

INSECTS AND MITES ASSOCIATED WITH SUGARCANE IN FLORIDA

DAVID G. HALL
Research Department
United States Sugar Corporation
Clewiston, Florida 33440

ABSTRACT

A list of insects and mites associated with sugarcane in Florida is presented. Phytophagous species are listed along with their parasitoids and predators. A literature review of sugarcane entomology in Florida is also given.

RESUMEN

Se presenta una lista de insectos y ácaros asociados con la caña de azúcar en la Florida. Se incluyen especies que se alimentan de plantas junto con sus parásitos y depredadores. También se da un resumen de la literatura de la entomología de la caña de azúcar en la Florida.

Sugarcane has been grown commercially in southern Florida since the 1920s and has become one of the most important crops in the State. Some 400,000 acres are currently grown each year in a general area extending around the lower half of Lake Okeechobee in Glades, Hendry, Palm Beach, and Martin counties. Cane is planted during the fall and winter months and reaches maturity 12 to 15 months later. Usually, one plant-cane crop and two to four ratoon crops are harvested. Fields average around 40 acres in size, but some are as large as 80 acres.

Sugarcane in Florida is attacked by a full complement of arthropod pests including root, stalk, and foliage feeders. Different pest problems develop during different seasons each year, but pest problems can occur all year long due to the subtropical climate of the sugarcane region. Sugarcane pests in Florida were reviewed by Ingram et al. (1938) and by Gifford (1964). During the last 23 years, however, a number of new pests such as *Perkinsiella saccharicida* Kirkaldy and *Melanaphis sacchari* (Zehntner) have appeared in Florida cane. In addition to new pests, new information on other pests and their natural enemies has become available over the last 23 years.

During 1981-1987, I compiled records of insects and mites associated with sugarcane in Florida along with their predators and parasitoids. The list is based on a literature review and on specimens I collected in sugarcane. Frequent trips were made each year to different areas across the sugarcane growing area of Florida to collect specimens. Specimens were also collected during other sugarcane research projects. Many phytophagous species were collected and held in a laboratory to determine if they had been attacked by parasitoids.

Orders are presented alphabetically as are families within orders. Pest species are listed along with their parasitoids and, in some cases, specific predators. The more important pest species are denoted by an asterisk (*). General predators and some noteworthy non-pest species are also listed. Throughout the list, insect and mite species that were common in cane are denoted by superscript "a". All species I personally observed are designated by superscript "b". Where possible and appropriate, a general comment on each listed species is presented along with references pertaining to the

species in Florida sugarcane. Finally, the taxonomist who identified specimens for me is named (det. = determined by). Affiliations for most of the taxonomists are abbreviated: "BMNH" is the British Museum of Natural History, London; "BRI" is the Biosystematics Research Institute, Agriculture Canada, Ottawa, Ontario; "FSCA" is the Florida Center for Arthropod Systematics, Florida State Collection of Arthropods, Division of Plant Industry, Gainesville, Florida; "SI" is the Smithsonian Institute, Washington, D.C.; and "USDA" is the Systematic Laboratory, Insect Identification and Beneficial Insect Introduction Institute, United States Department of Agriculture, Beltsville, Maryland.

ACARINA

ERIOPHYIDAE

Abacarus officinari K.—Collected by Ru Nguyen near Belle Glade during 1983.

TETRANYCHIDAE

**Oligonychus stickneyi* (McGregor)^{ab}—A common pest of leaves. Damage by this mite is sometimes extensive. Miticides occasionally used for control. (Hall 1986a, Strayer 1975) (det. H. A. Denmark, FSCA)

predators:

Phytoseiidae—*Fundiseius cesi* (Muma)^b, *Neoseiulus umbraticus* (Chant)^b (det. H. A. Denmark, FSCA)

Paratetranychus simplex (Banks)—(Box 1953, Ingram et al. 1951)

TARSONEMIDAE

Steneotarsonemus bancrofti (Michael)—First found on sugarcane stalks in Florida at Canal Point in 1922 by E. W. Brands. (Ingram et al. 1938, Ingram et al. 1951)

TYDEIDAE

Pronematus sp.^b—The feeding habits of this mite in cane were not known. (det. H. A. Denmark, FSCA)

COLEOPTERA

ALLECULIDAE

Lobopoda sp.^b—The larvae resemble wireworms and were occasionally encountered in the soil. Apparently saprophytic. (det. R. E. Woodruff, FSCA)

CARABIDAE

Calosoma scrutator (Fab.)^b—A general predator.

Scarites subterraneus Fab.^{ab}—A general predator common in cane. (det. R. E. Woodruff, FSCA)

CERAMBYCIDAE

Prionus sp.—(Box 1953)

CHRYSOMELIDAE

Diabrotica spp.—(Gifford 1964)

COCCINELLIDAE

General predators of aphids and other small arthropods:

Coleomegilla maculata fuscilabris (Mulsant)^b—(det. R. D. Gordon)

Cycloneda sanguinea (Lin.)^{ab}—(Gifford 1964) (det. R. D. Gordon)

Diomus melsheimeri Weise—(Gifford 1964) (There were no FSCA records for this species in Florida)

Diomus terminatus Say^{ab}—(Gifford 1964, Hall 1987a)(det. R. D. Gordon, USDA)

Hippodamia convergens Guerin^{ab}—(det. R. D. Gordon)

Ola v-nigrum Mulsant^b—(det. R. D. Gordon)

Stethorus utilis (Horn)^b—Observed feeding on eggs of *Oligonychus stickneyi*. (det. R. D. Gordon)

CURCULIONIDAE

Pachneus litus (Germar)^b—Large infestation levels of adults observed in several fields during 1987. (det. F. N. Young, FSCA)

Sphenophorus coesifrons (Gyllenhal)^b—Low population levels sometimes found in cane, large levels uncommon. (Hall and Remik 1982) (det. R. E. Woodruff, FSCA)

Sphenophorus venatus vestitus (Chittenden)^b—Low population levels sometimes found in cane, large levels uncommon. (Hall and Remik 1982) (det. R. E. Woodruff, FSCA)

ELATERIDAE

Aeolus dorsalis Say—(Box 1953, Wilson 1940)

A. perversus (Brown)^b—Uncommon in cane. (det. E. C. Becker, BRI)

Conoderus ampliocollis (Gyllenhal)^{ab}—Common wireworm in cane. (Box 1953, Ingram et al. 1938, Ingram et al. 1951, Wilson 1940, Wilson 1946) (det. E. C. Becker, BRI)

C. falli (Lane)^{ab}—Common wireworm in cane. (Gifford 1964, Strayer 1975) (det. E. C. Becker, BRI)

C. rudis Brown^{ab}—Common wireworm in cane. (det. E. C. Becker, BRI)

C. scissus (Schaeffer)^b—Adults common in light-traps operated in cane fields. (det. E. C. Becker, BRI)

Parasitoid reared from unidentified wireworms of the genus *Conoderus*:

Anomalon ejuncidum (Say)^b (Ichneumonidae) (det. V. K. Gupta, FSCA)

Dolopius sp—(Wilson 1940)

Glyphonyx bimarginatus Schaeffer^{ab}—Small wireworm often present. (det. E. C. Becker, BRI)

Ischiodontus sp.^b—Localized populations of this wireworm are sometimes encountered. (det. T. J. Spilman, USDA)

**Melanotus communis* (Gyllenhal)^{ab}—An important soil pest. Insecticides routinely applied at planting time for control. (Box 1953, Bregger et al. 1959, Cherry and Hall 1986, Gifford 1964, Hall 1982, Hall 1985b, Hall and Cherry 1985, Ingram et al. 1938, Ingram et al. 1951, Samol and Johnson 1973, Strayer 1975, Wilson 1940, Wilson 1946) (det. E. C. Becker, BRI)

parasitoid:

Bethylidae—*Pristocera armifera* (Say)^b (det. A. S. Menke, USDA)

Neotrichophorus carolinensis (Schaeffer)^b—A large wireworm occasionally seen in cane. (det. E. C. Becker, BRI)

Orthostethus infuscatus (Germar)^b—Adults sometimes collected at light-traps operated in cane fields. (Box 1953, Ingram et al. 1938, Ingram et al. 1951) (det. E. C. Becker, BRI)

NITIDULIDAE

Carpophilus humeralis (Fab.)^{ab}—Commonly associated with decaying seedpieces in the soil. (det. W. A. Connell, USDA)

SCARABAEIDAE

- Anomola marginata* (Fab.)^{ab}—Common. (Gordon and Anderson 1981, Hall 1987b, Prewitt and Summers 1981)
- Cyclocephala parallela* Casey^{ab}—Common. (Boucias et al. 1986, Bregger et al. 1959, Cherry 1984a, Cherry 1985, Gifford 1964, Gordon and Anderson 1981, Hall 1987b, Ingram et al. 1938, Ingram et al. 1951, Prewitt and Summers 1981, Strayer 1975, Watve and Shuler 1985, Watve et al. 1981)
- Dyscinetus morator* (Fab.)^b—Adults commonly collected at light traps in cane fields, but larvae rarely found in cane. (Gordon and Anderson 1981)
- Euphoria sepulchralis* (Fab.)^b—Common in some areas. (Gordon and Anderson 1981, Strayer 1975)
- **Ligyris subtropicus* (Blatchley)^{ab}—This large grub can cause extensive damage. Infestations common but usually localized and occur primarily in organic soils. (Boucias et al. 1986, Cherry 1983a, Cherry 1983b, Cherry 1984a, Cherry 1984b, Cherry 1985, Gordon and Anderson 1981, Hall 1987b, Miller and Bell 1985, Prewitt and Summers 1981, Sosa 1984a, Sosa 1984b, Sosa and Beavers 1985, Strayer 1975, Summers 1974, Summers 1978a, Summers et al. 1981, Watve and Shuler 1985, Watve et al. 1981)
- Phyllophaga latifrons* (LeConte)^{ab}—Common in some areas. (Box 1953, Gordon and Anderson 1981, Hall 1987b, Ingram et al. 1938, Ingram et al. 1951, Prewitt and Summers 1981)

Pupae of the following parasitoid species were often collected in the soil around cane infested by grubs, notably *C. parallela*:

- Tiphiidae—*Tiphia floridana floridana* Robertson^b, *Tiphia* spp^b
(det. R. W. Carlson, USDA)
- Scoliididae—*Scolia bicincta* Fab.^b (det. R. W. Carlson, USDA)

STAPHYLINIDAE

General predators in sugarcane. (Adams et al. 1981):

- Anotylas insignitus* (Gravenhorst)
- A. nanus* (Erichson)
- Acrotona hebiticornis* Notman
- Atheta macrops* Notman
- A.* spp
- Belonuchus pallidus* Casey
- Diochus schaumii* Kraatz
- Meronea venustula* (Erichson)
- Philonthus hepaticus* Erichson
- Sunius debilicornis* (Wollaston)
- Thoracophorus* sp
- Tinotus* sp

COLLEMBOLA

ENTOMOBRYIDAE

Salina beta Christiansen & Bellinger^{ab}—A yellowish, fast-moving species often present on the underside of sugarcane leaves. (det. M. M. Bush-Davis, SI)

ONYCHIURIDAE

- Lepidocyrtus cyaneus* Tullberg—(Box 1953, Ingram et al. 1951)
- Onychiurus armatus* (Tullberg)—(Ingram et al. 1951)
- Pseudosinella violenta* (Folsom)—(Ingram et al. 1951)

DERMAPTERA

LABIDURIDAE

Labidura riparia (Pallas)^{ab}—A general predator, notably of *Diatraea saccharalis*.
(Ingram et al. 1951)

DIPTERA

ASILIDAE

Robberfly larvae sometimes appear to be important predators of scarab grubs.

Diogmites neoternatus Bromley—(det. A. G. Scarbrough, FSCA) (R. H. Cherry, pers. comm.)

prob. *Diogmites esuriens* Bromley^b—(det. S. W. Bullington, Virginia Polytech. Instit. and St. Univ.)

Triorla interrupta (Macquart)^b—(det. S. W. Bullington, Virginia Polytech. Instit. and St. Univ.)

OTITIDAE

Euxesta stigmatias Loew—Adults often in sugarcane fields. (det. H. V. Weems, FSCA) (O. Sosa, pers. comm.)

SYRPHIDAE

Allograpta exotica (Wiedemann)^b—A general predator of aphids and mites. (Hall 1987a) (det. F. C. Thompson, USDA)

HEMIPTERA

CYDNIDAE

Cyrtomenus ciliatus (Palisot de Beauvois)^b—Low population levels found in a few fields. (det. J. E. Eger, Dow Chemical USA)

Pangaeus bilineatus (Say)^b—Low population levels found in a few fields. (det. J. E. Eger, Dow Chemical USA)

PENTATOMIDAE

Andrallus spinidens (Fab.)^b—Occasional predator, notably of *Mocis latipes*. (det. J. E. Eger, Dow Chemical USA)

Podisus maculiventris (Say)^b—Occasional predator. (det. J. E. Eger, Dow Chemical USA)

HOMOPTERA

APHIDIDAE

Hysteroneura setariae (Thomas)—(Gifford 1964, Ingram et al. 1938) (There were no FSCA records for this aphid in Florida sugarcane)

Melanaphis sacchari (Zehntner)^{ab}—Common and sometimes present at large levels. (Hall 1987a, Mead 1978, Summers 1978b)

parasitoid:

Aphidiidae—*Lysiphlebus testaceipes* (Cresson)^b (det. P. M. Marsh, USDA)

Rhopalosiphum maidis (Fitch)—(Gifford 1964, Ingram et al. 1938) (There were no FSCA records for this aphid in Florida sugarcane)

**Sipha flava* (Forbes)^{ab}—An important pest of cane. Common but frequently localized within a cane field. Insecticides occasionally used for control. (Bregger

et al. 1959, Gifford 1964, Hoffman 1959, Ingram et al. 1938, Ingram et al. 1951, Strayer 1975)

CERCOPIDAE

Prosapia bicincta (Say)^b—Low population levels sometimes occur but no economic damage has been reported. (Gifford 1964, Ingram et al. 1938, Ingram et al. 1951, Strayer 1975)

CICADELLIDAE

Draeculacephala portola Ball^{ab}—Common but has not been reported to cause economic damage in Florida cane. (Gifford 1964, Ingram et al. 1951, Strayer 1975)

parasitoids:

Mymaridae—*Lymaenon koebelei* (Perkins)

Trichogrammatidae—*Ufens niger* (Ashmead)

Homalodisca insolita (Walker)^b—(det. J. P. Kramer, USDA)

Two leafhoppers, *Graminella nigrifrons* (Forbes) and *Balclutha caldwelli* Blocker, were collected in sweepnet samples taken in young cane fields. *Draeculacephala producta* (Walker) and *D. inscripta* (Van Duzee) were collected at black-light traps operated in cane fields. (Cicadellids det. J. P. Kramer, USDA)

CIXIIDAE

Myndus crudus Van Duzee^b—Sometimes present in low numbers. (det. J. P. Kramer, USDA)

COCCIDAE

**Pulvinaria elongata* Newstead^{ab}—Damage by this scale can be severe. Localized infestations sometimes occur. These scales frequently controlled by natural enemies. (Ingram et al. 1951, Williams et al. 1969)

parasitoids:

Aphelinidae—*Coccophagus lycimnia* (Walker)^b, *Coccophagus* sp^b, *Encarsia* sp^b

Encyrtidae—*Homosemion* sp^b, *Metaphycus flavus* (Howard)^b, *Metaphycus* spp^b, prob. *Trichomasthus* sp^b. *Cheiloneurus pulvinariae* Dozier^b was a hyperparasite of *M. flavus*. (parasitoids det. M. E. Schauff, USDA)

DELPHACIDAE

Perkinsiella saccharicida Kirkaldy^{ab}—Common but has not caused serious damage in Florida cane. (Hall 1985b, Nguyen et al. 1984, Sosa 1982, Sosa 1983b, Sosa 1985b, Sosa and Cherry 1982)

predator:

Miridae—*Tytthus parviceps* (Reuter)^b (det. T. J. Henry, USDA)

parasitoid:

Mymaridae—*Anagrus* sp

Saccharosydne saccharivora Westwood^{ab}—Common but usually not present in large enough numbers to be damaging. (Bregger et al. 1959, Gifford 1964, Ingram et al. 1938, Ingram et al. 1951, Strayer 1975)

predators:

Miridae—*Tytthus parviceps* (Reuter)^b (det. T. J. Henry, USDA)

Reduviidae—*Zelus longipes* (Lin.) (Released into cane during 1960 and may still be present; F. D. Bennett, pers. comm.)

parasitoids:

- Mymaridae—*Anagrus armatus* (Ashmead)
 Trichogrammatidae—*Paracentrobia* (= *Abbella*) spp
 Dryinidae—*Pseudogonatopus variistriatus* Fen.^b
 Stylopidae—*Stenocranophilus quadratus* Pierce

The following delphacids were collected in sweepnet samples taken in young cane fields: *Sogatodes molinus* Fennah, *Delphacodes propinqua* (Fieber), *Delphacodes puella* (Van Duzee), *Sogatella kolophon* (Kirkaldy), *Pissonotus piceus* (Van Duzee), and *Megamelus gracilis* Beamer. (delphacids det. J. P. Kramer, USDA)

DIASPIDIDAE

Aspidiella sacchari (Cockerell)—(Box 1953, Dekle 1976, Williams et al. 1969)

parasitoid:

- Encyrtidae—*Adelencyrtus moderatus* (Howard) (det. J. Noyes, BMNH) (F. D. Bennett, pers. comm.)

PSEUDOCOCCIDAE

Dysmicoccus boninsis (Kuwana)^{ab}—Common but not regarded as an economic pest. (Box 1953, Gifford 1964, Ingram et al. 1938, Ingram et al. 1951, Strayer 1975, Warner 1941)

parasitoid:

- Encyrtidae—*Metaphycus* sp.^b (det. M. E. Schauff, USDA)
Dysmicoccus brevipes Cockerell—On sugarcane at the Miami World Collection of Sugarcane. (det. A. Hamon, FSCA) (F. D. Bennett, pers. comm.)

HYMENOPTERA

FORMICIDAE

Over 30 different species of ants have been reported in Florida sugarcane fields (Adams et al. 1981a, Adams et al. 1981b, Carroll 1970, Prewitt et al. 1981). The imported red fire ant, *Solenopsis invicta* Buren, is common. It may be an important predator of *Diatraea saccharalis* and other insects.

LEPIDOPTERA

ELACHISTIDAE

Dicranoctetes sp.^b—Low population levels of this leafminer sometimes occur. (Hall 1983) (det. R. W. Hodges, USDA)

parasitoids:

- Eulophidae—*Chrysocharis imbratus* (Walker)^b, *Cirrospilus* sp.^b (det. M. E. Schauff, USDA)

HESPERIDAE

prob. *Lerema accius* Abbot and Smith^b—Uncommon.

NOCTUIDAE

Agrotis ipsilon (Hufnagel)^b—(Box 1953, Ingram et al. 1938, Ingram et al. 1951) (det. R. W. Poole, USDA)

Agrotis malefida Guenée—(Box 1953, Ingram et al. 1938, Ingram et al. 1951)

Agrotis subterranea (Fab.)^b—(Box 1953, Ingram et al. 1951) (det. R. W. Poole, USDA)

- Anicla infecta* (Ochsenheimer)^b—(det. R. W. Poole, USDA)
Elaphira chalcedonia (Hubner)—(Box 1953, Ingram et al. 1938, Ingram et al. 1951)
Elaphira nucicolora (Guenée)—(Box 1953, Ingram et al. 1938, Ingram et al. 1951)
Leucania latiuscula Herrich-Schaffer—(Gifford 1964, Ingram et al. 1938, Ingram et al. 1951, Strayer 1975, Wylie 1946)

parasitoids:

- Tachinidae—*Archytas piliventris* Van der Wulp, *Belvosia luteola* Coquillett, *Eucelatoria rubentis* (Coquillett)
 Braconidae—*Cotesia floridanus* Muesebeck, *C. rufocoxalis* (Riley)
 Eulophidae—*Euplectrus plathypenae* Howard
 Ichneumonidae—*Ichneumon* sp near *laetus* Brulle, *Netelia emorsa* Townsend, *Ophion ancyloneura* Cameron, undet. sp of Ichneumonini

- Leucania scirpicola* (Guenée)^b—Low levels are common in some areas. (det. R. W. Poole, USDA)

parasitoid:

- Braconidae—*Cotesia rufocoxalis* (Riley)^b (det. P. M. Marsh, USDA)

- Meropleon cosmion* Dyar—(Ingram et al. 1951)

- Mocis latipes* Guenée^{ab}—Infestations frequently occur, especially on some varieties. Can cause extensive defoliation. (Gifford 1964, Hall 1985c, Strayer 1975) (det. D. M. Weisman, USDA)

parasitoids:

- Sarcophagidae—*Sarcodexia sternodontis* (Townsend)^b (det. N. E. Woodley, USDA)
 Tachinidae—*Chetogena* sp.^b (det. N. E. Woodley, USDA)
 Ichneumonidae—*Enicospilus* sp.^b (det. L. A. Stange, FSCA), *Gambrus ultimus* (Cresson)^b (det. V. K. Gupta, FSCA)
 Braconidae—*Rogas* sp.^b (det. S. R. Shaw, USDA)
 Chalcididae—*Spilochalcis* sp.^b (det. E. E. Grissell, USDA)

- Prodenia eridania* (Cramer)—(Gifford 1964)

- Spodoptera frugiperda* J. E. Smith^{ab}—Large infestations sometimes occur. (Gifford 1964, Ingram et al. 1938, Ingram et al. 1951, Strayer 1975) (det. R. W. Poole, USDA)

parasitoids:

- Tachinidae—*Lespesia archippivora* (Riley)^b (det. N. E. Woodley, USDA)
 Braconidae—*Meteorus autographae* Muesebeck^b (det. P. M. Marsh, USDA)

- Parasitoids reported to be active against some cutworms and armyworms (Box 1953, Ingram et al. 1938):

- Braconidae—*Agathis texana* (Cresson)
 Ichneumonidae—*Enicospilus purgatus* (Say), *Paniscus ocellata* Viereck
 Tachinidae—*Eucelatoria comosa* (Van der Wulp)

PYRALIDAE

- Diatraea crambidoides* Grote—(Box 1953)

- Diatraea evanescens* Dyar^b—Low infestation levels occur. (det. D. C. Ferguson, USDA)

- **Diatraea saccharalis* (Fab.)^{ab}—An important, widespread pest. Insecticides often used for control. (Adams et al. 1981b, Alvarez and Kidder 1981, Box 1953,

Bregger et al. 1959, Carroll 1970, Charpentier et al. 1965, Gifford 1964, Gifford 1965, Gifford and Mann 1967, Hoffman 1959, Hall 1981, Hall 1986b, Hall 1986c, Ingram et al. 1938, Ingram et al. 1951, Long and Hensley 1972, Mathes et al. 1953, Prewitt et al. 1982, Reagan 1984, Reagan et al. 1973, Rice 1981, Scaramuzza 1942, Sosa 1981, Sosa 1983a, Sosa 1985a, Strayer 1975, Summers 1976a, Summers 1976b, Summers et al. 1976, Summers et al. 1977, Taylor 1944, Ulloa et al. 1982, Williams et al. 1969, Wilson 1941, Wilson 1942)

parasitoids:

Braconidae—*Agathis stigmatera* (Cresson)^b, *Cotesia flavipes* (Cameron)^b (det. P. M. Marsh, USDA)

Trichogrammatidae^b—*Trichogramma fasciatum* (Perkins), *Trichogramma minutum* Riley

Elasmopalpus lignosellus (Zeller)^{ab}—Large infestations sometimes occur. (Bregger et al. 1959, Gifford 1964, Ingram et al. 1938, Ingram et al. 1951, Mathes et al. 1953, Strayer 1975)

parasitoids:

Tachinidae—*Chetogena floridensis* (Townsend)^b (det. N. E. Woodley, USDA)

Braconidae—*Orgilus elasmopalpi* Muesebeck^b (det. P. M. Marsh, USDA)

Herpetogramma bipunctalis (Fab.)^b—The southern beet webworm is uncommon in cane. (det. J. B. Heppner, FSCA)

Marasmia trapezalis (Guenée)^{ab}—Large infestations sometimes occur. (Strayer 1975) (det. D. C. Ferguson, USDA)

parasitoids:

Braconidae—*Agathis discolor* (Cresson)^b, *Agathis texana* (Cresson)^b, *Chelonus (Microchelonus) sp^b*, *Dolichogenidea sp^b*, *Rogas laphygmae* Viereck^b (det. P. M. Marsh, USDA)

Tachinidae—*Chetogena floridensis* (Townsend)^b (det. N. E. Woodley, USDA)

NEUROPTERA

CHRYSOPIDAE

Chrysoperla externa (Hagan)^b—A general predator of aphids and mites. (det. L. A. Stange, FSCA)

HEMEROBIIDAE

Micromus subanticus (Walker)^b—A general predator of aphids and mites. (det. L. A. Stange, FSCA)

ORTHOPTERA

ACRIDIDAE

Schistocera obscura (Fab.)^b—Localized infestations sometimes occur.

GRYLLIDAE

Gryllus assimilis (Fab.)^b

Gryllus firmus Scudder^b

GRYLLOTALPIDAE

Mole crickets sometimes kill young cane shoots.

Scapteriscus acletus Rehn and Hebard^b—(det. D. A. Nickle, USDA)
Scapteriscus vicinus Scudder^b—(det. D. A. Nickle, USDA)

PSOCOPTERA

ECTOPSOCIDAE

Ectopsocopsis cryptomeridae (Enderlein)^b—Sometimes present during late spring.
 Appeared to feed on the sugarcane rust fungus. (det. E. L. Mocford, Ill. State Univ.)

ACKNOWLEDGEMENTS

I am grateful to the taxonomists who identified specimens for me. Rick A. Armstrong provided invaluable assistance with collecting, mounting and submitting specimens for identification. Diana Ford typed the manuscript. For their special assistance during this project, I would like to thank F. D. Bennett, R. H. Cherry, O. Sosa, E. C. Becker, S. W. Bullington, J. E. Eger, H. A. Denmark, M. S. Irely, and R. E. Woodruff.

REFERENCES CITED

- ADAMS, C. T., C. S. LOFGREN, AND R. BEUTELL. 1981a. Interrelationship of the red imported fire ant and staphylinids collected in pitfall traps in Florida sugarcane fields. Semi Annual Report of Research conducted on Imported Fire Ants, Sci. Educ. Adm., Agr. Res., Gainesville, FL and Gulfport, MS. Rept. 80(1): 10-11.
- ADAMS, C. T., T. E. SUMMERS, C. S. LOFGREN, D. A. FOCKS, AND J. C. PREWITT. 1981b. Interrelationship of ants and the sugarcane borer in Florida sugarcane fields. *Envir. Entomol.* 10(3): 415-418.
- ALVAREZ, J. AND G. KIDDER. 1981. Economic thresholds for sugarcane borer populations in Florida. *Proc. Amer. Soc. Sugar Cane Techn.* 9: 104.
- BOUCIAS, D. G., R. H. CHERRY, AND D. L. ANDERSON. 1986. Incidence of *Bacillus popilliae* in *Ligyris subtropicus* and *Cyclocephala parallela* (Coleoptera: Scarabaeidae) in Florida sugarcane fields. *Envir. Entomol.* 15: 703-705.
- BOX, H. E. 1953. List of sugar-cane insects—a synonymic catalogue of the sugar-cane insects and mites of the world, and of their insect parasites and predators, arranged systematically. London: Commonwealth Instit. Entomol., 41, Queen's Gate, London, S.W.7. 101 pp.
- BREGGER, T., P. H. DUNCKELMAN, F. LEGRAND, E. H. TODD, AND D. D. QUESTEL. 1959. A brief review of sugarcane research in Florida, 1939-1959. *Proc. Soil and Crop Sci. Soc. Fla.* 19: 287-294.
- CARROLL, J. F. 1970. Role of ants as predators of the sugarcane borer, *Diatraea saccharalis*. Unpub. MS Thesis, University of Fla. 70 pp.
- CHARPENTIER, L. J., J. R. GIFFORD, AND R. MATHES. 1965. Present status of biological control of the sugarcane borer in continental United States. *Proc. Internat'l. Soc. Sugar Cane Techn.* 12: 1287-1294.
- CHERRY, R. H. 1983a. Flooding to control the grub *Ligyris subtropicus* in Florida sugarcane. *Univ. Fla., Belle Glade Agr. Res. Ed. Center Res. Rept. EV-1983-7.* 7 pp.
- . 1983b. Contact toxicities of ten insecticides to the sugarcane grub, *Ligyris subtropicus* (Coleoptera: Scarabaeidae). *Fla. Entomol.* 66(4): 503-506.
- . 1984a. Spatial distribution of white grubs (Coleoptera: Scarabaeidae) in Florida sugarcane. *J. Econ. Entomol.* 77: 1341-1343.
- . 1984b. Flooding to control the grub *Ligyris subtropicus* (Coleoptera: Scarabaeidae) in Florida sugarcane. *J. Econ. Entomol.* 77: 254-257.

- . 1985. Seasonal phenology of white grubs (Coleoptera: Scarabaeidae) in Florida sugarcane fields. *J. Econ. Entomol.* 78(4): 787-789.
- CHERRY, R. H. AND D. G. HALL. 1986. Flight activity of *Melanotus communis* (Coleoptera: Elateridae) in Florida sugar cane fields. *J. Econ. Entomol.* 79: 626-628.
- DEKLE, G. W. 1976. Florida armored scale insects. *Arthropods of Florida*. Fla. Dept. Agr. Vol. 3, 345 pp.
- GIFFORD, J. R. 1964. A brief review of sugarcane insect research in Florida, 1960-1964. *Proc. Soil and Crop Sci. Soc. Fla.* 24: 449-453.
- GIFFORD, J. R. 1965. *Goniozus indicus* as a parasite of the sugarcane borer. *J. Econ. Entomol.* 58: 799-800.
- GIFFORD, J. R. AND G. A. MANN. 1967. Biology, rearing, and a trial release of *Apanteles flavipes* in the Florida Everglades to control the sugarcane borer. *J. Econ. Entomol.* 60: 44-47.
- GORDON, R. D. AND D. M. ANDERSON. 1981. The species of Scarabaeidae (Coleoptera) associated with sugarcane in south Florida. *Fla. Entomol.* 64(1): 119-138.
- HOFFMAN, C. H. 1959. Entomology Research Division programs relating to Florida insect problems. *Fla. Entomol.* 42: 1-10.
- HALL, D. G. 1981. A biological-chemical IPM program for the sugarcane borer. *Proc. 2nd Inter-Amer. Sugar Cane Sem.—Insect and Rodent Pests*: 89-95.
- . 1982. A parasite, *Pristocera armifera* (Say), of the wireworm *Melanotus communis* (Gyll.) in south Florida. *Fla. Entomol.* 65: 574.
- . 1983. A leaf miner, *Dicranoctetes* sp (Lepidoptera: Elachistidae), infesting sugarcane in south Florida. *Fla. Entomol.* 66: 521.
- . 1985a. Damage by the corn wireworm, *Melanotus communis* (Gyll.), to plant cane during germination and early growth. *J. Amer. Soc. Sugar Cane Techn.* 4: 13-17.
- . 1985b. Sugarcane delphacid control, small plot insecticide test, 1984. *Insect. and Acar. Tests.* 10: 248-249.
- . 1985c. Parasitoids of grasshopper prepupae and pupae in south Florida sugarcane. *Fla. Entomol.* 68: 486-487.
- . 1986a. *Oligonychus stickneyi* (McGregor): a mite pest of sugarcane in Florida. *J. Amer. Soc. Sugar Cane Techn.* 6: 134-135.
- . 1986b. Seasonal activity of parasitoids against sugarcane borer larvae in Florida. *J. Amer. Soc. Sugar Cane Techn.* 6: 19-23.
- . 1986c. Sampling for the sugarcane borer (Lepidoptera: Pyralidae) in sugarcane. *J. Econ. Entomol.* 79: 813-816.
- . 1987a. The sugarcane aphid, *Melanaphis sacchari*, in Florida sugarcane. *J. Amer. Soc. Sugar Cane Techn.* 7: 26-29.
- . 1987b. Seasonal flight activity of sugarcane grubs in Florida. *J. Amer. Soc. Sugar Cane Techn.* 7: 39-42.
- HALL, D. G. AND M. D. REMIK. 1982. Billbugs in Florida sugarcane. *Sugar J.* 45(5): 27.
- HALL, D. G. AND R. H. CHERRY. 1985. Contact toxicities of eight insecticides to the wireworm *Melanotus communis* (Coleoptera: Elateridae). *Fla. Entomol.* 68: 350-352.
- INGRAM, J. W., H. A. JAYNES, AND R. N. LOBDELL. 1938. Sugarcane pests in Florida. *Proc. Internat'l. Soc. Sugar Cane Techn.* 6: 89-98.
- INGRAM, J. W., E. K. BYNUM, RALPH MATHES, W. E. HALEY, AND L. J. CHARPENTIER. 1951. Pests of sugarcane and their control. U.S.D.A. Cir. 878. 38 pp.
- LONG, W. H. AND S. D. HENSLEY. 1972. Insect pests of sugarcane. *Ann. Rev. Entomol.* 17: 149-176.
- MATHES, RALPH, J. W. INGRAM, D. D. QUESTEL, W. H. THAMES, AND A. L. DUGAS. 1953. Current status of sugarcane-insect investigations in the United States. *Proc. Internat'l. Soc. Sugar Cane Techn.* 8: 560-567.
- MEAD, F. W. 1978. Sugarcane aphid (*Melanaphis sacchari* (Zehntner))—Florida—new continental United States record. *Coop. Plant Pest Rept.* 3(34): 475.
- MILLER, J. D. AND M. G. BELL. 1985. Life cycle of the white grub and its effect on sugarcane. *J. Amer. Soc. Sugar Cane Techn.* 4: 38-42.

- NGUYEN, RU, O. SOSA, JR., AND F. W. MEAD. 1984. Sugarcane delphacid, *Perkinsiella saccharicida* Kirkaldy 1903. Fla. Dept. Agric. and Consum. Serv., Div. Plant Ind., Entomol. Circ. 265. 2 pp.
- PREWITT, J., T. E. SUMMERS, W. BEARDSLEY, AND F. POLHILL. 1982. Monitoring fields for effective sugarcane borer control. J. Amer. Soc. Sugar Cane Techn. 1: 86.
- PREWITT, J. C. AND T. E. SUMMERS. 1981. White grubs of sugarcane in south Florida. Proc. 2nd Inter-Amer. Sugar Cane Sem.—Insect and Rodent Pests: 49-450.
- PREWITT, J., R. BROWN, T. L. CARPENTER, G. B. POWELL, AND T. E. SUMMERS. 1981. Known distribution of the imported fire ant *Solenopsis invicta* Buren in Florida sugarcane fields: benefit or problem for the future. Proc. Amer. Soc. Sugar Cane Techn. 8: 160.
- REAGAN, T. E. 1984. Insecticide resistance studies with Florida and Louisiana sugarcane borer populations. J. Amer. Soc. Sugar Cane Techn. 3: 90.
- REAGAN, T. E., S. D. HENSLEY, AND J. B. GRAVES. 1973. Status of insecticide resistance in sugarcane borer populations in Louisiana. J. Econ. Entomol. 66: 576.
- RICE, E. R. 1981. Biological-chemical control of the sugarcane borer in Florida. Sugar J. 43(9): 17-19.
- SAMOL, H. H. AND S. R. JOHNSON. 1973. Effect of some soil pesticides on sugarcane yields in Florida. Proc. Amer. Soc. Sugar Cane Techn. 2: 37-40.
- SCARAMUZZA, L. C. 1942. Results attained in the biological control of *Diatraea saccharalis* (F.) in Florida. J. Econ. Entomol. 35: 642-645.
- SOSA, O., JR. 1981. Sugarcane borer, *Diatraea saccharalis*, in Florida: a review. Proc. 2nd Inter-Amer. Sugar Cane Sem.—Insect and Rodent Pests: 145-152.
- . 1982. Discovery of a new insect pest of sugarcane in Florida, *Perkinsiella saccharicida* Kirkaldy, a North American record. Proc. 3rd Inter-Amer. Sugar Cane Sem.—Varieties and Breeding: 223-226.
- . 1983a. Sugar cane borer survey of the 1980-1981 sugarcane variety tests in Florida. J. Amer. Soc. Sugar Cane Techn. 2: 86-87.
- . 1983b. Sugarcane delphacid discovered in Florida. Sugar J. 45: 16.
- . 1984a. Effect of white grub (Coleoptera: Scarabaeidae) infestations on sugarcane yields. J. Econ. Entomol. 77: 183-185.
- . 1984b. Losses caused by the white grub *Ligyrrus subtropicus* in sugarcane. J. Amer. Soc. Sugar Cane Techn. 3: 91-92.
- . 1985a. Evaluation of sugar cane clones for resistance to the sugar cane borer in Florida. J. Amer. Soc. Sugar Cane Techn. 4: 118.
- . 1985b. The sugarcane delphacid, *Perkinsiella saccharicida* (Homoptera: Delphacidae), a sugarcane pest new to North America detected in Florida. Fla. Entomol. 68(2): 357-360.
- SOSA, O., JR. AND R. CHERRY. 1982. Status of *Perkinsiella saccharicida* Kirkaldy, the sugarcane planthopper in Florida, and some background information on this pest. Belle Glade AREC Res. Rept. EV-1982-5. 8 pp.
- SOSA, O., JR. AND J. B. BEAVERS. 1985. Entomogenous nematodes as biological control organisms for *Ligyrrus subtropicus* (Coleoptera: Scarabaeidae) in sugarcane. Envir. Entomol. 14(1): 80-82.
- STRAYER, J. 1975. Sugarcane insect control. Fla. Coop. Ext. Serv., Plant Protect. Pointers, Ext. Entomol. Rept. No. 40. 6 pp.
- SUMMERS, T. E. 1974. Florida sugarcane attacked by white grubs in 1972. Proc. Amer. Soc. Sugar Cane Techn. 3: 124.
- . 1976a. Some calculated costs and returns from monitoring Florida sugarcane for the sugarcane borer, *Diatraea saccharalis* (F.). Proc. Amer. Soc. Sugar Cane Techn. 5: 130.
- . 1976b. Parasitism and control of the sugarcane borer by field released *Lixophaga diatraeae* (T.). Proc. Amer. Soc. Sugar Cane Techn. 5: 131.
- . 1978a. Flooding for the control of the white grub *Bothynus subtropicus* in Florida. Proc. Amer. Soc. Sugar Cane Techn. 7: 128.

- . 1978b. Sugarcane aphid (*Melanaphis sacchari*). Coop. Plant Pest Rept. 3(35): 496.
- SUMMERS, T. E., E. G. KING, D. F. MARTIN, AND R. D. JACKSON. 1976. Biological control of *Diatraea saccharalis* (Lep.: Pyralidae) in Florida by periodic releases of *Lixophaga diatraeae* (Dipt.: Tachinidae). Entomophaga. 21: 359-366.
- SUMMERS, T. E., J. R. ORSENIGO, AND G. KIDDER. 1977. Field monitoring to determine threshold of economic loss due to the sugarcane borer, *Diatraea saccharalis*. Proc. Amer. Soc. Sugar Cane Techn. 6: 148-149.
- SUMMERS, T. E., M. G. BELL, J. PREWITT, D. G. HOLDER, AND J. D. STACY. 1981. Field evaluation of insecticides for control of the white grub *Bothynus subtropicus* in Florida sugar cane. Proc. Amer. Soc. Sugar Cane Techn. 8: 162.
- TAYLOR, D. J. 1944. Life history studies of the sugarcane moth borer, *Diatraea saccharalis* Linn. Fla. Entomol. 27: 10-13.
- ULLOA, M., M. G. BELL, AND J. D. MILLER. 1982. Losses caused by *Diatraea saccharalis* in Florida. J. Amer. Soc. Sugar Cane Techn. 1: 7-10.
- WARNER, J. D. 1941. Sugar cane mealy bug control on seed cane, with special reference to cold water treatment, at the North Florida experiment station. Fla. Entomol. 24(3): 6-7.
- WATVE, C. M. AND K. D. SHULER. 1985. A summary of research activities on white grubs injurious to Florida sugarcane. J. Amer. Soc. Sugar Cane Techn. 4: 73-79.
- WATVE, C. M., J. D. MILLER, M. G. BELL, AND K. D. SHULER. 1981. A summary of research activities on white grubs injurious to Florida sugarcane. Proc. 2nd Inter-Amer. Sugar Cane Sem.—Insect and Rodent Pests: 51-59.
- WILLIAMS, J. R., J. R. METCALFE, R. W. MUNGOMERY, AND R. MATHES (eds.). 1969. Pests of Sugar Cane. Elsevier Pub. Co. 568 pp.
- WILSON, J. W. 1940. Preliminary report on wireworm investigations in the Everglades. Fla. Entomol. 23: 1-6.
- . 1941. Biological control of *Diatraea saccharalis* in the Florida Everglades during 1940 and 1941. Fla. Entomol. 24: 52-57.
- . 1942. Correlation of sugar yields with the percent of joints bored by *Diatraea saccharalis* (F.). Fla. Entomol. 25(2): 19-24.
- . 1946. Present status of the wireworm problem in south Florida. Fla. State Hort. Soc. 59: 103-106.
- WYLIE, W. D. 1946. Entomological control investigations. United States Sugar Corporation, Research Department Doc. 123 (unpublished).

A NEW SPECIES OF *EFFERIA* COQUILLET (DIPTERA:
ASILIDAE), *STAMINEA* SPECIES GROUP,
FROM GRAND CAYMAN ISLAND, WEST INDIES

A. G. SCARBROUGH
Department of Biological Sciences
Towson State University
Baltimore, Maryland 21204

ABSTRACT

Efferia caymanensis is described as a new species from Grand Cayman Island, West Indies. This species is the first *Efferia* reported from the Cayman Islands and the first member of the *staminea* group reported from the West Indies. Illustrations of the terminalia are included.