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## Studies on West Indian Scolytidae (Coleoptera) 4 A review of the Scolytidae of Puerto Rico, U.S.A. with descriptions of one new genus, fourteen new species and notes on new synonymy (Coleoptera: Scolytidae)

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### Abstract

A comprehensive biodiversity study of the Scolytidae (Coleoptera) of Puerto Rico, USA has been underway for several years. Seventy-one species are now recorded from the island. One new genus, *Allothenemus*, is described with *Allothenemus minutus* new species, as the type species. An additional 13 new species are described: *Chramesus atlanticus*, *Scolytodes puertoricensis*, *S. atlanticus*, *Pseudothysanoes magnispinatus*, *Hypothenemus amplissimus*, *H. concavifrons*, *Trischidias puertoricensis*, *Xyleborus atlanticus*, *Theoborus puertoricensis*, *Coptoborus bellus*, *Xyleborinus insulosus*, *Pityophthorus convexicollis*, and *Corthylus insularis*. Twenty-one species are recorded from Puerto Rico for the first time. Four new cases of synonymy are reported: *Dryocoetoides cristatus* (FABRICIUS) (= *Dryocoetoides caracicolai* HOPKINS, **syn.n.**), *Hypothenemus crudiae* (PANZER) (= *Stephanoderes trinitatis* HOPKINS, **syn.n.**) and *Monarthrum mali* (FITCH) (= *Pterocyclon praeustum* EGGERS, **syn.n.**, and *Pterocyclon omissum* SCHEDL, **syn.n.**). Two species, *Hypothenemus hampei* WESTWOOD and *Xyleborus xylographus* (SAY), are deleted from the Puerto Rican list. New host records for several species are reported.

**Key words:** Coleoptera, Scolytidae, West Indies, new species, new records, new synonymy, taxonomy.

### Introduction

For the past several years, a biodiversity study of the Scolytidae (Coleoptera) of Puerto Rico has been conducted by the second author of this article. The study used a combination of collecting from infested plants, seeds, dead trees and dry vines and using various types of traps, especially light traps and pitfall traps containing 70% ethanol. The purpose of the study was to determine the species present in the various forest communities on the island in order to more successfully manage the forest resources.

Thirty-nine species of Scolytidae in 15 genera were recorded from Puerto Rico in WOOD & BRIGHT (1992) and BRIGHT & SKIDMORE (1997). With the addition of 21 previously unrecorded species that were collected during the present study, plus fourteen previously undescribed species, several species names placed in synonymy, and two species deleted from the faunal list, the total number of species recognized from the island is now 71. Most genera are represented by only one or two species, with the exceptions of *Coccotrypes* EICHHOFF (six species), *Ambrosiodmus* HOPKINS (three species), *Xyleborus* EICHHOFF (nine species), *Hypothenemus* WESTWOOD (15 species), *Pityophthorus* EICHHOFF (three species) and *Scolytodes* FERRARI (three species).

Although there are some previous reports dealing with this group of insects in Puerto Rico (BLACKWELDER 1947; MARTORELL 1945, 1976; WOLCOTT 1936, 1948; and BRIGHT 1985), this

is the first time that a comprehensive survey of the Scolytidae of the island has been conducted. WOLCOTT (1936) gives a history of entomological activities in Puerto Rico and provides the first list of the insects from Puerto Rico. Twenty-two species are listed, but many of these are now recognized as synonyms and several additional species were identified to genus only. WOLCOTT (1948) published a revised list of the insects of Puerto Rico and listed 28 taxa, but as above, many of these are synonyms or are listed as genus only. It should also be noted that the list of "The Insects of Puerto Rico" (WOLCOTT 1948) contains a number of species that were only intercepted at various ports and the question remains whether or not these species are actually established and therefore should actually be considered as part of the fauna of Puerto Rico.

The Scolytidae are small beetles that feed and reproduce under the bark, in the wood, or in nuts and seeds of various trees and shrubs. They may, at times, become serious pests and can be a major influence in forest management operations. Two species, *Xyleborus volvulus* (FABRICIUS) and *X. affinis* EICHHOFF are reported as being the species responsible for killing trees of *Albizia lebbek* in the Río Piedras region in 1944–45 (WOLCOTT 1948). Sugar cane, coconut palms and coffee shade trees can also be attacked and sometimes killed.

Puerto Rico is the eastern-most of the islands comprising the Greater Antilles. It is about 160 km long and 55 km wide. The topography of the island is mainly mountainous with a maximum elevation of 1338 m. The lowest mean annual temperature is 18°C and the highest is 27°C. Rainfall is the lowest in the southwest coastal areas (ca. 750 mm/year) and is the highest in the eastern portion of the island (1500–2000 mm/year) (BIRDSEY & WEAVER 1982).

Although the Puerto Rican insect fauna is considered depauperate (TORRES 1994; ALLEN et al 1973; MARTORELL 1945), the total scolytid fauna of 71 species compares favourable with the total of 61 species recorded from Jamaica (BRIGHT 1972). Part of this difference can be explained by the higher intensity of the collecting effort on Puerto Rico and a longer period of collecting compared with that done on Jamaica. The depauperate consideration of the fauna is related to the fact that colonization by insects is difficult because Puerto Rico is the farthest east of the Greater Antilles and the trade winds come from the east or northeast, where land masses are almost non-existent.

### Methods

The following list contains the names of all species of Scolytidae known from Puerto Rico taken from WOOD & BRIGHT (1992) and BRIGHT & SKIDMORE (1997, 2002) plus twenty-one species not previously recorded from Puerto Rico and fourteen species that are newly described. Two species previously recorded from Puerto Rico are deleted from the faunal list. Under each name is given a brief statement of the distribution, followed by a list of the localities and hosts where the species was collected in Puerto Rico. Since almost all records refer to material collected by J.A. Torres (or his colleagues) we have usually omitted the collectors name unless the record was obtained from other sources.

Species recorded in the literature from Puerto Rico, but not collected during the present study or not documented by specimens seen in examined collections, are marked by an (\*). Many of these questionable records are in genera such as *Hypothenemus* and *Coccotrypes* where the possibility of misidentification is very high unless the identifier has considerable experience and a good reference collection to work with. Until specimens documenting the occurrence of a particular species are examined, the records marked by an asterisk (\*) should be viewed as tentative.

All specimens collected during this study were preserved and sent to the senior author in ethyl alcohol. Specimens were identified in the alcohol and returned to J.A. Torres after locality and host data were recorded. Questionable specimens or specimens where more detailed examination

was needed were mounted on points in the standard museum method. A total of nearly 2000 specimens were examined, of these, about 1000 were mounted. A complete total of specimens identified for each species was not kept; therefore, in the list that follows, the number of specimens examined, in parenthesis, only includes those that were mounted. For the newly described species, all data are included.

In order to assist workers in studying the biodiversity of Puerto Rico (and the West Indies as a whole), a key to genera is included and keys to species are included where more than one species of a genus is recognized. A complete faunal treatment of the West Indian bark-beetle fauna is under preparation, and complete keys to genera and species plus descriptions and additional data will be provided in that work.

Just before this manuscript was completed, three large collections of Scolytidae from the West Indies were received by the senior author. These collections, one from the West Indies Beetle Fauna Project at Montana State University at Bozeman, Montana (M.A. Ivie) (WIBFP), one from C.W. O'Brien, Green Valley, Arizona (CWOB), and the third from R.H. Turnbow, Fort Rucker, Alabama (RHTC), contained numerous additional Puerto Rico records, most of which are recorded herein.

The arrangement of tribes and genera follows the system in WOOD & BRIGHT (1992). Species are listed alphabetically.

#### Key to the genera of Scolytidae from Puerto Rico

- 1 Lateral margin of pro- and metatibiae unarmed except for a single curved process at outer apical angle that curves toward and extends beyond process of outer apical angle; lateral line of pronotum sharply elevated; antennal club flattened, sutures strongly curved..... *Cnemonyx* EICHHOFF
- Lateral margin of protibia armed by several toothlike processes, none of which curve toward inner process; lateral line of pronotum elevated or not; antennal club and funicle variable ..... 2
- 2 Each basal margin of elytra procurved and armed by a series of marginal crenulations; pronotum weakly if at all declivous on anterior half; head visible from above..... 3
- Basal margin of elytra forming a straight, transverse line across body, margin unarmed; pronotum weakly to strongly declivous on anterior half; head not visible from above..... 6
- 3 Scutellum visible, elytral bases notched for its reception; body vestiture of hairlike setae or scales..... 4
- Scutellum obsolete, elytral bases only slightly notched at suture; body vestiture of scales..... *Chaetophloeus* LECONTE
- 4 Elytral bases strongly produced anteriorly, each strongly procurved; body black, stout; procoxae widely separated..... *Dendrosinus* CHAPUIS
- Elytral bases not strongly produced anteriorly; procoxae contiguous or moderately separated..... 5
- 5 Antennal club subglobular, sutures obsolete or indicated by rows of sparse setae, funicle attached to base of club; procoxae contiguous ..... *Cladoctonus* STROHMEYER
- Antennal club flat, large, asymmetrical, sutures not visible, funicle attached to side of club..... *Chramesus* LECONTE
- 6 Lateral margins of prothorax subacutely elevated..... 7
- Lateral margins of prothorax rounded, or with a fine raised line ..... 9
- 7 Anterior surface of pronotum transversely rugose; body glabrous..... *Scolytodes* FERRARI
- Anterior surface of pronotum smooth, punctured; body sparsely setose to densely scaly ..... 8

- 8 Pronotum longer than wide, from above lateral margin straight to slightly constricted; elytral vestiture consisting only of short, hairlike setae in a median row on each interstria; antennal club subglobular, about as long as wide; length 1.3–1.6 mm..... *Microborus* BLANDFORD
- Pronotum wider than long, from above lateral margin arcuate; elytral vestiture consisting of abundant, short, erect scales; antennal club flat, longer than wide; body longer than 1.6 mm....  
..... *Pycnarthrum* EICHHOFF
- 9 Protibia with sides parallel, armed by denticles only on apical margin or posterior face; antennal funicle 6-segmented ..... 10
- Protibia much wider apically, armed on lateral margin by several denticles; antennal funicle 1- to 5-segmented ..... 11
- 10 Elytra broadly rounded at apex; lateral margin of antennal club constricted at suture 1; body smaller, length 1.5 mm or less ..... *Pseudothysanoes* BLACKMAN
- Elytra acuminate at apex; sutures on antennal club broadly procurved, first extending less than 1/3 length of club ..... *Hylocurus* EICHHOFF
- 11 Metepisternum visible throughout its length ..... 12
- Metepisternum largely covered by elytra ..... 27
- 12 Antennal club flat, with transverse sutures or sutures obsolete; vestiture consisting of scales ..... 13
- Antennal club flat, with strongly arcuate sutures or club obliquely truncate; vestiture hairlike ..... 18
- 13 Posterior face of metatibiae with a groove for reception of tarsus, grooved area glabrous, with a row of setae along its mesal margin; antennal club solid, with suture 1 partly septate; antennal funicle 4-segmented ..... *Scolytogenes* EICHHOFF
- Posterior face of metatibiae without groove for reception of tarsus, setae randomly distributed on posterior face; antennal club with distinct transverse or arcuate sutures; antennal funicle 3- to 5-segmented ..... 14
- 14 Antennal funicle 3-segmented; body about 1.0 mm in length ..... 15
- Antennal funicle 4- or 5-segmented; body larger than 1.0 mm ..... 16
- 15 Pronotal asperities basally contiguous, arranged into definite concentric rows; body about 2.0 times longer than wide ..... *Allothenemus* gen.n.
- Pronotal asperities separated, scattered in no apparent order; body about 2.2 times as long as wide ..... *Trischidias* HOPKINS
- 16 Antennal funicle 4-segmented; antennal club large, slightly smaller than eye, with procurved sutures; elytra densely clothed with short, recumbent setae, each interspace also with a row of much longer, erect, hairlike setae ..... *Hypocryphalus* HOPKINS
- Antennal funicle 5-segmented (rarely 3-segmented); antennal club much smaller than eye; elytra with erect interstitial scales and scattered narrower scales ..... 17
- 17 Anterior margin of pronotum armed by 10–16 serrations; antennal club with obscure sutures, marked only by rows of setae; vestiture usually very sparse; body 1.4 mm in length.....  
..... *Cryptocarenus* EGGERS
- Anterior margin of prothorax armed by less than 10 serrations; antennal club clearly marked by sutures; vestiture abundant, scalelike; body 1.1–1.4 mm in length .... *Hypothenemus* WESTWOOD
- 18 Antennal club flattened, without visible sutures, basal corneous area reduced, its distal margin strongly procurved ..... *Premnobius* EICHHOFF
- Antennal club obliquely truncate, basal corneous area enlarged, its distal margin recurved, or club flat with strongly arcuate sutures ..... 19
- 19 Meso- and metathoracic tibiae slender, abruptly narrowed on apical fourth, lateral and apical margins armed by a few, coarse, socketed denticles; pregular area not depressed ..... 20

- Meso- and metathoracic tibiae expanded to about middle, then gradually tapering to apex, apical two-thirds on outer margin armed by numerous, small, close-set socketed denticles; preular area depressed ..... 21
- 20 Protibia armed on lateral margin by 2 to 4 socketed teeth; frons convergently aciculate; basal area of antennal club distinctly corneous; elytral declivity evenly convex .... *Coccotrypes* EICHHOFF
- Protibia armed on lateral margin by 7 or more socketed teeth; frons not convergently aciculate; basal area of antennal club not corneous; elytral declivity impressed..... *Dendrocranulus* SCHEDL
- 21 Scutellum flat, flush with surrounding surface of elytra ..... 22
- Scutellum conical, base of elytra notched for its reception ..... *Xyleborinus* REITTER
- 22 Posterior face of antennal club marked by 2 curved sutures ..... 23
- Posterior face of antennal club solid, unmarked by sutures ..... 24
- 23 Posterior fourth of elytra evenly, broadly rounded, apex at suture very slightly notched; body stout ..... *Theoborus* HOPKINS
- Posterior third of elytra attenuately extended or acuminate, very narrowly rounded, apex at suture distinctly, moderately deeply notched; body elongate..... *Coptoborus* HOPKINS
- 24 Posterior half of pronotum smooth, with minute punctures ..... 25
- Posterior half of pronotum with low asperities..... *Ambrosiodmus* HOPKINS
- 25 Protibia with posterior face flat, devoid of tubercles or granules ..... 26
- Protibia with posterior face inflated and armed by numerous fine tubercles..... *Dryocoetoides* HOPKINS
- 26 Procoxae widely separated; body stout, usually less than 1.9 times longer than wide..... *Xylosandrus* REITTER
- Procoxae contiguous; body slender, usually more than 2.0 times longer than wide..... *Xyleborus* EICHHOFF
- 27 Antennal funicle 5-segmented, club smaller than eye, symmetrical, with distinct transverse to procurved sutures; elytral declivity convex to weakly sulcate or bisulcate..... 28
- Antennal funicle 1- to 4-segmented, club larger than eye, without sutures; elytral declivity convex to truncate to deeply excavated, commonly with spinelike processes ..... 29
- 28 Dorsal surface of pronotum evenly sloping from base to anterior margin, without an elevated summit at or near middle; antennal club usually with moderately to profoundly procurved sutures, straight in a few species, only first suture septate ..... *Araptus* EICHHOFF
- Dorsal surface of pronotum with a distinct, elevated summit at or near middle; antennal club with three distinct, nearly straight to slightly procurved sutures, all at least partly septate at lateral margin ..... *Pityophthorus* HAGEDORN
- 29 Antennal funicle 2- to 3-segmented; elytral apex divaricate, commonly explanate, declivity excavated, armed with spines; body slender. . . . *Monarthrum* KIRSCH
- Antennal funicle 1-segmented; elytral apex entire, not explanate, declivity convex to weakly sulcate; body stout ..... *Corthylus* ERICHSON

## TRIBE SCOLYTINI

### 1) \**Cnemonyx vagabundus* (WOOD)

In the West Indies recorded from Antigua, Dominican Republic, Puerto Rico, and the Virgin Islands; also from southern Florida and Panama. In Florida it occurs in branches and trunks of *Hippomane mancinella* (ATKINSON & PECK 1994) and was recorded by WOOD (1961) from Mona Island, Puerto Rico. This species was not collected during the present study, although the host plant occurs on the island.

## TRIBE HYPOBORINI

### 2) *Chaetophloeus insularis* (BLACKMAN)

In the West Indies recorded from Cuba and the Virgin Islands; also from southern Florida and the Bahama Islands.

Specimens examined: PUERTO RICO (new island record): Sabana, Luquillo, 14.IV.1990, light trap (1).

## TRIBE PHLOEOSININI

### 3) \**Dendrosinus bourreriae* Schwarz

In the West Indies recorded from Jamaica and Puerto Rico; also from southern Florida and the Bahama Islands. Specimens were not collected during the present survey; however, WOLCOTT (1936) reports the species from dead wood at Guayanilla, Puerto Rico. Specimens have also been intercepted in orange fruit (WOLCOTT 1948) at Ponce, Puerto Rico.

### 4) *Cladoctonus brevisetosus* Bright

Previously known only from Jamaica.

Specimens examined: PUERTO RICO (new island record): Guaynabo, 5.VIII.1995 and 15.XII.1995, light trap (2).

## *Chramesus* LECONTE

Two species of *Chramesus* are recorded from Puerto Rico.

### Key to species of *Chramesus* from Puerto Rico

- 1 Length 2.1 mm, 1.5 times longer than wide; elytral discal interstriae broad, very densely scaly; discal striae broad, deeply impressed ..... *rotundatus* (CHAPUIS)
- Length 1.5–1.7 mm, about 1.8 times longer than wide; each discal interstria with a median row of erect, short, stout scales with rows of smaller, recumbent scales on each side; discal striae narrow, weakly impressed ..... *atlanticus* sp.n.

**5) *Chramesus atlanticus* sp.n.**

(Fig. 1)

TYPE LOCALITY: Guaynabo, Puerto Rico.

TYPE MATERIAL: **Holotype** (male): "PUERTO RICO, Guaynabo, X.20-25.1999, J. A. Torres, collr./light trap".**Allotype**: Same data as holotype. **Paratypes** (29): all from the same locality as holotype with various dates of collections as follows: 29.IX.1995 (1), 12.XII.1995 (1), 5.I.1996 (1), 23.III.1996 (1), 20.VI.1996 (1), VII.1-30.1999 (5), X.20-25.1999 (14) and XII.1999 (5).

The type series is currently in the personal collection of the senior author while additional studies on the West Indian fauna are completed. Upon completion of those studies, the holotype, allotype and most of the paratypes will be placed in the United States Museum of Natural History, Washington D.C. Two paratypes will be deposited in the Canadian National Collection of Insects, Ottawa, and two will be placed in the Museum of Entomology at the Agricultural Experimental Station, Río Piedras, Puerto Rico.

**DESCRIPTION** (male): Length 1.5–1.7 mm, about 1.8 times as long as wide; color light to dark reddish-brown, head usually darker.

Frons evenly, slightly concave from epistoma to above upper level of eyes and laterally from eye to eye, with a very small, median, bifid tubercle just above epistomal margin at level of antennal insertions; lateral margins of concavity not distinctly elevated; surface of concavity shining, minutely reticulate, with very small obscure punctures, covered with sparse, erect, narrowly spatulate scales.

Antennal funicle nearly glabrous, with only a few, very short setae, distinct brush of setae absent; club narrowly oval, about 2.4 times as long as wide, without visible sutures and with a fringe of longer setae around periphery.

Pronotum 1.3–1.4 times wider than long; sides broadly arcuate; anterior margin broadly rounded, smooth; discal surface evenly convex; discal surface moderately shining, minutely reticulate, with widely scattered, very fine punctures and very small, acute, shining granules, each with a short, yellowish, backward-pointing, narrowly spatulate scale, about equal in length to those on frons, granules becoming slightly larger on lateral areas.

Elytra about 1.1 times longer than wide; sides parallel on anterior three-fourths; discal striae weakly impressed, punctured in regular rows, punctures of moderate size, distinctly impressed; discal interstriae weakly convex, mostly 3.0–4.0 times wider than striae, each with three rows of very short, spatulate, yellowish scales, scales in median row slightly longer, about half as long as interstitial width.

Declivity evenly convex; essentially as on disc except scales very slightly shorter and stouter, with a row of very small, acute granules in each interstria.

**DESCRIPTION** (female): Essentially as in male except frons evenly convex, weakly transversely impressed at level of antennal insertions, and without tubercles or other modifications; asperities on lateral portions of pronotum distinctly larger.

**DISCUSSION**: Adults of this species may be easily recognized by the characters summarized in the above key.

**ETYMOLOGY**: The name refers to the Atlantic Ocean, the general location of Puerto Rico.

**6) *Chramesus rotundatus* (CHAPUIS)**

In the West Indies recorded only from Guadeloupe; also from Veracruz in Mexico.

Specimens examined: PUERTO RICO (new island record): Cabo Rojo, XII.1960, leg. Ramonita Cotte (1).



## TRIBE CTENOPHORINI

### 7) *Microborus lautus* WOOD

Known only from Puerto Rico.

Specimens examined: PUERTO RICO: Guánica, 26.XII.1996, light trap (1); same locality, V.1999, *Plumeria alba*, leg. F. Pedreros (47).

### 8) *Pycnarthrum hispidum* (FERRARI)

Widespread throughout the West Indies; also from Central America, Mexico, and northern South America.

Specimens examined: PUERTO RICO: Arecibo, 15.IV.1995, *Ficus laevigata* log (25); Guánica, VII.1996, M. Canals, light trap (1); Guaynabo, various dates in 1995 & 1996, light trap (40); La Parguara, 28.VII.1969, leg. H. & A. Howden (2).

### *Scolytodes* FERRARI

Four species of *Scolytodes* are recorded from Puerto Rico.

#### Key to species of *Scolytodes* from Puerto Rico

- 1 Length 1.3–1.5 mm; frons of female with a dense brush of setae distributed evenly over entire surface; elytral interstriae each with a median row of short setae ..... *notatus* (EGGERS)
- Length greater than 1.5 mm, frons of female not as above; elytral interstriae devoid of setae or setae very sparse, widely scattered ..... 2
- 2 Length 1.8–2.1 mm, 1.9–2.1 times longer than wide; elytra black, pronotum reddish on basal half or more; female frons pubescent on a small oval area, male frons transversely impressed above epistoma, sparsely pubescent ..... *atlanticus* sp.n.
- Length less than 2.0 mm, more than 2.2 times longer than wide; color of elytra and pronotum not as above; female frons with a brush of long setae on periphery of glabrous area, male frons transversely bisulcate or impressed ..... 3
- 3 Elytra and pronotum uniformly reddish-brown; female frons with central third smooth, polished, glabrous, periphery with a brush of long setae; male frons weakly, transversely bisulcate above epistoma; elytra essentially glabrous but with about 3 setae in interstriae 3 (often abraded) ..... *schwarzi* (HOPKINS)
- Elytra reddish-brown, pronotum darker; female frons with central half glabrous, reticulate, dull, periphery with a brush of long setae; male frons weakly, transversely impressed, not bisulcate above epistoma; elytra completely glabrous except for minute striae setae ..... *puertoricensis* sp.n.

### 9) *Scolytodes atlanticus* sp.n. (Figs. 2, 4)

TYPE LOCALITY: Guaynabo, Puerto Rico.

TYPE MATERIAL: **Holotype** (female): "PUERTO RICO, Guaynabo, VIII.2000, J.A. Torres, collr./ex. light trap".

**Allotype**: same data except date is VII.2000. **Paratypes** (10): all with same data except various dates in 2000.



The type series is currently in the personal collection of the senior author while additional studies on the West Indian fauna are completed. Upon completion of those studies, the holotype, allotype and five paratypes will be placed in the U.S. National Museum of Natural History, Washington D.C., three paratypes will be placed in the Canadian National Collection of Insects, Ottawa, and two paratypes will be placed in the Museum of Entomology at the Agricultural Experiment Station, Río Piedras, Puerto Rico.

**DESCRIPTION (female):** Length 1.8–2.1 mm, 1.9 times longer than wide; elytra very dark reddish-brown to black, lighter reddish-brown on basal half of pronotum, legs, and antenna.

Frons weakly convex, very weakly impressed in a triangular or oval shape just above epistomal margin, and with a very weak, longitudinal carina on lower half of impression; surface of impression very finely, densely punctate, with a sparse brush of short, erect, yellowish setae; epistomal process slightly extended in median area, with short setae.

Antennal funicle 5-segmented; club oval, about 1.8 times longer than wide, with two transverse sutures and one arcuate suture at tip, each marked by rows of setae, suture 1 chitinized at lateral one-quarter.

Pronotum about 1.15 times wider than long; sides weakly, broadly arcuate on basal three-fourths, broadly rounded anteriorly; anterior margin unarmed; anterior half of surface with numerous, very slightly elevated, transverse, shining elevations, surface between elevations shining, smooth, with minute reticulation; posterior half smooth, dull, with closely placed, shallow punctures, these separated by a distance equal to 2.0 to 3.0 times their diameters; interpuncture space minutely reticulate.

Elytra 1.3 times longer than wide, 1.4 times longer than pronotum; sides weakly arcuate on basal three-fourths; apex broadly rounded; entire surface densely, minutely punctured, striae not readily discernible except for stria 1 which is very slightly impressed and very weakly visible; punctures very small, weakly impressed, each with a minute seta.

Declivity evenly convex, surface essentially as on disc, interstriae 3 and 9 very slightly elevated, joined at apex. Anterior tibia without special modification, without a tubercle on posterior face.

**DESCRIPTION (male):** Similar in size and color to female.

Frons evenly convex, weakly impressed just above epistoma, surface shining, microreticulate, with scattered punctures; vestiture absent.

**DISCUSSION:** Females of this species may be recognized by the flattened frons which bears a brush of short setae in a triangular or oval shape, by the color pattern which is very dark reddish-brown to black and lighter reddish-brown on basal half of the pronotum, legs, and antenna, and by the densely, randomly punctured elytra on which the striae are entirely to almost entirely indiscernible. On several of the paratypes the elytral striae are vaguely visible. The male can be recognized by the convex frons, which is shining, micro-reticulate and sparsely punctured, and without setae.

**ETYMOLOGY:** The name refers to the Atlantic Ocean, the general location of Puerto Rico.

### 10) *Scolytodes notatus* (EGGERS)

Recorded from Cuba, Dominica, Guadeloupe, and Puerto Rico.

Specimens examined: PUERTO RICO: Guaynabo, III.2000, light trap (1); Guaynabo, 20.–25.X.2000 (1).

WOOD (1982), under the synonymous name *S. pelicerinus* (SCHEDL), reports this species from 19 km east of Mayagüez, Puerto Rico.

**11) *Scolytodes puertoricensis* sp.n.**  
(Figs. 3, 5)

TYPE LOCALITY: El Yunque, Puerto Rico.

TYPE MATERIAL: **Holotype** (female): "PUERTO RICO, El Yunque, IX.1996, C. Laboy, collr./ex: light trap".  
**Allotype**: same data as holotype. **Paratypes** (8): six with same data as holotype; one bears the same data except dated 17.VI.1996 and one is labelled: "PUERTO RICO: El Yunque, USFS aviary, July-August 1985, E. LaRue, at light".

The type series is currently in the personal collection of the senior author while additional studies on the West Indian fauna are completed. Upon completion of those studies, the holotype, allotype and two paratypes will be placed in the United States Museum of Natural History, Washington D.C., three paratypes will be deposited in the Canadian National Collection of Insects, Ottawa, two paratypes will be deposited in the Museum of Entomology at the Agricultural Experimental Station, Río Piedras, Puerto Rico, and 1 paratype will be deposited at the West Indian Beetle Fauna Project Collection, Bozeman, Montana.

DESCRIPTION (female): Length 1.5–1.7 mm, 2.4 times longer than wide; elytra light reddish-brown, usually darker brown on pronotum, head and elytral apex.

Frons weakly, narrowly concave longitudinally, sulcus extending from epistomal margin to slightly above middle of eye, surface of sulcus densely, minutely reticulate, bordered by a fringe of long, incurved setae with short, inconspicuous setae in sulcus; epistomal process straight, with distinct long setae extending almost to tip of mandibles.

Antennal funicle 5-segmented; club oval, 1.65 times longer than wide, with two transverse sutures and one arcuate suture at tip, each marked by rows of setae, suture 1 chitinized at lateral one-quarter.

Pronotum as long as wide; sides parallel on basal three-fourths, broadly rounded anteriorly; anterior margin unarmed; anterior two-thirds of surface with numerous, slightly elevated, rounded, shining elevations, surface between elevations shining, smooth, with minute, scattered points; posterior one-third smooth, shining, smooth, with closely placed, deeply impressed punctures, these separated by a distance equal to or less than their diameters.

Elytra 1.65 times longer than wide, 1.8 times longer than pronotum; sides parallel on basal three-fourths; apex broadly rounded; striae not impressed, punctured in even, regular rows, punctures larger, more deeply impressed than those on base of pronotum; interstriae brightly shining, with a median row of weak punctures, these only slightly smaller and slightly shallower than those in striae; interstriae 10 slightly convex from base to level of hind coxa; vestiture absent.

Declivity evenly convex; unmodified, striae and interstriae punctures as on disk. Anterior tibia with one small tubercle on posterior face just opposite tarsal insertion between terminal mucro and first tooth on lateral margin.

DESCRIPTION (male): Similar in size and color to female.

Frons evenly convex, weakly flattened just above epistoma, surface dull, microreticulate, vestiture sparse, inconspicuous.

DISCUSSION: Females of this species may be recognized by the longitudinally concave frons which bears a fringe of scattered, long, incurved setae around the margin of the concavity, by the shape and structure of the antennal club, and usually by the color pattern which is dark brown on the head, pronotum, ventral areas, and elytral apex and light brown on the elytral disc. The color pattern varies from the basic color scheme described above to completely, or nearly completely, light brown, but even in these cases, the basic scheme of darker on the pronotum and

elytral apex and lighter on the elytral disc can still be detected. The male can be recognized by the convex frons, which is dull and densely micro-reticulate, by the structure of the antennal club, and by the color pattern.

ETYMOLOGY: Named for the type locality.

## 12) *Scolytodes schwarzi* (HOPKINS)

Recorded from southern Florida, Andros Island in the Bahamas, and Jalisco and Veracruz in Mexico.

Specimens examined: PUERTO RICO (new island record): Bisley, El Yunque, 16.VII.1990, *Swietenia macrophylla* log (3); Guaynabo, various dates in 1999 and 2000, light trap (10); Matrullas, 22.X.1934, dead tree, leg. R.G. Oakley (1).

## TRIBE MICRACINI

### *Pseudothysanoes* BLACKMAN

Two species of *Pseudothysanoes* are recorded from Puerto Rico.

#### Key to species of *Pseudothysanoes* from Puerto Rico

- 1 Elytral declivity evenly convex, without armature ..... *securigerus* (BLACKMAN)
- Elytral declivity nearly vertical, with large spines ..... *magnispinatus* sp.n.

## 13) *Pseudothysanoes magnispinatus* sp.n. (Fig. 6)

TYPE LOCALITY: Duck Island Reef National Monument, Buck Island, Virgin Islands.

TYPE MATERIAL: **Holotype** (female): "VIRGIN IS.: Buck Island, Duck Island Reef National Monument, Sept. 10-Oct. 1, 1993, 140 ft., Z. M. Hillis, colr.[!], flight intercept trap #14". **Paratypes** (4): three with the same data as holotype; one is labelled: "PUERTO RICO, Guaynabo, 15.XII.1995, J. A. Torres, collr./ex: light trap".

The type series is currently in the personal collection of the senior author until additional studies on the West Indian fauna are completed. Upon completion of those studies, the holotype and two paratypes will be deposited in the West Indian Beetle Fauna Project Collection, Bozeman, Montana and one paratype will be sent to the Museum of Entomology at the Agricultural Experiment Station in Río Piedras, Puerto Rico.

DESCRIPTION (female): Length 1.5 mm, about 2.4 times longer than wide; color reddish-brown.

Frons evenly convex, very weakly concave just above epistomal margin; surface weakly shining, densely granulate, with several slightly larger, acute granules on upper margin of concave area and smaller granules over remainder of surface and with a group of long, downward-pointing setae on epistomal margin.

Antennal club oval, about 1.5 times longer than wide, without visible sutures on anterior face and with a fringe of longer setae around periphery.

Pronotum as long as wide; sides broadly arcuate; apex broadly rounded with a row of 10 acute serrations; summit distinct, elevated; anterior slope dull, with numerous, scattered serrations; posterior surface very weakly transversely concave, with numerous acute granules to base, these smaller than serrations on anterior slope and with scattered, erect, short, narrow, yellowish scales.

Elytra 1.5 times longer than wide; sides parallel on anterior three-fourths; discal striae weakly impressed, becoming slightly more strongly impressed near declivity, punctured in regular rows, punctures very large, distinctly impressed; discal interstriae weakly convex, mostly distinctly narrower than striae, each with a median row of erect, yellowish scales, these mostly as long as width of interstriae.

Declivity abrupt, nearly vertical, apex slightly mucronate; sutural interstriae with one very small, acute denticle at upper margin of declivity; interstriae 2 with a larger denticle on declivital margin; interstriae 3 with a very large, acute, laterally flattened spine on upper third; interstriae 4, 5, and 6 each with a single acute denticle on upper margin of declivity; interstriae 7 with a large, acute, laterally flattened spine, this slightly smaller than spine on interstriae 3; interstriae 8 with a small, acute serration on base; interstriae 9 with another very large, acute, incurved spine on base; declivital face glabrous except for a row of scales in interstriae 1, a few scales at base of each interstria, and scattered scales on the large spines.

Male unknown.

DISCUSSION: The presence of very large spines on the elytral declivity, as described above, make this species unmistakable.

ETYMOLOGY: The name refers to the very large spines on the elytral declivity (*magnus* = large and *spinus* = spines).

#### 14) *Pseudothysanoes securigerus* (BLACKMAN)

Recorded in the West Indies from Haiti and Puerto Rico; also from southern Florida.

Specimens examined: PUERTO RICO: Guánica, various dates, 1996 and 1997, leg. J. Torres or M. Canals, light trap (6).

#### 15) *Hylocurus dubius* SCHEDL

Previously known only from Brazil.

Specimens examined: PUERTO RICO (new island record): Guaynabo, IX.2000, light trap (1). The specimen was compared to a specimen previously identified by Schedl.

### TRIBE CRYPHALINI

#### *Allothenemus* gen.n.

TYPE SPECIES: *Allothenemus minutus* sp.n., by present designation.

DIAGNOSIS: With the character states of the Cryphalini, e.g. frons usually convex and rarely sexually dimorphic, eye usually entire, antennal scape elongate, simple; antennal club flattened, usually with distinct arcuate sutures; pronotum asperate on anterior slope, anterior margin serrate, basal margin with a fine, raised line, lateral margin unarmed; procoxae contiguous; tibia

flattened, armed by four or more socketed teeth; scutellum distinct, flush with elytral surface; basal margin of elytra with a fine, raised line; elytra with scales.

**GENERIC CHARACTERS:** Pronotal asperities on anterior slope basally contiguous, arranged into three concentric rows with a very short, inconspicuous 4<sup>th</sup> row at summit, no other asperities present on surface; anterior margin of pronotum with four serrations, the median pair slightly larger; basal margin of pronotum with a fine, elevated line; lateral margin of pronotum without an elevated line; antennal funicle 3-segmented, basal segment much larger than others; antennal club nearly circular, very slightly longer than wide.

**DISCUSSION:** This genus is in the tribe Cryphalini and is most easily characterized by the characters given above, most notably by the presence of three distinct concentric rows of asperities on the anterior slope of the pronotum, with a vague 4<sup>th</sup> row at the summit and the 3-segmented antennal funicle.

### 16) *Allothenemus minutus* sp.n.

(Fig. 7)

**TYPE LOCALITY:** Guaynabo, Puerto Rico.

**TYPE MATERIAL:** **Holotype** (sex ?): "PUERTO RICO, Guaynabo, VII.1-30.1999, ex: light trap/J. A. Torres, collr." **Paratype:** "PUERTO RICO, Guaynabo, 15-30.VII.1996/ex: light trap/J. A. Torres, collr."

The type series is currently in the personal collection of the senior author while additional studies on the West Indian fauna are completed. Upon completion of those studies, the holotype will be placed in the United States Museum of Natural History, Washington D.C. and the paratype will be placed in the Canadian National Collection of Insects, Ottawa, Ontario.

**DESCRIPTION** Length 1.0 mm, 2.0 times longer than wide; color light reddish-brown.

Frons evenly convex, with what appears to be a large puncture in middle at level of upper margin of eyes and a very weak granule at mid-point of epistomal margin; surface weakly shining, densely minutely-reticulate with a few, scattered, yellowish setae along epistomal margin.

Antennal funicle 3-segmented, with basal segment much larger than others, club nearly circular, only very slightly longer than wide, with a single, very vague, arcuate row of setae on apical half of anterior face.

Pronotum 1.25 times wider than long; sides broadly arcuate; apex narrowly rounded with a row of four acute serrations, the median pair slightly longer; summit distinct, elevated; anterior slope shining, with three distinctly elevated, concentric rows of basally contiguous serrations and a vague row at summit; posterior surface weakly shining, densely minutely-reticulate; vestiture consisting of very short, scattered, erect, hairlike to narrowly flattened scales, these arranged in a row behind each concentric row of asperities and scattered on basal and lateral areas.

Elytra 1.25 times longer than wide; sides parallel on anterior three-fourths, apex broadly rounded; discal surface weakly shining, minutely reticulate over entire surface, striae not impressed except first stria very weakly impressed, stria punctures not visible or very weakly visible in proper light; discal interstriae not discernable, but each with a median row of erect, very short, yellowish scales, these about half as long as distance between rows.

Declivity evenly convex, surface and vestiture as on elytral disk.

**DISCUSSION:** Although only two specimens of this species have been seen, the characteristics are so unique that there should be no problem in recognizing the species in the future. It differs from all members of the Cryphalini by the presence of three distinct concentric rows of asperities

on the pronotum as described above, by the antennal characters also described above, by the very small size, and by the other characters mentioned in the description of the genus and the species.

ETYMOLOGY: The name refers to the very small size of the adults (minutus = small).

### 17) *Hypocryphalus mangiferae* (STEBBING)

In the West Indies recorded from Guadeloupe and Puerto Rico (CABRERA-ASENCIO 1996); also from southern Florida, the Barbados (BRIGHT 1985), Central America, and northern South America.

Specimens examined: PUERTO RICO: Guaynabo, various dates in 1996–2000, light trap (7).

### 18) *Scolytogenes knabi* (HOPKINS)

In the West Indies recorded from Cuba, Dominican Republic, Guadeloupe, and Jamaica; also from Central America, southern Mexico, and northern South America.

Specimens examined: PUERTO RICO (new island record): Guaynabo, various dates in 1995–2000, light trap (16); Guánica, VII.1996, leg. M. Canals, light trap (1).

### *Hypothenemus* WESTWOOD

Sixteen species of *Hypothenemus* are recorded from Puerto Rico, but at least one of these should be questioned.

#### Key to species of *Hypothenemus* from Puerto Rico

- 1 Frons distinctly concave on a circular area extending from epistoma to above upper eye level; anterior margin of pronotum with four large serrations, arranged into two widely separated pairs; 1.75 mm ..... *concaivifrons* sp.n.
- Frons convex or transversely impressed above epistoma; anterior margin of pronotum with 2-8 more or less evenly separated serrations..... 2
- 2 Frons with a conspicuous tubercle or transverse carina at middle, lower half of frons weakly to strongly, transversely impressed; interstitial ground vestiture, if present, hairlike, abundant..... 3
- Frons convex, with or without a narrow, longitudinal, median groove, usually devoid of a median frontal tubercle; elytral vestiture consisting of rows of erect, interstitial scales and uniseriate rows of striae ..... 7
- 3 Females 1.0–1.2 mm in length, 2.6 times longer than wide; interstitial scales on declivity hairlike, about 2.0–4.0 times longer than wide; carina on frons strongly, acutely elevated at middle, lower frons concave; posterior half of pronotum mostly reticulate..... *columbi* HOPKINS
- Females larger than 1.2 mm, about 2.3 times longer than wide; other characters not as above ..... 4
- 4 Interstitial scales on declivity almost as long as distance between rows, each scale broad, about 2.0–3.0 times longer than wide; pronotal surface in posterior-lateral areas smooth, shining; length 1.7–1.9 mm ..... *africanus* (HOPKINS)
- Interstitial scales on declivity shorter than distance between rows, each scale slender, at least 4.0 times longer than wide; posterior-lateral areas of pronotum subreticulate to rugose-reticulate; length 1.3–1.7 mm ..... 5
- 5 Frons with a small rounded median tubercle at upper level of eyes; lower half of frons shallowly longitudinally impressed, sometimes with a variable, shallow, median groove extending to median tubercle; 1.4–1.6 mm..... *crudiae* (PANZER) (in part)

- Not as above ..... 6
- 6 Anterior margin of pronotum with 2–4 serrations; body stout, about 2.2 times longer than wide; anterior slope of pronotum with 12–18 coarse asperities; 1.3–1.5 mm ..... *brunneus* (HOPKINS)
- Anterior margin of pronotum with 6–8 serrations; body slender, 2.2–2.3 times longer than wide; anterior slope of pronotum with about 25 small asperities; 1.6–1.7 mm ..... *setosus* (EICHHOFF)
- 7 Anterior margin of pronotum with 2–4 serrations; anterior slope of pronotum with 8–25 coarse asperities; ground vestiture on declivital interstriae scalelike, either hair- or scale-like on disc; length 1.5 mm or larger ..... 8
- Anterior margin of pronotum with 4–8 serrations; anterior slope of pronotum with more than 25 asperities; ground vestiture on declivital interstriae absent or narrowly scalelike; length 1.6 mm or smaller ..... 10
- 8 Anterior margin of pronotum with 2 serrations; anterior slope of pronotum with 8–15 asperities; short ground vestiture on declivital interstriae scalelike; discal striae more distinctly impressed, punctures larger ..... 9
- Anterior margin of pronotum with 4 serrations, lateral pair smaller; anterior slope of pronotum with at least 15 asperities; discal striae not impressed, punctures small; 1.5–2.1 mm ..... *birmanus* (EICHHOFF)
- 9 Elytral declivity evenly convex; postero-lateral portion of pronotum with very narrow scalelike setae and hairlike setae intermixed; 1.5–1.8 mm ..... *rotundicollis* (EICHHOFF)
- Elytral declivity steeply flattened, weakly impressed at about middle; posterolateral portion of pronotum with erect and recumbent hairlike setae; 1.9–2.2 mm ..... *amplissimus* sp.n.
- 10 Interstitial ground vestiture consisting of fine, confused setae, at least in posterolateral areas, in addition to uniseriate rows of erect scales and striae setae; length 1.0–1.4 mm ..... 11
- Interstitial ground vestiture absent, elytral vestiture consisting only of uniseriate rows of erect interstitial scales and rows of fine striae setae, one setae arising from each striae puncture; length 1.2–1.9 mm ..... 12
- 11 Body stout, 2.3 times longer than wide; interstitial scales on declivity short, half as long as distance between rows, and less than 2.0 times as long as wide; yellowish-brown; 1.0–1.1 mm ..... *pubescens* HOPKINS
- Body more slender, more than 2.4 times longer than wide; interstitial scales on declivity equal in length to distance between rows, and each more than 3.0 times as long as wide; dark brown to black; 1.0–1.4 mm ..... *eruditus* WESTWOOD
- 12 Interstitial bristles on declivity very slender, slightly flattened, each scale usually more than 8 times longer than wide; discal and declivital bristles equal in width; elytral declivity gradual, extending to middle of elytra; found in coffee beans ..... *hampei* (FERRARI)
- Interstitial bristles on declivity strongly flattened, each scale not more than 6 times longer than wide; other characters not as above ..... 13
- 13 Pronotum broadly convex, summit not evident; pronotal asperities small, very numerous; setae on pronotal disc all hairlike; 1.6–1.7 mm ..... *dolosus* WOOD
- Summit of pronotum strongly convex, transverse impression evident behind summit; other characters not as above ..... 14
- 14 Declivital striae distinctly, strongly impressed; interstriae narrower than striae, narrowly convex, with small granules extending to apices; 1.3–1.5 mm ..... *squamosus* (HOPKINS)
- Declivital interstriae not impressed; interstriae as wide as or wider than striae, with or without small granules ..... 15
- 15 Frons with a small rounded median tubercle at upper level of eyes; lower half of frons shallowly longitudinally impressed, sometimes with a variable, shallow, median groove extending to median tubercle; 1.4–1.6 mm ..... *crudiae* (PANZER) (in part)
- Frons uniformly convex, devoid of median tubercle ..... 16



- 16 Entire elytral surface minutely rugose; frons with a deep, narrow, median groove extending from epistoma to upper eye level; 1.2–1.4 mm ..... *obscurus* (FABRICIUS)
- Elytral surface largely smooth, shining; frontal groove on frons shorter, rarely extending half of distance from epistoma to upper level of eyes; 1.4–1.6 mm ..... *seriatus* (EICHHOFF)

### 19) *Hypothenemus africanus* (HOPKINS)

In the West Indies recorded from Dominican Republic, Jamaica, Puerto Rico, and the Virgin Islands; also from the Bahamas, southern United States to northern South America, South Africa, Malaysia, and Indonesia.

Specimens examined: PUERTO RICO: Cayey, 1.VIII.1994, in *Delonix regia* pods. Guánica, 15.IV.1996, light trap (1). Intercepted at New York in *Poinciana* pod from Puerto Rico (2-USNM).

### 20) *Hypothenemus amplissimus* sp.n. (Fig. 8)

TYPE LOCALITY: Guánica, Puerto Rico.

TYPE MATERIAL: **Holotype** (female): "PUERTO RICO, Guánica, 8.VII.1989, J. A. Torres, collr./Ex: *Serjania polyphylla* vine". **Paratypes** (3): all with same data as holotype.

The type series is currently in the personal collection of the senior author while additional studies on the West Indian fauna are completed. Upon completion of those studies, the holotype and one paratype will be placed in the United States Museum of Natural History, Washington D.C. and two paratypes will be placed in the Canadian National Collection of Insects, Ottawa, Ontario.

DESCRIPTION (female): Length 1.9–2.2 mm, 2.3 times longer than wide; light reddish-brown, head and pronotum slightly darker.

Frons evenly convex, without median elevation, transverse carina, or longitudinal groove; surface moderately shining, minutely reticulate, with fine, scattered granules and very faint, longitudinal scratches or rugosities.

Antennal funicle 5-segmented; club elongate-oval, 1.9 times longer than wide, with two transverse sutures, each marked by rows of setae, suture 1 chitinized for half of its length.

Pronotum 1.25 times wider than long; sides broadly arcuate, broadly rounded anteriorly; anterior margin with two large, basally contiguous serrations; summit high; anterior slope steeply declivous, with about 14 coarse, strongly elevated serrations; posterior portion brightly shining, with numerous, fine punctures and with erect, fine setae, scale-like setae absent.

Elytra 1.55 times longer than wide; sides parallel on basal three-fourths, apex broadly rounded; discal striae weakly impressed, with large, deeply impressed punctures, each puncture with a very short seta about as long as diameter of puncture; discal interstriae about 1.5–2.0 times wider than striae, brightly shining, weakly convex, with more weakly impressed, often scattered (usually 2-ranked) punctures, each with a median row of scattered, erect, flattened, narrow scales, these becoming more abundant toward declivity.

Declivity steeply convex, flattened or very weakly, transversely impressed in median area between third interstriae; stria slightly more deeply impressed than on disc, with punctures more obscure; third interstriae slightly more convex, weakly elevated, with very obscure, fine granules; vestiture abundant, consisting of dense interstitial scales, these in a single median row in interstriae 1, arranged in partial double row in remaining interstriae, and with very short scalelike setae along margin of interstriae, each stria puncture with a very short seta; interstitial

scales truncate at apex, slightly longer than interstitial width, placed closer than scale length in rows.

Male unknown.

**DISCUSSION:** Adults of this species are characterized by their larger size, by the strongly convex pronotum with only about 14 large serrations on the anterior slope, and by the flattened to weakly impressed elytral declivity with abundant, closely placed scales about as long as interstitial width. This is the largest species of *Hypothenemus* so far seen from Puerto Rico. It is one of only five or six species in North America that have the combination of two serrations on the anterior pronotal margin, less than 20 serrations on the anterior slope of the pronotum, and only setae on the posterior half of the pronotum. The present species differs by the specific characters mentioned above. Paratypes vary in length from 1.9–2.2 mm.

**ETYMOLOGY:** Named to reflect the large size of the adults, *amplissimus* is the inflected form of the Latin word *amplus*, meaning of large extent, great, or ample.

### 21) *Hypothenemus birmanus* (EICHHOFF)

In the West Indies recorded from Cuba and Jamaica; also widespread throughout the tropical and subtropical regions of the world.

Specimens examined: PUERTO RICO (new island record): Arecibo, 8 km SE., II.8.1969, leg. L. & C.W. O'Brien (1-CWOB); Guánica St. For., Fuerte-Granados Trail, VIII.9.1999, leg. C.W. O'Brien & P. Kovarik (2-CWOB); Guaynabo, various dates 1995 to 1998, light trap (14); Guaynabo, same data except ex: *Terminalia catappa* log (1).

### 22) *Hypothenemus brunneus* (HOPKINS)

In the West Indies recorded from Cuba, Guadeloupe, Jamaica, Puerto Rico, and the Virgin Islands; also from the southern United States to Panama and in the Galapagos Islands.

Specimens examined: PUERTO RICO: Guánica Forest, 25.–26.VII.1969, leg. H. & A. Howden (4); Guánica, 15.V.1991, light trap (1); Guánica St. For., VIII.9.1999, leg. C.W. O'Brien & P. Kovarik (1-CWOB).

### 23) *Hypothenemus columbi* HOPKINS

In the West Indies recorded only from Cuba; also from the Bahama Islands and from the southern United States to northern South America.

Specimens examined: PUERTO RICO (new island record): Guánica, III.1997, M. Canals (1); same locality, 15.IV.1996, light trap (1).

### 24) *Hypothenemus concavifrons* sp.n.

**TYPE LOCALITY:** Guánica, Puerto Rico.

**TYPE MATERIAL:** **Holotype** (female): "PUERTO RICO: Guánica, III.1997, M. Canals, collr./No 165, light trap".

The holotype is currently in the personal collection of the senior author while additional studies on the West Indian fauna are completed. Upon completion of those studies, it will be placed in the United States Museum of Natural History, Washington D.C.

**DESCRIPTION** (female): Length 1.75 mm, 2.5 times longer than wide; uniformly reddish-brown.

Frons distinctly concave on a circular area extending from epistomal margin to well above eyes; surface of concavity brightly shining, minutely reticulate, with abundant, moderately long, yellowish setae, these almost as long as those along epistomal margin, median line glabrous; surface above and lateral to concavity shining, minutely reticulate, glabrous.

Antennal club oval, about 1.2 times longer than wide, with two transverse sutures, each marked by rows of setae.

Pronotum 1.1 times wider than long; sides broadly arcuate, broadly rounded anteriorly; anterior margin with four large serrations, these arranged into two widely separated pairs; summit high; anterior slope steeply declivous, with about 29 large, coarse, strongly elevated serrations; posterior portion brightly shining, with numerous, fine punctures and rugae, with intermixed erect, fine setae and erect, narrow scales.

Elytra 1.65 times longer than wide; sides parallel on basal three-fourths, apex broadly rounded; discal striae very weakly impressed, with large, deeply impressed punctures, each stria with numerous very short setae, each slightly longer than diameter of puncture; discal interstriae about as wide or very slightly wider than striae, moderately shining, weakly convex, with an even median row of erect, flattened, narrow scales, these about 3.0 times longer than wide and truncate at tip.

Declivity steeply, evenly convex; essentially as on disc except striae less distinctly impressed and recumbent ground setae slightly longer more abundant.

Male unknown.

DISCUSSION: Although only one specimen of this species was available, the characteristics are so distinct that there should be no problem recognizing this species in the future. The frons is distinctly and deeply concave on a large circular area that extends from very near the epistomal margin to well above the eyes, and laterally occupying slightly less than the median three-fourths, and which bears numerous long, erect setae except on a longitudinal median area. The anterior margin of the pronotum bears four large, distinct serrations arranged in two widely separated pairs. The anterior slope of the pronotum bears about 30 large, distinct asperities and the elytra bears ground vestiture consisting of rather numerous, short, recumbent setae. We are aware of no other species of *Hypothenemus* in North America or the West Indies with that combination of characters.

ETYMOLOGY: Name refers to the concave impression on the frons of the beetle.

## 25) *Hypothenemus crudiae* (PANZER)

*Stephanoderes trinitatis* HOPKINS, **syn.n.**

In the West Indies recorded from Cuba, Grenada, and Puerto Rico; also widespread throughout the tropical, subtropical, and temperate regions of the world.

Specimens examined: PUERTO RICO: Bayamón, II.9.1995, in *Ricinus communis* dry fruits; Carite St. For., VII.28.1999, leg. C.W. O'Brien & P. Kovarik (1-CWOB); Fajardo, XII.23.1996, in seedpods of *Delonix regia* (12); Guaynabo, various dates from 1991 to 2000, ex: *Almendrus* seeds (3); same data except ex: *Melicoccus bijugatus* seeds (2); same data except ex: dry flowers of *Musa sapientum* (15); same locality, 21.V.1991, in *Terminalia catappa* seeds. Pueblo Viejo, leg. A.S. Mills, 14.VIII.1930 (2).

Under the synonymous name, *Stephanoderes brasiliensis* HOPKINS, WOLCOTT (1948) records this species from stems of *Derris elliptica* at Río Piedras, from dead branches of *Delonix regia* in the patio of the School of Tropical Medicine, and from numerous hosts intercepted at several ports.

The holotype of *Stephanoderes trinitatis* HOPKINS in the United States Museum of Natural History was examined and compared to specimens of *H. crudiae* (PANZER). No differences could be seen and we consider HOPKINS name to be a synonym. WOLCOTT (1948) records this species from Patillas from a dead twig of “guaraguao” (*Guarea trichilioides*) and, under the name *Stephanoderes georgiae* HOPKINS, WOLCOTT (1948) records this species from guava fruits from Peuelas.

## 26) *Hypothenemus dolosus* WOOD

In the West Indies recorded only from Jamaica; also from Costa Rica, Honduras, and in Mexico from the states of Chiapas, Oaxaca, and Veracruz.

Specimens examined: PUERTO RICO (new island record): Guaynabo, various dates from 1999 to 2000, light trap (16).

## 27) *Hypothenemus eruditus* (WESTWOOD)

In the West Indies recorded from Cuba, Guadeloupe, Jamaica, and Puerto Rico; also widespread throughout the tropical, subtropical, and temperate regions of the world.

Specimens examined: PUERTO RICO: Aguas Buenas, 7–17.V.1973, leg. S. Peck, berlese 265 (1). Bayamón, 9.II.1995, in dry fruits of *Ricinus communis*. Carite St. For., VII.26.1999, leg. C.W. O'Brien & P. Kovarik (1-CWOB). Cayey, 13.VIII.2000, in dry flowers of *Musa paradisiaca* (2). Guánica, 15.IV.1996, light trap, leg. M. Canals (2). Guaynabo, various dates in 1994 to 1997, light trap (40); same locality, in *Melicoccus bijugatus* seeds (2); same locality, in dry flowers of *Musa sapientum* (11); same locality, in *Psidium guajava* seeds; same locality, in *Terminalia catappa* seeds. Luquillo, 5.I.1990 (1). Pico El Yunque, Caribbean National Forest, 23.IX.1987, leg. M.A. Ivie, dwarf forest litter (1-WIBFP). Río Grande, 20.VIII.1990, in *Artocarpus altilis* log. San Lorenzo, 7.VIII.2000, in dry fruit of *Lagenaria siceraria* (5).

WOLCOTT (1948) records this species from Camp Dona Juana, Villalba, in a dead pole of “maricao” (*Byrsonima spicata*), and in dead twigs of “masa” (*Tetragastris balsamifera*) at Ciales.

## \**Hypothenemus hampei* (FERRARI)

Coffee Berry Borer. In the West Indies recorded from Jamaica and Puerto Rico; also from throughout the coffee producing regions of Africa, Asia, Indonesia, Central America, and South America.

All of the specimens of *Hypothenemus* collected during the present study were carefully examined and no specimens of this species were recognized. A survey for the Coffee Berry Borer in the major coffee growing regions of Puerto Rico in 1998 and 2002 also indicated that the beetle was not present on the island (VEGA, FRANQUI & BENAVIDES 2002), and that previous reports of its occurrence were erroneous. The species is widely considered to be the most devastating pest of coffee; therefore we have included the species in the key to species to enable it to be recognized should it be found on the island. For the present, the species should be deleted from the Puerto Rico list.

## 28) *Hypothenemus obscurus* (FABRICIUS)

In the West Indies recorded from Cuba, Dominican Republic, Guadeloupe, Jamaica, Puerto Rico, and the Virgin Islands; also widespread throughout the tropical and subtropical regions of the New World.

Specimens examined: PUERTO RICO: Guánica, IV.1997, light trap (6); same locality, 8.VII.1989, eating *Tamarindus indica* seeds (8); same locality, XII.4.1996, in seeds of *Melicoccus bijugatus* (19); same locality, VI.1996, leg. M. Canals, light trap (3). Guaynabo, various dates in 1995 to 2000, light trap (28); same data except ex: *Melicoccus bijugatus* seeds (3). Río Piedras, 11.III.1995, in male flower of *Artocarpus heterophyllus* (1).

Under the name *Stephanoderes buscki* HOPKINS, WOLCOTT (1948) notes this species being repeatedly intercepted at various ports in Puerto Rico, and from guava fruit at Pequeñas, and in *Tamarindus indica* pods from San Juan and Ponce.

### 29) *Hypothenemus pubescens* HOPKINS

In the West Indies recorded only from Puerto Rico; also from the southern United States to Argentina, and in the Hawaiian Islands.

Specimens examined: PUERTO RICO: Guaynabo, III.2000, light trap (1). WOOD (1982) also lists this species from Aguadilla, and Villalba, on *Byrsonima spicata*.

### 30) *Hypothenemus rotundicollis* (EICHHOFF)

In the West Indies recorded from Puerto Rico and the Virgin Islands; also from the eastern United States to southern Mexico.

Specimens examined: PUERTO RICO: Guánica, VI.1996, leg. M. Canals, light trap (2); same locality, 15.IV.1996, light trap (1). Guánica Forest, VII.25–26.1969, leg. H. & A. Howden (1), VII.29.1969 (1) and 15.IV.1996 (1). Guaynabo, various dates in 1996, light trap (4). La Parguera, July 30, 1969, leg. H. & A. Howden (1).

### 31) *Hypothenemus seriatus* (EICHHOFF)

In the West Indies recorded from Cuba, Haiti, Puerto Rico, and the Virgin Islands; also widespread throughout the temperate to tropical regions of the world.

Specimens examined: PUERTO RICO: El Yunque, 17.VII.1989, in *Cyrilla racemiflora* log. Guánica, 8.VII.1989, eating seeds of *Tamarindus indica* (5). Guaynabo, various dates 1994 to 1996, light trap (13), in *Hymenaea courbaril* seeds and in *Melicoccus bijugatus* seeds (3). Río Piedras, 22.VIII.1994, in *Genipa americana* seeds.

### 32) *Hypothenemus setosus* (EICHHOFF)

In the West Indies recorded from Cuba, Guadeloupe, Haiti, Jamaica, and Puerto Rico; also widespread throughout the tropical regions of the world.

Specimens examined: PUERTO RICO: Guaynabo, VIII.23.1994, in *Melicoccus bijugatus* seeds (4); same locality, 23.VIII.1995, light trap (2); same locality, 5.II.1995, in *Psidium guajava* seeds. Río Grande, 20.VIII.1990, in *Artocarpus altalis* log (6). San Lorenzo, 7.VIII.2000, in dry fruit of *Lagenaria siceraria* (1). Pueblo Viejo, leg. A. S. Mills, 14.VIII.1930 (1).

### 33) *Hypothenemus squamosus* (HOPKINS)

Recorded in the West Indies only from Cuba; also from southern Mexico, Tobago, and in the southern United States from Florida and Texas.

Specimens examined: PUERTO RICO (new island record): Guaynabo, 23.VIII.1994, in *Melicoccus bijugatus* seeds. Punta Santiago, south of Fajardo, 25.IX.1987, M.A. Ivie, beating on beach (2-WIBFP).

***Cryptocarenum* EGGERS**

Two species of *Cryptocarenum* are recorded from Puerto Rico.

**Key to species of *Cryptocarenum* from Puerto Rico**

- 1 Length (female) less than 2.0 mm; frons finely rugose on both sides of a weak, transverse impression..... *heveae* (HAGEDORN)
- Length (female) more than 2.0 mm; frons coarsely rugose on both sides of a weak, transverse impression..... *seriatus* EGGERS

**34) *Cryptocarenum heveae* (HAGEDORN)**

In the West Indies recorded from Cuba, Guadeloupe, Jamaica, and the Virgin Islands; also from southern Florida to northern South America.

Specimens examined: PUERTO RICO (new island record): Guaynabo, 21.IV.1996, ex: *Terminalia catappa* log (1); same locality, ex: *Melicoccus bijugatus* seeds (2); same locality, light trap (2). Guánica, 8.VII.1989, ex: *Serjania polyphylla* vine (1).

**35) *Cryptocarenum seriatus* EGGERS**

In the West Indies recorded from Cuba, Haiti, Jamaica, and the Virgin Islands; also from southern Mexico to northern South America.

Specimens examined: PUERTO RICO (new island record): Guánica, 8.VII.1989, ex: *Serjania polyphylla* vine. Guaynabo, 23.VIII.1994, in *Melicoccus bijugatus* seeds (2); same locality, 23.III.1996, light trap; same locality, 4.VI.1995, light trap; same locality, 25.VII.1995, light trap.

**36) *Trischidias puertoricensis* sp.n.**

(Fig. 9)

TYPE LOCALITY: Guaynabo, Puerto Rico.

TYPE MATERIAL: **Holotype** (female): "PUERTO RICO: Guaynabo, VIII.23.1994, J. A. Torres, collr./*Psidium guajava* seeds". **Paratypes** (2): "PUERTO RICO: Guaynabo, 21.V.1991, J. A. Torres, collr./*Terminalia catappa* seeds".

The type series is currently in the personal collection of the senior author while additional studies on the West Indian fauna are completed. Upon completion of these studies the holotype will be deposited in the United States Museum of Natural History, Washington, D.C. and two paratypes will be deposited in the Canadian National Collection of Insect, Ottawa, Ontario.

DESCRIPTION (female): Length 0.7–1.0 mm, 2.2 times longer than wide.

Frons weakly, transversely impressed above epistoma, with a very small, shining elevation on upper margin of impression, evenly convex above impression; surface very finely, reticulate-rugose, except smooth and shining in median portion of transverse impression.

Antennal club elongate-oval, about 1.6 times longer than wide, longer than funicle, with two distinct, transverse sutures.

Pronotum 1.2 times wider than long, widest at base; sides broadly rounded, converging to narrowly rounded anterior margin; anterior margin with six scattered serrations; anterior slope with about 10 scattered asperities; summit distinctly elevated, with numerous, small, scattered

asperities; posterior half shining, with scattered, very small granules; vestiture consisting of very short, semi-recumbent, hairlike setae and longer, erect scales, scales truncate at tip, about 3.0–4.0 longer than width at tip.

Elytra 1.25 times longer than wide; sides parallel on basal half, converging to broadly rounded apex; striae weakly impressed, punctured in regular rows, punctures large, deeply impressed, separated by much less than half of diameter of puncture, each with a minute seta; interspaces narrower than striae, each with a median row of erect scales; each scale about 3.0 times longer than wide, about as long as width between interspaces, apex truncate.

Declivity evenly convex, striae and interstriae as on disc except for a row of minute granules in each interspace at base of each scale.

Male unknown.

**DISCUSSION:** This is presently the only species of this genus known from the West Indies, although two more species are known from other islands in the archipelago; these will be treated in a future paper on the entire West Indian fauna. Adults of this species may be recognized by their very small size, by the presence of 6 widely separated serrations on the anterior margin of the pronotum, by the wide, weakly impressed elytral interspaces, and by the erect, narrow elytral scales.

Adults of species in this genus are unique among the Scolytidae in that the adults and larvae feed on the fruiting bodies of ascomycetous fungi on branches or on wood invaded by the hyphae of these fungi (DEYRUP 1987).

**ETYMOLOGY:** Named for the type locality.

## TRIBE DRYOCOETINI

### *Coccotrypes* EICHHOFF

Six species of *Coccotrypes* are recorded from Puerto Rico. The systematics of this genus is in a chaotic condition. There are numerous misidentification and misinterpretations in the literature so that an accurate view of the species is impossible. WOOD (1982) has provided a good synopsis of the North American species. The following key to species reflects the current view of the senior author and follows, to a large extent, that provided by WOOD (1982). The genus is in desperate need of a thorough and comprehensive revision.

#### Key to species of *Coccotrypes* from Puerto Rico

- |   |  |                          |
|---|--|--------------------------|
| 1 | Strial setae entirely absent; anterior margin of pronotum devoid of serrations .....                                   | 2                        |
| - | Strial setae present; anterior margin of pronotum with serrations .....  | 3                        |
| 2 | Pronotum smooth, shining, entirely devoid of asperities; 1.4–2.0 mm .....  | <i>advena</i> BLANDFORD  |
| - | Pronotum with distinct asperities, these moderately coarse, close, extending to base; 1.7–2.3 mm .....                 | <i>cyperi</i> (BEESON)   |
| 3 | Body slender, 2.5 times longer than wide; strial setae erect, almost as long as those in interstriae; 1.3–1.8 mm ..... | <i>robustus</i> EICHHOFF |
| - | Body stouter, 2.1–2.2 times longer than wide; strial setae recumbent, distinctly shorter than interstitial setae ..... | 4                        |



- 4 Pronotal asperities very small, widely separated and sparse; interstrial setae pointed at apex, about 2.0 times longer than distance between rows; 1.7–2.3 mm ..... *distinctus* (MOTSCHULSKY)
- Pronotal asperities larger, placed very close to one another, abundant; interstrial setae hairlike, pointed to blunt at apex, occasionally slightly flattened..... 5
- 5 Length 1.5–1.9 mm; mature color dark brown to almost black; each stria seta equal to or shorter than diameter of stria puncture..... *carpophagus* (HORNUNG)
- Length 1.8–2.3 mm; mature color reddish-brown; each stria seta distinctly longer than diameter of stria puncture..... *dactyliperda* (FABRICIUS)

### 37) *Coccotrypes advena* BLANDFORD

In the West Indies recorded only from Cuba; also from throughout the Old World tropics, introduced into southern Florida, and Surinam.

Specimens examined: PUERTO RICO (new island record): Cayey, Reserva Forestal Carite, 28.VII.1999, leg. P. Kovarik & C.W. O'Brien, leaf litter (9-WIBFP). El Yunque, 9.IV.1990, *Pinus caribae* log; same locality, 13.IX.1989, *Sloanea berteriana* log. Hwy. 120, km 16.2, Hdqts. Maricao St. For., 8.VIII.1999, leg. C.W. O'Brien (1-CWOB). Luquillo, 28.V.1989, *Calyphyllum calaba* seeds; same locality, 8.VI.1989, *Syzygium jambos* seeds; same locality, 13.VII.1989, *Pouteria multiflora* seeds; same locality, 22.IV.1990, *Persea americana* seeds; same locality, 22.IV.1990. Luquillo Forest, El Yunque Sta., 2.–5.VIII.1969, leg. H. & A. Howden. Municipio Isabela, Bosque Est. Guajataca, 3.VIII.1999, leg. P. Kovarik, Berlese leaf litter (6-WIBFP). Río Piedras, 3.V.1996, ex *Dillenia indica* fruits.

### 38) *Coccotrypes carpophagus* (HORNUNG)

In the West Indies recorded from Cuba, Grenada, Guadeloupe, Montserrat, Puerto Rico, and Santo Domingo; also widespread throughout the temperate, tropical and subtropical areas of the world.

Specimens examined: PUERTO RICO: Guaynabo, various dates in 1995. El Yunque, IX.1996, leg. C. Laboy, El Yunque Sta., Luquillo Forest, 2.–5.VII.1969, leg. H. & A. Howden (9). Luquillo, 22.IV.1990, *Persea americana* seeds. Río Grande, 15.VI.1989, *Prestoea montana* seeds. Río Piedras, 3.V.1996, ex: *Dillenia indica* fruits. El Verde Research Station, 250 m, Carib. National Forest, Río Grande, 20.VII.1994, leg. M.A. Ivie, at light (1-WIBFP).

### 39) *Coccotrypes cyperi* (BEESON)

In the West Indies recorded from Guadeloupe, Jamaica, Martinique, and Puerto Rico; also widespread throughout the temperate, tropical and subtropical areas of the world.

Specimens examined: PUERTO RICO: Cayey, Reserva Forestal Carite, 28.VII.1999, leg. P. Kovarik & C.W. O'Brien, leaf litter (1-WIBFP); same locality, 24.II.1999, in *Calophyllum calaba* log and in *Ceiba pentandra* log. El Yunque, 6.IX.1989, *Sloanea berteriana* log. Guaynabo, 4.VIII.1994, *Mammea americana* seeds. Luquillo, 13.VII.1989, *Pouteria multiflora* seeds. Mayagüez, 27.IX.1944, leg. H.K. Plank, ex. *Mammea americana* dry seeds (2-USNM). Río Piedras, 3.VIII.1994, *Mangifera indica* seeds.

### 40) *Coccotrypes dactyliperda* (FABRICIUS)

In the West Indies recorded from Cuba, Jamaica, and Puerto Rico; also widespread throughout the temperate, tropical and subtropical areas of the world.

Specimens examined: PUERTO RICO: El Yunque, 17.VI.1996, light trap.

**41) *Coccotrypes distinctus* (MOTSCHULSKY)**

In the West Indies recorded from Jamaica and Puerto Rico; also widespread throughout the tropical and subtropical areas of the world.

Specimens examined: PUERTO RICO: El Verde Research Station, 250 m, Caribbean National Forest, Río Grande, 20.VII.1994, leg. M.A. Ivie, at night (1-WIBFP). Guaynabo, 4.VIII.1994, in *Annona muricata* seeds. Río Grande, 24.VII.1989, light trap. El Yunque, 11.VII.1989, light trap (2-CNC).

**42) *Coccotrypes robustus* EICHHOFF**

In the West Indies recorded from Cuba and Puerto Rico; also from southern Florida.

Specimens examined: PUERTO RICO: El Yunque, 5.VIII.1935, in nut of *Prestoea montana*, leg. C.L. Horn, (2-USNM). Maricao Forest Reserve, Hwy. 120, K17 HO, 25.VII.1979, leg. C.W. & L.B. O'Brien (1-CWOB).

**43) *Dendrocranulus carbonarius* (FERRARI)**

In the West Indies recorded from Cuba and Jamaica; also from southern Florida.

Specimens examined: PUERTO RICO (new island record): Guaynabo, 14.IV.1995, light trap; same locality, 15–30.VII.1996, light trap. San Lorenzo, 1.VII.1989, in *Sechium edule* vine (11-CNC).

**TRIBE PREMNOBINI**

Most recent authors (see WOOD & BRIGHT 1992) place *Premnobius* EICHHOFF in the tribe Xyleborini; however, the characteristics of the species in this genus are not consistent with the other genera in the tribe and the genus must be removed from the Xyleborini and placed in a tribe of its own. BROWNE (1961) has discussed the generic characters and taxonomic status of this genus and presented convincing evidence that the genus should be placed in a tribe of its own, but did not formally establish a new tribe for the genus. NOBUCHI (1969) placed this genus in a new tribe, Premnobiini, based on studies of the proventriculatus. NORMARK, JORDAL, & FARRELL (1999), on the basis of DNA studies, have shown that *Premnobius* falls outside of the Xyleborini clade and have indicated some relationship with the Ipini. Further studies are needed to fully understand the relationship of this genus.

**44) *Premnobius cavipennis* EICHHOFF**

In the West Indies recorded from Cuba, Guadeloupe, Jamaica, and Puerto Rico; also widespread in Africa and Madagascar, introduced into North and South America.

Specimens examined: PUERTO RICO: Sabana, Luquillo, 12.VI.1989, light trap (1). Carite State Forest, at uv light, VII.28.1999, leg. C.W. O'Brien & P. Kovarik (2-CWOB). Cayey, 24.II.1999, in *Eucalyptus robusta* log; same locality and date, in *Calophyllum calaba* log. Guánica, VII.1996, M. Canals, ex. light trap (2). Guaynabo, 21.IV.1996, in *Terminalia catappa* log. Río Grande, 20.II.1999, in *Manilkara bidentata* log. Hwy. 120, km 16.2, Hdqt. Maricao St. For., 8.8.1999, at uv light, leg. C.W. O'Brien (1-CWOB).

## TRIBE XYLEBORINI

### *Ambrosiodmus* HOPKINS

Three species of *Ambrosiodmus* are recorded from Puerto Rico.

#### Key to species of *Ambrosiodmus* from Puerto Rico

- 1 Elytral declivity with two or three coarse tubercles in interstriae 2; elytral declivity strongly impressed near suture; 2.5–3.0 mm ..... *lecontei* HOPKINS
- Elytral declivity unarmed or with small granules ..... 2
- 2 Length 2.0–2.4 mm; interstriae 1 on declivity weakly elevated, 2 weakly sulcate with small granules as large as those on 1 ..... *obliquus* (LECONTE)
- Length 1.8–2.1 mm; interstriae 1 and 2 on declivity not elevated, granules absent ..... *devexus* (WOOD)

#### 45) *Ambrosiodmus devexus* (WOOD)

In the West Indies recorded from Dominican Republic and Puerto Rico; also from southern Florida.

Specimens examined: PUERTO RICO: Guaynabo, 15.XII.1995, light trap (1). Jayuya (5 miles NE), VII.22.1968, leg. H. & A. Howden (1).

#### 46) *Ambrosiodmus lecontei* HOPKINS

In the West Indies recorded from Cuba, Guadeloupe, Dominican Republic, and Puerto Rico; also from the Bahamas, Florida, and Louisiana.

Specimens examined: PUERTO RICO: Bisley, El Yunque, 16.IX.1989, on *Inga* logs (1). Cayey, 5.XI.1992, in *Delonix regia* branch. El Yunque, Mt. Britton Tr., 6.VIII.1999, leg. C.W. O'Brien & P. Kovarik (1-CWOB). Guaynabo, 20.VI.1996, light trap (1); same locality, 15.–30.VII.1996, ex. light trap (1). Hwy. 120, k11H8, Maricao St. Res., 7.26.1979, leg. O'Brien & Marshall (1-CWOB); same locality, km 15–16, 10.VIII.1999 (1-CWOB).

WOLCOTT (1948) records this species from El Verde Camp, Rio Grande, in dying terminals of “cedro” (*Cedrela mexicana*), and in dead twigs of “aceitillo” (*Zanthoxylum flavum*) at Maricao.

#### 47) \**Ambrosiodmus obliquus* (LECONTE)

In the West Indies recorded from Dominican Republic, Guadeloupe and Puerto Rico (WOOD & BRIGHT 1992); also from southern Florida. Not collected during the present study.

#### 48) *Dryocoetoides cristatus* (FABRICIUS)

*Dryocoetoides caracicolai* HOPKINS, **syn.n.**

In the West Indies recorded from Dominican Republic and Jamaica; also from northern South America, introduced into tropical Africa.

Specimens examined: PUERTO RICO (new island record): Carite St. For., at uv light, VII.28.1999, leg. C.W. O'Brien & P. Kovarik (1-CWOB). Guaynabo, various dates 1995–1999, light trap (28). Bisley, El Yunque, 10.IX.1989, light trap (1).

The holotype of *Dryocoetoides caracicolai* HOPKINS is in the United States Museum of Natural History and was examined and compared to my specimens of *D. cristatus*. No differences could be seen and Hopkin's name is placed in synonymy.

**49) *Theoborus puertoricensis* sp.n.**  
(Figs. 10, 11)

TYPE LOCALITY: Guaynabo, Puerto Rico.

TYPE MATERIAL: **Holotype** (female): "PUERTO RICO: Guaynabo, 11.III.1996, J. A. Torres, collr./ex: light trap". **Paratypes** (44): all from Guaynabo, Puerto Rico, but with different dates from 1995 to 2000, all from light trap, plus 10 additional paratypes labelled: "PUERTO RICO: Carite St. For., at uv light, VII.28.1999, C.W. O'Brien, P. Kovarik" and one additional specimen labelled: "PUERTO RICO, 12 mi. E. Mayagüez, II.8.1969/collectors L. & C.W. O'Brien".

The type series is currently in the personal collection of the senior author while additional studies on the West Indian fauna are completed. Upon completion of those studies the holotype and most of the paratypes from Guaynabo, P. R. will be deposited in the United States Museum of Natural History, Washington, D.C., 10 paratypes will be returned to C.W. O'Brien, Green Valley, Arizona, two paratypes will be deposited in the Museum of Entomology at the Agricultural Experiment Station, Río Piedras, Puerto Rico, and 2 paratypes will be deposited in the Canadian National Collection of Insects, Ottawa, Ontario.

DESCRIPTION (female): Length 2.2–2.4 mm, 2.6 times longer than wide; dark reddish-brown.

Frons evenly convex, surface dull, densely minutely-reticulate, with a few, scattered setae, these more abundant along epistomal margin.

Antennal club as long as wide; basal segment corneous, glabrous, occupying basal one-quarter of club; remainder of club pubescent with 2 indistinct, transverse sutures marked by rows of short setae.

Pronotum 1.1 times longer than wide; sides very weakly arcuate; anterior margin very narrowly rounded, sharply extended at center with two distinct, median serrations on margin, flanked on each side by one very small serration; anterior slope steeply declivous with numerous, small, low, shining asperities, space between asperities densely, minutely-reticulate, weakly shining; summit distinct, elevated, located slightly behind middle; posterior half moderately shining, densely, minutely-reticulate, with very obscure, very weakly impresses, widely scattered, small points, these sometimes barely visible.

Elytra 1.6 times longer than wide, sides parallel on basal half, then arcuately converging to narrowly rounded apex; apex with a very small sutural notch, each elytron separately rounded; discal striae not impressed, punctured in regular rows; discal interstriae flat, about 2–3 times wider than striae, surface minutely-reticulate, more brightly shining than posterior portion of pronotum.

Declivity basically evenly convex; interstriae 1 and 3 weakly elevated, each with a median row of small granules, interstriae 3 ends at junction with weakly elevated interstriae 9 which then continues as a weakly elevated ridge to elytral apex at junction with interstriae 1; interstriae 2 weakly impressed, also with a median row of very small granules; interstriae 9 at apex with several acute granules; entire surface dull, minutely-reticulate; vestiture consisting of very short, scattered setae.

Male unknown.

DISCUSSION: Females of this species are easily recognized by the very dull surface of the pronotum and elytral declivity, by the slightly prolonged median portion of the anterior pronotal

margin which bears a pair of distinct serrations, and by the features of the elytral declivity as described above.

*Theoborus* presently contains only eight species (WOOD & BRIGHT 1992) but more species of this genus are undoubtedly unrecognized in the genus *Xyleborus*. Females of this species have been compared with females of all eight of the currently recognized species of *Theoborus* and found to be unique.

ETYMOLOGY: Named for the type locality.

**50) *Coptoborus bellus* sp.n.**  
(Figs. 12, 13)

TYPE LOCALITY: Guaynabo, Puerto Rico.

TYPE MATERIAL: **Holotype** (female): "PUERTO RICO: 12 mi. E Mayaguez, II.8.1969/Collectors L. & C.W. O'Brien". **Paratypes** (4): one with same data as holotype; three from PUERTO RICO: Guaynabo, with various dates-VIII.1.1999 (1), 23.III.1996 (1) and 14.IV.1996 (1).

The type series is currently in the personal collection of the senior author while additional studies on the West Indian fauna are completed. Upon completion of those studies, the holotype and one paratype will be returned to C.W. O'Brien, Green Valley, Arizona, one paratype will be deposited in the United States Museum of Natural History, Washington, D.C. and two paratypes will be deposited in the Canadian National Collection of Insects, Ottawa, Ontario.

DESCRIPTION (female): Length 2.1–2.3 mm, 2.6 times longer than wide; dark reddish-brown.

Frons evenly convex, surface shining, densely minutely-reticulate, with a few, scattered setae, these more abundant along epistomal margin.

Antennal club as long as wide; basal segment corneous, glabrous, occupying basal one-quarter of club; remainder of club pubescent with two indistinct, transverse sutures marked by rows of short setae; posterior face with 1 arcuate suture at apex.

Pronotum 1.5 times longer than wide, widest on anterior third; sides very weakly arcuate; anterior margin narrowly rounded, with two distinct, median serrations on margin, flanked on each side by one much smaller serration; anterior slope steeply declivous with numerous, small, low, shining asperities, space between asperities densely, minutely-reticulate, weakly shining; summit distinct, elevated, located at middle; posterior half dull, densely minutely-reticulate, without punctures.

Elytra 1.5 times longer than wide, sides subparallel on basal half, then arcuately converging to narrowly rounded, attenuate apex; apex with a small, distinct sutural notch, each elytron separately rounded; discal striae not impressed, punctured in regular rows, punctures moderately large, each with a minute seta; discal interstriae flat, about 2–3 times wider than striae, surface smooth, brightly shining, with a median row of very fine points and a few small, erect setae.

Declivity evenly convex; interstriae not elevated, 1 and 3 with a median row of very small granules, interstriae 3 ends at apex and continues as a weakly elevated ridge to elytral apex at junction with interstriae 1; interstriae 2 with a median row of very small granules, these much smaller than those on 1 or 3; entire surface dull, densely minutely-reticulate, contrasting sharply with the brightly shining discal surface; vestiture consisting of very short, scattered setae.

Male unknown.

DISCUSSION: Females of this species are easily recognized by the dull surface of the pronotum and elytral declivity, by the presence of two large serrations on the anterior margin of the

pronotum, and by the attenuate, narrowly rounded elytral apex. Paratypes vary in length from 2.1–2.3 mm.

Although only one specimen of this species has been seen, the characters as outlined above are so significant that there should be no difficulty in recognizing the species.

ETYMOLOGY: *bellus* (Latin) = beautiful.

### *Xylosandrus* REITTER

Two species of *Xylosandrus* are recorded from Puerto Rico.

#### Key to species of *Xylosandrus* from Puerto Rico

- 1 Elytra as long as wide; elytral declivity commencing 1/3 of elytral length from base; mature color yellowish-brown ..... *morigerus* (BLANDFORD)
- Elytra 1.2 times longer than wide; elytral declivity commencing at middle of elytra; mature color dark brown to black ..... *compactus* (EICHHOFF)

#### 51) *Xylosandrus compactus* (EICHHOFF)

Recorded in the West Indies from Cuba, Puerto Rico, and the Virgin Islands; also widespread throughout the tropical and subtropical regions of the world.

Specimens examined: PUERTO RICO: Carite State Forest, VII.28.1999, leg. C.W. O'Brien & P. Kovarik (1-CWOB). Guaynabo, I.IV.1996, pitfall trap (2). Recorded attacking coffee branchlets and *Cattleya pseudobulbs* in Puerto Rico (FRANQUI et al. 1991).

#### 52) *Xylosandrus morigerus* (BLANDFORD)

In the West Indies recorded only from Puerto Rico; also widespread throughout the world, often intercepted at ports and introduced into numerous countries.

Specimens examined: PUERTO RICO: Cayey, II.24.1999, in *Ceiba pentandra* branch (1). El Yunque, 4.IX.1989, in *Sloanea berteriana* log. Guaynabo, I.IV.1996, pitfall trap (1).

### *Xyleborus* EICHHOFF

Ten species of *Xyleborus* are recorded from Puerto Rico, although one record should be questioned.

#### Key to species of *Xyleborus* from Puerto Rico

- 1 Elytral declivity excavated, margins with 2–5 pairs of large spines; declivital vestiture scalelike; 1.8–2.6 mm ..... *spinulosus* BLANDFORD
- Elytral declivity convex, may be weakly flattened or impressed, with small tubercles or granules; declivital vestiture hairlike ..... 2
- 2 Anterior margin of pronotum with several serrations, median pair slightly larger; striae setae present; declivity strongly convex, 2<sup>nd</sup> interstriae slightly impressed; 1<sup>st</sup> and 3<sup>rd</sup> declivital interstriae slightly elevated, with a median row of fine granules, elevation of 3 extends to elytral apex; 1.8–2.0 mm ..... *atlanticus* sp.n.

- Anterior margin of pronotum unarmed; striae setae absent; declivity not as above ..... 3
- 3 Slender species, 3.5 times longer than wide; pronotal summit well in front of middle; elytral declivity steep, weakly impressed along suture, with 2 large tubercles in interstriae 1 and smaller tubercles on lateral areas of declivity; 2.9–3.3 mm ..... *macer* BLANDFORD
- Stout species; pronotal summit at or near middle; declivital armature variable ..... 4
- 4 Declivital interstriae 1, 2, and 3 each with a median row of small granules; pronotum subquadrate, less than 1.1 times longer than wide; 2.4–2.5 mm ..... *posticus* EICHHOFF
- Only declivital interstriae 1 and 3 with small granules or with various combinations of large and small granules and tubercles ..... 5
- 5 Granules and/or tubercles on declivital interstriae 1 and 3 unequal in size ..... 6
- Granules and/or tubercles on declivital interstriae 1 and 3 equal in size ..... 7
- 6 Declivital interstriae 1 with 2 large tubercles, larger one placed below middle near apex, smaller one placed at base of declivity; interstriae 3 with a similar tubercle at base of declivity; apical margin of declivity acute, with several small serrations; 2.7 mm ..... *simulatus* BRIGHT
- Only declivital interstriae 3 with 1 large tubercle located in middle of interstriae, smaller granules scattered; apical margin of declivity rounded, unarmed; 2.0–3.3 mm ..... *ferrugineus* (FABRICIUS)
- 7 Elytral declivity steeply convex, distinctly flattened, surface dull, minutely reticulate-rugose, granules in interstriae 1 and 3 very small; 2.3–2.7 mm ..... *xylographus* (SAY)
- Elytral declivity gradually sloping, surface dull or shiny, granules or tubercles distinct ..... 8
- 8 Surface of declivity dull, minutely reticulate; 2.0–2.7 mm ..... *affinis* EICHHOFF
- Surface of declivity shining ..... 9
- 9 Granules in declivital interstriae 1 and 3 very small, much smaller than interstitial width; 2.1–2.8 mm ..... *volvulus* (FABRICIUS)
- Granules in declivital interstriae 1 and 3 large, distinct, about one-half as long as interstitial width; 4.5 mm ..... *elevatus* EGGERS

### 53) *Xyleborus affinis* EICHHOFF

In the West Indies recorded from Cuba, Dominica, Guadeloupe, Dominican Republic, Jamaica, and Puerto Rico; also widespread throughout the tropical, subtropical, and subtemperate regions of the world. Detailed locality records of examined specimens are not listed below; the species occurs everywhere on the island. Host plants of examined specimens are: in *Eucalyptus robusta* log, *Cecropia schreberiana* log, *Calophyllum calaba* log, *Sloanea berteriana* log, *Pinus caribaea* log, *Swietenia macrophylla* log, “Laurel blanco”, *Cajanus cajan* stump, *Syzygium malaccense* log, *Andira inermis* stump, *Mangifera indica* log, *Spathodea campanulata* stump, *Spondias dulcis* log and branch, *Terminalia catappa* log, *Annona reticulata* branch, *Melicoccus bijugatus* log, live plants of *Cocos nucifera*, *Anthocephalus chinensis* log, *Tabebuia heterophylla* log, *Sapium laurocerasus* log, *Ocotea coriacea* log, *Dacryodes excelsa* log, *Miconia prasina* log, *Micropholis garcinifolia* log, *Cyrtia racemiflora* log, *Prestoea montana* log, *Hymenaea courbaril* log, *Buchenavia tetraphylla* log, *Manilkara bidentata* log, *Persea americana* log, *Barringtonia asiatica* log, *Inga vera* log and *Syzygium jambos* log.

### 54) *Xyleborus atlanticus* sp.n.

(Fig. 14)

TYPE LOCALITY: Guaynabo, Puerto Rico.



TYPE MATERIAL: **Holotype** (female): "PUERTO RICO: Guaynabo, VIII.1-30.1999, ex: light trap/J. A. Torres, collr.". **Paratypes** (7): same locality with dates as follows: XI.8.1995 (1), VII.1-30.1999 (1), IX.1-30.1999 (2) and VIII.1-30.1999 (3).

The type series is currently in the personal collection of the senior author while additional studies on the West Indian fauna are completed. Upon completion of those studies, the holotype and most of the paratypes will be placed in the United States Museum of Natural History, Washington, D.C. Several paratypes will be placed in the Canadian National Collection of Insects, Ottawa, Ontario.

DESCRIPTION (female): Length 1.8–2.0 mm, 2.7 times longer than wide; dark reddish-brown.

Frons evenly convex, surface dull, densely minutely-reticulate, with a few, scattered setae, these more abundant along epistomal margin.

Antennal club as long as wide; basal segment corneous, glabrous, occupying basal one-quarter of club; remainder of club pubescent with two indistinct, transverse sutures marked by rows of short setae.

Pronotum less than 1.1 times longer than wide; sides very weakly arcuate to subparallel; anterior margin narrowly rounded, with two distinct, median serrations on margin, flanked on each side by one smaller serration; anterior slope steeply declivous with numerous, small, low, shining asperities, space between asperities densely, minutely-reticulate, weakly shining; summit distinct, elevated, located slightly behind middle; posterior half moderately shining, densely, minutely-reticulate, without obvious punctures.

Elytra 1.6 times longer than wide, sides parallel on basal 2/3, then arcuately converging to narrowly rounded apex; apex with a very small sutural notch, each elytron vaguely separately rounded; discal striae not impressed, punctured in regular rows, each puncture with a very short seta; discal interstriae flat, about 2–3 times wider than striae, surface brightly shining, each interstria with a median row of long, erect setae, each seta about as long as interstitial width, stria row extends from base to apex.

Declivity basically evenly convex; interstriae 1 and 3 weakly elevated, each with a median row of small granules, those in interstriae 3 slightly larger than those in interstriae 1, interstriae 3 ends at junction with interstriae 9 which then continues as a weakly elevated ridge to elytral apex at junction with interstriae 1; interstriae 2 weakly impressed, also with a median row of extremely small granules; interstriae 9 at apex with several very small serrations; entire surface shining, very minutely-rugose; vestiture consisting of abundant, erect, scattered setae, these more abundant than on elytral disc.

Male unknown.

DISCUSSION: Females of this species are easily recognized by the very dull surface of the pronotum, by the slightly prolonged median portion of the anterior pronotal margin which bears a pair of distinct serrations, and by the features of the elytral declivity as described above.

ETYMOLOGY: Named for the Atlantic Ocean, the general location of Puerto Rico.

### 55) *Xyleborus elevatus* EGGERS

In the West Indies recorded only from Puerto Rico; also from Venezuela.

Specimens examined: PUERTO RICO: Bisley, El Yunque, 10.IX.1989, in *Sloanea berteriana* trunk (1); same locality, 16.IX.1989, on *Inga* sp. logs (2); same locality, 17.VI.1996, light trap (1); El Yunque Sta., Luquillo Forest, 10–16.VII.1969, leg. H. & A. Howden (3); Río Grande, 12.II.1999, in *Miconia prasina* log (1); same locality, 17.II.1999, in *Ocotea coriacea* log (1); Caribbean N.F., Mt. Britton Trailhead, mv & bl, 28.V.1994, leg. R. Turnbow (2-RHTC).

BRIGHT (1982) recorded this species from El Yunque Station, Luquillo Forest, H. and A. Howden.

#### **56) *Xyleborus ferrugineus* (FABRICIUS)**

In the West Indies recorded from Cuba, Guadeloupe, Dominican Republic, Haiti, Jamaica, and Puerto Rico; also widespread throughout the tropical, subtropical and subtemperate regions of the world. Detailed locality records of examined specimens are not listed below; the species occurs everywhere on the island. Host plants of examined specimens are: *Eucalyptus robusta* log, *Cecropia schreberiana* log, *Swietenia macrophylla* log, *Inga* sp. log, *Pinus caribaea* log, *Sloanea berteriana* log, *Melicoccus bijugatus* log, *Andira inermis* stump, *Cajanus cajan* stump, *Spathodea campanulata* stump, *Persea americana* log, *Spondias dulcis* branch, *Tabebuia heterophylla* log, *Dacryodes excelsa* log, *Miconia prasina* log, *Micropholis garcinifolia* log, *Hymenaea courbaril* log, *Dendropanax arboreus* log, and *Barringtonia asiatica* dead tree. Recorded on diseased coconut palms in Puerto Rico (MARAMOROSCH et al. 1972).

#### **57) \**Xyleborus macer* BLANDFORD**

Recorded in the West Indies only from Puerto Rico; also from northern South America to southern Mexico. BRIGHT (1981) recorded this species from Almirante, Puerto Rico, November 5, 1952, F. L. Blanton. Not collected during the present study.

#### **58) *Xyleborus posticus* EICHHOFF**

In the West Indies recorded from Guadeloupe and Puerto Rico; also from northern South America to southern Mexico.

Specimens examined: PUERTO RICO: Bisley, El Yunque, 16.IX.1989, in *Inga* sp. (1). El Yunque Sta., Luquillo Forest, VII.6–9.1969, H. & A. Howden (2). El Yunque, 17.VII.1989, in *Cyrilla racemiflora* log.

#### **59) *Xyleborus simulatus* BRIGHT**

Only known from the West Indies from Jamaica and Puerto Rico.

Specimens examined: PUERTO RICO: El Yunque Station, Luquillo Forest, 6–9.VII.1969, H. & A. Howden (1).

#### **60) *Xyleborus spinulosus* BLANDFORD**

Recorded in the West Indies from Grenada, Guadeloupe, Dominican Republic, Haiti, and Jamaica; also widespread in Central America, southern Mexico, and South America.

Specimens examined: PUERTO RICO (new island record): Sabana, Luquillo, 5.I.1990, light trap (1). Guaynabo, 13.II.1995 and 17.IX.1995, light trap (2).

#### **61) *Xyleborus volvulus* (FABRICIUS)**

Recorded in the West Indies from Cuba, Jamaica, Puerto Rico, and Santo Domingo; also widespread throughout the tropical and subtropical regions of the world.

Specimens examined: PUERTO RICO: El Yunque, 14.IV.1990, in *Syzygium jambos* log; same locality, 10.IX.1989, in *Sloanea berteriana* log; same locality, 16.VI.1990, in *Swietenia macrophylla* log; same locality, 4.IX.1989, in

*Inga* sp. log; same locality, 21.IV.1996, in *Terminalia catappa* log. Guánica, VI.1996, leg. M. Canals, light trap. Guaynabo, various dates from 1996 to 2000, light trap (7); same locality, 18.I.1995, in *Andira inermis* log; same locality, 28.I.1991, in *Cajanus cajan* stump; same locality, 18.I.1995, in *Mangifera indica* log; same locality, 6.II.1995, *Persea americana* log. Río Grande, 9.IV.1990, in *Antocephalus chinensis* log.

### **\**Xyleborus xylographus* SAY**

Recorded in the West Indies from Cuba, Guadeloupe, and Puerto Rico; also widespread across southern Canada and throughout eastern North America. Not collected during this study. A record of this species is reported by WOLCOTT (1948), under the synonymous name *Xyleborus inermis* EICHHOFF, from adults intercepted in mango at San Juan, and from specimens eaten by the cliff swallow and the honey creeper. We believe this species has not become established on Puerto Rico, and therefore should be deleted from the list of species.

### ***Xyleborinus* REITTER**

Two species of *Xyleborinus* are recorded from Puerto Rico.

#### **Key to the species of *Xyleborinus* from Puerto Rico**

- 1 Length 1.8 mm; elytral declivity sloping, with several, small, acute tubercles in interstriae 3, 4, and 5 and very small granules in a median row in interstriae 1 ..... *gracilis* (EICHHOFF)
- Length 2.4 mm; elytral declivity steep, shallowly sulcate, with a large spine on apical margin at apex of interstriae 3, granules in interstriae 1 absent ..... *insulosus* sp.n.

#### **62) *Xyleborinus gracilis* (EICHHOFF)**

Recorded in the West Indies only from Guadeloupe; also from southern United States to South America, and the Azores and the Galapagos Islands.

Specimens examined: PUERTO RICO (new island record): Guaynabo, 23.III.1996, light trap (1).

#### **63) *Xyleborinus insulosus* sp.n. (Figs. 15, 16)**

TYPE LOCALITY: Valle de Icacos, El Yunque, Puerto Rico.

TYPE MATERIAL: **Holotype** (female): “PUERTO RICO: Valle de Icacos, El Yunque, 17.VII.1989, in *Cyrtilla racemiflora* log, J. A. Torres, collector”. **Paratype** (1): “PUERTO RICO: El Yunque, Mt. Britton Tr[ail]. VIII.11.1999, C.W. O’Brien, P. Kovarik/ex. Fallen spathe *Prestoea montana*”.

The type series is currently in the personal collection of the senior author while additional studies on the West Indian fauna are completed. Upon completion of those studies the holotype will be deposited in the United States Museum of Natural History, Washington, D.C. and the paratype will be returned to C.W. O’Brien, Green Valley, Arizona.

DESCRIPTION (female): Length 2.4 mm, 2.9 times longer than wide; light brown on the legs, antenna, and elytra, darker reddish-brown on pronotum and head.

Frons slightly convex, with a faint, longitudinal, median carina extending from epistoma to vertex of head; surface dull, densely minutely reticulate, with weakly impressed, scattered punctures; epistoma slightly elevated, brightly shining, with a fringe of long, yellowish setae.

Antennal club as long as wide, basal corneous portion occupying 1/3 of club length.

Pronotum 1.1 times longer than wide; sides evenly arcuate; anterior margin broadly rounded, unarmed, but several serrations are very near margin; anterior half steeply declivous, with numerous, scattered erect asperities, surface between asperities shining, smooth; summit elevated, located slightly anterior of middle; surface of posterior half dull, minutely reticulate, without distinct punctures and with scattered, long, erect setae.

Elytra 1.8 times longer than wide, measured from base to apex of interstriae 1; stria not impressed, punctured in even rows, each puncture with a minute seta; interstriae flat, brightly shining, about as wide as striae, each with a median row of long, erect setae, these about as long as interstitial width.

Declivity occupying about 1/5 of elytral length, broadly, shallowly sulcate; face moderately dull, with small, scattered punctures, stria punctures not readily visible; interstriae 1 very weakly elevated, with one small, acute granule at commencement of declivity; interstriae 2 with 2 larger, acute granules at base, these larger than the one in interstriae 1; interstriae 3 with 2 larger, acute granules at base, as in interstriae 2 but slightly larger, and one large, acute spine at apex on apical margin; interstriae 4 with about seven small, acute granules, these forming lateral margin of declivity.

Male unknown.

DISCUSSION: Females of this species may be recognized by the slightly, but distinctly, concave elytral declivity which bears one large spine on the postero-lateral margin and several, small, acute granules on the base in line with interstriae 1, 2, and 3. Seven or 8 small, acute granules, in interstriae 4, form the lateral margin of the declivity. The frons bears a faint, longitudinal carina which extends from the epistomal margin to the vertex of the head. No other species of *Xyleborinus*, that we know of, resembles this species.

ETYMOLOGY: *insulosus* (Latin) = of islands. Refers to the island habitat of this species.

## TRIBE PITYOPHTHORINI

### *Araptus* EICHHOFF

Two species of *Araptus* are recorded from Puerto Rico.

#### Key to the species of *Araptus* from Puerto Rico

- 1    Length 1.8 mm; posterior half of elytral interstriae 1, 3, and 5 with a median row of short, flattened or narrowly spatulate setae; elytral declivity devoid of granules; pronotum evenly convex from base to apex ..... *hymenaeae* (EGGERS)
- Length 1.6 mm; elytra glabrous except near and on declivity, setae hairlike; elytral declivity with fine granules in interstriae 3; pronotum with a weakly elevated, median summit ..... *pallidus* (BLACKMAN)

#### 64) *Araptus hymenaeae* (EGGERS)

Recorded in the West Indies from Guadeloupe, Dominican Republic, Jamaica, Santa Lucia, and St. Vincent; also from Panama to northern South America.

Specimens examined: PUERTO RICO (new island record): Guaynabo, various dates in 1995–2000, light trap (5).

**65) \**Araptus pallidus* (BLACKMAN)**

Recorded in the West Indies from Cuba, Dominican Republic, and Puerto Rico; also from Brasil. SCHEDL (1951) described a synonym of this species from Puerto Rico, without any further locality data. Specimens were not collected during the present study.

***Pityophthorus* EICHHOFF**

Three named species of *Pityophthorus* are recorded from Puerto Rico, but several additional, as yet unnamed, species are in the material at hand.

**Key to species of *Pityophthorus* from Puerto Rico**

- 1 Length 1.7 mm; elytral declivity with interstriae 2 distinctly impressed below level of 3, flat; interstriae 3 elevated, with a median row of fine granules; pronotal asperities arranged in broken concentric rows..... *hispaniolus* BRIGHT
- Length less than 1.4 mm; elytral declivity evenly convex; interstriae 3 not elevated, without granules; pronotal asperities scattered, arranged in no apparent order..... 2
- 2 Elytra surface dull, minutely rugose, without rows of striae punctures; each declivital interstriae with a median row of short, spatulate setae; pronotum with a distinct summit at middle, posterior surface dull, minutely rugose, with very faint, minute points..... *pudens* (BLACKMAN)
- Elytral surface shining, with definite rows of striae punctures; each declivital interstriae with a median row of short, hairlike to very narrowly spatulate setae; pronotum without a distinct summit at middle, posterior surface weakly shining, minutely reticulate, with distinct punctures..... *convexicollis* sp.n.

**66) *Pityophthorus convexicollis* sp.n.**

(Fig. 17)

TYPE LOCALITY: Summit of Mt. Britton, 941 m, Caribbean National Forest, Puerto Rico.

TYPE MATERIAL: **Holotype** (female): "PUERTO RICO, Caribbean Nat. Forest, Mt. Britton summit, 4–12 AUG 1999, 941 m, P. Kovarik, F[light] I[ntercept] T[rap]". **Paratypes** (3): with same data as holotype.

The type series is currently in the personal collection of the senior author while additional studies on the West Indian fauna are completed. Upon completion of those studies the holotype and 1 paratype will be returned to the West Indian Beetle Fauna Collection, Bozeman, Montana (Dr. M.A. Ivie) and two paratypes will be placed in the Canadian National Collection of Insects, Ottawa, Ontario.

DESCRIPTION (female): Length 0.9–1.1 mm, 2.7–2.8 times longer than wide; dark to light brown.

Frons convex, weakly flattened from epistoma to about upper level of eyes; surface shining, minutely reticulate, generally glabrous but with a few, scattered, long, yellowish setae.

Antennal club oval, about as long as wide; sutures visible only at lateral margins, evidently transverse, chitinized at lateral margins.

Pronotum 1.15 times as long as wide, widest on posterior half; sides weakly arcuate on basal two-thirds; anterior margin with a sharply elevated ridge, without serrations; anterior one-third of disc convex, with numerous, scattered, low asperities; summit not elevated; posterior two-thirds

smooth, moderately shining, densely minutely-reticulate, with scattered, rather large, deeply impressed punctures; vestiture absent.

Elytra 1.8 times longer than wide; sides parallel on basal three-quarters, converging to broadly rounded apex; disc shining, glabrous, with striae distinctly punctured in regular rows, not impressed except sutural stria which is weakly impressed, more so toward declivity; stria punctures rather large, deeply impressed; interspaces narrower than striae.

Declivity evenly convex; stria punctures distinct; sutural stria distinctly but weakly impressed; sutural interstriae weakly elevated, flat, smooth; remaining interstriae not elevated, each interstria with a median row of erect, hairlike to very narrowly spatulate setae and a few very minute granules.

Male unknown.

DISCUSSION: Adults of this species superficially resemble those of *P. pudens* but are distinguished by their smaller size, by the lack of an elevated summit on the pronotal disc, by the more deeply impressed sutural stria on the declivity, by the distinctly punctured elytral stria, and by the much narrower declivital setae.

ETYMOLOGY: Named to refer to the convex shape of the elytral declivity.

#### 67) *Pityophthorus hispaniolus* BRIGHT

Recorded only from the West Indies from the Dominican Republic.

Specimens examined: PUERTO RICO (new island record): Guaynabo, VIII.2000, light trap (6); same locality, IX.2000, light trap (3).

The Puerto Rico specimens differ slightly from those in the type series by having a slightly more deeply sulcate declivity but the other characters are almost identical.

#### 68) *Pityophthorus pudens* (BLACKMAN)

Known previously only from Cuba.

Specimens examined: PUERTO RICO (new island record): Guaynabo, 1.–30.VII.1999, light trap (1). A specimen was also seen from the Dominican Republic. The Puerto Rico specimen was compared to the holotype and 2 paratypes of *P. pudens*.

### TRIBE CORTHYLINI

#### 69) *Monarthrum mali* (FITCH)

*Pterocyclon omissum* SCHEDL, **syn.n.**

*Pterocyclon praestum* EGGERS, **syn.n.**

Known only from Dominica, Guadeloupe, and Puerto Rico in the West Indies.

Specimens examined: PUERTO RICO: Sabana, Luquillo, 31.V.1989, light trap (1). El Yunque, 17.VI.1996, light trap (1). Guánica, III.1997, leg. M. Canals (1). Guaynabo, various dates from 1995–2000, light trap (44). Rio Grande, II.20.1999, in *Manilkara bidentata* log (4). Villalba, V–3–40, D. DeLeon, in *Dacryodes excelsa* (2).

A syntype of *P. omissum* SCHEDL was examined and found to agree in all respects with specimens of *P. praeustum* EGGERS that had previously been compared to the lectotype and the holotype of *P. praeustum*. This specimen was then compared to authentic specimens of *M. mali* and no significant differences could be noted.

***Corthylus* ERICHSON**

Two species of *Corthylus* are recorded from Puerto Rico.

**Key to species of *Corthylus* from Puerto Rico**

- 1 Antennal club completely aseptate; antennal club of female with a fringe of setae not longer than width of club; anterior margin of pronotum with 2 or more very obscure serrations...  
..... *insularis* sp.n.
- Antennal club with 3 arcuate grooves and 3 elevated, shining, arcuate bands; antennal club of female with a tuft of very long setae, these much longer than width of antennal club; anterior margin of pronotum with 2 distinct, median serrations..... *tuberculatus* (EGGERS)

**70) *Corthylus insularis* sp.n.**

(Figs. 18, 19)

TYPE LOCALITY: El Yunque, Puerto Rico.

TYPE MATERIAL: **Holotype** (female): "PUERTO RICO, El Yunque, 17.VI.1996, J. A. Torres, collr./ex: light trap". **Paratypes** (8): "PUERTO RICO, El Yunque, light trap, 20.VII.1989"(2); same locality, VIII.1996, C. Laboy, collr., light trap (1); same locality, IX.1996, C. Laboy, collr., light trap (1); same locality, June–July 1985, E. LaRue (1-WIBFP). "Guaynabo, VIII.1-30.1999, light trap" (1); same locality, VIII.2.2000, light trap (1). "Río Grande, II.17.1999, in *Dacryodes excelsa* log" (1).

The type series is currently in the personal collection of the senior author while additional studies on the West Indian fauna are completed. Upon completion of those studies, the holotype will be placed in the United States Museum of Natural History, Washington D.C. Paratypes will be deposited in the Canadian National Collection of Insects, Ottawa, Ontario, the United States Museum of Natural History, Washington D.C., the West Indian Beetle Fauna Project Collection, Bozeman, Montana and the Museum of Entomology at the Agricultural Experiment Station in Río Piedras, Puerto Rico.

DESCRIPTION (female): Length 2.0–2.2 mm, 2.4 times longer than wide; head and elytra dark to light brown, pronotum, antenna, legs and ventral surface lighter.

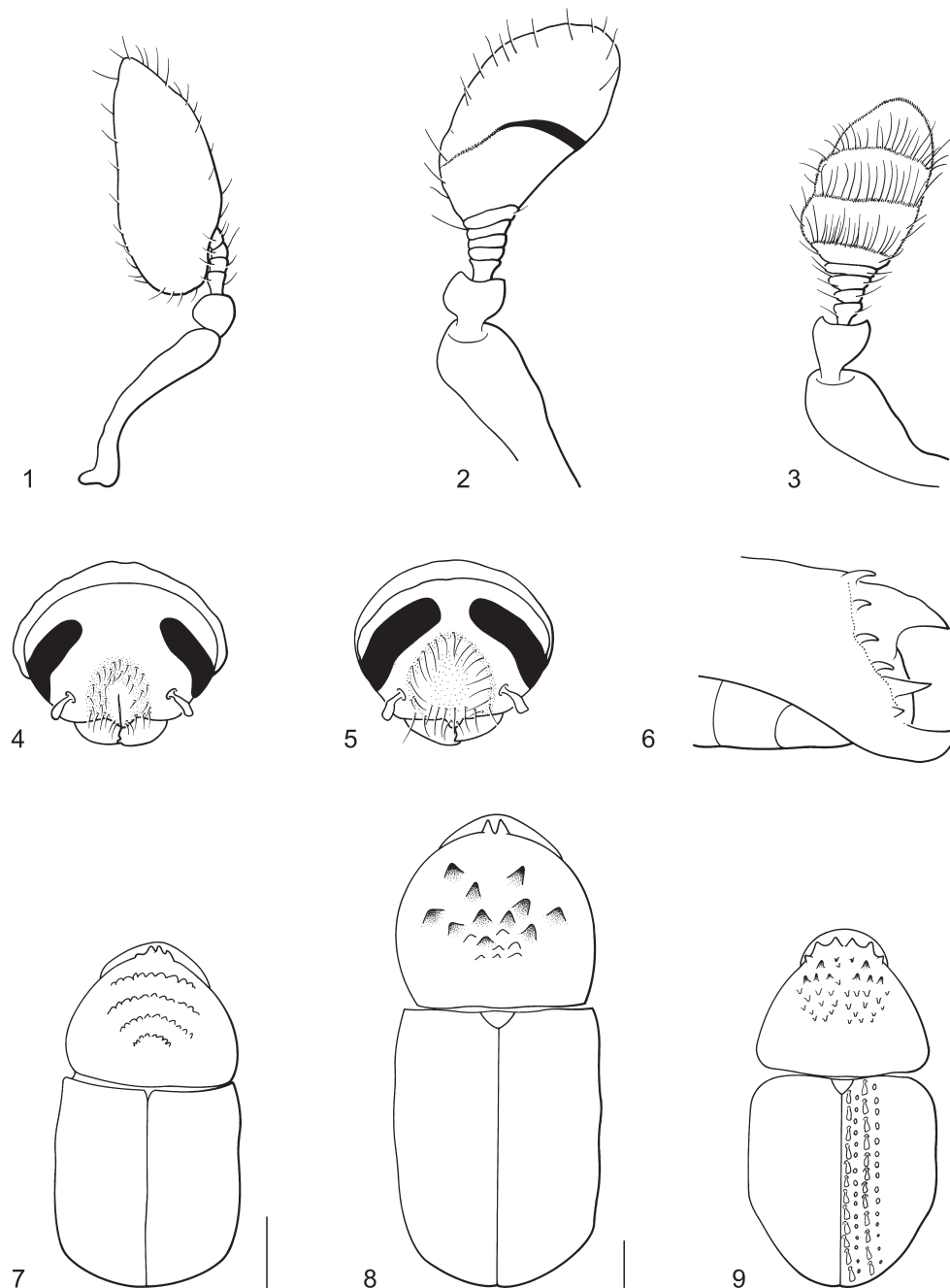
Frons shallowly concave from epistoma to well above eyes and laterally from eye to eye; surface dull, densely minutely reticulate, glabrous but with a sparse fringe of long, incurved, yellowish setae, these not obscuring the surface.

Antennal club broadly, asymmetrically oval, about 1.6 times longer than wide, completely aseptate, with one vague, shallow, arcuate impression on anterior face; posterior face with sparse, long setae on margin and with an obscure clump of longer setae at upper angle of margin.

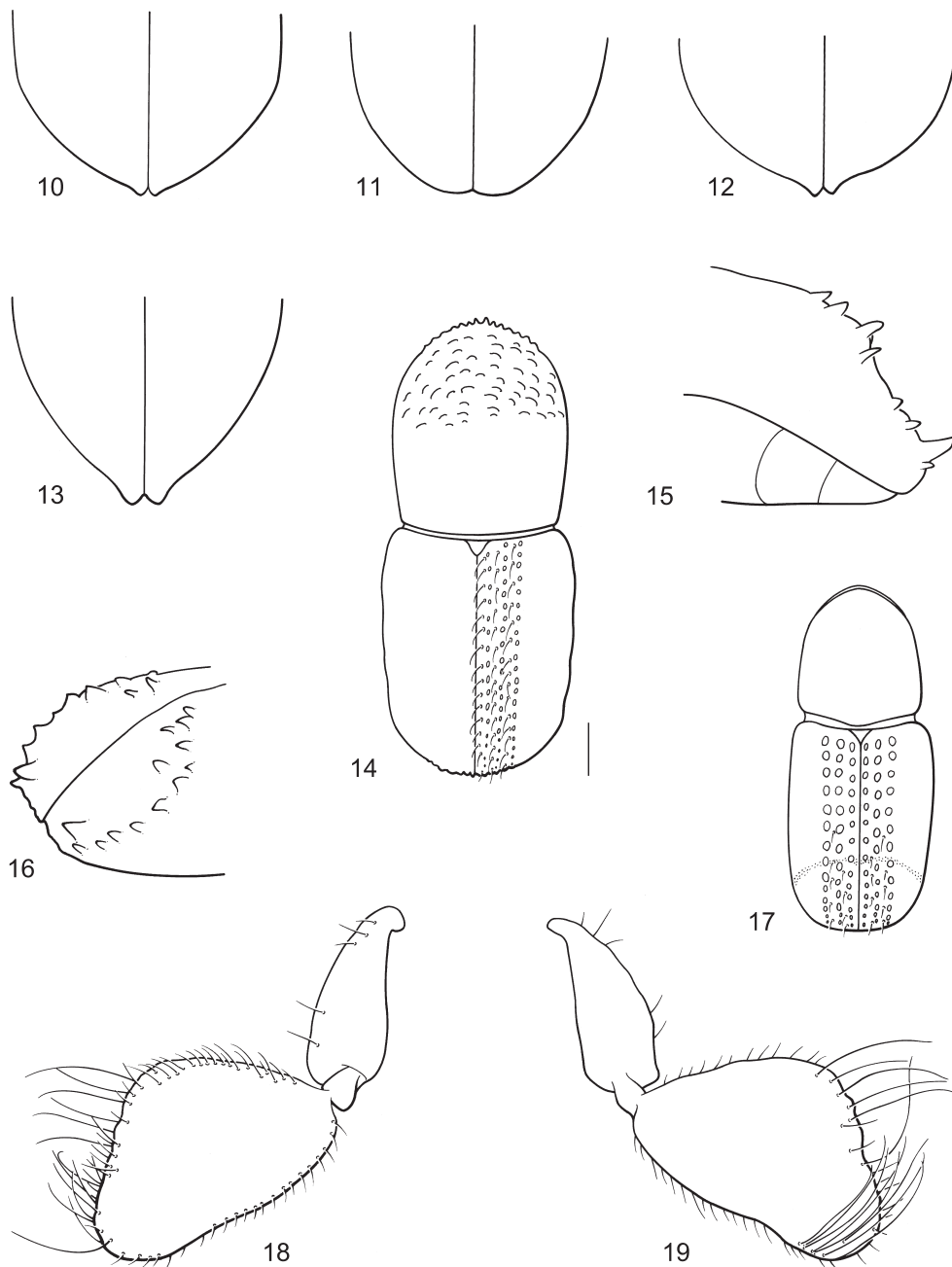
Pronotum very slightly wider than long, widest on posterior half; sides weakly arcuate on basal two-thirds, weakly constricted before broadly rounded anterior margin; anterior margin with 2 low, closely placed, median serrations; anterior one-third of disc convex, with numerous, low, wide asperities; summit not elevated; posterior two-thirds smooth, dull, densely minutely-reticulate, with widely scattered, very fine, weakly impressed points; vestiture absent.

Elytra 1.4 times longer than wide; sides parallel on basal three-quarters, converging to broadly rounded apex; disc brightly shining, glabrous, with striae at most weakly indicated, not impressed, punctures obscure, shallowly impressed in barely detectible rows; interspaces obscure, not readily detectable.





Figs. 1–9: 1) Antenna of *Chramesus atlanticus*; 2) Antenna of *Scolytodes atlanticus*; 3) Antenna of *Scolytodes puertoricensis*; 4) Frons of female *Scolytodes atlanticus*; 5) Frons of *Scolytodes puertoricensis*; 6) Declivity of *Pseudothysanoes magnispinatus*; 7) Outline of *Allothenemus minutus*; 8) Outline of *Hypothenemus amplissimus*; 9) Outline of *Trischidas puertoricensis*.



Figs. 10–19: 10) Elytral apex of *Theoborus puertoricensis*; 11) Anterior margin of pronotum of *Theoborus puertoricensis*; 12) Elytral apex of *Coptoborus bellus*; 13) Anterior margin of pronotum of *Coptoborus bellus*; 14) Outline of *Xyleborus atlanticus*; 15–16) Declivity of *Xyleborinus insulosus*; 17) Outline of *Pityophthorus convexifrons*; 18–19) Antenna of *Corthylus insularis*, 18: anterior face, 19: posterior face.

Declivity evenly convex; punctures in stria 1 and 2 distinct; first and third interstriae slightly elevated, convex, each with a median row of small acute granules and a median row of erect setae; interstriae 2 slightly impressed, flat, unarmed; interstriae 4–8 not elevated, devoid of granules, each with a median row of erect setae; all setae about equal in length, length about equal to distance between rows of setae in first and third interstriae.

Male unknown.

DISCUSSION: This is one of only a few species of *Corthylus* with a completely aseptate antennal club. Females of this species may be recognized by the sulcate frons with a fringe of longer setae on the periphery, by the evenly convex elytral declivity with a row of small granules and setae in interstriae 1 and 3, and by the color pattern described above.

EYTMOLOGY: *insularis* (Latin). Refers to the insular distribution of the species.

### 71) *Corthylus tuberculatus* (EGGERS)

Recorded only from the West Indies from Dominica and Guadeloupe.

Specimens examined: PUERTO RICO (new island record): Guaynabo, various dates 1995–2000, light trap (4). El Yunque, VIII.1996, light trap, leg. C. Laboy (1). Sabana, Luquillo, 4.VI.1989, light trap (1).

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