

ANNOTATED CHECKLIST
OF THE BARK AND AMBROSIA BEETLES
(COLEOPTERA: PLATYPODIDAE AND SCOLYTIDAE)
OF TROPICAL SOUTHERN FLORIDA

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ABSTRACT

The fauna of Scolytidae and Platypodidae is reviewed for tropical southern Florida (Collier, Broward, Dade, and Monroe Counties). The family Platypodidae is represented by 3 species, all in the genus *Platypus*. The family Scolytidae includes 83 species in 37 genera in the region. This total includes 20 species considered immigrants to the area. Three species previously reported from the region, *Cryptocarenum spatulatus* Wood, *Xyleborus xylographus* (Say), and *Araptus politus* (Blandford), probably do not occur there. Feeding habits, mating systems, hosts, and distributions are summarized for all species included.

Key Words: Taxonomy, distributions, ecology, hosts, introduced species

RESUMEN

Se revisa la fauna de las familias Scolytidae y Platypodidae de la region tropical del sur de Florida (condados de Collier, Broward, Dade y Monroe). La familia Platypodidae está representada por 3 especies, todas en el genero *Platypus*. La familia Scolytidae esta representada por 83 especies en 37 generos. Este total incluye 20 especies las cuales se consideran inmigrantes al area. Tres especies previamente reportadas de la region, *Cryptocarenum spatulatus* Wood, *Xyleborus xylographus* (Say) y *Araptus politus* (Blandford), probablemente no existen allí. Habitats alimenticios, sistemas de apareamiento y distribuciones se resumen para todas las especies incluidas.

Bark and ambrosia beetles (Coleoptera: Scolytidae and Platypodidae) constitute a diverse group of beetles that bore in a variety of woody tissues and are well represented in most temperate and tropical forests. Best known are species of *Dendroctonus*, *Ips*, and *Scolytus* that are primary pests of conifers in high-latitude forests, although most of these are atypical of the group as a whole. All species breed in live, stressed, or newly-killed host material. Adults excavate a system of galleries within which eggs are laid and immature development occurs. The greater part of the life cycle takes place within host tissues, except for dispersal between hosts. A fascinating range of patterns of host plant utilization (tissues consumed, relationships with fungal symbionts, and host specificity) and mating behaviors exists within this basic life

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history paradigm. Most species leave a persistent physical record of their life history and activities in the woody tissues of their hosts that can be interpreted by a student of the group. As a consequence, one can easily tabulate several important biological parameters for a large proportion of the species in an area, including those that have not been studied in detail.

The taxonomy of the group is well-known (Wood 1982, Wood & Bright 1993) for the United States as a whole, but there is little information available from southern Florida, largely due to its remoteness. Some collecting was done near the turn of the century by E. A. Schwarz and A.D. Hopkins. S. L. Wood collected there in the 1950's. Besides ourselves, more recent collectors of note include D.E. Bright, M. A. Deyrup, R. H. Turnbow, E. G. Riley and R. A. Anderson. Bright's (1985) checklist of the Caribbean highlighted the paucity of available information from that region. No student of the group has ever collected extensively on any of the Greater Antilles.

The physical, historical, and floristic geography of southern Florida has been reviewed by Peck (1989). The area is geologically recent and has a subtropical climate. It has had direct and continuous land contact with temperate areas, but has never had any land connections with any tropical areas that would serve as source areas for its current biota. Most of the Neotropical flora of southern Florida has apparently dispersed there by wind, water, or birds from the Bahamas and Greater Antilles (Tomlinson 1980).

This checklist represents a convergence of 2 separate projects, a faunal study of the entire group for the southeastern United States by the first author and a biogeographic study of the insect fauna of tropical southern Florida by the second author (Peck 1989). The purpose of this paper is to document the scolytid and platypodid fauna of tropical southern Florida for a subsequent ecological and biogeographical analysis.

METHODS

The second author has collected extensively in the region and accumulated large numbers of specimens of bark and ambrosia beetles as part of a large scale project on the biogeography of the insect fauna of tropical southern Florida (Peck 1989). Sampling was done with flight intercept traps that were left in place over extended periods for 5 years in areas of natural vegetation on the Keys and mainland (sites described in Peck 1989). Over 2,500 specimens of Scolytidae and Platypodidae were collected. Most specimens and representatives of all species collected by the second author were deposited in the Canadian National Collection, the Canadian Museum of Nature, and the S.B. Peck collection (all in Ottawa, Ontario). Some representative specimens were deposited in the Florida State Collection of Arthropods, Gainesville, Florida.

The first author has been involved in a faunal study of the Scolytidae and Platypodidae of the southeastern United States for several years. A total of 1,250 specimens (other than those collected by the second author) were examined from southern Florida, as well as an additional 3,000 specimens of the same species from other parts of the United States, Canada, the Caribbean, and Latin America. Scolytidae and Platypodidae were examined by the first author from the following collections (abbreviations used are from Arnett & Samuelson (1986)): Archbold Biological Station, Lake Placid, Florida (ABSC); Canadian Museum of Nature Collection, Ottawa, Ontario (CMNC); E. G. Riley private collection, College Station, Texas (EGRC), Department of Forestry and Environmental Science, State University of New York, Syracuse, New York (DFEC), Florida State Collection of Arthropods, Gainesville, Florida (FSCA), Henry and Ann Howden collection, Ottawa, Ontario, (CHAH), Museum of Compara-

tive Zoology, Cambridge, Massachusetts (MCZC), R.H. Turnbow private collection, Ft. Rucker, Alabama (RHTC), S.L. Wood private collection, Provo, Utah (SLWC); T.H. Atkinson private collection, Riverside, California (THAC), University of Georgia at Athens Georgia (UGCA), and U. S.. National Museum of Natural History, Washington, D.C. (USNM).

In addition to data taken from museum specimens, the relevant literature on the Scolytidae and Platypodidae was critically reviewed by the first author for specific distribution records in southern Florida, as well as host records and distribution records for the entire ranges of the species included.

ADVENTIVE SPECIES

Exactly what constitutes an adventive species and unambiguous criteria by which one might judge particular cases are matters of considerable debate (Frank & McCoy 1990, 1992, Whitehead & Wheeler 1990). Whitehead & Wheeler (1990) argued that as a general criterion one should consider species to be adventive if newly reported (or detected) in the United States. They recognized that southern Florida had not been well-collected historically and that new records for Antillean species did not necessarily imply that these species were non-native. Frank & McCoy followed this criterion literally in their recent list of new immigrants into Florida (1992) (i.e., new record means new arrival), although they also acknowledged the lack of complete historical information on the insect fauna of tropical southern Florida.

Part of the problem is semantic (Frank & McCoy 1990). Many terms have been used inconsistently in the literature to indicate natural occurrence, occurrence through human intervention (accidental or not), and various types of restricted distributions. Frank & McCoy (1990) restricted the term "introduced" to mean species deliberately brought into a new area. They used the term "immigrant" to refer to species that have arrived and become established without intentional human activities. Their definition is deficient in an important sense in that it does not distinguish between the accidental establishment of species through human agency and the movement and establishment of species into historically new areas by natural means of dispersal, passive or active. To further complicate matters, there is no reason to suppose that the process of accumulation of the biota of southern Florida through "natural means" has come to a stop.

This distinction is not trivial for southern Florida. Given that southern peninsular Florida (including the Keys) has only become emergent in Wisconsinian and recent geological periods (Tomlinson 1980, Peck 1989) and has never had any land connections to the Greater Antilles, virtually any species with an Antillean or Neotropical distribution currently found in Florida is immigrant by this definition. Nonetheless, most of these occur there naturally and should be considered native. These would not be considered "indigenous" as defined by Frank & McCoy (1990). The same would also be true of any Nearctic or Holarctic species occurring naturally in the Florida peninsula as well, although it has been available for colonization by terrestrial organisms since the mid-late Tertiary and Pleistocene. Some Nearctic and Holarctic species have only recently been reported from the peninsula (e.g., Deyrup & Atkinson 1987, Atkinson et al. 1991), yet no one would think to call these "immigrants".

To avoid confusion, we consistently use the terms "adventive" and "immigrant" to refer to species that do not naturally occur in southern Florida. None of the adventive species known from the area have been deliberately introduced in the sense of Frank & McCoy (1990). We use the term "native" to refer to any species which we believe occurs naturally in southern Florida whether "indigenous" (*sensu* Frank & McCoy 1990)

or "immigrant" in the sense of having dispersed to Florida as part of a natural dispersal process not mediated by deliberate or accidental human activity.

There is no evidence that any Neotropical species of Scolytidae or Platypodidae has been introduced, intentionally or accidentally, into Florida in modern times. Such an event might have occurred more than 150 years ago and passed unnoticed (i.e., before the publication dates of works treating the area). Neotropical adventives may be recognized by any combination of the following criteria: (1) the main part of the species' historical distribution does not include the Caribbean; (2) strict association with a non-native host plant; (3) clear association with disturbed habitats and / or absence from natural communities; and (4) documented invasion and / or subsequent spread. Several species that originated in the Old World tropics have become established in this century in the United States and have shown an historical pattern of distribution consistent with spread from a single point, even when the original invasion and colonization passed unremarked. Examples include *Xylosandrus germanus* (Blandford) (Bright 1968, Chapin & Oliver 1986, Staines 1984, Weber & MacPherson 1982), *X. compactus* (Eichhoff) (Dixon & Woodruff 1982, Ngoan et al. 1976), *X. crassiusculus* (Motschulsky) (Anderson 1974, Chapin & Oliver 1986, Deyrup & Atkinson 1987, Kovach & Gorsuch 1985, Atkinson et al. 1991), and *Xyleborus atratus* (Eichhoff) (Atkinson et al. 1990, 1991). In all of these cases, either the historical pattern of spread can be documented from collection records (*Xylosandrus* spp.) or else a "novel species" known from another continent is detected over a wide area almost simultaneously (*Xyleborus atratus*).

We maintain that any species that is currently found in southern Florida and in the Bahamas and / or the Greater Antilles should be considered native (although almost certainly immigrant) unless there is evidence to the contrary. There are 24 species in our area that have this distribution pattern. By the same token, any Neotropical species whose modern range includes the Gulf Coast of the southeastern United States and Texas and is continuously distributed into Mexico and Central America should also be considered native (12 species, some of which are also widely distributed in the eastern United States and / or the Caribbean).

By our restricted criteria, we consider 20 species of Scolytidae found in southern Florida to be immigrants, mostly from Africa or Asia. Frank & McCoy (1992), by a mechanical application of the rule of "recent record means new immigrant", listed 3 other species as immigrants (*Pseudothysanoes securigerus* (Blackman), *Theoborus solitariceps* Schedl, and *Trischidias exigua* Wood) that we consider natives. Wood (1977, 1982) listed an additional 14 Neotropical species as immigrants with distributions that fit one of the 2 patterns described above. *Cryptocarenum heveae* (Hagedorn), *C. seriatus* (Eggers), *Xyleborus volvulus* (F.), *Xylosandrus zimmermanni* (Hopkins), and *Corthylus spinifer* Schwarz have ranges that include the Antilles and South Florida. *Hypothenemus eruditus* Westwood, *H. seriatus* (Eichhoff), *Xyleborus affinis* Eichhoff, and *X. ferrugineus* (F.) are continuously distributed along the Gulf Coast into Mexico and Central America. In contrast, other Neotropical species with similar distributions were treated as native. *Dendrosinus bourreriae* Schwarz, *Chaetophloeus insularis* (Blackman), *Pycnarthrum hispidum* (Ferrari), *Scolytodes schwarzi* (Hopkins), and *Ambrosiodmus lecontei* Hopkins are found in the Antilles and South Florida. *Cnesinus strigicollis* LeConte is continuously distributed along the Gulf Coast through Texas and into Mexico. In neither publication were the criteria explained by which this conclusion was reached. All of these putative "Neotropical exotics" are host generalists (polyphagous) and many reproduce by inbred polygyny. As noted by Wood (1977), this is true of many species recently established in North America, but it does not constitute *a priori* evidence that a particular species is non-native.

EXCLUDED SPECIES

Three species previously reported from southern Florida, *Cryptocarenum spatulatus* Wood, *Xyleborus xylographus* (Say), and *Araptus politus* (Blandford), probably do not occur there. *Cryptocarenum spatulatus* and *Araptus politus* were intercepted coming into Miami from Latin America (Wood 1982), but no specimens of either species have ever been collected from local populations. *Araptus politus* is a host specialist and breeds in seeds of *Mucuna* spp. (Leguminosae) which are not known to occur in Florida. *Xyleborus xylographus* was cited by Bright (1968) and Wood (1982) from Key West (presumably from the same specimen(s) in the Canadian National Collection). This species breeds in oaks and no other authentic specimens have ever been found in peninsular Florida despite extensive collecting by the first author in northern Florida. The only species of oak that occurs in southern Florida is *Quercus virginiana* L., found only in Dade County near Miami and on Key Largo (Long & Lakela 1971, Tomlinson 1980). The "Key West" material most likely represents an error in labelling or an interception.

ORGANIZATION OF CHECKLIST

The sequence of subfamilies and tribes follows Wood & Bright (1992). Species are arranged alphabetically within genera, and genera alphabetically within tribes. Abbreviations for feeding habits (host tissues consumed), degree of host specificity, and mating system are listed in parenthesis for each species. Host information and overall distribution patterns are also included. Abbreviations are used to indicate: (1) *Feeding Habits*: ph, phloem feeding (= true bark beetles) (phloeophagy); xm, feeding on ectosymbiotic fungi (= ambrosia beetles) (xylomycetophagy); xy, direct feeding on sapwood (xylophagy); my, pith of twigs and branches (myelophagy); sp, seeds (spermatophagy); myc, non-ambrosial fungi (mycophagy); (2) *Host Specificity*: mo, restricted to hosts of a single species or genus (monophagy); ol, restricted to hosts of a single family (or to a very limited number of hosts) (oligophagy); po, not host specific (polyphagy); (3) *Mating Systems*: mg, monogyny; hpg, harem polygyny (including bigamy); ipg, inbred polygyny (mating terminology follows Kirkendall 1983). A question mark (?) after any abbreviation indicates an absence of data.

Collection localities are listed by county for the four southern Florida counties in the following sequence: Collier, Broward, Dade and Monroe. Each locality is followed by a parenthetical reference to the collection(s) in which specimens are deposited (abbreviations listed in Methods) or a literature reference. Complete collection data are not included because of space limitations, but are available from the authors. Specimens were examined by the first author for all localities for which a collection is designated.

ANNOTATED CHECKLIST OF THE PLATYPODIDAE AND SCOLYTIDAE
OF SOUTHERN FLORIDA

Family Platypodidae

Platypus compositus Say. (xm, po, mg). Found in large trunks and stumps of most hardwoods within its range, also bald cypress, *Taxodium distichum* (L.) Rich.. Widely distributed in the Neotropics, apparently adventive to Africa. Southeastern U.S. from

Texas eastward. **Collier:** Royal Palm Hammock St. Park (USNM); **Dade:** Paradise Key (USNM); **Monroe:** Big Pine Key (CMNC); Sugarloaf Key (CMNC).

Platypus flavicornis (F.). (xm, mo, mg). Found in trunks and stumps of all species of *Pinus* (Pinaceae) within its range. Southeastern U.S., from eastern Texas. **Dade:** Homestead (FSCA); Opa-locka (FSCA).

Platypus parallelus (F.). (xm, po, mg). Breeds in large diameter host material of virtually any woody plant within its range. It has also been reported from palm trunks. Widely distributed in the Neotropics. In the U.S. found only in southern Florida and southern Texas. **Broward:** Fort Lauderdale (FSCA); **Collier:** Collier Seminole St. Park (FSCA); Marco Island (FSCA); 8 mi SE Naples, (USNM); **Dade:** Everglades Natl. Park, Royal Palm Hammock (CMNC); Homestead (FSCA); 6 mi N Homestead, (USNM); Miami (FSCA); Miami Beach (FSCA); Perrine (FSCA); West Miami (FSCA); **Monroe:** Big Pine Key (EGRC); Big Torch Key (CMNC); Cape Sable (FSCA); John Pennekamp St. Park (ABSC); Key Largo (USNM, RHTC); Key West (FSCA); No Name Key (EGRC); Plantation Key (FSCA); Stock Island (FSCA, USNM).

Family Scolytidae

Subfamily Hylesininae

Tribe Hylastini

Hylastes salebrosus Eichhoff. (ph, mo, mg). Found in roots, stumps, or branches in contact with the soil of most Pines within its range. Southeastern U.S., from Texas eastward. **Dade:** "Biscayne Bay" (Wood 1982).

Hylastes tenuis Eichhoff. (ph, mo, mg). Found in roots, stumps or branches in contact with the soil of most Pines within its range. Southeastern U.S., from Texas eastward, also known from Hispaniola. Southwestern U.S. to central Mexico in montane regions. **Monroe:** Key West (USNM).

Tribe Tomicini

Dendroctonus terebrans (Olivier). (ph, mo, mg). Found in stumps, large roots, and the lower portion of large pines. Southeastern U.S. from eastern Texas to Atlantic seaboard. **Broward:** Fort Lauderdale (Wood 1982); **Dade:** Kendall (FSCA); Opa-locka (FSCA).

Tribe Bothrosternini

Cnesinus strigicollis LeConte. (my, po, mg). Very polyphagous, breeding in twigs of a wide variety of plant species. Southeastern U.S. from eastern Texas to lower Atlantic seaboard. In Mexico along Gulf Coast to Yucatan Peninsula. **Dade:** Elliot Key (ABSC); Miami (FSCA); Deering Estate (CMNC); Matheson Hammock (CMNC); **Monroe:** Key Largo (UGCA, CMNC, Wood 1982); N. Key Largo (ABSC); Plantation Key (FSCA, ABSC).

Pagiocerus frontalis (F.) (sp, mo, mg). Breeds in fleshy seeds of several genera of Lauraceae, notably *Persea*. Widely distributed in lowland Neotropical areas. In U.S. found along lower Gulf Coast and lower Atlantic seaboard to North Carolina. It has not been collected in the Keys but native and exotic species of *Persea* (avocado) do occur there (Long & Lakela 1971, Tomlinson 1980). **Collier:** Monroe Sta. (ABSC); **Dade:** Chekika St. Rec. Area, 50 km SW Miami (CMNC); Miami, Deering Estate (CMNC).

Tribe Phloeotribini

Phloeotribus texanus Schaeffer. (ph, mo, mg). Breeds in branches of *Celtis* spp (Ulmaceae). Southeastern U.S. from Texas eastward; lowland regions of Mexico. **Collier:** Collier Seminole St. Park (ABSC); **Dade:** "Biscayne" (Wood 1982).

Tribe Phloeosinini

Dendrosinus bourreriae Schwarz (xy, po, mg). Reported from branches of several unrelated families of tropical hardwoods. Known only from southern Florida and Greater Antilles. This species has not been collected from the mainland although some of its reported hosts are found in tropical hardwood hammocks there (Long & Lakela 1971, Tomlinson 1980). **Monroe:** Key Largo (FSCA); Stock Island (FSCA).

Phloeosinus taxodii taxodii Blackman. (ph, mo, mg). Breeds in branches of bald cypress, *Taxodium distichum* (Taxodiaceae). Southeastern U.S. from eastern Texas. A different subspecies, *P. taxodii taxodiicolens* Wood, is found throughout Mexico in Montezuma cypress, *Taxodium mucronatum* Ten. **Collier:** Naples, 8 mi SE (USNM).

Tribe Hypoborini

Chaetophloeus insularis (Blackman). (ph, mo, mg). Breeds in branches of native and exotic *Manilkara* spp. (Sapotaceae). Southern Florida and Greater Antilles. This species has not been collected from the mainland although its native host, *Manilkara bahamensis* (Baker) Lam. & Meeuse, is found in there and an exotic host, *M. zapota* (L.) Royen is grown widely in southern Florida (Long & Lakela 1971, Tomlinson 1980). **Monroe:** Big Pine Key, Cactus Hammock (CMNC); Big Torch Key (CMNC); Cudjoe Key (CMNC); Fat Deer Key (CMNC); Key West (Wood 1982); Lower Matecumbe Key (Wood 1982); No Name Key (CMNC); Sugarloaf Key (CMNC, Wood 1982).

Subfamily Scolytinae

Tribe Scolytini

Cnemomyx ficus (Schwarz). (ph, mo?, mg). The type series was reportedly collected from *Ficus* (Moraceae), probably due to an error in identification. The true host is the manchineel tree, *Hippomane mancinella* L. (Euphorbiaceae) (Atkinson 1993). This species breeds in larger branches (> 3 cm diameter) and trunks of its host tree. The host occurs throughout the Keys and on the mainland near Cape Sable, although it is not abundant (Long & Lakela 1971, Tomlinson 1980). Southern Florida, Bahamas, Virgin Islands. **Monroe:** Big Pine Key (CMNC, THAC); Key West (MCZC, Wood 1982).

Cnemomyx vagabundus Wood. (ph, mo?, mg). The type series was reportedly collected from *Piscidia piscipula* (Leguminosae), probably due to an error in identification. The true host is the manchineel tree, *Hippomane mancinella* L. (Euphorbiaceae) (Atkinson 1993). This species breeds in smaller branches (< 3 cm diameter) and trunks of its host tree. Southern Florida, Puerto Rico and Panama. **Monroe:** Big Pine Key (CMNC, THAC); Key West (Wood 1982).

Tribe Ctenophorini

Pycnarthrum hispidum (Ferrari). (ph, mo, mg). Branches of native and exotic figs (*Ficus* spp.) (Moraceae). Widely distributed in lowland Neotropical areas. In the U.S.

known only from southern Florida and southern Texas. **Broward:** 1 mi N Andytown, (RHTC); **Dade:** "Biscayne" (MCZC); Coconut Grove (MCZC); Homestead (SLWC); Miami (FSCA); **Monroe:** Key Largo (UGCA); Plantation Key (FSCA); Stock Isl. (FSCA); Sugarloaf Key (SLWC).

Scolytodes schwarzi (Hopkins). (ph, mo, hpg). Breeds in shaded-out branches of living *Ficus* spp. (Moraceae). Based on personal experience (THA), this species does not breed in cut branches. Southern Florida, Greater Antilles, lowland regions of Mexico. **Broward:** 1 mi N Andytown (RHTC); **Collier:** Corkscrew Swamp Sanctuary (ABSC); **Dade:** "Biscayne" (MCZC); Deering Estate Park (CMNC); Matheson Hammock (ABSC); Miami (Wood 1982); **Monroe:** Big Pine Key (CMNC); Everglades Natl. Park (Wood 1982); Key Largo (ABSC, Wood 1982); Plantation Key (Wood 1982); Sugarloaf Key (SLWC).

Tribe Micracini

Micracis swainei Blackman. (xy, po, hpg). Reported from branches of a variety of hardwood species. It is commonly found in willow (*Salix*) in Florida. Southeastern U.S. from eastern Texas, lowland regions of Mexico and Central America. **Dade:** 6 mi N. Homestead (USNM).

Micracisella nanula (LeConte). (my, po, mg). Breeds in twigs of a variety of trees, shrubs, and vines. Southeastern U.S. from Texas eastward. A closely related species, *M. opacithorax* Schedl (possibly conspecific) is found in southern Texas and the Gulf Coast of Mexico. **Dade:** "Biscayne" (DFEC, MCZC); Homestead (Wood 1982); Miami (Wood 1982); **Monroe:** Big Pine Key (ABSC, Wood 1982); Key Largo (Wood 1982); Key Vaca, Marathon (Wood 1982); Key West (Wood 1982, Blackman 1928); Missouri Key (Wood 1982); N. Key Largo (ABSC); Sugarloaf Key (CMNC, Wood 1982).

Pseudothysanoes securigerus (Blackman). (?,?,?). Nothing is known about the hosts or feeding habits of this species. Species of *Pseudothysanoes* may be either phloem or sap-wood borers. All studied species are bigynous. Southern Florida, Hispaniola. **Dade:** Everglades Natl. Park, Long Pine Key (CMNC); **Monroe:** Big Pine Key (CMNC); No Name Key (CMNC).

Thysanoes fimbriicornis LeConte. (xy, po, hp). Breeds in branches of a variety of hardwood species. Southeastern U.S. from eastern Texas. Found in lowland areas of eastern and southeastern Mexico. **Dade:** "Biscayne" (Blackman 1928).

Tribe Ipinini

Ips avulsus (Eichhoff). (ph, mo, hp). Breeds in branches and crowns of all pines within its range. Southeastern U.S. from eastern Texas. **Dade:** "Biscayne" (MCZC); Miami (MCZC).

Ips calligraphus (Germar). (ph, mo, hp). Breeds in trunks and large branches of all pines within its range. Eastern U.S. and southeastern Canada, Montane regions of the southwestern U.S., Mexico, Guatemala and Honduras. Cuba and Hispaniola. **Dade:** Everglades Natl. Park, Paradise Key (Hopping 1965b); **Monroe:** Key Largo (Hopping 1965b); Key West (Hopping 1965b).

Ips grandicollis (Eichhoff). (ph, mo, hpg). Breeds in branches and trunks of all pines within its range. Eastern U.S. and southeastern Canada, Montane regions of the southwestern U.S., Mexico, Guatemala and Honduras. Cuba and Hispaniola. **Dade:** Biscayne (MCZC); Everglades Natl. Park, Long Pine Key (CMNC); Everglades Natl. Park, Paradise Key (Hopping 1965a); Homestead (Hopping 1965a); **Monroe:** Big Pine Key (CMNC).

Tribe Dryocoetini

Coccotrypes advena (Blandford). (sp, po, ipg). Breeds in seeds of a variety of plants. Widely distributed in Old World tropics, adventive in New World. **Dade:** Coral Gables (FSCA). This species was intercepted in imported seeds and may not actually be established in Florida.

Coccotrypes carpophagus (Hornung). (sp, ol, ipg). Breeds in seeds of palms, especially *Sabal palmetto* (Walt.) Lodd. ex Schultes and *Washingtonia robusta* Wendl. Widely distributed in Old World tropics, adventive in New World. **Dade:** Coconut Grove (Wood 1982); Deering Estate Park (CMNC); Everglades Natl. Park, Royal Palm Hammock (CMNC); Homestead (ABSC); Matheson Hammock (CMNC); **Monroe:** Big Pine Key (CMNC); Big Torch Key (CMNC); Cudjoe Key (CMNC); Fat Deer Key (CMNC); Grassy Key (ABSC); Key Largo (CMNC); Key Vaca, Marathon (CMNC, MCZC); No Name Key (CMNC); Plantation Key (ABSC); Sugarloaf Key (CMNC).

Coccotrypes cyperi (Beeson). (sp-ph, po, ipg). Extremely polyphagous. Breeds in phloem and seeds of many hosts. Widely distributed in Old World tropics, adventive in New World. **Dade:** Deering Estate Park (CMNC); Homestead (ABSC); Miami (FSCA); **Monroe:** Big Pine Key (CMNC); Fat Deer Key (CMNC).

Coccotrypes dactyliperda (F.). (sp, ol, ipg). Breeds in seeds of palms, especially *Phoenix* spp. Widely distributed in Old World tropics, adventive in New World. **Monroe:** Sugarloaf Key (CMNC).

Coccotrypes distinctus (Motschulsky). (sp, ol, ipg). Breeds in seeds of palms, especially *Phoenix* spp., *Sabal palmetto*, and *Washingtonia robusta*. Widely distributed in Old World tropics, adventive in New World. **Collier:** Collier Seminole St. Park (ABSC); **Dade:** Chekika State Rec. Area (CMNC); Coconut Grove (Wood 1982); Deering Estate Park (CMNC); Everglades Natl. Park, Long Pine Key (CMNC); Fairchild Tropical Gardens (FSCA); Homestead (ABSC); Matheson Hammock (CMNC); Miami (FSCA); Miami Beach (Wood 1982); Old Cutler Hammock (CMNC); **Monroe:** Plantation Key (ABSC); Stock Isl. (ABSC, CHAH, CMNC).

Coccotrypes rhizophorae (Hopkins). (sp, ol, ipg). Hosts: (Rhizophoraceae) Breeds in expanding prop roots and propagules of its host, *Rhizophora mangle* L. All other species of *Coccotrypes* found in the New World are believed to be immigrants from Africa or Asia. *C. rhizophorae* is a special case and possible exception because it may have immigrated to the New World without human aid or intervention. *Coccotrypes rhizophorae* is also known from southeastern Asia in *Rhizophora* spp. Given that this beetle breeds in the fruits and developing seedlings of red mangrove which are capable of floating long distances in salt water, it is entirely plausible that this insect was dispersed to the New World by infested host propagules, just as its host presumably dispersed to the New World by ocean currents (Tomlinson 1980). **Collier:** Everglades City (USNM); **Dade:** Homestead (Wood 1982); Miami (MCZC, THAC); Miami, Deering Estate (CMNC); **Monroe:** Key Largo (ABSC, USNM); Key West (Wood 1982).

Coccotrypes robustus Eichhoff (sp, ?, ipg). Reported from seeds of *Euterpe* sp. (Palmae). No host records from Florida. This species is known only from southern Florida and the Greater Antilles. It is presumably of Old World origin as are all other species in this genus. **Dade:** Deering Estate Park (CMNC); **Monroe:** Big Pine Key (CMNC); Big Torch Key (CMNC); Cudjoe Key (CMNC); Fat Deer Key (CMNC); Key Vaca (CMNC); No Name Key (CMNC); Sugarloaf Key (THAC).

Coccotrypes vulgaris (Eggers). (sp, po, ipg). Breeds in seeds of many hosts. Widely distributed in Old World tropics, immigrant in New World. **Dade:** Everglades Natl. Park, Long Pine Key (CMNC).

Dendrocranulus carbonarius (Hopkins). (my, ol?, mo?). All species of *Dendrocranulus* with known habits breed in the stems of cucurbit vines. Presumably *D. carbonarius*

arius does so as well. The original host record from *Annona* is almost certainly due to an error in labelling. Found in southern Florida and Caribbean Islands. This species has not been collected in Florida since its original description. **Dade:** "Biscayne Bay" (Wood 1982).

Tribe Crypturgini

Crypturgus alutaceus Schwarz. (ph, mo, mg). Breeds in phloem of dead or dying pines (Pinaceae). Southeastern U.S. from eastern Texas to Atlantic seaboard. **Collier:** Collier Seminole St. Park (Wood 1982); **Monroe:** Big Pine Key (Wood 1982).

Tribe Xyleborini

Ambrosiodmus devexus (Wood). (xm, po, ipg). In wide variety of hosts. **Dade:** Homestead (Wood 1982).

Ambrosiodmus lecontei Hopkins. (xm, po, ipg). Wide variety of hosts. Usually found in branches or other small diameter material. Peninsular Florida and Caribbean. **Dade:** "Biscayne" (MCZC); Everglades Natl. Park, Long Pine Key (CMNC); Everglades Natl. Park, Royal Palm Hammock (CMNC); Homestead (FSCA, Wood 1982); Miami (FSCA, Wood 1982); North Miami (FSCA); **Monroe:** Key Largo (CMNC, Wood 1982); Key Vaca (CMNC); Key West (Wood 1982); No Name Key (CMNC); Sugarloaf Key (CMNC).

Ambrosiodmus obliquus (LeConte). (xm, po, ipg). Wide variety of hosts. Widely distributed in lowland Neotropical areas. Southeastern U.S. **Dade:** Everglades Natl. Park, Long Pine Key (CMNC); Everglades Natl. Park, Royal Palm Hammock (CMNC); Homestead (Bright 1968); **Monroe:** Cudjoe Key (CMNC); No Name Key (CMNC); Sugarloaf Key (CMNC).

Dryocoetoides sp. (xm, po?, ipg). Hosts unknown. A single specimen was collected in a flight-intercept trap. It may represent an undescribed species because it does not agree with any species of this genus previously reported from the Caribbean or Mesoamerica and is not of any species found in the USNM or SLWC. **Monroe:** Big Torch Key (CMNC).

Premnobius cavipennis Eichhoff. (xm, po, ipg). Breeds in trunks of a wide variety of hosts. Native to Africa, widely distributed in lowland Neotropical areas. In the U.S., found in southern Florida only. **Collier:** Collier Seminole St. Park (Bright 1968); **Dade:** Chekika State Rec. Area (CMNC); Everglades Natl. Park, Long Pine Key (CMNC); Everglades Natl. Park, Royal Palm Hammock (CMNC); Homestead (Bright 1968); Miami (Wood 1982); **Monroe:** Big Pine Key (CMNC); Flamingo Camp, Everglades (ABSC); Key Largo (CMNC); No Name Key (CMNC); Sugarloaf Key (CMNC).

Theoborus solitariceps Schedl. (xm, po, ipg). Found in branches of a wide variety of hosts. Widely distributed in lowland Neotropical areas including the Caribbean. Known only from a single collection in Florida. **Dade:** Deering Estate Park (CMNC).

Xyleborinus gracilis (Eichhoff). (xm, po, ipg). Breeds in a wide variety of hosts. Lowland Neotropical areas. In U.S. known from Florida, Louisiana and North Carolina (Bright 1987). **Dade:** Biscayne Bay (Wood 1982); Everglades Natl. Park, Long Pine Key (CMNC).

Xyleborinus saxeseni (Ratzeburg). (xm, po, ipg). Breeds in virtually any woody plant within its range, including conifers. Eurasian species, immigrant in the New World. **Dade:** Deering Estate Park (CMNC); Everglades Natl. Park, Long Pine Key (CMNC).

Xyleborus affinis (Eichhoff). (xm, po, ipg). Breeds in trunks of most woody plants within its range. Widely distributed in lowland Neotropical areas, southeastern U.S. **Dade:** Chekika State Rec. Area (CMNC); Deering Estate Park (CMNC); Everglades Natl. Park, Long Pine Key (CMNC); Everglades Natl. Park, Royal Palm Hammock (CMNC); **Monroe:** Big Pine Key (CMNC); Big Torch Key (CMNC); Cudjoe Key (CMNC); Key Largo (CMNC, RHTC); Key West (MCZC); Sugarloaf Key (CMNC).

Xyleborus ferrugineus (F.). (xm, po, ipg). Breeds in trunks of most woody plants in its range. Widely distributed in lowland neotropical areas, eastern U.S., southeastern Canada. **Dade:** Chekika State Rec. Area (CMNC); Coconut Grove (MCZC); Deering Estate Park (CMNC); Everglades Natl. Park, Long Pine Key (CMNC); Everglades Natl. Park, Royal Palm Hammock (CMNC); **Monroe:** Big Pine Key (CMNC); Big Torch Key (CMNC); Cudjoe Key (CMNC); Fat Deer Key (CMNC); Key Largo (CMNC, RHTC); Key Vaca (CMNC); No Name Key (CMNC); Sugarloaf Key (CMNC).

Xyleborus pubescens (Zimmermann). (xm, mo, ipg). Breeds in trunks of pines (Pinaceae). This is one of the few species of this genus that is host specific. Southeastern U.S. **Collier:** Collier Seminole St. Park (Wood 1982); **Dade:** Chekika State Rec. Area (CMNC); Dade Co. (Wood 1982); Everglades Natl. Park, Long Pine Key (CMNC); Paradise Key (Wood 1982); **Monroe:** Big Pine Key (CMNC); Key Largo (UGCA); Key West (Bright 1968).

Xyleborus volvulus (F.). (xm, po, ipg). Breeds in trunks of most woody plants in its range. Widely distributed in lowland Neotropical areas. In U.S. only in southern Florida and southern Texas. **Broward:** Ft. Lauderdale (FSCA); **Collier:** Naples (FSCA, Bright 1968); **Dade:** Biscayne Bay (Bright 1968); Chekika State Rec. Area (CMNC); Coconut Grove (MCZC); Coral Gables (FSCA); Deering Estate Park (CMNC); Everglades Natl. Park, Long Pine Key (CMNC); Everglades Natl. Park, Royal Palm Hammock (CMNC); Homestead (FSCA); Miami (FSCA); Miami Beach (FSCA); Perrine (FSCA); **Monroe:** Big Pine Key (CMNC); Big Torch Key (CMNC); Cudjoe Key (CMNC); Fat Deer Key (CMNC); Key Largo (CMNC, FSCA, RHTC); Key Vaca (CMNC); Key West (Bright 1968); Loggerhead Key (FSCA); No Name Key (CMNC); Plantation Key (FSCA); Sugarloaf Key (CMNC).

Xyleborus xylographus (Say). (xm, mo, ipg). This species breeds in Oaks (*Quercus* sp.) (Fagaceae). The record from Key West (Bright 1968, Wood 1982) is either based on a misidentification or an interception since this species is not known to breed anywhere in peninsular Florida. (T.H.A., unpublished).

Xylosandrus compactus (Eichhoff). (xm, mo, ipg). Breeds in twigs of a wide variety of living trees, shrubs, and vines resulting in the death of the twig. This species seldom breeds in cut material. Native to southeastern Asia. Found along Gulf Coast to Texas. **Broward:** Ft. Lauderdale (Wood 1982); **Collier:** Collier Seminole St. Park (ABSC); Copeland (ABSC); **Dade:** Chekika State Rec. Area (CMNC); Coconut Grove (Wood 1982); Deering Estate Park (CMNC); Everglades Natl. Park, Long Pine Key (CMNC); Everglades Natl. Park, Royal Palm Hammock (CMNC); Miami (Wood 1982); Naranja (FSCA); **Monroe:** Big Pine Key (CMNC); Big Torch Key (CMNC); Cudjoe Key (CMNC); Key Largo (CMNC, Wood 1982); N Key Largo (ABSC); No Name Key (CMNC); Plantation Key (ABSC); Sugarloaf Key (CMNC).

Xylosandrus crassiusculus (Motschulsky). (xm, po, ipg). Breeds in stems of a wide variety of trees and shrubs. This species frequently breeds in living stems, especially near ground level. Secondary fungal invasions of old galleries may result in death of the plant. Native to Asia. First detected in coastal South Carolina, now found west to Texas (Atkinson et al. 1991). **Collier:** Collier Seminole St. Park (Deyrup & Atkinson 1987); **Dade:** Chekika State Rec. Area (CMNC); Deering Estate Park (CMNC); Ever-

glades Natl. Park, Long Pine Key (CMNC); Everglades Natl. Park, Royal Palm Hammock (CMNC); Old Cutler Hammock (CMNC).

Xylosandrus zimmermanni (Hopkins). (xm, po, ipg). Breeds in small diameter material. Not known to attack living hosts. Lowland Neotropical areas, southern Florida.

Dade: Biscayne Bay (Bright 1968); Everglades Natl. Park, Long Pine Key (CMNC); Everglades Natl. Park, Long Pine Key (CMNC).

Tribe Cryphalini

Cryptocarenum heveae (Hagedorn). (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Widely distributed in lowland Neotropical areas, southern Florida.

Collier: Collier Seminole St. Park (ABSC, Wood 1982); **Dade:** Everglades Natl. Park, Long Pine Key (CMNC).

Cryptocarenum seriatus Eggers. (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Widely distributed in lowland Neotropical areas, peninsular Florida.

Collier: Collier Seminole St. Park (ABSC, Wood 1982); Copeland (ABSC); Fakahatchee Strand (ABSC); Ochopee (Wood 1982); **Dade:** "Biscayne" (Wood 1982); Deering Estate Park (CMNC); Entrance Everglades Natl. Park (RHTC); Everglades Natl. Park, Long Pine Key (CMNC); Hialeah (FSCA); Miami (FSCA); Paradise Key (Wood 1982); **Monroe:** Big Pine Key (Wood 1982); Big Torch Key (CMNC); Fat Deer Key (CMNC); Grassy Key (Wood 1982); Key Largo (Wood 1982); Key Vaca (Wood 1982); Key West (Wood 1982); Lower Matecumbe Key (Wood 1982); Stock Island (FSCA).

Cryptocarenum spatulatus Wood. (xm, po, ipg). The record from Miami (Wood 1982) is based on an interception from Peru. There is no indication at present that it is actually established in Florida.

Hypocryphalus mangiferae Schedl. (ph, mo, mg). Breeds in branches of mango (*Mangifera indica* L.) (Anacardiaceae). Native to southern Asia, widely established in tropical areas of the world where its host is grown, including southern Florida. **Dade:** Homestead (Wood 1982); Perrine (Wood 1954).

Hypothenemus areccae (Hornung). (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Immigrant from Old World tropics. **Dade:** Everglades Natl. Park, Long Pine Key (CMNC); Homestead (FSCA).

Hypothenemus birmanus (Eichhoff). (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Immigrant from Old World Tropics. **Broward:** Andytown, 1 mi N (RHTC); Hollywood (ABSC); **Collier:** Collier Seminole St. Park (ABSC, Wood 1982); Fakahatchee Strand (ABSC); **Dade:** Chekika State Rec. Area (CMNC); Deering Estate Park (CMNC); Everglades Natl. Park, Long Pine Key (CMNC); Everglades Natl. Park, Royal Palm Hammock (CMNC); Homestead (ABSC, Wood 1982); Matheson Hammock (THAC, Wood 1982); Miami (Wood 1982); Perrine (Wood 1982); **Monroe:** Big Pine Key (CMNC); Cudjoe Key (CMNC); Key Largo (UGCA, CMNC, Wood 1982); Key Vaca (CMNC); Lower Matecumbe Key (ABSC); N. Key Largo (ABSC); No Name Key (CMNC); Sugarloaf Key (CMNC).

Hypothenemus brunneus (Hopkins). (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Immigrant from Old World tropics. **Collier:** Copeland (ABSC); **Dade:** "Biscayne" (MCZC); Everglades Natl. Park, Long Pine Key (CMN

C); Homestead (Wood 1982); Miami (Wood 1982); **Monroe:** Key Largo (Wood 1982); Key West (Wood 1982); Matecumbe Key (Wood 1982); Plantation Key (ABSC, FSCA); Sugarloaf Key (Wood 1982).

Hypothenemus californicus Hopkins. (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Immigrant from Old World tropics. **Dade:** Homestead (Wood 1982);

Perrine (Wood 1982); **Monroe:** Key Largo (Wood 1982); Key Vaca (Wood 1982); Key West (Wood 1982); Matecumbe Key (Wood 1982); Plantation Key (Wood 1982).

Hypothenemus columbi Hopkins. (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Immigrant from Old World tropics. **Dade:** Homestead (Wood 1982); Perrine (Wood 1982).

Hypothenemus crudiae (Panzer). (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Immigrant from Old World tropics. **Broward:** Davie (FSCA); **Collier:** Collier Seminole St. Park (ABSC); Monroe Sta. (ABSC); **Dade:** Chekika State Rec. Area (CMNC); Elliot Key (ABSC); Everglades Natl. Park, Long Pine Key (CMNC); Hialeah (FSCA); Homestead (FSCA); **Monroe:** Big Pine Key (CMNC); Big Torch Key (CMNC); Cudjoe Key (CMNC); Fat Deer Key (CMNC); Key Largo (CMNC, ABSC); No Name Key (ABSC); Sugarloaf Key (CMNC).

Hypothenemus dissimilis (Zimmermann). (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Eastern U.S. **Dade:** "Biscayne Bay" (Wood 1982).

Hypothenemus eruditus Westwood. (ph-my, po, ipg). Breeds in pith or phloem of twigs and branches of a wide variety of hosts. Widely distributed in lowland Neotropical areas, eastern U.S. **Broward:** Andytown, 1 mi N (RHTC); **Collier:** Collier Seminole St. Park (ABSC); Copeland (ABSC); **Dade:** Chekika State Rec. Area (CMNC); Deering Estate Park (CMNC); Elliot Key (ABSC); Everglades Natl. Park, Long Pine Key (CMNC); Everglades Natl. Park, Royal Palm Hammock (CMNC); Homestead (ABSC); Old Cutler Hammock (CMNC); **Monroe:** Big Pine Key (CMNC); Big Torch Key (CMNC); Cudjoe Key (CMNC); Fat Deer Key (CMNC); Islamorada (UGCA); Key Largo (CMNC); Key Vaca (CMNC); No Name Key (CMNC); Upper Matecumbe Key (CMNC).

Hypothenemus gossypii (Hopkins). (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Mexico, Cuba, southern Florida. **Dade:** Everglades Natl. Park, Long Pine Key (CMNC, THAC); Homestead (Wood 1982); **Monroe:** Key Largo (Wood 1982); Key West (Wood 1982); Long Key (Wood 1982); Matecumbe Key (Wood 1982); Plantation Key (Wood 1982).

Hypothenemus hirsutus (Wood). (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Known from southern Florida only. **Dade:** Elliott Key (ABSC); **Monroe:** Big Pine Key (CMNC, Wood 1982); Big Torch Key (CMNC); Cudjoe Key (CMNC); Fat Deer Key (CMNC); Grassy Key (Wood 1982); Key Largo (Wood 1982); Key Vaca (Wood 1982); Key West (Wood 1982); Matecumbe Key (Wood 1982); No Name Key (ABSC, CMNC); Plantation Key (Wood 1982); Sugarloaf Key (CMNC, Wood 1982).

Hypothenemus interstitialis (Hopkins). (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Widely distributed in lowland Neotropical areas, southeastern U.S. **Collier:** Collier Seminole St. Park (ABSC); Fakahatchee Strand (ABSC); Monroe Station (ABSC); **Dade:** Deering Estate Park (CMNC); Everglades Natl. Park, Long Pine Key (CMNC); **Monroe:** Big Pine Key (CMNC); Big Torch Key (CMNC); Key Largo (ABSC, CMNC, UGCA); Key Vaca (CMNC); No Name Key (ABSC); Sugarloaf Key (CMNC).

Hypothenemus javanus (Eggers). (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Immigrant from Old World. **Broward:** Delray Beach (Wood 1982); Holywood (ABSC); **Collier:** Collier Seminole St. Park (Wood 1982); **Dade:** Chekika State Rec. Area (CMNC); Coconut Grove (Wood 1982); Deering Estate Park (CMNC); Everglades Natl. Park, Long Pine Key (CMNC); Everglades Natl. Park, Royal Palm Hammock (CMNC); Homestead (Wood 1982); Miami (Wood 1982); Paradise Key (Wood 1982); Perrine (Wood 1982); **Monroe:** Key Largo (CMNC, Wood 1982); Key Vaca (CMNC); N. Key Largo (ABSC); No Name Key (CMNC); Sugarloaf Key (CMNC).

Hypothenemus miles (LeConte). (my?, ?, ipg). Hosts unknown. Gulf Coast from Florida to Texas. **Dade:** Everglades Natl. Park, Long Pine Key (CMNC); **Monroe:** Sugarloaf Key (CMNC).

Hypothenemus obscurus (F.). (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Immigrant from Old World. **Dade:** Homestead (FSCA); Miami (Wood 1982); **Monroe:** Fat Deer Key (CMNC); Key Vaca (CMNC); No Name Key (CMNC); Sugarloaf Key (CMNC).

Hypothenemus pubescens (Hopkins). (my, ol, ipg). Breeds in stems of grasses. Mexico, Puerto Rico, southern Florida, southern Texas. **Dade:** Everglades Natl. Park, Long Pine Key (CMNC); **Monroe:** Cudjoe Key (CMNC); Fat Deer Key (CMNC); Key Largo, Pennekamp St. Park (CMNC); Key Vaca (Wood 1982); Key West (Wood 1982); Missouri Key (Wood 1982).

Hypothenemus seriatus (Eichhoff). (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Widely distributed on lowland Neotropical areas, eastern U.S. **Broward:** Davie (FSCA); Ft. Lauderdale (USNM); **Dade:** Everglades Natl. Park, Long Pine Key (CMNC); **Monroe:** Big Pine Key (CMNC); Big Torch Key (CMNC); Cudjoe Key (CMNC, FSCA); Fat Deer Key (CMNC); Islamorada (UGCA); Key Largo (UGCA, CMNC); Key West (FSCA); No Name Key (CMNC); Stock Isl. (CMNC, FSCA); Sugarloaf Key (CMNC); Windley Key (CHAH).

Hypothenemus setosus (Eichhoff). (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Native to Old World, southern Florida. **Dade:** Miami (Wood 1982).

Hypothenemus squamosus (Hopkins). (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Lowland areas of Mexico, Central America, and the Antilles. Southern Florida. **Monroe:** Key Largo (FSCA, Wood 1982); Matecumbe Key (Wood 1982).

Hypothenemus sp. (my, po, ipg). Breeds in pith of twigs of a wide variety of hosts. Southern Florida, Cuba. **Collier:** 1 mi W Ochopee (THAC); **Dade:** Everglades Natl. Park, Long Pine Key (CMNC); Homestead (ABSC); **Monroe:** Big Pine Key (CMNC); Key Largo (CMNC); Key Vaca (CMNC). This species does not match any included for North and Central America (Wood 1982) or from the Caribbean (Bright 1985). It was compared to all available types in the U.S. National Museum of Natural History (including types of Hopkins) and the S.L. Wood collection. It may be a previously undetected and undescribed native or Antillean species or may have been introduced from the Old World.

Scolytogenes knabi (Hopkins). (ph-my, po?, mg). Breeds in pith of twigs of a wide variety of hosts. Lowland Neotropical areas, Peninsular Florida. **Collier:** Collier Seminole St. Park (ABSC, ABSC); **Dade:** Miami (Wood 1982); Chekika State Rec. Area (CMNC); **Monroe:** Crawl Key (RHTC); Fat Deer Key (CMNC); Plantation Key (Wood 1982); Sugarloaf Key (Wood 1982).

Trischidias atoma (Hopkins). (myc. ?, ipg). Breeds in fungus-infested twigs and branches. Southeastern U.S. **Collier:** Copeland (ABSC); **Dade:** Everglades Natl. Park, Long Pine Key (CMNC); **Monroe:** No Name Key (CMNC); Sugarloaf Key (CMNC).

Trischidias exigua Wood. (myc. ?, ipg). Breeds in carbonaceous fruiting bodies of ascomycete fungi on branches (Deyrup 1987). Known from southern Florida and the Yucatan Peninsula. **Dade:** Everglades Natl. Park, Long Pine Key (CMNC); Old Cutler Hammock (CMNC); **Monroe:** Big Pine Key (CMNC); Big Torch Key (CMNC); Key Largo (CMNC); Sugarloaf Key (CMNC).

Trischidias minutissima Wood. (myc. ?, ipg). Found in fungus pustules on aerial roots of red mangrove. Known only from Keys. **Monroe:** Sugarloaf Key (SLWC).

Trischidias striatus Atkinson. (? , ? , ?). Hosts unknown. Known only from Keys. **Dade:** Everglades Natl. Park, Long Pine Key (CMNC); **Monroe:** Big Pine Key (CMNC); Big Torch Key (CMNC); Cudjoe Key (CMNC); Key Largo (CMNC); No Name Key (CMNC); Sugarloaf Key (CMNC).

Tribe Corythini

Araptus dentifrons Wood. (my, mo, mg). In stems of milkweed vine (*Sarcostemma clausum* (Jacq.) R. & S.) (Asclepiadaceae). Known from several localities in Mexico, southern Texas and southern Florida. **Collier:** Fakahatchee Strand (ABSC); Monroe Station (ABSC).

Araptus politus (Blandford). This species was intercepted in Miami in "bird seed" but there is no evidence that it has become established (Wood 1982). It breeds in the large seeds of *Mucuna* spp. (Leguminosae) which are not known to occur in Florida.

Corthylus papulans Eichhoff (= *spinifer* Schwarz). (xm, po, mg). Breeds in branches of a wide variety of hosts. Widely distributed in lowland neotropical areas, peninsular Florida. **Broward:** Andytown, 1 mi N (RHTC); **Collier:** Copeland (ABSC); Ochopee Trail Lake campsite (UGCA); **Dade:** Everglades Natl. Park, Long Pine Key (CMNC); Miami (FSCA, Wood 1982); Paradise Key (Wood 1982); **Monroe:** Key Largo (UGCA); Ramrod Key (Wood 1982); Sugarloaf Key (CMNC).

Monarthrum mali (Fitch). (xm, po, hpg). Breeds in trunks of a variety of hardwood species. Widely distributed in eastern North America. **Collier:** Collier Seminole St. Park (Wood 1982).

Pityoborus comatus (Zimmermann). (xm, mo, mg). In shaded-out branches of living pines. Southeastern U.S., Bahamas. **Dade:** "Biscayne Bay" (Wood 1982); Everglades Natl. Park, Long Pine Key (UGCA); **Monroe:** Big Pine Key (Wood 1982).

Pityophthorus annectens LeConte. (ph, mo, hpg). In branches of pines. Southeastern U.S. Montane areas of southwestern U.S., Mexico, Central America, and Caribbean. **Dade:** Homestead (Bright 1981); **Monroe:** Big Pine Key (Bright 1981).

Pityophthorus borrichiae Wood. (ph, mo, hpg). Stems of *Borrchia arborescens* (L.) DC., *B. frutescens* (L.) DC. (Compositae). Known only from the Keys, although both hosts are found on the mainland as well (Long & Lakela 1971, Tomlinson 1980). **Monroe:** Key Largo (SLWC).

Pityophthorus centralis Eichhoff. (ph, mo, hpg). Branches and trunks of *Mecopium toxiferum* (L.) Krug & Urban (Anacardiaceae). Southern Florida, Cuba. **Collier:** Royal Palm Hammock St. Park (Bright 1981); **Dade:** "Biscayne Bay" (MCZC, Wood 1982); Deering Estate Park (CMNC); Everglades Natl. Park, Long Pine Key (CMNC); Everglades Natl. Park, Royal Palm Hammock (CMNC); Paradise Key (Bright 1981); **Monroe:** Big Pine Key (CMNC, Bright 1981); Big Torch Key (CMNC); Fat Deer Key (CMNC); Everglades Natl. Pk., Flamingo (RHTC); Key Largo (THAC, UGCA); Key Vaca (Wood 1982, Bright 1981); Key West (Wood 1982); No Name Key (ABSC, CMNC); Plantation Key (Wood 1982, Bright 1981); Stock Isl. (Wood 1982); Sugarloaf Key (CMNC, Bright 1981, Wood 1982).

Pityophthorus crinalis Blackman. (ph, mo, hpg). *Toxicodendron radicans* (L.) Kuntze (Anacardiaceae). This species has not been collected in the Keys although its host is found there (Long & Lakela 1971). Southeastern U.S. **Collier:** Collier Seminole St. Park (ABSC); **Dade:** S. Miami, Deering Estate Park (CMNC).

Pityophthorus lautus Eichhoff. (ph, mo, hpg). *Toxicodendron radicans* (Anacardiaceae). Widely distributed in eastern North America, possibly a species complex. Specimens referred to *Pityophthorus lautus* have been collected in several unrelated

hosts in the eastern United States including *Cercis canadensis* L. (Leguminosae), *Acer saccharinum* L. (Aceraceae), *Sassafras albidum* (Nutt.) Nees. (Lauraceae), *Ulmus rubra* Muhl. (Ulmaceae), *Pinus strobus* L. (Pinaceae), as well as several hosts in the Anacardiaceae. At first glance this might appear to be a polyphagous species except that it does not normally occur in any hosts other than those mentioned above and their close relatives. All specimens referable to this species collected in peninsular Florida have only been collected in poison ivy, despite the fact that some of these other hosts also occur in the same areas (T.H. A., unpublished data). It may occur in the Keys as well as on the mainland since poison ivy is found on the islands (Long & Lakela 1971. **Collier:** Copeland (ABSC).

Pityophthorus pulicarius (Zimmermann). (ph-my, mo, hpg). In phloem and pith of branches and twigs of pines (Pinaceae). Southeastern U.S. **Collier:** Royal Palm Hammock St. Park (Bright 1981); **Dade:** Biscayne (MCZC); Everglades Natl. Park, Long Pine Key (CMNC); Homestead (Bright 1981); Paradise Key (Bright 1981); **Monroe:** Big Pine Key (ABSC, CMNC, Bright 1981).

Pityophthorus pecki Atkinson. (ph?, ?, hpg?). Hosts unknown. Known only from the Keys. **Monroe:** Big Pine Key (CMNC); No Name Key (CMNC).

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