number of sharp spines.

The genus is composed of thirteen species and is confined to the Western Hemisphere. Four species occur north of Mexico, all of which have been taken in Florida.

KEY TO FLORIDA SPECIES OF *OEDANCALA*

1. Apical corial margin with a distinct dark spot (may be faint) along margin.
..... *crassimana*, p. 79
- 1'. Apical corial margin immaculate, lacking a distinct dark spot. 2
2. First antennal segment elongate, longer than length of pronotum and longer than combined length of antennal segments II and III (fig. 46). *cubana*, p. 82
- 2'. First antennal segment shorter than pronotal length and shorter than combined length of antennal segments II & III (fig. 48). 3
3. Labium short, not reaching midpoint of mesosternum, color reddish.
..... *cladiumicola*, p. 84
- 3'. Labium longer, extending posterior to midpoint of mesosternum, color yellow brown, (northern Florida).
..... *dorsalis*, p. 81

OEDANCALA CRASSIMANA (Fabricius) (map XXXXVII)

Lygaeus crassimana Fabricius 1803:233.

Oedancala dorsilinea Amyot & Serville 1843:258-259.

Oedancala crassimanus Stal 1868:122.

Diagnosis: Bright yellowish tan, often marked with reddish and brown. Apical corial margin with a dark spot midway along margin (in some specimens, very much obscured). Antennae much more elongate than in *dorsalis*. First antennal segment almost as long as second and third combined. Scutellum usually not black adjacent to pale caloused areas. First labial segment extending only to bases of antennae.

As in most species of this and related genera, the sexes are dimorphic in antennal length, those of the males being proportionally much longer than those of the females.

Most literature records prior to Slater (1952) are under the name *dorsilinea* which is a synonym.

Biology: Reported by Slater (1952) breeding on *Scirpus* sp. in Louisiana. Little is known of the life cycle. It is a very common species in damp marshy habitats in Florida where *Carex*, *Scirpus* and *Cyperus* grow. In the Kissimmee prairie area it has been swept from grazed fields in large numbers.

Distribution: The range in the United States is primarily southern from Florida west to Texas. It has been reported from as far north as New York but is extremely rare in the northern portions of the range.

Florida Distribution: Reported by Barber (1914) from Punta Gorda, Titusville, Lakeland, Jacksonville, LaBelle, Ft. Meyers, Crescent City and La Grange. Blatchley (1926) mentions taking it at nearly all collecting stations, but gives no locality data. ALACHUA CO.: 13-VII-54, H. A. Denmark, (FSCA); 16-X-35, (FSCA); Fla. Ag. Exp. Sta., (NMNH); Gainesville, 20-X-37, (FSCA); same, 14-VI-67, F. W. Mead, (RMB); same, 16-V-64, (RMB); same, 16-V-64, (RMB); same, 10-XI-57, (RMB); same, 29-III-65, (RMB); same, 24-IV-64, (RMB); same, 27-V-67, (RMB); same, 4-V-

UNION CO.: Lake Butler, 11-V-83, (on *Carex lupulina*), C. Riherd, (FSCA).

OEDANCALA CUBANA Stal (figs. 46, 47, map XXXXIX)

Oedancala cubana Stal 1874:139.

Diagnosis: Very elongate, slender. Antennal segments extremely elongate and show striking sexual dimorphism.

In addition to the elongate slender body and very elongate antennae, *cubana* may readily be distinguished by the characters given in the preceding key.



Map XXXXIX. Distribution of *O. cubana*.

Biology: Unlike other members of the genus, *cubana* breeds on grasses rather than on sedges. It utilizes *Paspalum blodgettii* Chapm., *P. caespitosus*

Flugge, *Sporobolus indicus* (L.) R. Br., *Eragrostis ciliaris* (L.) R. Br. and *Cenchrus incertus* N. A. Curtis as breeding hosts. Baranowski and Slater (1989) discuss habitat and biology and describe the immature stages (fig. 46).

Distribution: Known only from Cuba and Florida.

Florida Distribution: Uhler (1876) reported *cubana* from Florida without definite locality. Slater (1955) believed that this record was probably in error. However, there is a female specimen labeled "Homestead, Florida, April 18, 1923 F. D. 4673" in the American Museum of Natural History and as noted below it definitely does occur on the Keys, so the Uhler record may be correct. MONROE CO.: Big Pine Key, 2-XII-75, R. M. Baranowski, J. A. Slater, (RMB); same, 8-VI-60, H. V. Weems, Jr., (JAS); same, (RMB); same, Watson Hammock, 19-VII-83, R. M. Baranowski, (RMB); same, 29-VI-83, (RMB); same, 6-VII-85, (RMB); same, 4-XI-82, (RMB); same, 6-VIII-80, (RMB); same, 9-VIII-80, (RMB); same, 23-IX-80, (NMNH); Key West, 20-VII-39, P. B. Lawson, (NMNH).



Fig. 46. *O. cubana*, 5th instar

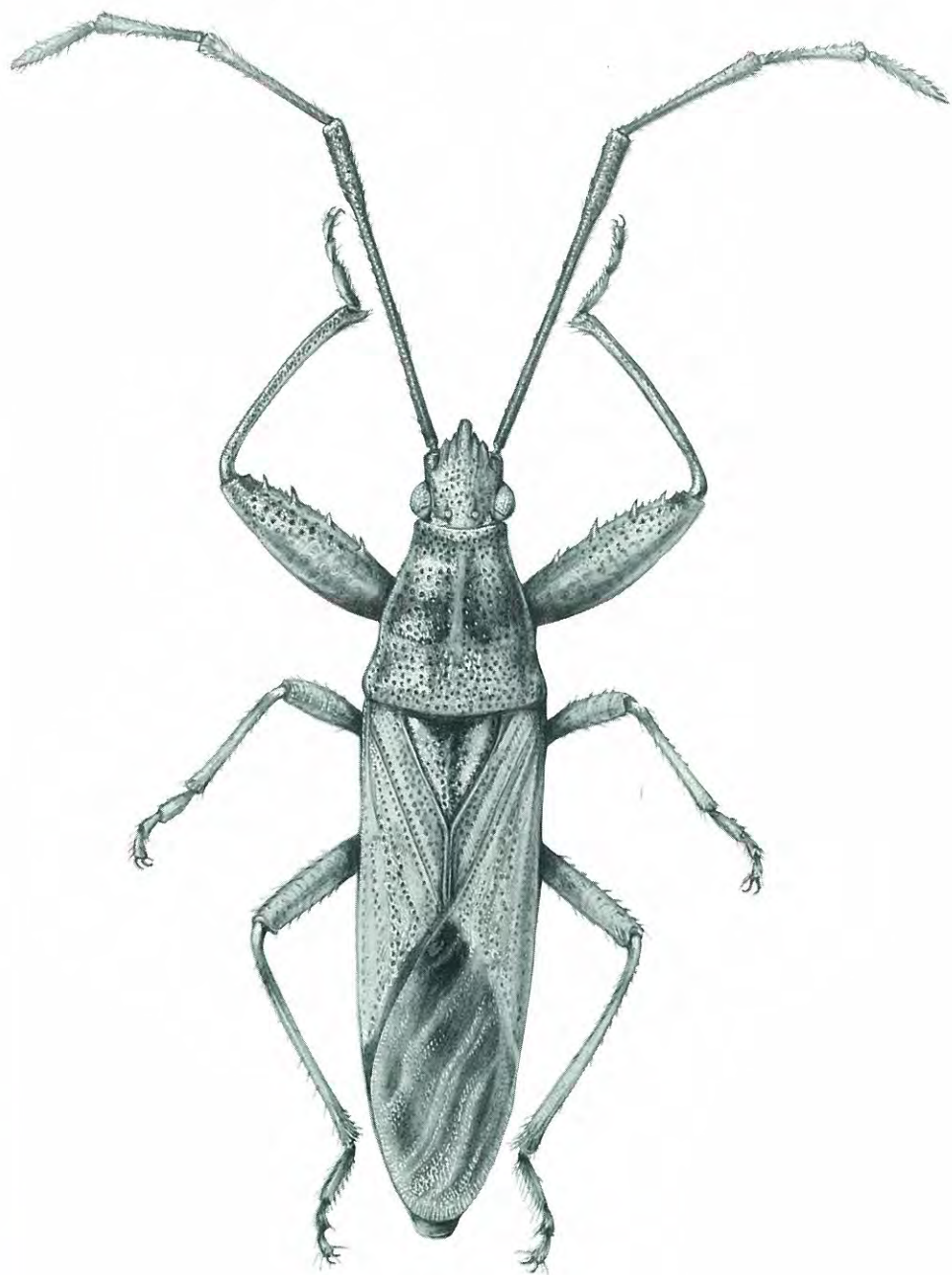


Fig. 47. *Oedancala cubana*

OEDANCALA CLADIUMICOLA
Baranowski and Slater
(fig. 48, map L)

Oedancala cladiumicola Baranowski & Slater
1989.

Diagnosis: Similar to *crassimana*, but lacking black spot along apical corial margins. Reddish in color.

Biology: Breeds upon the seed heads of sawgrass, *Cladium jamaicensis* Cranz and is found on the plants only when the seeds are close to or at maturity. Overwinters as adults. Adults have been kept in the laboratory throughout the winter with only water available. Baranowski and Slater (1989) discuss the biology and describe the immature stages.

Distribution: Known from Bahamas, Jamaica and Florida.

Florida Distribution: DADE CO.: 11 mi. north of US Hwy 41, on State Rd. 997, 8-VIII-84, R. M. Baranowski, (RMB); US Hwy 41, 6 mi. west of State Rd. 997, 30-VII-84, R. M. Baranowski, (RMB); 29 mi. North of Homestead on State Rd. 997, 30-VII-84, R. M. Baranowski, (RMB); 997, 30-VII-84, R. M. Baranowski, (RMB); Everglades National Park, 10 mi. west of Toll Gate on State Rd. 997, 6-VI-84, H. Glenn, (RMB); same, 2 mi. west of Toll Gate on State Rd. 997, 21-VI-84, H. Glenn, (RMB); same, Royal Palm Hammock area, 10-VI-69, R. M. Baranowski, (RMB); same, Royal Palm Road, 31-VII-83, R. M. Baranowski, (RMB); Homestead, 27-VII-68, R. M. Baranowski, (RMB); LEE CO.: Sanibel Island, 5-VIII-84, R. M. Baranowski, (RMB); MONROE CO.: Big Pine Key, Watson Hammock, 19-VII-83, R. M. Baranowski, (RMB); U.S.#1 m.m. 120, 8-VI-84, H. Glenn, (RMB); U.S.#1 m.m. 124, 18-VI-84, H. Glenn, (RMB); U.S.#1 m.m. 118, 19-VII-83, R. M. Baranowski, (RMB); U.S.#1 m.m. 117, 28-VI-84, H. Glenn, (RMB); U.S.#1 m.m. 117, 4-VI-84, H. Glenn, (RMB); U.S.#1 m.m. 118, 18-VI-84, H. Glenn, (RMB).



Map L. Distribution of *O. cladiumicola*

TERACRIINI Stal

PHLEGYAS Stal 1865

Phlegyas Stal 1865:145.
Helonotus Uhler 1876:145.
Peliopelta Uhler 1886:15.
Helonotocoris Lethierry 1888:463.

Type Species: *Phlegyas annulicrus* Stal 1869. First included species.

The members of this genus are stout, thick-bodied insects with the head across the eyes broader than the anterior pronotal margin and strongly declivent. The fore femora are strongly incrassate and heavily armed below.

Three species are recognized, two of which occur in north of Mexico.

**KEY TO FLORIDA SPECIES OF
PHLEGYAS**

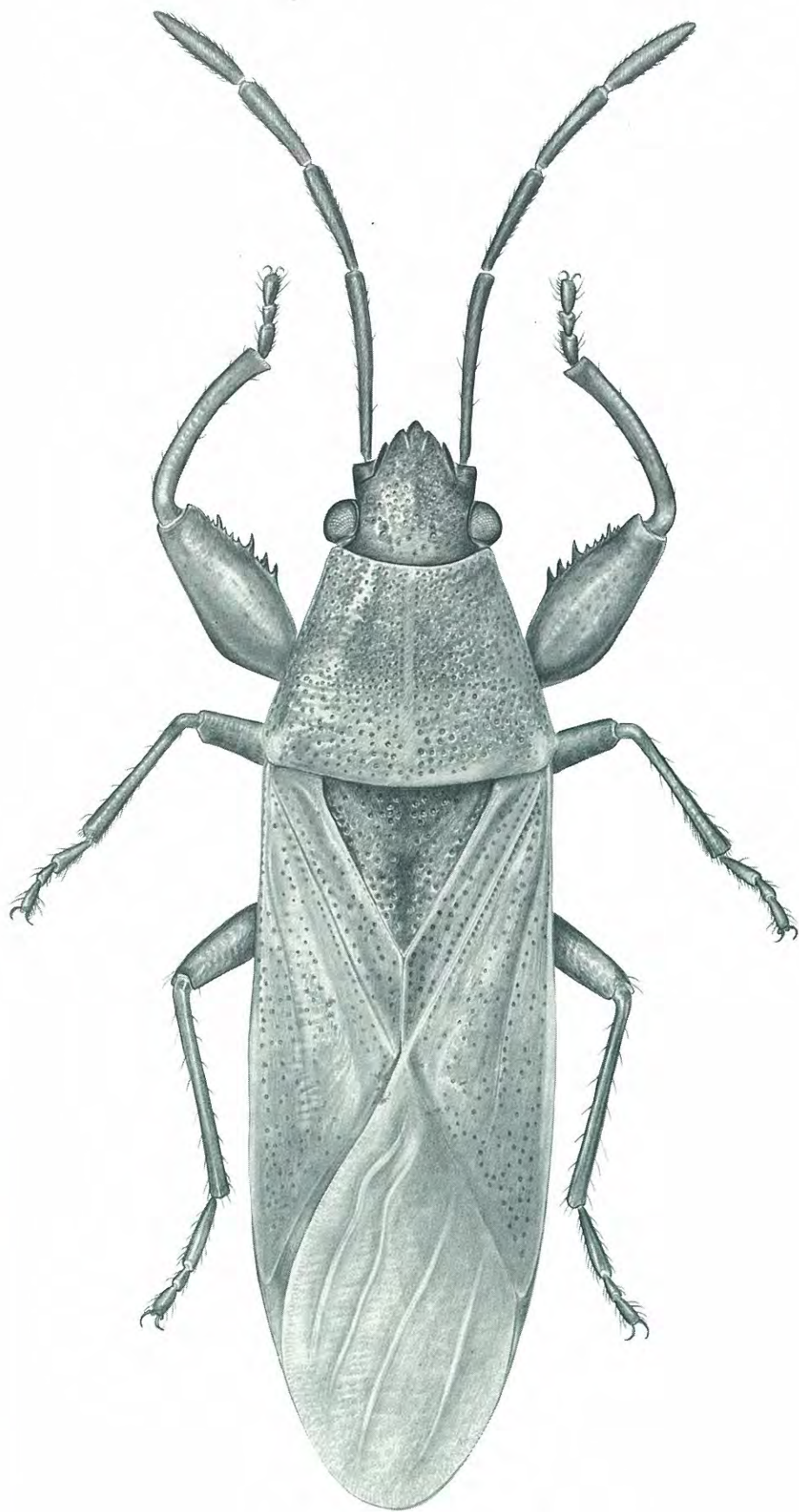


Fig. 48. *Oedancala cladiumicola*

1. Second antennal segment twice or nearly twice the length of segment one; antennal segment 2, at least 1.00-1.11 times length of segment 3 *annulicrus*, p. 86
- 1'. Second antennal segment nearly 2.5 times the length of segment one; antennal segment 2 at least 1.20-1.28 times length of segment 3 *abbreviatus*, p. 86

***PHLEGYAS ABBREVIATUS* (Uhler)**
(fig. 49, map LI)

Helonotus abbreviatus Uhler 1876:313-314.
Phlegyas abbreviatus Van Duzee 1905:549.

Diagnosis: Small (3.5-4.5), yellowish to chestnut with extensive black markings (particularly on pronotal calli) as 4 streaks on posterior pronotal lobe, as a median scutellar stripe and on apical corial margin.

The majority of specimens are submacropterous or brachypterous.

Biology: *P. abbreviatus* is a grass feeder and is often abundant in grassy fields in the northern and central states, but is scarce in Florida.

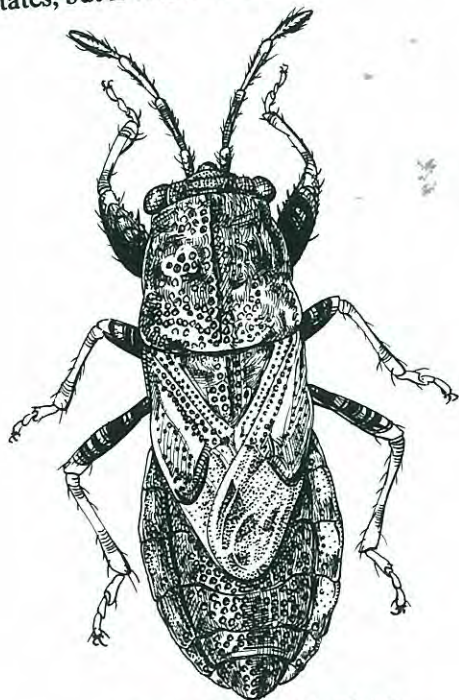
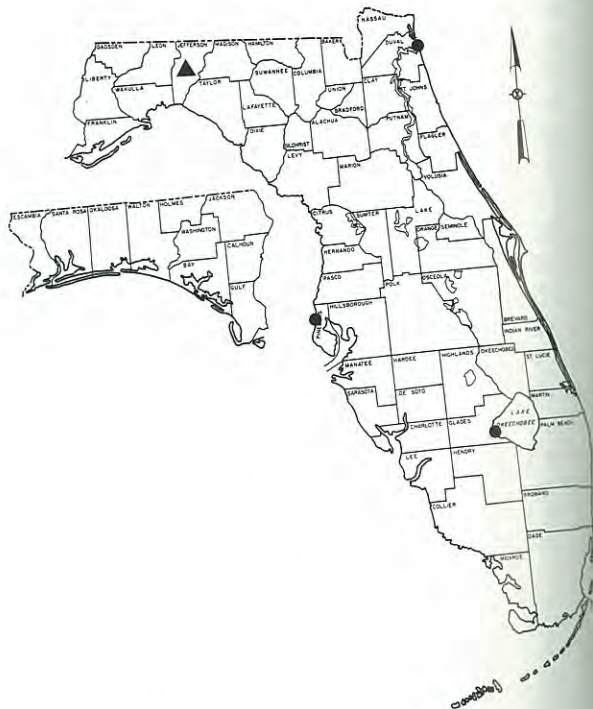


Fig. 49. *Phlegyas abbreviatus*

Distribution: Ranges from southern Canada and New England south to Florida and west to the Great Plains.



Map LI. Distribution of *Phlegyas abbreviatus*

Florida Distribution: Reported by Blatchley (1926) from Dunedin and Moore Haven. DUVAL CO.: St. Johns Bluff, 11-IX-56, F. W. Mead, (RMB); JEFFERSON CO.: 27-VII-54, F. W. Mead, (RMB).

***PHLEGYAS ANNULICRUS* Stal**
(map LII)

Phlegyas annulicrus Stal 1869:230.
Peliopelta tropicalis Distant 1893:114.

Diagnosis: Similar in habitus to *abbreviatus*, antennal proportions different. Generally much paler, giving a dull straw yellow impression. Darker markings usually dark reddish rather than black.

Biology: Nothing is known.

Distribution: Southern, extending from Florida across the Gulf states westward to California and south into Mexico.

colored insects marked with various combinations of brown, yellow, black, and white. They are characteristically ground bugs living in seed litter below plants. There is a variable degree of host specificity and certainly great differences in habitat preference although this has scarcely been investigated for the Floridian fauna. All are seed feeders, some climbing herbaceous vegetation when seeds are available. In Florida, of the common species, only *Paromius longulus*, a grass feeder, habitually lives above ground, but several species of *Neopamera* and *Pseudopachybrachius* occur frequently on weedy vegetation. Many species, difficult to collect in the field, frequently come to lights.

The systematics of the subfamily is complex. Unfortunately much of the tribal classification is based upon the position of the abdominal spiracles and of the trichobothria. These characters are often difficult to see in uncleared specimens. The beginning student should be willing to clear the abdomen of difficult specimens until he or she has a clear understanding of the character states involved.

The Floridian fauna is striking in that it is composed chiefly of species belonging to 4 tribes (Myodochini, Lethaeini, Antilocorini and Ozophorini). Representatives of these four make up almost the entire Rhyparochrominae fauna of the Neotropics.



Map LII. Distribution of *Phlegyas annulicrus*

Florida Distribution: Reported by Barber (1914) from Florida without definite station. ALACHUA CO.: 11-XI-56, R. A. Morse, (RMB); 29-XI-53, F. W. Mead, (FSCA); Gainesville, 23-IV-24, G. Merrill, (FSCA); same, 28-I-54, H. V. Weems, Jr., (FSCA); JACKSON CO.: 3 mi SW Butlers, 12-IX-54, R. F. Hussey, (FSCA).

RHYPAROCHROMINAE

Amyot & Serville

This is the largest and most complex subfamily of Lygaeidae. Most species are somber

KEY TO TRIBES OF FLORIDA

RHYPAROCHROMINAE

1. With at least spiracles of abdominal segment 4 located dorsally 2
- 1'. All abdominal spiracles located ventrally .
..... 4
2. Lateral margins of anterior pronotal lobe rounded; abdominal spiracles on segments 2, 3 and 4 located dorsally (fig. 50)
..... Myodochini, p. 122
- 2'. Lateral margins of anterior pronotal lobe carinate or explanate; only spiracles of abdominal segments 3 and 4 or 4 only located dorsally 3
3. Spiracles of abdominal segments 3 and 4 located dorsally; abdominal scent gland

Biology: Nothing is known.

Distribution: Southern, extending from Florida across the Gulf states westward to California and south into Mexico.

colored insects marked with various combinations of brown, yellow, black, and white. They are characteristically ground bugs living in seed litter below plants. There is a variable degree of host specificity and certainly great differences in habitat preference although this has scarcely been investigated for the Floridian fauna. All are seed feeders, some climbing herbaceous vegetation when seeds are available. In Florida, of the common species, only *Paromius longulus*, a grass feeder, habitually lives above ground, but several species of *Neopamera* and *Pseudopachybrachius* occur frequently on weedy vegetation. Many species, difficult to collect in the field, frequently come to lights.

The systematics of the subfamily is complex. Unfortunately much of the tribal classification is based upon the position of the abdominal spiracles and of the trichobothria. These characters are often difficult to see in uncleared specimens. The beginning student should be willing to clear the abdomen of difficult specimens until he or she has a clear understanding of the character states involved.

The Floridian fauna is striking in that it is composed chiefly of species belonging to 4 tribes (Myodochini, Lethaeini, Antillocorini and Ozophorini). Representatives of these four make up almost the entire Rhyparochrominae fauna of the Neotropics.



Map LII. Distribution of *Phlegyas annulicrus*

Florida Distribution: Reported by Barber (1914) from Florida without definite station. ALACHUA CO.: 11-XI-56, R. A. Morse, (RMB); 29-XI-53, F. W. Mead, (FSCA); Gainesville, 23-IV-24, G. Merrill, (FSCA); same, 28-I-54, H. V. Weems, Jr., (FSCA); JACKSON CO.: 3 mi SW Butlers, 12-IX-54, R. F. Hussey, (FSCA).

RHYPAROCHROMINAE Amyot & Serville

This is the largest and most complex subfamily of Lygaeidae. Most species are somber

KEY TO TRIBES OF FLORIDA RHYPAROCHROMINAE

1. With at least spiracles of abdominal segment 4 located dorsally 2
- 1'. All abdominal spiracles located ventrally .
..... 4
2. Lateral margins of anterior pronotal lobe rounded; abdominal spiracles on segments 2, 3 and 4 located dorsally (fig. 50)
..... Myodochini, p. 122
- 2'. Lateral margins of anterior pronotal lobe carinate or explanate; only spiracles of abdominal segments 3 and 4 or 4 only located dorsally 3
3. Spiracles of abdominal segments 3 and 4 located dorsally; abdominal scent gland

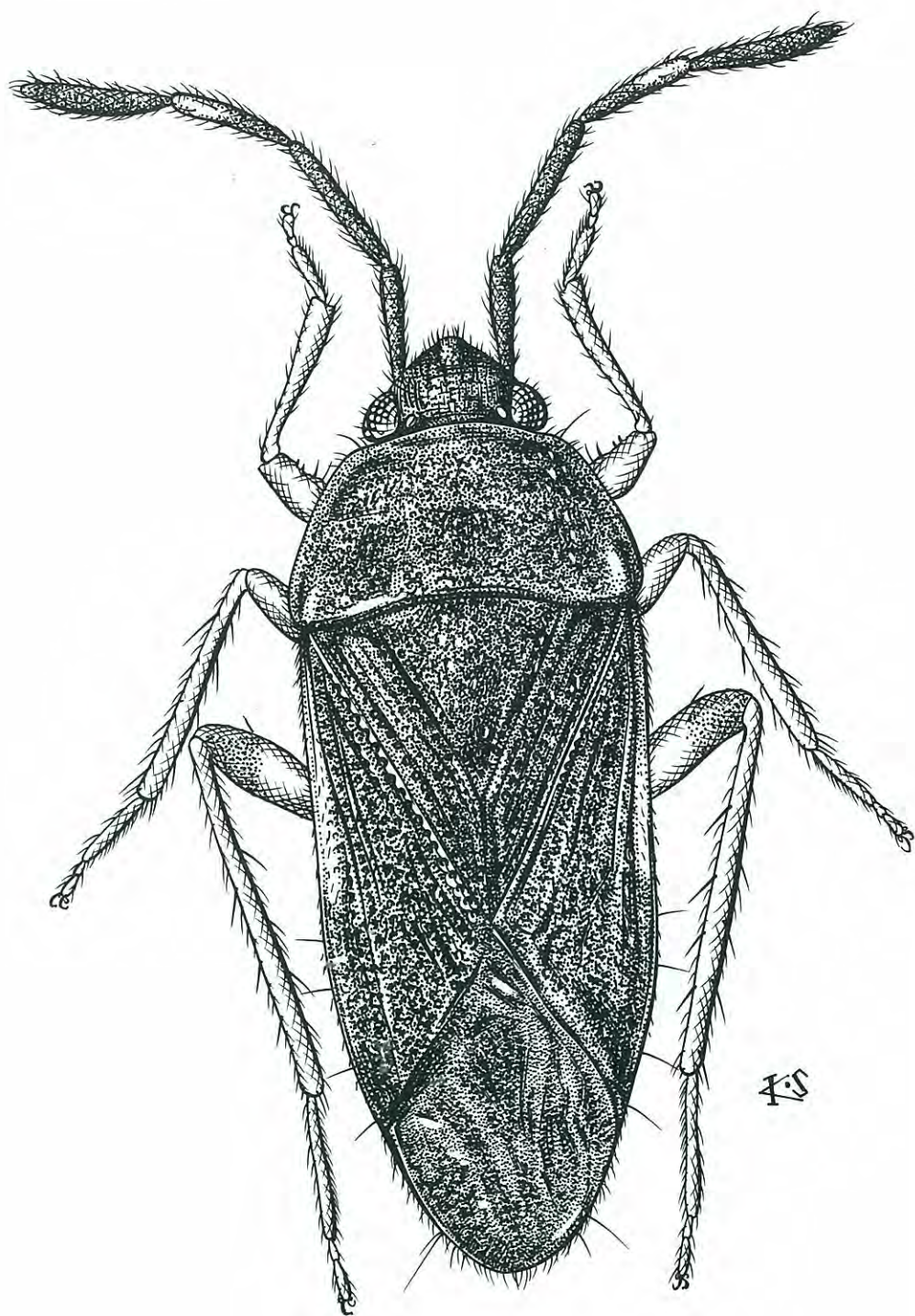


Fig. 55. *Cistalia signoreti*

It closely resembles *Paragonatas costaricensis* in size and color but is readily distinguishable by the white distal portion of the third antennal segment.

Biology: Nothing has been reported on the biology. Slater & Baranowski (1973) describe the 1st, 4th and 5th instar nymphs.

Distribution: Although only reported from Cuba, Brazil and Venezuela, it is probably widespread in the Neotropics. Earlier North American records from Texas have been referred to *explanata*.

Florida Distribution: The only previous Florida record is that of Slater and Baranowski (1973) of 5 specimens taken at blacklight at Flamingo Prairie, Everglades National Park. HIGHLANDS CO.: 2 mi S. Childes, 22-23-VIII-72, (light trap catch 623), J. E. Carrel (UMC); MONROE CO.: Everglades National Park, Flamingo Prairie, 26-IX-69, R. M. Baranowski, (RMB); same, 14-VII-70, (RMB).

CRYPHULA Stal 1874

Cryphula Stal 1874:164-166.

Trapezus Distant 1882:217.

Type Species: *Cryphula parallogramma* Stal 1874. Monobasic.

The members of this genus are small shining or subshining short legged rather robust stocky insects with the pronotum subquadrate, completely lacking any transverse impression and with lateral margins very narrowly explanate. The scutellum lacks a median elevation.

The genus at present contains 8 species that occur widely in the Neotropical region with 6 species occurring north of Mexico. Only one species occurs in Florida.

CRYPHULA TRIMACULATA (Distant) (fig. 56, map LIV)

Trapezus trimaculata Distant 1882:217.

Cryphula trimaculata Scudder 1962:766.

Diagnosis: Small (3-4), shining, dark castaneous brown. Anterior portion of pronotum impunctate, posterior closely punctate. Pronotal humeral angles, 3 spots on scutellum pale yellow as are some veins on hemelytra. Third and 4th antennal segments brown.

Both macropters and brachypters occur with the latter predominating.

Most of the literature treats this species under the name *parallelogramma* Stal. Scudder (1962) restricts the latter name to a small dark species from Texas and Arizona and assigns eastern North American populations to *trimaculata* (Dist.) which was originally described from Guatemala. The status of the Florida population needs further analysis relative to both Guatemalan and northeastern United States populations.

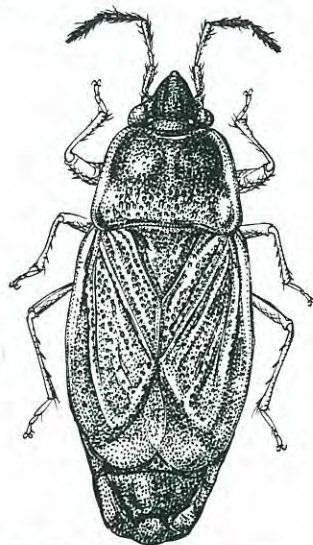


Fig. 56. *Cryphula trimaculata*

Biology: Sweet (1964) has studied the biology of this species in Connecticut. Its habitat is characterized as "a ground litter inhabitant of long lasting old fields vegetated with perennial bunch grasses such as *Andropogon scoparius* J., *Festuca rubra* L., and *Panicum* sp." This habitat is similar to that in which *Cnemodus mavortius* is found, the two species frequently being taken together. It often occurs along woodland margins, but is not a woodland species. It prefers seeds of *Panicum*. There is one generation a year, in Connecticut, with adults overwintering. Sweet (1964) took

Florida specimens in short grasses in a palmetto-slash pine habitat ecologically similar to Connecticut habitats.



Map LIV. Distribution of *Cryphula trimaculata*

Distribution: If Scudder's (1962) interpretation of the species is correct, the range is a very wide one from southern New England west to Colorado and south to Florida, Texas and in the highlands to Guatemala.

Florida Distribution: Reported by Blatchley (1926) from Bassenger, Istokpoga and Dunedin, and by Sweet (1964) from Naranja. BREVARD CO.: Eau Gallie, 5-XII-70, R. M. Baranowski, (RMB); DADE CO.: Miami, 3-XII-62, (at blacklight), B. L. Blackburn, (NMNH); INDIAN RIVER CO.: Vero Beach at S. Beach, 7-X-78, (Berlese, mixed beach scrub litter), O'Brien, Marshall, (JAS); JACKSON CO.: Marianna, 3-III-33, (ex moss), W. S. Blatchley, (LSU); LEON CO.: Tallahassee, 11-III-77, (Berlese, hardwood litter) G. B. Marshall, (JAS); MARION CO.:

Ocala Nat. Forest, 12 mi. E. Lynne, 22-II-74, (Berlese Sand pine-Oak Palmetto litter), C. W. O'Brien, (JAS); MARTIN CO.: Stuart, 17-19-III-39, F. E. Lutz, (AMNH); MONROE CO.: North Key Largo, 14-I-69, R. M. Baranowski, (JAS); Everglades National Park, 14-VII-70, R. M. Baranowski, (RMB); PINELLAS CO.: Dunedin, 20-XII-23, W. S. Blatchley, (Purdue); same, 17-XII-16, (Purdue); same, 30-XII-23, (Purdue); same, 14-III-22, (Purdue); same, 18-II-21, (Purdue); same, 30-XII-24, (Purdue); same, 19-II-17, (Purdue); same, 20-II-13, (Purdue); same, 4-I-25, (Purdue); same, XII-29, (BMNH); IV-30, (BMNH); same, 1-4-25, (BMNH); POLK CO.: North of Lake Alfred, flat pine, 12-II-69, (can trap), M. H. Muma, (RMB); VOLUSIA CO.: 9.5 mi. N Hwy 40, Ormond Beach, Rte A1A, P. D. Ashlock, (PDA).
UNKNOWN COUNTY: Florida Agricultural Experiment Station 7126 (FSCA).

PARAGONATAS Barber 1939

Paragonatas Barber 1939:362-363.

Type Species: *Gonatas divergens* Distant 1882. By original designation.

This genus contains moderate to small sized lethaeines with the dorsal surface distinctly and prominently pubescent or pilose, the lateral pronotal margins carinate but not distinctly explanate, the anterior lobe in the area of the calli impunctate, the posterior lobe distinctly but sometimes finely punctate. The fore femora, in the only known Florida species, lack distinct spines below but have a series of elongate setae present.

Two Neotropical species are known, of which one definitely occurs in southern Florida. The other species, *divergens*, (Distant) is widespread in the West Indies and is included in the following key as it has been reported from Florida.

KEY TO FLORIDA SPECIES OF PARAGONATAS

1. Dorsal surface polished, strongly shining; lacking a distinct comma-shaped or irregular pale macula distally on corium; fore femora lacking 2-3 short stout spines on ventral surface distad of elongate setae; scent gland auricle broad and strongly "hooked" posteriorly; evaporative area not covering lateral (outer) 1/2 of metapleuron *costaricensis*, p. 93
- 1'. Dorsal surface dull or at most subshining, never appearing strongly polished; possessing a conspicuous testaceous irregular or comma-shaped macula distally on corium; fore femora possess 2-3 short acute spines below distad of a series of elongate setae; scent gland auricle slender, acuminate, not strongly "hooked" posteriorly; evaporative area covering all but outer (lateral) 1/3 of metapleuron *divergens*, p. 93

PARAGONATAS COSTARICENSIS
(Distant)
(map LV)

Gonatas costaricensis Distant 1903:526.

Paragonatas costaricensis Barber 1939:362.

Diagnosis: Strongly polished pubescent reddish brown, resembling *Cistalia signoreti* in general habitus. Appendages pale yellow, sometimes somewhat infuscated. Pale stripe present along clavus adjacent to claval suture and corial veins, as well as narrowly explanate lateral corial margins.

There is some question in our minds as to whether this species and *divergens* should be considered as congeneric. The lack of fore femoral spines in *costaricensis* as well as the extremely differently shaped scent gland auricle and evaporative area indicate that the two species are only distantly related. In some respects *divergens* appears to be more closely related to *Cistalia* than to *costaricensis*.

Distribution: This species has not been reported previously from the United States and is known in the literature only from Costa Rica. We have, however, examined specimens from Venezuela and Trinidad and it occurs in Mexico as well. It is thus

surprising to find *costaricensis* rather than *divergens* in southern Florida as the latter is very widespread in the West Indies and Central America.



Map LV. Distribution of *Paragonatas costaricensis*

Florida Distribution: DADE CO.: Homestead, 7-X-68, (at light) R. M. Baranowski, (RMB); same, 28-IX-68, (RMB); 26000 S.W. 197 Ave, 6-V-77, R. M. Baranowski, (RMB); MONROE CO. Stock Island, 28-V-68, F. A. Buchanan, (RMB); Key Largo, -5?, (at light) H. V. Weems, Jr., (UMAA); Key Largo, 6-VI-60, (at light) H. V. Weems, Jr., (JAS); Plantation Key, 3-V-57, (at light) F. W. Mead, (UMAA).

PARAGONATAS DIVERGENS (Distant)

Gonatas divergens Distant 1882:219-220.

Paragonatas divergens Barber 1939:362-363.

Diagnosis: Body surface dull, not polished. Recognizable otherwise by characters given in the preceding key.

Ecology: In the West Indies a ubiquitous ground-dwelling species. It is found primarily in temporary successional stages of old field habitats where it apparently feeds on a variety of seeds. Palmer and Bennett (1988) report it from Florida on *Eleocharis halimifolia* L. (see below).

Distribution: This species is widely distributed in the West Indies and on the mainland from Mexico south at least to Panama.

Florida Distribution: Palmer and Bennett (1988), as noted above, report this species from Florida without definite locality (as *Palagonatas* (sic.)). This is the first record from Florida. However, there is no voucher specimen in the Florida State Collection of Arthropods, nor have we been able to find the specimen upon which this record is based elsewhere. Until a specimen from Florida is verified, *P. divergens* must remain a questionable Florida species.

ANTILLOCORINI Ashlock

The members of this tribe are usually minute insects, among the smallest of Lygaeidae. They are most closely related to the Lethaeini in which tribe they were formerly placed. Antillocorines are characterized by having the mesal portion of the apical corial margin deeply concave, the bucculae joined by a carina well behind the labium, by lacking iridescent areas at the base of the head and lacking antero-lateral pronotal trichobothria. Nymphs lack a Y-shaped suture, have lateral evaporative areas similar to those of the Lethaeini but have all three dorsal abdominal scent gland openings well developed and similar in size.

The Antillocorini have a distribution that is similar to the Lethaeini in that, while found in all major zoogeographic regions, they are predominantly tropical and subtropical. The Florida fauna is all derived from the Neotropics.

KEY TO FLORIDA GENERA OF ANTILLOCORINI

1. Trichobothria on abdominal sterna 4 and 5 arranged in a linear longitudinal series (fig. 57) *Cligenes*, p. 98

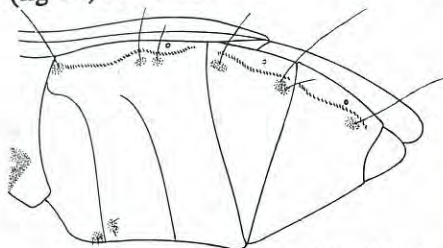


Fig. 57. *Cligenes* sp., abdomen, lateral view

- 1'. Trichobothria on abdominal sterna 4 and 5 not arranged in a linear, longitudinal series, the two posterior trichobothria arranged dorso-ventrally relative to each other (fig. 53) 2
2. Metathoracic scent gland auricle strongly curving posteriorly so that distal end is considerably caudad of orifice; bucculae small, not extending outward far beyond labium; lateral pronotal margins obtuse; 2nd and 3rd antennal segments stout, as thick or nearly as thick as segment 4 *Antillocoris*, p. 94
- 2'. Metathoracic scent gland auricle elliptical and nearly straight, distal end not located distinctly caudad of orifice; bucculae very large extending outward well beyond labium; lateral pronotal margins acutely carinate; 2nd & 3rd antennal segments conspicuously more slender than segment 4 *Paurocoris*, p. 101

ANTILLOCORIS Kirkaldy 1904

Salacia Stal 1874:156 (section aa).

Pygaeus Uhler 1894:187 (preocc.).

Antillocoris Kirkaldy 1904:280.

Type Species: *Pygaeus pallidus* Uhler 1894.
Monobasic.

The members of this genus are among the smallest species of Lygaeidae that occur in North America, not exceeding 3 mm in length and usually are of a bright reddish brown to chestnut color. The dorsal surface is coarsely punctate.

The genus is confined to the Western Hemisphere. Six species are known of which 3 or 4 (1 questionable) occur in the United States east of the Great Plains, 3 of which are thought to occur in Florida.

KEY TO FLORIDA SPECIES OF *ANTILLOCORIS*

1. Dorsal surface distinctly pilose with longest hairs on scutellar and corial surface much longer than hairs on 1st antennal segment *pilosulus*, p. 95
- 1'. Dorsal surface appearing nearly glabrous or at most with hairs on scutellum and corial surface shorter than longest hairs on 1st antennal segment. 2
2. Dorsal surface of pronotum and scutellum dull, anterior acetabula not separated from propleuron by a row of punctures; lateral margins of pronotum distinctly carinate in lateral view. . . . *discretus*, p. 96
- 2'. Dorsal surface shining; anterior acetabula separated from propleuron by several punctures; lateral margins of anterior pronotal lobe scarcely carinate or emarginate in lateral view. . . *pallidus*, p. 98

ANTILLOCORIS PILOSULUS (Stal) (map LVI)

Salacia pilosula Stal 1874:158.

Antillocoris (*Cligenes*) *pilosulus* Torre Bueno 1912:212.

Diagnosis: Dark brown readily distinguishable by elongate pale hairs on dorsal surface.

Barber (1952) indicated that both macropterous and brachypterous conditions occur, but Sweet (1964) believed that the species is entirely macropterous. However, the series taken

in beach litter in Gadsden Co. contained 20 brachypterous and only one macropterous individual.

Biology: Sweet (1964) summarized what is known of the life history. At Noank Ct., he collected specimens in thick litter beneath bayberry, *Myrica pennsylvanica* Loisel, and in southern Florida in mesic leaf litter under an avocado tree.

Distribution: Although it is widespread in eastern North America, the range is more southern than is that of *minutus*, from southern New England and New York south to Florida and west to Missouri and Texas.



Map LVI. Distribution of *Antillocoris pilosulus*

Florida Distribution: Reported by Barber (1914) from Biscayne Bay and by Sweet (1964) from Naranja. ALACHUA CO.: 7-IX-55, H. V. Weems, Jr., (FSCA); 9 mi. NW Gainesville, Univ. of Fla. Horticultural Unit, 21-VI-78, R. A. Belmont, (RMB); Gainesville, 18-V-59, H. V. Weems, Jr., (FSCA); same, 18-VI-59, H. V. Weems, Jr.,

(RMB); Gainesville, Doyle Connor Building, 13-VI-73, F. W. Mead, (RMB); same, 14-16-VI-74, (RMB); same, 14-VI-73, (RMB); same, 25-VI-74, (RMB); same, 3-IV-74, (RMB); same, 5-7-VII-74, (RMB); same, 27-VI-74, (RMB); BAKER CO., Olustee, 30-V-63, E. P. Merkle, (RMB); DADE CO.: 26000 SW 197 Ave, 6-VI-77, R. M. Baranowski, (RMB); Agricultural Research Education Center, Homestead, 12-IV-69, R. M. Baranowski, (RMB); same, 11-IV-69, R. M. Baranowski, (RMB); Biscayne Bay, A. T. Slosson, (AMNH); Coconut Grove, III, G. Fairchild, (AMNH); Castello Hammock, 17-IV-78, R. M. Baranowski, (RMB); Grossman Hammock State Park, 24-V-72, R. M. Baranowski, (RMB); Homestead, 12-V-69, R. M. Baranowski, (RMB); same, 18-V-69, R. M. Baranowski, (RMB); same, 24-III-69, R. M. Baranowski, (RMB); same, 7-X-68, (RMB); same, 25-VI-69, R. M. Baranowski, (RMB); same, 24-III-69, (JAS); same, 2-IV-69, (JAS); same, 10-11-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); same, 25-XI-48, R. H. Beamer, (NMNH); same, 8-XII-74, J. A. Slater (JAS); Orchid Jungle Hammock, Newton Road, 23-III-70, R. M. Baranowski, (RMB); same, 28-IV-70, R. M. Baranowski, (RMB); Ross & Castello Hammock, 18-III-72, R. M. Baranowski, (RMB); Royal Palm Park, 21-VII-48, R. H. Beamer, (NMNH); same, 7-21-48, R. H. Beamer, (NMNH); FRANKLIN CO.: Alligator Pt., 18-III-74, (Berlese, palmetto & oak litter), C. W. O'Brien & Marshall, (JAS); GADSDEN CO., 1 mi. W. Greensboro Church, Hwy 259, 22-I-78, E. D. Healy, (Berlese beach litter), (JAS); Chattahoochee, 8-IV-55, (at light), R. F. Hussey, (FSCA); HENDRY CO.: La Belle, 16-VII-39, Oman, (NMNH); HIGHLANDS CO.: Archbold Biol. Sta., 7-8-VI-69, (at light), J. Harrington, T. Schuh, J. Slater, (JAS); Lake Placid, 8 mi S Archbold Biological Station, 2-IX-82, M. Deyrup, (RMB); same, 1-IX-82, (RMB); Se-
Nr Avon Park, 7-XI-61, T. Morris, (AMNH); bring, 1-16-IX, C. T. Parsons, (AMNH); same, 12-VIII, (AMNH); same, 25-31-VII, (AMNH); same, 7-VIII, (AMNH); same, XII, (AMNH); HILLSBOROUGH CO., Little Manatee River, U.S. Highway 41, 14-VIII-38, Hubbell and Friauf, (NMNH); JEFFERSON CO.: 2 mi. N. Wacissa, 3-VII-73, (UV light), G. B. Marshall, R. D. Kaplan, (JAS); Monticello, Big Bend Horticultural Lab., 11-IX-68, W. H. Whitcomb, (RMB); LEON CO., Tall Timbers Research Station, 8-15-VIII-69, Donny L. Harris, (RMB); Tallahassee, 13-II-78, C.

W. O'Brien & Marshall, (hardwood litter), (JAS); MARION CO.: 14 mi. SW Ocala, Ross Prairie, 12-VI-75, P. C. Drummond, (RMB); 9 mi. SSW of Ocala, 2-X-75, J. Wiley, (RMB); same, 27-VIII-75, Drummond & Wiley, (RMB); same, 28-VI-75, P. C. Drummond, (RMB); same, 28-VI-75, P. C. Drummond, (RMB); Lake Eaton, 22-IV-75, Peter Drummond, (RMB); same, 8-IV-75, Peter Drummond, (RMB); North end of Heather Island, 10-IX-75, J. Wiley, (RMB); same, 3-XI-75, J. Wiley, (RMB); Sharpes Ferry Field Station, 15-V-75, P. C. Drummond, (RMB); same, 2-X-75, J. Wiley, (RMB); same, 27-VII-75, Drummond & Wiley, (RMB); MONROE CO., Everglades National Park, Flamingo Prairie, 23-III-70, R. M. Baranowski, (RMB); same 28-III-70, (RMB); same, 8-IV-72, (RMB); NASSAU CO.: Hilliard, 19-VIII-30, L. D. Tuthill, (NMNH); ORANGE CO.: Orlando, 11-V-31 (at light), (FSCA); Winter Park, 15-V-44, H. T. Fernald, (AMNH); same, 20-VI-44, (FSCA); same, 23-IV-44, (FSCA); PASCO CO.: Lacoochee, 7-VII-48, R. H. Beamer, (NMNH); POLK CO.: Lake Alfred, 7-8-52, M. H. Muma, (NMNH); Lakeland, 13-IV-48, R. F. Hussey, (NMNH); same, 10-V-52, (at light), (FSCA); PUTNAM CO.: 2 mi. NW of Orange Springs, 1-3-VIII-75, B. Bowman, (RMB); SEMINOLE CO.: Sanford, 7-28-48, R. H. Beamer, (NMNH); SUWANNEE CO.: Branford, 8-4-39, D. E. Hardy, (NMNH); WAKULLA CO.: 20-IV-55, F. W. Mead, (FSCA); 3-VI-69, (blacklight), J. Slater, T. Schuh, Harrington, (AMNH); 1 mi. N. Spring Creek, 31-V-73, (at light), C. W. O'Brien, (JAS).

ANTILLOCORIS DISCRETUS Barber (map LVII)

Antilocoris discretus Barber 1952:86-87.

Diagnosis: Small (2.0), dull yellowish tawny, nearly glabrous on dorsal surface.

It is thus far known to occur only in the macropterous condition.

Biology: Nothing appears to be known of its biology, other than data on collecting labels, but presumably it is similar to other members of the genus.

Distribution: It is a common species in Florida, and is also known from Georgia, Texas, and New Jersey. Many early southern records of *pallidus* should be referred here.



Map LVII. Distribution of *Antillocoris discretus*

Florida Distribution: The holotype was described by Barber (1952) from LaBelle, paratypes from Suwanee Springs, Branford, Hilliard, Hillsborough Co., and Rock Bluff. Additional localities recorded by Barber (1952) are Royal Palm Park, Deerfield, Sanford, Old Town, Lacoochee, Lake City, Sebastian, Cedar Keys, Parish, Plant City and Lake Placid. Blatchley's (1926) records of *pallidus* from Dunedin, Royal Palm Park and Ft. Meyers as well as Barber's (1914) of *pallidus* from Biscayne Bay are referred here. ALACHUA CO., 27-VIII-54, H. V. Weems, Jr., (FSCA); 7-IX-55, H. V. Weems, Jr., (RMB); DADE CO., 26000 SW 197 Ave, 6-VI-77, R. M. Baranowski, (RMB); Castello Hammock, 17-IV-78, R. M. Baranowski, same, 29-V-69, (RMB); Grossman Hammock State Pk. 24-V-72, R. M. Baranowski, (RMB); Homestead, 5-

X-68, R. M. Baranowski, (RMB); Orchid Jungle Hammock, Newton Road, 23-III-70, R. M. Baranowski, (RMB); same, 5-XI-68 (blacklight trap), R. M. Baranowski, (RMB); same, 2-VIII-68, (blacklight trap), R. M. Baranowski, (JAS); Ross & Castello Hammock, 18-III-70, R. M. Baranowski, (RMB); FRANKLIN CO.: Alligator Pt., 18-III-74, (Berlese, palmetto & oak litter), C. O'Brien & Marshall, (JAS); GADSDEN CO., Chattahoochee, 12-IV-54, (at light), R. Hussey, (FSCA); 1 mi W. Greensboro Church, Hwy 259, 22-I-78, (beach litter), E. D. Healy, (JAS); GULF CO.: 1 mi. n. White City, 20-IX-78, (UV trap), C. W. O'Brien & Marshall, (JAS); HIGHLANDS CO., Lake Placid, 8 mi. S. Archbold Biological Station, 1-IX-82, M. Deyrup, (RMB); same, 31-VIII-82, (RMB); Archbold Biol. Sta., 7-8-VI-69, J. Harrington, T. Schuh, J. Slater, (at light), (JAS); HILLSBOROUGH CO., Hillsborough River State Park, 18-VIII-38, (at light), Hubbell and Friauf, (NMNH); Hillsborough State Park, 18-VIII-38, Hubbell and Friauf, (FSCA); Little Manatee River, U.S. Highway 41, 14-VIII-38, (at light), Hubbell and Friauf, (NMNH); JEFFERSON CO., Monticello, 29-IX-68, W.H. Whitcomb, (RMB); Monticello, Big Bend Horticultural Lab, 11-IX-68, W. H. Whitcomb, (RMB); same, 19-IX-68, (RMB); LEON CO., Tall Timbers Research Station, 19-VIII-68, Donny L. Harris, (RMB); MANATEE CO.: Myakka River State Park, 3-VI-54, H. V. Weems, Jr., (FSCA); MARION CO.: 14 mi. SW of Ocala, Ross Prairie, 12-VI-75, P. C. Drummond, (RMB); 9 mi. SSW of Ocala, 27-VIII-75, Drummond & Wiley, (RMB); same, 2-X-75, J. Wiley, (RMB); same, 28-VI-75, P. C. Drummond, (RMB); Lake Eaton, 22-IV-75, Peter Drummond, (RMB); same, 8-IV-75, P. C. Drummond, (RMB); north end of Heather Island, 10-IX-75, J. Wiley, (RMB); Sharpes Ferry Field Station, 15-V-75, P. C. Drummond, (RMB); same, 2-X-75, J. Wiley, (RMB); same, 27-VII-75, Drummond & Wiley, (RMB); same, 30-IV-75, N. Holler, (RMB); ORANGE CO.: Winter Park, 25-VII-40, H. T. Fernald, (FSCA); POLK CO.: Lakeland, 19-VII-51, R. F. Hussey, (RMB); same, 2-V-50, (at light), R. Hussey, (FSCA); same, 27-IV-50, (at light), R. Hussey, (FSCA); PUTNAM CO., 2 mi. NW of Orange Springs, 13-VIII-75, B. Bowman, (RMB); SUWANNEE Co.: Branford, 8-4-39, J. D. Beamer, (NMNH); WAKULLA CO.: Wakulla Springs, 3-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS).

ANTILLOCORIS PALLIDUS (Uhler) (fig. 53, map LVIII)

Pygaeus pallidus Uhler 1894:187-188.
Antilocoris pallidus Barber 1952:85.

Diagnosis: Shining reddish brown, distinguishable primarily by characters given in key.



Map LVIII. Distribution of *Antilocoris pallidus*

Distribution: This species has been reported from many areas in North America, but northern records are referable to *minutus* (Bergroth) and most southern ones to *discretus* Barber. *A. pallidus* is a widespread Neotropical species. Barber (1952) indicated that it possibly occurs in Florida, but there are no previous definite records. However, true *pallidus* does occur in Florida although it apparently is uncommon.

Florida Distribution: DADE CO.: Biscayne Bay, A. T. Slosson, (AMNH); Homestead, 8-XII-74, J.

A. Slater, (JAS); Orchid Jungle Hammock, Newton Rd., 10-VIII-68, (blacklight trap), R. M. Baranowski, (JAS); HIGHLANDS CO.: Sebring, 10-IX, C. T. Parsons, (AMNH); Sebring, 12-VIII, C. T. Parsons, (AMNH); JEFFERSON CO.: 2 mi. N. Wacissa, 3-VII-73, G. B. Marshall, R. D. Kaplan, (JAS).

CLIGENES Distant 1893

Cligenes Distant 1893:405.
Tomopelta Uhler 1893:708.

Type Species: *Cligenes distinctus* Distant 1893. Monobasic.

This genus is composed of minute insects, about the size of species of *Antilocoris* and thus among the smallest of the Western Hemisphere Lygaeidae. The anterior lobe of the pronotum is much wider than the head, strongly convex, and distinctly sinuately explanate along the lateral margins. The apical corial margin is deeply sinuate on the mesal half. The membrane is hyaline, and the scutellum has a distinct median carina on the distal half.

Only two species now are referable to *Cligenes*. In the past this genus has been much confused with *Botocudo* Kirkaldy, and a number of species pertaining to the latter genus have been included in *Cligenes*. We accept the generic definition of Scudder (1962) as to the relationships of these two genera.

As presently understood it is essentially a Neotropical genus reaching the United States only in southern Florida.

CLIGENES DISTINCTUS Distant (fig. 58, map LIX)

Cligenes distinctus Distant 1893:405.
Tomopelta munda Uhler 1893:709.

Diagnosis: Small (2.5-3.0), robust with generally dark appearance. Head blackish, anterior pronotal lobe, scutellum and ventral surface dark brown strongly contrasting with testaceous hemelytra and legs. Corium with two spots along lateral margins, one at apex of corium one midway

between base and apex. Entire pronotal surface densely punctate with a very coarse row anteriorly giving impression of a weak pronotal collar.

This appears to be an entirely macropterous species.



Map LIX. Distribution of *Cligenes distinctus*

Biology: There is little information in the literature concerning the biology of this species. Blatchley (1926) took numerous specimens by beating the dead leaves of a royal palm in a hammock on Paradise Key, and others by sifting dead leaves on moist ground along roadways. It appears to be an insect primarily adapted to woody mesic conditions in southern Florida. We have found it to be associated almost entirely with hammocks where it is possible to take large numbers at light at night. In the West Indies and at Homestead we have found *distinctus* abundant in seed litter below fig trees and it may be an obligatory phytophage of *Ficus*.

Distribution: Described from St. Vincent, West Indies where it was taken at an altitude of 1,000 ft

in a forest at sunset. Appears to be widespread in the West Indies, but is otherwise known only from southern Florida.

Florida Distribution: First reported from North America by Blatchley (1926) under the synonym *Tomopelta munda* Uhler from Royal Palm Park and Paradise Key. BREVARD CO.: Titusville, (on *Sesuvium*), 26-VI-86, (FSCA); DADE CO.: Agricultural Research and Education Center, Homestead, 12-IV-69, R. M. Baranowski, (RMB); Castello Hammock, 17-IV-72, R. M. Baranowski, (RMB); same, 19-V-70, (RMB); same 29-III-78, (RMB); same, 17-IV-78, (RMB); same, 29-V-69, (RMB); Homestead, 12-V-69, R. M. Baranowski, (RMB); same, 5-X-68, (RMB); same, 15-X-68, (blacklight trap), (JAS); same, 16-XII-74, J. A. Slater, (JAS); Naranja, 20-IV-60, R. M. Baranowski, (RMB); Orchid Jungle Hammock, Newton Road, 14-X-68, R. M. Baranowski, same, 5-XI-68, (RMB); same, 4-IX-68, (RMB); same, 19-IX-68, (RMB); same, 12-IX-68, (RMB); same, 2-X-68, (RMB); same, 2-X-68, (RMB); same, 19-IX-68, (RMB); same, 22-X-68, (RMB); same, 5-XI-68, (RMB); same, 1-X-68, (RMB); same, 21-VI-69, (RMB); same, 21-VI-69, (RMB); same, 28-IV-70, (RMB); same, 21-VII-70, (RMB); same, 23-III-70, (RMB); same, 9-VI-69, (RMB); same, 29-VIII-68, (RMB); same, 9-VI-69, (RMB); same, 1-X-68, (RMB); same, 18-IX-68, (RMB); same, 1-X-68, (blacklight trap), (JAS); same, 16-VIII-68, (JAS); same, 10-III-68, (JAS); same, 19-IX-68, (JAS); same, 22-X-68, (JAS); Ross & Castello Hammock, 12-IX-68, R. M. Baranowski, (RMB); same, 19-IX-68, (RMB); same, 19-IX-68, (RMB); same, 2-X-68, (RMB); same, 21-VII-70, (RMB); same, 4-IX-68, (RMB); same, 22-X-68, (RMB); same, 2-X-68, (RMB); same, 23-III-70, (RMB); same, 23-III-70, (RMB); same, 4-IX-68, (RMB); same, 15-X-68, (blacklight trap), (RMB); same, 7-X-68, (RMB); same, 10-VIII-68, (RMB); same, 5-VIII-68, (RMB); same, 7-X-68, (RMB); same, 25-IX-68, (RMB); Tims Hammock, 24-II-19, H. S. Barber, (NMNH); VI-49, (FSCA); Royal Palm Park, 12-11-24, W. S. Blatchley, (NMNH); MONROE CO.: (JAS); Everglades Nat. Pk., 31-III-60, R. M. Baranowski, (JAS); same, Flamingo Prairie, 28-III-70, (RMB); Key West 2-V-69, F. A. Buchanan, (RMB); same, 13-IX-68, (RMB); same, 21-IX-68, (RMB); same, 2-V-69, (RMB); same, 20-VIII-71,

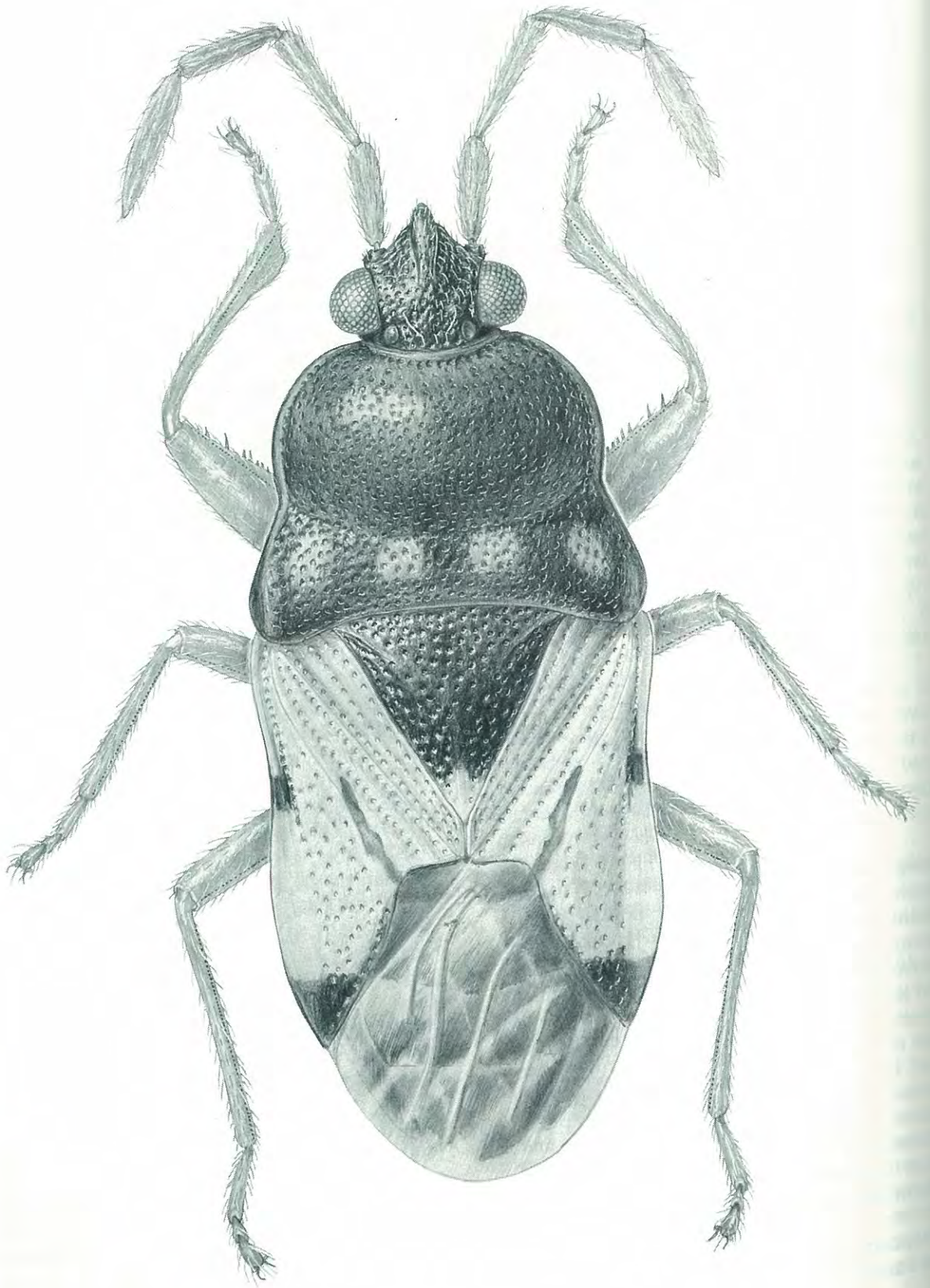


Fig. 58. *Cligenes distinctus*

(RMB); Stock Island, 5-VIII-62, F. A. Buchanan, (RMB); same, 3-IV-63, (blacklight trap), (JAS).
UNKNOWN COUNTY: Everglades National Park, 31-III-60, R. M. Baranowski, (RMB).

PAUROCORIS Slater 1980

Type Species: *Paurocoris wygodzinskyi* Slater. By original designation.

This genus is characterized by the sharply carinate lateral pronotal margins, shining head and abdominal sternum that contrasts markedly with the pruinose surface of the rest of the body, lack of scutellar carina, mutic fore femora, coarsely punctate pronotum and other characters as noted in the preceding key.

It is most closely related to *Bathydema* Uhler, which has a number of species in the West Indies. However, unlike many other Neotropical elements in North America, *Paurocoris* is not a West Indian element but rather a Central American one.

PAUROCORIS PUNCTATUS (Distant) (fig. 59)

Salacia ? *punctatus* Distant 1893:406.
Paurocoris punctatus Slater 1980:221.

Diagnosis: Tiny (2.1), stocky, nearly uniformly chocolate brown. Usually a very obscure pale macula laterally on the basal 1/3 of the corium. Pronotum and hemelytra thickly punctate and dorsally clothed with conspicuous semidecumbent hairs.

Paurocoris punctatus has previously been known from Mexico, Guatemala and Panama and intercepted on more than one occasion in Texas on orchids.

While still not known in Florida, Dr. P. D. Ashlock has kindly brought to our attention a single male taken by C. L. Smith near a pond off Rte 37, 2.4 mi W. Newton, Georgia (Baker Co.) on April 11, 1975. It seems certain that this species

(if not adventitious) will be found in the Appalachian drainage in northern Florida.

DRYMINI Stal

The members of this tribe are small to medium sized rhyparochromines. Our taxa may be recognized by the (at least partially) explanate pronotal margins, the almost straight apical corial margins and especially by the position of the abdominal spiracles. These are all ventral but the posterior pair of trichobothria are located dorso-ventral of one another but anterior to spiracle 5 (fig. 48).

The Drymini is a very large tribe with numerous genera in the old world tropics, Australia and the Palearctic Region. The new world distribution is interesting in that this tribe is completely absent from the Neotropics. Several of the Nearctic genera are also found in the Palearctic (including both Floridian genera) but there is an endemic component in the Western United States.

Thus the Drymini in Florida undoubtedly represent a Holarctic rather than a Neotropical element in the lygaeid fauna.

KEY TO FLORIDA GENERA OF DRYMINI

1. Anterior pronotal lobe impunctate; lateral margins of pronotum explanate, at least along anterior lobe.
..... *Eremocoris*, p. 101
- 1'. Anterior as well as posterior pronotal lobe coarsely and thickly punctate; pronotum distinctly explanate only adjacent to transverse constriction
..... *Drymus*, p. 104

EREMOCORIS Fieber

Eremocoris Fieber 1860, pp. 49, 187-8.

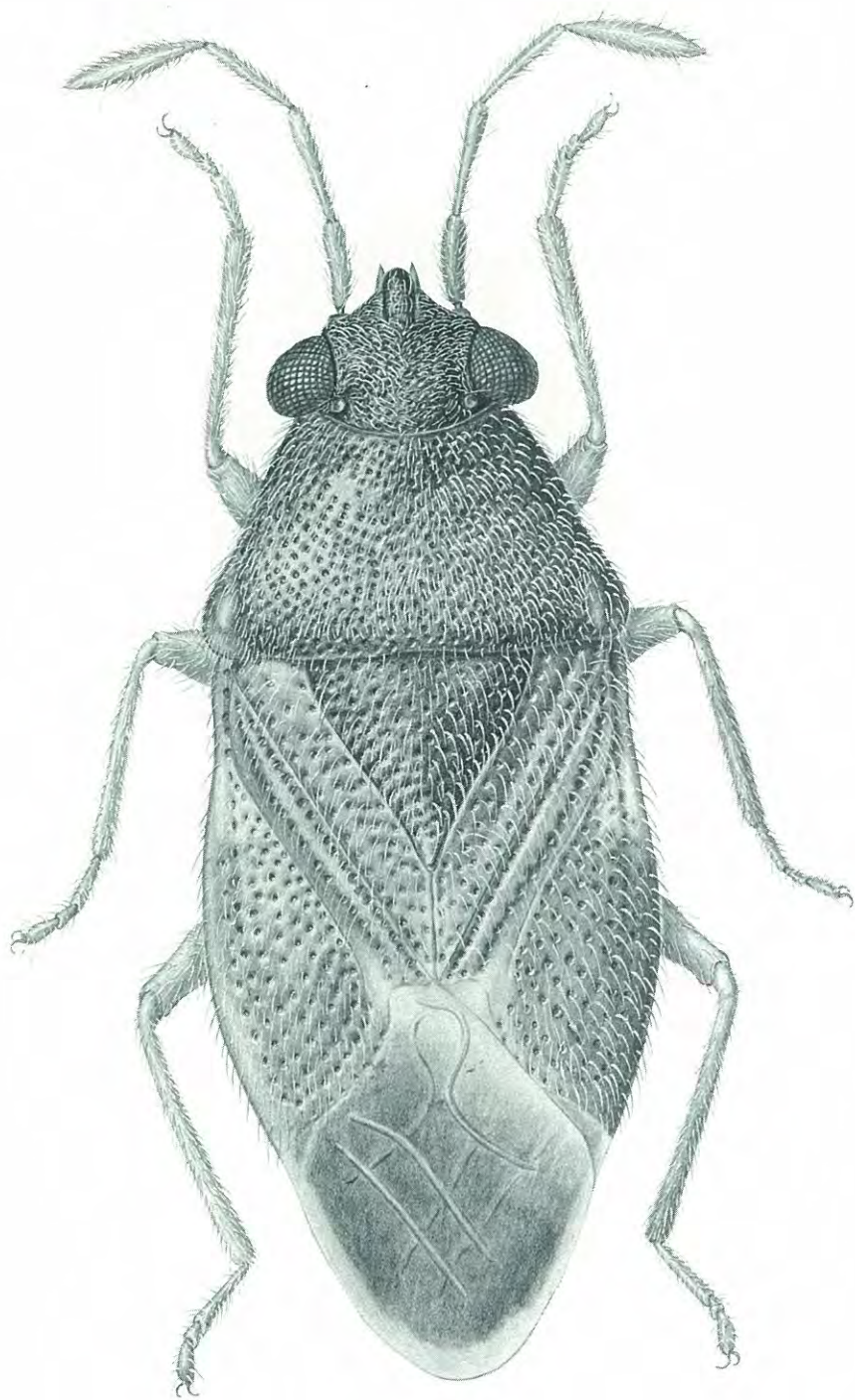


Fig. 59. *Paurocoris punctatus*

Type species: *Lygaeus erraticus* Fabricius 1794 = *Cimex abietus* Linnaeus 1758. Fixed by Distant 1910.

This is a large predominately Holarctic genus with approximately 20 species in the Nearctic region and 23 in the Palearctic. There are also a few old world tropical species assigned to the genus (2 African; 4 Oriental). However, the generic limits of *Eremocoris* are weakly defined.

In North America the majority of species are northern and western. Recently a number of species have been described along the Mexican Cordillera.

Eremocoris is most closely related to *Scolopostethus* and readily recognizable from *Drymus*, the only other Floridian drymine lygaeid by the lack of numerous closely set punctures over the pronotal surface, the coloration and by the more elongate body shape.



Map LX. Distribution of *Eremocoris setosus*

KEY TO FLORIDA SPECIES OF *EREMOCORIS*

1. Entire body and legs densely covered with long erect hairs; fore femur armed below with two major spines. . . . *setosus*, p. 103
- 1'. Body and legs nearly glabrous, at most with a few scattered hairs present. Fore femur armed below with only one major spine *depressus*, p. 103

EREMOCORIS SETOSUS Blatchley (map LX)

Eremocoris setosus Blatchley 1926, p. 433.

Eremocoris plebejus Barber 1928b, p. 60.

Eremocoris setosus Torre-Bueno 1946, p. 130.

Eremocoris setosis (sic) Sweet 1977, p. 175.

Diagnosis: Densely pilose over entire body surface. Head, pronotum and scutellum black. Anterior and posterior pronotal lobes nearly concolorous.

This species was first recognized by H. G. Barber who considered it a variety of the the Palearctic species *plebejus* (Fallen). However, it actually was first formally described by Blatchley who credited it to "Barber ms.".

Biology: Nothing appears to be known of its biology other than a collecting note by Barber (1928b) who reported it as abundant at a Virginia site "in sifting dead leaves in or about the woods".

Distribution: A wide, although chiefly southern, distribution. It has been reported from Florida, South Carolina and Georgia north to Massachusetts, Indiana and Ohio. The record of Moore (1950) from Quebec requires verification.

Florida Distribution: Reported by Barber (1928b) from Gainesville. GADSDEN CO., Chattahoochee, 8-IV-55, R. H. Hussey, (FSCA).

EREMOCORIS DEPRESSUS Barber (map LXI)

Eremocoris depressus Barber 1928b, p. 59.

Diagnosis: Reddish brown to dark castaneous. Head, anterior pronotal lobe, pleura and

scutellum sometimes black. In one Florida specimen the coloration is almost uniformly bright tan.

E. depressus is readily distinguishable from other eastern North American species of the genus by its much more flattened body surface, uniformly brown (rather than bicolored), corium, and almost glabrous dorsal body surface. The flattened body surface may be expressed by the thickness of the abdomen being much less than either the length of the second antennal segment or the length of the anterior pronotal lobe.



Map LXI. Distribution of *Eremocoris depressus*

Biology: Until recently nothing has been known of the biology of this species other than collecting notes on some of the paratypes "from *Pinus virginiana* P. Mill." and "feeding on squash". By an interesting coincidence Mead (pers. comm.) and Wheeler (pers. comm.) have both independently discovered that *depressus* feeds in the cones of *Pinus*. It apparently is arboreal. Wheeler (ibid) took numbers of specimens by beating pine cones in New Jersey in the Serpentine Barrens in Chester Co. PA., the northern most

record for the species. (For a description of this unusual area see Ent. News 89:p. 134). Mead's records are from specimens collected by K. B. Nicholson (see below).

The establishment of *depressus* as an arboreal cone feeding insect accounts for its flattened body form. It is the first known cone feeding lygaeid in the southeastern United States.

Distribution: This species has been thought to have an essentially Carolinian distribution. It was described from southern New Jersey, Virginia, North Carolina, Mississippi and Louisiana and subsequently reported only from South Carolina.

It has not previously been reported from Florida, thus, the presence of this species in the southern part of the state is remarkable.

Florida Distribution: DADE CO.: 26000 SW 197 Ave.: 23-V-77, (at light) R.M. Baranowski (RMB). PALM BEACH CO.: Tequesta, 19560 Gulfstream Rd., 5-VI-88, (shaken from slash pine, *P. elliottii*), K. B. Nicholson (FSCA).

DRYMUS Fieber 1860

Drymus Fieber 1860:178-179.

Type Species: *Drymus pilipes* Fieber 1861. Fixed by Distant 1904.

The members of this genus are small to medium sized insects of a dull brown to black color. The body is short and stout. The dorsal body surface, including both pronotal lobes, is coarsely and densely punctate. There is no pronotal collar and the lateral margins of the pronotum are distinctly explanate only adjacent to the transverse impression.

At least 17 species are recognized, all but two of which are Palearctic.

DRYMUS CRASSUS Van Duzee (fig. 60, map LXII)

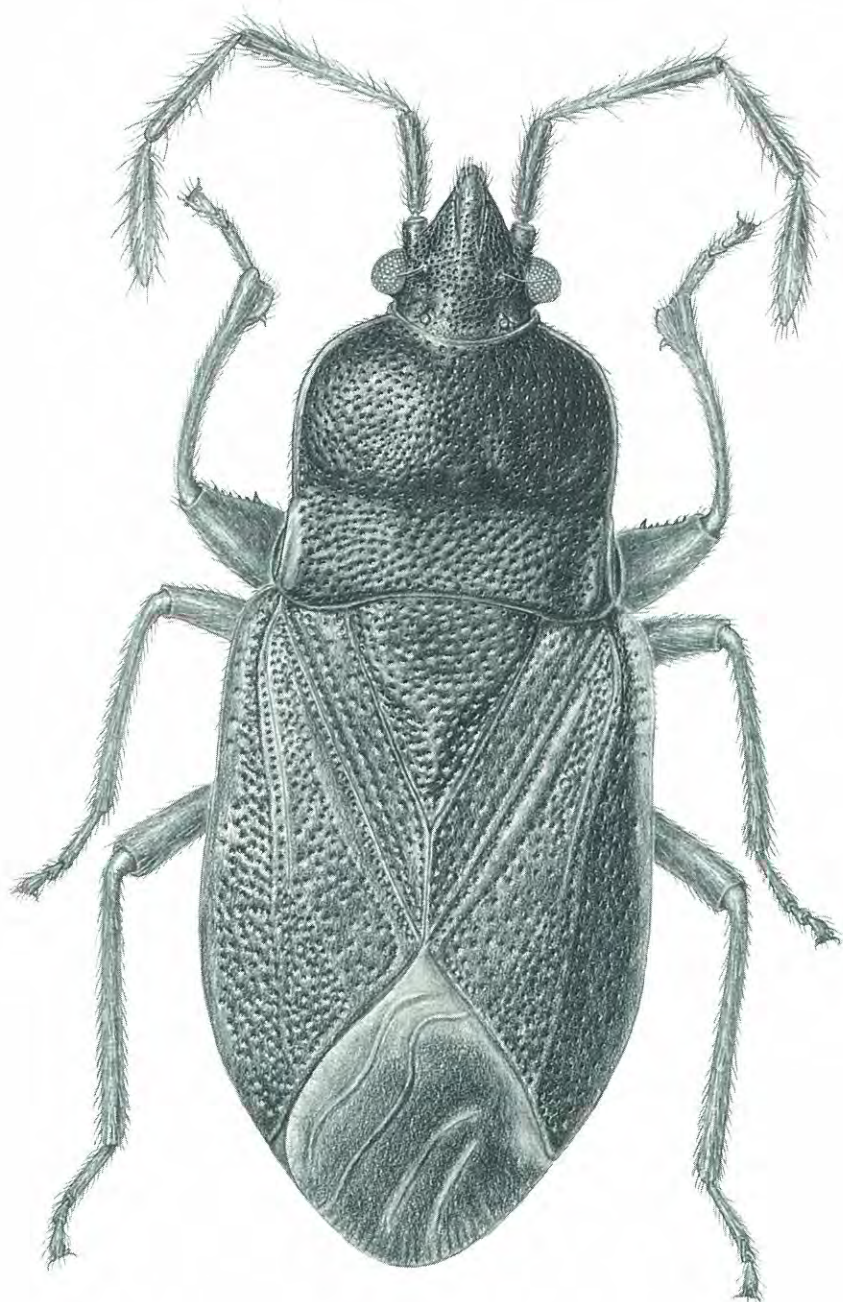


Fig. 60. *Drymus crassus*

Drymus crassus Van Duzee 1910:76-77.

Diagnosis: Relatively large, usually over 6.5 mm.; entire dorsal surface very dark red-brown to black; anterior and posterior pronotal lobes equally coarsely punctate. Macropters and coleopteroids occur, the later with corium elongated, membrane narrowed, only partially overlapping opposite wing. Hind wing reduced in coleopteroids.

Biology: This species has not previously been known south of North Carolina, thus nothing is known of its habits within the state. The predominance of flightless coleopteroids in the north suggests strongly that it is a species that lives in relatively permanent habitats. This is supported by Sweet's (1964) study of the biology in Connecticut where he found *crassus* to occur almost exclusively in mature leaf mold beneath mesophytic forest, especially on northern slopes. In Connecticut such habitats are usually chiefly birch-maple. It thus is a species of relatively mesic habitats. Sweet (ibid) reports one generation a year in the north with overwintering in the egg stage.



Map LXII. Distribution of *Drymus crassus*

Distribution: The previously known range was from New England west to South Dakota and south to North Carolina and Texas.

Florida Distribution: LEON CO.: Tall Timbers Research Station, 24-XI-72, (Berlese funnel), C. W. O'Brien, (JAS); NASSAU CO.: 2 mi SW Callahan, Hwy. 301, 8-IX-78, (Berlese mixed hardwood litter), C. W. O'Brien, (JAS); VOLUSIA CO.: Edgewater, 15-III-39, C. A. Frost, (NMNH).

OZOPHORINI Sweet

The members of this tribe may be recognized by the rather porrect head that has longitudinal grooves on the vertex, a distinct pronotal collar, usually only slightly incrassate fore femora, all abdominal scent spiracles located ventrally and the abdominal inner laterotergites absent. Nymphs have a well developed Y-suture and 3 pairs of dorsal abdominal scent glands.

The tribe is moderate in size and represented in most tropical and subtropical parts of the world, although in the Eastern Hemisphere with a somewhat "peripheral" distribution. In the Western Hemisphere the tribe is dominated by the large and difficult genus *Ozophora*, which is the only ozophorine genus that occurs in Florida.

OZOPHORA Uhler 1871

Ozophora Uhler 1871:102.
Davila Distant 1893:394.
Peggichisme Kirkaldy 1904:280.

Type Species: *Ozophora picturata* Uhler 1871.
 Monobasic.

The members of this genus are moderate sized to small rhyarochromines, generally with a variegated yellow and brown or black color pattern. Most species have a conspicuous white annulus on the proximal part of the 4th antennal segment. The lateral margins of the pronotum are obtusely rather than sharply carinate and the

mesosternum is usually differentiated as a shining plate.

Ozophora is one of the most complex of New World lygaeid taxa, and has speciated considerably in Florida and the West Indies. The Slater & Baranowski (1983) locality records for previously described species were listed without dates and collectors. These are included here in the locality data for each species.

KEY TO FLORIDA SPECIES OF *OZOPHORA*

1. Pronotum and hemelytra with numerous elongate upstanding hairs present (viewed laterally) 2
- 1'. Pronotum and hemelytra nearly glabrous, at most with very short inconspicuous hairs present 3
2. Posterior tibia bearing several rows of very elongate upright hairs, these as long as or longer than the diameter of a femur (fig. 61) *trinotata*, p.120
- 2'. Hairs on posterior tibia much shorter, not longer than diameter of tibia (fig. 62) *burmeisteri*, p. 108

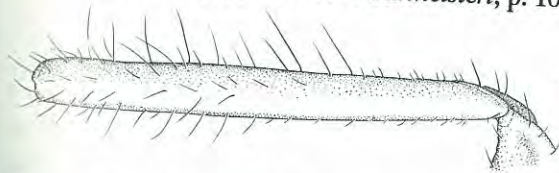


Fig. 61. *Ozophora trinotata*, metatibia

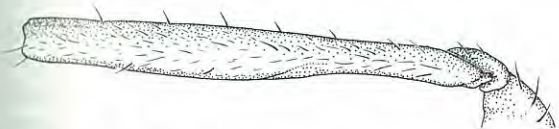


Fig. 62. *Ozophora burmeisteri*, metatibia

3. Fore femora armed below with 3 or 4 large spines; body length usually greater than 4.5 mm 4
- 3'. Fore femora usually armed below with only 2 large spines, or, if 3 "major" spines

- present then body length not exceeding 4.5 mm 8
4. General coloration of dorsal surface dark chocolate brown, membrane of fore wing dark throughout, lacking an apical pale area *levis*, p. 118
- 4'. General coloration brownish, orangish or yellowish, never predominately dark chocolate brown; apical area of membrane pale or membrane chiefly pale 5
5. Lateral portion of apical corial margin usually at least obscurely tinged with crimson, apical dark macula not extensively invading adjacent apical corial margin *picturata*, p. 118
- 5'. Lateral portion of apical corial margin not tinged with crimson (if a slight crimson tinge at extreme apex then dark apical macula extensively invading apical corial margin immediately before extreme apex) 6
6. Fourth antennal segment without a strongly contrasting large white proximal annulus or annulus very narrow, not nearly covering proximal 1/3 of segment; a small post median dark macula present along each lateral corial margin that at most barely extends mesad of explanate margin; corium without a well differentiated large subapical white macula *gilva*, p. 114
- 6'. Fourth antennal segment with a strongly contrasting large white proximal annulus occupying at least proximal 1/3 of segment; each lateral corial margin with a large post median dark macula that usually extends (although irregularly) completely across corium; corium with a well differentiated large subapical white macula 7
7. Posterior pronotal lobe extensively marked with dark red brown contrasting strongly with pale yellow posterior margin; anterior 1/3 of corium with an elongate dark patch present *caroli*, p. 109
- 7'. Posterior pronotal lobe nearly uniformly light yellowish tan (at most with slightly darker brown stripes), without a strongly contrasting light posterior margin; anterior 1/3 of corium lacking an elongate dark patch *floridana*, p. 112

8. Width of head across eyes greater than length of third antennal segment. 9
- 8'. Width of head across eyes less than length of third antennal segment. . . *reperta*, p. 119
9. Head with apex of tylus bluntly truncate, scarcely if at all exceeding juga and bent downward at right angle to long axis of body. *laticephala*, p. 116
- 9'. Head with apex of tylus subacuminate, tapering, curving downward but not bluntly truncate, conspicuously exceeding juga. *divaricata*, p. 111

OZOPHORA BURMEISTERI
(Guerin-Meneville)
(figs. 62, map LXIII)

Lygaeus (Beosus) burmeisteri Guerin 1857:397.
Ozophora burmeisteri Stal 1874:156.

Diagnosis: Pronotum nearly uniformly black or dark chocolate brown. Posterior pronotal lobe with yellow streak midway between meson and margin or a pair of yellow spots in same area. Fourth antennal segment with conspicuous white annulus, 3rd segment slightly swollen distally and dark chocolate brown on distal 1/3.

Readily distinguishable from all other species of Florida *Ozophora* by the combination of its very dark pronotum and upstanding dorsal hairs.

Biology: Common in southern Florida, frequently coming to light in large numbers. We have collected adults and nymphs on the ground among fallen seeds of *Ficus religiosa* L. and *F. retusa* L. at the Tropical Research and Education Center, Homestead. The insects survived in the laboratory on water and *Ficus* seeds. Eggs were deposited on and in the fruits and adults moved to feed on fresh seeds immediately when the latter were introduced. We have collected beneath *Ficus* trees at many locations on Jamaica and have collected many species of *Ozophora*, yet we never collected *burmeisteri* although it occurs there and we did collect it at lights. It thus seems certain that while *burmeisteri* can and will use *Ficus* seed as a breeding host, it is not the only host. Slater and

Baranowski (1983) describe the egg and all immature stages.

Distribution: Reported from many West Indian Islands, Texas, Lower California, Mexico and Florida.



Map. LXIII. Distribution of *Ozophora burmeisteri*

Florida Distribution: Reported by Barber (1914) from Everglade and St. Augustine and by Blatchley (1926) from Chokoloskee, Royal Palm Park and Lake Wales. BROWARD CO.: Ft. Lauderdale, X-52, R. P. Clements, (NMNH); CLAY CO.: Bellair, A. T. Slosson, (AMNH); COLLIER CO.: Everglade, 15-IV-12, William T. Davis, (NMNH); DADE CO.: 26000 SW 197 Ave, 6-VI-77, (blacklight trap), R. M. Baranowski, (RMB); same, 23-V-77, (RMB); same 19-V-77, (RMB); same, 24-V-77, (RMB); same, 17-IX-77, (RMB); same, 31-V-77, (RMB); same, 6-V-77, (RMB); 26030 SW 177 Ave, 13-IV-84, H. B. Glenn, (RMB); same, 16-IV-84, (RMB); same, 5-IV-84, (RMB); same, 9-V-85, (RMB); same, 24-IV-84, (RMB); Agricultural Research & Education

Center, Homestead, 12-VIII-85, (blacklight trap), R. M. Baranowski, (RMB); same, 28-VI-69, (RMB); same, 27-VI-69, (RMB); Bernecker's Nsy, 11-14-IX-86, (blacklight trap), H. B. Glenn, (RMB); Biscayne Bay, A. T. Slosson, (AMNH); Castello Hammock, 20-X-76, (blacklight trap), R. M. Baranowski, (RMB); Goulds, SW 152 St., behind Monkey Jungle, 28-III-87, (blacklight trap), R. E. Woodruff, (RMB); Homestead, 1-V-74, (FSCA); same, 11-X-69, (blacklight trap), R. M. Baranowski, (RMB); same, 2-VI-69, (RMB); same, 6-X-69, (RMB); same, 18-V-69, (RMB); same, 10-VIII-68, (RMB); same 11-VIII-68, (RMB); same, 26-XI-69, (RMB); 22-VIII-69, (RMB); same, 21-IX-68, (RMB); same, 16-VIII-68, (RMB); same, 30-VIII-69, (RMB); same, 11-X-69, (RMB); same, 9-X-69, (RMB); same, 2-X-69, (RMB); same, 26-XII-69, (RMB); same, 18-XI-69, (RMB); same, 27-VII-68, (RMB); same, 13-X-69, (RMB); same, 5-X-68, (RMB); same, 26-VIII-68, (RMB); same, 27-III-70, (RMB); same, 20-X-69, (RMB); same, 27-V-70, (RMB); same, 9-XII-69, (RMB); same, 7-X-69, (RMB); same 27-V-70, (RMB); same, 24-X-69, (RMB); same, 12-V-69, (RMB); Kendall, 25-VI-56, E. F. Miles, (RMB); Miami, 13-IX-62, (blacklight trap), J. R. McFarlin, (RMB); same, 29-V-87, D. Gruber, (FSCA); Orchid Jungle Hammock, Newton Road, 12-V-70, (blacklight trap), R. M. Baranowski, (RMB); same, 22-V-69, (RMB); Subtropical Research Station, 4 mi. NW of Homestead, 9-VI-74, (blacklight trap), J. B. Heppner, (RMB); INDIAN RIVER CO.: Vero Beach, 14-V-87, G. Johnson, (FSCA); MONROE CO.: Big Coppit Key, 25-III-72, (blacklight trap), Brenda & Dennis Beck, (RMB); Everglades National Park, 7-II-72, (blacklight trap), R. M. Baranowski, (RMB); Key West 29-VIII-68, (blacklight trap), F. A. Buchanan, (RMB); same, 17-XI-68, (RMB); same, 17-IX-68, (RMB); same, 25-IV-69, (RMB); same, 9-VIII-72, (blacklight trap), Dale Groom, (RMB); Stock Island, 21-V-68, (blacklight trap), F. A. Buchanan, (RMB); same, 26-29-VI-84, (blacklight trap), J. Bunch, (RMB); same, 27-VI-85, (RMB); same, 22-VIII-84, (RMB); same, 8-9-VII-85, (RMB); same, 31-VII-85, (RMB); same, 9-13-VII-84, (RMB); same, 12-X-84, (RMB); same, 9-13-VII-84, (RMB); same, 2-5-VII-84, (RMB); same, 25-26-VI-84, (RMB); same, 13-17-VII-84, (RMB); Stock Island, 28-V-68, (blacklight trap), F. A.

Buchanan, (RMB); Stock Island, Co. Mosquito Control Hqtrs, 10-IX-71, W. H. Pierce, (RMB). DRY TORTUGAS, Loggerhead Key, 3-VI-62, R. E. Woodruff, (RMB); same, Loggerhead Key, 6-VI-62, (blacklight trap), H. V. Weems, Jr. & R. E. Woodruff, (RMB).

OZOPHORA CAROLI
Slater & Baranowski
(fig. 63, map LXIV)

Ozophora caroli Slater & Baranowski 1983:422-424.

Diagnosis: Body elongate, relatively stout, head, anterior pronotal lobe and broad rays extending through posterior pronotal lobe dark red brown. Anterior pronotal color broadly pale yellow on either side of median red brown spot. Scutellum chiefly dark red brown, but with raised elliptical calloused area yellow, shading anteriorly to reddish brown. Antennal segments I, II and III pale yellow with distal end of III, proximal end and distal 3/4 of IV contrastingly dark chocolate brown. Body nearly glabrous above, lacking conspicuous upstanding hairs.

Biology: Appears to be associated with hammocks in southern Florida where it frequently comes to light.

Distribution: Florida, Hispaniola and possibly Mexico.

Florida Distribution: Slater and Baranowski (1983) reported it from light trap collections in hammocks in Dade County. Additionally, we have examined a specimen from the Dominican Republic that is definitely conspecific and 2 specimens from Chiapas, Mexico that are very closely related to, if not conspecific, with this species. DADE CO.: 26000 SW 197 Ave. 9-V-77, (blacklight trap), R. M. Baranowski, (RMB); Castello Hammock, 26-III-70, (Blacklight trap), R. M. Baranowski, (FSCA); same, 21-VIII-70, (FSCA); same, 14-IV-70, (FSCA) Goulds, SW 152 St, behind Monkey Jungle, 28-III-87, (blacklight trap), R. E. Woodruff, (RMB); Kendall Drive, 19-II-51, A. M. Nabber, (RMB); Orchid Jungle Hammock, Newton Road, 20-V-70,

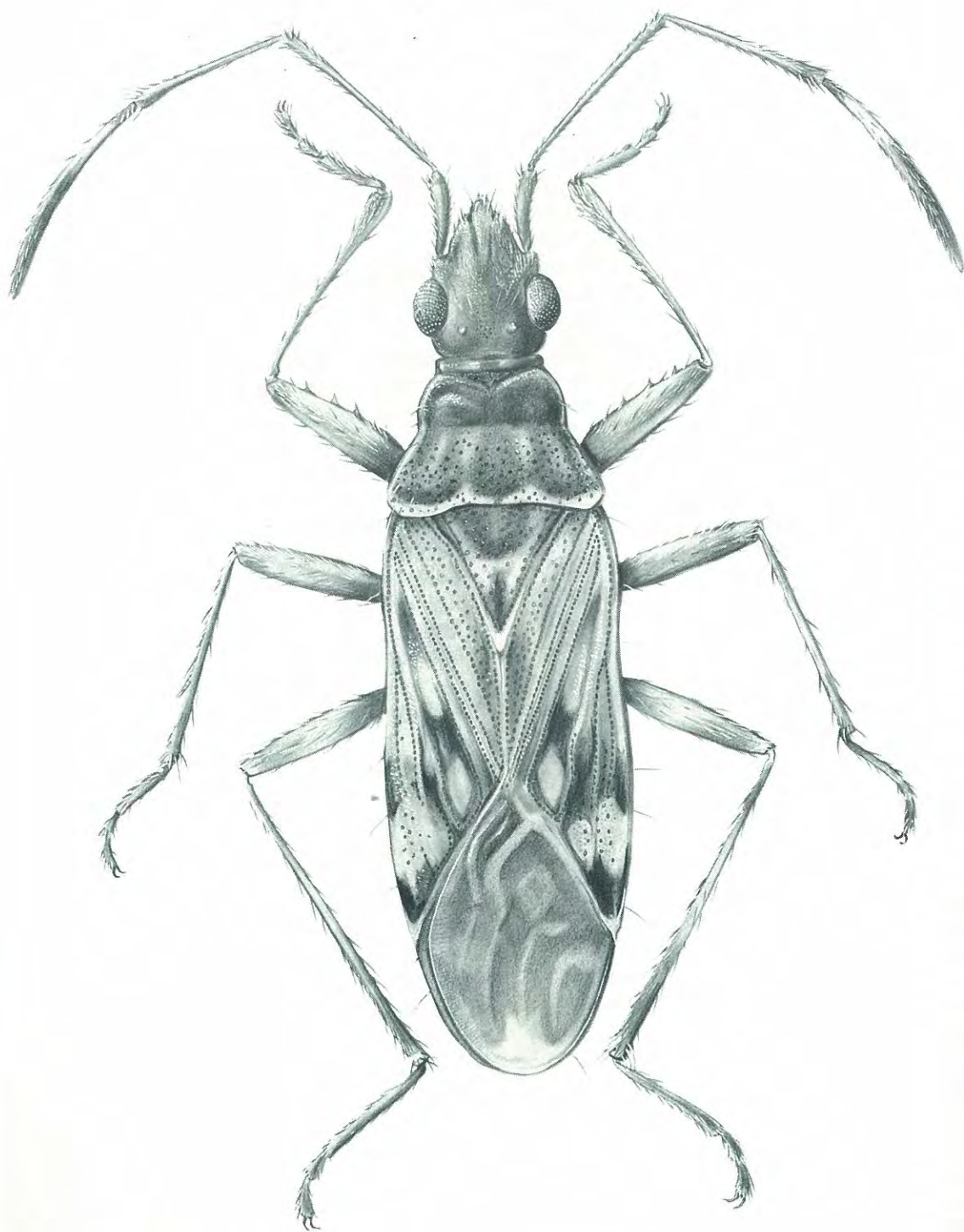


Fig. 63. *Ozophora caroli*

(blacklight trap), R. M. Baranowski, (RMB); same, 12-V-70, (RMB); Ross & Castello Hammock, 26-III-70, (blacklight trap), R. M. Baranowski, (RMB); same, 3-VI-70, (RMB); same, 21-VII-70, (RMB); same, 2-VI-70, (RMB).

Gynoxys incana Less. and *Conyza karuninskianus* DC and describe the egg and all immature stages.

Distribution: Greater Antilles, Bahamas and Florida.



Map LXIV. Distribution of *Ozophora caroli*

OZOPHORA DIVARICATA Barber. (map LXV)

Ozophora divaricata Barber 1954:6.

Diagnosis: Small (4-4.5), brightly marked. Posterior pronotal lobe with series of longitudinal chocolate brown markings that coalesce posteriorly to give appearance of 3 loops. Hemelytra strongly marked with conspicuous dark chocolate brown patches including an apical corial one. Fore femora usually with 2 ventral spines. Fourth antennal segment with pale proximal annulus, this short and often dull yellow rather than white.

Biology: Slater and Baranowski (1983) reported collecting it under *Pluchea odorata* (L.) Cass.



Map LXV. Distribution of *Ozophora divaricata*

Florida Distribution: DADE CO.: 26030 SW 177 Ave, 3-IV-84, H. B. Glenn, (RMB); Everglades National Park, Gumbo Limbo Trail, 27-III-73, C. W. & L. B. O'Brien, (RMB); Grossman Hammock State Park, 15-VII-72, (blacklight trap), R. M. Baranowski, (RMB); same, 4-V-72, (RMB); Orchid Jungle Hammock, Newton Road, 2-X-69, (blacklight trap), R. M. Baranowski, (RMB); same, 26-III-70, (RMB); Ross & Castello Hammock, 18-III-70, (blacklight trap), R. M. Baranowski, (RMB); same, 2-VI-70, (RMB); V-49, (RMB); Homestead, 18-V-69, (blacklight trap), R. M. Baranowski, (RMB); same, 10-X-69, (RMB); same, 11-VIII-68, (RMB); same, 26-XI-

69, (RMB); MANATEE CO.: Bradenton, Perico Island, 18-IV-72, (tidal flat), F. W. Mead, (RMB); MONROE CO.: Big Pine Key, Key Deer Refuge, 5-XI-82, (blacklight trap), S. Klett, (RMB); Everglades National Park, Flamingo Prairie, 8-IV-72, (blacklight trap), R. M. Baranowski, (RMB); Key West, 25-IV-69, (blacklight trap), F. A. Buchanan, (RMB); N. Key Largo Key, 6-V-77, R. M. Baranowski, (RMB); same, 18-IV-77, (RMB); same, 19-IV-77, (RMB); same, 15-IV-77, (RMB). Stock Island, 13-17-VII-84, (blacklight trap), J. Bunch, (RMB); same, 26-29-VI-84, (RMB); Upper Key Largo, 11-XI-72, C. W. & L. B. O'Brien, (RMB).

OZOPHORA FLORIDANA
Slater & Baranowski
(fig. 64, map LXVI)

Ozophora floridana Slater & Baranowski 1983:426-428.

Diagnosis: Elongate (5.90), nearly parallel sided. Head, anterior pronotal lobe bright reddish brown. Distal end of tylus, anterior pronotal collar, posterior pronotal lobe, clavus and anterior half of corium nearly uniformly pale testaceous, sometimes almost dull orange. Scutellum somewhat darker yellowish tan. Legs uniformly light yellow without conspicuous dark distal banding on femora. First, 2nd and 3rd antennal segments light yellow with distal end of antennal segment III and distal 2/3rd of IV contrasting dark chocolate brown. Fourth antennal segment with broad conspicuous white annulus on proximal 1/3 except extreme base. Body nearly glabrous above, lacking conspicuous hairs.

This species is a member of the *quinquemaculata* complex and quite different from all other Florida species. It may readily be separated from all other Florida *Ozophora* by the nearly uniform light orange yellow posterior pronotal lobe, clavus and anterior 1/2 of the corium.

Biology: Often collected together with *caroli* in light traps in south Florida. We have collected adults on and adults and nymphs in seed litter under *Schinus terebinthifolius* Raddi.

Distribution: Known only from Florida.



Map LXVI. Distribution of *Ozophora floridana*

Florida Distribution: DADE CO.: 26000 SW 197 Ave, 17-IX-77, (blacklight trap), R. M. Baranowski, (RMB); same, 24-V-77, (RMB); same, 9-V-77, (FSCA); same, 6-VI-77, (RMB); same, 17-IX-77, (RMB); same, 27-III-78, (RMB); same, 6-V-77, (RMB); same, 31-V-77, (RMB); same, 27-III-78, (RMB); 26030 SW 177 Ave, 24-IV-84, H. B. Glenn, (RMB); same, 9-V-84, (RMB); same, 28-IV-84, (RMB); Agr. Res. & Ed. Ctr, 21-X-76, (blacklight trap), R. M. Baranowski, (FSCA); same 14-X-69, (FSCA); Agricultural Research & Education Center, 17-XI-82, H. Glenn, (RMB); same, 17-IX-82, (on *Schinus* fruit), H. Glenn, (RMB); Castello Hammock, 17-IV-72, (blacklight trap), R. M. Baranowski, (RMB); same, 18-V-70, (RMB); same, 4-X-70, (RMB); same, 19-V-70, (RMB); same, 24-III-77, (RMB); same 20-X-75, (RMB); same, 3-VI-70, (RMB); same, 2-VI-70, (RMB); same, 23-III-70, (RMB); same, 10-X-69, (RMB); same, 2-X-69, (RMB); same, 5-VI-69, (RMB); same, 18-IX-68, (RMB); same, 20-X-69, (RMB); same, 20-X-76, (RMB);

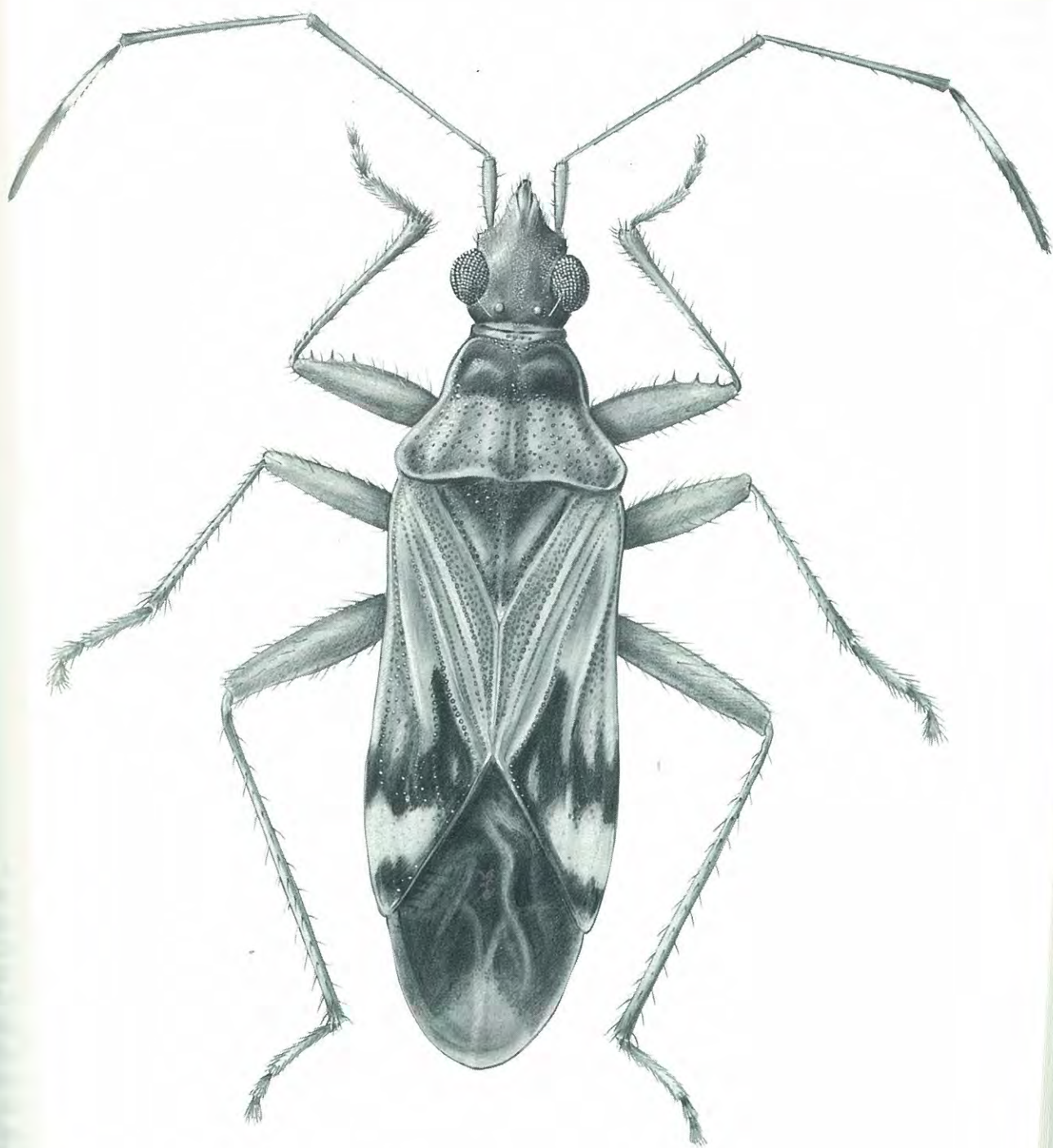


Fig. 64. *Ozophora floridana*

same, 28-X-76, (FSCA); same, 17-IV-72, (FSCA); same, 9-XI-76, (FSCA); same, 28-X-76, (FSCA); Goulds, SW 152 St, behind Monkey Jungle, 28-III-87, (blacklight trap), R. E. Woodruff, (RMB); Homestead, 15-XII-74, J. A. Slater, (RMB); same, 22-V-69, (Blacklight trap), R. M. Baranowski, (FSCA); same, 27-III-69, (FSCA); same, 13-X-69, (FSCA); same, 11-X-69, (FSCA); same, 10-X-69, (FSCA); Orchid Jungle Hammock, Newton Rd., (Blacklight trap), R. M. Baranowski, (FSCA); same, 27-V-69, (RMB); same 22-V-69, (RMB); same, 20-X-69, (RMB); same, 1-X-69, (RMB); same, 2-X-69, (RMB); same, 2-VI-70, (RMB); same, 2-VI-70, (RMB); same, 20-V-70, (RMB); same, 19-V-70, (RMB); same, 28-X-69, (RMB); same, 3-IV-70, (RMB); same, 9-X-69, (RMB); same, 28-IV-70, (RMB); same, 26-III-70, (RMB); same, 23-III-70, (RMB); same, 18-III-70, (RMB); same, 17-VI-70, (RMB); same 12-V-70, (RMB); same, 5-VI-69, (RMB); same, 21-VI-69, (RMB); same, 20-X-75, (RMB); same, 6-X-75, (RMB); same, 9-VI-69, (RMB).

OZOPHORA GILVA
Slater & Baranowski
(fig. 65, map LXVII)

Ozophora gilva Slater & Baranowski 1983:428-431.

Diagnosis: Head, anterior pronotal lobe red brown, tylus paler. Posterior pronotal lobe and hemelytra in large part very pale testaceous, almost white. Scutellum olive colored with white apex. Corium largely pale testaceous marked with chocolate brown. Apical corial margin completely pale. Membrane uniformly very light brown. Legs, labium and antennae pale testaceous, nearly white. Head short, tylus not extending beyond middle of 1st antennal segment. Dorsal surface of body lacking upstanding hairs, nearly glabrous.

This is a very distinctive species by virtue of its extremely pale, nearly white appearance. The light color of the clavus and corium obliterates the posterior macula so that the corium appears completely pale with the exception of the 3 contrasting dark chocolate brown markings.

This is the species reported as *pallescens* (Distant) by Blatchley (1926).

Biology: Blatchley (1926) reported this species as *pallescens* taken from the leaf axils of thistle on Hog Island and by beating Spanish moss and sweeping ferns in dense hammocks.

Distribution: Known only from Florida.



Map LXVII. Distribution of *Ozophora gilva*

Florida Distribution: Blatchley (1926) reported it from Dunedin. ALACHUA CO.: 15-V-50, E. W. Michelson, (RMB); Gainesville, 18-VIII-69, (blacklight trap), F. W. Mead, (RMB); CITRUS CO.: Inverness, 27-IV-65, (RMB); DADE CO.: Orchid Jungle Hammock, Newton Road, 12-V-70, (blacklight trap), R. M. Baranowski, (RMB); HARDEE CO.: Wachulla, 13-IV-65, (RMB); HIGHLANDS CO.: Archbold Biological Station, 7-8-VI-69, (at light), J. Harrington, T. Shuh, J. Slater, (RMB); Lake Placid, Archbold Biological Station, 2-V-83, M. Deyrup, (RMB); LAKE CO.: 2 mi. S of Tavares, Rt. 448, 25-IV-67, (blacklight trap), R. E. Woodruff, (RMB); LEON CO.: Tallahassee, 16-III-74, (uv trap), C. W. O'Brien, (RMB); MANATEE CO.: Bradenton, 27-IV-65,

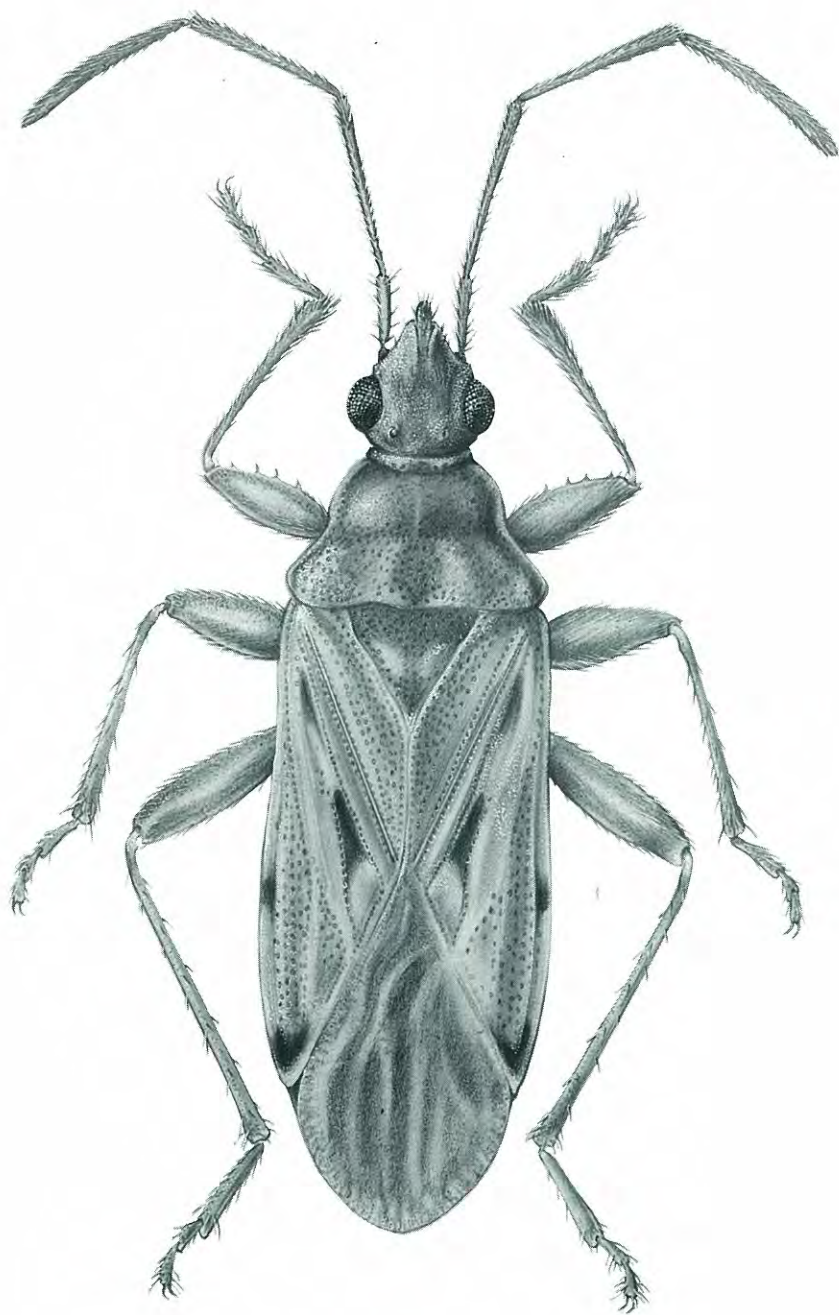


Fig. 65. *Ozophora gilva*

(RMB); MARION CO.: 14 mi. SW of Ocala, Ross Prairie, 12-VI-75, (blacklight trap), P. C. Drummond, (RMB); MONROE CO.: Everglades National Park, Flamingo Prairie, 28-III-70, R. M. Baranowski, (RMB); PINELLAS CO.: Largo, 27-IV-65, (RMB); POLK CO.: Lakeland, 21-XI-48, (breeding on Spanish Moss), R. F. Hussey, (RMB); Pierce, 5-XI-49, (taken in Spanish Moss), R. F. Hussey, (RMB); Lakeland, 16-III-48, (taken at light), R. F. Hussey, (RMB); same, 5-V-48, (RMB); same, 9-IV-48, (RMB); same, 21-XI-48, (breeding in Spanish Moss), R. F. Hussey, (RMB); VOLUSIA CO.: Coronado Beach, 26-II-39, C. A. Frost, (RMB); Edgewater, 14-III-39, C. A. Frost, (RMB); same, 6-III-39, (RMB); same, 20-II-39, (RMB); same, 24-II-39, (RMB); same, 5-III-39, (RMB); same, 28-II-39, (RMB); same, 6-III-39, (FSCA); same, 20-II-39, (FSCA); same, 5-III-39, (FSCA).

OZOPHORA LATICEPHALA Slater & O'Donnell (fig. 66, map LXVIII)

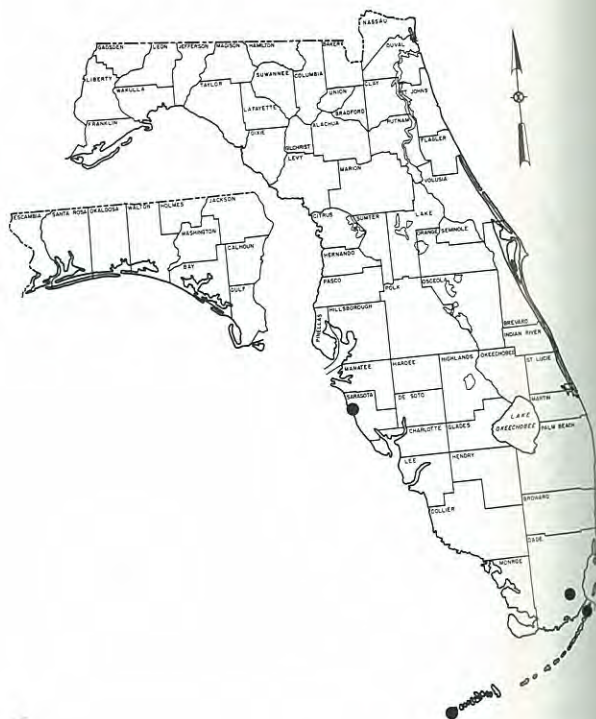
Ozophora laticephala Slater & O'Donnell
1979:161.

Diagnosis: Small (3.0), stout, lateral pronotal margins pale white, lacking strongly contrasting white annulus proximally on 4th antennal segment. Head broad with short strongly truncate down-turned tylus.

Biology: Often present in large numbers feeding on *Ficus* seeds upon the ground. Slater (1972) noted a population estimated at over 1/4 million individuals feeding on fallen seeds below a single tree of *Ficus trigonata* L. on Jamaica. In March of 1982 we collected a large series of adults and nymphs under a large *Ficus microcarpa* L. (F.) growing at the Tropical Research and Education Center, Homestead. This tree had been under observation for several years and while *Cligenes distinctus*, *Ozophora burmeisteri* and *Neopamera neotropicalis* (Kirkaldy) had been collected, not a single specimen of *Ozophora laticephala* was taken prior to 1982. It seems possible that in view of the extensive collecting in this area, including light

trap collecting, that this West Indian species may be a recent introduction, but note 1956 record below. It may be restricted to *Ficus* sp. as a breeding host. Slater and O'Donnell (1979) describe the nymphs and figure the 5th instar.

Distribution: A West Indian species that occurs in the Bahamas, widespread in the Greater Antilles, but not yet known from the Lesser Antilles.



Map LXVIII. Distribution of *Ozophora laticephala*

Florida Distribution: Slater and O'Donnell (1979) reported *laticephala* from Florida for the first time based upon a series taken at Stock Island (Key West). DADE CO.: 26030 SW 177 Ave, 5-IV-84, H. B. Glenn, (RMB); SARASOTA CO.: Sarasota, 31-V-88, sweeping weeds, K. E. Jenkins, (FSCA); MONROE CO.: Key Largo, 26-II-56, (at light), R. A. Morse, (RMB); Stock Island, 13-17-VII-84, (blacklight trap), J. Bunch, (RMB); same, 26-29-VI-84, (RMB); same, 8-9-VII-85, (RMB); same, 9-18-VII-84, (RMB).

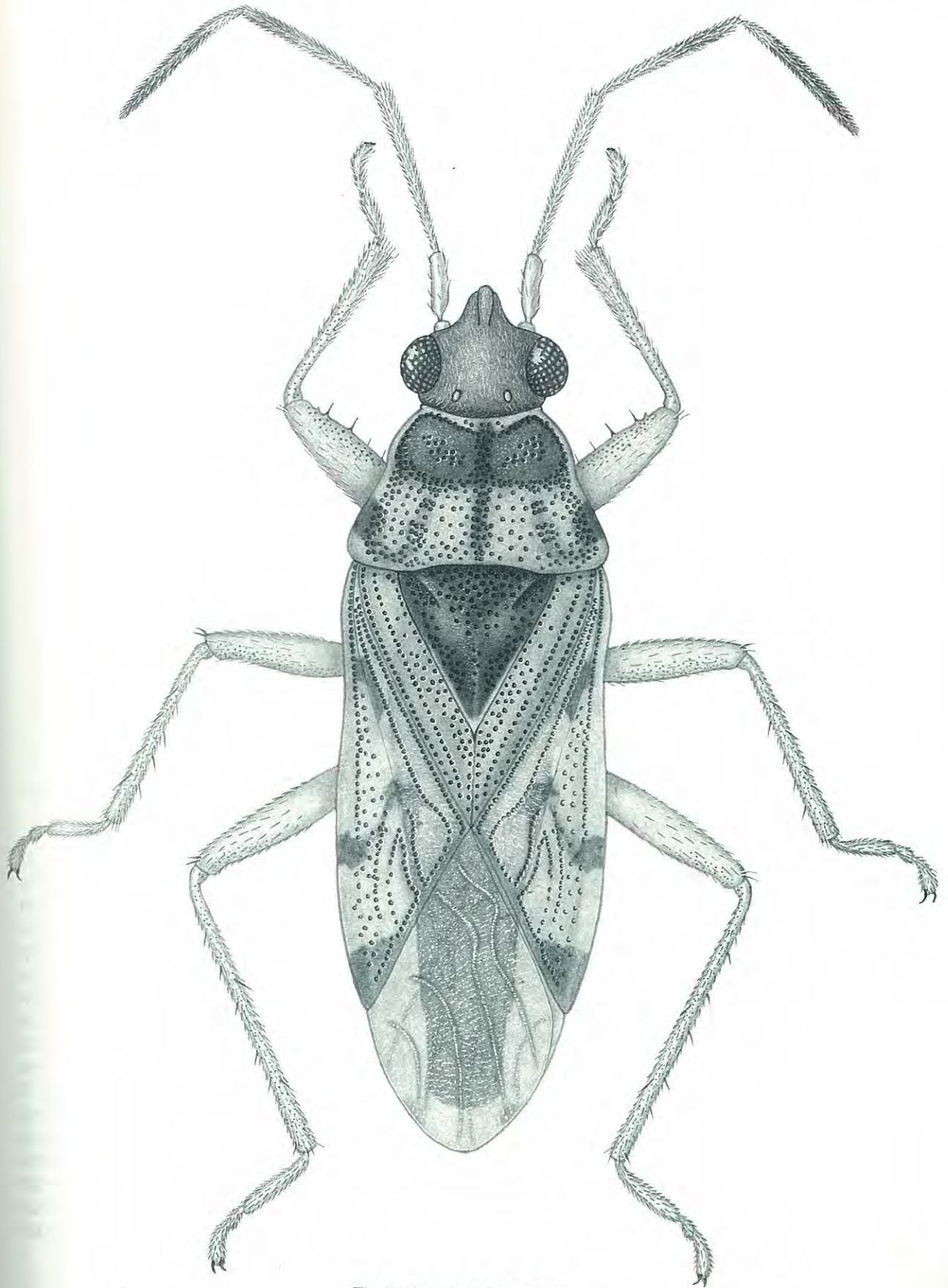


Fig. 66. *Ozophora laticephala*

OZOPHORA LEVIS Slater & Baranowski (map LXIX)

Ozophora levis Slater & Baranowski 1983:433-435.



Map LXIX. Distribution of *Ozophora levis*

Diagnosis: Predominately dark reddish brown, marked with contrasting pale yellow. Lateral explanate flange of corium white, interrupted near apex where only extreme lateral margin narrowly yellow. Coxae yellowish brown. Dorsal surface lacking conspicuous upstanding hairs.

This species is readily recognizable by its predominately dark reddish brown (sometimes almost chocolate brown) coloration. The only other very dark colored species of *Ozophora* in Florida are *burmeisteri* and *trinotata*, both of which have conspicuous upstanding dorsal pubescence.

Biology: Nothing has been reported.

Distribution: Florida, widespread in the Bahamas (see Slater and Baranowski, 1983).

Florida Distribution: Known only from the Florida Keys. MONROE CO.: (in the type collection at NMNH) Big Pine Key, 26-III-73, C. W. & L. B. O'Brien, (RMB); Key Largo, 25-II-56, R. A. Morse, (RMB); Key West, 25-IV-69, (blacklight trap), F. A. Buchanan, (RMB); Plantation Key, 3-V-57, (at light), F. W. Mead, (RMB); Stock Island, 28-V-68, (blacklight trap), F. A. Buchanan, (RMB).

OZOPHORA PICTURATA Uhler (map LXX)

Ozophora picturata Uhler 1871:102-103.

Diagnosis: Large with relatively porrect head and anteriorly tapering pronotum. Distinct crimson streak along posterior portion of each apical corial margin.

Biology: Sweet (1964) studied the biology in Connecticut where it is "strictly an inhabitant of forest floors, ranging from oak-hickory forests to shrubby consolidation seres". The habitat in Florida is not known, but it surely will prove to be a woodland species.

Distribution: *O. picturata* has the most northern distribution of any species of *Ozophora*. It is known to occur from New England west to at least Iowa and south to Texas and Florida. Some Caribbean, Central American and California records may be correct, but need verification.

Florida Distribution: Reported by Barber (1914) from Biscayne Bay and Kissimmee; by Blatchley (1926) from Dunedin, Lakeland and Royal Palm Park. ALACHUA CO.: 1-V-50, T. G. Stewart, (RMB); 16-V-49, E. H. McConkey, (RMB); Gainesville, 15-V-25, F. W. Walker, (RMB); same, 24-VI-77, Robert A. Belmont, (RMB); same, 25-III-39, G. B. Merrill, (RMB); same, 6-V-63, (at light), R. P. Esser, (RMB); same, 10-V-63, (RMB); same, 15-V-63, (RMB); same, Gainesville, Doyle Connor Building, 14-VI-77, (blacklight trap), F. W. Mead, (RMB); same, 2-4-VI-78, (RMB); same, 6-X-78, (RMB); same, 1-VI-78, (RMB); same, 25-IX-78, (RMB); same, 24-V-78, (RMB); same, 17-VI-78, (RMB); same, 18-VII-79, (RMB); same, 8-X-78, (RMB); same, 24-V-78, (RMB); same, 25-V-78, (RMB); same, 12-V-75, (RMB);

same, 14-VI-77, (RMB); same, Doyle Connor Building, 31-V-73, (RMB); Newnans Lake, 3-IX-29, T. H. Hubbell, (RMB); BAKER CO.: Olustee, 2-4-VII-66, (blacklight trap), E. P. Merkel, (RMB); same, 9-10-VII-66, (RMB); same, 30-V-63, (RMB); same, 12-VII-66, (RMB); DADE CO.: 26000 SW 197 Ave, 6-VI-77, (blacklight

Placid, 5-II-43, M. Cazier, (AMNH); Sebring 1-10-VI, C. T. Parsons, (AMNH); same, 13-VIII, (AMNH); JACKSON CO.: Cottondale, 11-IX-29, T. H. Hubbell, (RMB); JEFFERSON CO.: Monticello, 9-IX-68, (blacklight trap), W. H. Whitcomb, (RMB); LEON CO.: Tall Timbers Research Station, 23-IV-69, E. V. Komarek, (RMB); same, 1-VI-64, (alcohol pitfall trap), Wilson Baker, (RMB); Tall Timbers Research Station, Aucilla River, 26-VIII-67, Smith, (RMB); LIBERTY CO.: Camp Torreya, R7WT210, 13-VII-35, I. J. Cantrall, (RMB); Torreya State Park, 18-IX-68, F. W. Mead, (RMB); same, 14-V-70, (blacklight trap), H. Greenbaum, (RMB); MARION CO.: Lake Eaton, 8-IV-75, (blacklight trap), Peter Drummond, (RMB); MONROE CO.: Everglades National Park, Flamingo Prairie, 4-V-70, (blacklight trap), R. M. Baranowski, (RMB); ORANGE CO.: Winter Park, 4-III-39, F. E. Lutz, (AMNH); same, 28-V-40, (at light), H. T. Fernald, (RMB); PINELLAS CO.: Dunedin, 2-5-18, W. S. B. collection, (NMNH); POLK CO.: Lakeland, 19-V-53, (at light), R. F. Hussey, (RMB); same, 19-VI-49-, (RMB); same, 2-V-48, (RMB); same, 25-VII-48, (RMB); same, 14-V-48, (RMB); same, 2-V-50, (RMB); same, 2-V-50, (RMB); Winter Haven, 16-X-70, M. H. Muma, (RMB); VOLUSIA CO.: 4-VIII-56, H. A. Denmark, (RMB).



Map LXX. Distribution of *Ozophora picturata*

trap), R. M. Baranowski, (RMB); same, 8-V-77, (RMB); same, 9-V-77, (RMB); same, 19-V-77, (RMB); same, 23-V-77, (RMB); same, 6-V-77, (RMB); same, 24-V-77, (RMB); Biscayne Bay, A. T. Slosson, (AMNH); Castello Hammock, 17-IV-72, (blacklight trap), R. M. Baranowski, (RMB); same, 26-IV-77, (RMB); Orchid Jungle Hammock, Newton Road, 21-VII-70, (blacklight trap), R. M. Baranowski, (RMB); Ross & Castello Hammock, 18-V-70, (blacklight trap), R. M. Baranowski, (RMB); GADSDEN CO.: Chattahoochee, 7-VI-53, (at light), R. F. Hussey, (RMB); HARDEE CO.: Bowling Green, 24-V-67, R. H. Rhodes, (RMB); HIGHLANDS CO.: Lake

OZOPHORA REPERTA Blatchley (map LXXI)

Ozophora reperta Blatchley 1926:416-417.
Ozophora inornata Barber 1954:5-6.

Diagnosis: Small dull brown without strongly contrasting white macula on distal portion of corium. Fore femora usually with 2 ventral spines distally, but occasionally with 3. Calli usually conspicuously elevated above pronotal surface. Third antennal segment darkened at distal end, 4th segment with a broad white annulus.

Biology: Nothing has been reported.

Distribution: Bahamas, Dominican Republic and Florida.

OZOPHORA TRINOTATA Barber (fig. 61, map LXXII)

Florida Distribution: Originally described by Blatchley (1926) from 6 specimens "swept from weeds along the margins of everglades", Royal Palm Park, 4 April 1925. Slater and Baranowski (1983) reported it from Orchid Jungle Hammock, Newton Rd., Dade Co. DADE CO.: 12-III-49, (RMB); 26000 SW 197 Ave, 6-V-77, (blacklight trap), R. M. Baranowski, (RMB); same, 9-V-77,, (RMB); 26030 SW 177 Ave, 24-IV-84, H. B. Glenn, (RMB); same, 28-IV-84, (RMB); same, 4-IV-84, (RMB); same, 19-IV-84, (RMB); Homestead, 24-IX-74, J. A. Slater, (RMB); same, 16-XII-74, (RMB); same, 15-XII-74, (RMB); same, 7-X-69, (RMB); same, 27-III-70, (RMB); Naranja, 23-V-62, R. M. Baranowski, (RMB); same, 9-IV-62, (RMB); Orchid Jungle Hammock, Newton Road, 23-III-70, (blacklight trap), R. M. Baranowski, (RMB); same, 9-X-69, (RMB); Paradise Key, 1-III-19, H. Barber. (NMNH); MONROE CO.: Everglades National Park, Flamingo Prairie, 28-III-70, (blacklight trap), R. M. Baranowski, (RMB); same, 4-V-70, (RMB); PINELLAS CO.: Dunedin, 22-III-27, W. S. Blatchley (NMNH).

Ozophora trinotata Barber 1914:515.

Diagnosis: Large, reddish brown, with upstanding dorsal pubescence. Hind femoral hairs long. Hemelytral membrane completely dusky. Corium with narrow but conspicuous distally placed pale macula and broad chocolate fascia immediately anterior to it.

Biology: Little is known of its biology. Blatchley (1926) reported it from ferns, certainly not a host plant. It is commonly taken in blacklight traps in hammocks in the Homestead area. We have taken breeding populations in dense vegetation and also feeding on the fallen seeds of *Conocarpus erectus* L. in the Florida Keys. Slater and Baranowski (1983) describe the egg and all immature stages.

Distribution: Known only from Florida.

Florida Distribution: Originally described by Barber (1914) from Marco, Everglade, Ft. Meyers, Ormond, Biscayne Bay and Belleair. Reported by Blatchley (1926) from Dunedin and Royal Palm Park; by Torre Bueno (1931) from Royal Palm Park as *binotata* (sic). ALACHUA CO.: 12-IV-54, H. V. Weems, Jr., (FSCA); 14-V-40, E. D. McRae, (FSCA); 6-IV-34, student collection, (RMB); Gainesville, 13-X-46, H. V. Weems, Jr., (FSCA); same, 23-I-59, (blacklight), R. E. Woodruff, (AMNH); same, 1-X-69, (blacklight trap), F. W. Mead, (RMB); Gainesville, 12-V-74, (blacklight trap), F. W. Mead, (FSCA); same, 9-X-68, (blacklight trap), (RMB); same, 13-VI-68, (blacklight trap), (RMB); same, 25-VI-69, (blacklight trap), (RMB); same, 16-V-67, (blacklight trap), (RMB); same, 31-VI-66, (blacklight trap), (RMB); Gainesville, Doyle Connor Building, 12-V-75, (blacklight trap), F. W. Mead, (RMB); same, 19-VI-74, (RMB); same, IV-74, (RMB); same, 16-18-VII-76, (RMB); same, 14-16-VI-74, (RMB); same, 18-VI-74, (RMB); same, 1-IV-74, (RMB); same, 27-V-74, (RMB); same, 30-V-70, (RMB); same, 27-V-71, (RMB); same, 7-9-IX-73, (RMB); same, 22-V-71, (RMB); same, 20-V-71, (RMB); same, 17-VI-71, (RMB); same, 3-VI-71, (RMB); same, VIII-69, (RMB); same, 27-VI-70, (RMB); same



Map LXXI. Distribution of *Ozophora reperta*

22-IX-69, (RMB); same, 25-V-71, (RMB); same, 13-VI-70, (RMB); same, 6-VII-70, (RMB); same, 3-VI-70, (RMB); same, 4-VIII-70, (RMB); same, 13-VII-70, (RMB); same, 27-29-V-68, (RMB); same, 3-VI-69, (RMB); same, 4-VI-69, (RMB); same, 9-11-V-75, (RMB); same, 23-25-V-75, (RMB); same, 2-4-V-75, (RMB); same, 9-11-VI-78, (RMB); same, 14-VI-78, (RMB); same, 18-20-V-79, (RMB); same, 12-14-V-78, (RMB); same, 1-VI-78, (RMB); Micanopy, Fall of 1930, T. H. Hubbell, (RMB); BAKER CO.: Olustee, 12-VII-66, (blacklight trap), E. P. Merkel, (RMB); same, 2-4-VII-66, (RMB); same, 9-10-VII-66, (RMB); same, II-VII-66, (RMB); BREVARD CO.: 23-III-54, (at light), H. V. Weems, Jr., (FSCA); 23-III-54, H. V. Weems, Jr., (FSCA); Indiatlantic, 27-VI-81, F. A. Smith, (FSCA); BROWARD CO.: Ft. Lauderdale, 21-VI-71, J. A. Reinart, (FSCA); Pompano, 21-VIII-79, D. C. Clinton, (FSCA); CHARLOTTE CO.: Gilchrist, 24-III-48, (FSCA); COLLIER CO.: 14-V-49, (FSCA); DADE CO.: 8-VI-77, B. Salrog, (FSCA); 26000 SW 197 Ave, 19-V-77, (blacklight trap), R. M. Baranowski, (RMB); same, 31-V-77, (RMB); same, 17-IV-77, (RMB); same, 23-V-77, (RMB); same, 27-III-78, (RMB); same, 6-VI-77, (RMB); same, 9-V-77, (RMB); same, 8-V-77, (RMB); same, 19-V-77, (RMB); same, 24-V-77, (RMB); same, 6-V-77, (RMB); Agricultural Research & Education Center, Homestead, 8-III-70, (blacklight trap), R. M. Baranowski, (RMB); same, 4-III-70, (RMB); same, 27-VI-69, (RMB); same, 8-III-70, (RMB); same, 21-X-76, (RMB); Biscayne Bay, A. T. Slosson, (AMNH); Castello Hammock, 17-IV-72, (blacklight trap), R. M. Baranowski, (RMB); same, 28-X-76, (RMB); Goulds, SW 152 St, behind Monkey Jungle, 28-III-87, (blacklight trap), R. E. Woodruff, (RMB); Homestead, 11-IV-69, (blacklight trap), R. M. Baranowski, (RMB); same, 12-IX-69, (RMB); same, 18-XI-68, (RMB); same, 19-VI-69, (RMB); same, 27-III-70, (RMB); same, 18-V-69, (RMB); same, 27-V-70, (RMB); same, Subtropical Experiment Station, 2-IV-70, (blacklight trap), R. M. Baranowski, (RMB); Naranja, 9-IV-62, R. M. Baranowski, (RMB); Orchid Jungle Hammock, Newton Road, 12-V-70, (blacklight trap), R. M. Baranowski, (RMB); same, 23-III-70, (RMB); same, 5-VI-69, (RMB); same, 22-V-69, (RMB); same, 3-IV-69, (RMB); same, 26-II-70, (RMB); same, 2-IV-70, (RMB); same, 28-IV-70, (RMB); same, 18-III-70, (RMB); same, 12-V-70, (RMB); same, 27-V-70, (RMB);

same, 19-V-70, (RMB); same, 24-X-69, (RMB); Paradise Key, 1-III-19, H. Barber, (NMNH); same, 10-III-19, (NMNH); same, 12-IV-19, C. A. Mosier, (NMNH); Ross & Castello Hammock, 18-V-70, (blacklight trap), R. M. Baranowski, (RMB); same, 18-III-70, (RMB); same, 22-V-70, (RMB); same, 26-III-70, (RMB); same, 18-V-70, (RMB); DE SOTO CO.: Arcadia, 1-VII-55, H. A. Denmark, (FSCA); Hog Bay, 15-V-67, R. H. Rhodes, (RMB); HARDEE CO.: Ft. Green, 23-V-67, R. H. Rhodes, (RMB); Wauchulla, 24-V-67, (in Steiner trap), R. H. Rhodes, (RMB); HIGHLANDS CO.: Archbold Biological Station, 27-III-60, M. A. Deyrup, (AMNH); Lake Placid, 27-I-43, M. Cazier, (AMNH); S-29 2 miles north of section S-70, Parker Island, 28-III-66, M. Deyrup, (AMNH); Lake Placid, Archbold Biological Station, 18-IX-82, M. Deyrup, (RMB); INDIAN RIVER CO.: Sebastian, G. Nelson, (AMNH); LEE CO.: Boca Grande, 26-VI-61, (blacklight trap), H. M. Faircloth, (RMB); MANATEE CO.: Onico, Paula Dilman, (FSCA); MARION CO.: 14 mi. SW of Ocala, Ross Prairie, 12-VI-75, (blacklight trap), P. C. Drummond, (RMB); 9 mi SSW of Ocala, 1-VIII-75, (blacklight trap), P. C. Drummond, (RMB); same, 2-X-75, (blacklight trap), J. Wiley, (RMB); same, 27-VIII-75, Drummond & Wiley, (RMB); same, 1-VIII-75, (blacklight trap), P. C. Drummond, (RMB); same, 28-VI-75, (blacklight trap), P. C. Drummond, (RMB); Lake Eaton, 8-IV-75, (blacklight trap), P. C. Drummond, (RMB); same, 22-IV-75, (RMB); north end of Heather Island, 13-X-75, (blacklight trap), J. Wiley, (RMB); Ocala National Forest, T17 State Rd. 26, E section 16, 25-VII-38, Hubble & Friauf, (RMB); MONROE CO.: 27-XI-55, H. A. Denmark, (FSCA); Big Coppit Key, 25-III-72, (blacklight trap), Brenda & Dennis Beck, (RMB); Big Pine Key, 12-V-61, (at light), F. W. Mead, (RMB); Everglades National Park, Flamingo Prairie, 23-III-70, (blacklight trap), R. M. Baranowski, (RMB); same, 28-III-70, (RMB); same, 8-IV-72, (RMB); same, 21-IV-72, (RMB); same, 8-IV-72, (RMB); Flamingo Prairie, Everglades, 26-I-61, A. N. Nadler, (AMNH); Key Largo, 26-XI-55, H. A. Denmark, (FSCA); same, 27-XI-55, (FSCA); same, (RMB); No Name Key, 29-XII-72, H. Rodney Dodge, (RMB); Plantation Key, 27-VI-55, (at light), H. V. Weems, Jr., (FSCA); Stock Island, 21-III-63, (blacklight trap), F. A. Buchanan, (RMB); same, 21-V-68, (RMB); same, 7-IX-62, (RMB); Stock Island, 31-VII-85,

MYODOCHINI Stal

(blacklight trap), J. Bunch, (RMB); same, 8-9-VII-85, (RMB); ORANGE CO.: Apopka, 16-IV-75, T. L. Kipp, (FSCA); Orlando, 12-V-81, F. L. Ware, (FSCA); Winter Park, 1-V-43, (at light), H. T. Fernald, (FSCA); same, 18-III-44, (FSCA); same, 28-V-40, (FSCA); same, 23-III-44, H. T. (RMB); same, 28-V-40, (FSCA); same, 20-IV, E. N. Davis, (AMNH); same, 24-I, (AMNH); same, 28-III, (AMNH) same, 3-IV, (AMNH); same, 4-III-39, F. E. Lutz, (AMNH); PALM BEACH CO.: Lantana, 2-V-78, J. Bennet, (FSCA); Belle Glade, (NMNH); PINELLAS CO.: 2.4 mi. E. Tarpon Springs, 17-VIII-38, Hubbell & Friauf, (RMB); 8-III-30, B. P. Moora, (NMNH); Dunedin, 26-IV-27, W. S. Blatchely (NMNH); same, 3-4-17, (NMNH); St. Petersburg, (NMNH); POLK CO.: Lake Alfred, 5-VIII-70, M. H. Muma, (RMB); SARASOTA CO.: Venice, 8-V-60, H. A. Denmark, (RMB); SEMINOLE CO.: Fern Park, 1-IX-61, C. O. Youtsey, (FSCA); Sanford, 15-III-28, F. M. Mueller, (NMNH); ST. LUCIE CO.: Ft. Pierce, 19-VI-79, E. W. Campbell, (FSCA); VOLUSIA CO.: 21-VII-54, H. A. Denmark, (FSCA); Harbor Oaks, 26-IV-72, J. N. Pott, (FSCA); Edgewater, 6-III-39, C. A. Frost, (NMNH).

This is a large diverse tribe. Harrington (1980) includes 56 genera and over 260 species ranging from small to among our largest rhyparochromines. The tribe is characterized by the rounded non-carinate pronotal margins, usually distinct anterior pronotal collar, and the presence of dorsal spiracles on abdominal segments 2, 3, and 4. Nymphs have a well developed Y-suture and dorsal abdominal scent gland openings between terga 3-4, 4-5 and 5-6.

This is the largest and most diverse of the rhyparochromine tribes in the Western Hemisphere where it has undergone marked radiation. In Florida half of all of the rhyparochromines are Myodochini (both genera and species), and several of the species are ubiquitous and of some economic importance.

Harrington's (1980) revision should be consulted for complete generic descriptions and a world list of species.

KEY TO THE GENERA OF FLORIDA MYODOCHINI

- 1. Postocular distance much greater than interocular distance. *Myodocha*, p. 14
- 1'. Interocular distance as great as or greater than postocular distance
- 2. A cross striated stridulatory area present on propleuron (fig. 67) *Pseudocnemodus*, p. 17

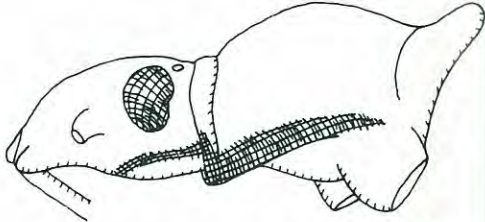


Fig. 67. *P. canadensis*, propleuron

- 2'. Propleuron lacking a striated stridulatory area.
- 3. Ocelli absent *Cnemodus*, p.
- 3'. Ocelli present.



Map LXXII. Distribution of *Ozophora trinotata*

4. A crescent shaped striated stridulatory area present laterally on anterior portion of abdomen (fig. 68).....5

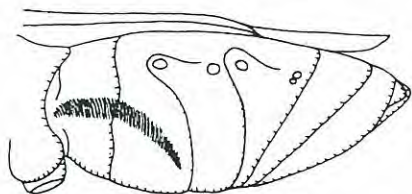


Fig. 68. *L. sylvestris*, abdomen.

- 4'. No crescent shaped stridulatory area on anterior portion of abdomen. 7
5. Length antennal segment 1 greater than interocular distance; pronotum shining, not pruinose *Pseudopamera*, p. 140
- 5'. Length antennal segment 1 less than interocular distance; pronotum pruinose 6
6. Lateral margins of posterior pronotal lobe angled posterolaterad at approximately a 45 degree angle; pronotum with deeply incised transverse impression; fourth antennal segment with a pale proximal band; spines present on both inner and outer edges of ventral surface of fore femora (double ranked) *Froeschneria*, p. 137
- 6'. Lateral margins of posterior pronotal lobe angled posterolaterad at less than a 45 degree angle; transverse impression shallowly incised; fourth antennal segment usually uniformly dark; fore femoral spines present only along inner edge of ventral surface (single ranked). *Ligyrocoris*, p. 134
7. Evaporative area around metathoracic scent gland auricle reduced to a narrow band around auricle; claval punctures usually in 3 rows; length of 3rd antennal segment usually less than interocular distance 8
- 7'. Evaporative area covering a considerable portion of metapleuron; more than 3 rows of claval punctures; 3rd antennal segment usually longer than interocular distance 11
8. All antennal segments stout, bearing long hairs perpendicular to long axis of antennae; wings uniformly pale yellow

with slightly darker punctures

- 8'. *Carpilis*, p. 124
- Antennae either almost filiform or capitate, in the latter case with segments 3 and 4 swollen bearing only distally directed hairs; hemelytra with areas of darker pigmentation present and usually with large darker punctures 9
9. Third antennal segment filiform or if somewhat clavate with distal end not of greater diameter than segment one; lateral margins of pronotum non-carinate. *Prytanus*, p. 170
- 9'. Third antennal segment strongly enlarged and swollen distally, of greater diameter than segment one; lateral margins of posterior pronotal lobe bluntly subcarinate 10
10. Anterior pronotal lobe globose, strongly convex when viewed laterally; transverse pronotal impression complete and distinct; antennal segments II, III and IV subequal in length. . . *Ptochiomera*, p. 178
- 10'. Anterior pronotal lobe rounded but not globose, appearing nearly flat when viewed laterally; transverse pronotal impression obsolete mesally; antennal segment IV distinctly longer than either segment II or III. *Sisamnes*, p. 180
11. Meso-acetabulum with mesepimeron emergent from between meso- and metepisternum (fig. 69).....12

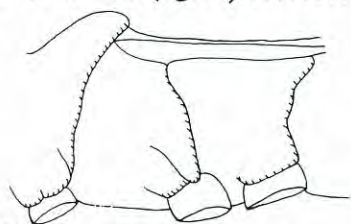


Fig. 69. Thorax, "emergent" mesepimeron.

- 11'. Mesepimeron enclosed by metepisternum touching mesoepisternum (fig. 70)....13

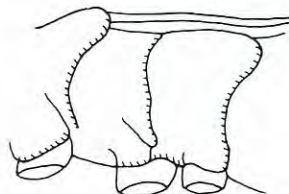


Fig. 70. Thorax, "enclosed" mesepimeron.

12. Head relatively elongate with a distinct "neck" present; postocular distance equal to or greater than distance between ocelli. *Heraeus*, p. 130
- 12'. Head less elongate, lacking a distinct "neck"; postocular distance less than distance between ocelli. *Neopamera*, p. 144
13. Head and anterior pronotal lobe including anterior collar impunctate, collar narrow and ringlike (sometimes with a few faint punctures) *Perigenes*, p. 167
- 13'. Anterior pronotal collar broad and distinctly punctate 14
14. Small, not over 5-6 mm in length; anterior pronotal lobe strongly convex, not lower than posterior lobe in lateral view; pronotal collar essentially straight across midline *Pseudopachybrachius*, p. 154
- 14'. Elongate, usually 7-9 mm in length; anterior pronotal lobe flattened, very little convex, in lateral view lower than posterior lobe; pronotal collar with a median "dip" to posterior margin *Paromius*, p. 163

CARPILIS Stal 1874

Carpilis Stal 1874:144-145.

Type Species: *Carpilis ferruginea* Stal 1874. Monobasic.

The members of this genus are small, stout, short legged myodochines with the 2nd, 3rd and 4th antennal segments strongly incrassate and with elongate hairs produced at right angles to the long axis of the segment. The anterior tibiae of the males are curved and possess a small distal spine on the inner side. The dorsal surface is glabrous and subshining with the lateral corial margins somewhat convexly rounded from the base. Generally the hemelytra are uniformly bright yellow or testaceous and contrast strongly with the reddish brown pronotum.

Three species are known, all North American, one southwestern, one northwestern and the third known only from Florida.

CARPILIS BARBERI (Blatchley) (fig. 71, 72, map LXXIII)

Ptochiomera (Carpilis) barberi Blatchley 1924:89-90.

Carpilis barberi Barber 1928:176.

Diagnosis: Small (2.8-3), oblong-oval. Posterior half of scutellum brown. Pronotal humeri yellowish. Antennae reddish brown, proximal end of segment II pale.

In brachypters the anterior pronotal lobe is wider than long and the distal end of the hemelytra truncate.



Map LXXIII. Distribution of *Carpilis barberi*

Biology: Little is known of its biology, but despite the paucity of records it is not an uncommon species in Florida in grass clumps; etc. Blatchley (1926) reported it under boards on beaches.

Distribution: Known only from Florida.

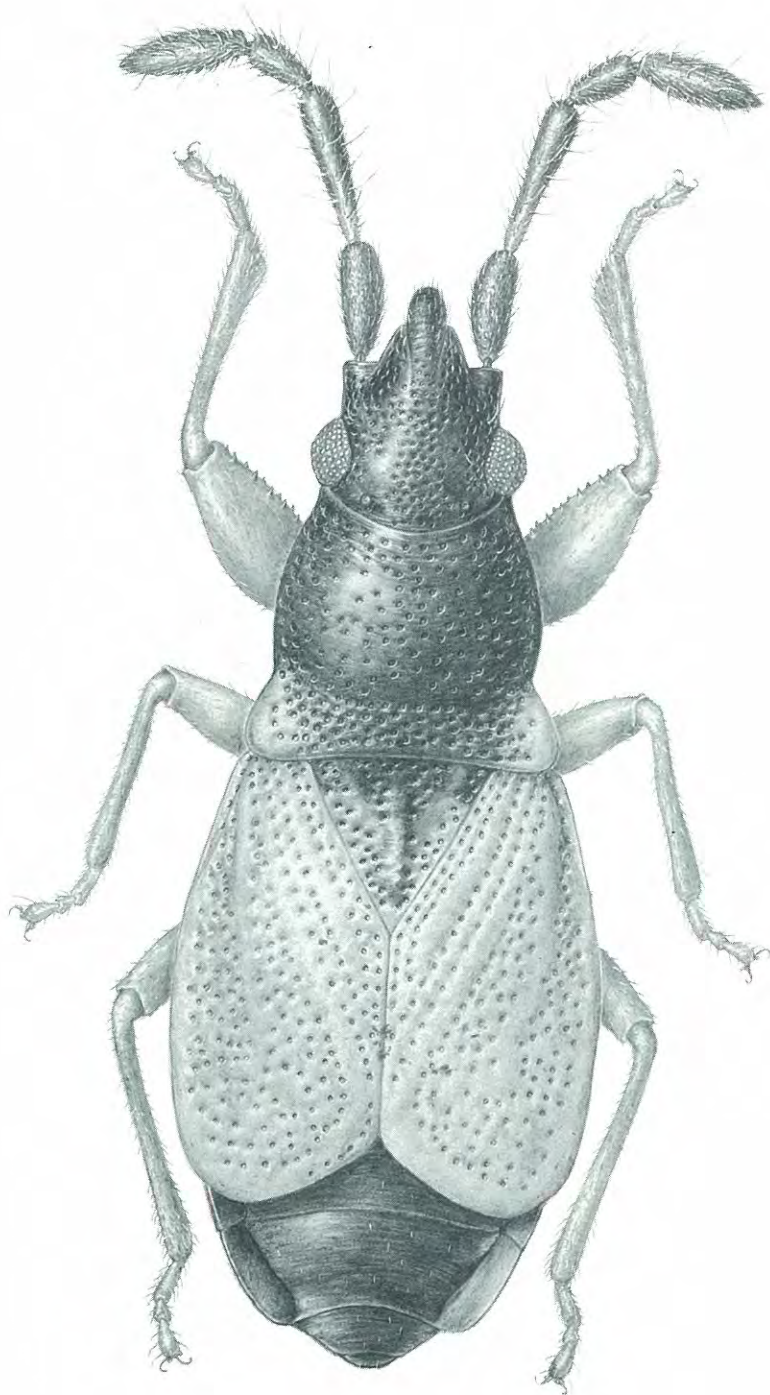


Fig. 71. *Carpilis barberi*

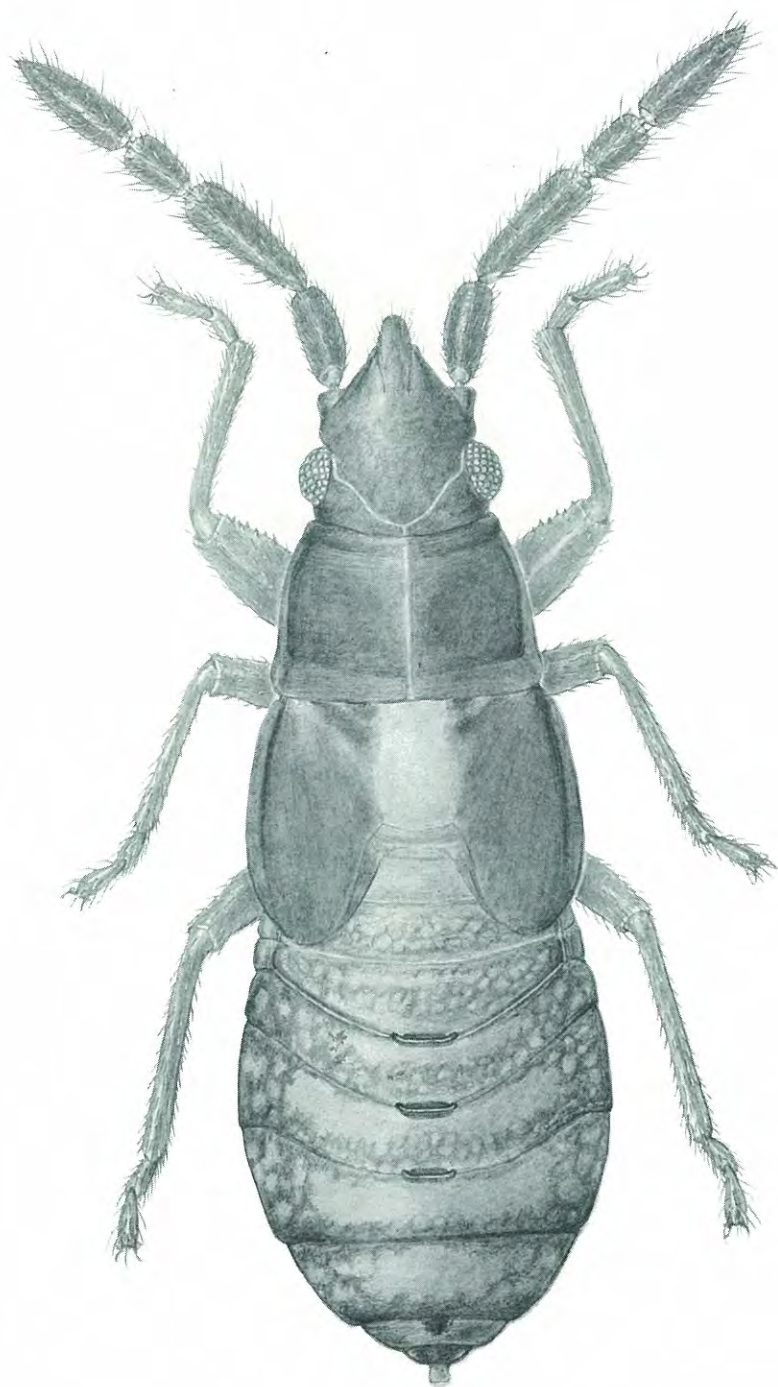


Fig. 72. *Carpilis barberi*, fifth instar

Florida Distribution: Described by Blatchley (1924) from Dunedin and Cape Sable and reported by Blatchley (1926) from Royal Palm Park. LEE CO.: Sanibel Island, 9-VI-69, J. A. Slater, J. Harrington, T. Schuh, (JAS); LEON CO.: Tallahassee, 27-X-76, (Berlese hardwood litter), L. D. Justice, (JAS); MONROE CO.: Big Pine Key, 30-XI-61, (JAS); Cape Sable, 22-II-19, Blatchley, (NMNH); Everglades National Park, Flamingo Prairie, 8-VI-70, R. M. Baranowski, (RMB); same, 12-VI-69, (RMB); same, 10-XI-72, (RMB); same, 10-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); same, 25-III-73, (night), C. W. & L. B. O'Brien, (JAS); Everglades National Park, Snake Bight Trail, R. M. Baranowski, J. Slater, T. Schuh, J. Harrington, (JAS); PINELLAS CO.: Dunedin, 6-III-27, Blatchley, (NMNH); Dunedin, 3-6-27, W. S. Blatchley, (NMNH); WAKULLA CO.: 1 mi. N. Spring Creek, 31-V-73, (at light), C. W. O'Brien, (JAS).

CNEMODUS Herrich-Schaeffer 1850

Cnemodus Herrich-Schaeffer 1850:184.

Type Species: *Cnemodus brevipennis* Herrich-Schaeffer 1850 = *Astemma mavortia* Say 1831. Monobasic.

The members of this genus are large elongate, shagreened black myodochines and very unusual in that both macropters and brachypters lack ocelli. The eyes are set well away from the anterior pronotal margin and the anterior pronotal lobe is much longer than the posterior and completely impunctate. The legs are elongate. Four species are recognized with a 5th questionable species described from North Carolina. Two species are South American, one known only from Florida, and the 4th is widespread in the eastern United States. Harrington (1980) lists *brevipennis* Herrich-Schaeffer 1850 as a valid species. However, this is a *lapsus* as earlier she correctly cites it as a junior synonym of *mavortia* Say 1831.

KEY TO FLORIDA SPECIES OF *CNEMODUS*

1. Femora and tibiae bearing numerous elongate erect hairs. *hirtipes*, p. 127
- 1'. Femora and tibiae at most with only a few scattered elongate hairs. *mavortius*, p. 128

CNEMODUS HIRTIPES Blatchley (fig. 73, map LXXIV)

Cnemodus hirtipes Blatchley 1924:90.

Diagnosis: Large (7-8), elongate, black with brown legs. Antennae and corial margins pale.

A long legged species occurring in both macropterous and brachypterous conditions, the latter the more common. Like the closely related *mavortius*, in the field it resembles a large black ant in form and action.

Biology: Nothing significant has been reported of its biology, but presumably it is similar to that of *mavortius*.

Distribution: Known only from Florida.

Florida Distribution: Described by Blatchley (1924) from Ormond, Moore Haven, Sarasota and Dunedin. Blatchley (1926) refers Barber's (1914) records of *mavortius* from Jacksonville, Cleveland and Punta Gorda here. ALACHUA CO.: 27-IV-54, (at light), H. V. Weems, Jr., (RMB); Gainesville, 14-IX-55, R. A. Morse, (RMB); same, 6-V-55, (FSCA); same, 16-V-67, (blacklight trap), J. W. Perry, (JAS); same, 2-VI-59, (at light), H. V. Weems, Jr., (RMB); same, 4-VI-59, (RMB); same, 7-VI-56, (at light) R. F. Hussey, (FSCA); same, 9-VI-48, H. V. Weems, Jr., (FSCA); BAKER CO.: Olustee, 2-4-VII-66, (blacklight trap), E. P. Merkel, (RMB); same, II-VII-66, (RMB); same, 30-V-63, (RMB); COLLIER CO.: Naples, 8-VI-81, K. Delate, (FSCA); DADE CO.: Agricultural Research & Education Center, Homestead, 21-X-76, (blacklight trap), R. M. Baranowski, (RMB); same, 2-X-69, (RMB); same, 11-IV-69, (RMB); DE SOTO CO.: Arcadia, 1-VI-55, H. A. Denmark, (FSCA); GADSDEN CO.: Chattahoochee, 4-VI-55, (at light), R. F. Hussey, (FSCA); same, 2-VI, (FSCA); HIGHLANDS CO.: Archbold Biological Station, 30-III-62, D. C. Ferguson, (NMNH); same, 8-VII-

66, L. Penner, (JAS); same, 29-IV-64, R. W. Hodges, (NMNH); Sebring, 1-16-IX, C. T. Parsons, (AMNH); same, 1-11-IX, (AMHN); same, 10-VI-60, H. V. Weems, Jr., (RMB);

XII-20, Blatchley, (NMNH); St. Petersburg, (NMNH); POLK CO.: Lakeland, 12-10-39, J. R. Watson, (FSCA); same, 27-V-50, (at light), R. F. Hussey, (FSCA); same, 7-VII-48, (at light), (FSCA); same, 8-V-49, (at light), (FSCA); PUTNAM CO.: 1.7 mi. NE Satsuma, 30-VII-38, Hubbell and Friauf, (NMNH); Georgetown, C. T. Brues, (AMNH); SARASOTA CO.: Sarasota, 23-II-11, Blatchley, (NMNH); WAKULLA CO.: Spring Creek, 31-V-73, (UV Trap), (JAS). UNKNOWN COUNTY: St. Nicholas, (NMNH).



Map. LXXIV. Distribution of *Cnemodius hirtipes*

same, 29-XII-60, (JAS); LEON CO.: 17 mi. N. Tallahassee, Tall Timbers Research Station, 5-11-VII-67, L. Collins, (NMNH); Tallahassee, 24-VIII-73, (at UV), C. W. O'Brien, (JAS); LIBERTY CO.: Torreya State Park, 20-V-66, H. V. Weems, Jr., (JAS); MARION CO.: 4 mi. NW of Dunnellon, 3-VIII-38, Hubbell and Friauf, (NMNH); 9 mi. SSW of Ocala, 27-VIII-75, Drummond & Wiley, (RMB); Lake Eaton, 8-IV-75, (blacklight trap), Peter Drummond, (RMB); OKALOOSA CO.: Valparaiso, VII-43, G. A. Edwards, (AMNH); ORANGE CO.: Orlando, 7-VI-81, W. J. Shirley, (FSCA); Plymouth, 12-V-81, R. Saar, (FSCA); Winter Park, 14-VII-44, (at light), H. T. Fernald, (FSCA); same, 20-IV, E. M. Davis, (AMNH); PASCO CO.: 13-I-30, O. C. Tigner, (NMNH); PINELLAS CO.: Dunedin, 16-

CNEMODUS MAVORTIUS (Say)

Astemma mavortia Say 1831: 337-338 (Leconte Edition).

Cnemodius brevipennis Herrich-Schaeffer 1850:184.

Thaumastopsis alacris Walker 1872:147-148.

Cnemodius mavortius Uhler 1876:308.

Diagnosis: Closely related to *hirtipes*, differing primarily by the characters given in the key.

Biology: Sweet (1964) reported on the biology of this species in Connecticut. He found it to be "highly specific to fully exposed old overdrained morainic sites dominated by *Andropogon scoparium*". It occurs especially where areas of bare gravelly soil are present, such as gravel pits. It is thus an insect that prefers hot and dry habitats.

Brachyptery is common suggesting that the habitats, while "temporary" must be relatively long lasting. *C. mavortius*, in the field, resembles a large black ant and, as noted by Sweet (1964), this resemblance is enhanced by rapid, jerky "ant-like" movements. Nymphs are striking ant mimics.

Sweet (1964) notes parasitization by a tachinid fly (*Catharosia* sp.).

Two generations a year occur in Connecticut with adults overwintering.

Distribution: Said to range from New England south to Florida and west to Colorado and Iowa. Blatchley (1926) referred previous Florida records to *hirtipes*. However, since *mavortius* is known from Georgia, it may occur in the northern counties of the state.

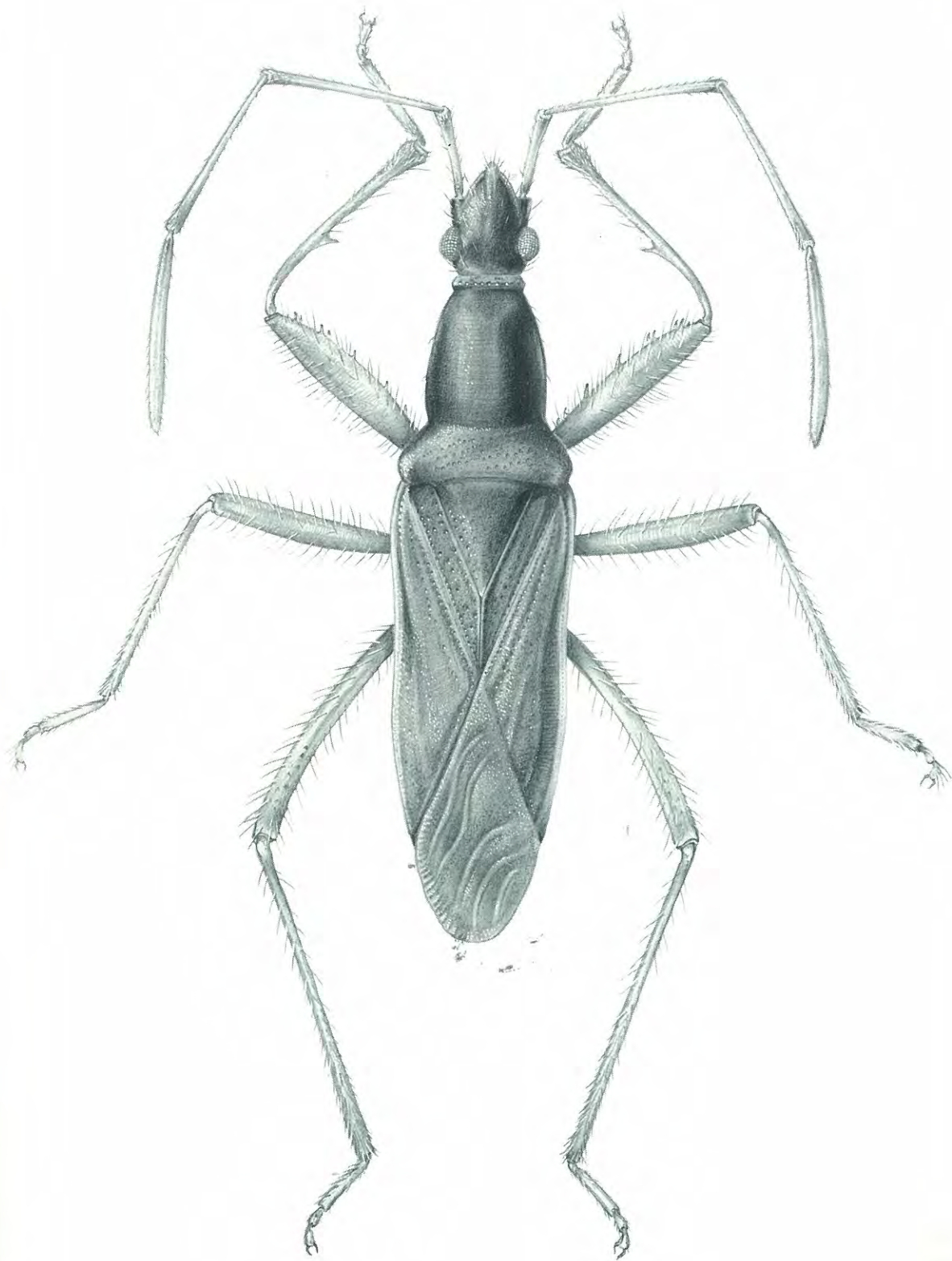


Fig. 73. *Cnemodus hirtipes*

HERAEUS Stal 1862

Heraeus Stal 1862:314-315.

Type Species: *Lygaeus* (*Plociomerus*) *triguttatus* Guerin-Meneville 1857. Monobasic.

The members of this genus resemble small species of *Myodocha*, but the pronotal surface is pruinose and the base of the head, while strongly constricted, is produced only into a relatively short short slender "neck". The transverse impression of the pronotum is usually near or a little behind the middle and the legs are moderately elongate. The anterior pronotal collar is diagnostic, being very narrow dorsally, but broadening ventrally and extending forward beneath the head.

Twelve species are recognized, most of which are Neotropical, with 5 species occurring north of Mexico, all but one southern or southwestern in distribution.

KEY TO FLORIDA SPECIES OF HERAEUS

1. Fourth antennal segment with sub-proximal 2/3 white or pale yellow, strongly contrasting with dark distal portion of segment; legs entirely pale yellowish brown *triguttatus*, p. 132
- 1'. Fourth antennal segment uniformly dark; distal ends of fore femora black to very dark brown *plebejus*, p. 130

HERAEUS PLEBEJUS Stal (fig. 74, map LXXV)

Heraeus plebejus Stal 1874:147.

Diagnosis: Small (5.0), slender, obscure dull brown color. Head dull blackish rather than polished with eyes placed about midway along lateral head margin. Dorsal surface distinctly pilose.

Biology: Sweet (1964) has carefully studied the biology of this species in Connecticut. It migrates to mesic woodland margins to hibernate where it is frequently found together with overwintering aggregations of *Myodocha serripes*. In the summer it lives in open mesic, rank forb habitats frequently near streams and "shaded ecotones between woodlands and fields or marshes." It is usually present in a given site for a single year. Barber (1923) states that brachyptery occurs, but Sweet (1964) states that it is always macropterous. We have never seen a brachypterous individual. Its adaptation to short lived seral stages would seem to militate against the development of brachyptery. It frequently comes to lights. Blatchley (1926) reports taking adults in winter at Dunedin in Spanish moss and in dead leaves of cabbage palmettos.

Distribution: Widely distributed from Quebec west to Kansas and Arizona and south to Florida and possibly the West Indies.

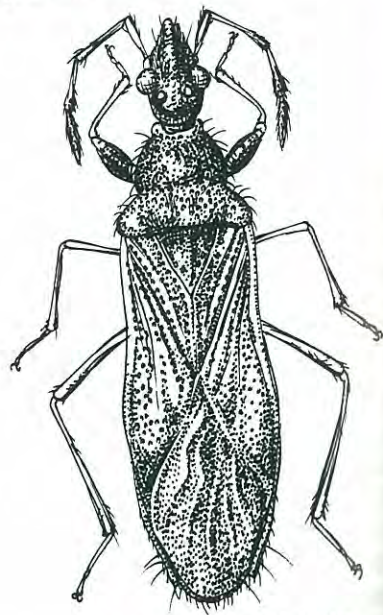


Fig.74. *Heraeus plebejus*

Florida Distribution: Van Duzee (1909) reported it from Sanford, Barber (1914) from Everglade and Blatchley (1926) from Dunedin and Royal Palm Park. ALACHUA CO.: Cross Creek, 1-VII-62, I. V. Weems, Jr., (RMB); Gainesville, Doy Connor Building, 11-VI-74, (blacklight trap), W. Mead, (RMB); same, 15-VII-74, (RMB).

same, 4-6-V-79, (RMB); same, 9-11-VI-78, (RMB); same, 3-4-VII-74, (RMB); same, 14-VII-79, (RMB); same, 12-VI-78, (RMB); same, 12-14-V-78, (RMB); same, 5-VI-78, (RMB); same, 12-V-75, (RMB); same, 16-IV-73, (RMB); same, 31-V-78, (RMB); same, 9-11-V-75, (RMB); same, 23-25-VI-75, (RMB); same, 2-4-V-75, (RMB);



Map LXXV. Distribution of *Heraeus plebejus*

BAKER CO.: Olustee, 2-4-VII-66, (blacklight trap), E. P. Merkel, (RMB); same, 30-V-63, (RMB); same, 12-VII-66, (RMB); BROWARD CO.: HWY. 27, Sawgrass Rec. Area, 23 mi. NW Ft. Lauderdale, 21-V-1976, (JAS); Ft. Lauderdale, 24-IV-28, D. M. Bates, (NMNH); same, 26-III-28, (NMNH); COLLIER CO.: 6 mi. e. Ochopee, 21-VII-73, (UV Trap), C. W. O'Brien and Marshall, (JAS); Ochopee, 26-V-76, (UV Trap), C. W. O'Brien & Marshall, (JAS); DADE CO.: Agricultural Research & Education Center, Homestead, 21-X-76, (blacklight trap), R. M. Baranowski, (RMB); Grossman Hammock State Park, 2-V-72, (blacklight trap), R. M. Baranowski, (RMB); same, 24-V-72, (RMB); Homestead, 11-

IV-69, (blacklight trap), R. M. Baranowski, (RMB); same, 5-X-68, (RMB); same, 7-X-68, (RMB); same, 18-V-69, (RMB); Subtropical Experiment Station, Waldin Dr., 17-IV-7?, (blacklight trap), R. M. Baranowski, (RMB); Homestead, 16-XII-74, J. A. Slater, (JAS); same, 20-XI-74, (JAS); same, 8-XII-74, (JAS); Homestead, 9-IV-57, R. M. Baranowski, (JAS); Miami, A. E. Wight, (AMNH); Paradise Key, 3-III-19, H. Barber, (NMNH); same, VI-19, C. A. Moser, (NMNH); Royal Palm Park, 20-VII-48, E. L. Todd, (NMNH); same, 22-VII-48, (NMNH); FRANKLIN CO.: Alligator Pt., 18-III-74, (Berlese palmetto oak Litter), C. W. O'Brien & Marshall, (JAS); HENDRY CO.: La Belle, 10-11-III-74, (UV in oak grove), J. Reynolds, (JAS); Clewiston, 4-6-41, M. Wright, (NMNH); HIGHLANDS CO.: Archbold Bio. Sta., 11-VII-66, L. Penner, (JAS); same, 7-8-VI-69, (at light), J. Harrington, T. Schuh, J. Slater, (JAS); Lake Placid, Archbold Biological Station, 6-IV-83, (UV light trap), M. Deyrup, (RMB); same, 2-V-83, (RMB); Nr. Avon Park, 7-XI-61, T. Morris, (AMNH); Sebring, 7-12-III-39, F. E. Lutz, (AMNH); JEFFERSON CO.: 2 mi. N. Wacissa, 3-VII-73, (UV light), G. B. Marshall & R. D. Kaplan, (JAS); 4 miles S. Wacissa, 29-VI-73, C. W. O'Brien, (JAS); LEE CO.: Sanibel Island, 9-VI-69 J. Slater, T. Schuh, J. Harrington, (JAS); LEON CO.: Tallahassee, 10-VII-73, (UV Trap), C. W. O'Brien, (JAS); MARION CO.: 14 mi SW of Ocala, Ross Prairie, 12-VI-75, (blacklight trap), P. C. Drummond, (RMB); Lake Eaton, 22-IV-75, (blacklight trap), Peter Drummond, (RMB); same, 8-IV-75, (RMB); Sharpes Ferry Field Station, 15-V-75, (blacklight trap), P. C. Drummond, (RMB); same, 3-IV-75, (blacklight trap), N. Holler, (RMB); same, 30-X-75, (blacklight trap), J. Wiley, (RMB); MONROE CO.: Everglades Nat. Park, Snake Bight Trail, 10-VI-69, R. M. Baranowski, J. Slater, T. Schuh, J. Harrington, (JAS); same, Flamingo Prairie, 14-VII-70, R. M. Baranowski, (RMB); same, 20-III-70, (RMB); same, 27-II-72, (blacklight trap), (RMB); same, 21-IV-72, (RMB); same, 23-III-70, (RMB); same, 28-III-70, (RMB); same, 8-IV-72, (RMB); same, 4-V-70, (RMB); Flamingo Prairie, 10-XI-72, (night), C. W. & L. B. O'Brien, (JAS); Stock Island, 28-VIII-63, (blacklight trap), F. A. Buchanan, (RMB); same, 7-XI-62, (RMB); ORANGE CO.: Winter Park, 12-VI-44, H. G. Fernald, (AMNH); same 25-V-44, (AMNH); PALM BEACH CO.: 4 mi. SE Canal

Point, 16-VII-73, (UV Trap), C. W. O'Brien, (JAS); POLK CO.: Lake Alfred, 24-VI-63, (on *Eremochloa ophiuroides*), (RMB); PUTNAM CO.: 2 mi NW of Orange Springs, 1-3-VIII-75, (blacklight trap), D. Bowman, (RMB); SEMINOLE CO.: Sanford, 20-II-62, G. W. Desin. Nr. Avon Park, Aug. 22-VIII-61, T. Morris, (AMNH); Sanford, 5-5-28, E. D. Ball, (NMNH); VOLUSIA CO.: 4-VIII-56, (at light), H. A. Denmark, (RMB); same, 6-VIII-56, (RMB); 6-VIII-56, H. A. Denmark, (RMB); De Land, 24-26-III-39, F. E. Lutz, (AMNH); Edgewater, 28-II-39, C. A. Frost, (NMNH); WAKULLA CO.: 1 mi. N. Spring Creek, 31-V-73 (at light), C.W. O'Brien, (JAS); Spring Creek, 31-V-73, (UV Trap), C. W. O'Brien & E. F. Riek, (JAS); WASHINGTON CO.: 5 mi E. Chipley, 31-VIII-60, (blacklight trap), W. C. Rhodes, (RMB).

HERAEUS TRIGUTTATUS (Guerin) (fig. 75, map LXXVI)

Lygaeus (*Plociomerus*) *triguttatus* Guerin-Meneville 1857:400.
Heraeus triguttata Stal 1862:315.

Diagnosis: Larger (7.8), than *plebejus*. Bright reddish brown with apex of corium and most of membrane black. Apical area of corium possessing large irregular white macula. Apex of the membrane with conspicuous subquadrate median white area.

Biology: Little appears to be known of its biology, but in Cuba it obviously forms a mimicry association with the lygaeids *Myodocha fulvosa* Barber, *Pamphantus elegantulus* Stal and the spider, *Synemosyna smithi* Peck. These all appear to be Batesian mimics of the ant *Pseudomyrma flavidula* Sm. var. *pazusi* Santschi (Myers and Salt 1926).

Distribution: Originally described from Cuba and known elsewhere only from Florida. Slater (1988) cites this species as an example of overwater dispersal to Florida from Cuba. He reasons that with the mimetic model and the other mimics confined to Cuba, to believe otherwise would necessitate believing that the mimetic coloration

was acquired independently or the other members of the association have gone extinct in Florida.



Map LXXVI. Distribution of *Heraeus triguttatus*

Florida Distribution: Barber (1914) recorded it from Biscayne Bay; Blatchley (1926) from Royal Palm Park and Paradise Key. DADE CO.: 26000 SW 197 Ave, 6-V-77, (blacklight trap), R. M. Baranowski, (RMB); Agricultural Research & Education Center, Homestead, 12-IV-69, (blacklight trap), R. M. Baranowski, (RMB); same, 21-X-76, (RMB); Goulds, 24-I-41, (light trap), O. D. Link, (RMB); same, 6-I-41, (light trap), L. F. Light, Jr., (RMB); Homestead, 11-IV-69, (blacklight trap), R. M. Baranowski, (RMB); same, 18-XI-68, (RMB); same, 15-X-69, (RMB); same, 18-XI-69, (RMB); same, 26-IX-69, (RMB); same, 7-X-69, (RMB); same, 26-XI-69, (RMB); same, 4-III-70, (RMB); same, 30-XII-54, D. O. Wolfenbarger, (RMB); Homestead, 22-I-43, (light trap), O. W. Calkins, (RMB); same, 4-III-49, (light trap), (RMB); same, (JAS); same, 15-XII-74, J. A. Slater, (JAS), same, 20-XI-74, (JAS); same,

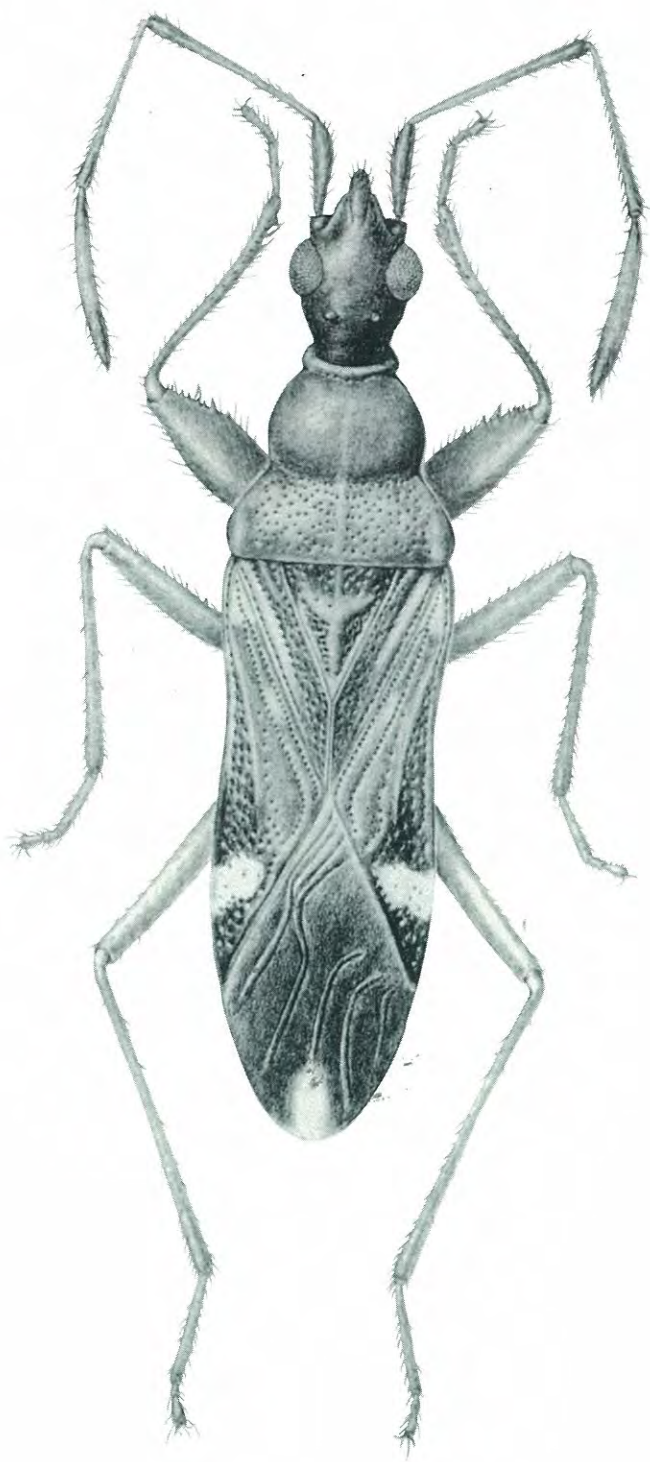


Fig. 75. *Heraeus triguttatus*

24-XI-74, (JAS); same, 16-XII-74, (JAS); same, 12-XII-74, (JAS); same, 26-XI-74, (JAS); Matheson Hammock, 11-XI-72, (under drift wood), C. W. & L. B. O'Brien, (JAS); Miami, 7-VII-22, J. C. Lutz collection, (NMNH); Naranja, 24-IX-60, R. M. Baranowski, (RMB); Princeton, 5-I-70, (blacklight trapp), R. M. Baranowski, (RMB); Paradise Key, 8-III-19, H. Barber, (NMNH); Ross & Castello Hammock, 4-X-70, (blacklight trap), R. M. Baranowski, (RMB); MONROE CO.: Big Pine Key, Key Deer Refuge, 5-XI-82, (blacklight trap), S. Klett, (RMB); Everglades National Park, 5-IV-58, R. E. Woodruff, (RMB); same, 27-II-72, (blacklight trap), R. M. Baranowski, (RMB); Everglades National Park, Flamingo Prairie, 25-III-70, R. M. Baranowski, (RMB); same, 28-III-70, same, 4-V-70, (blacklight trap), R. M. Baranowski, (RMB); same, 23-III-70, (RMB); same, 8-IX-72, (RMB); same, 23-III-70, Slater, Baranowski, (JAS); N. Key Largo Key, 5-III-82, J. A. Slater, R. M. Baranowski, (RMB); Stock Island, 21-III-62, (blacklight trap), F. A. Buchanan, (RMB); same, 28-V-68, (RMB); same, 5-VIII-62, (blacklight trap), (RMB); Stock Island, Mosquito Control Headquarters, 10-XI-71, W. H. Pierce, (RMB); PALM BEACH CO.: Pahokee, 28-I-41, (in light trap), Jno. Haynie, (JAS).

LIGYROCORIS Stal

Ligyrocoris Stal 1872:51.

Type Species: *Cimex sylvestris* Linnaeus 1758. Monobasic.

The members of this genus are moderately elongate, pruinose, long legged myodochines. The pronotal transverse impression is usually shallow, sometimes obsolete mesally with the anterior lobe narrower than the posterior. There is a distinct lunate stridulatory area (stridulitrum) on the anterior portion of the abdominal sternum and a scattered field of tiny spines basally on the hind femur (pectrum). There are only single ranked ventral fore femoral spines. The general habitus is very similar to species of *Neopamera* and *Zeridoneus*.

The genus contains 12 described species and its various members are widely distributed through the Western Hemisphere with a single

Holarctic species also occurring in the Palearctic region. All are known to occur north of Mexico; are present in Florida.

KEY TO FLORIDA SPECIES OF *LIGYROCORIS*

1. Corium lacking a post median dark fasciae the lateral margin completely pale or infuscated only anteriorly *litigiosus*, p. 13
- 1'. Corium with a post median dark fasciae present, usually reaching or nearly reaching the lateral corial margin
2. Femora and tibiae reddish, contrasting with yellow tarsi; pronotum with at most few scattered hairs; one major forefemoral spine present *slossonae*, p. 13
- 2'. Tibiae and tarsi unicolorous pale yellow; pronotum densely hairy; two major forefemoral spines present *barberi*, p. 13

LIGYROCORIS LITIGIOSUS (Stal) (fig. 76, map LXXVII)

Plociomera litigiosa Stal 1862:313.
Ligyrocoris litigiosus Stal 1874:145.

Diagnosis: Small (5-6). Head, anterior pronotal lobe black, posterior pronotal lobe and hemelytra testaceous.

Habitus similar to that of the northern *Zeridoneus costalis* (V. D.), but possesses a distinct abdominal stridulitrum. It lacks a distinct post median corial fasciae.

Biology: Nothing significant appears to be known of its biology. There is a collecting record from *Lantana camara* L.

Distribution: A Neotropical species known in the United States only from Florida and Arizona.

Florida Distribution: Reported by Van Duzee (1909) from Biscayne Bay and by Blatchley (1921)

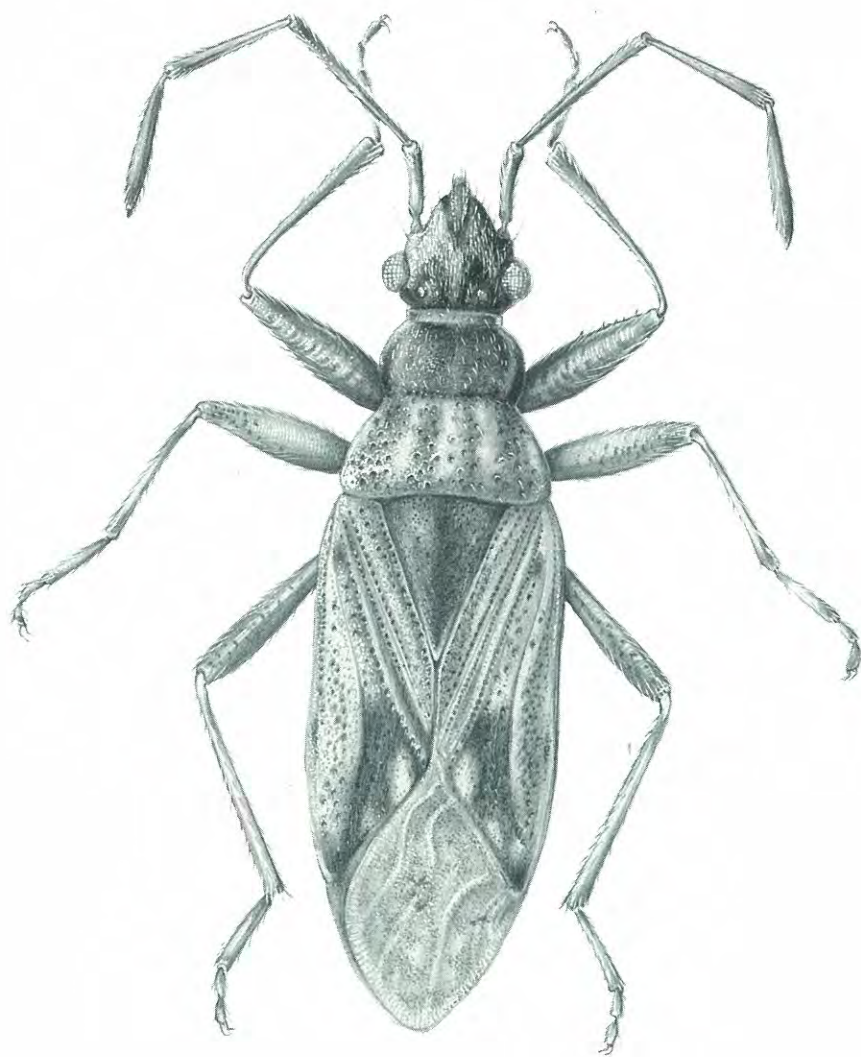


Fig. 76. *Ligyrocoris litigiosus*

from Royal Palm Park. DADE CO.: 25-VI-64, K. J. Stone, (RMB); Homestead, 10-IV-62, R. M. Baranowski, (RMB); Matheson Hammock, 11-IV-55, F. W. Mead, (RMB); same, 8-IV-55, R. F. Hussey, (JAS); Miami, NW N. River Dr & 20th Ave, 9-V-63, R. M. Baranowski, (RMB); Coconut Grove, 15-IV-44, (NMNH); Homestead, 20-I-44, (NMNH); Homestead, 8-I-57, R. M. Baranowski, (JAS); Homestead, 8-XII-74, J. A. Slater, (JAS); HENDRY CO.: Clewiston, 6-II-44, Lutz collection, (NMNH); HIGHLANDS CO.: Lake Placid, 8-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); INDIAN RIVER CO.: Sebastian, IV, G. Nelson, (AMNH); MONROE CO.: Everglades National Park, Snake Bight Trail, 10-VII-69, R. M. Baranowski, J. Slater, T. Schuh, J. Harrington, (JAS); Everglades National Park, Snake Bight Trail, 8-IV-70, R. M. Baranowski, (RMB); same, 10-VI-69, (RMB); Key Largo, 11-VI-69, R. M. Baranowski, J. Slater, T. Schuh, J. Harrington, (JAS); Marathon Key, 19-VII-73, C. W. O'Brien, (JAS); Big Pine Key, 30-XI-70, J. Slater, (JAS); POLK CO.: Lake Alfred, 8-VII-70, M. H. Muma, (RMB); SARASOTA CO.: Sarasota, 3-II-87, G. Johnson, (FSCA).



Map LXXVII. Distribution of *Ligyrocoris litigiousus*

LIGYROCORIS SLOSSONAE Barber (map LXXVIII)

Ligyrocoris slossoni Barber 1914:513-514.

Diagnosis: Small (5-5.6), head dull reddish, Anterior pronotal lobe, scutellum, corial fascia and underparts dark brown to blackish. Anterior pronotal lobe impunctate, lacking upright setae.

Biology: Nothing is known of its biology.

Distribution: Sweet (1986) believes this species to be a rare north Florida endemic.



Map LXXVIII. Distribution of *L. slossonae*

Florida Distribution: Originally described by Barber (1914) from Lake Worth and subsequently reported by Barber (1924) and Blatchley (1924) from Dunedin, and by Sweet (1986) from Gainesville.

LIGYROCORIS BARBERI Sweet
(map LXXIX)

Ligyrocoris barberi Sweet 1986:282-285.

Diagnosis: Head dark brown. Hemelytra and thorax, except for lateral bars on mesosternum pruinose, other body areas subshining. Pronotum densely and evenly covered with erect hairs. Hemelytra with broad post median transverse dark fascia broadly attaining lateral margins. Distal two thirds of femora, 4th antennal segments light reddish brown. Antennal segments one, two and three, tibiae and tarsi pale yellow. Fore femora armed on inner distal ventral surface with two large and 5 to 6 smaller spines. Pronotal collar not set off by distinct groove.



Map LXXIX. Distribution of *Ligyrocoris barberi*

Biology: Sweet (1986) studied the biology in Texas. He found its annual composite host to be *Rudbeckia hirta* (L.). It was found on the ground in open dry prairie habitats. Interestingly, it is not found in early successional communities in Texas

despite the abundance of *Rudbeckia* in such communities. Sweet found the insect to be dependant upon *Rudbeckia*. There are two generations a year in Texas with an overwintering egg diapause. Sweet (ibid) reported adult parasitization by a tachinid, *Catharosia*.

L. barberi occurs in both the macropterous and brachypterous (or submacropterous) condition with the latter predominating. Sweet (ibid) notes defense of seeds and a courtship dance with stridulation involved. The predominance of the flightlessness morphs is another example of wing reduction in a species living in relatively permanent habitats.

Distribution: A southern species from North Carolina through the Gulf states to Texas and north in the midwest to Missouri, Kansas and southern Illinois.

Florida Distribution: Two males and one female paratype reported by Sweet (1986) from Duval Co.

FROESCHNERIA Harrington 1980

Froeschneria Harrington 1980:101.

Type Species: *Ligyrocoris multispinus* Stal 1874. By original designation.

The members of this genus were, until recently (Harrington 1980), included in the genus *Ligyrocoris* with which genus they share the completely pruinose pronotum and lunate stridulatory area laterally in the anterior portion of the abdomen. The transverse pronotal impression is deeply incised; the fourth antennal segments have a broad pale basal annulus and the fore femoral spines are double ranked. Species of *Froeschneria* tend to be larger, more robust insects than are *Ligyrocoris* species. The Florida species superficially resemble species of *Perigenes*.

Four species are recognized, two of which occur in Florida.

KEY TO FLORIDA SPECIES OF
FROESCHNERIA

1. Fore femora with spines present only on inner margin; dorsal (lateral) 2/3 of metapleuron distinctly swollen; posterior margin of metapleuron nearly straight. *piligera*, p. 140
- 1'. Fore femora with a few small spines below on outer margin distally as well as an inner series of spines; dorsal (lateral) 2/3 of metapleuron nearly flat, not distinctly swollen; posterior margin of metapleuron concave *multispinus*, p. 138

FROESCHNERIA MULTISPINUS (Stal)
(fig. 77, map LXXX)

Ligyrocoris multispinus Stal 1874:145.
Ligyrocoris confraternus Barber 1914:512.
Froeschneria multispinus Harrington 1980:101.

Diagnosis: Relatively slender, head, anterior pronotal lobe, scutellum and venter dark brown to reddish brown. Head attenuated, fore femora strongly spotted with brown.

Biology: Nothing is known of its biology other than a collecting note by Blatchley (1926).

Distribution: A Neotropical species of wide distribution, but known in this country only from Florida.

Florida Distribution: Reported by Van Duzee (1909) from Sanford; by Barber (1914) from Everglade and Ft. Meyers; by Blatchley (1926) from Dunedin and by Torre-Bueno (1931) from Royal Palm Pk. BROWARD CO.: Andytown, 19-VI-62, H. V. Weems Jr., (JAS); DADE CO.: Agricultural Research & Education Center, Homestead, 21-X-76, (blacklight trap), R. M. Baranowski, (RMB); same, 12-IV-69, (RMB); Biscayne, 9-5-1887. Grossman Hammock State Park, 15-VII-72, (blacklight trap), R. M. Baranowski, (RMB); same, 24-V-72, (RMB); Homestead, 26-II-41, O. W. Calkins, (RMB); same, 24-XI-74, J. A. Slater, (JAS); same, 20-XI-74; same; 15-XII-74; same, 5-VIII-1968, (blacklight trap), R. M. Baranowski, (JAS); same,

5-X-68; same, 9-IV-59, (JAS); same, 11-VIII-68, (RMB); same, 16-VIII-68, (RMB); same, 26-VIII-69, same, 8-XII-74, J. A. Slater, (JAS); (RMB); same, 9-X-69, (RMB); same, 10-X-69, (RMB); Naranja, 21-IX-62, R. M. Baranowski, (RMB); Paradise Key, 2-III-19, Swartz and Barber, (NMNH); Royal Palm Park, 20-VII-48, E. A. Todd, (NMNH); Subtropical Experiment Station, Waldin Dr., 10-X-69, (blacklight trap), R. M. Baranowski, (RMB); same, 24-III-70, (RMB); HIGHLANDS CO.: Lake Placid, 8 mi S. of Archbold Biological Station, 2-IX-82, M. Deyrup, (RMB); Lake Placid, 13-VII-48, R. H. Beamer, (NMNH); Nr. Avon Park, 7-XI-61, T. Morris, (AMNH); MONROE CO.: Everglades National Park, 5-IV-58, R. E. Woodruff, (RMB); same, Flamingo Prairie, 23-III-70, (blacklight trap), R. M. Baranowski, (RMB); same, 4-V-70, (RMB); same, 8-IV-72, (RMB); same, 28-III-70, (RMB); PALM BEACH CO.: Pahokee, 20-I-41, Jna. Haynie, (JAS). 4 mi. S.E. Canal Pt., 16-VII-73, (UV Trap), C. W. O'Brien, (JAS); ST. LUCIE CO.: White City, 3-VII-87, K. L. Hibbard, (RMB). UNKNOWN COUNTY: Everglades National Park, 20-VII-73, C. W. O'Brien, (JAS).



Map LXXX. Distribution of *F. multispinus*

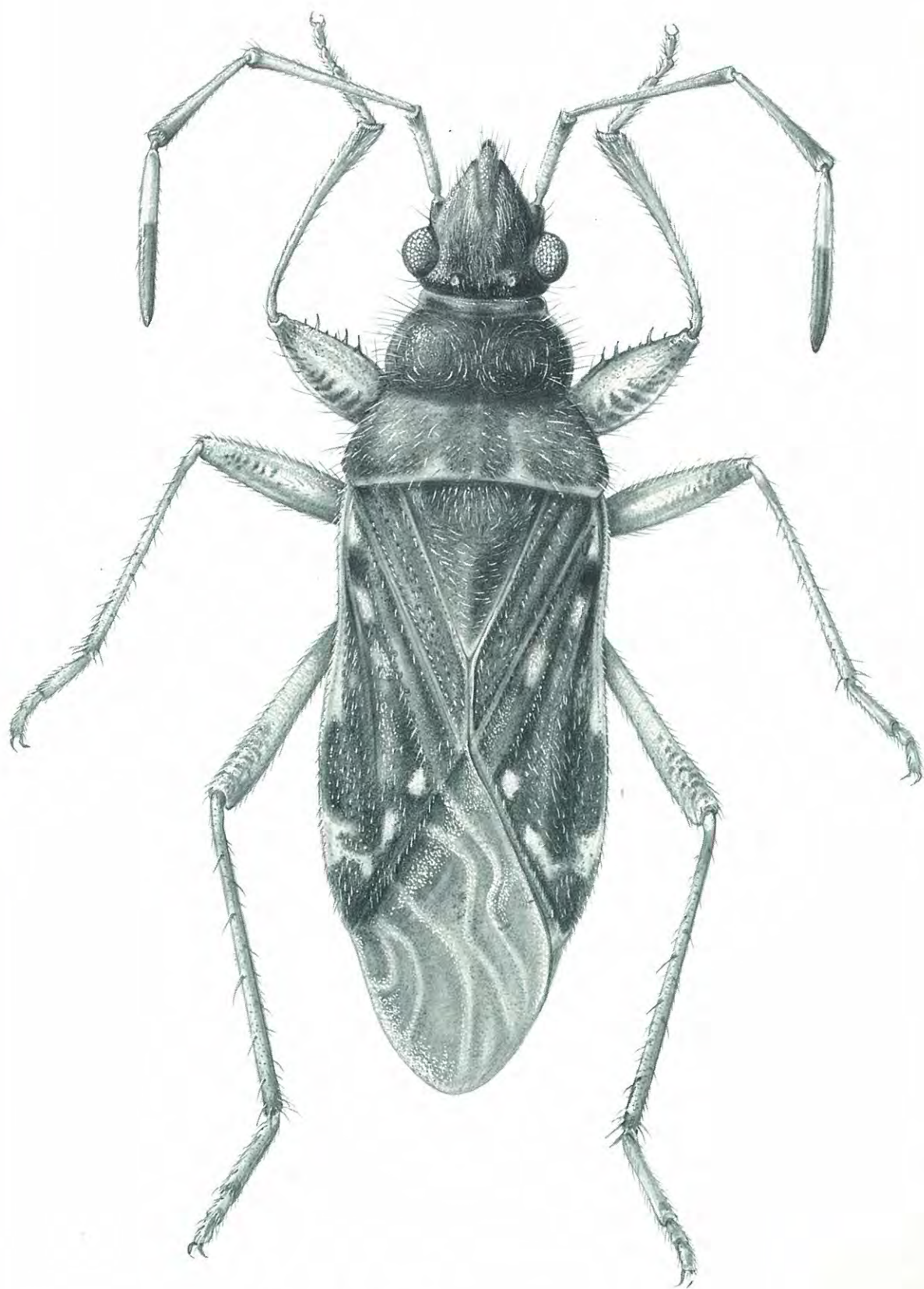


Fig. 77. *Froeschneria multispinus*

FROESCHNERIA PILIGERA (Stal) (map LXXXI)

Lygaeus (Beosus) abdominalis Guerin-Meneville
1857:397-398 (preocc.).
Plociomera piligera Stal 1862:312-313.
Froeschneria piligera Harrington 1980:101.

Diagnosis: Large (7-8), robust hirsute. Head, anterior pronotal lobe, scutellum and ventral surfaces dull black. Hemelytra dark brown to blackish with pale lateral margins and usually a pale yellow spot near inner apical area of the corium.

This species bears considerable superficial resemblance to *Perigenes constrictus* (Say).



Map LXXXI. Distribution of *Froeschneria piligera*

Biology: Nothing appears to be known other than a few collecting notes of Blatchley (1926). It has been taken on *Helianthus debilis* Nutt.

Distribution: A widely distributed Neotropical species. The distribution in the United States is in the extreme southern states from Florida to Texas, but records in the past have been confused with those of *Perigenes constrictus* and some of the southern records of the latter undoubtedly belong here.

Florida Distribution: Reported by Van Duzee (1909) from Ft. Myers and Lake Worth; by Barber (1914) from Biscayne Bay and by Blatchley (1926) from Dunedin. BROWARD CO.: Ft. Lauderdale, 24-IV-28, D. N. Bates, (NMNH); DADE CO.: Homestead, 7-X-68, (blacklight trap), R. M. Baranowski, (RMB); same, 5-VIII-68, (RMB); same, 1-X-69, (RMB); Subtropical Experiment Station, Waldin Dr, 3-X-69, (blacklight trap), R. M. Baranowski, (RMB); South Miami 12-II-44, (NMNH); INDIAN RIVER CO.: Vero Beach (S. Bch.), 8-X-78, (under drift wood), G. B. Marshall, (JAS); same, 7-X-78; Wabasso, 4-XII-1986, K.L. Hubbard (on *Helianthus debilis*) (FSCA). PALM BEACH CO.: Lake Worth, A. T. Slosson, (AMNH); PINELLAS CO.: Dunedin, 22-IV-27, W. S. Blatchley, (NMNH); VOLUSIA CO.: Edgewater, 28-II-39, C. A. Frost, (NMNH).

PSEUDOPAMERA Distant 1882

Pseudopamera Distant 1882:209.
Ligyrocoris sg. *Neoligyrocoris* Barber
1921b:104:106.

Type Species: *Pseudopamera aurivilliana* Distant 1882. Monobasic.

The genus is characterized by the shining polished pronotal surface; crescent shaped abdominal stridulitrum with plectrum of hind femur consisting of a "fairly extensive" field of small spines (Harrington 1980); by the moderately to very elongate, parallel sided body; by the fore tibia of the males having a spine present distally along the shaft and by the double ranked fore femoral spines.

Eight species are recognized from the southwestern United States and south into northern South America.

PSEUDOPAMERA AURIVILLIANA

Distant 1882

(fig. 78)

Pseudopamera aurivilliana Distant 1882:209.

Ligyrocoris pseudoheraeus Barber 1906:275-276.

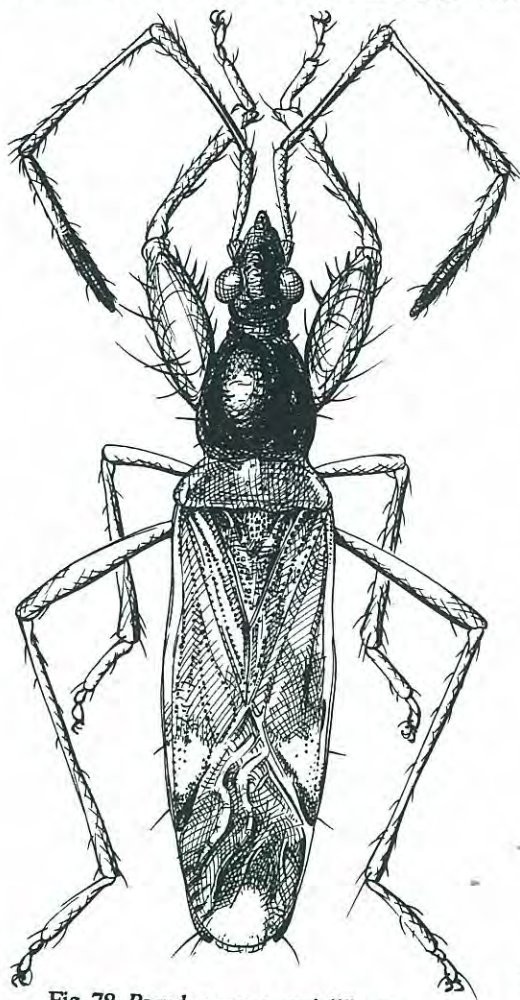


Fig. 78. *Pseudopamera aurivilliana*

Diagnosis: Very elongate, slender; head and pronotum light red-brown to almost castaneous, very highly polished; corium with narrow white lateral margins and a large subtriangular white macula near corial apex; apex of membrane with a large white macula; proximal half of antennal segment four with a broad pale annulus; dorsal surface clothed with numerous elongate upstanding hairs.

Biology: Anonymous (1977) quotes M. A. Sweet (pers. comm.) as stating that in Texas *aurivilliana*

feeds on the seeds of cacti that have dropped to the ground below the plants.

Its inclusion here is based upon an introduction in a nursery at Bradenton, in 1977, where collections of adults and nymphs were taken under species of *Mammillaria* cacti that had been shipped from Mission, Texas after crossing the border from Mexico.

The species has apparently not become established but is included here because of the probability of future introductions and given the cacti native to Florida, the strong possibility of the insect being able to successfully establish itself (see Anonymous 1977).

MYODOCHA Latreille 1807

Myodocha Latreille 1807: 126.

Type Species: *Myodocha serripes* Olivier 1811. By Opinion 669 International Commission on Zoological Nomenclature.

The members of this genus are very distinctive insects, readily recognizable by the basal portion of the head being drawn out into an elongate slender "neck", the head thus being longer than the pronotum. The body is narrow and elongate.

The genus is composed of 7 species and is primarily Neotropical with 2 species occurring north of Mexico, one confined to Florida and the other widely distributed.

KEY TO FLORIDA SPECIES OF *MYODOCHA*

1. Fourth antennal segment with proximal 1/2 to 1/3 white or pale yellow, strongly contrasting with dark coloration of remainder of segment *annulicornis*, p. 142
- 1'. Fourth antennal segment uniformly dark colored *serripes*, p. 143

MYODOCHA ANNULICORNIS
Blatchley
(map LXXXII)

Myodocha annulicornis Blatchley 1926:388-389.

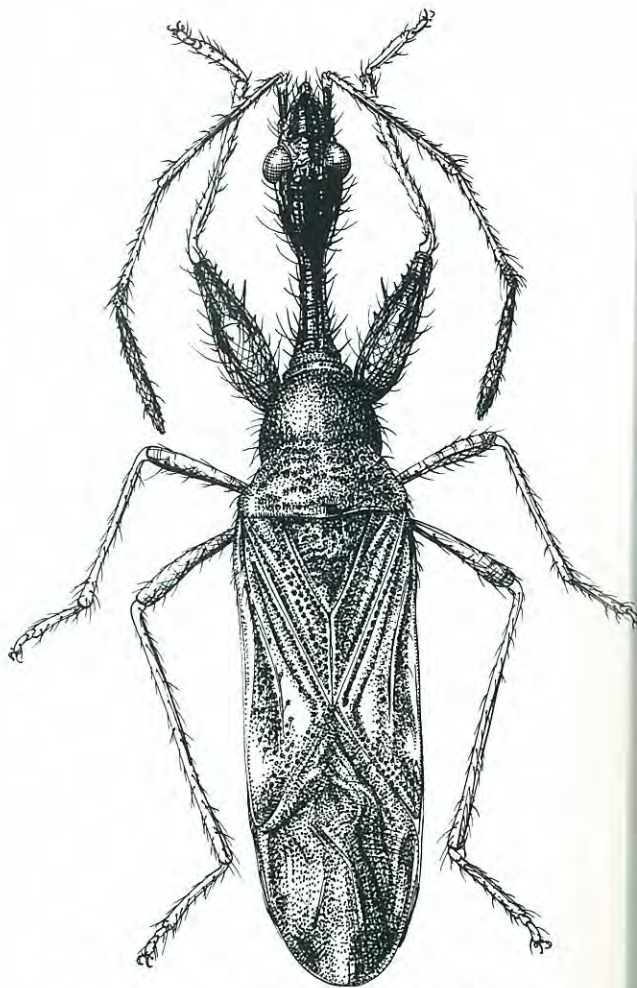


Fig 79. *Myodocha serripes*

Map LXXXII. Distribution of *M. annulicornis*

Diagnosis: Fourth antennal segment with pale white proximal annulus.

The hemelytra are darker than those of *serripes* and the lateral margins are less conspicuously pale. It is very similar in size and habitus to *serripes*.

Biology: Little is known. Sweet (1964) reports nymphs from a rank forb habitat at the margin of an avocado grove in southern Florida and stated that the habitat preferences will be found to be similar to those of *serripes*. Blatchley (1926) found adults hibernating beneath cabbage palmetto and plant debris near Dunedin.

Distribution: Known only from Florida.

Florida Distribution: Described by Blatchley (1926) from Orange City Junction, Royal Palm Park, Dunedin and Paradise Key; by Sweet (1964) from Naranja. Blatchley believed the *serripes* record of Uhler (1877) from "Florida" and that of Van Duzee (1909) from St. Petersburg should be referred here. ALACHUA CO.: Gainesville, 18 V-60, (at light), H. V. Weems Jr., (JAS); BAKER CO.: Olustee, 2-4-VII-66, (blacklight trap), E. F. Merkel, (RMB); same, II-VII-66, (RMB); DADY CO.: Homestead, 11-IV-69, (blacklight trap), F. M. Baranowski, (RMB); same, 24-III-69, (RMB); Subtropical Experiment Station, Waldin Drive, II-70, R. M. Baranowski, (RMB); same, 27-III-70, (RMB); INDIAN RIVER CO.: Vero Beach, 30-VII-73, P. Araoz; MADISON CO.: near Lamora, 4-VIII-25, T. H. Hubbell, (NMNH); MANATEE CO.: Bradenton, 10-VI-36 at light, (FSCA); same

20-VI, (FSCA); MARION CO.: Lake Eaton, 8-IV-75, (blacklight trap), Peter Drummond, (RMB); Sharpes Ferry Field Station, 15-V-75, (blacklight trap), P. C. Drummond, (RMB); same, 3-X-75, (blacklight trap), J. Wiley, (RMB); MONROE CO.: Everglades National Park, 5-IV-58, (at light), H. V. Weems, Jr., (RMB); Everglades National Park, Flamingo Prairie, 26-IX-69, R. M. Baranowski, (RMB); same, 25-III-70, (RMB); POLK CO.: Lakeland, 5-V-48, (at light), R. F. Hussey, (FSCA); same, 14-V-48, (FSCA); PUTNAM CO.: 2 mi NW of Orange Springs, 1-3-VIII-75, (blacklight trap), D. Bowman, (RMB); VOLUSIA CO.: Edgewater, 6-III-39, C. A. Frost, (NMNH); WAKULLA CO.: 1 mi. N. Spring Cr., 7-VII-73, (UV Trap), G. B. Marshall & R. D. Kaplan, (JAS).

MYODOCHA SERRIPES (Olivier)
(fig. 79, map LXXXIII)

Myodochus serripes Olivier 1811:105-106.
Myodocha opetolata Say 1831:337 (Leconte Ed.).
Myodocha serripes Laporte 1832:33.
Chiroleptes raptor Kirby 1837:281.

Diagnosis: Similar in appearance to *annulicornis* and distinguishable chiefly by the characters mentioned in the discussion of the latter species.

Biology: Sweet (1964) studied the biology of this species in Connecticut and summarized the previous literature. *M. serripes* overwinters in the adult stage in woodlands and migrates to field habitats in the spring. Breeding areas are usually "new" habitats such as fallow fields, gardens or embankments with a rank growth of forbs. *Hypericum* and *Fragaria* seeds appear to be favored, although many other plant seeds are also utilized. There are several reports of injury to strawberries. Wheeler (1981) reports it under mats of *Euphoria maculata* L. Payne, Mead and King (1968) note feeding on pig carrion. The species is always macropterous and frequently comes to lights. In Connecticut there are 2 generations a year. Early records of this species as being predaceous are erroneous.

Distribution: From southern Canada and Minnesota south to Texas and Florida and west to Colorado.

Florida Distribution: Not reported in the literature. ALACHUA CO.: Alachua, 3-V-76, (blacklight trap), W. B. Poke, (FSCA); Gainesville, Doyle Connor Building, 2-X-73, (blacklight trap), F. W. Mead, (RMB); same, 31-VIII-2-IX-73, (RMB); same, 25-IX-78, (RMB); same, 2-4-V-75, (RMB); same, 3-4-VII-74, (RMB); BAKER CO.: Olustee, 2-4-VII-66, (blacklight trap), E. P. Merkel, (RMB); ESCAMBIA CO.: Pensacola, 7-VIII-84, D. F. Reese, (FSCA); Pensacola, 28-V-63, (on dog fennel), M. W. Peacock, (RMB); GADSDEN CO.: Chattahoochee, 3-VI-55, R. F. Hussey, (FSCA); LEON CO.: Tallahassee, 13-II-78, C. W. O'Brien & Marshall, (JAS).



Map LXXXIII. Distribution of *M. serripes*

NEOPAMERA Harrington 1980

Neopamera Harrington:1980:107-108.

Type Species: *Pamera bilobata* Say 1831. By original designation.

This genus contains the majority of Western Hemisphere species formerly contained in the polyphyletic assemblage known as *Pachybrachius* (earlier as *Pamera*). As Harrington (1980) points out it is still a rather heterogeneous assemblage and may prove not to be holophyletic.

It is characterized by pruinose, non-shining dorsal body surface, lack of a spine along the fore tibia of the males, lack of a distinct "neck" region behind the eyes, emergent mesepimeron, flattened head vertex, claval punctures forming 4 or more rows, a "V" shaped buccular juncture and doubly ranked fore femoral spines.

Twenty species are currently recognized, the majority being Neotropical. It is confined in distribution to the Western Hemisphere.

KEY TO FLORIDA SPECIES OF NEOPAMERA

1. Basal 1/2 to 1/3 of 4th antennal segment white or light yellow, strongly contrasting with dark terminal portion of segment . . . 2
- 1'. Fourth antennal segment uniformly dark *bilobata*, p. 148
2. Relatively large (8-10), clavus brown with only extreme apical area light.
- 2'. Smaller (under 6), clavus ground color sordid white with only punctures brown. *neotropicalis*, p. 153
- 2'. Smaller (under 6), clavus ground color sordid white with only punctures brown. *albocincta*, p. 144

NEOPAMERA ALBOCINCTA (Barber) (figs. 80, 81, map LXXXIV)

Pachybrachius albocinctus Barber 1953b:216-218.
Neopamera albocincta Harrington 1980:107.

Diagnosis: Elongate (5-5.5), pale reddish to reddish brown, post median corial fascia generally broken up into series of spots. Fourth antennal segment with proximal white annulus. Elongate head relatively more attenuated than *bilobata*. Only macropters are known.

Biology: Sweet (1964) studied the biology in Connecticut. Unlike most ground living lygaeids, this species is adapted to wet conditions where it has been taken abundantly along a pond margin with *Ligyrocoris caricis* on *Carex* and *Scirpus* on the seeds of which it feeds. There are 2 generations a year in Connecticut with adults overwintering. It is a much more common insect in Florida than further north and occurs in similar wet habitats.

Distribution: Widespread in the Neotropics (probably a species complex), it extends northward to Illinois, Michigan, New York and Connecticut.



Map LXXXIV. Distribution of *N. albocincta*

Florida Distribution: Reported as *Pamera bilobata* var. *scutellatus* by Van Duzee (1909) from

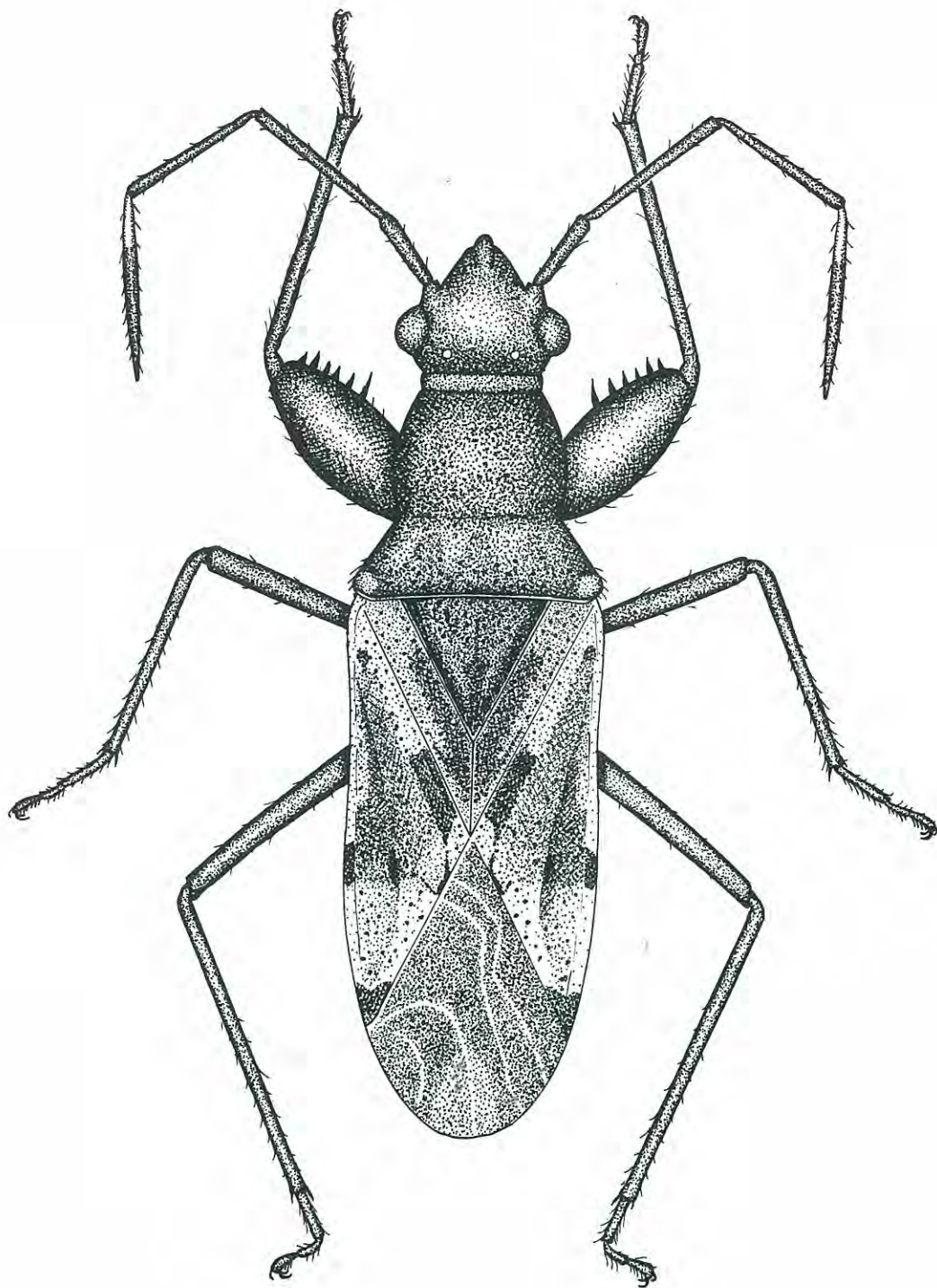


Fig. 80. *Neopamera albocincta*

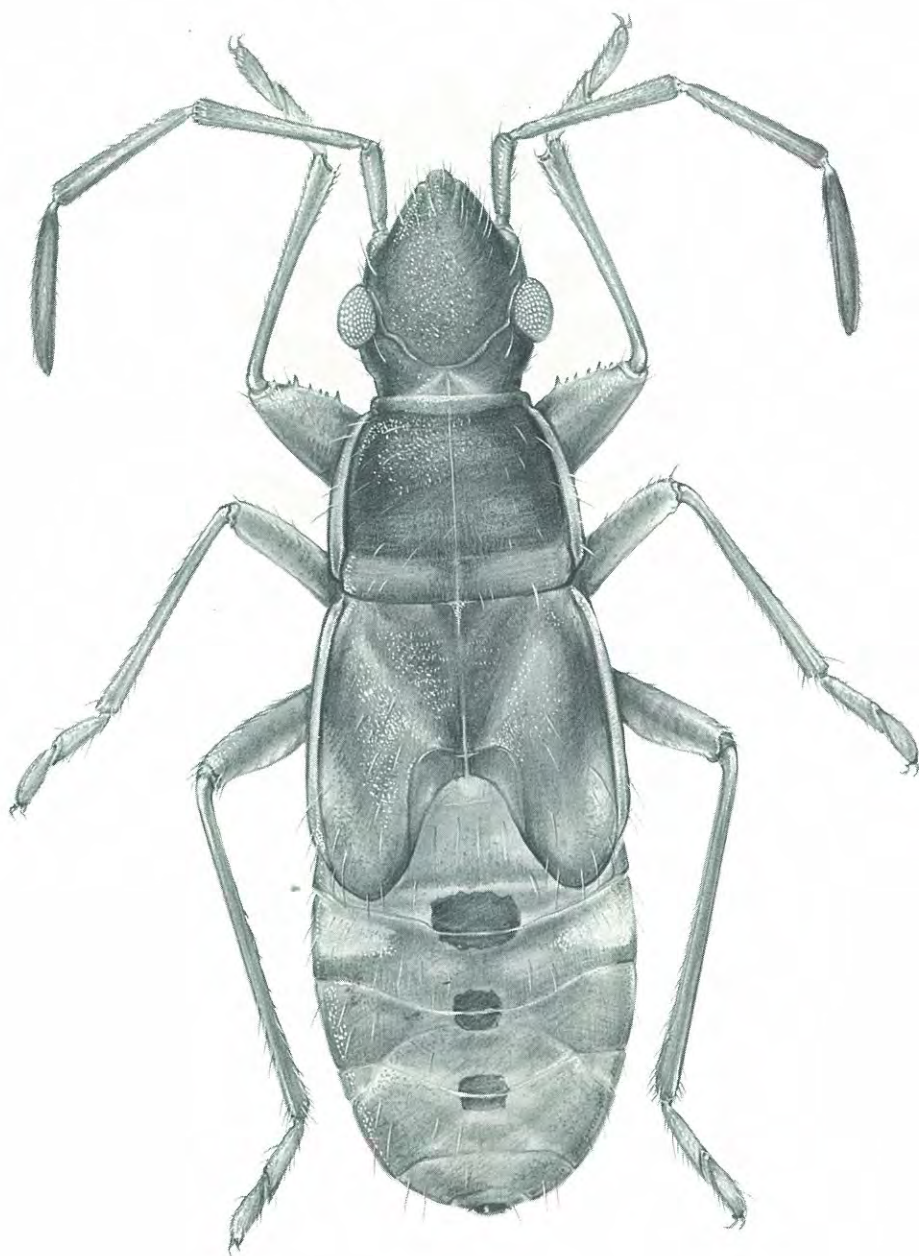


Fig. 81. *Neopamera albocincta*, fifth instar

Crescent City; by Blatchley (1926) from Dunedin, Moore Haven, Royal Palm Park and Lake Okeechobee and by Torre-Bueno (1931) as *Orthea servillei*, from Royal Palm Park. Barber's (1953) records included material from Ft. Lauderdale, Clearwater, Everglade, Belle Glade, Canal Point, Gainesville, Leon Co., Paradise Key, Lake Myakka, Marion Co. and Putnam Co. Slater's (1964) citation of Van Duzee's record is also referable here. ALACHUA CO.: Bivens Arm Lake, 3 mi SW Gainesville, 13-X-72, D. H. Habeck, (FSCA); Gainesville, 12-V-55, R. A. Morse, (AMNH); same, 6-VI-55, (FSCA), same, 6-VIII-55, R. F. Hussey, (FSCA); same, 15-V-55, (at light), (FSCA); same, Doyle Connor Building, 1-V-78, (blacklight trap), F. W. Mead, (RMB); BAKER CO.: Olustee, 2-4-VII-66, (blacklight trap), E. P. Merkel, (RMB); same, 9-10-VII-66, (RMB); BREVARD CO.: Patrick Air Force Base, 25-III-71, H. C. Levan and R. J. Griffin, (FSCA); BROWARD CO.: Ft. Lauderdale, 26-VI-71, J. A. Reinert, (FSCA); Hwy. 27 Saw Grass Rec. Area 23 mi. N.W. Fort Lauderdale, 21-V-76, (JAS); Deerfield, 26-VII-48, B. T. McDermott, (NMNH); COLLIER CO.: Ochopee, 26-V-76 (UV Trap), C. W. O'Brien & Marshall, (JAS); Seminole State Park, 13-XI-72, C. W. & L. B. O'Brien, (JAS); Everglade, 12-V, William T. Davis, (NMNH); DADE CO.: 25-VI-64, K. J. Stone, (RMB); 26000 SW 197 Ave, 23-V-77, (blacklight trap), R. M. Baranowski, (RMB); same, 6-V-77, (RMB); same, 8-V-77, (RMB); same, 9-V-77, (RMB); Agricultural Research & Education Center, Homestead, 12-IV-69, (blacklight trap), R. M. Baranowski, (RMB); same, 21-IX-69, (RMB); same, 11-IV-69, (RMB); same, 8-III-70, (RMB); Castello Hammock, 17-IV-78, (blacklight trap), R. M. Baranowski, (RMB); same, 7-IV-78, (RMB); Coral Gables, 29-VIII-46, G. N. Kay, (FSCA); Cutler Ridge, 21-III-62, (at light), R. T. McMillan, Jr., (RMB); Everglades National Park, 19-VII-73, (UV Trap), C. W. O'Brien, (JAS); Goulds, 16-I-41, (at light), L. S. Light, Jr., (FSCA); Grossman Hammock State Park, 24-V-72, (blacklight trap), R. M. Baranowski, (RMB); Homestead, 23-VIII-68, R. M. Baranowski, (JAS); same, 11-VI-69, (JAS); same, 11-IV-69, (JAS); same, 20-XI-74, J. A. Slater (JAS); same, 16-XII-74, same, 16-VIII-68, R. M. Baranowski, (JAS); same, 29-XI-56, (JAS); same, 18-XI-68, (JAS); same, 18-XI-68, (JAS); same, 15-X-68, (JAS); same, 13-II-42, O. W. Calkins, (FSCA); same, 28-IV-59, D. O.

Wolfenbarger, (RMB); same, 11-IV-69, (blacklight trap), R. M. Baranowski, (RMB); same, 18-XI-68, (RMB); same, 19-VI-69, (RMB); same 1-X-69, (RMB); same, 16-VIII-68, (RMB); same, 12-IX-69, (RMB); same, 14-X-69, (RMB); same, 2-X-69, (RMB); same, 4-X-69, (RMB); same, 13-X-69, (RMB); same, 18-V-69, (RMB); same, 4-III-70, (RMB); same, 27-III-70, (RMB); same, 2-VI-69, (RMB); same, 24-X-69, (RMB); same, 7-X-69, (RMB); Naranja, 21-VI-59, R. M. Baranowski, (RMB); same, 25-VII-60, (JAS); same, 9-IV-62, (RMB); Paradise Key, 22-II-19, H. S. Barber, (NMNH); same, 3-III-19, (NMNH); same, 22-III-54, K. V. Krombein, (NMNH); Ross & Castello Hammock, 18-III-70, (blacklight trap), R. M. Baranowski, (RMB); same, 18-V-70, (RMB); same, 23-III-70, (RMB); Royal Palm Park, 25-VII-48, E. L. Todd, (NMNH); DE SOTO CO.: Arcadia, 1-VI-55, H. A. Denmark, (FSCA); GADSDEN CO.: Chattahoochee, 4-VI-55, R. F. Hussey, (FSCA); HENDRY CO.: Clewiston, 8-2-27, M. D. Leonard, (NMNH); HIGHLANDS CO.: Archbold Bio. Sta., 11-VII-66, L. Penner, (JAS); same, 7-8-VI-69, (at light), J. Harrington, T. Schuh, J. Slater, (JAS); Lake Placid, Archbold Biological Station, 10-III-83, (UV light), M. Deyrup, (RMB); Nr. Avon Park, 7-XI-61, T. Morris, (AMNH); same, 22-VIII-61, (AMNH); JACKSON CO.: 1-VIII-56, F. M. Mead, (FSCA); Fla. Caverns State Park, 6-X-60, F. W. Mead, (RMB); JEFFERSON CO.: 2 mi. n. Wacissa, 3-VII-73, (UV trap), Marshall & Kaplan, (JAS); Monticello, Big Bend Horticulture Lab, 19-IX-68, (blacklight trap), W. H. Whitcomb, (RMB); LEE CO.: 19 mi. S. Ft. Myers, 28-III-73, C. W. & L. B. O'Brien, (JAS); Ft. Meyers, 28-V-88, K. E. Jenkins, (FSCA); LEON CO.: 19-III-05, T. D. O'Connor, (NMNH); Tall Timbers Research Station, 13-VIII-68, (blacklight trap), Donny L. Harris, (RMB); same, 8-15-X-69, (RMB); Tallahassee, 6-III-78, (Berlsee mixed hardwood litter), E. D. Heally, (JAS); MANATEE CO.: Lake Myaka, 6-4-39, J. R. Watson, (NMNH); MARION Co., 14 mi SW of Ocala, Ross Prairie, 12-VI-75, (blacklight trap), P. C. Drummond, (RMB); 9 mi SSW of Ocala, 1-VII-75, (blacklight trap), P. C. Drummond, (RMB); Lake Eaton, 22-IV-75, (blacklight trap), Peter Drummond, (RMB); same, 8-IV-75, (RMB); north end of Heather Island, 10-IX-75, (blacklight trap), J. Wiley, (RMB); same, 3-X-75, (RMB); Sharpes Ferry Field Station, 15-V-75, (blacklight trap), P. C. Drummond, (RMB);

same, 2-X-75, J. Wiley, (RMB); same, 30-X-75, (RMB); Silver Springs, 4-VI-69, J. Slater, T. Schuh, J. Harrington, (at light), (JAS); MARTIN CO.: 5-11-54, H. V. Weems, Jr., Hobe Sound, 21-V-87, G. Johnson, (FSCA); MONROE CO.: Everglades Nat. Park, Snake Bight Trail, 10-VI-69, R. M. Baranowski, J. Slater, T. Schuh, J. Harrington, (JAS); same, Flamingo Prairie, 28-III-70, R. M. Baranowski, (RMB); same, 4-V-70, ((RMB); Key West, 2-V-69, (blacklight trap), F. A. Buchanan, (RMB); same, 27-V-69, (RMB); Stock Island, 13-17-VII-84, (blacklight trap), J. Bunch, (RMB); same, 8-9-VII-85, (RMB); same, 31-VII-85, (RMB); same, 9-13-VII-84, (RMB); ORANGE CO.: Winter Park, 21-VI-40, (at light), col. H. T. Fernald, (RMB); same, 20-X-40, (RMB); same, 27-IV-44, (FSCA); same, 28-V-40, (FSCA); PALM BEACH CO.: Belle Glade, 4-VI-27, Leonard, (NMNH); Pahokee, 20-I-41, J. Haynie, (FSCA); PASCO CO.: Lacoochee, 7-VII-48, B. T. McDermott, (NMNH); POLK CO.: Bartow, 22-IV-52, R. F. Hussey, (FSCA); Lakeland, 10-III-48, (at light), R. F. Hussey, (FSCA); same, 2-V-48, (FSCA); PUTNAM CO.: 1.7 mi No. East Satsuma, 30-VII-38, Hubbell and Friauf, (NMNH); SARASOTA CO.: Sarasota, 4-II-87, G. Johnson, (FSCA); SEMINOLE CO.: Sanford, 4-11-29; Gilchrist Co., 6-VII-54, F. W. Mead, (FSCA); ST. LUCIE CO.: White City, 25-VII-83, K. L. Hibbard, (FSCA); VOLUSIA CO.: 23-VII-54, H. A. Denmark, (FSCA); WAKULLA CO.: 1 mi N. Spring Cr., 7-VII-73, (UV Trap), G. B. Marshall & R. D. Caplan, (JAS); 1 mi. N. Spring Cr., 19-VI-73, C. W. O'Brien, (JAS); Shell Point Beach 3-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); Wakulla Springs, 3-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); WASHINGTON CO.: 5 mi E of Chipley, 31-VIII-60, (blacklight trap), W. C. Rhodes, (RMB).
UNKNOWN COUNTY: Lake Okeechobee, 3-7-13, W. S. Blatchley, (NMNH).

NEOPAMERA BILOBATA (Say)
(figs. 82, 83, map LXXXV)

Pamera bilobata Say 1831:334-345 (Leconte Ed.).
Plociomeris maculatus Amyot & Serville 1843:255-256.

Lygaeus (Plociomeris) servillei Guérin-Meneville 1857:399.

Rhyparochromus (Plociomeris) ochroceras Stål 1858:39.

Pamera dallasi Distant 1882: 208.

Neopamera bilobata Harrington 1980:107.



Map LXXXV. Distribution of *Neopamera bilobata*

Diagnosis: Resembles *albocincta* closely in form and color, but tends to run somewhat darker (although the color is variable), and is slightly larger and more robust and lacks a pale proximal area on the 4th antennal segment. It is always macropterous.

Biology: Prefers drier habitats than *albocincta* and is essentially a species of temporary disturbed habitats such as old fields, weedy lawns and roadsides. It frequently climbs up on vegetation to feed. It has been reported as destructive to strawberries in Florida by many authors including McAtee (1927), Brooks *et al* (1929), Watts (1931), Wilson (1938), Watson and Tissot (1944), Wolcott (1936) and Brooks and Kelsheimer (1950).

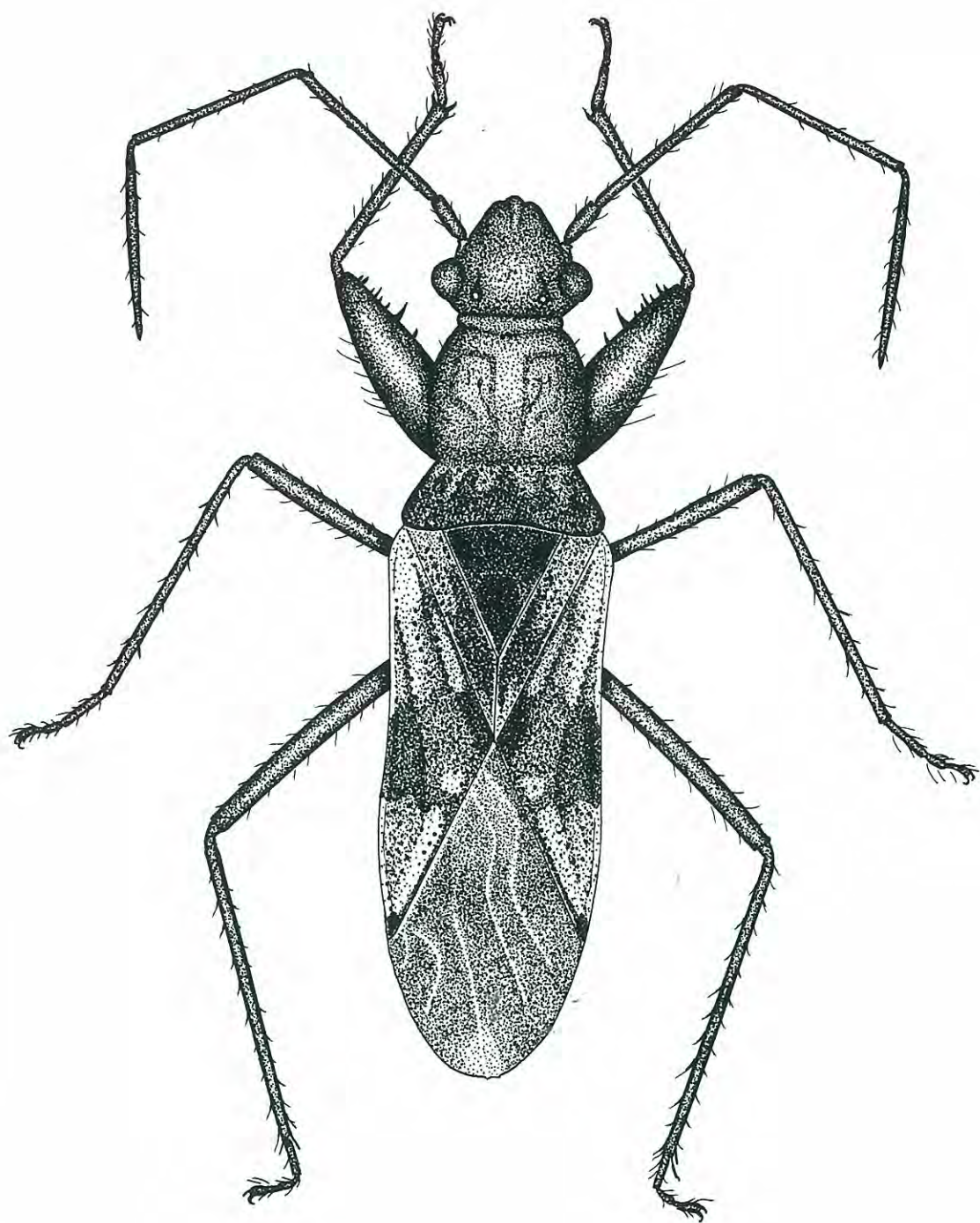


Fig. 82. *Neopamera bilobata*

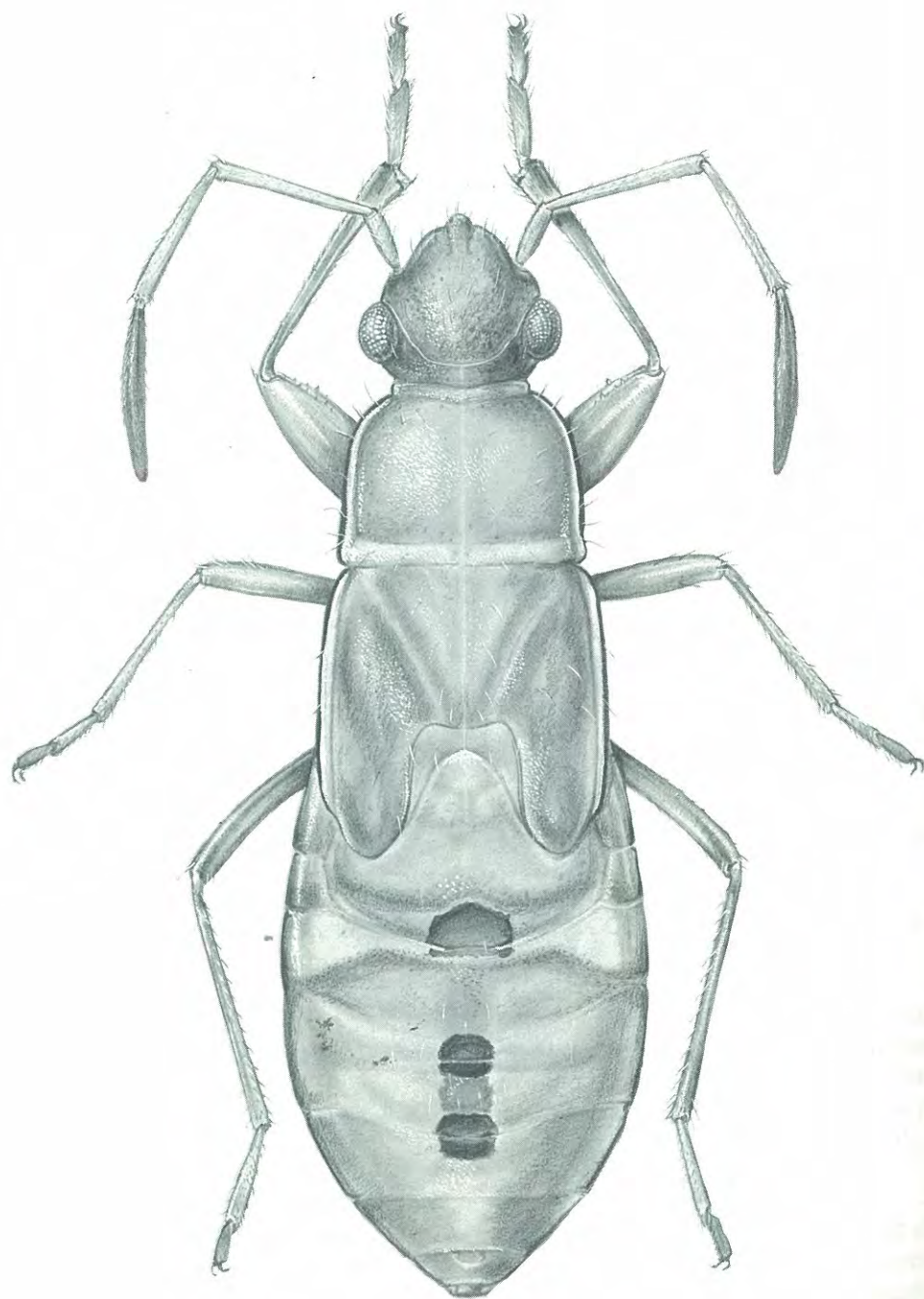


Fig. 83. *Neopamera bilobata*, fifth instar

1961). Altieri and Whitcomb (1979, 1980) report it feeding on *Chenopodium ambrosoides* L., *Croton*, *Richardia*, and *Solidago*. Wheeler (1981) noted it among mats of *Euphorbia maculata* L., where large numbers of adults and nymphs were feeding on the seeds. Crocker and Whitcomb (1980) report it as prey of *Geocoris uliginosus*.

Distribution: An extremely common and widespread species in the Neotropics, but in the United States has a southern distribution extending north to Missouri, Pennsylvania, New Jersey and rarely Connecticut.

Florida Distribution: Reported by Altieri and Whitcomb (1979, 1980) at Tall Timbers Research Station, Tallahassee, by Quaintance (1897) as *Pamera vincta* from Lake City (this record moved here by McAtee (1927)); by Barber (1914) from Charlotte Harbor, Jacksonville, Biscayne Bay, Atlantic Beach, Lakeland, Titusville, Punta Gorda, Ft. Myers, Everglade, Okeechobee, La Grange, Tampa, Miami and Leon Co.; by Blatchley (1926) at almost all collecting stations but without specific localities and by Uhler (1878) without definite station. ALACHUA CO.: 29-XI-51, (FSCA); 15-X-51, (FSCA); 16-III-55, R. A. Morse, (FSCA); 16-XI-53, H. V. Weems, Jr., (FSCA); 20-XI-55, F. W. Mead, (FSCA); 29-X-37, H. Hixson, (FSCA); 30-X-51, W. C. Sloan, (FSCA); 9 mi NW of Gainesville, University Hort. Unit, 21-VI-78, R. A. Belmont, (RMB); Gainesville, 26-IX-2-X-14, (AMNH); same, 12-I-37, K. Wheeler, (FSCA); same, 13-V-62, F. W. Mead, (RMB); same, 22-XI-46, H. V. Weems, Jr., (FSCA); same, 15-I-47, (FSCA); same, 8-V-18, G. B. Merrill, (FSCA); same, 15-III-39, (FSCA); same, 19-III-38, D. M. DeLong, (NMNH); same, 27-X-58, A. N. Tissot, (NMNH); same, 27-X-38, (FSCA); same, 28-X-37, A. N. Tissot collection, (FSCA); same, 23-VI-59, (blacklight trap), R. E. Woodruff, (AMNH); same, 31-VI-18, C. J. Drake, (NMNH); same, 6-VI-55, R. A. Morse, (AMNH); same, 9-V-67, (at *Triticum aestivum*), F. W. Mead, (RMB); same, VII-37, W. A. Murrill, (NMNH); same, Doyle Connor Building, 14-VI-77, (blacklight trap), F. W. Mead, (RMB); same, 9-11-VI-78, (RMB); Rt. 236, 2.3 mi W of Santa Fe, 19-X-60, F. W. Mead, (RMB); BAKER CO.: Olustee, 12-VII-66, (blacklight trap), E. P. Merkel, (RMB); same, 2-4-VII-66, (RMB); same, 9-10-VII-66, (RMB); same, II-VII-66, (RMB); BAY CO.: St. Andrews

State Park, 19-VIII-60, H. V. Weems, Jr., (RMB); BREVARD CO.: 5 mi N. Eau Gallie, 13-VI-69, J. A. Slater, J. Harrington, (JAS); BROWARD CO.: Dania, 17-XI-54, (on *Stenotaphrum secundatum*), O. D. Link, (RMB); Ft. Lauderdale, 24-VII-27, G. B. Merrill, (FSCA); same, 25-VI-71, J. A. Reinert, (FSCA); same, 9-XII-55, J. B. Guthrie, (FSCA); CHARLOTTE CO.: Punta Gorda, 11-XI-11, (AMNH); COLLIER CO.: Ochopee, 26-V-76, C. W. O'Brien & Marshall, (JAS); COLUMBIA CO.: 21-XI-53, R. F. Hussey, (FSCA); DADE CO.: 26000 SW 197 Ave, 23-V-77, (blacklight trap), R. M. Baranowski, (RMB); same, 31-V-77, (RMB); same, 6-V-77, (RMB); same, 24-V-77, (RMB); same, 8-V-77, (RMB); same, 9-V-77, ((RMB); Agricultural Research & Education Center, Homestead, 21-IX-69, (blacklight trap), R. M. Baranowski, (RMB); same, 21-IX-69, (RMB); same, 27-VI-69, (RMB); same, 11-IV-69, (RMB); same, 12-IV-69, (RMB); Berneker's Nsy, 11-14-IX-86, (blacklight trap), H. B. Glenn, (RMB); Biscayne Bay A. T. Slosson, (AMNH); Castello Hammock, 17-IV-72, (blacklight trap), R. M. Baranowski, (RMB); same, 17-IV-78, (RMB); Coconut Grove, III, G. Fairchild, (AMNH); Crestview, 15-16-X-14, (AMNH); Grossman Hammock State Park, 15-VII-72, (blacklight trap), R. M. Baranowski, (RMB); same, 2-V-72, (RMB); same, 16-V-72, (RMB); same, 24-V-72, (RMB); same, 24-V-72, (RMB); Homestead, 11-IV-69, R. M. Baranowski, (RMB); same, 29-X-56, (JAS); same, 5-I-57, (RMB); same, 16-III-57, (RMB); same, 1-XII-56, (RMB); same, 8-X-56, (RMB); same, 29-IX-56, (RMB); same, 26-IX-57, (RMB); same, 22-V-57, (RMB); same, 16-III-67, (RMB); same, 18-X-56, (RMB); same, 13-III-57, (RMB); same, 20-VII-48, R. H. Beamer (NMNH); same, 12-XII-74, J. A. Slater, 5-XII-74, (JAS) same, 20-XI-74, (JAS); same, 8-XII-74, (JAS); same, 26-XI-74, (JAS); same, 24-XI-74, (JAS); same, 15-XII-74, (JAS); same, 16-XII-74, (JAS); same, 8-XII-74, (JAS); same, 10-VIII-68, (blacklight trap), R. M. Baranowski, (RMB); same, 16-VIII-68, (RMB); same, 21-IX-68, (RMB); same, 22-VIII-68, (RMB); same, 7-X-68, (RMB); same, 18-X-68, (RMB); same, 11-VIII-68, (RMB); same, 12-V-69, (RMB); same, 12-X-69, (RMB); same, 18-XI-68, (RMB); same, 2-I-70, (RMB); same, 2-IV-70, (RMB); same, 2-VI-69, (RMB); same, 24-X-69, (RMB); same, 27-V-70, (RMB); same, 18-V-69, (RMB); same, 28-IX-68, (RMB); Kendall, 20-VI-67, R. W. Swanson, (RMB); Miami, 1-11-52,

(FSCA); same, 16-VI-57, (on *Eremochloa ophiuroides*), J. E. Porter, (RMB); same, 18-V-48, (FSCA); V-49, (FSCA); same, 2-VII-54, C. C. Reichart, (JAS); same, 3-VII-32, (at *Fregaria*), L. S. Light, Jr., (RMB); same, A. E. Wight, (AMNH); Naranja, 1-IX-59, R. M. Baranowski, (RMB); same, 25-VII-60, (RMB); same, 9-IV-62, (RMB); Orchid Jungle Hammock, Newton Rd., 5-VI-69, (blacklight trap), R. M. Baranowski, (RMB); same, 12-V-70, (blacklight trap), (RMB); Ross & Castello Hammock, 18-III-70, (blacklight trap), R. M. Baranowski, (RMB); same, 19-V-70, (RMB); Subtropical Experiment Station, Waldin Dr., 24-III-70, (blacklight trap), R. M. Baranowski, (RMB); same, 27-III-70, (RMB); DIXIE CO.: Old Town, 17-VI-54, D. L. Haynes, (JAS); DUVAL CO.: (NMNH); Jacksonville, 3-XI-11, (AMNH); same, 9-VII-67, C. F. Zeiger, (RMB); ESCAMBIA CO.: 20-VII-55, F. W. Mead, (RMB); 21-VII-55, F. W. Mead, (RMB); Pensacola, 11-14-X-14, (AMNH); FRANKLIN CO.: Alligator Pt., 26-IX-75, C. W. O'Brien, (JAS); GADSDEN CO.: 1-VII-56, F. W. Mead, (FSCA); Chattahoochee, 3-VI-53, L. Berner, (FSCA); same, 2-VI-55, (at light) R. F. Hussey, (FSCA); HAMILTON CO.: 21-XI-53, R. F. Hussey, (FSCA); HENDRY CO.: La Belle, 10-11-III-74, (UV in oak grove), J. Reynolds, (JAS); HERNANDO CO.: 13-III-56, R. A. Morse, (FSCA); Weekiwachee, 23-VII-73 C. W. O'Brien & Marshall, (JAS); HIGHLANDS Co., Archbold Bio. Sta., 11-VII-66, L. Penner, (JAS); same, 27-III-67, M. A. Deyrup, (AMNH); same, Archbold Bio. Sta., 7-8-VI-69, (at light), J. Harrington, T. Schuh, J. Slater, (JAS); Avon Park, 26-III-54, F. M. Mead, (FSCA); Lake Placid, Archbold Biological Station, 2-V-83, (UV light trap), M. Deyrup, (RMB); Sanford, 26-IV-08, Van Duzee collection, (AMNH); Sebring 1-16-IX, C. T. Parsons, (AMNH); same, 1-11-IX, C. T. Parsons, (AMNH); same, 10-30-VIII, C. T. Parsons, (AMNH); HILLSBOROUGH CO.: Plant City, 1-III-30, (NMNH); Plant City, 1-III-30, (NMNH); Plant City, 16-XII-39, A. N. Brooks, (FSCA); Tampa, 25-V-44, (NMNH); INDIAN RIVER CO.: Sebastian, III, G. Nelson, (AMNH); Sebastian, XI, G. Nelson, (AMNH); JACKSON SO.: Royal Cavern State Park, 9-VII-54, F. W. Mead, (FSCA); 1-VII-56, F. W. Mead, (FSCA); T6W, R7W section 31/32, 7-VI-53, R. F. Hussey, (FSCA); JEFFERSON CO.: 1 mi NE Wacissa, 7-VIII-73, (blacklight trap), R. D. Simmons, (JAS); 1 mi S. Wacissa, 20-X-73, C. W. O'Brien, (JAS); 1

mi SW Wacissa, 7-X-73, C. W. O'Brien & G. B. Marshall, (JAS); 2 mi N. Wacissa, 3-VII-73, (UV Trap), Marshall & Kaplan, (JAS); Monticello, 4-8-X-14, (AMNH); same, Big Bend Horticultural Lab, 19-IX-68, (blacklight trap), W. H. Whitcomb, (RMB); same, 19-IX-68, (RMB); same, 19-IX-68, (RMB); same, 11-IX-68, (RMB); LEE CO.: 19 mi SE Ft. Myers, 16-III-73, C. W. & L. B. O'Brien, (JAS); Ft. Myers, 3-XI-12, (AMNH); Sanibel Island, 9-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); LEON CO.: 17 mi. N. Tallahassee, Tall Timbers Research Station, 16-24-VI-67, L. Collins, (NMNH); Tall Timbers Research Station, 13-VIII-68, (blacklight trap), Donny L. Harris, (RMB); same, 19-VIII-68, (RMB); same, 8-15-VIII-69, (RMB); Tallahassee, 9-X-73, C. W. O'Brien, (JAS); same, 24-VIII-73, (UV), C. W. O'Brien, (JAS); LIBERTY CO.: Torreya State Park, 20-V-66, H. V. Weems, Jr., (RMB); same, 7-XII-57, F. W. Mead, (FSCA); MANATEE CO.: Bradenton 20-VI-36, (at light), (FSCA); same, 10-VI-36, (FSCA); same, 17-III-63, F. W. Mead, (RMB); same, 2-II-73, S. Poe, (FSCA); De Soto National Memorial, 11-I-64, F. W. Mead, (RMB); Palmetto, 25-V-53, (NMNH); MARION CO.: 18-XI-29, L. B. Blain, (NMNH); 14 mi SW of Ocala, Ross Prairie, 12-VI-75, (blacklight trap), P. C. Drummond, (RMB); 9 mi SSW of Ocala, 1-VIII-75, (blacklight trap), P. C. Drummond, (RMB); same, 28-VI-75, (RMB); same, 2-X-75, (blacklight trap), J. Wiley, (RMB); same, 8-13-X-75, (RMB); same, 27-VIII-75, Drummond & Wiley, (RMB); same, Kingsland Country Estates, 5-XI-75, J. Wiley, (RMB); Ocala Nat. For., 3 mi N. Hwy. 40 at Zay Prairie, 25-I-74, C. W. O'Brien, (at night), (JAS); Sharpes Ferry Field Station, 15-V-75, (blacklight trap), P. C. Drummond, (RMB); same, 2-X-75, J. Wiley, (RMB); same, 3-IV-75, N. Holler, (RMB); same, 30-IV-75, (RMB); Silver Springs, 4-VI-69, (at light), J. Slater, T. Schuh, J. Harrington, (JAS); Nr. Reddick, C. H. Paige, (AMNH); MARTIN CO.: Stuart, 22-IX-55, N. Hayslip, (FSCA); MONROE CO.: Big Pine Key, Key Deer Refuge, 15-XI-82, (blacklight trap), S. Klett, (RMB); same, 5-XI-82, (RMB); Everglades National Park, 14-VII-70, R. M. Baranowski, (RMB); same, Flamingo Prairie, 10-VI-69, R. M. Baranowski, (RMB); same, 26-IX-69, (RMB); same, 28-II-70, (RMB); same, 5-XII-74, J. A. Slater, (JAS); same, 4-V-70, (blacklight trap), R. M. Baranowski, (RMB); same, 8-IV-72, (RMB); John Pennekam

State Park, 23-VII-76, C. W. O'Brien & Marshall, (JAS); Key Largo, 1-I-69, J. A. Slater, R. M. Baranowski, (JAS); same, 11-VI-69, R. M. Baranowski, J. Slater, T. Schuh, J. Harrington, (JAS); same, 16-II-46, C. O. Esselbaugh, (NMNH); same, 6-VI-60, H. V. Weems, Jr., (RMB); same, 13-IX-68, (blacklight trap), F. A. Buchanan, (RMB); same, 21-IX-62, (RMB); Stock Island, 13-17-VII-84, (blacklight trap), J. Bunch, (RMB); same, 9-13-VII-84, (RMB); same, 12-X-84, (RMB); same, 6-IX-84, (RMB); same, 26-29-VI-84, (RMB); same, 21-V-68, (blacklight trap), F. A. Buchanan, (RMB); same, 26-IX-67, (RMB); same, 9-X-63, (RMB); NASSAU CO.: Amelia, 16-VI-54, R. L. Fischer, (JAS); Hilliard, 5-X-38, Oman, (NMNH); ORANGE CO.: Orlando, 13-X-32, (FSCA); same, 14-I-39, L. Maxwell, (FSCA); same, 20-V-55, H. A. Denmark, (FSCA); same, 30-V-55, (FSCA); same, 30-V-55, H. A. Denmark, (FSCA); same, VIII-26, M. D. Leonard, (NMNH); Winter Park, 1,2-X-31, H. T. Fernald, (FSCA); same, 20-IV, E. M. Davis, (AMNH); same, 28-V-40, (at light), H. T. Fernald, (FSCA); same, 7-IV, C. H. Paige, (AMNH); OSCEOLA CO.: Kissimmee, 5-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); PALM BEACH CO.: Belle Glade, VII-26, M. D. Leonard, (NMNH); West Palm Beach, 2-VIII-38, W. C. Clements, (FSCA); same, 6-IX-55, R. Price, (FSCA); PASCO CO.: New Port Richey, 7-X-38, Oman, (NMNH); PINELLAS CO.: Bradenton, 6-VI-36, (at light), (FSCA); Clearwater, (NMNH); Dunedin, 22-III-27, Blatchley, (NMNH); same, 7-X-38, Floyd Andre, (NMNH); POLK CO.: Ft. Meade, 12-II-87, J. Hughes, (FSCA); Lake Alfred, 27-V-70, (can trap), M. H. Muma, (RMB); Lake Wales, 17-VIII-53, (FSCA); Winter Haven, 30-V-56, (on *Stenotaphrum secundatum*), H. B. Wesson, (RMB); PUTNAM CO. 2 mi NW of Orange Springs, 1-3-VIII-75, (blacklight trap), D. Bowman, (RMB); same, 13-X-5-IX-75, (malaise trap), J. R. Wiley, (RMB); same, 19-X-5-XI-75, (RMB); same, 27-VIII-10-IX-75, (RMB); Crescent City, VI-38, C. T. Brues, (AMNH); SARASOTA CO.: Sarasota, Orange Grove B Ridge Road, 17-VII-66, R. Allen, (JAS); SEMINOLE CO.: Sanford, IX-XII-25, H. G. Barber, (NMNH); ST JOHNS CO.: Hastings, 25-I-77, R. Nguyn, (FSCA); ST LUCIE CO.: 28-IX-55, E. W. Campbell, (FSCA); TAYLOR CO.: 5 mi S. Perry, Hwy. B61, 29-VI-73, (light), G. B. Marshall, (JAS); VOLUSIA CO.: Deland, 27-III-67, M. A. Deyrup, (AMNH); 23-VII-54, H. A.

Denmark, (FSCA); 27-VII-54, H. A. Denmark, (FSCA); Samsoula, 25-V-79, J. N. Pott, (FSCA); WAKULLA CO.: 1 mi N. Spring Creek, 24-VIII-73, C. W. O'Brien, (JAS); Wakulla Co., Shell Point Beach, 3-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); WALTON CO.: DeFuniak Springs, 17-19-X-14, (AMNH); WASHINGTON CO.: 5 mi E of Chipley, 31-VIII-60, (blacklight trap), W. C. Rhodes, (RMB); 5 mi E. Chipley, 31-VIII-60, (blacklight trap), W. C. Rhodes, (RMB); 5 mi E. Chipley, 31-VIII-60, (blacklight trap), W. C. Rhodes, (RMB).

DRY TORTUGAS, Bush Key, 10-V-61, F. W. Mead, (RMB); same, Garden Key, 10-VII-63, (blacklight trap), H. V. Weems, Jr., (RMB); same, Loggerhead Key, 2-IX-71, H. V. Weems, Jr., (RMB); same, Marine Laboratory, (AMNH).

UNKNOWN COUNTY: Iola, 25-VII-26, (FSCA).

NEOPAMERA NEOTROPICALIS

(Kirkaldy)

(fig. 84, map LXXXVI)

Lygaeus serripes Fabricius 1803:236 (preocc.).

Orthea neotropicalis Kirkaldy 1909:31.

Neopamera neotropicalis Harrington 1980:107.

Diagnosis: Large (8-10), fore wings dark brown, white markings reduced or obsolete. Fore femora light brown and relatively slender. Pronotum blackish with 4 small yellowish brown spots on posterior lobe.

Biology: Comes to light readily, but has proven to be elusive in the field. In December, 1974 we were able to take a few adults in leaf and seed litter beneath a large *Ficus microcarpa* L. at the Tropical Research and Education Center, however there was no indication of a breeding population. They run very rapidly and fly quickly when disturbed. Have also been observed feeding on ripe guava fruit on the ground, presumably feeding on the seeds. Schuh (pers. comm.) collected this species in South America on foliage where it was observed feeding on seeds in bird droppings.

Distribution: A widespread Neotropical species ranging south to Argentina. In the United States it is known only from Florida.

Florida Distribution: Hussey (1960) reported it from Miami (first U.S. record). DADE CO.; 11-X-68, (black-light trap), E. Briggs, (FSCA); Agriculture Research & Education Center, Homestead, 21-X-76, (blacklight trap), R. M. Baranowski, (RMB); Homestead, 26-XI-74, J. A. Slater, (JAS); same, 20-XI-74, (JAS); same, 8-XII-74, (JAS); same, 1-X-69, (blacklight trap), R. M. Baranowski, (RMB); same, 15-X-68, (RMB); same, 26-XI-69, (RMB); same, 3-I-70, (RMB); same, 8-X-69, (RMB); same, 9-IX-68, (RMB); Miami, 15-XI-60, (blacklight trap), P. E. Briggs, (RMB); same, 2-XI-61, (blacklight trap), J. R. McFarlin, (RMB); same, 23-VI-59, J. N. Todd; (FSCA); same, 25-XI-59, J. L. Weaver, (FSCA); same, 5-IV-62, R. T. McMillan, Jr., (FSCA); same, 8-V-61, (Steiner trap), W. S. Brewton, (RMB); Princeton, 5-I-70, (blacklight trap), R. M. Baranowski, (RMB); South Miami, 14-X-66, D. H. Habeck, (RMB); same, 1966, R. M. Baranowski, (JAS); Subtropical Experiment Station, Waldin Dr, 18-X-69, (blacklight trap), R. M. Baranowski, (RMB).

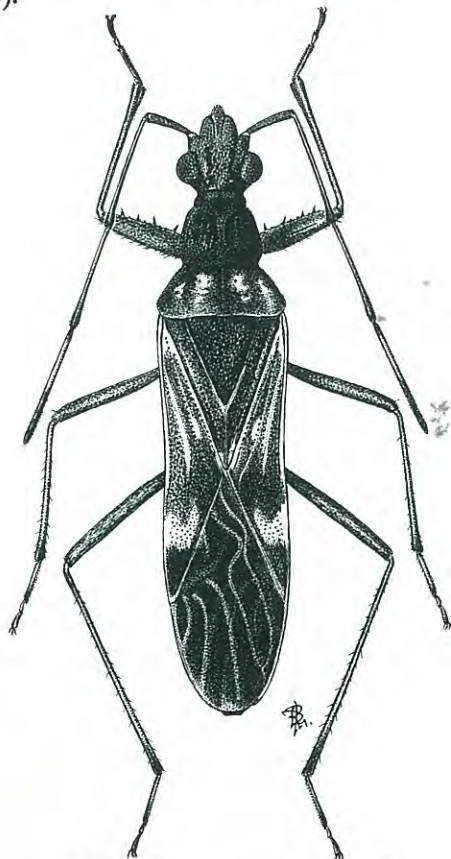
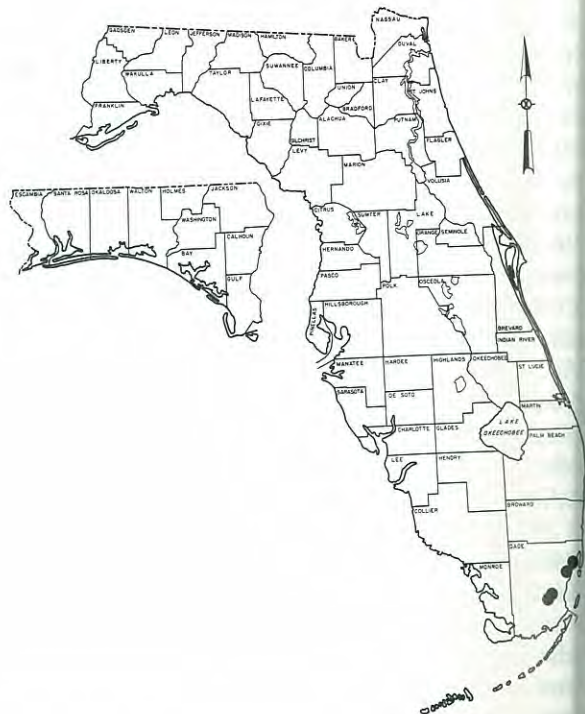


Fig. 84. *Neopamera neotropialis*



Map LXXXVI. Distribution of *Neopamera neotropialis*

PSEUDOPACHYBRACHIUS Malipatil 1978

Pseudopachybrachius Malipatil 1978:63.

Type Species: *Rhyparochromus gutta* Dallas 1852
By original designation.

The genus is recognized by the small size (less than 4.5 mm.), complete anterior pronotal collar that is demarked posteriorly by a line-like groove, a V-shaped buccular juncture, 4 or more rows of claval punctures, an extensively developed evaporative area, double ranked fore femora

spines and lack of spines on the male anterior tibiae. The hemelytra are generally largely pale.

The genus is represented in both Hemispheres. Seven species are currently recognized.

KEY TO FLORIDA SPECIES OF *PSEUDOPACHYBRACHIUS*

1. Posterior (apical) margin of corium pale or light brown; posterior femora with dark markings *basalis*, p. 155
- 1'. Posterior margin of corium black; posterior femora pale. *vincta*, p. 158

PSEUDOPACHYBRACHIUS BASALIS (Dallas) (figs. 85, 86, map LXXXVII)

Rhyparochromus basalis Dallas 1852:575.

Pamera curvipes Stal 1874:148.

Pseudopachybrachius basalis Harrington 1980:95.

Diagnosis: Small (3.5-4.5), robust, stocky. Lateral corial margins completely pale and corium lacking a distinct post median transverse fascia. Oval pale spot present near inner apical corial angle. Head, pronotum and scutellum dull black, corium dull yellow with dark brown punctures.

An entirely macropterous species.

Biology: Sweet (1964) stated that it has an extremely wide ecological range in Connecticut, but is essentially a species of field habitats ranging from mesic meadows near streams to rather dry upland fields. It is most abundant where *Panicum* grasses are common. Interestingly, populations from wet sites are larger and darker than those from drier habitats, the latter having been described as *curvipes*. However, the two forms do interbreed freely in the laboratory and there is complete integradation morphologically. In Connecticut there are 2 generations and adults overwinter.

Distribution: Throughout eastern and central North America from Quebec south to Florida and

west to at least Texas and Kansas. Also reported from New Mexico, California, Mexico, Grenada, Honduras, Costa Rica and Panama.



Map LXXXVII. Distribution of *P. basalis*

Florida Distribution: Reported by Van Duzee (1909) from Crescent City, Biscayne Bay, Lakeland and Jacksonville; by Blatchley (1926) from Dunedin and Royal Palm Park and by Sweet (1964) from Naranja. ALACHUA CO.: 19-IV-55, (at light), R. A. Morse, (RMB); Gainesville, 27-V-62, F. W. Mead, (RMB); same, 2-V-66, (on *Secale cereale* L.), F. W. Mead, (RMB); Gainesville, Doyle Connor Building, 2-4-V-75, (blacklight trapp), F. W. Mead, (RMB); same, 14-VI-77, (RMB); Gainesville, 29-IV-63, (at light), R. P. Esser, (RMB); BAKER CO.: Olustee, 2-4VII-66, (blacklight trap), E. P. Merkel, (RMB); same, Olustee, 30-V-63, (RMB); DADE CO.: 26000 SW 197 Ave, 6-VI-77, R. M. Baranowski, (RMB); Grossman Hammock State Park, 24-V-72, (blacklight trap), R. M. Baranowski, (RMB); same, 2-V-72, (RMB); same, 4-V-72, (RMB); Homestead, 27-IV-59, R. M. Baranowski, (RMB);

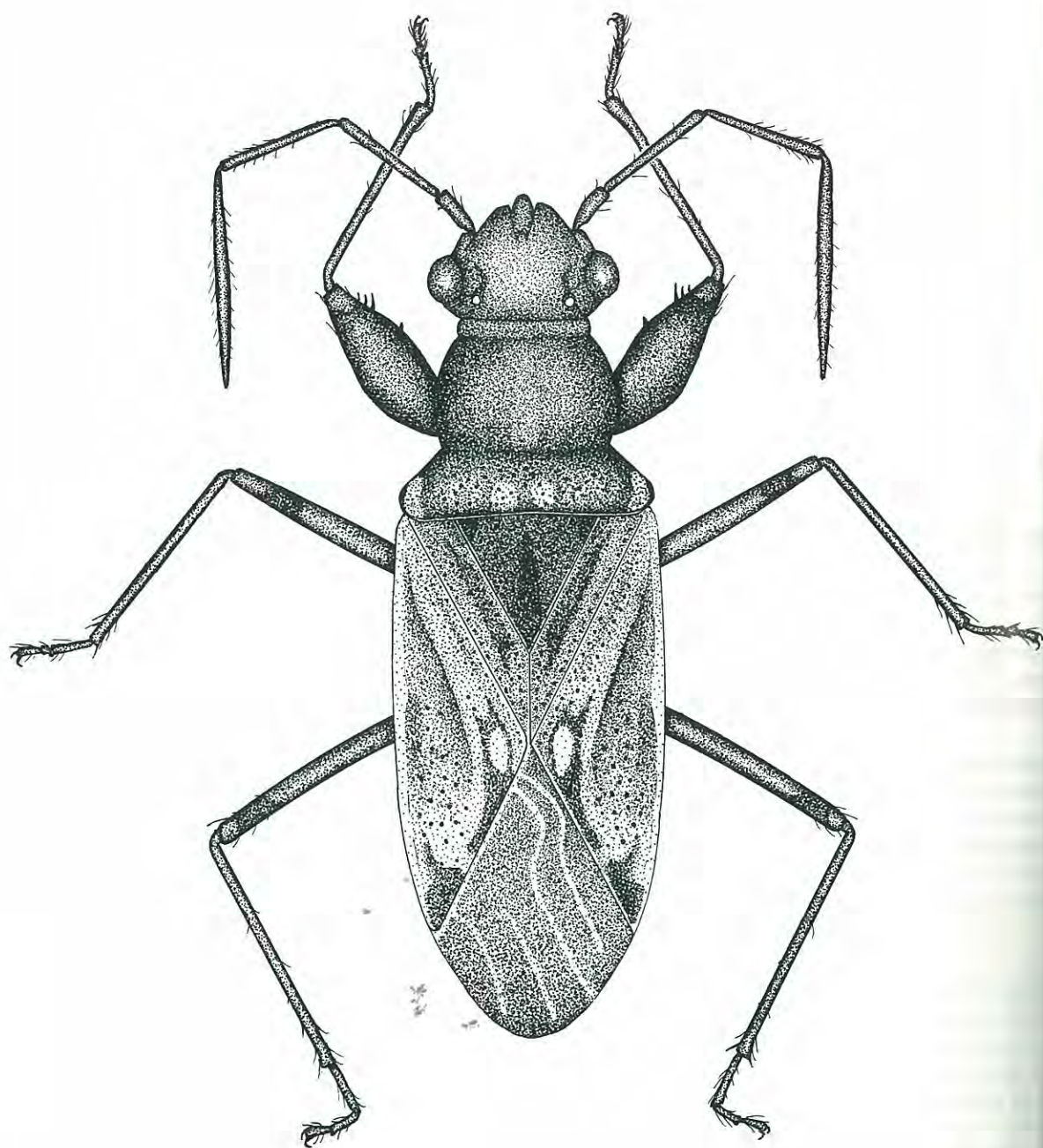


Fig. 85. *Pseudopachybrachius basalis*

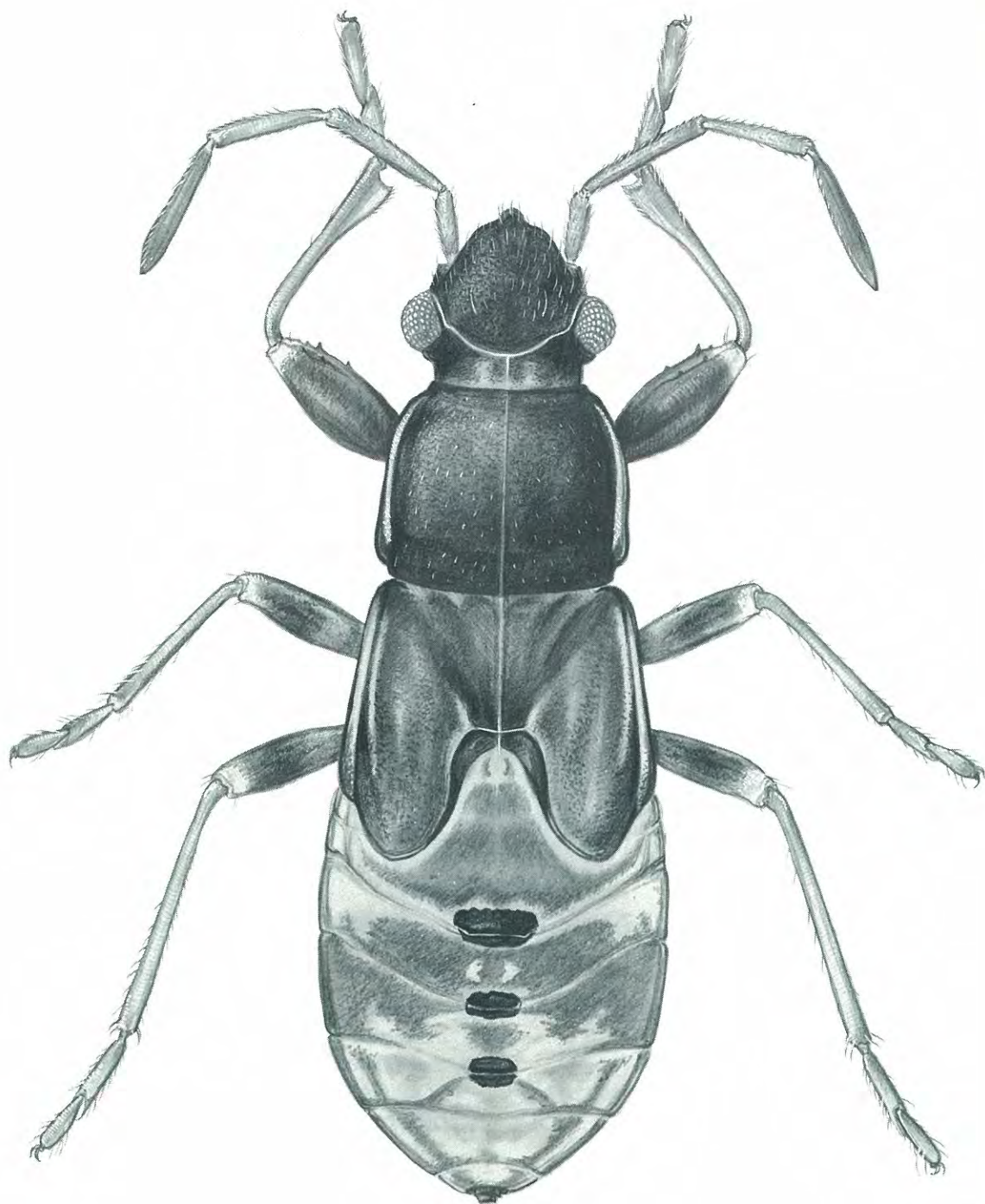


Fig. 86. *Pseudopachybrachius basalis*, fifth instar

same, 18-XI-68, (blacklight trap), R. M. Baranowski, (RMB); same, 23-VIII-68, (RMB); same, 7-X-68, (RMB); GADSDEN CO.: Chattahoochee, 3-VI-55, (at light), R. F. Hussey, (FSCA); HARDEE CO.: Lilly, 6-I-87, G. Johnson, (FSCA); HIGHLANDS CO.: Lake Placid, Archbold Biological Station, 2-V-83, (UV light trap), M. Deyrup, (RMB); Nr. Avon Park, 7-XI-61, T. Morris, (AMNH); JEFFERSON CO.: 22-VII-54, F. W. Mead, (FSCA); MADISON CO.: Suwanee River State Park, 31-VII-56, F. W. Mead, (RMB); MANATEE CO.: Myakka River State Park, 3-VI-54, H. A. Weems, Jr., (FSCA); MARION CO.: 14 mi SW of Ocala, Ross Prairie, 12-VI-75, (blacklight trap), P. C. Drummond, (RMB); 9 mi SSW of Ocala, 13-IX-2-X-75, (malaise trap), J. R. Wiley, (RMB); Lake Eaton, 22-IV-75, (blacklight trap), Peter Drummond, (RMB); Sharpes Ferry Field Station, 27-VII-75, (blacklight trap), Drummond & Wiley, (RMB); MONROE CO.: Big Pine Key, Watson Hammock, 29-VI-83, R. M. Baranowski, (RMB); Everglades National Park, Snake Bight Trail, 8-IV-70, R. M. Baranowski, (RMB); N Key Largo Key, 3-I-69, R. M. Baranowski, (RMB); same, 5-III-82, J. A. Slater, R. M. Baranowski, (RMB); ORANGE CO.: Orlando, 2-VIII-61, J. R. Woodley, (FSCA); Winter Park 28-V-40, (at light), H. T. Fernald, PINELLAS CO.: Mullet Key, 24-X-63, (on tidal flat), F. W. Mead, (RMB); POLK CO.: Lake Alfred, 22-VII-70, M. H. Muma, (RMB); PUTNAM CO.: 31-I-57, F. W. Mead, (FSCA); WASHINGTON CO.: 5 mi E. Chipley, 31-VIII-60, (blacklight trap), W. C. Rhodes, (RMB).

PSEUDOPACHYBRACHIUS VINCTA (Say)

(figs. 87, 88, map LXXXVIII)

Pamera vincta Say 1831:333 (Leconte Ed.).

Rhyparochromus parvulus Dallas 1852:576.

Lygaeus (Pleciomeris) amyoti Guérin-Meneville 1857:400.

Rhyparochromus (Pleciomeris) vinulus Stål 1858:40.

Pleciomeris ustulatus Motschulsky 1863:81.

Ligyrocoris bipunctatus Kirby 1890:547.

Pseudopachybrachius vincta Malipatil 1978:63.

Diagnosis: Small (2.8-3.0), head dark, pronotum contrasting with pale hemelytra having a conspicuous black spot on apical corial margin. Fourth antennal segment dark brown contrasting with 3 pale proximal segments. Legs pale.

Both macropters and brachypters occur.



Map LXXXVIII. Distribution of *P. vincta*

Biology: Quaintance (1897) reported the life history in Florida, but Blatchley (1926) indicated that Quaintance's figures and description are of *basalis*. Although this is undoubtedly true, much of the biological information appears to pertain more to *vincta* than *basalis*. Either Quaintance was working with both species, or his descriptive and illustrated material was not based on the same specimens as his field information.

It is a ubiquitous species in Florida in temporary habitats such as roadsides, garden, abandoned fields and lawns, and even occurs on extremely hot dry sites on beaches. Although ground lygaeids living in temporary habitats a

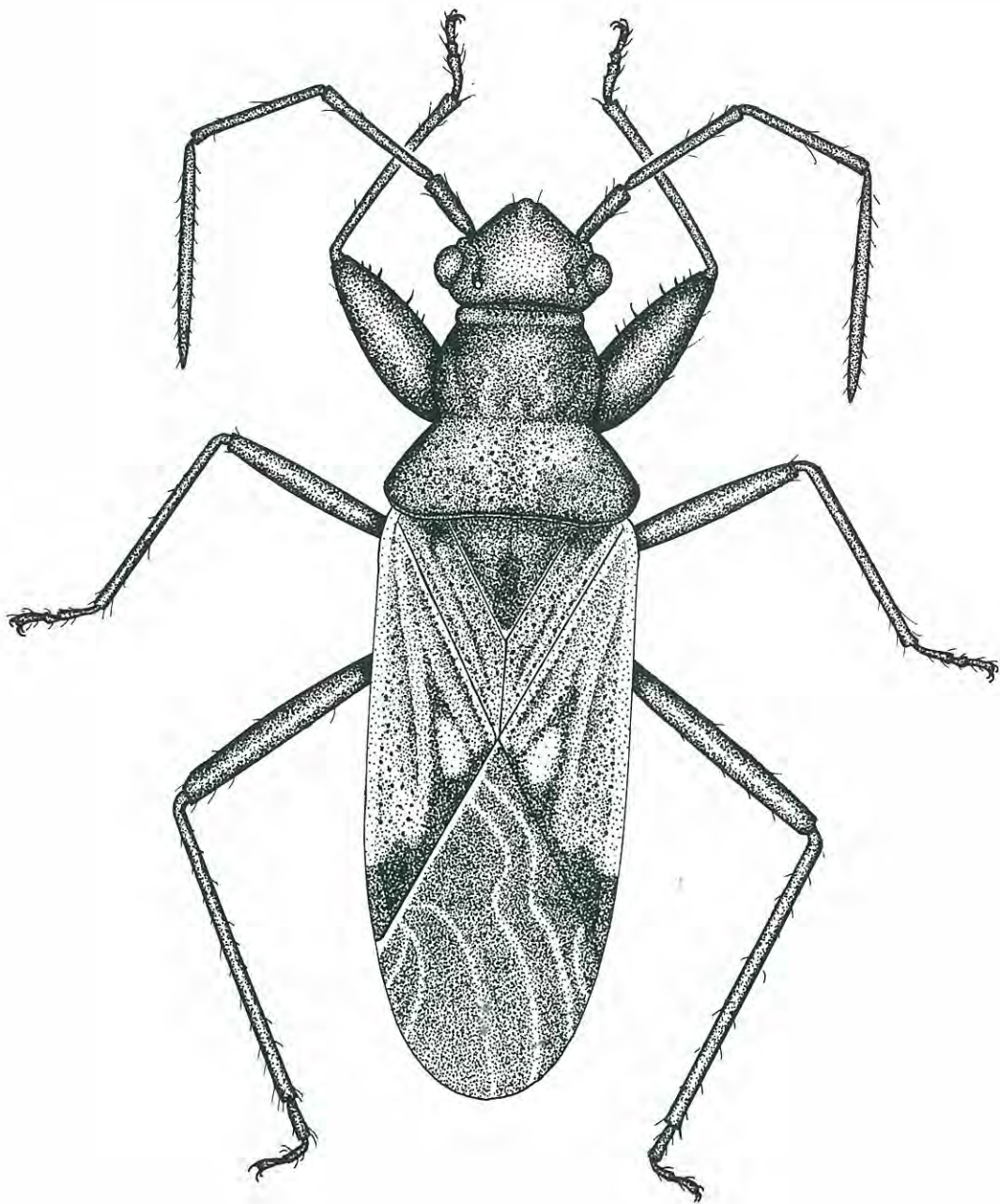


Fig. 87. *Pseudopachybrachius vincta*

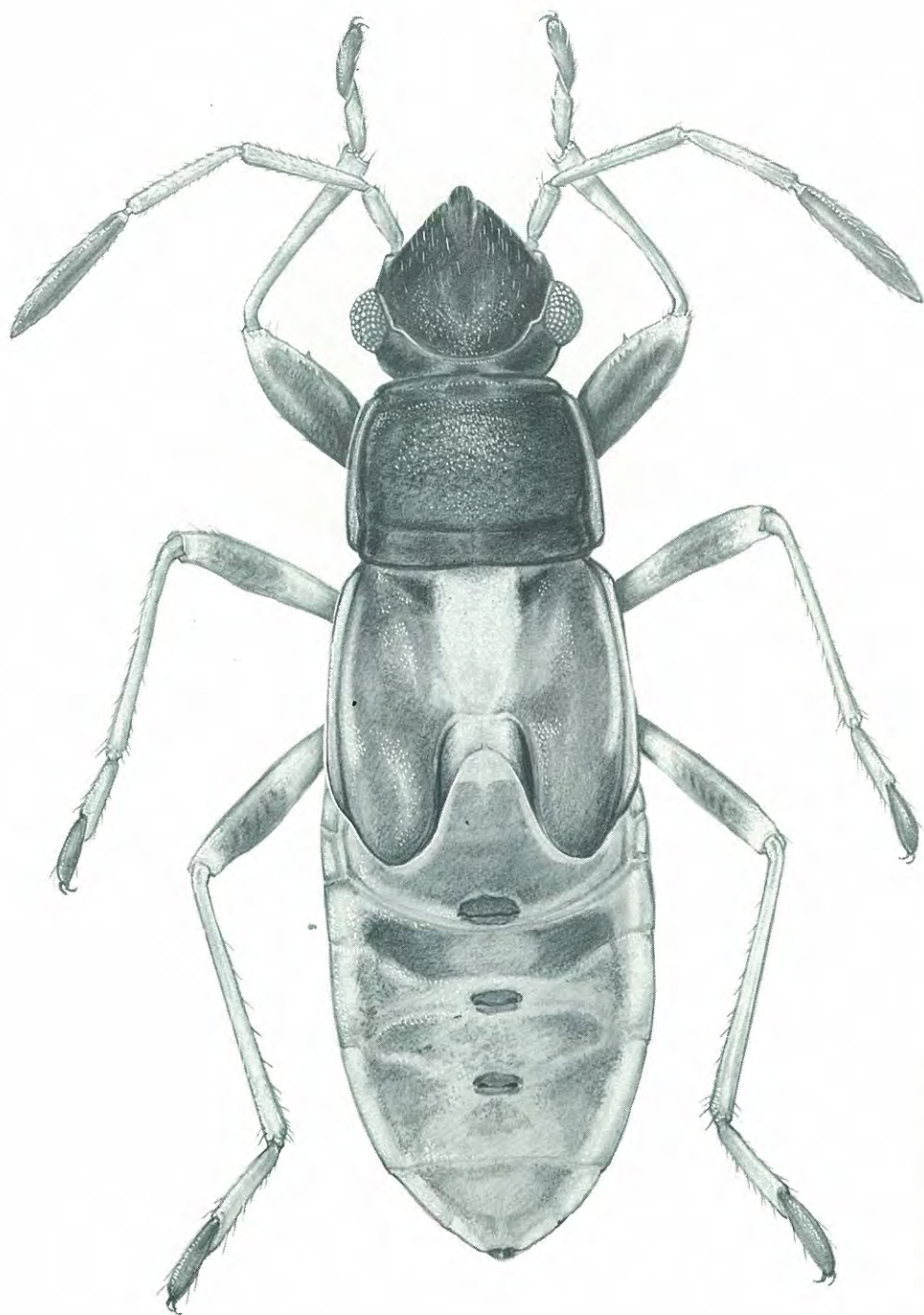


Fig. 88. *Pseudopachybrachius vincta*, fifth instar

almost always macropterous, *P. vincta*, when occurring on large beaches such as that on Sanibel Island, develops flightless submacropterous and brachypterous populations. This illustrates very well the relatively permanent habitat which these beaches are for mobile terrestrial insects that occur there (Zheng & Slater 1984). Brooks *et al* (1929), Wilson (1938), Watson (1931), Brooks and Watson (1932), Watson & Tissot (1942), among others, report injury to strawberries. Wheeler (1981) reports it under mats of *Euphorbia maculata* L.

Distribution: A very widespread Neotropical species, but restricted in the United States to the southern states from North Carolina to Florida. It is one of the most common lygaeids in Florida.

Florida Distribution: Reported by Uhler (1876) as *Pamera parvula* and Glover (1876) as *Plociomerus vincta* without definite station; by Rey (1981) from islands off Spring Creek, by Barber (1914) from Biscayne Bay, Lake Worth, Jacksonville, Belleair, Clearwater, Crescent City, Sanford, St. Petersburg, Ft. Meyers, Lakeland, Key Largo, Punta Gorda, La Belle, Miami, Everglade, Daytona and Lake City, and by Zheng & Slater (1984) from Sanibel Island, and Everglades National Park, Snake Bight Trail. ALACHUA CO.: Gainesville, 20-I-27, (FSCA); same, 5-XII-85, R. I. Sailer, (FSCA); same, 18-VII-68, (at light), Ladonia O'Berry, (RMB); same, 19-V-60, (at light), K. A. Nagel, (RMB); same, 31-X-65, (at light), Ladonia O'Berry, (RMB); same, Doyle Connor Building, 2-4-V-75, (blacklight trap), F. W. Mead, (RMB); same, 23-25-V-75, (RMB); (RMB); RT. 236, 2.3 mi W of Santa Fe, 19-X-60, F. W. Mead, (RMB); Waldo, 26-I-14, G. G. Ainsle, (NMNH); BAKER CO.: Olustee, 22-28-IX-66, (blacklight trap), E. P. Merkel. COLLIER CO.: Everglade, 10-IV-12, William T. Davis, (NMNH); Ochopee, (UV trap), 26-V-76, C. W. O'Brien & Marshall, (JAS); Seminole State Park, 13-XI-72, C. W. & L. B. O'Brien, (JAS); COLUMBIA CO.: Lake City, 19-VII-1899, (FSCA); DADE CO.: 35 miles N. Miami Springs, 25-III-73, C. W. & L. B. O'Brien, (JAS); Agricultural Research & Education Center, Homestead, 21-IX-69, (blacklight trap), R. M. Baranowski, (RMB); Castello Hammock, 17-IX-72, (blacklight trap), R. M. Baranowski, (RMB); same, 6-VI-78, (RMB); Everglades National Park,

Palm Vista, 26-XI-61, J. A. Slater, (JAS); Grossman Hammock State Park, 2-V-72, (blacklight trap), R. M. Baranowski, (RMB); Homestead, 1-XII-56, R. M. Baranowski, (RMB); same, 23-XII-56, (RMB); same, 7-X-56, (RMB); same, 18-X-56, (RMB); same, 1-X-58, (RMB); same, 28-IX-56, (RMB); same, 26-IX-57, (RMB); same, 29-IX-56, (RMB); same, 30-IX-56, (JAS); Homestead, 20-XI-74 J. A. Slater, (JAS); same, 8-XII-74, (JAS) same, 24-XI-74, (JAS); Homestead, 18-V-69, (blacklight trap), R. M. Baranowski, (RMB); same, 18-XI-68, (RMB); same, 16-VIII-68, (RMB); same, 25-IX-68, (RMB); same, 10-VIII-68, (RMB); same, 7-X-68, (RMB); same, 21-IX-68, (RMB); same, 5-X-68, (RMB); same, 2-I-70, (RMB); same, 22-VIII-69, (RMB); Naranja, 25-VII-60, R. M. Baranowski, (RMB); same, 3-VI-59, (RMB); same, 21-VI-59, (RMB); Orchid Jungle Hammock, Newton Road, 28-X-69, (blacklight trap), R. M. Baranowski, (RMB); Paradise Key, 31-VIII-25, T. H. Hubbell, (NMNH); same, II, Brooks, (AMNH); Ross & Castello Hammock, 27-V-62, H. V. Weems, Jr., (RMB); same, 28-VIII-68, (blacklight trap), R. M. Baranowski, (RMB); Royal Palm State Park, 22-VII-48, E. L. Todd, (NMNH); same, 24-V-72, (RMB); same, 15-VII-72, (RMB); DIXIE CO.: Old Town, 11-VII-39, Oman, (NMNH); DUVAL CO.: Jacksonville, 7-I-56, D. A. Young, (NMNH); St. Johns Bluff, 26-VIII-59, F. W. Mead, (RMB); FRANKLIN CO.: Alligator Point, 26-IX-75, C. W. O'Brien, (JAS); GADSDEN CO.: 1-VIII-56, F. W. Mead, (FSCA); Chattahoochee, 12-IX-54, R. F. Hussey, (FSCA); same, Apalachicola R. Flood Plain, 1-VI-53, T. H. Hubbell, (FSCA); GULF CO.: 1 mi N. White City, 20-IX-78, C. W. O'Brien & Marshall, (JAS); HAMILTON CO.: 21-VI-53, R. F. Hussey, (FSCA); HARDEE CO.: 5 mi S. Zolfo Springs, 22-VII-73, C. W. O'Brien & Marshall, (JAS); HENDRY CO.: La Belle, 16-VII-39 Oman, (NMNH); HIGHLANDS CO.: Archbold Bio. Sta., 1-4-VII-66, L. Penner, (JAS); same, 25-V-57, A. M. Laessle; same, 7-8-VI-69, (at light), J. Harrington, T. Schuh, J. A. Slater, (JAS); Lake Letta near Sebring and Avon Park 31-V-61, (NMNH); Lake Placid, 10-VII-48, B. T. McDermott, (NMNH); same, 13-VII-48, R. H. Beamer, (NMNH); Sebring 10-30-VIII, C. T. Parsons, (AMNH); same, 13-VIII, (AMNH); same, 24-VII, (AMNH); same, 24-29-VII, (AMNH); same, 11-XII-53, H. V. Weems, Jr.,

(FSCA); HILLSBOROUGH CO.: Little Manatee River, U. S. Highway 41, 14-VIII-38, Hubbell and Friauf, (NMNH); INDIAN RIVER DO.: Sebastian, 24-27-VII, C. T. Parsons, (AMNH); same, II, G. Nelson, (AMNH); same, IV, (AMNH); Wabasso, IV, G. Nelson, (AMNH); JACKSON CO.: 1-VIII-56, F. W. Mead, (FSCA); JEFFERSON CO.: 1 mi. NE Wacissa, 7-VIII-73, (blacklight trap), R. E. Simmons, (JAS); 2 mi N. Wacissa 3-VII-73, G. B. Marshall, R. D. Kaplan, (JAS); same, 3-VII-73 (UV trap), Marshall & Kaplan, (JAS); Monticello, 29-IX-68, (blacklight trap), W. H. Whitcomb, (RMB); same, Big Bend Horticulture Lab, 11-IX-68, (blacklight trap), W. H. Whitcomb, (RMB); same, 11-IX-68, (RMB); same, 19-IX-68, (RMB); same, 19-IX-68, (RMB); same, 29-IX-68, (RMB); LAKE CO.: 1-IX-54, F. W. Mead, (FSCA); LEE CO.: Sanibel Island, 9-VI-69 J. Slater, T. Schuh, J. Harrington, (JAS); LEON CO.: 3-VII-24 C. O. Handley, (NMNH); Tall Timbers Research Station, 13-VIII-68, (blacklight trap), Donny L. Harris, (RMB); same, 8-15-VIII-69, (RMB); Tallahassee, 8-VIII-03, A. P. Morse, (AMNH); same, 21-VIII-73, (at blacklight), C. W. O'Brien, (JAS); LEVY CO.: Cedar Key, 12-VI-39, Oman, (NMNH); LIBERTY CO.: Torreya State Park, 4-VII-65, (blacklight trap), H. V. Weems, Jr., (RMB); MADISON CO.: Suwannee River State Park, 31-VII-56, F. W. Mead, (RMB); MANATEE CO.: Palmetto, 22-VII-73, C. W. O'Brien, (JAS); Horse Trail Entrance, Myakka St. Park 14-VIII-66, R. Allen, (JAS); MARION CO.: 9 mi SSW of Ocala, 27-VIII-75, Drummond & Wiley, (RMB); same, 11-19-IX-75, (malaise trap), Wiley & Holler, (RMB); same, 19-IX-2-X-75, (malaise trap), J. R. Wiley, (RMB); same, Kingsland Country Estates, 5-XI-75, J. Wiley, (RMB); 14 mi NW of Ocala, Ross Prairie, 12-VI-75, (blacklight trap), P. C. Drummond, (RMB); north end of Heather Island, 10-IX-75 (blacklight trap), J. Wiley, (RMB); same, 3-X-75, (RMB); Sharpes Ferry Field Station, 15-V-75, (blacklight trap), P. C. Drummond, (RMB); same, 30-X-75, (blacklight trap), J. Wiley, (RMB); same, 2-X-75, (RMB); same, 27-VII-75, (blacklight trap), Drummond & Wiley, (RMB); same, 30-IV-75, (blacklight trap), N. Holler, (RMB); Silver Springs, 4-VI-69, (at light), J. Slater, T. Schuh, J. Harrington, (JAS); MONROE CO.: Big Pine Key, 1-XII-74, J. A. Slater, R. M. Baranowski, (JAS); same, Key Deer Refuge, 5-IX-82, (blacklight trap), S. Klett,

(RMB); same,, Watson Hammock, 29-VI-83, R. M. Baranowski, (RMB); Everglades National Park, 5-IV-58, H. V. Weems, Jr., (RMB); same, 5-IV-58, R. E. Woodruff, (RMB); same, 8-VI-70, R. M. Baranowski, (RMB); same, Flamingo Prairie, 8-VI-70, R. M. Baranowski, (RMB); same, 10-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); same, 10-VI-69, R. M. Baranowski, (RMB); same, 28-III-70, (RMB); same, 4-V-70, (blacklight trap), R. M. Baranowski, (RMB); Everglades National Park, Snake Bight Trail, 6-X-69, R. M. Baranowski, J. Slater, T. Schuh, J. Harrington, (JAS); same, 10-VI-69, (JAS); Key largo, 1-I-69, J. A. Slater, R. M. Baranowski, (JAS); same, 19-VII-39, Oman, (NMNH); same, 26-II-56, H. V. Weems, Jr., (FSCA); Key West, 29-XII-54, H. V. Weems, Jr., (FSCA); same, 27-V-69, (blacklight trap), F. A. Buchanan, (RMB); same, 2-V-69, (RMB); N. Key Largo Key, 14-I-69, R. M. Baranowski, (RMB); same, 10-I-69, (RMB); Stock Island, 13-17-VII-84, (blacklight trap), J. Bunch, (RMB); same, 25-X-84, (RMB); same, 6-IX-84, (RMB); same, 12-X-84, (RMB); same, 9-13-VII-84, (RMB); same, 28-V-68, (blacklight trap), F. A. Buchanan, (RMB); same, 9-X-63, (RMB); same, Co. Mosquito Control Headquarters, 10-XI-71, W. H. Pierce, (RMB); OKEECHOBEE CO.: 8 mi W. Okeechobee, 16-VII-73, O'Brien & Marshall, (JAS); ORANGE CO.: 17-I-29, E. Storrs, (NMNH); 21-VII-29, W. A. Hires, (NMNH); Winter Park, 27-VII-39, L. S. Light, Jr., (FSCA); same, 8-X-40, H. T. Fernald, (FSCA); same, 7-X-41, (FSCA); OSCEOLA CO., 17-VIII-29, J. R. Barrass (NMNH); PALM BEACH CO.: 4 mi SE Canal Point, Hwy. 98, 16-VII-73, (at light), O'Brien & Marshall, (JAS); Canal Point, 20-VII-27, Leonard, (NMNH); PINELLAS CO.: Cabbage Key, 24-X-63, F. W. Mead, (FSCA); Clearwater, 29-IV-08, Van Duzee, (NMNH); Dunedin, 2-5-26, W. S. Blatchley, (NMNH); same, 3-III-27, (NMNH); Mullet Key, 24-X-63, (on tidal flat), F. W. Mead, (RMB); POLK CO.: Lakeland, 10-XI-11, H. G. Barber, (NMNH); same, 9-XI-11, W. T. Davis, (NMNH); Winter Haven, 30-V-56, (on *Stenotaphrum secundatum*), H. B. Wesson, (RMB); PUTNAM CO.: 31-I-57, F. W. Mead, (RMB); 1 mi NW of Orange Springs, 1-3-VIII-75, (blacklight trap), D. Bowman, (RMB); same, 13-X-5-XI-75, (malaise trap), J. R. Wiley, (RMB); same, 15-X-IX-75, (RMB); same, 27-VIII-10-X-75, (RMB); Crescent City, VI, C. T. Brues, (AMNH); SARASOTA CO.: Myakka R. State Park, 25-VI-

76, (at night), O'Brien & Marshall, (JAS); same, 5-VI-54, H. V. Weems, Jr., (FSCA); Venice, 8-X-38, Oman. (NMNH); same, 9-V-60, R. E. Woodruff, (RMB); SEMINOLE CO.: 3 mi W. Sanford, 26-I-74, C. W. O'Brien & Marshall, (JAS); Sanford, 22-VIII-28, E. D. Ball, (NMNH); same, 3-V-08, Van Duzee, (NMNH); same, 8-VIII-39, L. D. Tuthill, (JAS); ST. JOHNS CO.: 11-III-30, L. L. Knight, (NMNH); ST. LUCIE CO.: 3-11-54, H. A. Denmark, (FSCA); TAYLOR CO.: 5-X-60, F. W. Mead, (RMB); VOLUSIA CO.: Daytona, 16-XI-11, (NMNH); Edgewater, 15-III-39, C. A. Frost, (NMNH); same, 28-II-39, C. A. Frost, (NMNH); WAKULLA CO.: 1 mi N. Spring Creek, 19-VI-73, (UV Trap), C. W. O'Brien, (JAS); Wakulla Springs, 3-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); WASHINGTON CO.: 5 mi E of Chipley, 31-VIII-60, (blacklight trap), W. C. Rhodes, (RMB); 5 mi E of Chipley, 31-VIII-60, (blacklight trap), W. C. Rhodes, (RMB).
 DRY TORTUGAS, Loggerhead Key, 3-IX-61, H. V. Weems, Jr., (RMB).

PAROMIUS Fieber 1860

Stenocoris Rambur 1839:139-140 (preocc.).
Paromius Fieber 1860:45, 170, 171.

Type Species: *Stenocoris gracilis* Rambur 1839.
 Monobasic.

The members of this genus are elongate, slender, pale yellowish testaceous insects resembling some of the more elongate species of *Neopamera* but differing from our North American species in lacking a conspicuous pale oval spot near the inner apical angle of the corium. The corium is sometimes infuscated but always lacks a conspicuous post median transverse dark fascia. The anterior pronotal lobe is frequently twice the length of the posterior lobe.

Twelve species are recognized in the literature, many of them closely related. The distribution is nearly throughout the tropical and subtropical regions of the world. Three species are known to occur in the Western Hemisphere, one of these being common and widely distributed in the southern United States.

PAROMIUS LONGULUS (Dallas) (fig. 89, map LXXXIX)

Rhyparochromus longulus Dallas 1852:578-579.
Paromius longulus Stal 1862: 312.

Diagnosis: Elongate, of moderate size (5.5-70), head, anterior pronotal lobe, scutellum and under surface frequently dull black, often thickly clothed with grayish pubescence. Posterior pronotal lobe reddish brown with darker punctures. Corium and clavus dull testaceous. Antennae reddish brown with distal end of 3rd and usually all of 4th segment fuscous.



Map LXXXIX. Distribution of *Paromius longulus*

Biology: Despite the often great abundance of this species, very little is known of its biology. It is often found together with *N. bilobata* and *P. vincta* in disturbed grassy habitats. It generally lives above ground on plants and thus is more frequently swept than other members of the subfamily. Blatchley (1926) reported adults

hibernating in bunches of Spanish moss and in dead cabbage palm fronds and beneath rubbish on the ground.

Distribution: *P. longulus* has an extremely wide range in the Western Hemisphere, occurring from South America through Central America into Mexico and the West Indies and widespread in the United States from North Carolina and Florida west to Texas.

Florida Distribution: Reported by Uhler (1876) from Florida without definite station; by Van Duzee (1909) from St. Petersburg, Ft. Meyers, Crescent City, and Estero; by Blatchley (1926) from nearly all of his collecting stations but without definite locality; by Barber (1914) from Crescent City, St. Petersburg, Estero, Biscayne Bay, Lake Worth, Jacksonville, Ormond, Silver Springs, Tampa, St. Augustine, Lake City, Clearwater, Sanford, Marco, La Grange, Lakeland, Punta Gorda, Newberry, Everglade, Key Largo, Titusville, La Belle and Miami; by Torre-Bueno (1931) from Royal Palm Park and by Torre-Bueno (1933) from Matecumbe, Windley Key and Homestead. ALACHUA CO.: 13-18-30, L. B. Blain, (NMNH); 16-V-39, (FSCA); 24-IV-50, (RMB); 30-X-51, W. C. Sloan, (FSCA); .2 mi N Newberry, 22-IV-48, E. D. McRae, (FSCA); Alachua, 10-IX-65, L. Kuitert, (RMB); Gainesville, 1-VII-54, R. F. Hussey, (FSCA); same, XI-36, A. W. Murrill (NMNH); same, 14-III-59, (FSCA); same, 6-VII-58, (FSCA); same, 14-VI-67, F. W. Mead, (RMB); same, 26-IX-2-X-14, (AMNH); same, 25-I-54, H. V. Weems, Jr., (FSCA); same, 19-V-68, (at light), K. A. Nogel, (RMB); same, 7-XII-55, R. P. Esser, (FSCA); same, 9-V-67, (at *Triticum aestivum*), F. W. Mead, (RMB); same, 10-X-63, (on *Glycine max* (L.) Merr.), F. W. Mead, (RMB); same, Doyle Connor Building, 2-4-V-75, (blacklight trap), F. W. Mead, (RMB); same, 12-V-75, (RMB); same, 9-11-V-75, (RMB); same, 20-III-79, (RMB); Gainesville, Station 40, moist oak pine flatwoods open, 27-V-67, F. W. Mead, (RMB); BAKER CO.: 1-3-30, R. S. Howard, (NMNH); Olustee, 12-VII-66, (blacklight trap), E. P. Merkel, (RMB); same, 22-28-IX-66, (RMB); BREVARD CO.: 24-III-54, F. W. Mead, (FSCA); Titusville, 8-XI-11, (AMNH); BROWARD CO.: Ft. Lauderdale, 3-IV, G. Fairchild, (AMNH); same, 30-VI-33, M. Bates, (AMNH); same, N. Bates, (AMNH); Pompano

Park, 19-IX-73, D. C. Clinton & W. H. Pierce, (RMB); CLAY CO.: Camp Crystal, 19-V-62, (at *Serenoa repens* (Bartr.) Small, H. V. Weems, Jr., (RMB); Camp Crystal, 19-V-62, H. V. Weems, Jr., (RMB); COLLIER CO.: Marco, 20-IV-12, (AMNH); Seminole State Park, 13-XI-72, C. W. & L. B. COLUMBIA CO.: 21-VI-53, R. Hussey, (FSCA); Lake City, 2-VI-1899, (FSCA); same 19-VI-1899, (FSCA); same, 3-IX-1897, (FSCA); DADE CO.: 26000 SW 197 Ave, 17-IX-77, (blacklight trap), R. M. Baranowski, (RMB); Agricultural Research & Education Center, Homestead, 11-IX-69, (blacklight trap), R. M. Baranowski, (RMB); same, 12-IV-69, (RMB); same, 21-IX-69, (RMB); same, 21-X-76, (RMB); Bernecker's Nrsy, 11-14-IX-86, (blacklight trap), H. B. Glenn, (RMB); Biscayne Bay, A. T. Slosson, (AMNH); Chapman Field, Miami, 21-IV-33, C. F. Rainwater, (NMNH); Coconut Grove, III, G. Fairchild, (AMNH); Coral Gables, X-48, (FSCA); Everglades National Park, 20-X-54, H. V. Weems, Jr., (FSCA); same, Palm Vista, 26-XI-61, J. A. Slater, (JAS); same, Pine Glade, 1-XII-61, J. A. Slater, (JAS); Florida City, 19-VII-73, G. B. Marshall, (JAS); Goulds, 28-I-41, O. D. Link, (FSCA); Homestead, 1-XII-56, R. M. Baranowski, (RMB); same, 18-X-56, (RMB); same, 8-X-56, (RMB); same, 23-XII-56, (RMB); same, 14-I-57, (RMB); same, 28-II-57, (RMB); same, 20-X-58, (RMB); same, 13-IV-61, (RMB); same, 19-VII-54, O. D. Link, (FSCA); same, 18-IX-68, (blacklight trap), R. M. Baranowski, (RMB); same, 2-IX-70, (RMB); same, 25-IX-68, (RMB); same, 5-X-68, (RMB); same, 10-VIII-68, (RMB); same, 25-IX-68, (RMB); same, 6-VIII-68, (RMB); same, 16-VIII-68, (RMB); Kendall, 20-VI-67, R. W. Swanson, (RMB); Miami, 17-IV-18, (NMNH); same, 5-XI-11, (AMNH); same, 5-XI-11, (AMNH); same, 2-V-51, B. K. Dozier, (RMB); same, 5-XI-11, (AMNH); Naranja, 25-VII-60, R. M. Baranowski, (RMB); Orchid Jungle Hammock, Newton Road, 8-XI-68, (blacklight trap), R. M. Baranowski, (RMB); Paradise Key, T. E. Snyder, 24-II-19 (NMNH); same, 24-II-19, H. S. Barber, (NMNH); same, 3-III, (NMNH); Princeton, 19-VII-54, O. D. Link, (FSCA); DE SOTO CO.: Arcadia, 30-III-54, K. V. Krombein, (NMNH); DIXIE CO.: 2 mi W. Fannin Springs, 4-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); Old Town, 11-VII-39, Oman, (NMNH); DUVAL CO.: 1-I-52, W. C. Sloan, (FSCA); Jacksonville, 3-XI-11, (AMNH); same, 7-I-56 D. A. Young,

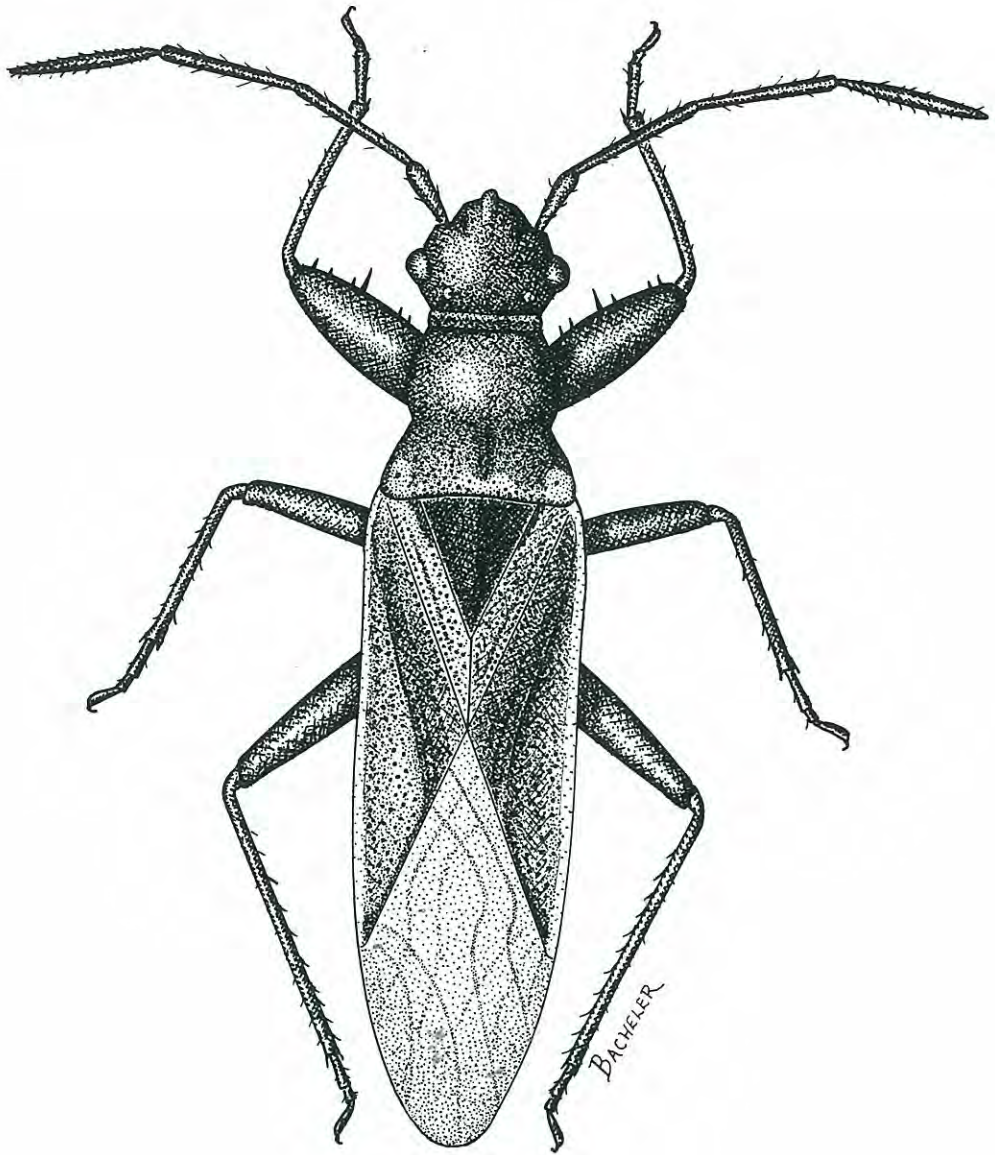


Fig. 89. *Paromius longulus*

(NMNH); same, 24-VIII-56, (on *Altenathera philoxeroides* (Mart.) Griseb.), C. F. Zieger, (RMB); same, 6-VI-66, (on *Altenathera philoxeroides*), C. F. Zieger, (RMB); St. Johns Bluff, 16-VIII-67, F. W. Mead, (RMB); ESCAMBIA CO.: 2.7 mi W of Escambia River, on US 90A, 13-IX-54, T. H. Hubbell & I. J. Cantrall, (RMB); GADSDEN CO.: 12-VII-54, F. W. Mead, (FSCA); Chattahoochee, 12-IX-54, (taken at light), R. Hussey, (FSCA); same, 31-V-53, (at light), T. H. Hubbell, (FSCA); GILCHRIST CO.: Blue Springs, 3-IV-55, (taken in Spanish Moss), R. Hussey, (FSCA); GULF CO.: 10-VII-54, F. W. Mead, (FSCA); Jackson Co., 1-VII-56, F. W. Mead, (FSCA); 1 mi N. White City 20-IX-78, C. W. O'Brien & Marshall, (JAS); HENDRY CO.: Ft. Myers, 14-XI-11, (AMNH); La Belle, 14-XI-11, (AMNH); same, 10-11-III-74, (UV in oak grove), J. Reynolds, (JAS); HIGHLANDS CO.: Lake Placid, 8-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); HOLMES CO.: 4 mi W. Ponce de Leon, 5-XII-73, (Berlese forest litter), C. W. O'Brien, (JAS); 5 mi S of Sebring, 21-III-78, (on fossil dunes), L. A. Stange, (RMB); 3 mi W. Lake Marion, 15-III-56, Howden & Harrell, (JAS); Sebring, 11-XII-53, H. V. Weems, Jr., (FSCA); HILLSBOROUGH CO.: Tampa, 7-IX-38, Oman, (NMNH); Plant City, 10-12-37, J. W. Wilson, (FSCA); INDIAN RIVER CO.: Sebastian, III, G. Nelson, (AMNH); same, IV, (AMNH); JACKSON CO.: T6W, R7W Section 31/32, 7-VI-33, R. F. Hussey, (FSCA); JEFFERSON CO.: 1 mi NW Wacissa, 7-VIII-73, R. E. Simmons, (blacklight trap), (JAS); 1 mi S Wacissa, 18-IV-76, G. B. Marshall, (JAS); 19 mi S Wacissa, 3-VII-73, R. D. Kaplan, (JAS); 2 mi N. Wacissa, (UV trap), 3-VII-73, Marshall & Kaplan, (JAS); same, 11-V-75, G. B. Marshall, (JAS); Aucilla River, 31-VIII-67, R. Smith, (RMB); Monticello, 17-VIII, G. Fairchild, (AMNH); same, 4-8-X-14, (AMNH); same, Big Bend Horticulture Lab, 19-IX-68, (blacklight trap), W. H. Whitcomb, (RMB); same, 11-IX-68, (RMB); LAKE CO.: 17-I-30, B. L. Smith, (NMNH); LEE CO.: Ft. Myers, 23-IV-12, William T. Davis, (NMNH); Ft. Myers, 30-III-12, (AMNH); LEON CO.: H. P. Whitney Farm, 9-VII-24, C. O. Handley, (NMNH); same, 3-VII-24, (NMNH); Tall Timbers Research Station, Gay's Island, 16-IV-76, G. B. Marshall, (JAS); Tallahassee, (UV trap), 10-III-74, C. W. O'Brien, (JAS); same, 24-VIII-73, (at UV), (JAS); same, 21-VIII-73, (JAS); LEVY CO.: Cedar Key,

29-IX-23, T. H. Hubbell, (FSCA); MADISON CO.: 31-VII-56, F. W. Mead, (RMB); Suwanee River State Park, 31-VII-56, F. W. Mead, (RMB); MANATEE CO.: Palmetto, 22-VII-73, C. W. O'Brien, (JAS); Horse Trail Entrance, Myakka State Park, 14-VIII-66, R. Allen, (JAS); Myakka River State Park, 3-IX-54, H. V. Weems, Jr., (FSCA); same, 15-VII-66, R. Allen, (JAS); MARION CO.: Silver Springs, 5 mi East of, 23-X-65, F. W. Mead, (RMB); 14 mi SW of Ocala, Ross Prairie, 12-VI-75, (blacklight trap), P. C. Drummond, (RMB); 9 mi SSW of Ocala, 10-19-IX-75, (malaise trap), Wiley & Holler, (RMB); same, 19-IX-2-X-75, (malaise trap), J. R. Wiley, (RMB); same, 8-13-VIII-75, (blacklight trap), J. Wiley, (RMB); Lake Eaton, 22-IV-75, (blacklight trap), Peter Drummond, (RMB); same, 8-IV-75, (RMB); Ocala National Forest, 25-VII-38, Hubbell and Friauf, (NMNH); Sharpes Ferry Field Station, 15-V-75, (blacklight trap), P. C. Drummond, (RMB); same, 2-X-75, (blacklight trap), J. R. Wiley, (RMB); same, 27-VII-75, (blacklight trap), Drummond & Wiley, (RMB); same, 30-IV-75, (blacklight trap), N. Holler, (RMB); Silver Springs, 4-VI-69, (at light), J. Slater, T. Schuh, J. Harrington, (JAS). MARTIN CO.: Palm City, IX-2-88, W. Schirmer, (FSCA); MONROE CO.: Everglades National Park, 5-IV-58, R. E. Woodruff, (RMB); same, 5-IV-58, (at light), H. V. Weems, Jr., (RMB); Everglades National Park, Flamingo Prairie, 23-III-70, (blacklight trap), R. M. Baranowski, (RMB); same, 26-IX-69, (RMB); same, 28-III-70, (RMB); same, 4-V-70, (RMB); Everglades National Park, Snake Bight Trail, 10-VI-69, R. M. Baranowski, J. Slater, T. Schuh, J. Harrington, (JAS); Key Largo 16-II-46, C. O. Esselbaugh, (NMNH); same, 17-VII-63, H. A. Denmark, (RMB); same, 3-IV-66, H. V. Weems, Jr., (RMB); same, 1-I-69, J. A. Slater, R. M. Baranowski, (JAS); same, 11-VI-69, R. M. Baranowski, J. Slater, T. Schuh, J. Harrington, (JAS); same, 17-VI-53, O. D. Link, (FSCA); same, 6-XI-11, (AMNH); same, 7-VII-54, C. V. Reichart, (JAS); N. Key Largo Key, 10-I-69, R. M. Baranowski, (RMB); same, 3-I-69, (RMB); Key West, 2-V-69, (blacklight trap), F. A. Buchanan, (RMB); Stock Island, 16-VIII-59, (light trap), W. Warner, (RMB); same, 16-X-59, (RMB); Plantation Key, 2-I-56, D. A. Young, (NMNH); NASSAU CO.: 7 mi SW Boulogne, 14-VI-69, J. A. Slater, J. Harrington, (JAS); OKEECHOBEE CO.: 8 mi W. Okeechobee, 16-VII-73, O'Brien

Marshall, (JAS); ORANGE CO.: 14-XII-29, W. M. Loe, (NMNH); 25-VI-29, M. N. Smith, (NMNH); Lake Apopka, (NMNH); Orlando, 15-VII-48, O. D. Link, (FSCA); same, 20-IV-28, (FSCA); same, 6-IV-47, H. V. Weems, Jr., (FSCA); Winter Park, 31-VII-48, H. T. Fernald, (FSCA); OSCEOLA CO.: 17-VIII-29, J. J. Kirkland, (NMNH); PALM BEACH CO.: 4 mi SE Canal Point, Hwy 98, (JAS); Tequesta, 5-IV-66, F. W. Mead, (RMB); Belle Glade, 4-VI-27, Leonard, (NMNH); PASCO CO.: New Port Richey, 7-X-38, Oman, (NMNH); PINELLAS CO.: 12-11-29, B. P. Moora, (NMNH); Cabbage Key, 24-X-63, F. W. Mead, (RMB); Clearwater, 29-IV, (AMNH); Dunedin, 10-III-1927, W. S. Blatchley, (NMNH); same, 7-X-38, Oman, (NMNH); Safety Harbor, 25-IV-55 R. P. Esser, (FSCA); St. Petersburg, 1-VII-54, C. V. Reichart, (JAS); POLK CO.: 26-III-54, F. W. Mead, (FSCA); Davenport, 19-X-48, J. Soowal, (FSCA); Lake Wales, 24-III-1923, E. M. Craighead, (NMNH); Lakeland, 10-XI-11, (AMNH); same, 14-XII-49, C. V. Reichart, (JAS); PUTNAM CO.: 2 mi NW of Orange Springs, 1-3-VIII-75, (blacklight trap), D. Bowman, (RMB); same, 13-X-5-XI-75, (malaise trap), J. Wiley, (RMB); same, 27-VIII-10-IX-75, (RMB); 28-IV-54, H. A. Denmark, (FSCA); 31-I-57, F. W. Mead, (RMB); Crescent City, 23-IV-08, Van Duzee, (AMNH); SARASOTA CO.: Siesta Key, 19-VIII-66, R. Allen, (JAS); Venice, 8-X-38, Oman, (NMNH); SEMINOLE CO.: 23-XI-29, B. D. Hires, (NMNH); Geneva, 11-V-60, C. O. Yautze, (RMB); Sanford, 26-IV-08, Van Duzee, (AMNH); same, 28-IV-08 (AMNH); same, 3-V-08, (AMNH); same, E. D. Ball 1925, (NMNH); ST. JOHNS CO.: Guano Wildlife Management Area, 15-IV-64, F. W. Mead, (RMB); Hastings, 3-III-27, Leonard, (NMNH); SUWANNEE CO.: Live Oak, 31-VII-56, F. W. Mead, (RMB). TAYLOR CO.: 18 mi W Perry 4-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); UNION CO.: 22-VIII-54, F. W. Mead, (RMB); RT 241, Santa Fe Rd, 19-X-60, F. W. Mead, (RMB); VOLUSIA CO.: Deland, 27-III-67, M. A. Deyrup, (AMNH); WAKULLA CO.: 1 mi N. Spring Cr., 19-VI-73, (UV trap), C. W. O'Brien, (JAS); 2 mi N. Live Oak Point, 7-VIII-73, Marshall & Kaplan, (JAS); Shell Point Beach, 3-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); St. Marks, 14-VI-76, F. W. Mead, (RMB); same, 16-XI-59, (FSCA); Wakulla Springs, 3-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS);

WASHINGTON CO.: 5 mi E. Chipley, 31-VIII-60, (blacklight trap), W. C. Rhodes, (RMB); 5 mi E. Chipley, 31-VIII-60, (blacklight trap), W. C. Rhodes, (RMB).

PERIGENES Distant 1893

Perigenes Distant 1893:396.

Type Species: *Perigenes dispositus* Distant 1893. Monobasic.

The members of this genus are dull colored, robust elongate-oval, long legged myodochines. The posterior tibiae possess long setose hairs. The species resemble robust members of *Zeridoneus* and *Froeschneria*.

Three species are currently recognized, one known from Guatemala, a second occurring in the northeastern states and a third widespread in the southern United States including Florida.

PERIGENES SIMILIS Barber (fig. 90, map LXXXX)

Perigines (sic) similis Barber 1906:276.

Diagnosis: Moderately large, heavily bodied. Head, anterior pronotal lobe, scutellum and ventral surfaces dull black. Posterior pronotal lobe and hemelytra dull brownish with numerous yellow hairs present.

It is closely related to the more northern *P. constrictus* (Say), but may readily be distinguished by the relatively much shorter 2nd antennal segment which is not longer than the 4th, whereas in *constrictus* the 2nd antennal segment is 1.5 times the length of the 4th. This is an entirely macropterous species. It is sexually dimorphic, the males having the entire legs and 1st antennal segment pale yellowish, whereas females have the femora and 1st antennal segment with the exception of the extreme proximal and distal ends black or dark chocolate brown.



Fig. 90. *Perigenes similis*

Biology: Little has been reported in the literature. It appears to be associated with ruderal exposed sites such as vacant lots, roadsides and fields. It probably resembles its northern congener *constrictus* in preferring somewhat mesic conditions. Blatchley (1926) reported it under the name *constrictus* as being collected by beating dead leaves of cabbage palmetto and by sifting weed debris. It frequently comes to lights.

Distribution: The general range is southern from Florida westward across the southern states to Texas and New Mexico. It has been reported as far north as Missouri and the Carolinas.



Map LXXXX. Distribution of *Perigenes similis*

Florida Distribution: Reported by Hussey (1952) from Lakeland and by Blatchley (1926) as *constrictus* from Dunedin, and by Uhler (1876) as *Ligyrocoris constrictus* without definite station. ALACHUA CO.: Flagler Beach, 23-X-65, F. W. Mead, (RMB); Gainesville, 1-VI-59, (at light), H. V. Weems, Jr., (RMB); same, 4-VI-59, (RMB); same, 17-V-66, (blacklight trap), J. W. Perry,

(RMB); same, 23-V-60, (at light), R. E. Woodruff, (RMB); same, 27-V-59, (at light), H. V. Weems, Jr., (RMB); same, Doyle Connor Building, 2-4-V-75, (blacklight trap), F. W. Mead, (RMB); same, 23-25-V-75, (RMB); same, 9-11-V-75, (RMB); BAKER CO.: Olustee, 2-4-VII-66, (blacklight trap), E. P. Merkel, (RMB); BREVARD CO.: 24-IV-54, H. V. Weems, Jr., BROWARD CO.: Golden Beach, 18-X-50, (FSCA); DADE CO.: 25-VII-49, (FSCA); VIII-49, (FSCA); Coral Gables, 14-IX-46, J. A. Tierney; Homestead, 24-IX-56, R. M. Baranowski, (RMB); same, 29-IX-56, (RMB); same, 8-X-56, (RMB); same, 24-XI-74, J. A. Slater, (JAS); same, 20-XI-74, (JAS); same, 26-XI-74, (JAS); same, 29-IX-56, R. M. Baranowski, (JAS); same, 6-VII-68, (JAS); same 25-IX-68, (JAS); same, 29-IX-56, (JAS); same, 5-VIII-68; (JAS); same, 21-IX-68, (JAS); same, 16-VIII-68, (JAS); same, 27-VII-68, (blacklight trap), R. M. Baranowski, (RMB); same, 12-IX-69, (RMB); same, 27-X-70, (RMB); same, 21-IX-68, (RMB); same, 23-VIII-68, (RMB); same, 16-VIII-68, (RMB); same, 27-VII-68, (RMB); same, 18-V-69, (RMB); same, 21-IX-69, (RMB); same, 26-VIII-69, (RMB); same, 22-VIII-69, (RMB); same, 30-IX-69, (RMB); same, 11-VIII-68, (RMB); same, 6-VIII-68, (RMB); same, 5-VIII-68, (RMB); same, 31-VIII-68, (RMB); same, 25-IX-68, (RMB); same, 16-VIII-68, (RMB); same, 7-X-68, (RMB); same, 20-VIII-68, (RMB); same, 30-VIII-69, (RMB); same, 1-X-69, (RMB); Naranja, 4-IX-62, R. M. Baranowski, (RMB); same, 21-IX-62, (RMB); same, 3-IX-62, (RMB); Subtropical Experiment Station, Waldin Drive, 24-III-70, (blacklight trap), R. M. Baranowski, same, 21-IX-69, (RMB); GADSDEN CO.: Chattahoochee, 4-VI-55, (taken at light), R. F. Hussey, (FSCA); HIGHLANDS CO.: Nr. Avon Park, 7-XI-61, T. Morse, (AMNH); HENDRY CO.: Clewiston, 17-VIII-83, J. M. Benton, (FSCA); MARION CO.: Silver Springs, 4-VI-69, J. Slater, T. Schuh, J. Harrington, (at light), (JAS); MONROE CO.: Big Pine Key, 26-III-73, C. W. & L. B. O'Brien, (JAS); Stock Island, 7-XI-62, (blacklight trap), F. A. Buchanan, (RMB); ORANGE CO.: Winter Park, 10-IV-44, (at light), H. T. Fernald, (FSCA); Same, 22-VI-44, (FSCA); same, 4-VII-42, (FSCA); POLK CO.: Lakeland, 19-VII-51, (at light), R. F. Hussey, (FSCA); same, 5-V-48, (FSCA); SEMINOLE CO.: Junction, Hwy. 46, Wekiwa Rd., 26-I-74; C. W. O'Brien & G. B. Marshall, (JAS); VOLUSIA CO.: 4-VIII-56, H. A.

Denmark, (RMB); WASHINGTON CO.: 5 mi E. Chipley, 31-VIII-60, (blacklight trap), W. C. Rhodes, (RMB).

PRYTANES Distant 1893

Prytanus Distant 1893:401.

Exptochiomera Barber 1928a:175.

Type Species: *Lygaeus (Beosus) minimus* Guerin-Meneville 1857. By original designation.

The members of this genus are small, short legged myodochines usually with both pronotal lobes punctate and the body either glabrous, sericeous or at most sparsely pilose. The antennae are filiform, lacking incrassate development of the 3rd and 4th segments that occur so frequently in the other genera of small short legged myodochines. The males usually lack a post median spine on the fore tibia.

Sometimes only macropterous forms are known, indicative of the adaptation of the various species to relatively temporary habitats. Most North American literature is under the name *Exptochiomera* which Harrington (1980) has shown to be a junior synonym.

The genus is widely distributed in the Neotropical and southern Nearctic regions. Thirteen species are known of which eight have been reported north of Mexico. Four species have been reported from Florida.

KEY TO FLORIDA SPECIES OF PRYTANES

1. Transverse constriction between pronotal lobes shallow, not sharply defined (fig. 91); anterior lateral corial margins straight *intercisa*, p. 172
- 1'. Transverse constriction between pronotal lobes sharply defined (fig. 92); anterior lateral corial margins concavely arcuate at level of posterior end of scutellum 2

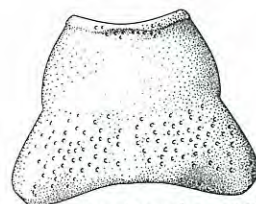


Fig. 91. *Prytanus intercisa*, pronotum

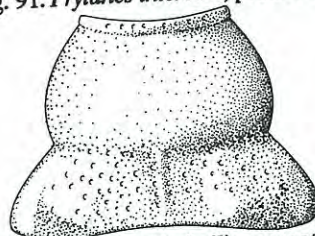


Fig. 92. *Prytanus dissimilis*, pronotum

2. Anterior tibia of male with a post-median spine. *confusa*, p. 176
- 2'. Anterior tibia of male mutic (but sometimes swollen at distal end 3
3. Anterior femora except distal and proximal ends castaneous; 1st antennal segment exceeding tylus by nearly 1/2 its length. *dissimilis*, p. 170
- 3'. Anterior femoral unicolorous stramineous; 1st antennal segment scarcely exceeding apex of tylus ... *minima*, p. 174

PRYTANES DISSIMILIS (Barber) (fig. 92, 93, map LXXXXI)

Exptochiomera dissimilis Barber 1953a:22.
Prytanus dissimilis Harrington 1980:87.

Diagnosis: Head, pronotum most of scutellum (bicolored) black. Interocular space twice width of eye. Anterior pronotal lobe about 1/4 longer than posterior lobe. Dorsal surface somewhat shining and sparsely sericeous.

The relatively shorter anterior pronotal lobe and the bicolored scutellum will separate this species from *confusa* to which it is closely related.

Biology: Nothing has been reported of its biology other than Barber's (1953) note of taking it at light and Sweet's (1964) comment that in south Florida it exhibits a crepuscular and early evening activity rhythm.

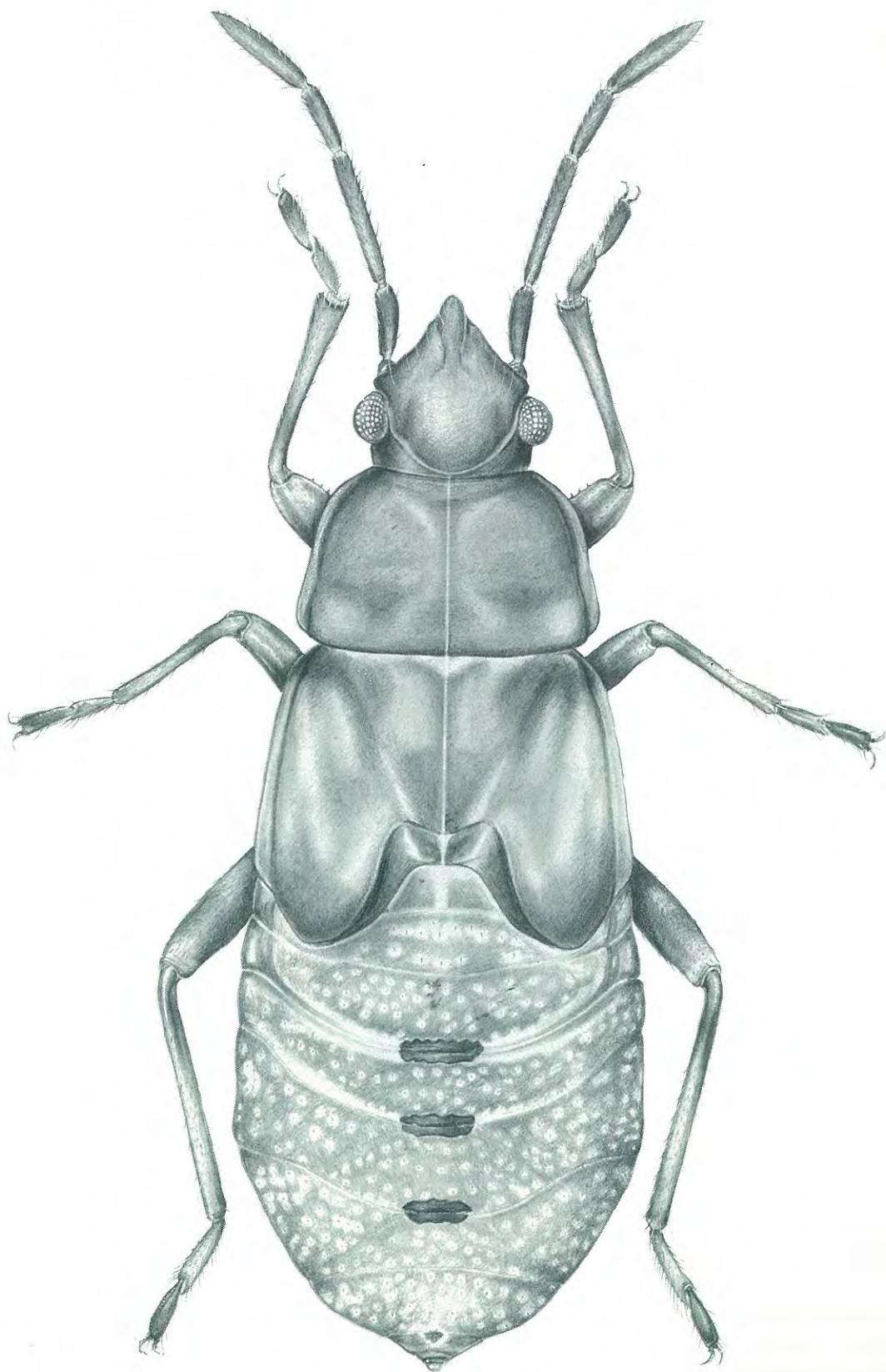


Fig. 93. *Prytanus dissimilis*, fifth instar

Distribution: Known only from Cuba, Puerto Rico, the Bahamas and Florida.



Map LXXXI. Distribution of *P. dissimilis*

Florida Distribution: Barber's (1953) holotype was from Everglade and paratypes from Ocean Beach, Miami, Homestead, La Belle, Paradise Key, and Key West. BROWARD CO.: Ft. Lauderdale, M. Bates (as *albomaculatus*) (AMNH); COLLIER CO.: Everglade, V-12, William T. Davis, (NMNH); DADE CO.: 26000 SW 197 Ave, 6-V-77, (blacklight trap), R. M. Baranowski, (RMB); Homestead, 28-II-18, A. Wetmore, (NMNH); same, 11-VIII-68, (blacklight trap), R. M. Baranowski, (RMB); same, 12-V-69, (RMB); same, 18-XI-68, (RMB); same, 11-VIII-68, R. M. Baranowski, (JAS); Naranja, 23-V-62, R. M. Baranowski, (RMB); same, 9-IV-62, (RMB); same, 16-V-62, (RMB); same, 16-V-62, (JAS); Ocean Beach, Miami 23-XI-13, William T. Davis, (NMNH); Paradise Key, 28-II-19, H. Barber, (NMNH); MONROE CO.: Big Pine Key, 30-XI-61, J. Slater, T. Woodward, M. Sweet. (JAS); same,

Key Deer Refuge, 15-XI-82, (blacklight trap), S. Klett, (RMB); Everglades National Park, 5-IV-58, R. E. Woodruff, (JAS); same, 27-II-72, (blacklight trap), R. M. Baranowski, (RMB); same, 5-IV-58, (at light), H. V. Weems, Jr., (RMB); same, (JAS); same, Flamingo Prairie, 10-VI-69, J. A. Slater, T. Schuh, J. Harrington, (JAS); same, 8-IV-72, (blacklight trap), R. M. Baranowski, (RMB); same, 4-V-70, (RMB); same, 12-VI-69, (RMB); same, 28-III-70, (RMB); same, 21-IV-72, (RMB); same, Flamingo, 10-V-66, (at light), F. C. Craighead, (RMB); Key Largo 26-II-56, (at light), R. A. Morse, (RMB); same, 31-I-59, (at light), H. V. Weems, Jr., (RMB); same, 25-II-56, (at light), H. V. Weems, Jr., (RMB); same, 26-II-56, (at light), H. V. Weems, Jr., (RMB); same, 27-XI-55, (at light), H. V. Weems, Jr., (RMB); N. Key Largo Key, 19-V-77, R. M. Baranowski, (RMB); same, 6-V-77, (RMB); same, 11-V-77, (RMB); Plantation Key, 26-II-56, (at light), R. A. Morse, (RMB); same, 3-V-57, (at light), F. W. Mead, (RMB); same, (JAS); Stock Island, 13-17-VII-84, (blacklight trap), J. Bunch, (RMB); same, 26-29-VI-84, (RMB); same, 6-IX-84, (RMB); same, 5-VIII-62, (blacklight trap), F. A. Buchanan, (RMB); same, 21-V-68, (RMB); VOLUSIA CO.: 1-VIII-56, (at light), H. A. Denmark, (RMB). DRY TORTUGAS, Garden Key, 12-VII-63, H. V. Weems, Jr., (RMB); same, 10-VII-63, (blacklight trap), H. V. Weems, Jr., (RMB); same, Loggerhead Key, 6-VI-62, (blacklight trap), H. V. Weems, Jr., (RMB).

PRYTANES INTERCISA (Barber) (fig. 91, 94, map LXXXII)

Exptochiomera intercisa Barber 1932:357.
Prytanus intercisa Harrington 1980:87.

Diagnosis: Relatively large (4.4). Transverse pronotal impression shallow, incomplete. Anterior lobe strongly tapered, about 2.5 times as long as posterior lobe.

Biology: Nothing appears to be known of its biology, but from its habitus one might anticipate an unusual habitat.

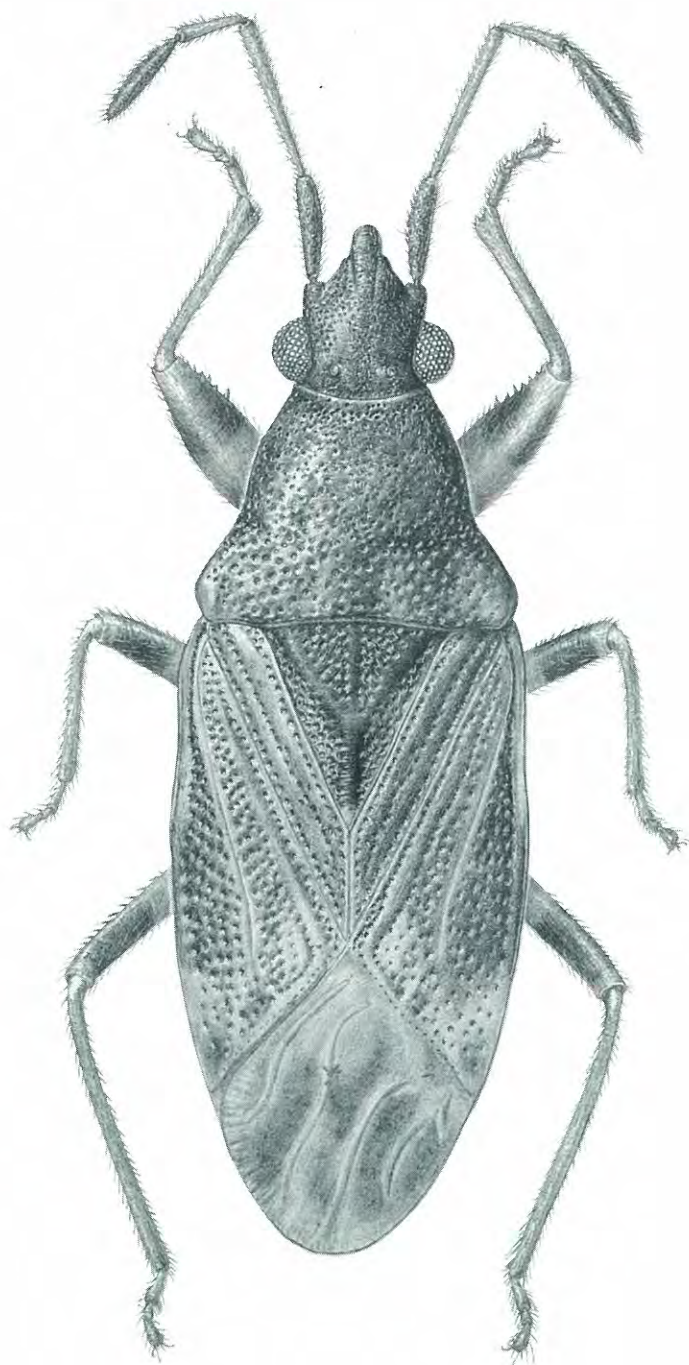


Fig. 94. *Prytanus intercisa*

Distribution: Originally described from Cuba (holotype) and Florida. The Florida record was a female paratype in the USNM collection labelled "Florida" and "*Ligyrocoris intercisus* Uhler." Although Barber (1953a) again listed it from Florida it was still without definite locality and to our knowledge it has not been reported in the literature from a definite locality. Barber (1953a) reported it from Arkansas and Louisiana, thus it must be widespread in the southeastern states.



Map LXXXII. Distribution of *P. intercisus*

Florida Distribution: A female in the Slater collection bears 3 labels as follows: (1) "L. Worth 2/6 1887 Fla."; (2) "*Ligyrocoris intercisus* Uhler det. by Uhler"; (3) "*Exptochiomeria* (*Ptochiomeria*) n. sp. Det. H. G. Barber." Unfortunately Slater can no longer remember how this specimen came into his possession, but possibly from Mr. Barber who must have seen it only subsequent to 1932. BREVARD CO.: Titusville, (on *Sesuvium*) 26-VI-86, (RMB); BROWARD CO.: Andytown, 19-VI-62, H. V. Weems, Jr., (RMB); DADE CO.: Grossman Hammock State Park, 24-V-72,

(blacklight trap), R. M. Baranowski, (RMB); Homestead, 11-IV-69, (blacklight trap), R. M. Baranowski, (RMB); same, 16-XII-74, J. A. Slater, (JAS); Naranja, 23-V-62, R. M. Baranowski, (RMB); Subtropical Experiment Station, Waldin Drive, 17-IV-7?, (blacklight trap), R. M. Baranowski, (RMB); VI-49, (RMB); HIGHLANDS CO.: Nr. Avon Park, 7-XI-61, T. Morris, (AMNH); LEVY CO.: 9-IX-55, (at light), H. V. Weems, Jr. (FSCA); MARION CO.: Silver Springs, 4-VI-69, Slater. Schuh, Harrington, (JAS); MONROE CO.: Big Pine Key, 18-VII-73, C. W. O'Brien, (JAS). UNKNOWN CO.: Everglades Natural Park, 19-VII-73, O'Brien & Marshall, (JAS).

PRYTANES MINIMA (Guerin)
(fig. 95, map LXXXIII)

Lygaeus (*Beosus*) *minima* Guerin-Meneville
1857:398.

Exptochiomeria minima Barber 1928a:176.

Prytanus minima Harrington 1980:87.

Diagnosis: Small (usually under 3), reddish brown. Third antennal segment, particularly in males somewhat thickened see (*Sisamnes contractus*).

Macropters usually have the lateral margins and a broad vitta midway between the margin and median line pale, the former with a dark brown macula on the humeral angle. The hemelytra are variegated on the corium with the membrane hyaline and weakly suffused with brown. The legs are nearly uniformly pale yellow. Males have the anterior pronotal lobe noticeably more strongly swollen than do the females.

Coleoptery is common with the corium elongated to reach laterally onto the 7th abdominal tergum and with inward directed and overlapping membranes present. However, in a random sample of 62 specimens from Key Largo the usual condition of flightless predominance in species in which it occurs does not hold. This sample contained 19 macropterous males and 15 coleopters and 15 macropterous females and 13 coleopters. This essentially 50:50 ratio is unusual if not an artifact of sampling error. We have examined 2 specimens from Key Largo with

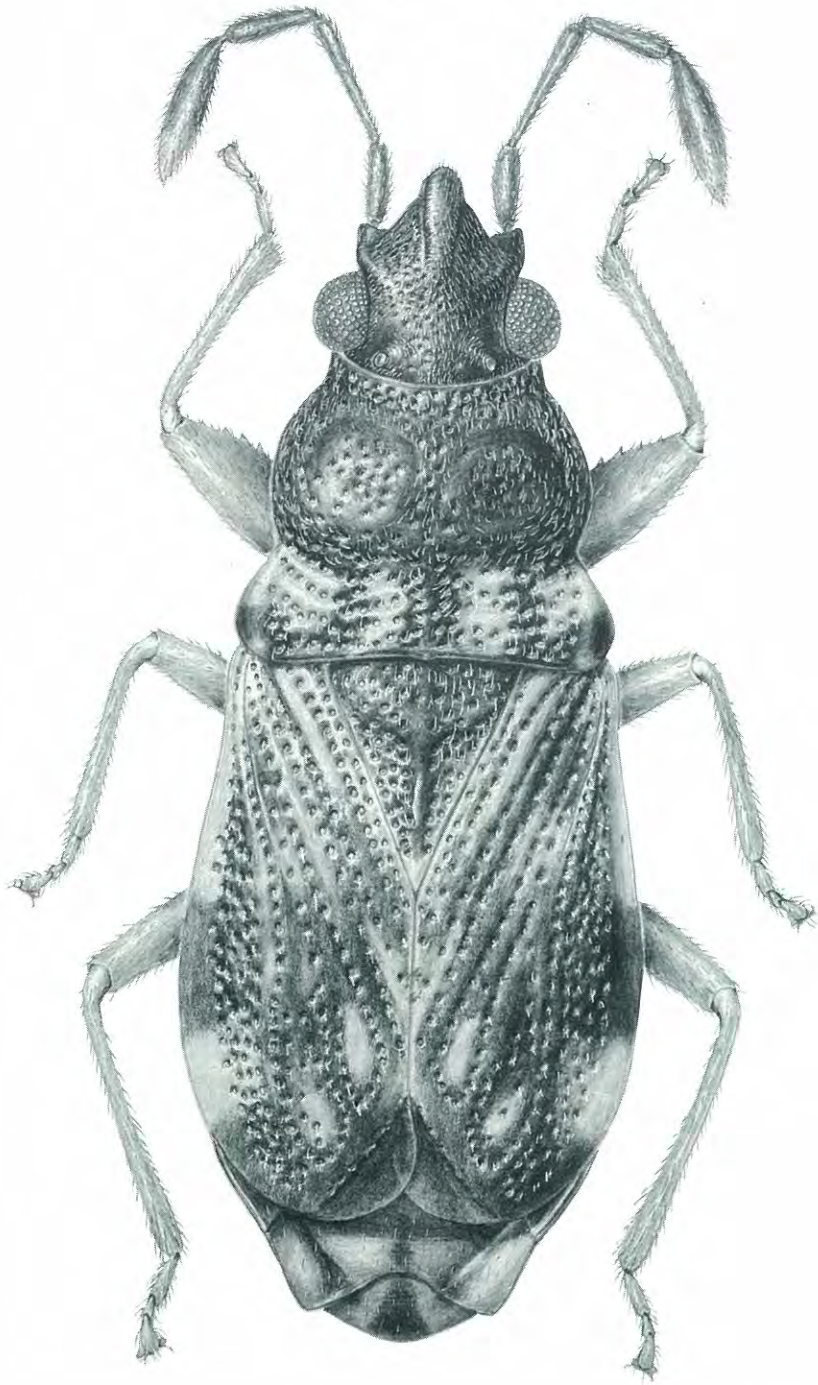


Fig. 95. *Prytanus minima*

antennal oligomery, one of the left antenna, the other of the right. In both cases the 3rd (terminal) segment is strongly fusiform and much elongated.

The status of *P. minima* in Florida has been the subject of considerable confusion. It is easily misidentified as *Sisamnes contractus*. In addition Barber (1953) referred previous records of *minima* from Florida to *P. confusa* n. sp. However, a year later (1954) Barber stated that *minima* does occur in Florida. Barber's (1954) paper must have been written after the 1953 paper in which *confusa* was first described as he refers to *confusa* in the 1954 paper. As noted under the discussion of *confusa*, we have not seen a specimen of that species from Florida. Thus, while specimens of *minima* reported from Florida prior to 1953 will, if still extant, need to be reexamined, they almost certainly do not pertain to *confusa* and must be tentatively accepted as authentic.

Biology: Nothing has been reported.

Distribution: Originally described from Cuba and subsequently reported from the Bahamas, Caymans, Hispaniola, Puerto Rico and Florida.

Florida Distribution: Reported by Barber (1914) from Titusville, Everglade, Miami and St. Augustine; by Blatchley (1926) from Chokoloskee and Moore Haven and by Torre-Bueno (1931) from Royal Palm Park. BREVARD CO.: Titusville, 8-XI-11, (AMNH); DADE CO.: Homestead, 16-XII-74, J. A. Slater, (JAS); same, 18-V-69, (blacklight trap), R. M. Baranowski, (RMB); same, 2-VI-69, (RMB); same, 5-X-68, (RMB); Naranja, 24-VII-60, R. M. Baranowski, (RMB); Everglades National Park, 19-VII-79, O'Brien & Marshall, (JAS); BROWARD CO.: Andytown, 19-VII-62, H. V. Weems, Jr., (JAS); PALM BEACH CO.: Lake Worth, 6-II-1887, (JAS); MONROE CO.: Big Pine Key, 18-VII-73, C. W. O'Brien, (JAS) same, 30-XI-61, (JAS); N. Key Largo Key, 19-IV-77, R. M. Baranowski, (RMB); same, (JAS); same, 16-V-77, (RMB); same, 11-V-77, (RMB); same, 3-I-68, (RMB); same, 11-II-81, (RMB); Key Largo, 30-XI-70, J. A. Slater, (JAS); same, 31-XII-68, Slater & Baranowski, (JAS); same, 1-I-69, (JAS); Stock Island, 26-29-VI-84, (blacklight trap), J. Bunch, (RMB); Everglades National Park, Snake Bight

Trail, 10-VI-69, Baranowski, Slater, Schuh, Harrington, (JAS).



Map LXXXIII. Distribution of *P. minima*

PRYTANES CONFUSA (Barber)

Exptochiomera confusa Barber 1953a:21.
Prytanus confusa Harrington 1980:87.

Diagnosis: Small (3.73), shining, sparsely sericeous. Body straw colored with head, anterior pronotal lobe, scutellum, corial fascia and antennal segments 1 and 4 dark reddish brown. Anterior pronotal lobe nearly 1/3 longer than posterior.

Distribution: Reported from Florida and Texas southward to at least Ecuador, Cuba and the Bahamas. Records of *minima* (Guerin) from North America prior to 1953 were referred by Barber (1953) to this species. As noted below a

under the discussion of *minima* we do not believe this to be correct.

Florida Distribution: Barber (1953a) reported a paratype of *confusa* from Homestead. We have not seen an authentic specimen of *confusa* from Florida and feel that until Barber's paratype is reexamined, it must remain a questionable species in Florida even though we include this species in the key.

PSEUDOCNEMODUS Barber 1911

Pseudocnemodus Barber 1911:25-26.

Type Species: *Pseudocnemodus bruneri* Barber 1911 = *Pterometus canadensis* Provancher 1886. Monobasic.

This genus is particularly noteworthy because of the striking stridulitrum on the sides of the prothorax. The body is elongate with a porrect head. Ocelli are present and the posterior pronotal lobe is elongate, slender and rounded. Only a single species is known.

PSEUDOCNEMODUS CANADENSIS (Provancher) (fig. 67, 96, map LXXXXIV)

Pterometus canadensis Provancher 1886:84-85.

Pseudocnemodus bruneri Barber 1911:26.

Pseudocnemodus canadensis Van Duzee 1912:320.

Diagnosis: Small (5.6), shining dark reddish brown. Lateral corial margins, often posterior pronotal lobe and particularly humeral angles pale. Head and anterior pronotal lobe usually dark brown to nearly black.

Biology: Sweet (1964) has studied the biology in New England. There he found it typically on dry overdrained slopes especially on edge habitats between forests and old fields. These areas were dominated by low bunch forming grasses. Such

habitats undergo slow succession probably accounting for the development of a flightless morph.

Sweet notes ant mimicry by both adults and nymphs. It is parasitized by a tachinid, *Catharosia* sp.

In the north overwintering is in the egg stage. Both univoltine and bivoltine conditions are known.

Frequently the corium is elongated and the membrane reduced to a large flap that does not extend posteriorly beyond the apex of the corium producing a somewhat coleopteroid appearing wing.

Distribution: Essentially a northern species, the most southerly previous record being from North Carolina.

Florida Distribution: DUVAL CO.: 1919, (NMNH); MARION CO.: Silver Springs, 4-VI-69, J. A. Slater (JAS).



Map LXXXXIV. Distribution of *P. canadensis*

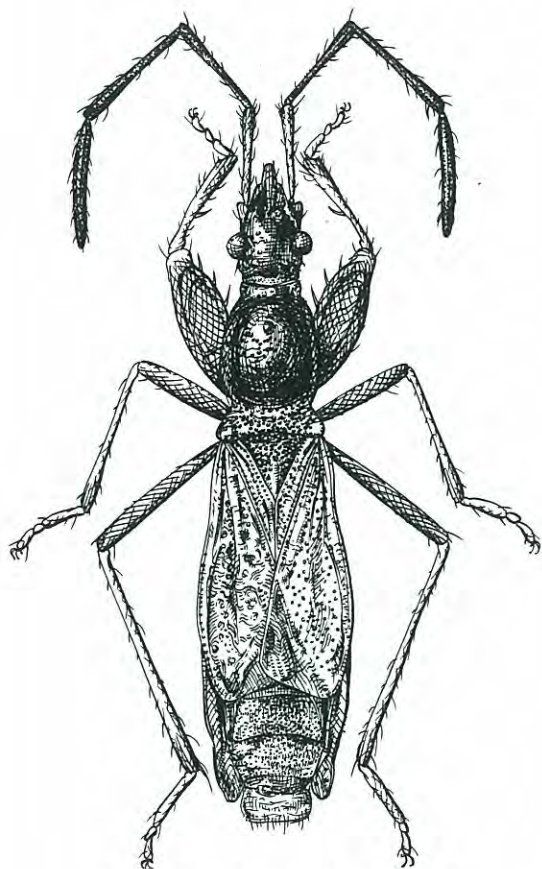


Fig. 96. *Pseudocnemodus canadensis*

PTOCHIOMERA Say 1831

Ptochiomera Say 1831:335 (Leconte Ed.).

Type Species: *Ptochiomera nodosa* Say 1831.
Monobasic.

This genus resembles *Carpilis* in having strongly incrassate antennal segments, a light testaceous or yellowish corium contrasting strongly with the dark head and anterior pronotal lobe and the anteriorly straight lateral corial margin. In *Ptochiomera* the 2nd antennal segment is considerably more incrassate than segment 4 and the males have the anterior tibiae mutic.

Only a single widely distributed North American species is known, although Sweet (1964) mentions an undescribed South American species. In the past many species have been included in *Ptochiomera*; most North American species are now in *Prytanus*, *Carpilis*, *Sisamnes*, and *Valonetus*.

PTOCHIOMERA NODOSA Say (fig 97, map LXXXXV)

Ptochiomera nodosa Say 1831:335-336 (Leconte Ed.).

Aphanus clavatus Dallas 1852:560.

Diagnosis: Small (3-3.5), body shining, almost completely glabrous. Anterior pronotal lobe swollen, black contrasting strongly with pale posterior lobe and hemelytra.

Both brachypters and macropters are known.



Map LXXXXV. Distribution of *P. nodosa*

Biology: Sweet (1964) has carefully studied the life history of this species in southern Connecticut. He found it to be an inhabitant of temporary habitats such as roadsides and parking lots. It feeds on seeds of *Rumex*, *Agropyron repens* (L. Beauv.) and *Plantago*. Overwintering is apparent in the adult stage, and there appears to be several generations a year. Sweet also noted a tendency

for this species to be gregarious and exhibiting a crepuscular activity cycle. Wheeler (1981) reported large numbers of adults and nymphs feeding on the seeds under mats of *Euphorbia maculata* L.

Distribution: Widely distributed from southern New England west to Iowa and south to Florida, Texas and Mexico.

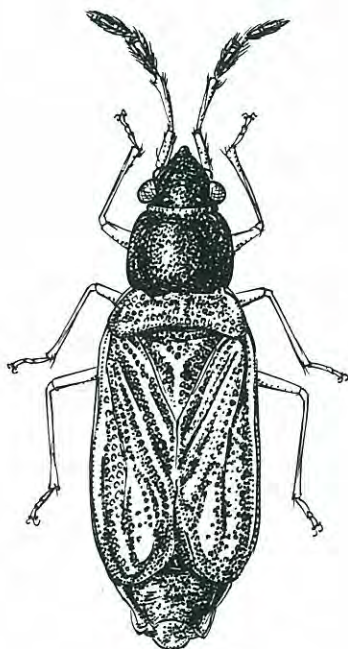


Fig. 97. *Ptochiomera nodosa*

Florida Distribution: Reported by Uhler (1876) from Florida without definite station; by Van Duzee (1909) from Crescent City; by Barber (1914) from Jacksonville, Lake Worth, Biscayne Bay and Titusville; by Blatchley (1926) from Moore Haven, Royal Palm Park and Dunedin and by Hussey (1952) from Lakeland. ALACHUA CO.: 15-VIII-55, H. V. Weems, Jr., (FSCA); 27-VIII-54, H. V. Weems, Jr., (FSCA); Alachua, 15-VIII-55, H. V. Weems, Jr., (FSCA); same, 6-VIII-55, H. V. Weems, Jr., (FSCA); Gainesville 26-V-57 F. W. Mead, (FSCA); same, 2-VII-56, F. W. Mead, (RMB); same, 21-I-54, F. W. Mead, (FSCA); same, 6-VII-38, R. Hussey, (FSCA); same, 18-VI-59, (at light), H. V. Weems, Jr., (RMB); same, 18-VII-66, (at light), Ladonia O'Berry, (JAS); same, 18-VII-

66, (RMB); same, 12-15-VI-66, (RMB); same, Doyle Connor Building, 11-VI-74, (blacklight trap), F. W. Mead, (RMB); same, 2-VI-73, (RMB); same, 11-VI-74, (RMB); BAKER CO.: Olustee, 2-4-VII-66, (blacklight trap), E. P. Merkel, (RMB); same, 22-28-IX-66, (RMB); same, 12-VII-66, (RMB); BREVARD CO.: Titusville, 8-XI-11, (AMNH); same, 26-VI-86, (FSCA); BROWARD CO.: 20 mi SW Hialeah, on Hwy. 27, 17-VII-73, C. W. O'Brien, (JAS); COLLIER CO.: Ochoppee, 26-V-76, (UV Trap), C. W. O'Brien & Marshall, (JAS); Seminole State Park, 13-XI-72, C. W. & L. B. O'Brien, (JAS); DADE CO.: Biscayne Bay, A. T. Slosson, (AMNH); Homestead, 21-XI-56, R. M. Baranowski, (JAS); same, 28-IX-68, (blacklight trap), R. M. Baranowski, (RMB); same, 25-IX-68, (RMB); same, 16-VIII-68, (RMB); same, 31-VIII-68, (RMB); same, 21-IX-68, (RMB); same, 7-X-68, (RMB); same, 5-X-68, (RMB); same, 11-VIII-68, (RMB); same, 23-VIII-68, (RMB); same, 26-VIII-68, (RMB); same, 9-IX-68, (RMB); same, 15-X-68, (RMB); Naranja, 23-V-62, R. M. Baranowski, (RMB); same, 24-VII-60, (RMB); same, 21-VI-59, (RMB); same, 23-V-63, (RMB); same, VI-61, (RMB); Royal Palm Park, 22-VII-48, R. H. Beamer, (NMNH); DUVAL CO.: Jacksonville, A. T. Slosson, (AMNH); GADSDEN CO.: Chattahoochee, 8-VI-55, R. F. Hussey, (FSCA); GULF CO.: 1 mi N. White City, 20-IX-78, C. W. O'Brien & Marshall, (JAS); HIGHLANDS CO.: Archbold Biol. Sta., 7-8-VI-69, (at light), J. Harrington, T. Schuh, J. Slater, (JAS); Nr. Avon Park, 22-VIII-61, T. Morse, (AMNH); JEFFERSON CO.: 2 mi N. Wacissa, (UV trap), 3-VII-73, Marshall & Kaplan, (JAS); Monticello, Big Bend Horticulture Lab, 19-IX-68, (blacklight trap), W. H. Whitcomb, (RMB); LAKE CO.: 3 mi N. Altoona, 5-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); LEON CO.: Tall Timbers Research Station, 19-VIII-68, (blacklight trap), Donny L. Harris, (RMB); same, 8-15-VIII-69, (RMB); Tallahassee, 21-VIII-73, (blacklight), C. W. O'Brien, (JAS); MARION CO.: 9 mi SSW of Ocala, 27-VIII-75, Drummond & Wiley, (RMB); same, 28-VI-75, (blacklight trap), P. C. Drummond, (RMB); Sharpes Ferry Field Station, 2-X-75, (blacklight trap), J. Wiley, (RMB); MONROE CO.: Everglades National Park, Flamingo Prairie, 10-VI-69, R. M. Baranowski, (RMB); same, (blacklight trap), 25-III-70, (RMB); Key Largo, 1-I-69, R. M. Baranowski, J. A. Slater,

(JAS); OKALOOSA CO.: 31-VII-55, F. W. Mead, (FSCA); OKEECHOBEE CO.: Okeechobee, 13-III-39, F. E. Lutz, (AMNH); ORANGE CO.: Apopka, 2-VI-79, S. Mydora, (FSCA); Winter Park, 20-VI-44, (at light), H. T. Fernald, (FSCA); same, 5-X-45, (FSCA); PALM BEACH CO.: 4 mi SE Canal Point, 16-VII-73, C. W. O'Brien, (UV trap), (JAS); PINELLAS CO.: Dunedin, 19-XII-21, W. S. Blatchley, (NMNH); POLK CO.: Lake Alfred, 22-VII-70, M. H. Muma, (RMB); PUTNAM CO.: 2 mi NW of Orange Springs, 13-VIII-75, (blacklight trap), D. Bowman, (RMB); VOLUSIA CO.: Edgewater, 24-II-38, C. A. Frost, (NMNH); WAKULLA CO.: 1 mi N. Spring Creek, 23-VIII-75, (at light), G. B. Marshall, (JAS); 1 mi N. Spring Creek, 7-VII-73, (UV trap), C. W. O'Brien, (JAS); WASHINGTON CO.: 6 mi E. Chipley, 31-VIII-60, (blacklight trap), W. C. Rhodes, (RMB).

SISAMNES Distant 1893

Type Species: *Sisamnes contractus* Distant 1893. Monobasic.

The members of this genus are small thick bodied insects, characterized by the stout strongly incrassate antennal segments, sericeous hairs present dorsally, macropters with a straight lateral corial margin anteriorly and straight male anterior tibiae each of which has a prominent spine present near the distal end. The carinate lateral margin of the posterior pronotal lobe used as a differentiating character between *Sisamnes* and *Prytanes* by Harrington (1980) cannot be used for Florida material.

The Florida species is very similar to and easily confused with *Prytanes minima* (Guerin) since *contractus* has a somewhat less strongly swollen 3rd antennal segment than do the other members of the genus.

Three species are recognized of which one occurs in Florida.

SISAMNES CONTRACTUS Distant 1893 (map LXXXXVI)

Sisamnes contractus Distant 1893:402.

Ptochiomera antennata Van Duzee 1909:172.

Sisamnes puberula Barber (nec Stal) 1928a: 177 (part).

Diagnosis: Small coarsely punctate. Head and anterior pronotal lobe dark brown, posterior lobe with 4-5 irregular dark stripes. Antennae clavate. Hemelytra in macropters yellowish with large dark macula along lateral margins behind middle and a second at the corial apex.

Coleopters are common in which the clavus and corium are fused, the membrane is reduced to a small flap and the wings meet evenly down the midline like those of a small beetle. Of 41 specimens examined, 59% were coleopteroid.

This species is very similar in size, shape and color to *Prytanes minima* (Guerin) and both occur in the macropterous and coleopteroid conditions. When both species are available for study the appreciably thicker 3rd antennal segment of *contractus* is quite apparent, but particularly males of *P. minima* have the segment somewhat enlarged and measurements are critical. Both species are coarsely punctate, yellowish brown insects with similar dark markings on the posterior pronotal lobe, scutellum and hemelytra. *S. contractus* tends to be paler overall than *minima*. In addition to the antennal differences coleopters can be differentiated in that all specimens of *contractus* that we have examined completely lack a wing membrane and have the corium reaching only midway over the 6th abdominal tergum whereas in *P. minima* the corium laterally extends well onto abdominal tergum 7 and along the edge of the sharply angled apical corial margin there is a wing membrane remnant that overlaps the membrane of the opposite wing. In *contractus* males, a definite "tooth" is present distally on each anterior tibia, and in *P. minima*, while the distal end of each anterior tibia is swollen, the area is not clearly differentiated as a definite tooth.

Biology: Van Duzee (1909) took the original Florida specimens from a hot sand bank. Blatchley (1926) reported it from beneath boards along pond margins and from the bases of grass tufts. We have collected it in dry grassy habitats adjacent to damp areas. Wheeler (pers. comm.) has taken nymphs and adults under *Stenodia tomentosa* on sand dunes at Padre Is. Texas.

Distribution: The distribution may be disjunct. Barber (1953) gives the distribution as "occurs in southern Texas, Arizona, Southern California and throughout Mexico and Central America." However Van Duzee (1909) described *Ptochiomera antennata* from Tampa, Fla. Barber (1953) stated he "has not been able to separate Van Duzee's *P. antennata* from Distant's species" and formally synonymizes the two as well as referring Blatchley's (1926) records of *antennata* to *contracta*, thus implying, despite his earlier statement, that he recognized its occurrence in Florida. It has not otherwise been reported from the southeastern states.



Map LXXXVI. Distribution of *S. contractus*

Florida Distribution: *P. antennata* Van Duzee was originally described from Tampa and reported by Barber (1914) from Miami and by Blatchley (1926) from Dunedin and Key West. FRANKLIN CO.: Alligator Point, 18-III-74, (Berlese palmetto under oak litter), C. W. O'Brien & Marshall, (JAS); LAKE CO.: 5 mi E. Cassia Station, 26-III-76,

(Night), O'Brien & Marshall, (JAS); LEE CO.: Lehigh Acres, 17-XII-1986, Z. Smith (slash pine cone) (FSCA). MONROE CO.: Everglades National Park, Flamingo Prairie, 5-XII-74, J. A. Slater, (JAS); same, 10-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); same, 8-IV-70, R. M. Baranowski, (RMB); N. Key Largo Key, 11-V-77, R. M. Baranowski, (RMB); same, 16-V-77, (RMB); PUTNAM CO.: Crescent City, P. R. Uuler, (NMNH); VOLUSIA CO.: Edgewater, 24-II-39, C. A. Frost. (NMNH); same, 5-III-39, (NMNH).

RHYPAROCHROMINI Stal

This tribe is characterized by having the spiracles of abdominal segments 3 and 4 located dorsally, carinate or (frequently) explanate lateral pronotal margins and nymphs with a Y-suture present between abdominal terga 3-4.

It is a very large taxon with a center of abundance in Africa and the Oriental region. It is absent from the Neotropics, and the Nearctic fauna is relatively depauperate.

In Florida it represents a Holarctic element in the fauna.

PERITRECHUS Fieber 1860

Peritrechus Fieber 1860:48, 183.

Pasatus Stal 1872:54.

Type Species: *Beosus angusticollis* Sahlberg 1848. Fixed by Distant 1904.

The members of this genus are small dull colored species with the lateral pronotal margins carinate, no pronotal collar, the anterior pronotal lobe black, the posterior lobe pale and with a pale V-shaped mark on the scutellum.

Species of *Peritrechus* resemble the genus *Sphragisticus* closely in size, color and habitus, but lack explanate and setose lateral pronotal margins.

This is a large genus containing 22 species. Most species are Palearctic in distribution. Four species are known from North

America, two confined to the western states and two widely distributed in the eastern states. One species occurs in Florida.

***PERITRECHUS PALUDEMARIS* Barber**
(fig. 98, map LXXXXVII)

Peritrechus paludemaris Barber 1914:516-517.

Diagnosis: Moderate sized (5-6), dull grayish black and mottled brown. Membrane fuscous. Fourth antennal segment 1.5 times length of the 2nd.

Biology: Sweet (1964) studied the biology of this species in Connecticut. It is restricted to brackish areas and salt marshes where it lives on the ground in litter on slightly raised hummocks of *Spartina patens* (Ait.) Muhl. It is the only ground dwelling lygaeid found far out in salt marshes. There is one generation a year in Connecticut with adults overwintering. The Florida collecting records indicate that it not entirely associated with salt marshes in this state.

Distribution: Ranges along the eastern seaboard from Massachusetts to Florida and west along the Gulf coast at least to Mississippi.

Florida Distribution: Described by Barber (1914) from Everglade; reported by Blatchley (1926) and Torre Bueno (1931) from Royal Palm Park, and by Frost (1975) from Archbold Biological Station (Highlands Co.). BROWARD CO.: Hwy. 27, Saw Grass Recreational Area, 23 mi NW Ft. Lauderdale, 21-V-76, (JAS); DADE CO.: Homestead, 1-III-18, A. Wetmore, (NMNH); same, 2-III-18 (NMNH); same, 20-VII-62, (at light), H. V. Weems, Jr., (RMB); 6-V-49, (FSCA); same, 27-V-70, (blacklight trap), R. M. Baranowski, (RMB); Naranja, 19-IV-62, R. M. Baranowski, (JAS); same, 7-VI-62, (JAS); same, 7-VI-62, (RMB); Paradise Key, 23-II-18, H. S. Barber, (NMNH); HIGHLANDS CO.: Archbold Biological Station, 3-?-64, C. A. Frost, (NMNH); MONROE CO.: Big Pine Key, 19-VII-73, (on *Sesuvium portulacastrum*), C. W. O'Brien, (JAS); Everglades National Park, Flamingo Prairie, 23-III-70, (blacklight trap), R. M. Baranowski,

(RMB); same, 8-IV-72, (RMB); same, 4-V-70, (RMB); same, 28-III-70, (RMB); same, 20-III-70, (RMB); Key Largo, 25-II-56, (at light), H. V. Weems, Jr., (FSCA); Stock Island, 7-XI-62, (blacklight trap), F. A. Buchanan, (RMB); PALM BEACH CO.: 4 mi SE Canal Point, 16-VII-73, (UV light), C. W. O'Brien, (JAS). DRY TORTUGAS, Loggerhead Key, 11-VII-63, (in light trap), H. V. Weems, Jr., (JAS).



Map LXXXXVII. Distribution of *P. paludemaris*

GONIANOTINI Stal 1872

The members of this tribe are usually broad, elliptical species of moderate size. The tribe is characterized by having carinate or explanate lateral pronotal margins with only the spiracles on the 4th abdominal segment located dorsally. Nymphs lack a Y-suture and are unusual

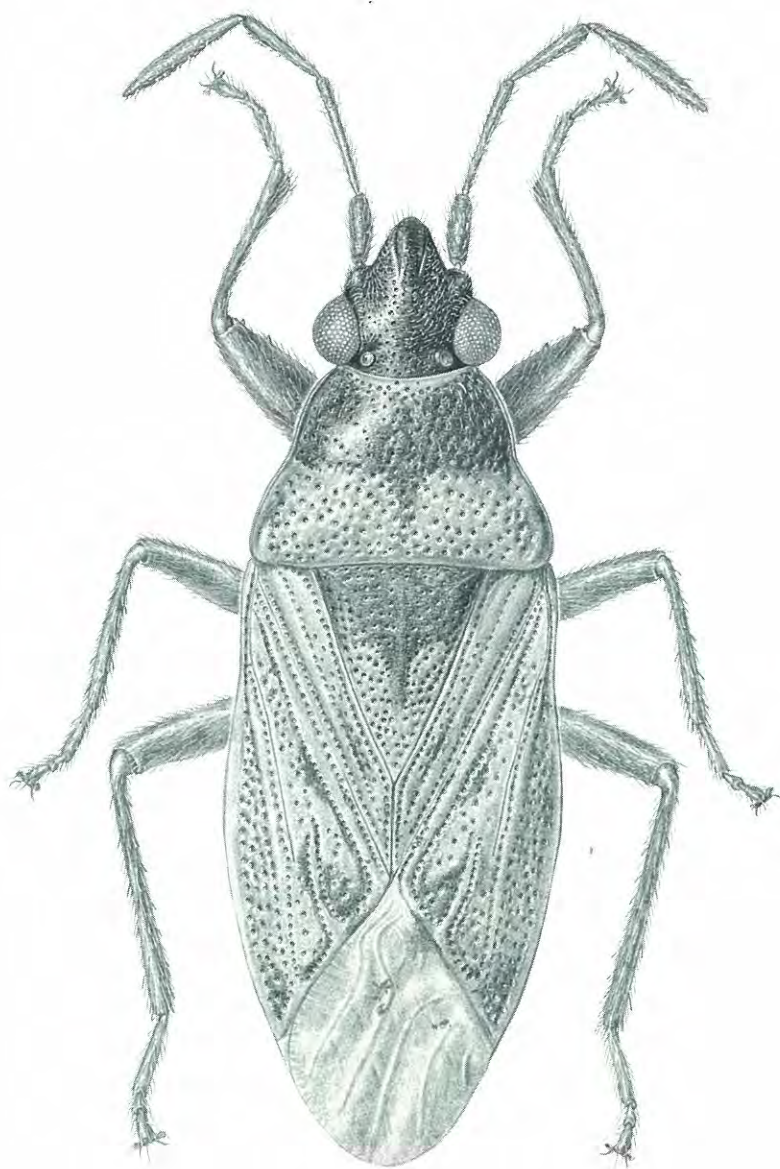


Fig. 98. *Peritrechus paludemaris*

among the Rhyparochrominae in lacking the anterior scent gland openings, these openings are present only between abdominal terga 4-5 and 5-6.

The Gonianotini are essentially a Palearctic group. However they have invaded North America on at least two occasions and far enough in the past to have developed endemic genera. Although known from Central America, the tribe there actually represents a Nearctic element and is absent from the Neotropics proper.

KEY TO FLORIDA GENERA OF GONIANOTINI

1. Explanate lateral margins of pronotum punctate; general color yellowish brown or griseus. *Emblethis*, p. 184
- 1'. Lateral margins of pronotum impunctate; general color of body black. 2
2. Fore femora with spines in two ranks, more than 10 spines present, major spines interspersed with minute spines; veins of membrane reticulate. *Delochilocoris*, p. 185
- 2'. Fore femora with spines in a single rank, no more than 6 spines present, major spines not interspersed with minute spines; veins of membrane simple, not reticulate. *Atrazonotus*, p. 185

EMBLETHIS Fieber 1860

Emblethis Fieber 1860:51, 197.

Platychilus Jakovlev 1874:256-259.

Type Species: *Emblethis platychilus* Fieber 1861 = *Lygaeus verbasci* Fabricius 1803. Fixed by Van Duzee 1917.

The members of this genus are broadly ovoid light yellowish to grayish heavily punctate insects. The lateral pronotal margins are very broadly explanate with the explanate area coarsely punctate. The first 3 antennal segments possess a number of stout bristles.

This is primarily a Palearctic genus with 36 species in that region and a single widely distributed species in North America.

EMBLETHIS VICARIUS Horvath (map LXXXXVIII)

Emblethis vicarius Horvath 1908:563-564.

Diagnosis: Moderately large (6-7), robust. Coarse dark punctures strongly contrasting with pale yellow or grayish ground color.

The species is entirely macropterous. The color is highly variable, so much so that a careful study should be undertaken to determine if a single species is involved. Sweet (1964) noted that when specimens from various North American localities are run through a key to Palearctic species, they run to several different species.

Biology: Sweet (1964) studied the biology of this species in Connecticut. He called it the "sand bug" as it is largely restricted to open sandy habitats such as gravel pits, parking lots, sandy fields, roadsides and frequently on beaches above the high tide line. In southern New England there are 2 generations a year and adults overwinter. It may continue to breed throughout the year in southern Florida as we took nymphs and adults in December at Flamingo Prairie (Everglades National Park). Kumar *et al* (1976) report feeding on cow droppings.

Distribution: Ranges from southern Canada throughout most of the United States and south in the highlands to Guatemala.

Florida Distribution: Reported by Barber (1914) from Atlantic Beach; by Blatchley (1926) from Dunedin and by Wickham (1895) as *Gonianotus marginepunctatus* from Garden Key, Tortugas. FRANKLIN CO.: Alligator Point, 18-VII-76, (on *Sesuvium portulacastrum*), G. B. Marshall, (JAS); INDIAN RIVER CO.: Vero Beach, 26-VIII-86, K. L. Hibbard, (FSCA); Wabasso, 6-II-87, R. H. Kendrick, (FSCA); MONROE CO.: Everglades National Park, Flamingo Prairie, 10-VI-69, J. Slater, T. Schuh, J. Harrington, (JAS); same, 5-XII-74, J. A. Slater, (JAS); Key Largo, 22-I-62, R.

M. Baranowski,(JAS); same, 30-XI-70, J. A. Slater,(JAS); Key West, 17-VI-1-VII, H. F. Wickam, (NMNH); N. Key Largo Key, 18-VI-81, R. M. Baranowski, (RMB); same, 11-VI-69, (RMB); same, 3-XII-61, R. M. Baranowski, (RMB).

DRY TORTUGAS, Bush Key, 13-I-62, (Under dead *Cyperus brunneus* Sw.), F. W. Mead,(JAS); same, 19-I-62, (under dead *Cyperus brunneus*), (RMB); same, Loggerhead Key, 2-IX-61, H. V. Weems, Jr.,(JAS); same,(RMB).



Map LXXXXVIII. Distribution of *E. vicarius*

ATRAZONOTUS Slater & Ashlock 1966

Atrazonotus Slater & Ashlock 1966:152.

Type Species: *Dorachosa illuminatus umbrosus* Distant 1893. Monobasic.

This genus contains a single completely black shining or subshining species with simple

non-reticulate veins in the membrane, the lateral pronotal margins strongly arcuate and narrowly explanate, and with the fore femora bearing a single row of not more than 6 spines. It is closely related to *Malezonotus* and *Delochilocoris*.

ATRAZONOTUS UMBROSUS (Distant) (fig. 99)

Dorachosa illuminatus umbrosus Distant 1893:409.
Atrazonotus umbrosus Slater & Ashlock 1966:152.

Diagnosis: Moderate sized (5-7), body and appendages completely black. Lateral margins of pronotum explanate and arcuate.

Biology: Sweet (1964) has studied the biology in southern New England. He found it chiefly in fully exposed open sub-climax areas with a sparse litter layer. It appears to be a species of new very temporary habitats, even flood wash situations. The temporary nature of the habitats is suggested by the lack of a flightless morph and by the literature records that comment on its relative scarcity (summarized by Sweet 1964). In the north it overwinters as an adult.

Distribution: The distribution is over much of the Nearctic region and south in the mountains to Panama.

Florida Distribution: The presence of this species as a member of the Florida fauna remains to be established. Barber (1914) noted a specimen in the Slosson collection from Florida without definite locality.

DELOCHILOCORIS Begroth 1893

Dorachosa Distant 1893:409 (preocc.).
Delochilocoris Bergroth 1893, p. 154.

Type Species: *Dorachosa illuminatus* 1893. Monobasic.

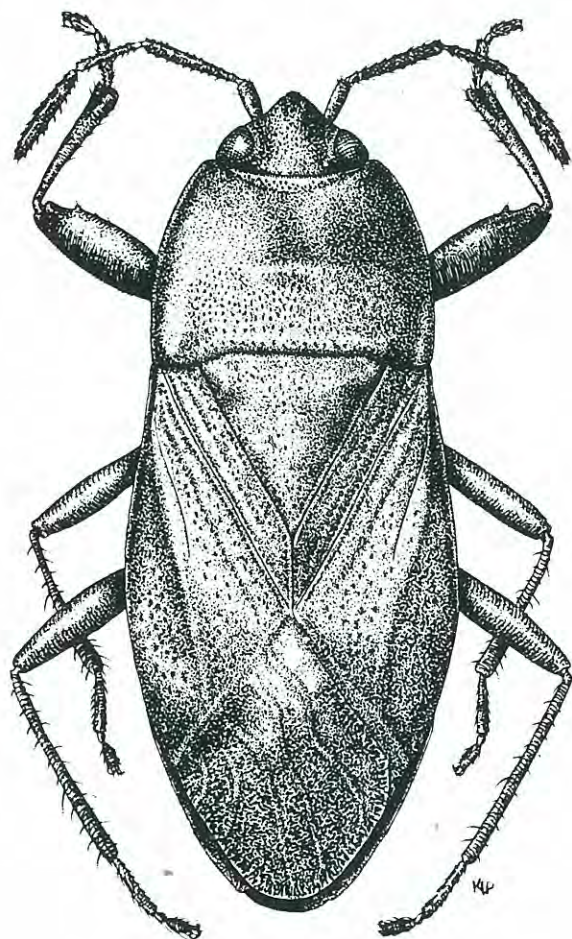


Fig. 99. *Atrazonotus umbrosus*

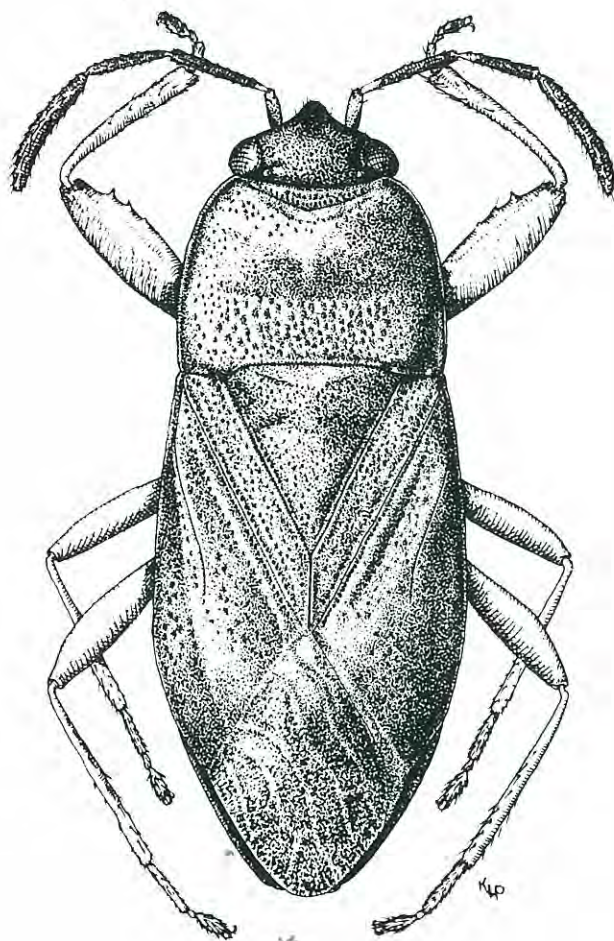


Fig. 100. *Delochilocoris illuminatus*

The members of this genus are moderately large black shining or subshining insects closely resembling the genus *Atrazonotus* Slater and Ashlock, but differing in possessing reticulate veins in the membrane of the fore wing and by having 2 series of spines below on the fore femora with more than 10 spines present.

The genus has 2 species, one confined to the southwest and the second occurring in Florida.

DELOCHILOCORIS ILLUMINATUS (Distant)
(fig. 100, map LXXXXIX)

Dorachosa illuminatus Distant 1893:409.

Delochilocoris illuminatus Bergroth 1893:154.



Diagnosis: Moderately sized (4.5-5.5), shining, with strongly contrasting pale yellow or orange legs and antennae. Entirely macropterous.

Biology: Nothing has been reported on its biology. We collected it on Key Largo in large numbers in a recently cleared field with a dry substrate and scattered rank forbs. The temporary nature of the population was remarkable as in several subsequent visits to the site we failed to locate a single individual. this suggests use of early stage temporary habitats as is true for *Atrazonotus umbrosus* (see above). The type series included specimens of *Atrazonotus umbrosus* and presumably the habitat requirements of both species are similar.

Distribution: Originally described from Mexico and Guatemala and is otherwise known only from Florida.

Florida Distribution: Reported by Barber (1918a) without definite locality; by Blatchley (1926) from Buck Key and by Torre Bueno (1933) from Matecumbe. MONROE CO.: Islamorada, 6-V-61, H. V. Weems, Jr., (RMB); same, (JAS); Key Largo, 27-II-57, H. V. Weems, Jr., (FSCA); same, 30-XI-60, J. A. Slater, M. H. Sweet, R. M. Baranowski, (JAS); same, 30-XI-61, (JAS); N. Key Largo, 8-XII-61, R. M. Baranowski, (RMB); same, 3-XII-61, (RMB).

DRY TORTUGAS, Loggerhead Key, 3-IX-61, H. V. Weems, Jr., (JAS); same, (RMB); same, 30-V-62, (RMB); same, 8-V-61, (RMB); same, (in litter of *Casuarina* sp.), 11-I-62.

UNKNOWN COUNTY: Buck Key, G. F. Brainard, (NMNH).

Map LXXXXIX. Distribution of *D. illuminatus*

LIST OF ASSOCIATED PLANTS

- ACHILLEA SP.
Lygaeus kalmii
 AGROPOGON REPENS
Ptochiomera nodosa
 AIR PLANTS
Ochrimnus tripligatus
 ALDER
Kleidocerys resedae
 ALTHENATHERA PHILOXEROIDES,
Paromius longulus
 AMNOPHILA BREVIGULATA,
Blissus arenarius maritimus
 ANDROPOGON SCOPARIUM
Cnemodus mavortius
Cryphula trimaculata
 ARACHIS HYPOGEA
Nysius raphanus
 ARTEMISIA TRIDENTATA
Nysius tenellus
 ASCLEPIADACEAE
Lygaeinae
 ASCLEPIAS CURASSAVICA
Oncopeltus cingulifer
Oncopeltus fasciatus
 ASCLEPIAS PROCERA
Oncopeltus cingulifer
 ASCLEPIAS SYRIACA
Lygaeus kalmii
 AVOCADO
Antillicoris pilosulus
 AXONOPUS COMPRESSUS
Blissus insularis
 BACCHARIS HALIMIFOLIA
Nysius raphanus
Ochrimnus lineoloides
Ochrimnus mimulus
Oncopeltus fasciatus
Paragonatas divergens
 BACCHARIS NEGLECTA
Lygaeus kalmii
Nysius raphanus
Ochrimnus mimulus
Oncopeltus fasciatus
Oncopeltus sexmaculatus
 BACCHARIS SAROTHROIDES
Nysius raphanus
 BAMBOO
Blissus minutus
Ischnodemus fulvipes
 BETA VULGARIS
Nysius tenellus
 BETULA
Kleidocerys resedae
 BIDENS PILOSA
Neortholomus koreshanus
 BIRCH
Kleidocerys resedae
 BROMELIAD
Ischnodemus fulvipes
 CABBAGE PALMETTO
Heraeus plebejus
Myodocha annulicornis
Perigenes similis
 CACALIA ATRIPLICIFOLIA
Neacoryphus bicrucis
 CACTUS
Pseudopamera aurivilliana
 CAKILE CONSTRICTA
Geocoris floridanus
 CALOTROPIS PROCERA
Oncopeltus fasciatus
 CANNA INDICA
Ischnodemus fulvipes
Lygaeus formosus
 CAREX LUPULINA
Oedancala dorsalis
 CAREX SP.
Cyminae
Neopamera albocincta
Oedancala crassimana
 CAREX VESICARIA,
Cymus angustatus
Cymus discors
Cymus luridus
 CAREX VULPINOIDEA
Oedancala dorsalis
 CASUARINA SP.
Delochilocoris illuminatus
 CATTAILS
Kleidocerys resedae
 CENDRUS INCERTUS
Oedancala cubana
 CHENOPODIUM AMBEROSOIDES
Geocoris punctipes
Geocoris uliginosus
Neopamera bilobata
 CHINESE FAN PALM
Ischnodemus praecultus
 CHRYSANTHEMUMS
Nysius tenellus
 CHRYSOTHAMNUS SPECIOSUS
Nysius tenellus
 CITRUS SINENSIS
Lygaeus formosus

LIST OF ASSOCIATED PLANTS

EA SP.
s kalmii
OGON REPENS
mnera nodosa
NTS
uus tripligatus
rys resedae
ATHERA PHILOXEROIDES,
s longulus
ILA BREVIGULATA,
renarius maritimus
OGON SCOPARIUM
is mavortius
trimaculata
HYPOGEA
phanus
LA TRIDENTATA
vellus
ADACEAE
S CURASSAVICA
s cingulifer
s fasciatus
S PROCERA
s cingulifer
S SYRIACA
ilmii
)
pilosulus
S COMPRESSUS
ularis
S HALIMIFOLIA
vanus
lineoloides
mimulus
fasciatus
s divergens
S NEGLECTA
mii
anus
nimulus
fasciatus
sexmaculatus
SAROTHOIDES
inus
tus
fulvipes
IRIS
is

Kleidocerys resedae
BIDENS PILOSA
Neortholomus koreshanus
BIRCH
Kleidocerys resedae
BROMELIAD
Ischnodemus fulvipes
CABBAGE PALMETTO
Heraeus plebejus
Myodocha annulicornis
Perigenes similis
CACALIA ATRIPLICIFOLIA
Neacoryphus bicrucis
CACTUS
Pseudopamera aurivilliana
CAKILE CONSTRICTA
Geocoris floridanus
CALOTROPIS PROCERA
Oncopeltus fasciatus
CANNA INDICA
Ischnodemus fulvipes
Lygaeus formosus
CAREX LUPULINA
Oedancala dorsalis
CAREX SP.
Cyminae
Neopamera albocincta
Oedancala crassimana
CAREX VESICARIA,
Cymus angustatus
Cymus discors
Cymus luridus
CAREX VULPINOIDEA
Oedancala dorsalis
CASUARINA SP.
Delochilocoris illuminatus
CATTAILS
Kleidocerys resedae
CENDRUS INCERTUS
Oedancala cubana
CHENOPODIUM AMBEROSOIDES
Geocoris punctipes
Geocoris uliginosus
Neopamera bilobata
CHINESE FAN PALM
Ischnodemus praecultus
CHRYSANTHEMUMS
Nysius tenellus
CHRYSOTHAMNUS SPECIOSUS
Nysius tenellus
CITRUS SINENSIS
Lygaeus formosus

CLADIUM JAMAICENSIS
Oedancala cladiumicola
CLADIUM MARISCOIDES
Ischnodemus slossonae
CLADIUM SP.
Ischnodemus praecultus
CONOCARPUS ERECTUS
Ozophora trinotata
CONYZA KARUNINSKALANUS
Ozophora divaricata
CORCHORUS SILIQUOSUS
Craspeduchus pulchellus
CORN
Blissus sp.
COTTON
Geocoris punctipes
CRAB GRASS
Lygaeospilus tripunctatus
CROTON SP.
Neopamera bilobata
CRYPTOSTEPIA GRANDIFLORA
Oncopeltus aulicus
CYNODON DACTYLON
Blissus insularis
CYPERACEAE
Blissinae
Teracrine
CYPERUS ALTERNIFOLIUS
Ischnodemus praecultus
CYPERUS BRUNNEUS
Emblethis vicarius
CYPERUS FLAVUS
Ischnodemus praecultus
CYPERUS ODORATUS
Ischnodemus praecultus
Ischnodemus fulvipes
DIGITARIA DECUMBENS
Blissus insularis
DISTICHILIS SPICATA
Cymodema breviceps
ECHINOCHLOA
Ischnodemus robustus
EGGPLANT
Kleidocerys virescens
ERAGROSTIS CILLARIS
Oedancala cubana
ERECHITES HIERACIIFOLIA
Neacoryphus bicrucis
EREMOCHLOA OPHIUROIDES
Neopamera bilobata
Blissus insularis
Heraeus plebejus

ERIGERON CANADENSIS
Nysius tenellus
ERIGERON QUERCIFOLIUS
Lygaeospilus tripunctatus
Xyonysius californicus
EUPHORBIA MACULATA
Neopamera bilobata
Pseudopachybrachius vineta
Geocoris uliginosus
Myodocha serripes
Ptochiomera nodosa
EYSOTRIUM ADENOPHORUM
Nysius tenellus
FERNS
Ozophora gilva
FESTUCA RUBRA
Cryphula trimaculata
FEVERFEW
Nysius tenellus
FICUS MICROCARPA
Ozophora laticephala
Neopamera neotropicalis
FICUS RELIGIOSA
Ozophora burmeisteri
FICUS RETUSA
Ozophora burmeisteri
FICUS TRIGONATA
Ozophora laticephala
FLAVERIA LINEARIS
Xyonysius basalis
Xyonysius californicus
FOX SEDGE
Oedancala dorsalis
FRAGARIA SP
Myodocha serripes
Neopamera bilobata
GLYCINE MAX
Paromius longulus
GNAPHILIUM PURPUREUM
Nysius raphanus
GOLDENROD
Neacoryphus bicrucis
GRAMINAE
Cyminae
Pathygronthini
GRASSES,
Blissus sp.
Oncopeltus aulicus
Ochrimnus lineoloides
Phlegyas abbreviata
Nysius scutellatus
Lygaeus kalmii

neria neotropicalis
 US INCANA
ra divaricata
 THUS DEBILIS
neria piligera
 THUS SP.
nellus
is californicus
 NTHERA RENIFORMIS
emus brunnipennis
 'UM ASPALATHOIDES
rys resedae
 UM SP.
a serripes
 SP.
formosus
 EAE

 nthini
 RACHYCEPHALUS
igustatus
scors
 OEMERIANUS
a breviceps

llus
 CAMARA
s litigiosus

ellus
 BAR STYRACIFLUA
s resedae
 A CHINENSIS
us praecultus
 TRIDIFLORA
s virescens
 JCIDA
s resedae
 4RLA SP.
nera aurivilliana
 OLOPULINA
californicus
 O

lmii
 ADISIACA
s fulvipes
 NNSYLVANICA
pilosulus
 EANDER

Oncopeltus aulicus
 OATS
Blissus sp.
 OLEANDER
Oncopeltus fasciatus
 ORYZA SATIVA
Blissus insularis
 PANICUM AGROSTOIDES
Ischnodemus slossonae
 PANICUM BARTOWENSE
Blissus insularis
 PANICUM GEMINATUM
Ischnodemus robustus
 PANICUM HEMITOMON
Ischnodemus brunnipennis
 PANICUM MAXIMUM
Blissus insularis
 PANICUM MILLACEUM
Blissus leucopterus
 PANICUM REPENS
Blissus insularis
 PANICUM SP.
Cryphula trimaculata
Pseudopachybrachius basalis
 PARTHENIUM ARGENTATUM
Nysius tenellus
 PASPALUM BLODGETTII
Oedancala cubana
 PASPALUM CAESPITOSUS
Oedancala cubana
 PEACHES
Nysius tenellus
Perigenes similis
 PENNYROYAL
Neortholomus koreshanus
 PILOBLEPHIS RIGIDA
Neortholomus koreshanus
 PINUS ELLIOTTI
Eremocoris depressus
 PINUS SP.
Eremocoris depressus
 PINUS VIRGINIANA
Eremocoris depressus
 PISSONIA ALBA
Oncopeltus aulicus
 PLANTAGO SP.
Ptochiomera nodosa
 PLATANUS OCCIDENTALIS
Belonochilus numenius
 PLATANUS RACEMOSA
Belonochilus numenius
 PLATANUS SP.

Belonchilus numenius
PLATANUS WRIGHTI
Belonochilus numenius
PLATANUS x ACERIFOLIA
Belonochilus numenius
PLUCHEA FOETIDA
Ochrimnus lineoloides
PLUCHEA ODORATA
Ozophora divaricata
PLUCHEA PURPURASCENS
Nysius tenellus
POA LEIBERGI
Nysius tenellus
POTENTILLA CANADENSIS
Isthmocoris piceus
PYCNOTHYMUS RIGIDUS
Neortholomus koreshanus
QUERCUS LAEVIS
Lygaeospilus tripunctatus
QUERCUS NIGRA
Neortholomus koreshanus
RHODODENDRON
Kleidocerys resedae
RICHARDIA SP.
Neopamera bilobata
RUBUS ALLEGHENIENSIS
Kleidocerys resedae
RUDBECKIA HIRTA
Ligyrocorys barberi
RUMEX SP.
Ptochiomera nodosa
RUSHES
Cymodema breviceps
Cymoninus notabilis
SACCIOLEPIS STRIATA
Ischnodemus slossonae
Ischnodemus brunnipennis
SARCOSTOMA CLAUSA
Oncopeltus aulicus
Oncopeltus cayensis
SCHINUS TEREBINTHEFOLIUS
Ozophora floridana
SCIRPUS CYPRINUS
Cymus discors
SCIRPUS POLYPHYLLUS
Cymus discors
SCIRPUS SP.
Oedancala crassimana
Neopamera albocincta
Cyminae
SCOPARIA DULCIS
Kleidocerys virescens

SEA OATS
Blissus minutus
Blissus arenarius maritimus
SECALE CERALE
Pseudopachybrachius basalis
SEDGES
Cymodema breviceps
Cymoninus notabilis
SENECIO GLABELLUS
Neacoryphus bicrucis
SENECIO TOMENTOSUS
Neacoryphus bicrucis
SENECIO VULGARIS
Lygaeus kalmii
SENECIONEAE
Neacoryphus bicrucis
SERENOA REPENS
Paromius longulus
SESUVIUM PORTULACASTRUM
Blissus minutus
Geocoris floridanus
Emblethis vicarius
Peritrechus paludemaris
SESUVIUM SP.
Prytanus intercisa
Cligenes distinctus
SHASTA DAISIES
Nysius tenellus
SOLANUM SP.
Ochrimnus tripligatus
SOLIDAGO ALTISSIMA
Ochrimnus mimulus
SOLIDAGO SP.
Neopamera bilobata
SORGHUM
Geocoris punctipes
SORGUM BICOLOR
Blissus leucopterus
SORGUM VULGARE
Blissus leucopterus
SOYBEAN,
Geocoris punctipes
SPANISH MOSS
Heraeus plebejus
Paromius longulus
Ochrimnus lineoloides
Xyonysius californicus
SPARTINA ALTERNIFLORA
Ischnodemus badius
Ischnodemus conicus
SPARTINA BAKERI
Ischnodemus badius

IA PATENS
ma breviceps
emus badius
ius paludemaris
IA PECTINATA
emus brunnipennis
ALACEA SP.
nellus
rys resedae
OLUS INDICUS
ila cubana
ris depressus
IA TOMENTOSA
s contractus
IPHERUM SECUNDATUM
era bilobata
IPHRUM SECUNDATUM
ichybrachius vincta
sularis
ERRY
era bilobata
ichybrachius vincta
a serripes
'ANE
sularis

THALIA GENICULATA
Ischnodemus fulvipes
THISTLE
Ochrimnus lineoloides
Ozophora gilva
TRITICUM AESTIVUM
Neopamera bilobata
Paromius longulus
TYPHA SP.
Kleidocerys resedae
UNIOLA PANICULATA
Blissus minutus
Blissus arenarius maritimus
VIGNA SP.
Ochrimnus lineoloides
WHEAT
Blissus sp.
WILLOW
Kleidocerys resedae
YARROW
Lygaeus kalmii
YUCCA
Melacoryophus facetus
ZEA MAYS
Blissus leucopterus

LITERATURE CITED

- Alayo, D.P. 1973. Los Hemipteros de Cuba, Parte XI, Familia Lygaeidae. Torreia No. 25; 19 pp.
- Aller, T. D. Hirai and R. L. Caldwell. 1979. A comparison of the correcting behavior exhibited by two milkweed bugs, *Oncopeltus fasciatus* and *Lygaeus kalmii*. *Physiol. Entomol.* 4:99-102.
- Aller, T. & R. L. Caldwell. 1979. An investigation of the possible presence of an aggregation pheromone in the milkweed bugs, *Oncopeltus fasciatus* and *Lygaeus kalmii*. *Physiol. Entomol.* 4:287-290.
- Altieri, M. A. & W. H. Whitcomb. 1979. Predaceous arthropods associated with Mexican Tea in North Florida. *Florida Ent.* 62: 175-182.
- _____. 1980. Predaceous and herbivorous arthropods associated with camphorweed (*Heterotheca subaxillaris* Lamb.) in North America. *J. Georgia Entomol. Soc.* 15(3). July 1980, 290-299.
- Amyot, C. J. B. and J. G. A. Serville. 1843. Historie naturelle des insectes. Hemiptera. Paris. lxvi + 675 + 6p.
- Anonymous. 1977. Triology Tech Report. Florida Dept. Agr. & Consumer Services, Div. Plant Ind. 16:7: p. 4.
- Anonymous. 1982. Triology Tech Report. Florida Dept. of Agr. & Consumer Services, Div. Plant Ind. 21:4: p.2.
- Ashlock, P. D. 1960. New synonymies and generic changes in the Lygaeidae (Hemiptera-Heteroptera) *Proc. Biol. Soc. Washington* 73: 235-238.
- _____. 1975. Toward a classification of North American Lygaeinae (Hemiptera-Heteroptera:Lygaeidae) *Jour. Kansas Entomol Soc.* 48:27-32.
- Ashlock, P. D. & J. D. Lattin. 1963. Stridulatory mechanisms in the Lygaeidae, with a new American genus of Orsillinae (Hemiptera: Heteroptera). *Ann. Ent. Soc. Amer.* 56: 693-703.
- Ashlock, P. D. & A. Slater. 1988. Lygaeidae pp. 167-245. In: Henry, J. J. & R. C. Froeschner. (edits) *Catalog of the Heteroptera or true bugs, of Canada and the Continental United States*. E. J. Brill. Leiden.
- Atim, A. B. & H. M. Graham. 1983. Parasites of *Geocoris* spp. near Tucson, Arizona. *Southwest Entomol.* 8:210-215.
- Baker, C. F. 1906. Notes on the *Nysius* and *Ortholomus* of America. *Invert. Pacifica* 1:133-140.
- Ballou, C. H. 1937. Insect notes from Costa Rica in 1936. *Insect Pest Surv. Bull. U.S.* 17: Supp. to No. 9: 483-590.
- Baranowski, R. M. & J. A. Slater 1975. The life history of *Craspeduchus pulchellus*, a lygaeid new to the United States (Hemiptera: Lygaeidae). *Florida Ent.* 58: 297-302.
- _____. 1983 (1984). The *Ozophora pallescens* complex in the West Indies with the description of four new species (Hemiptera: Lygaeidae). *Florida Ent.* 66: 440-463.
- _____. 1987 (1986). Coreidae of Florida (Hemiptera:Heteroptera). *Arthropods of Florida and Neighboring Land Areas*. vol. 12, 82 pp. Florida Dept. Agr. and Consumer Serv. Div. of Plant Ind. Gainesville.
- _____. 1989. Utilization of grasses as host plants by a species of *Oedancala* (Hemiptera: Lygaeidae) with description of a new species from Florida and the West Indies. *Florida Ent.* 72:243-251.
- Barber, H. G. 1906. Hemiptera from southwestern Texas. *Mus. News, Brooklyn* 1:9:255-289.
- _____. 1911. Descriptions of some new Hemiptera-Heteroptera. *Jour. New York Ent. Soc.* 19: 23-31.
- _____. 1914. Insects of Florida. II. Hemiptera. *Bull. Amer. Mus. Nat. Hist.* 33: Art. 31: 495-535.
- _____. 1918a. Concerning Lygaeidae-No. 2. *Jour. N.Y. Ent. Soc.* 26: 49-66.
- _____. 1918b. A new species of *Leptoglossus*: a new *Blissus* and varieties. *Bull. Brooklyn Ent. Soc.* 13: 35-39.
- _____. 1921a. Revision of the genus *Lygaeus* Fabr. (Hemiptera-Heteroptera). *Proc. Ent. Soc. Washington* 23: 63-68.
- _____. 1921b. Revision of the genus *Ligyrocoris* Stal (Hemiptera, Lygaeidae). *Jour. New York Entomol. Soc.* 29:100-114.
- _____. 1923. Family Lygaeidae: In Britton--*Guide to the Insects of Connecticut*: Pt.

- Hemiptera or sucking insects of Connecticut. Bull. Conn. Geol. Nat. Hist. 10: 708-737.
4. Corrections and comments. Hemiptera-Heteroptera. Jour. New York Ent. Soc. 32: 133-137.
- 28a. Revision of the genus *Lygaea* Say (Hemiptera, Lygaeidae). Jour. New York Ent. Soc. 36: 175-177.
- 28b. The genus *Eremocoris* in the United States, with description of new species & a new variety (Hemiptera-Lygaeidae). Proc. Ent. Soc. Washington 30:59-60.
32. Three new species of *Exemnicora* from the United States (Hemiptera-Lygaeidae). Jour. New York Ent. Soc. 40: 357-363.
7. Descriptions of six new species of *Lygaea* (Hemiptera-Heteroptera: Lygaeidae). Proc. Ent. Soc. Washington 31: 1-10.
9. Scientific survey of Porto Rico and the Virgin Islands: Insects of Porto Rico and the Virgin Islands: Hemiptera-Heteroptera (excepting the Miridae & Lygaeidae). Sci. Surv. Porto Rico 14:3:263-264.
47. The family Lygaeidae (Hemiptera-Heteroptera) of the island of Cuba and the Isle of Pines. Mem. Soc. Hist. Nat. 19:55-75.
5. The genus *Antilloecoris* Kirk. in the United States (Hemiptera - Heteroptera). Bull. Brooklyn Ent. Soc. 47: 1-10.
- 6a. A second revision of the genus *Lygaea* Say & its allies (Hemiptera, Lygaeidae). Proc. Ent. Soc. Washington 31: 1-10.
- 6b. The genus *Pachybrachius* in the United States and Canada with the descriptions of two new species (Hemiptera-Lygaeidae). Jour. New York Ent. Soc. 60: 211-220.
- 6c. A revision of the genus *Lygaea* Stephens in the United States (Hemiptera, Lygaeidae). Proc. Ent. Soc. Washington 55: 273-283.
- 6a. A report on the Hemiptera-Heteroptera from the Bimini Islands, Bahamas, British West Indies. Amer. Mus. Novit. N. 1682: 1-18.
- 1954b. The family Lygaeidae (Hemiptera-Heteroptera) from the island of Cuba and the Isle of Pines Part II. Mem. Soc. Cubana Hist. Nat. 22: 335-353.
1956. A new arrangement in the subfamily Cyminae (Hemiptera, Lygaeidae). Proc. Ent. Soc. Washington 58:282.
- Barber, H. G. & P. D. Ashlock. 1960. The Lygaeidae of the Van Voast-American Museum of Natural History expedition to the Bahama Islands 1953. Proc. Ent. Soc. Washington 62:117-24.
- Berenbaum, M. R. & E. Miliczky. 1984. Mantids and milkweed bugs: efficacy of aposematic coloration against invertebrate predators. Amer. Midl. Naturalist. III:64-68.
- Bergroth, E. 1893. Mission scientifique de M. Ch. Alluaud aux iles Sechelles. Rev. Ent., Caen. 12: 197-209.
1893. Notes Hemipterologiques. Rev. Ent., Caen. 12: 153-155.
1903. Neue myrmecophile Hemipteren. Wien. ent. Ztg. 22: 253-256.
- Blakley, N. 1980. Divergence in seed resource use among Neotropical milkweed bugs (*Oncopeltus*). Oikos 35:8-15.
- Blanchard, E. 1840. Histoire naturelle des insectes III. Orthopteres, Neuropteres, Hemipteres, Hymenopteres, Lepidopteres & Dipteres. Paris: P. Dumeril pp. 85-218.
- Blatchley, W. S. 1924. Some apparently new Heteroptera from Florida. Ent. News 35: 85-90.
- 1925a. Some additional new species of Heteroptera from the southern United States with characterization of a new genus. Ent. News 36:45-52.
- 1925b. Two changes of names (Heteroptera, Coleoptera). Ent. News 36:245.
1926. Heteroptera or true bugs of eastern North America, with especial reference to the faunas of Indiana and Florida. Indianapolis: Nature Publishing Co. 1116 pp.
1928. Notes on the Heteroptera of eastern North America with descriptions of new species, I. Jour. New York Ent. Soc. 36:1-23.

- ovsky, H. 1982. Revision del complejo *Ochrimnus*, con descripcion de nuevas especies y nuevos generos (Hemiptera-Heteroptera-Lygaeidae-Lygaeinae). *Folia Entomol. Mexicana* 51:1-163.
- _____, P. E., W. Woods, & T. O. Robbins. 1988. Phytophagous insect fauna of *Baccharis sarothroides* Gray (Asteraceae) in Arizona and New Mexico. *Proc. Ent. Soc. Washington* 90:207-215.
- _____, G. 1907. Berytiden & Myodochiden von Ceylon aus der Sammelausbeute von Dr. W. Horn (Rhynch. het.) *Dtsch. Ent. Z.* 1907: 34-47.
- _____, A.N. *et al.* 1929. Strawberries in Florida. *Rep. Florida Exp. Sta.* 1929: 204: 517. (also in Brooks & Watson 1932).
- _____, A.N. & E.G. Kelsheimer 1951. Strawberries in Florida: Culture, diseases & insects. *Agric. Ext. Serv. Bull. Florida* 148: 32 pp.
- _____. 1961. Insects and diseases affecting strawberries. *U. Florida Agr. Expt. Sta. Bull.* 629: 35 pp.
- _____, A.N. & J.R. Watson 1932. Strawberry production. *Bull. Florida Agric. Exp. Sta.* 63: 51 pp.
- _____, H. 1835. *Handbuch der Entomologie*. Zweiter Band: II Ordnung Rhynchota. Berlin: Theod. Ehr. Friedr. Enslin i-iv, 1-400 pp.
- _____, F.G. 1957. Pollinating insects on Lychee blossoms. *Proc. Florida Hort. Soc.* pp. 326-328.
- _____, G.W. 1973. A mating aggregation of *Nysius raphanus* (Hem. Lyg.) *Jour. Kansas Ent. Soc.* 46: 281-282.
- _____, R. L. 1969. A comparison of the dispersal strategies of two milkweed bugs, *Oncopeltus fasciatus* and *Lygaeus kalmii*. Ph. D. Thesis. Iowa. U.
- _____, D. W. & H. D. Pierce. 1966. Natural enemies of some *Lygus* bugs. *Jour. Econ. Entomol.* 59:853-858.
- _____, R. L. 1978. Components of the feeding niches of *Geocoris* spp. (Hemiptera: Lygaeidae) *Dissert. Abstr. Inst.* (B):39:1:63.
- _____, R. L. & W. L. Whitcomb. 1980. Feeding niches of the big-eyed bugs, *Geocoris bullatus*, *G. punctipes* and *G. uliginosus*. (Hemiptera:Lygaeidae:Geocorinae). *Environ. Entomol.* 9:508-513.
- Curtis, J. 1833. *British entomology: being illustrations and descriptions of the genera of insects found in Great Britain and Ireland*. London: Author 10: pls. 434-481.
- Dallas, W.S. 1852. List of the specimens of Hemipterous insects in the collection of the British Museum Pt. II. London: Taylor & Francis Inc. pp. 369-592.
- Davis, L. V. & I. E. Gray 1966. Zonal and seasonal distribution of insects in North Carolina salt marshes. *Ecological Monographs* 36:275-295.
- DeGeer, C. 1773. *Memoires pour servir a l'histoire des insectes* III. Stockholm: Pierre Hasselberg pp. (i)-viii, 1-696.
- Dingle, H. 1968. Life history and population consequences of density, photoperiod, and temperature in a migrant insect, the milkweed bug, *Oncopeltus*. *Amer. Naturalist.* 102:149-163.
- Distant, W. L. 1880-1893. *Insecta. Rhynchota. Hemiptera-Heteroptera* Vol. I. *Biol. Cent. Amer.* London (Lygaeidae pp.173-220) *Supp.* 1893 pp. 378-462.
- _____. 1903. Additions to the Rhynchotal fauna of Central America. *Trans. R. Ent. Soc. London* Pt 4:1903:525-7.
- _____. 1904. Fauna of British India, including Ceylon & Burma Rhynchota. Vol. II (Heteroptera). London: Taylor & Francis. pp 1.503.
- _____. 1910. The fauna of British India, including Ceylon & Burma. Rhynchota vol V. Heteroptera: Appendix 362 pp.
- Drake, C. J. & N. T. Davis. 1958. The Morphology and systematics of the Piesmatidae (Hemiptera), with keys to World genera and American species. *Ann. Entomol. Soc. Amer.* 51:567-581.
- Duarte, J. & D. M. Calabrese. 1982. Is the binomen, *Lygaeus kalmii* Stal (Hemiptera:Lygaeidae) applied to sibling species? *Proc. Entomol. Soc. Washington.* 84:301-303.
- Dunbar, D. M. 1972. Notes on the mating behavior of *Geocoris punctipes* (Hemiptera:Lygaeidae). *Ann. Entomol. Soc. Amer.* 65:764-765.

- S. & G. G. E. Scudder. 1972. Cardiac glycosides in North American sclepiadaceae, a basis for unpalatability in brightly colored Hemiptera and Coleoptera. Jour. Insect Physiol. (8):63-68.
- J. C. 1775. Systema entomologiae. Lipsivburgi et Lipsiae: Korte 832 pp.
- _. 1781. Species insectorum II. Hamburgi et Kilonii: Ernest Bohnii. pp. 517.
- _. 1794. Entomologia systematica mendata & aucta IV. Hafniae: C.G. Proft pp. 1-472.
- _. 1803. Systema Rhngotorum secundum ordines, genera, species, adjectis synonymis, locis observationibus, descriptionibus. Brunsvigae: Apud Carolum Reichard vi & 314 pp.
- _. F. 1807. Monographia Cimicum Sueciae. Hafniae: C.G. Proft 123 pp.
- _. 1814. Specimen novam Hemiptera proponendi methodum exhibens (dissertation) (2 pts.) Lundae: Litteris Berlingianis pp. 1-26.
- _. 1829. Hemiptera Sueciae cimicides eorumque familiae affines. Londini: Berlingiana pp. 1-188.
1974. *Oncopeltus fasciatus*: a research animal. Ann. Review Ent. 19: 81-96.
- X. 1837. Beitrage zur Kenntniss der Insekten. I. Habelkerfern IV. Familie Lygaeodea. Beitr. ges. Natur- wissenschaft 1:337-355. (Wilh. Rud. Weitenweber).
- _. 1860-1861. Die Europaischen Hemiptera. Halbflugler (Rhynchota Heteroptera) Wien: Gerold vi,444 pp. (Introductory generic key published 1860).
- _. 1861. Die Gattung *Ophthalmicus*. Den. Ent. Mschr. 5:9: 266-285.
- V. 1975. Third supplement to insects taken in light traps at the Archbold Biological Station, Highland County, Florida. Florida Ent. 58: 35-42.
- C. 1972. *Neacoryphus bicrucis*. The recent immigrant bug, *N. bicrucis* has recently quickly invaded Molokai, Lanai and Maui since its original interception of Hawaii in May 1971. Proc. Hawaiian Entomol. Soc. 21:159.
- Germar, E. F. 1837. Hemiptera Heteroptera Promontorii Bonae Spei. Nundum Descripta, Quae Collegit C.F. Drege. Silberman's Rev. Entomologique 5: 121-192.
- Gibson, W. W. & J. L. Carrillo 1959. Lista de insectos en la coleccion entomologica de la oficina de estudios especiales, S.A.G. Mexico. Folleto Miscelaneo N.9:i-xviii,1-254.(Secretaria de Agricultura y Ganaderia Oficina de estudios especiales Mexico).
- Gistel, J. 1848. Naturgeschichte des Thierreichs fur Hohere Schulen. Stuttgart: Hoffman'sche Verlags Buchhandlung.
- Glover, T. 1876. Manuscript notes from my journal or illustrations of insects, native & foreign. Order Hemiptera, suborder Heteroptera or plant bugs. Washington: J.C. Entwistle pp. 1-132, 10 pl.
- Gordh, G. & R. A. Coker. 1973. A new species of *Telenomus* parasitic on *Geocoris* (Hymenoptera: Proctotrupoidea; Hemiptera: Lygaeidae) in California. Canadian Entomol. 105: 1407-1411.
- Guerin-Meneville, E.E. 1857. In Sagra, Historie physique, politique & naturelle de l'Isle de Cuba. Animaux articles a pieds articles. Paris: Arthus Bertrand.
- Hahn, C. W. 1831. De Wanzenartigen Insecten. 1: 1-36. Nurnberg: C.H. Zeh'schen Buchhandlung.
- Hamid, A. 1971. The life cycles of three species of *Cymus* (Hemiptera: Lygaeidae) in Connecticut. U. Connecticut Occas. Papers Biol. Sci. Ser. 2: 21-28.
- _. 1975. A systematic revision of the Cyminae (Heteroptera: Lygaeidae) of the world with a discussion of the morphology, biology, phylogeny and zoogeography. Entomol. Soc. Nigeria Occ. Publ. N. 14: 1-179.
- Hamilton, S. W. 1983. *Neortholomus*, a new genus of Orsillini (Hemiptera-Heteroptera: Lygaeidae: Orsillinae). Univ. Kansas Sci. Bull. 52: 197-234.
- Harrington, J. E. 1972. Notes on the Biology of *Ischnodemus* species of America north of Mexico (Hemiptera: Lygaeidae: Blissinae). U. Connecticut Occas. Papers Biol. Sci. Series 2: 47-56.

- Harrington, B. Jane (=J.E.) 1980. A generic level revision and cladistic analysis of the Myodochini of the world (Hemiptera, Lygaeidae, Rhyparochrominae) Bull. Amer. Mus. Nat. Hist. 167: 49-116.
- Heidemann, O. 1889. Remarks on Schwarz in Dade Co. etc. Proc. Entomol. Soc. Washington 1:137.
- _____. 1902. Notes on *Belonochilus numenius* Say. Proc. Ent. Soc. Washington. 5:11-12.
- Herrich-Schaeffer, G. H. W. 1843. Die Wanzenartigen Insecten. Nurnberg: C.H. Zeh'schen Buchhandlung 7: 20-22.
- _____. 1847. Die Wanzenartigen Insecten. Nurnberg: C. H. Zeh'schen Buchhandlung 8:101-130.
- _____. 1850. Die Wanzenartigen Insecten. Nurnberg: C. H. Zeh'schen Buchhandlung 9:188-217.
- Horvath, G. 1890. Synopsis des *Nysius* Palearctiques. Rev. Ent., Caen 9: 185-191.
- _____. 1894. Hemipteres recueillis dans la Russie Meridionale & en Transcaucasie. Rev. Ent., Caen 13: 169-189.
- _____. 1908. Remarques sur quelques Hemipteres de l'Amerique du Nord. Ann. hist-nat. Mus. Hung. 6: 555-569.
- Howard, L. O. 1872. (orig. desc. *Nysius raphanus*) Phillips So. Planter 1872 (Country Gent. 37:507) (Can. Ent. 4:219-220)
- Hunt, L. M. 1979. Observations on the habits of *Lygaeus kalmii angustomarginatus* (Hemiptera:Lygaeidae) in southern Michigan, Great Lakes Entomol. 12:31-33.
- Hussey, R. F. 1950. Bilateral abnormality of the antennae in *Ptochiomera nodosa* (Hemiptera, Lygaeidae. Bull. Brooklyn Ent. Soc. 45:27.
- Hussey, R.F. 1952. Food plants & new records for some Hemiptera in Florida. Fla. Ent. 35: 117-118.
- _____. 1955. Some records of Hemiptera new to Florida. Quart. J. Fla. Acad. Sci. 18:120-122.
- _____. 1960. A lygaeid new to the United States list (Hemiptera). Florida Ent. 43: 93.
- Jakovlev, B.E. 1874. Hemiptera-Heteroptera Astrachanskago Chraia. Bull. Soc. Nat. Moscou 48: 218-277.
- Kirby, W. 1837. The insects In: Richardson's Fauna Boreali-Americana. Vol IV., Norwich: J. Fletcher (i)-xxxix, 325 pp.
- Kirby, W.F. 1890. In: Ridley, H.N. Zoology of Fernando Noronha: Insecta excepting Coleoptera. Jour. Linn. Soc. (Zool.) 20: 530-548.
- Kirkaldy, G.W. 1904. Bibliographical & nomenclatorial notes on the Hemiptera N.3. Entomologist 37: 279-283.
- _____. 1909. Hemiptera: new and old, N. 1. Canad. Ent. 41: 30-32.
- Klausner, E., E. R. Miller & H. Dingle. 1980. *Nerium oleander* as an alternative host plant for south Florida milkweed bugs, *Oncopeltus fasciatus*. Ecological Ento. 5:137-142.
- Kumar, R. R., J. Lavigne, J. E. Lloyd & R. E. Pfadt. 1976. Insects of the Central Plains Experiment Range, Pawnee National Grassland. Wyoming Agr. Exp. Sta. Sci. Monog. 32:1-74.
- Lanham, U. N. 1975. A mountain-top swarm of the hemipteran, *Nysius raphanus*, in New Mexico, with notes on other insects. Pan-Pacific Entomol. 51: 166-167.
- Laporte, F.L. de Castelnau 1832. Essai d'une classification systematique de l'ordre des Hemipteres (Hemipteres Heteropteres, Latr.) Mag. Zool. 1: 1-88 & suppl.
- Latreille, P. A. 1807. Genera crustaceorum & insectorum, etc. vol. III. Paris: Amand Koenig pp. 1-258.
- LeBaron, W. 1850. The chinch bug. Prairie Farmer. 10:280-281.
- Leonard, D. E. 1966. Biosystematics of the "Leucopterus Complex" of the genus *Blissus* (Het.:Lyg.). Bull. Connecticut Agr. Expt. Stat. 677: 1-47.
- _____. 1968. A revision of the genus *Blissus* (Het. Lyg.) in eastern North America. Ann. Ent. Soc. Amer. 61: 239-250.
- Leslie, J. F. & H. Dingle. 1983. Interspecific hybridization and genetic divergence in milkweed bugs (*Oncopeltus*: Hemiptera: Lygaeidae). Evolution. 37:583-591.
- Leston, D. 1957. The stridulatory mechanisms on terrestrial species of Hemiptera Heteroptera. Proc. Zool. Soc. London 128: 369-386.
- Lethierry, L. 1881. Liste des Hemipteres recueillis par M. Delauney a la Guadeloupe, la

- Martinique & Saint Barthelemy. Ann. Soc. ent. Belg. 25: 8-19.
- _____. 1888. Liste des Hemipteres recueillis a Sumatra et dans l'ile Nias par M. E. Modigliani. Annali del Museo Civico di Storia Naturale di Genova. (2)6:460-470.
- y, L. & G. Severin 1894. General catalogue of the Hemiptera. Vol. II Heteropteres. Brussels: F. Hayez, Imprimeur de l'Academie Royale de Belgique.
- s, C. 1758. Systema Naturae Regnum Animale Editio Decima. Holmiae. Laurentii Salvii 1: 824 pp.
- _____. 1761. Fauna Suecica. Stockholmiae. Laurentii Salvii pp. 1-560.
- l, M.B. 1978. Revision of the Myodochini (Hemiptera: Lygaeidae: Rhyparochrominae) of the Australian region. Australian Journ. Zool. Supp. Ser. N. 56: 1-178.
- W. L. 1914. Key to the Nearctic genera & species of Geocorinae (Heteroptera: Lygaeidae). Proc. Biol. Soc. Washington 27: 125-136.
- _____. 1927. Notes on "Heteroptera or true bugs of eastern North America" Bull. Brooklyn Ent. Soc. 22: 267-281.
- , R. B. 1972. The first record of *Oncopeltus sandarachatus* (Hemiptera: Lygaeidae) in the Eastern United States. Jour. Georgia Ent. Soc. 7: 36-38.
- , R. B. & A. H. McGhee. 1971. The relation and migration of *Oncopeltus fasciatus* to distribution of *Phytomonas helmssiani* in the eastern United States. Jour. Protozool. 18: 344-353.
- D. K. 1981. Resource partitioning by three species of hemipteran herbivores on the basis of host plant density. Oecologia. 48:414-417.
- _____. 1982. Behavioral and evolutionary ecology of the seed bug, *Neacoryphus bicrucis*: a host plant specialist on alkaloid-bearing plants. Dissert. Abstr. Int. (B). 43:4:970.
- _____. 1984. Coevolution: Mullerian mimicry between a plant bug (Miridae) and a seed bug (Lygaeidae) and the relationship between host plant choice and unpalatability. Oikos. 43:143-148.
- D. K. & D. J. Shure. 1985. Host plant toxins and unpalatability of *Neacoryphus bicrucis* (Hemiptera: Lygaeidae). Ecol. Entomol. 10:291-298.
- _____. 1987. Pseudocompetition: interspecific displacement of insect species through misdirected courtship. Oikos. 49:291-296.
- Mead, F. W. 1972. Key to species of bigeyed bugs, *Geocoris* spp. in Florida, Hemiptera: Lygaeidae. Fla. Dept. Agr. & consumer Serv. Entomol. Circ. No. 21. 2 pp.
- Milliken, F. B. 1918. *Nysius ericae*, the false chinch bug. J. Agric. Res. 13:571-578.
- Montandon, A. L. 1908. Especies nouvelles ou peu connues du genre *Geocoris* Fall. Bull. Soc. Sci. Bucarest 16: 214-234.
- _____. 1913. Nouvelles etudes sur les Geocorinae (Hemipt.). Bull. Acad. Roumaine 2: 48-60.
- Moore, G. A. 1950. Check-list of Hemiptera of the province of Quebec. Contrib. instit. Biol. U. Montreal N. 26:1-49 (also Canadian Nat. 77:)
- Motschulsky, V. 1863. Essai d'un catalogue des insectes de l'ile Ceylan. Bull. Soc. Nat. Moscou 36: 1-153.
- Myers, J.G. & G. Salt. 1926. The phenomenon of myrmecoidy with new examples from Cuba. Trans. Ent. Soc. London 1926: 427-436.
- Needham, J. D. 1948. Ecological notes on the insect population of the flower heads of *Bidens pilosa*. Ecol. Monographs 18: 433-446.
- Olivier, A. G. 1811. Histoire naturelle insectes. Encycl. Method. 8:105. Paris: Chez H. Agasse N.6: 1-722.
- O'Rourke, F. 1976. Hybridization and Systematics of Western Hemisphere species of milkweed bugs of the genus *Oncopeltus* (Dallas) (Hemiptera: Lygaeidae). U. Connecticut, Storrs. PhD. Thesis 134 pp.
- Oshanin, B. 1912. Katalog der palaarktischen Hemipteren (Heteroptera, Homoptera Auchenorrhyncha & Psylloidea), Berlin: xvi + 187 pp.
- Palmer, W. A. 1986. Host specificity of *Ochrimnus mimulus* (Stal) (Hemiptera: Lygaeidae) with notes on its phenology. Proc. Ent. Soc., Washington 88:451-454.
- _____. 1987. The phytophagous insect fauna associated with *Baccharis kalimifolia* L. and *B. neglecta* Britton in Texas,

- Louisiana and northern Mexico. Proc. Ent. Soc. Washington 89: 185-199.
- Palmer, W. A. & F. D. Bennett. 1988. The phytophagous insect fauna associated with *Baccharis halimifolia* L. in the eastern United States. Proc. Entomol. Soc. Washington. 90:216-228.
- Panzer, G.W.F. 1797. Faunae Insectorum Germanicae initia oder Deutschlands Insecten. Hemiptera. Nurnberg: Felssecker (Lygaeidae).
- Payne, J. A., F. W. Mead & E. W. King. 1968. Hemiptera associated with pig carrion. Ann. Entomol. Soc. Amer. 61:565-567.
- Provancher, L. 1872. Description de plusieurs Hemipteres nouveaux. Nat. canad. 4:3:73-79.
- _____. 1886. Petite faune entomologique du Canada. Vol. 3, Les Hemipteres. Quebec 3:1-205.
- Quaintance, A.L. 1897. Some strawberry insects. Bull. Agric. Expt. Sta. Florida N. 42.: 551-600.
- Ralph, C. P. 1976. Natural food requirements of the large milkweed bug, *Oncopeltus fasciatus* (Hemiptera:Lygaeidae) and their relation to gregariousness and host plant morphology. Oecologia 26:157-175.
- Rambur, J. P. 1839. Faune entomologique de l'Andalousie. Tome II. Paris: Arthus Bertrand, Libraire. pp. 1-336.
- Radio, J. & M. H. Sweet 1982. A review of the Geocorinae of the United States east of the 100th meridian (Hemiptera: Lygaeidae). Misc. Publ. Ent. Soc. America 12:3: 1-91.
- Reed, E. C. 1900. Sinopsis de las Hemipteros de Chile. Valparaiso 107 pp. (also sep. Rev. chil. Hist. nat. ii-v).
- Reinert, J. A. & S. H. Kerr. 1973. Bionomics and control of lawn chinch bugs. Bull. Entomol. Soc. Amer. 19:91-92.
- Rey, J. R. 1981. Ecological biogeography of arthropods on *Spartina* islands in Northwest Florida. Ecological Monographs, 51(2): pp. 237-265.
- Riley, C. V. 1873. Eighth annual report on the noxious, beneficial, and other insects of the state of Missouri, etc. 8th Ann. Rept. St. Board Agr. for 1872, 160+8 pp.
- Root, R. B. 1986. The life of a Californian population of the facultative milkweed bug, *Lygaeus kalmii* (Heteroptera: Lygaeidae). Proc. Entomol. Soc. Washington 88: 201-214.
- Root, R. B. & S. J. Chaplin. 1976. The life styles of tropical milkweed bugs, *Oncopeltus* (Hemiptera:Lygaeidae) utilizing the same hosts. Ecology. 57:132-140.
- Sahlberg, R. F. 1848. Monographia Geocorisarum Fenniae. Helsingforsiae: Frenckelliana. pp. 1-154.
- Say, T. 1825. Descriptions of new Hemipterous insects collected in the Expedition to the Rocky Mountains, performed by order of Mr. Calhoun, Secretary of War, under command of Major Long. Proc. Acad. nat. Sci. Philadelphia 4:307-345. (also Leconte Editon, 1859).
- _____. 1831. Descriptions of new species of Heteropterous Hemiptera of North America. New Harmony Indiana. pp. 310-368. (also Leconte Edition, 1859).
- Schwartz, E. A. 1888. On the insects found on *Uniola paniculata* in southeastern Florida. Proc. Ent. Soc. Washington 1: 104-107.
- Schilling, P. S. 1829. Hemiptera Heteroptera Silesiae systematice disposuit Schilling. Beitr. Ent. 1: 34-92.
- Scudder, G. G. E. 1957. A revision of Ninini (Hemiptera-Heteroptera, Lygaeidae) including the description of a new species from Angola. Publ. cult. Comp. Diam. Angola. N. 34: 91-108.
- _____. 1958. Review of Stichel "Illustrierte Bestimm. Wanzen Europae II." Ent. Mon. Mag. 94:XIX.
- _____. 1962. The world Rhyparochrominae (Hemiptera: Lygaeidae) I. new synonymy and generic changes. Canad. Ent. 94: 764-773.
- Scudder, G.G.E. 1965 A new genus of Lygaeinae (Hem.:Lyg.). Proc. Ent. Soc. British Columbia. 62:34-37.
- Signoret, V. 1857. Essai monographique du genre *Micropus* Spinola. Ann Soc. ent. Fr. (3): 5:23-32.
- _____. 1860. Faune des Hemipteres de Madagascar 2nd part: Hemipteres 1. Ann. Ent. Soc. Fr. (3):8:917-972.
- Slater, Alex (=J. A. II). 1988. A new genus and two new species of Lygaeinae (Heteroptera:Lygaeidae). Jour. Kansas Entomol. Soc. 61:301-316.

- _____. 1952. A contribution to the biology of the Subfamily Cyminae (Heteroptera: Lygaeidae). Ann. Ent. Soc. Amer. 45: 315-36.
- _____. 1955. A revision of the subfamily Chytrinae of the world (Hemiptera: Lygaeidae). Philipp. J. Sci. 1:1-160.
- _____. 1964. A Catalogue of the Lygaeidae of the World. U. Connecticut. Storrs, Ct. 2 vols. 1668 pp.
- _____. 1972. Lygaeid bugs (Hemiptera: Lygaeidae) as seed predators of figs. Biotropica. 4(3):145-151.
- _____. 1974. A preliminary analysis of the diversification of the Heteroptera fauna of the Northeastern United States with special reference to the fauna of Connecticut. In: Brad, R. L. (Edit.) 25 Anniversary Memoirs Connecticut Entomological Society, New Haven, Ct. pp. 145-213.
- _____. 1976. Monocots and chinch bugs: A study of host plant relationships in the Lygaeid subfamily Blissinae (Hemiptera: Lygaeidae). Biotropica 8: 143-165.
- _____. 1977. The incidence and evolutionary significance of wing polymorphism in Lygaeid bugs with particular reference to the use of South Africa. Biotropica 9: 217-230.
- _____. 1979. The systematics, phylogeny, and biogeography of the Blissinae of the world (Hemiptera, Lygaeidae). Bull. Amer. Mus. Nat. Hist. 165: 1-180.
- _____. 1980. Systematic relationships of the Pentatomini of the Western Hemisphere (Hemiptera: Lygaeidae). Systematic Ent. 199-226.
- _____. 1988. Zoogeography of West Indian Lygaeidae (Hemiptera). pp. 38-60. In: Ashlock, J. K. (Edit.). Zoogeography of Caribbean Insects. Cornell U. Press. Ithaca & London. 285 pp.
- _____. & P. D. Ashlock. 1966. *Atrazonotus*, a new genus of Goniatini from N. Amer. (Hemiptera: Lyg.). Proc. Ent. Soc. Washington 152-156.
- _____. & R. M. Baranowski. 1973. A review of the genus *Cistalia* Stal. Florida Ent. 4(4): 263-272.
- _____. 1983. The genus *Ozophora* in Florida (Hemiptera: Lygaeidae). Fla. Ent. 66:416-440.
- Slater, J. A. & J. E. O'Donnell 1979. An analysis of the *Ozophora laticephala*-complex with the description of eight new species (Hemiptera: Lygaeidae). Jour. Kansas Ent. Soc. 52: 154-179.
- Slater, J. A. & N. F. Knop. 1968. Geographic variation in the North American milkweed bugs of the *Lygaeus kalmii* complex. Ann. Ent. Soc. Amer. 62:1221-1232.
- Slater, J. A. & D. B. Wilcox. 1969. A revision of the genus *Ischnodemus* in the Neotropical Region (Hemiptera: Lygaeidae; Blissinae). Misc. Pub. Ent. Soc. Amer. 6:199-238.
- Solbreck, C. 1978. Migration, diapause and direct development as alternative life histories in a seed bug, *Neocoryphus bicrucis*. In: Evolution of Insect Migration & Diapause (Edit. H. Dingle). Springer-Verlag N.Y. Inc. pp. 195-217.
- _____. 1979. Induction of diapause in a migratory seed bug, *Neocoryphus bicrucis* Say (Heteroptera: Lygaeidae) Oecologia 43: 41-49.
- Solbreck, C. & I. Pehrson 1979. Relations between environment, migration and reproduction in a seed bug, *Neocoryphus bicrucis* (Say) (Hemiptera: Lygaeidae). Oecologia 43: 51-62.
- _____. Southwood, T. R. E. & D. Leston. 1959. Land and water bugs of the British Isles. Fredrick Warne and Co. Ltd., London and New York. pp. i-xi, 1-436.
- Spinola, M. 1837. Essai sur les genres d'insectes appartenants a l'orde des Hemipteres Lin. ou Rhynogotes, Fab. et a la section Heteropteres, Dufour. Genes: Chez Yves Gravier Imprimeur-Libraire. pp. 1-383.
- Stal, C. 1858. Bidrag till Rio Janeiro-Traktens Hemiptera-fauna. Svenska VetenskAkad. Handl. 2:7:1-84.
- _____. 1859. Hemiptera species novas descriptis. Kongliga Svenska Fregattens Eugenies resa omkring jorden. III (Zoologi, Insekter) (1859:219-298.
- _____. 1862. Hemiptera Mexicana enumeravit speciesque novas descriptis. Stettin ent Ztg. 23: 81-118, 273-281, 289-325, 437-462.

- _____. 1865. Hemiptera Africana II. Stockholm: Norstedtiana. pp. 1-200.
- _____. 1868. Hemiptera Fabricana I. K. svenska VetenskAkad. Handl. 7:11:1-148.
- _____. 1869. Analecta Hemipterologica. Berl. Ent. Zeit. 13:225-242.
- _____. 1872. Genera Lygaeidarum Europae disposuit. Ofvers. VetenskAkad. Forh., Stockholm 29: 37-62.
- _____. 1874. Enumeratio Hemipterorum pt. 4. K. svenska VetenskAkad. Handl. 12:1: 1-186.
- Stephens, J.F. 1829. A systematic catalogue of British insects. London: Baldwin and Cradock pp. 1-387.
- Strand, E. 1928. Miscellanea nomenclatorica zoologica et Palaeontologica. Arch. Naturgesch. 92:30-69.
- Stys, P. 1967. Monograph of Malcinae with reconsideration of morphology and phylogeny of related groups (Het., Malcidae). Acta Ent. Mus. Nat. Prague 37:351-516.
- Sweet, M.H. 1960. The seed bugs; a contribution of the feeding habits of the Lygaeidae (Hemiptera: Heteroptera). Ann. Ent. Soc. Amer. 53: 317-321.
- _____. 1964. The biology and ecology of the Rhyparochrominae of New England (Heteroptera: Lygaeidae) Pt. I. Ent. Americana 43: 1-123. Pt. II. Entomol. Americana 44: 1-201.
- _____. 1977. Elevation of the seedbug *Eremocoris borealis* (Dallas) from synonymy with *Eremocoris fesus* (Say) (Hemiptera: Lygaeidae). Ent. News. 88:169-176.
- _____. 1986. *Ligyrocoris barberi* (Heteroptera: Lygaeidae), a new seedbug from the southeastern United States with a discussion of its ecology, life cycle, and reproductive isolation. Jour. N.Y. Ent. Soc. 94: 281-290.
- Torre-Bueno 1912. Three days in the pines of Yaphank, records of captures of Hemiptera Heteroptera. Canad. Ent. 44: 209-213.
- _____. 1921a. New records of Florida bugs. Bull. Brooklyn Ent. Soc. 16: 61.
- _____. 1921b. Food plants of *Cymus discors* Horv. Bull. Brooklyn Ent. Soc. 16:136.
- _____. 1931. Heteroptera collected by G. P. Engelhardt in the South and West II. Bull. Brooklyn Ent. Soc. 26:135-139.
- _____. 1933. On Floridian Heteroptera, with new state records from the Keys. Bull. Brooklyn Ent. Soc. 28:28-31.
- _____. 1935. Note on *Hypogeocoris piceus* Say. Bull. Brooklyn Ent. Soc. 30:118.
- _____. 1944. New records of *Oncopeltus* (Hemiptera, Lygaeidae) and a new species from the U.S. Bull. Brooklyn Ent. Soc. 39:135-136.
- _____. 1946. A synopsis of the Hemiptera-Heteroptera of America north of Mexico. III. Family XI. Lygaeidae. Ent. Amer. 26:1: 1-141.
- Townsend, C. H. T. 1887. On the life history of *Lygaeus turcicus* Fab. Ent. Amer. 3:53-55.
- Uhler, P.R. 1871. Notices of some Heteroptera in the collection of Dr. T.W. Harris. Proc. Boston Soc. Nat. Hist. 14: 93-109.
- _____. 1872. Notices of the Hemiptera of the western territories of the United States chiefly from the surveys of Dr. F.V. Hayden. In: Hayden, Prelim. Rep., U.S. Geol. Survey Mont. 1872: 392-423.
- _____. 1876. List of Hemiptera of the region west of the Mississippi River, including those collected during the Hayden explorations of 1873. Bull. U.S. Geol. Geog. Surv. Terr. 1:269-361.
- _____. 1877. Report upon the insects collected by P. R. Uhler during the explorations of 1875, including monographs of the families Cydnidae and Saldidae and the Hemiptera collected by A. S. Packard, Jr., M. D. Bull. U. S. Geol. Geog. Surv. Terr. 3:355-475.
- _____. 1878. Notices of the Hemiptera Heteroptera in the collection of the late T.W. Harris, MD. Proc. Boston Soc. Nat. Hist. 19:365-446.
- _____. 1886. Checklist of the Hemiptera Heteroptera of North America. Brooklyn Ent. Soc. Brooklyn, New York. pp. i-iv, 1-32.
- _____. 1893. A List of the Hemiptera-Heteroptera collected in the Island of St. Vincent by Mr. Herbert H. Smith; with descriptions of new genera and species. Proc. zool. Soc. London 1893: 705-719.

- _____. 1894. On the Hemiptera-Heteroptera of the island of Grenada, West Indies. Proc. zool. Soc. London 1894: 167-224.
- _____. 1895, In: Gillette & Baker. A preliminary list of the Hemiptera of Colorado. Bull. Colorado Agric. Exp. Sta. 31:1-137.
- _____, R. L. 1942. The genus *Nysius* and its allies in the Hawaiian Islands (Hemiptera, Lygaeidae, Orsillini) Bull. Bishop Mus. 173: 1-167.
- Duzee, E. P. 1888. Mimicry in Hemiptera. Psyche 4: 27-28.
- _____. 1905. List of Hemiptera taken in the Adirondack mountains. Bull. New York Mus. 97:546-556.
- _____. 1909. Observations on some Hemiptera taken in Florida in the spring of 1908. Bull. Buffalo Soc. Nat. Sci. 9:149-230.
- _____. 1910. Descriptions of some new or unfamiliar North American Hemiptera. Trans. Amer. Ent. Soc. 36: 73-88.
- _____. 1912. Synonymy of the Provancher collection of Hemiptera. Canad. Ent. 44: 317-329.
- _____. 1916. Check list of the Hemiptera (excepting the Aphididae, Aleurodidae and Coccidae) of America, north of Mexico. New York: New York Ent. Soc.
- _____. 1917. Catalogue of the Hemiptera of America north of Mexico. Berkeley: Univ. California Press.
- _____. 1923. Expedition of the California Academy of Sciences to the Gulf of California in 1921. The Hemiptera (true bugs etc.). Proc., California Acad. Sci. (Ser. 4):12: (11):123-200.
- _____, E. 1958. Der Nysius-Komplex (Hem. Het. Lygaeidae) in der Palaearktis. Comment. biol., Helsing. 19:(2):1-54.
- _____, F. 1872. Catalogue of the specimens of Hemiptera Heteroptera in the collection of the British Museum. London: 8 parts. (also 1871).
- _____. 1873. Catalogue of Hemiptera Heteroptera in the British Museum Supplement. London: E.W. Janson pp. 1-63.
- Watson, J. R. 1931. Florida truck and garden insects. Bull. Fla. Univ. Agric. Exp. Sta. 232: 1-112.
- Watson, J.R. & A.N. Tissot 1942. Insects and other pests of Florida vegetables. Bull. Fla. Univ. Agric. Exp. Sta. 1942: 1-118.
- Wheeler, A. G. Jr. 1976a. Birch Catkin Bug, *Kleidocerys resedae* (Panzer) Hemiptera: Lygaeidae. Pennsylvania Dept. Agric. Ent. Circ. No. 15 Vol. 2: 15-16,
- _____. 1976b. Life history of *Kleidocerys resedae* on european white birch and ericaceous Shrubs. Ann. Ent. Soc. Amer. 69: 459-463.
- _____. 1981. Insect associates of spurge, mainly *Euphorbia maculata* L., in Eastern United States. Proc. Ent. Soc. Washington 83: 631-641.
- _____. 1983. The Small Milkweed Bug, *Lygaeus kalmii* (Hemiptera: Lygaeidae): Milkweed specialist or opportunist? Jour. New York Entomol. Soc. 91: 57-62.
- _____. 1984. Seasonal history, habits and immature stages of *Belonochilus numenius* (Hemiptera: Lygaeidae). Proc. Ent. Soc. Washington. 86:790-796
- Wickham, H. F. 1895. A note on the insects of the Tortugas. Ent. News 6: 210-212.
- Wilson, J. W. 1938. Notes on *Pamera* populations on various types of plant communities in the vicinity of Plant City. Florida Entomol. 21:28-30.
- Wolcott, G. W. 1936. "Insectae Borinquenses." J. Dept. Agric. Porto Rico. 20:1:1-627.
- Wolff, J. F. 1804. Icones Cimicum descriptionibus illustratae. Erlangae: apud Joann. Jacobum Palm. 4: 127-161.
- Zheng, L. Y. & J. A. Slater. 1984. A revision of the lygaeid genus *Pseudopachybrachius* (Hemiptera). Systematic Entomol. 9:95-115.
- Zetterstedt, J. W. 1819. Nagra nya Svenska Insectarter. K.svenska Vetensk-Akad. Handl. 1819:69-86.

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