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Revision of the genus *Ischyrus* Lacordaire (1842) of North and Central America (Coleoptera: Erotylidae: Tritominae)

by

Paul E. Skelley



Ischyrus q. quadripunctatus (Olivier)
line = 1.0 mm

Ischyrus insolens Crotch
line = 1.0 mm

Florida Department of Agriculture and Consumer Services
Bob Crawford, Commissioner

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Revision of the genus *Ischyrus* Lacordaire (1842) of North and Central America (Coleoptera: Erotylidae: Tritominae)[1]

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[1] With some modifications, this was a dissertation presented to the Graduate School of the University of Florida in partial fulfillment of the requirements for the degree of Doctor of Philosophy, 1994.

This document is dedicated to my wife **Lucy**,
for her love and understanding over the many late evenings
and weekends it took to complete this work.

**"Progress in Natural History necessarily starts
from a basis of species, and until these are accurately descibed
so that others can arrive at a knowledge of them
no great advance is possible."**
G.H.Horn 1887

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Last, yet foremost, I thank my parents, Paul F. and Antoinette, and my wife, Lucy, for their encouragement and love over these many years.

FOREWORD

The revision of even a part of the Erotylidae forms an important addition to the beetle literature for North America, as well as being the dissertation for the doctoral degree for the author. As noted in the introduction, these beetles have not been under critical taxonomic review for over 120 years. The author revises the genus *Ischyrus* for the entire North American continent, from Panama north, and including the West Indies. Of the 42 species treated in this work, 16 species are described as new and 9 names are synonymized, giving a new total for the entire genus of 75 species (including South American species). The adults of this genus are among the more showy members of the Erotylidae, a family of beetles long a favorite of collectors. The treatment of *Ischyrus* provides a complete technical description for each species, in addition to the genus itself, with keys and careful notes on identification of each species. Numerous illustrations, including many SEM photographs, show details of each species. The appendices provide detailed label data for all specimens examined from the over 100 collections perused for these beetles.

Dr. Paul E. Skelley was born June 15, 1964, in Decatur, Illinois. While attending public school he became particularly interested in insects during a scout project in 1977. Thereafter, he continued and developed his interest in all natural sciences but for a short time in an engineering major at Eastern Illinois University, where after a year he changed majors to zoology. While at Eastern Illinois University, he helped curate the insect collection and in May 1986 graduated summa cum laude with a Bachelor of Science. Moving to Florida, he attended the University of Florida, Gainesville, and completed his Master of Science degree in August 1988, under the guidance of Dr. Robert E. Woodruff, while also helping to curate the beetle collection of the Florida State Collection of Arthropods (FSCA). Two years before receiving his Doctor of Philosophy in Entomology in April 1994, he married Lucile Heyer, in 1992, and they now have a son, Peter. Dr. Skelley and family now reside in Gainesville. He is employed at the Florida Department of Agriculture & Consumer Services, Division of Plant Industry, where he continues to help curate the FSCA beetle collection and other groups.

Dr. Skelley brings a clear enthusiasm for the study of beetles to the forefront in this thorough treatment of a colorful and interesting group of beetles. His main taxonomic interests in beetles are with the Erotylidae, as well as related beetles, and particularly also Histeridae, Scarabaeidae, and unusual beetle associations with other animals such as inquilines of pocket gophers. We look forward to more revisions of Erotylidae and other families from him.

Gainesville
March 1996

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ABSTRACT

This revision treats species of the genus *Ischyrus* Lacordaire 1842, *sensu* Crotch 1876 (*Micrischyrus* Alvarenga 1965), occurring from Panama north. A key to species, descriptions and illustrations of terms used, habitus and genitalic illustrations for all species, distribution maps, detailed species descriptions, complete synonymies, label data from specimens studied, and comparisons with similar species are presented. A list of all names used in combination with *Ischyrus* and their current status is presented to prevent future homonyms.

This revision treats 45 species: 26 previously described species plus 19 new species: *Ischyrus audbalus*, *I. celatus*, *I. cordiformis*, *I. erosus*, *I. goliai*, *I. ichnus*, *I. impressus*, *I. joplini*, *I. kovariki*, *I. malleus*, *I. mimus*, *I. monochromatus*, *I. mystacis*, *I. parallelus*, *I. parcarum*, *I. poseidon*, *I. putei*, *I. pyropodus*, *I. sapphirus*. Nine names were found to be junior synonyms: *I. quinquepunctatus* Gorham 1887 placed under *I. angularis* Lacordaire 1842; *Episcaphula bellopicta* Kuhnt 1910 placed under *I. auriculatus* Lacordaire 1842; *I. peruvianus* Gorham 1883 placed under *I. boucardi* Crotch 1876; *I. gratiosus* Guérin-Méneville 1844 placed under *I. incertus* Lacordaire 1842; *I. subcylindricus* Lacordaire 1842, *I. graphicus* Lacordaire 1842, and *I. puncticollis* Gorham 1887 placed under *I. quadripunctatus quadripunctatus* (Olivier 1792); *Dacne femoralis* Chevrolat 1841 and *I. velatus* Lacordaire 1842 placed under *I. scriptus* (Olivier 1807). *Ischyrus chiasticus* Boyle 1954 is reduced to a subspecies of *I. quadripunctatus* (Olivier 1792).

Lectotypes were designated for 23 names: *Dacne femoralis* Chevrolat, *Episcaphula bellopicta* Kuhnt, *Ischyrus agnatus* Crotch, *I. angularis* Lacordaire, *I. auriculatus* Lacordaire, *I. bogotae* Crotch, *I. boucardi* Crotch, *I. collatinus* Crotch, *I. distinguendus* Lacordaire, *I. elegantulus* Lacordaire, *I. ephippiatus* Gorham, *I. frontalis* Lacordaire, *I. graphicus* Lacordaire, *I. gratiosus* Guérin-Méneville, *I. insolens* Crotch, *I. maculiventris* Lacordaire, *I. peruvianus* Gorham, *I. proximus* Lacordaire, *I. septemsignatus* Gorham, *I. subcylindricus* Lacordaire, *I. tripunctatus* Crotch, *I. velatus* Lacordaire, *I. vespertilio* Lacordaire.

INTRODUCTION

General Introduction

The family Erotylidae is composed of fungus feeding beetles which vary greatly in body size and color; many are elaborately patterned. Recently published catalogs are: Delkeskamp 1981; Chûjô & Chûjô 1988, 1989, 1990; and Alvarenga 1994.

Crotch's (1876) world revision of the Erotylidae was the last study to cover the entire New World fauna at the species level, but it provided no keys nor illustrations, and only a few short descriptions. In the time between Crotch's revision and Alvarenga's (1994) catalog of the Neotropical erotylids, the New World erotylid fauna had been studied intermittently, with scattered regional studies, checklists, and species descriptions. Most New World erotylid genera have no modern revision.

The purpose of this study is to begin bringing the nomenclature of the New World Erotylidae into the 20th Century and to publish revisions in a manner which will enable others to identify their specimens. "Progress in Natural History necessarily starts from a basis of species, and until these are accurately described so that others can arrive at a knowledge of them no great advance is possible" (Horn 1887:7).

History

The first described member of the genus *Ischyrus* Lacordaire is *Erotylus quadripunctatus* Olivier (1792). The first use of the name *Ischyrus* was by Chevrolat in fascicle 5 of the second edition of Dejean's catalog (1836). Because most of the second edition was burned in a fire, the third edition of the Dejean catalog (1837) was immediately printed. Madge (1988) gives dates of publication and a brief history of the Dejean catalogs.

Dejean's (1836, 1837) catalogs were among the first works to split the genus *Erotylus* Fabricius (1775) into more manageable, related taxa. Species and generic concepts were in their infancy during the early 1800s. For the Erotylidae, Dejean's genera appear to be groups of species with similar body size and color. This is evident in the proposed genus *Ischyrus* Chevrolat containing large dull-black species, *Mycotretus* Chevrolat containing smaller species with yellow and black color patterns, and *Lybas* Chevrolat containing species which were oval and solid red. Dejean's catalogs were simply checklists of his collection in which many generic and specific names were proposed. Because Dejean names lacked descriptions, they were often disregarded as valid names by early taxonomists.

The next use of the name *Ischyrus* was by Falderman (1837) in describing *Ischyrus lepidus*, presently a member of *Triplax* Herbst (1793) (*fide* Chûjô & Chûjô 1990). The name *Ischyrus* was then used as a subgroup of *Erotylus* Fabricius (1775) by Guérin-Méneville (1841) in describing *E.* (*Ischyrus*) *nebulosus*, presently in *Iphiclus* (*Saccomorphus*) (*fide* Alvarenga 1994). These uses of "*Ischyrus*" illustrate early workers' attempts at placing new species into taxa based on vague superficial characters.

Lacordaire (1842) was the first to provide a description of the genus *Ischyrus*, for which he gave credit to Chevrolat *in* Dejean (1836) as the author of the name. He moved many previously described species into *Ischyrus* and described 17 new species. Unfortunately, Lacordaire did not designate a type species.

Lacordaire split the genus into two divisions. The first division contained species with larger body size and strongly keeled prosternum, mostly species listed in the Dejean catalogs as *Ischyrus* Chevrolat. The second division contained species with smaller body size and a weakly keeled prosternum, mostly species listed under *Mycotretus* Chevrolat in the Dejean catalogs, including *Erotylus quadripunctatus* Olivier. Lacordaire based his generic concepts on reasonably sound morphological features that are still in use. He also maintained many previously published species names which had not been described [*nomina nuda*]. With his descriptions, Lacordaire became the author of these names.

Guérin-Méneville (1844) and Erichson (1847) used Lacordaire's generic names and described seven additional species of *Ischyrus*.

Crotch (1873b) elevated Lacordaire's divisions to generic rank. The first division, containing species of larger size, he named *Megischyrus*. The second division, containing species of smaller size, he maintained as *Ischyrus*, crediting Lacordaire as the describer and noting the original use of the name by Chevrolat *in* Dejean (1836). At that time, it was common to give credit for a name to the first describer of the taxon and not to the author of that name. Following this trend, Crotch cited it as *Ischyrus* Lacordaire.

In 1873, Crotch received a grant to visit tropical Australia and adjacent islands to collect natural history

specimens. Before his departure from Cambridge, U.K., he placed his collection and manuscript in the care of E. W. Janson. Unfortunately, Crotch became ill and died in 1874 while in the U.S.A. Janson put Crotch's manuscript into final form and published it in 1876. Numerous notes within the revision are undoubtedly those of Janson. Without Crotch's input, many species problems were left unresolved. This "revision" is simply an annotated catalog, with brief descriptions of new species; yet, it has been the basis for all subsequent studies of the family. The name *Ischyrus* Lacordaire, as cited and used in Crotch's revision, was accepted and used by all subsequent workers, with the exception of Alvarenga (1965, 1994). Crotch (1876) listed 44 species of *Ischyrus*, 13 of which were new.

Ischyrus Lacordaire (*sensu* Crotch), has been referenced in a multitude of papers and texts. Many of these are simply species descriptions, regional studies, catalogs, general entomological texts, or biological accounts. These are too numerous to list here, but they can be found in the species accounts of this revision.

Some of the more important references, however, are worth noting. Gemminger & Harold's (1876) Catalogus Coleopterorum was published at the same time as Crotch's revision and contains names as used by Crotch. Gorham (1887-1899), in the Biologia Centrali-Americana, treated 22 species of *Ischyrus* including 10 new species. Kuhnt (1909, 1911) provided two catalogs, the first of which contained a grouping of the species by color pattern. Blackwelder's (1945) checklist lists 56 names. Boyle (1954, 1956) revised the family for America north of Mexico, thoroughly redescribing the genus *Ischyrus* and one new species.

Alvarenga (1965) realized that Crotch (1873b) had incorrectly applied the name *Ischyrus* and selected an invalid type species. Following current nomenclatural rules, Alvarenga made some major changes in the standing of the names *Ischyrus* and *Megischyrus*.

In my opinion, Alvarenga's (1965) actions were not fully justifiable because they create unnecessary confusion. The main purpose of the International Code of Zoological Nomenclature is to stabilize nomenclature, as stated in its preamble. The Code has provisions (Article 79) to conserve long-standing, widely accepted names like *Megischyrus* Crotch and *Ischyrus* Lacordaire (*sensu* Crotch). Therefore, a proposal was submitted to the International Commission of Zoological Nomenclature (Skelley & Goodrich 1994) to conserve these names by suppressing all uses and indications of the name *Ischyrus* prior to *Ischyrus* Lacordaire (1842). The Commission ruled in favor of this proposal (ICZN 1996). The name *Ischyrus* Lacordaire (*sensu* Crotch) is the official name for this taxon, not *Micrischyrus* Alvarenga (1965).

Recently Alvarenga (1994) published his catalog of the Neotropical Erotylidae. For *Ischyrus* Lacordaire 1842 (*sensu* Crotch 1876; = *Micrischyrus* Alvarenga 1965) this work lists all known species in the genus.

Before my study, there were 68 valid species names placed in the genus *Ischyrus* Lacordaire. This study addresses 26 of these, synonymizes 9, and describes 16 new species; bringing the total to 75 species. Appendix A lists all specific names used in association with *Ischyrus*, and their current status.

Format of Species Accounts

Title: This heading is the valid name for the species to be discussed. It is followed by a listing of figure numbers for the species discussed.

Synonymy: This section lists all combinations of the specific name, and any synonyms of the valid name. These are organized in the following manner: *Genus species* describer date:page [comments], author of the synonymy or combination date:page. Example: *Engis variegata* Dejean 1821:45 [*nomen nudum*], Gemminger & Harold 1876:3691.

Diagnosis: This section lists the set of characters separating the species under consideration from all other known species in the genus.

Description: This section is a detailed description organized in the following manner: body measurements, overall appearance, color pattern, head and antenna, visible mouthparts, pronotum, scutellum, elytra, prosternum, mesosternum, metasternum, first visible abdominal sternite, male genitalia, female genitalia, stridulatory files, sexual dimorphisms. Legs are not described because no characters of use at the species level were found.

Variation: This section is a discussion of the color pattern or morphological features which vary from specimen to specimen in the species.

Type: Here I list type specimens for all species names appearing in the synonymy, label data, type locality (if not on the labels), repository, sex, and if they were studied. This section is included only for previously described species.

Label data for type specimens are given in the following manner: "/ label data/ [my comments] label data/" [XXXX]. The quotation marks, " ", indicate the

beginning and ending of the data. The slash marks, /, indicate the beginning and ending of an individual label. My comments are placed in brackets, [ ], and usually indicate paper color or label shape. When no comment is made, the paper is white. After the label data are presented, an acronym is given in brackets, [ ], for the institution where the specimen is housed (see Appendix B).

Many species required lectotypes to be designated. A red "lectotype" label was placed on these specimens indicating their status.

Only one type specimen of a previously described species needed to be dissected to solve a species problem. All other types were left intact and, where possible, their gender was determined by external characters. In cases where the gender was unclear, it is listed as "not determined."

Specimens examined: Here I list label data for all specimens studied, if there were less than ten records. Species with more than ten collection records have their data presented in tabular form in Appendix C. This section is included only for previously described species.

Type material: Listed here are label data for the holotype and allotype of new species. Label data for these primary types are presented in the format discussed above for previously described species. If there were less than 10 records, paratype label data is also presented under this heading. Species with more than 10 records have their entire data presented in Appendix C.

Distribution: A brief account of the species known geographic distribution is presented. A map is provided for species with enough records to put more than four dots on the map.

Etymology: An attempt is made to present what the species epithet means and possibly why the original author chose it. This is included more for historical purposes and may help the reader remember the name. Brown's (1985) Composition of Scientific Words was an indispensable reference in this research.

Taxonomic notes: This section includes nomenclatural aspects which need clarification or justification. I also present some unsolved problems of taxonomic importance indicating that this revision is just a beginning.

Biology: This section is included for the few species where some biological or life history data are known.

Remarks: This section contains statements on similar species and how to distinguish them.

References: This section lists the references where the species name occurs. Each species name appearing in the synonymy is listed separately to aid in future literature searches for specific names other than the valid name.

Characters and Terminology

Basics: Most general terms follow the definition presented in The Torre-Bueno Glossary of Entomology (Nichols & Schuh 1989). Terms for the genitalia follow Sharp & Muir (1912), Tanner (1927), and Boyle (1956). Some characters and terms need further explanation, as follows.

Eye Facets: Eye facet size (coarse vs. fine) is used to separate many genera in the Tritominae. This character is based on the relative size and distinctiveness of the eye facets in relation to the head. Coarse facets (Fig. 1a) are larger and more prominent, often bulging from the surface. Fine facets (Fig. 1b) are smaller and less prominent, with a smoother eye surface. There are many species which are intermediate in facet development, making this character difficult to interpret.

Punctation: The puncture size is compared with the eye facet: facet diameter to puncture diameter. Most *Ischyrus* species have coarse punctation where the punctures are as large or larger in diameter than a facet.

Punctures can be normal, impressed, or foveate. A normal puncture appears like a simple pin-prick (Fig. 1b, epistome). Impressed punctures are deep punctures, usually with a rounded edge and bottom (Fig. 1a, most of head). Foveate punctures are large, shallow, flat-bottomed punctures, usually with a distinct edge (Fig. 1b, base of head).

Surface: The body is generally covered with hexagonal micro-sculpturing. Variations in the strength of this microreticulation change the surface from shiny to dull, often visible to the naked eye.

Body Shape: Most species are flattened to slightly convex dorsally (Fig. 2a); *I. vespertilio* Lacordaire and *I. duponti* Lacordaire are convex dorsally (Fig. 2b). Most parallel-sided bodies (Fig. 2c) are flattened dorsally. Most elongate bodies have the sides parabolically rounded (Fig. 2d) and are slightly convex above. Oval bodies (Fig. 2e) are rounded on the sides, and can be flattened or convex dorsally. Ovoid bodies are egg-

shaped (Fig. 2f) and wider anteriorly, and can be flattened or convex dorsally.

Color Pattern: Color patterns are the most useful characters in the recognition of species. Understanding the terms for various aspects of the color pattern is essential in using the key (Figs. 4-5).

A band is a wide transverse marking, wider than long. A stripe is a longitudinal marking, longer than wide. A spot is a small marking, usually circular or elongate. I use the term "fascia" to mean a band which may be broken by additional markings. A free spot is not connected to any margin. A tooth-like spot is a triangular spot connected to a margin.

The color patterns of most species are variations of a basic pattern. I have named the components of the pattern in reference to its position on the body: anterior pronotal, free pronotal, basal pronotal, pronotal hind angle, humeral, subhumeral, scutellar, elytral suture, central elytral, lateral elytral, and apical elytral. When the scutellar and humeral spots are connected, they make up the basal elytral band. When the central and lateral elytral spots are connected, they make up the central elytral band.

Head: The dorsal surface of the head has relatively few useful characters. On each side of the vertex following the margin of the eye is a line or shallow groove, the ocular stria (Fig. 1). Its length appears to be useful at generic levels and is commented upon for future reference. Since this line is shorter than the eye length in the vast majority of *Ischyrus*, its length is given as a decimal which indicates how far forward the line reaches in reference to the eye. For example, it could reach "0.75 distance to the anterior angle of the eye," which means the line stops at a point 3/4 of the distance from the base to the anterior angle of the eye. In Figure 1a, the ocular stria stops at the anterior angle.

The head size vs. eye size is given as a proportion: head width between eyes = "N" x eye widths (Fig. 3), where "N" = distance between the eyes/ dorsal width of the eye. The smaller the eyes or the wider the head, the larger the number "N."

The base of the head often has structures which have been called stridulatory files (Alexander *et al.* 1963; Arrow 1924, 1925, 1942; Delkeskamp 1959). These structures appear as iridescent bands under a dissecting microscope. Study with the scanning electron microscope shows them to be composed of parallel ridges (Fig. 17). Even though these have been called stridulatory files, I have found no published information about the sound produced. They appear only on males in some species, and on both sexes in others. The function of these structures is unknown.

Representative species' antennae, palpi, and mental plates are illustrated on single plates for ease in comparison (Figs. 6-8).

A "triangular mentum" is characteristic of many erotylids. The "triangle" is an impressed area of the mentum surrounded by a ridge (Fig. 8). The triangular impressed area is the mental plate. The ridge surrounding the plate is the mental ridge; it is often extended forward at the middle as a sharp divider between the labial palps. This projection is called the medial ridge extension.

Elytra: Except for color patterns mentioned above, the elytra have few useful characters. Most species have seven complete striae; I next to the suture, V & VI originating at the humerus. Stria VIII on most species is reduced to a short row of punctures visible at the basal quarter under the humerus and/or the apical quarter near the lateral edge of each elytron: exceptions are *I. impressus*, *I. joplini* and *I. parallelus* with stria VIII complete, *I. audbalus* and *I. kovariki* with part of stria IX visible, and *I. sapphirus* with striae lacking on the elytral discs.

Ventral Lines: A "line" refers to a ridge or fine groove on a sclerite that is not a suture, but probably has some stuctural function (Fig. 9). The term "coxal line" is used in reference to the line on the medial side of the coxa. The lines anterior or posterior to the coxae are referred to by the structure they are on or near; e.g., the prosternal line in front of the procoxa, or the metasternal line behind the mesocoxa.

Most species of *Ischyrus* have coxal lines that are not connected to other lines and extend onto the sclerite (Fig. 9a). If the coxal line is connected to the anterior or posterior line, it is "continuous around the coxae," because there is no break in the line surrounding the coxae (Fig. 9b), and the line does not extend onto the sclerite.

Prosternum: The prosternum is a T-shaped sclerite with the base between the procoxae and the cap anterior to the procoxae. The anteromedial section of the prosternum is often keel-like and elevated above the sides to the level between the procoxae (Fig. 10), straight in profile. This elevation makes the anterior margin project at the middle, appearing as a "pitcher-like lip" (*fide* Boyle 1956). When the prosternum is

keeled and has this "pitcher-like lip," I refer to it as being "pinched," because it appears laterally pinched. The strength of this pinch, also the amount it projects, is variable throughout *Ischyrus* and can be absent (Fig. 10a, 10b), weak (Fig. 10c, 10d), or strong (Fig. 10e, 10f).

In a few species (*I. monochromatus*, *I. impressus*, *I. joplini*, and *I. parallelus*) the prosternal keel appears anteriorly swollen just behind the margin (Fig. 10g, 10h). I call this "swollen above the pinch."

I use the term "prosternal plate" for the surface of the prosternum between the coxal lines (Fig. 9). This "plate" is most often flat, but can be slightly convex. The plate shape varies throughout the genus (Fig. 14), from semicircular (wider than long) to elongate, parallel-sided (longer than wide).

The length of the procoxal lines varies from species to species. I use three phrases to describe the length of these lines in relation to the procoxae: surpassing coxae, barely surpassing coxae, not surpassing coxae. The phrase "surpassing coxa" (Fig. 14b) indicates the coxal line passes beyond an imaginary line drawn between the anterior edges of the procoxae. The phrase "barely surpassing coxa" (Fig. 14a, 14c) indicates the coxal line passes beyond the point where the line in front of the coxa begins, but does not pass beyond an imaginary line drawn between the anterior edges of the procoxae. The phrase "not surpassing coxa" (Fig. 14d) indicates the coxal line stops before the line in front of procoxae begins, posterior to the imaginary line.

Many species have sexual dimorphism of the prosternum in one or two forms. The majority of the species studied have a differing number, or varying development, of foveate punctures in front of the procoxa. In these species, females have more numerous or distinctly foveate punctures than the males (Figs. 11-13); the opposite of Delkeskamp's (1959) observations of certain African Dacninae.

In a few species, males have the prosternum expanded laterally, obscuring the prosternal-pronotal epipleural suture (Figs. 12-13). The extent of the expansion appears consistent in all specimens of a species, but is variable among species. It can be a small expansion (Fig. 12), or it can nearly cover the entire pronotal epipleuron (Fig. 13).

Mesosternum: The mesosternum has few useful characters. The length of the mesosternal lines in relation to the distance between them, along with the shape of the meso-metasternal suture, is useful in grouping related species. This suture can be truncate (Fig. 15a), sinuate (Fig. 15f), or broadly sinuate (Fig. 15c).

Metasternum: The metacoxal lines usually extend posteriorly away from the medial side of the mesocoxa towards the hind angle of the metasternum (Fig. 9, 15). These lines are variable in shape and length.

Anteriorly, the metacoxal lines can stop near the mesocoxa or continue along the meso-metasternal suture, often meeting at the middle. The shape of the line between the coxae varies from species to species and appears useful in grouping related species. The term "recurved" is used to describe a line which curves away from the meso-metasternal suture (Fig. 15c-f). Medially, these lines can take several forms: absent, not recurved nor meeting medially (Fig. 15a); not recurved, meeting in a straight line (Fig. 15b); recurved and meeting with a series of punctures or undulations (Fig. 15c); recurved and meeting as a single tooth (Fig. 15e); recurved and meeting with two widespread teeth (Fig. 15d); or meeting with many teeth (Fig. 15f).

The metasternal line behind the mesocoxa is variable in its structure from species to species. It can be a simple line (Fig. 16a) which is single-sided, a groove (Fig. 16b) which is double-sided, or a groove which is notably deeper on one end and leads into a large pit (Fig. 16c, 15c, 15f). This pit is most often present at the medial end of this line, but the groove can be deepened at the lateral end (Fig. 15d).

First Visible Abdominal Ventrite: The coxal lines on the first visible abdominal ventrite extend posteriorly from the medial side of the metacoxa. They are variable in length from specimen to specimen and are of little use in determining species.

Male Genitalia: The internal sac of the male genitalia is held invaginated within the median lobe (Fig. 18a). During copulation, the internal sac is everted; exposing any microstructure and extending the flagellum (Fig. 18b). The median lobe, internal sac, and flagellum are the true intromittent organs and show the majority of species specific characters. For additional insight into the genitalia of Coleoptera see Lindroth (1957), Sharp & Muir (1912), Skelley (1993), Snodgrass (1957), Tuxen (1970), Verhoeff (1895), Williams (1945), and Wood (1952).

The internal sac occasionally has pigmented areas, which are patches of microspinules. These patches are known in only a few species.

The shape of the sclerite for muscle attachment at the base of the flagellum is important in species recognition. The sclerites are all basically U-shaped, but with many variations. Just posterior to this sclerite is an unpigmented section that is variable in shape and curvature. A close study showed it to be flexible, like cartilage. This structure was not used to distinguish species because it can vary from specimen to specimen. The flagellum is variable throughout the genus: long, cylindrical, and hair-like; flattened and ribbon-like; or straight and rigid. The tip of the flagellum can be pointed or flared.

Female Genitalia: Female genitalia (Fig. 19) seemed to vary little from species to species. Structures varied in proportions, but species recognition based on female genitalia was not possible with any degree of confidence. The sclerotized spermatheca showed some variation in shape which could be useful to determine relationships within the genus.

The spermatheca (Fig. 19a) consisted of two parts; the head and tail. The head is the large bulbous, terminal structure, which varies in shape from circular to kidney-shape. Many species have spermathecae with a top-knot (bump on the head), variable in size and occasionally in position. The spermatheca tail is a short sclerotized section of the duct extending from the spermatheca's head to the genitalia. The shape and thickness of the tail is variable, but similar in related species.

Materials and Methods

Specimens: Dry preserved specimens were borrowed from many institutions and individuals. Appendix B lists these sources with their acronyms (mostly from Arnett *et al.*, 1993).

Locating Types: Horn & Kahle (1935-1937) and Sachtleben (1961) were helpful in locating specimens that belonged to early collectors. The majority of New World type material from these early collections can be found in three places: the Museum National d'Histoire Naturelle, Paris (MNHN); the Crotch Erotylidae Collection, University of Cambridge, U.K. (CUMZ); and the Natural History Museum, London (NHML).

Alvarenga (1994) cites type repositories for many species. I found several errors between his citations and specimens studied at the NHML and CUMZ. Alvarenga's citations will need confirmation, but they give us a place to start.

Collecting: Erotylid beetles can often be found feeding in numbers on their host fungi. Based on the number of specimens and collections of most *Ischyrus* species, we still do not know where to look. Most specimens appear to have been haphazardly collected, even those collected in light traps.

No definitive statement can be made about where to look for, or how to collect, members of this genus. I have collected various species of *Ischyrus* and related genera by using a beating square on dead wood at night. Sticks, limbs, branches, logs, etc., which produced most specimens were either still on the tree, or on the ground, but suspended above the surface. The only known hosts are prostrate white fungi which grows on suspended wood.

Much work remains to be done on the biology of this genus and the family (see the Biology section under the Generic Account for additional comments).

Equipment: A Hitachi S-570 scanning electron microscope (SEM) was used to photograph structures of importance. Although useful in seeing and understanding many of the minute characters, the SEM was not an essential part of this study. I made an effort to base the key and the descriptions on characters visible at low magnification with normal lighting.

Techniques: I dissected genitalia from many specimens for further study. Specimens were chosen from across the distributional range of the species and from those showing variation in external characters. Detailed study of these genitalia rarely required more magnification than a dissecting microscope provided. Genitalia were placed in a genitalia vial and pinned under the appropriate specimens.

The "stridulatory files" were not studied for many species since this required removing the head from the body. Even if the specimen is relaxed, this type of dissection usually ended with a decapitated specimen. I was not willing to sacrifice the few specimens available for most species.

In plotting distribution maps, many specific localities were not found because of poor label data. If the information was adequate enough to find the general area, an open symbol was placed on the map in the general area. Specific localities are shown with solid symbols. If label data were vague and there was already a plotted locality in the general area, an additional symbol was not added. A question mark, "?," was used for questionable records.

Color Pattern Problems: In the Erotylidae, species level decisions have historically been based on color patterns. Museum specimens vary in the shades of orange because of age, killing agent, or preservation technique. Because of this, the exact color is of little use in species determination.

The color pattern is most important in determining species, but, because of variations, care must be taken in analyzing differences. Many recently described species were compared to unrelated species in the original description making determinations based on descriptions impossible.

Specimens with different appearing color patterns are not necessarily different species. For example, a species may have two spots on each elytron. When these spots are enlarged, they blend together and form a band. See the variation that occurs in *I. scriptus* (Figs. 29-31), *I. quadripunctatus* (Figs. 42-47), and *I. auriculatus* (Figs. 56-57).

Specimens with spots varying in location, generally were different species. Compare the following species: *I. mystacis* and *I. mimus* (Figs. 59-60), *I. poseidon* and *I. pictus* (Figs. 61-63). In *I. scriptus*, *I. proximus*, *I. palliatus*, and *I. incertus*, the relative position of the pronotal spots and the shape of the circle they form is useful in determining species. In some cases the differences are subtle, but they are constant and correlate with other morphological differences.

Studying series of specimens from a large geographic range allowed me to observe normal variations in color patterns that were once considered specific. One such character is the color of the head, which can be red, black, or with some variation of both.

The term "pattern" is used for pattern variations within a species that were found to be part of a cline, only when these "patterns" were previously described as distinct species. These named "patterns" have no nomenclatural status.

Another general trend is the change of elytral patterns from north to south. Many species have solid bands with smooth edges in the north; moving south, these edges become more and more sinuate, or develop into stripes as the sinuate edges meet. This is best illustrated with *I. quadripunctatus* and *I. scriptus*. This trend may indicate mimetic relationships among species.

Results: The genus *Ischyrus* is composed of 45 North and Central American species, including 19 previously undescribed. A total of 4399 North and Central American specimens was studied (3191 *I. quadripunctatus*) and 370 were dissected. The 147 figures, a key to species, appendices, and descriptions are provided to complete this revision.

ISCHYRUS LACORDAIRE

Ischyrus Lacordaire 1842:89-131. Type species: *Erotylus quadripunctatus* Olivier 1792:431,437; subsequent designation by Crotch 1873a:353; 1873b:144. Name conservation: Skelley & Goodrich 1994. Ruling: ICZN 1996.

Micrischyrus Alvarenga 1965:86, 1994:12-17. Type species: *Erotylus quadripunctatus* Olivier 1792:431,437; original designation. New name for *Ischyrus* Lacordaire 1842, *sensu* Crotch 1873, not *Ischyrus* Dejean 1836:428.

Diagnosis: Within the Tritominae, *Ischyrus* is characterized by having coarsely faceted eyes, triangular mental plate, short ocular stria not surpassing anterior angle of eye, undilated tibia, margined femur, loose antennal club, and semicircular or trapezoidal antennomere IX.

Description: Length 3.5 - 9.9 mm. Body shape parallel-sided, to elongate, or ovoid, slightly flattened to convex dorsally; microreticulation, surface dull to shining; unicolorous brown to variously banded or spotted, yellow-orange with black pattern.

Head with ocular striae generally ending at or before anterior angle of eye, rarely extending onto epistome at base of antenna; frons often with an impression at each side near base of antennae; epistome wedge-shaped, generally with truncate apex; epistome punctures generally denser than punctures on vertex. Eye large, bulging from side; facets coarse (Fig. 1a, 20), varying in size throughout the genus, rarely fine.

Antenna surpassing middle of pronotum, often reaching basal 0.25; antennomere I large, elongate; antennomere II circular, ball-like, length = 0.5 x antennomere I; antennomere III elongate, length equal to next 2 to 4 segments combined; antennomeres IV to VIII length subequal to width, length rarely more than 1.5 x width; antennomeres IV to VII apically rounded; antennomere VIII edged and angled apically; antennomeres IX to XI form a loose club; antennomeres IX to X 3 to 4 x wider and 1.5 to 2 x longer than antennomere VIII; antennomere IX semicircular to trape-

zoidal, rarely triangular (Fig. 6); antennomere X crescent-shaped to trapezoidal; antennomere XI transversely elongate-oval to circular; antennomeres X to XI often asymmetrical.

Mandibles each with two finger-like teeth and a large prostheca bearing many inwardly pointing setae. Maxilla with lacinia bearing an apical tooth, often bifid (Fig. 22b); terminal segment of palp triangular or securiform, width = 1 to 3 x length. Labial palpi vary from squared or circular to securiform, width = 1 to 2 x length (Fig. 7). Mentum with a pore on each side in front of basal corner; mental plate triangular, rarely longer than wide; ridge surrounding plate often raised laterally giving mentum a three prong crown-shape, medial prong (medial ridge extension) variously shaped, protruding or not (Figs. 8, 22a). Postmandibular lobes present, broadly rounded, forming inner side of groove next to the eye for reception of antennomeres II to III (Fig. 20).

Pronotal disc evenly rounded; sides variably arched inwardly toward eyes; anterior angles closer together than posterior angles; anterior edge not margined between eyes; anterior angles forwardly produced, making anterior edge concave; base sinuate, not margined, lobed at middle, with group of large punctures at each side along edge. Scutellum pentagonal, wider than long.

Elytra with sides parabolically rounded to apex; 7 to 9 stria evident by rows of punctures, lacking at humerus and extreme apex, rarely impressed or missing; intervals flattened, often with minute punctures; base rarely margined; elytral epipleuron widest at base, strongly narrowed at hind coxae, gradually folding under to apex (Fig. 9); some elytral punctures each with a small protruding seta, visible in profile.

Prosternum usually keeled, margined and constricted (pinched) at front (Figs. 10, 20); sternal plate shape and proportions variable (Fig. 4); lines anteriorly converging or parallel, rarely surpassing front of procoxa, lines not continuous around coxae (except *I. audbalus* and *I. kovariki*); posterior edge of prosternum truncate or slightly concave, not margined.

Mesosternal lines parallel or anteriorly divergent, straight or arched; plate square or transversely rectangular; posteriorly sinuate or truncate.

Metasternal lines extending onto disc from inside of mesocoxa toward posterior angle of metasternum, rarely continuous around mesocoxae; variable in length, up to 0.5 distance to posterior angle; line behind mesocoxae variably impressed or grooved, occasionally with pit (Fig. 16).

Legs with femora slightly swollen, complete margin on inner surface (Fig. 17); tibia straight, almost parallel-sided, slightly widened toward apex; tarsi pseudotetramerous.

The first visible abdominal ventrite with coxal lines present, short; rarely continuous around metacoxae.

Male genitalia (Fig. 18) with median strut length variable, equal to or larger than median lobe; internal sac may bear patches of spinules; flagellum varying in length and thickness, with sclerotized muscle attachment at base, unpigmented section at base flexible; lateral lobes of tegmen generally flattened.

Female genitalia with straps appendant to abdominal segment VIII; abdominal segment IX elastic, length variable; flattened plate-like proctigeral lobe; apical segment of coxite with slender styli (Fig. 19). Proportions of these stuctures vary little throughout the genus. Sperma theca sclerotized, shape of head and tail variable, occasionally with a top-knot (Fig. 19a).

Stridulatory files often present at the base of the head (Fig. 17).

Sexual dimorphism often present. Males of some species have the prosternum laterally expanded onto the pronotal epipleuron; not expanded in females (Figs. 12-13). Males of many species have fewer, or less distinct, punctures on the prosternum in front of the procoxae (Figs. 11-13).

Distribution: This genus is restricted to the New World, where it is widespread, occurring from southeastern Canada near the St. Lawrence Seaway and southeastern North Dakota through the eastern U.S. and southern Arizona, Mexico, Central America, the West Indies, into South America to northern Argentina and Paraguay.

Biology: The life history of this genus is basically unknown. Only one species has its larva described; the type species *I. q. quadripunctatus* (Olivier) (see Weiss 1920, Skelley 1988b, Chapuis & Candeze 1855, Chapuis 1876). The following is based on published accounts of this species, a few bits of information taken from label data, and personal communications and observations.

The larva of *I. q. quadripunctatus* has well developed dorsal sclerotization with short spines. It is unusual in that the pronotal sclerotized area is broken into parts appearing like false eyes (Fig. 23). Members of a related genus, *Epytus* Dejean, have a similar set of "eye-spots." This peculiarity could be of adaptive significance in warding off predators in that both have been found feeding on exposed white fungus on dead wood (personal observations). Other larvae of the Erotylidae are burrowers in fungi (some Tritominae, Dacninae) or are surface feeders (some Erotylinae). The surface feeding Erotylinae are often protected by a covering of large spines and often have color patterns; whereas burrowing species typically lack these spines and patterns (see Roberts 1958, Costa *et al.* 1988, and Lawrence 1991 for illustrations of various erotylid larvae).

Ischyrus q. quadripunctatus has been collected on a white resupinate polypore fungus, *Oxyporus latemarginatus* (Dur. & Mont. ex. Mont.) Donk, also known as *Poria ambigua* Bres. (Skelley, *et al.* 1991).

In Costa Rica, Richard Leschen (pers. comm.) collected *I. proximus* on *Schizopora paradoxa* (Fr.) Donk, also a white resupinate polypore. Both of these fungi are white rot fungi of wood.

Adults have been taken by general collecting methods; in leaf litter, under bark, sweeping vegetation, etc. Many specimens have been taken at light, suggesting nocturnal activity. This is also indicated by the large eye facets present in members of this genus.

Using a beating square and collecting at night, I found several species of *Ischyrus* and related genera on small dead limbs or logs both on the ground and hanging from the trees. In all cases, the wood was suspended above the ground.

Several species have pits on one of the thoracic sterna, for example; *I. undulatus* and *I. putei* on the metasternum behind the mesocoxa, and *I. audbalus* and *I. kovariki* on the prosternum. These pits occur on both sexes of the species and show no sexual dimorphism in their development. Their function is not known, but they could be used for structural support, muscle attachment, areas for glandular secreation, or mycangia (Crowson 1981).

Etymology: *Ischyros*: Greek for strong, mighty, excessive (Brown 1985). Possibly named in reference to the strongly clubbed antennae or pronounced color patterns. Gemminger & Harold (1876) indicate that the name *Ischyrus* means "validus".

Remarks: Although Boyle (1956:110) stated that adult *Ischyrus* lack teeth on the lacinia; this is incorrect. The teeth (Fig. 22) are obscured by a dense patch of setae.

Ischyrus Lacordaire appears most closely related to *Megischyrus* Crotch, *Callischyrus* Crotch, and *Epytus* Dejean in having a triangular mental plate, loose antennal club, strongly microreticulate body surface, and in basic color patterns.

Ischyrus differs from *Epytus* in having the femur margined along the inner side where the tibia meets the femur (Fig. 21a); this margin is lacking in *Epytus* (Fig. 21b). *Callischyrus* differs from *Ischyrus* in having the eyes finely faceted and the ocular stria surpassing the antennal base; in *Ischyrus* the eyes are coarsely faceted and the ocular stria at most touch the antennal base. *Megischyrus* differs from *Ischyrus* in having a larger body size (greater than 11 mm) and in having antennomere IX triangular (Figs. 6n-o); in *Ischyrus* the body size is smaller (less than 10 mm) and antennomere IX is semicircular or trapezoidal, rarely triangular.

Some species currently placed in *Ischyrus* (*I. audbalus*, *I. kovariki*, *I. vespertilio*, *I. sapphirus*, *I. duponti*, *et al.*) exhibit many of the diagnostic generic characters. Yet, they differ from typical *Ischyrus*, and may ultimately be removed, leaving *Ischyrus* much more homogenous. Their removal at this point is problematic, and, if needed, should be done in connection with a review or phylogenetic analysis of related genera.

References: Alvarenga 1965:85; 1994:12-17; Arnett 1963:817-821; 1985:341-342; Blackwelder 1945:465; Boyle 1956:132-137,128; Chapuis 1876:35-38; Crotch 1873a:353-354; 1873b:144; 1876:426-433(50-57); Curran 1944:1-5; Edwards 1949:94; Gemminger & Harold 1876:3690-3691; Germar 1843:133; Girard 1873:820; Gorham 1887:39-45; Kuhnt 1909:55,57,61-64; 1911:42-44; Lacordaire 1842:89-131; LeConte & Horn 1883:124; Leschen 1991:180,192; Mader 1942a:171,195-196; 1951:209-210; Neave 1939-1940:790; Pallister 1955a:4; 1955b:6-7; Seidlitz 1891:288; Skelley 1988b:60.

KEY TO SPECIES

This key was constructed using characters visible under low magnification, without dissection. Several species appear in the key more than once, because certain key characters are variable, difficult to interpret, or have an intermediate state. Couplet 4 is the best example of a difficult character to interpret. If a specimen does not adequately key, or does not match what it does key to, try the other choice in this couplet.

Since these beetles vary from red-orange-yellow in color, I have chosen to use "orange" uniformly throughout the key for anything not black or brown. See each individual species account for variations.

1. Antennomere IX triangular, sides straight, as long or longer than wide (Figs. 6k, 6n-o); body convex dorsally (Fig. 2b) 2

1'. Antennomere IX trapezoidal to semicircular, sides angled or rounded, generally wider than long (Figs. 6a-j, 6l-m); body parallel-sided, elongate or ovoid; flattened above (Fig. 2) 4

2.(1) Pronotum with 2 free spots (Fig. 24). . . . . *vespertilio* Lacordaire

2'. Pronotum without free spots 3

3(2') With humeral spot (Fig. 25) . . . . *audbalus* n.sp.

3' Without humeral spot (Fig. 144) . . *kovariki* n.sp.

4.(1') Antennal club segments distinctly asymmetrical; antennomere XI larger (wider or longer) than antennomere X (Fig. 6a-f) 5

4'. Antennal club segments symmetrical; antennomere XI size variable; if appearing asymmetrical, antennomere XI equal in size or smaller than antennomere X (Fig. 6g-m) 20

5.(4) Pronotum without free spots 6

5'. Pronotum with free spots 7

6.(5) Pronotum with a central black stripe and orange sides, no basal spots (Fig. 26)..... ..... *celatus* n.sp.

6'. Pronotum orange with three basal spots only (Fig. 27) ..... *distinguendus* Lacordaire

7.(5') Pronotal hind angles with a dark marking, black of lateral margin encroaches upon the side ... 8

7'. Pronotal hind angles without distinct dark markings 9

8.(7) Pronotum with 4 free spots in a transverse arc; 2 central spots well separated from the base (Fig. 28) ..... *insolens* Crotch

8'. Pronotum with 2 basal, 2 central, and 2 anterior spots forming a circle; 2 central spots close to or connected with the base (Figs. 29-31)..... ..... *scriptus* (Olivier)

9.(7') Pronotum with 2 free spots; basal spots rarely free or weakly touching margin; if appearing free, then spots separated from base by less than their diameter (Figs. 29, 32-35) 10

9'. Pronotum with 3-4 free spots; if 4, then central spots separated from base by more than their diameter (Figs. 37-47) 15

10.(9) Pronotum with spots on anterior margin 11

10'. Pronotum without spots on anterior margin .. 14

11.(10) Pronotum with 1 large basal spot (Fig. 32)..... ..... *bogotae* Crotch

11'. Pronotum with 2 basal spots 12

12.(11') Antennomere XI equal in size to antennomere X (Fig. 6l); femur black; elytra with weak microreticulation, strongly shining; pronotal spots forming a transversely elongate ellipse (Fig. 33) ..... *incertus* Lacordaire

12'. Antennomere XI larger than antennomere X (Fig. 6c); femur orange or black; elytra with dulling microreticulations; pronotal spots forming a circle, longitudinally elongate circle, or rarely a weak transverse ellipse (Figs. 29-31, 34) 13

13.(12') Femur orange with dark knee; humeral spot free from scutellar spot; elytral epipleural fold black, occasionally pale in teneral specimens; pronotal spots form a circle or weakly transversely elongate ellipse (Figs. 29-31)..... ..... *scriptus* (Olivier)

13'. Femur and scutellum black; humeral spot connected to scutellar spot; elytral epipleural fold orange, at least at base, rarely dark; pronotal spots forming a longitudinally elongate ellipse (Fig. 34) ..... *proximus* Lacordaire

14.(10') Elytra with central band and apical spots connected to suture (Fig. 35) .... *angularis* Lacordaire

14'. Elytra with central band and apical spots not reaching the edge (Fig. 36)..... ..... *septemsignatus* Gorham

15.(9') Pronotum with 3 free spots 16

15'. Pronotum with 4 free spots 18

16.(15) Central elytral band broken into spots 17

16'. Central elytral band complete (Fig. 37)..... ..... *tripunctatus* Crotch

17.(16) Lateral spot of elytra small, circular or elongate; Central America (Figs. 38-39)..... ..... *frontalis* Lacordaire

17'. Lateral spot of elytra greatly elongated, stripe-like; USA, Florida (Fig. 40)..... ..... *dunedinensis* Blatchley

18.(15') Maxillary palps narrow (Fig. 7f), longer than wide (Figs. 42-47)..... ..... *quadripunctatus* (Olivier). .19

18'. Maxillary palps wide (Fig. 7c), wider than long; (Fig. 41) ..... *boucardi* Crotch

19.(18) Scutellar spots form an X-shaped mark; narrow band of black at base of pronotum (Fig. 42).. .. .. *quadripunctatus chiasticus* Boyle

19'. Scutellar spots not X-shaped, or if X-shaped then base of pronotum with prominent tooth-like spots (Figs. 43-47)..... . *quadripunctatus quadripunctatus* (Olivier)

20.(4') Metasternal line behind mesocoxa impressed with a distinct pit medially (Figs. 15c, 15f, 16c); epistome angled at side, flat and sharp in profile; face flat, usually lacking impressions; body somewhat cylindrical 21

20'. Metasternal line behind mesocoxa without pit, often impressed (Figs. 15a-b, 15d-e, 16a-b); epistome angled or not, often thickened at apex and rounded in profile; face often with impressions; body often flattened 22

21.(20) Pronotum with 2 basal spots and a central stripe connecting the base and anterior margin (Fig. 48) ..... *putei* n.sp.
21'. Pronotum with 4 free spots, lacking a central stripe (Fig. 49) ..... *undulatus* Gorham

22.(20') With 7 complete elytral striae 25
22'. With 8 complete elytral striae 23

23.(22') Pronotum lacking color pattern 24
23'. Pronotum with 2 free spots (Fig. 143) .... *joplini* n.sp.

24.(23) Pronotal punctures distinctly larger laterally; shiny black; parabolically rounded at sides (Fig. 52) ..... *impressus* n.sp.
24'. Pronotal punctures same size throughout; dull brown; parallel-sided (Fig. 53). .... *parallelus* n.sp.

25.(22) Color pattern lacking, uniformly colored, often paler at lateral margins 26
25'. With distinct color pattern 28

26.(25) Body with metallic blue sheen; strial punctures present only at base and along sutural margin; Cuba (Fig. 50) ..... *sapphirus* n.sp.
26'. Body without metallic sheen; strial punctures present over entire elytral disc 27

27.(26') Legs and scutellum black (Fig. 142) .... *goliai* n.sp.
27'. Legs pale brown, scutellum same color as body (Fig. 51) ..... *monochromatus* n.sp.

28.(25') Pronotum without free spots 29
28'. Pronotum with free spots 37

29.(28) Prosternum not strongly constricted at anterior margin, not produced in profile, not pinched (Fig. 10a-b). 30
29'. Prosternum strongly constricted at anterior margin, produced in profile, pinched (Fig. 10c-f) 34

30.(29) Each elytron with 1 central stripe-like spot (Fig. 54) ..... *aleator* Boyle
30'. Elytra banded or spotted 31

31.(30') Pronotum entirely pale, elytra with small spots (Fig. 55) ..... *parcarum* n.sp.
31'. Pronotum black or with black markings, elytral marking variable. 32

32.(31') Elytra with distinct free spots, not banded; metasternal coxal lines continuous behind mesocoxae; line behind mesocoxa not impressed; prosternal line in front of coxa a pit-like groove (Fig. 9b) 33
32'. Elytra distinctly banded (Figs. 56-57); metasternal coxal lines not continuous behind mesocox ae, long; line behind mesocoxa impressed, groove-like; prosternal line in front of coxa simply impressed ..... *auriculatus* Lacordaire

33(32) With humeral spot (Fig. 25) .... *audbalus* n.sp.
33' Without humeral spot (Fig. 144) .. *kovariki* n.sp.

34.(29') Elytra with color pattern 35
34'. Elytra without color pattern ..... *goliai* n.sp.

35(34') Body stout, rounded laterally; pronotum entirely black, or with anterior angles pale; each elytron with a free basal spot 36
35' Body parallel-sided, elongate; pronotum with pale anterior angles and often with central orange markings; elytra lacking free basal spots (Fig. 58) ..... *ephippiatus* Gorham

36.(35) Free scutellar and humeral spots in transverse line, central elytral fascia not extended to apical quarter (Fig. 59) ..... *mystacis* n.sp.
36'. Free subhumeral spot located behind free scutellar spot; central elytral fascia reaching apical quarter (Fig. 60) ..... *mimus* n.sp.

37.(28') Pronotum with 2 free spots and three basal spots (1 band-like free spot in *I. collatinus*), 3 basal spots not including possible posterior angle spots 38
37'. Pronotum with 2 or more free spots, possibly with three basal spots, but not with the above combination 42

38.(37) Pronotal hind angle with a spot or widening in the black margin; often with 2 weak black spots at anterior margin of pronotum (Fig. 61) .... *poseidon* n.sp.
38'. Pronotal hind angle without spot, lacking spots at pronotal anterior margin 39

39.(38') Two free pronotal spots circular; scutellar spot often broadly connected to elytral base .. 40
39'. Free pronotal spot(s) transversely elongate, rectangular; scutellar spot not connected to elytral base 41

40.(39) Apical elytral spot free; central band not reaching lateral margin (Figs. 62-63) . *pictus* Gorham
40'. Apical elytral spot broadly connected to suture and apex; central band complete, reaching lateral margin (Fig. 35) ..... *angularis* Lacordaire

41.(39') Pronotum with 2 free rectangular spots; lacking sutural spot near elytral apex (Fig. 64). . . . . *episcaphulinus* Gorham

41'. Pronotum with 1 transverse spot; with a sutural spot near the elytral apex (Fig. 65). . . . . *collatinus* Crotch

42.(37') Pronotum with 2 free spots, base at most with thin black margin, rarely with anterior spots. . . 43

42'. Pronotum variously marked with 2-4 discal spots, other markings variously connected to margins 47

43.(42) Scutellar spot narrowly connected to elytral base at scutellum, connection narrower than the spots' width (Figs. 66-67) . . *elegantulus* Lacordaire

43'. Scutellar spot broadly connected to elytral base, connection same width as spot 44

44.(43') Humeral and scutellar spots usually separated; scutellar spot broadly connected to suture; antennomere IX rounded or angled at base, not triangular 45

44'. Humeral and scutellar spots connected, appearing as one, separated from suture; antennomere IX triangular (Fig. 24) . . *vespertilio* Lacordaire

45.(44) Head entirely orange; humeral spot not connected to elytral base 46

45'. Head with at least base black; humeral spot connected to elytral base, often connected to scutellar spot (Figs. 68-69) . . . . . *chacojae* Gorham

46.(45) Central elytral band broken into round spots (Figs. 70-71) . . . . . *scutellaris* Gorham

46'. Central elytral band broken into longitudinally elongate spots (Fig. 72) . . . . . *malleus* n.sp.

47.(42') Pronotum with 3 free spots 48

47'. Pronotum with 2 or 4 free spots 50

48.(47) Central elytral fascia complete (Fig. 37). . . . . *tripunctatus* Crotch

48'. Central elytral fascia broken into spots 49

49.(48') Lateral spot of elytra small, circular or elongate; Central America (Figs. 38-39) . . . . . *frontalis* Lacordaire

49'. Lateral spot of elytra greatly elongated, stripe-like; USA, Florida (Fig. 40). . . . . *dunedinensis* Blatchley

50.(47') Pronotum with 2 free, 2 basal, and 2 anterior spots (Fig. 33) . . . . . *incertus* Lacordaire

50'. Pronotum with 4 free spots; or with pronotal disc markings based on 4 spots in a transverse line; 2 central spots occasionally connected to the anterior margin, giving it the appearance of 2 free spots 51

51.(45') Pronotum with 4 free spots only; occasionally with dark base, but no distinct basal spots. . . . 52

51'. Pronotum with 4 free spots and additional markings connected to margins 53

52.(51) Elytral central spot not connected to suture (Fig. 73) . . . . . *ichnus* n.sp.

52'. Elytral central band complete, one continuous marking connected to suture, possibly reaching lateral margin (Fig. 74) . *tetrasticus* Gorham

53.(51') With distinct anterior pronotal markings, or markings connecting discal spots to anterior margin 54

53'. Without distinct anterior pronotal marks, discal spots free (Fig. 75) . . . . . *pyropodus* n.sp.

54.(53) Each pronotal hind angle with a spot, occasionally reduced and appearing as dark swelling at margin of disc 55

54'. Pronotal hind angles without spots, lateral margin dark but not extending onto disc (Fig. 76) . . . . . *cordiformis* n.sp.

55.(54) Humeral spot connected to elytral base; central elytral band divided by orange except at stria V & VI (Fig. 77) . . . . . *fulmineus* Delkeskamp

55'. Subhumeral spot not connected to elytral base; central elytral band completely divided by orange (Fig. 78) . . . . . *erosus* n.sp.

SPECIES ACCOUNTS

Ischyrus aleator Boyle

(Figs. 7m, 8i, 10a-b, 15b, 54, 79, 120)

Ischyrus aleator Boyle 1954:46-48.
Micrischyrus aleator (Boyle) 1954, Alvarenga 1994:12.

Diagnosis: Unique in *Ischyrus* by its linear elytral spots (from base at humerus to apical third), pronotum lacking free spots, and weakly pinched prosternum.

Description: Length: 5.6-7.4 mm; Width: 2.5-3.4 mm. Body elongate, parallel-sided, widest at basal third elytra; strongly microreticulate, dull; pale orange with black pattern (Fig. 54).

Head orange, often with black epistome. Pronotum entirely edged in black; anterior edge with 2 spots; basal edge with 2 spots farther apart than anterior spots; spots occasionally touching on disc. Scutellum black. Each elytron with black epipleural fold, often with pale base; suture finely edged in black; disc with elongate triangular stripe, widest anteriorly, narrowly connected at base near humerus, reaching apical quarter of elytra. Ventral color variable from mostly black to orange with black sclerite edges. Legs black, femur occasionally banded with pale orange.

Head dorsal distance between eyes = 2.3 x eye width; ocular striae reaching antennal base; vertex and epistome puncture size = 1 x facet, separated on vertex by 2 diameters, separated on epistome by 1 diameter. Antenna reaching base of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX-XI symmetrical; antennomere XI oval, circular to transverse (similar to Fig. 6i).

Maxillary palp terminal segment semicircular; medial edge straight at base, angle 90°; lateral side rounded, angle obtuse; width = length. Labial palp terminal segment triangular, extended on medial side, narrow, sides rounded, width = 0.8 x length. Labial palp width = 0.5 x maxillary palp width (Fig. 7m). Mentum with plate broadly triangular, length = 0.5 x width, sides slightly convex, ridge medial extension acutely pointed (Fig. 8i).

Pronotal disc puncture size = 1 x facet, separated by 2 to 3 diameters; lateral punctures slightly larger and denser, separated by 1 to 2 diameters. Scutellum pentagonal, length = 0.6 x width. Each elytron with 7 visible striae; strial puncture size = 0.5 x lateral pronotal puncture size, becoming finer toward apex; intervals finely punctate, obscured by strong microreticulation.

Prosternum not keeled, convex; anterior pinch weak, if present (Fig. 10a-b); with (female) or without (male) foveate punctures in front of procoxa; coxal lines nearly straight, length = 0.5 x sternal length, lines not surpassing coxae, length = 0.6 x basal width; prosternal plate flat, apical width = 0.75 x basal width; base shallowly concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight, parallel to anteriorly divergent; base sinuate. Metasternum coxal lines meeting at middle in straight line with a row of punctures, often weak (Fig. 15b); coxal line length variable, continuous around coxae or reaching a maximum of 0.33 distance to posterior angle of metasternum; line behind mesocoxa deep, groove-like; sternum medial punctures fine, few coarse lateral punctures.

First visible abdominal ventrite with coxal lines reaching 0.25 to 0.5 distance to posterior margin; rounded between metacoxae.

Male genitalia with median lobe weakly arched, narrowed and apically rounded; internal sac without noticeable sclerotized structures; flagellum long and narrow, straight and apparently rigid at basal 0.5, length = 2 x median lobe length (Fig. 79a); base of flagellum straight, sclerite at base elongate claw-shaped (Fig. 79b-d) (9 northern Mexican, 1 Central American dissected).

Female genitalia with spermathecal head cone-shaped; tail swollen and recurved onto itself at middle (Fig. 79e) (6 northern Mexican dissected).

Stridulatory files present on occipital region of male heads; absent on females. Males with few or no foveate punctures on prosternum in front of procoxae; females with few to many punctures on prosternum in front of procoxae. There is some overlap in the numbers of visible punctures between males and females.

Variation: Markings vary dramatically in the width on specimens from north to south. Pronotal markings often touch in the middle, becoming stripe-like, leaving 3 pale circles. The width of the elytral stripe varies from 1 to 3 strial intervals.

Central American specimens have banded legs, an orange elytral epipleural fold, and black epistome. Specimens from Northern Mexico and Arizona have entirely black legs, black epipleural fold, and an orange epistome. The holotype, which appears to be slightly teneral, has brown legs.

Variation in mesocoxal line, from parallel to anteriorly divergent, did not correlate with geographic range. Specimens from Arizona and northern Mexico have the metacoxal line short, reaching a quarter of the distance to the posterior angle, or continuous around the mesocoxae. Specimens from southern Mexico and Central America have the metacoxal lines longer, nearly reaching a third of the distance to the posterior angle.

The prosternal pinch is not present on the holotype. On other specimens this pinch varies from absent to weak but distinct.

Type: The male holotype (original designation) of *Ischyrus aleator* Boyle label data: "/Cave Creek, Cochise Co./ Chiricahua Mts., AZ., 7000ft, June 24, 1927/ J.A.Kusche Collector/ Van Dyke Collection/ [red] Holotype Ischyrus aleator Boyle/" [CASC, Type #8369, examined]. Alvarenga (1994:12) incorrectly cites the type locality as "Florida, Cochise Co...."

Specimens examined: The holotype and 44 specimens, representing 20 collection records, were studied (see Appendix C for specific data).

Distribution: Southeastern Arizona, down western Mexico to El Salvador, and Guatemala (Fig. 120).

Etymology: *aleator*: Latin = dice layer, gambler. Name alludes to the resemblence of the trifoliate tawny spot on the pronotum to the emblem of the club suit in a deck of cards (Boyle 1954).

Taxonomic notes: The variation in leg color, size of elytral stripe, and development of metacoxal lines, appear to be correlated with geographic range. Few specimens with banded legs were studied from central Mexico and Central America. The importance of these variations is uncertain.

References: Boyle 1956:133,136-137,169 f.131-132; Skelley *et al.* 1991:65.

Ischyrus angularis Lacordaire

(Figs. 6e, 35, 80, 120)

Ischyrus angularis Lacordaire 1842:126.
Micrischyrus angularis (Lacordaire) 1842, Alvarenga 1994:12.
Ischyrus quinquepunctatus Gorham 1887:43-44, t.3 f.6, **new synonymy**.
Micrischyrus quinquepunctatus (Gorham) 1887, Alvarenga 1994:16.

Diagnosis: Characterized by its elongate body, complete central elytral band, apical elytral spots touching margins, and 2 free and 3 basal pronotal spots.

Description: Length: 5.0-5.8 mm; Width: 2.4-2.9 mm. Body elongate, parallel-sided, widest at basal third of elytra; weakly microreticulate, shining; yellow-orange with black pattern (Fig. 35).

Head entirely black, or with orange epistome and frons. Pronotum with 2 free spots and 3 basal spots; medial basal spot small; lateral basal spots larger, tooth-like. Scutellum black. Each elytron with orange epipleural fold; elongate subhumeral spot connected to base, often narrowly connected to large scutellar spot at base; scutellar spot broadly connected to base and suture; suture finely edged black; central band connected to lateral margin and suture; apical spot broadly connected to suture and apical margin; lateral margin black from central band to apex. Venter black, except for the orange lateral abdominal ventrites and pronotal epipleuron. Legs black, tarsi brown.

Head dorsal distance between eyes = 2.2 x eye width; ocular striae reaching 0.8 to 1.0 distance to anterior angle of eye; vertex puncture size = 1 x facet, separated by 1 to 2 diameters; epistome puncture size = 0.5 x facet, separated by 1 diameter. Antenna reaching basal 0.25 of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres X to XI asymmetrical; antennomere XI transverse (Fig. 6e).

Maxillary palp terminal segment triangular, securiform, basally rounded, apical angles nearly 90°, length = 0.75 x width. Labial palp terminal segment triangular, extended on medial side, rounded basally, length = 0.66 x width. Labial palp width = 0.75 x maxillary palp width (similar to Fig. 7b). Mentum with plate broadly triangular, length = 0.6 x width, sides straight, ridge medial extension acutely pointed (similar to Fig. 8d).

Pronotal puncture size = 1 x facet, separated by 1 to 2 diameters; punctures smaller and denser at extreme lateral edge. Scutellum pentagonal, length = 0.75 x width. Each elytron with 7 complete striae; stria VIII weak, visible on apical half; strial puncture size = 2 x pronotal disc punctures, gradually decreasing in size posteriorly; intervals finely punctate.

Prosternum keeled and pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa; coxal lines straight, length = 0.5 x sternal length, lines surpassing coxae, length = basal width; prosternal plate flat, apical width = 0.6 x basal width; base shallowly concave.

Mesosternum basal width = 2.5 x mesocoxal line length; coxal lines straight; base sinuate, lobed medially. Metasternum coxal lines not meeting at middle; coxal lines extend 0.5 distance to posterior lateral angle; sternum with medial punctures fine, few coarse lateral punctures separated by 2 to 3 diameters.

First visible abdominal ventrite with coxal lines reaching 0.5 distance to posterior edge; rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe weakly arched, apically truncate with constriction just before tip; internal sac with end near median lobe roughened; flagellum long and narrow, length = 1.6 x median lobe length (Fig. 80a); base of flagellum straight, sclerite at base claw-shaped (Fig. 80b-d) (2 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail swollen, weakly curved (Fig. 80e) (3 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Females have foveate punctures on prosternum in front of procoxae; males lack these punctures.

Variation: One specimen with a red head, probably teneral, has the same collection data as a black headed specimen.

Types: The lectotype (here designated) of *Ischyrus angularis* Lacordaire label data: "/Colombie/ Angularis Lac./ Type/ Ex-Musaeo Mniszech/ [red] TYPE/ [pale blue] Muséum Paris ex Coll. R. Oberthür 1952/ [red] LECTOTYPE Ischyrus angularis Lacordaire des. P. E. Skelley 1993/" [MNHN, examined]. Sex apparently female, abdomen missing.

The holotype (by monotypy) of *Ischyrus quinquepunctatus* Gorham label data: "/[red circle on white paper] Type/ Type sp. figured/ Bugaba, Panama, Champion/ Ischyrus 5-punctatus Gorham/ B.C.A., Col.,VII, Ischyrus/" [NHML, examined]. Sex not determined.

Specimens examined: The 2 types and 10 specimens, representing 11 collection records, were studied (see Appendix C for specific data).

Distribution: Known from Honduras, Panama, and Colombia (Fig. 120).

Etymology: *angularis*: Latin = having angles. Possibly named for the oblique angled apical spot on the elytra, commented on by Lacordaire.

Taxonomic Notes: No differences were found between the types of *I. angularis* Lacordaire, from Colombia, and *I. quinquepunctatus* Gorham, from Panama. *Ischyrus quinquepunctatus* Gorham is here synonymized under *I. angularis* Lacordaire.

A lectotype was chosen for *I. angularis* because Lacordaire made no indication that only one specimen was seen. The specimen chosen is from the Oberthür collection, which contains specimens reported to have been studied by Lacordaire (N. Berti, personal communication), and it fits the original description both in label data and morphological characteristics.

Remarks: The color pattern of 2 free and 3 basal pronotal spots is much like the patterns of *I. pictus* and *I. episcaphulinus*. These species have free apical elytral spots, *I. angularis* has the apical elytral spot connected to the margins.

References: *Ischyrus angularis* Lacordaire: Blackwelder 1945:465; Crotch 1876:430(54); Gemminger & Harold 1876:3690; Kuhnt 1909:62; 1911:42.

Ischyrus quinquepunctatus Gorham: Blackwelder 1945:465; Kuhnt 1909:63; 1911:43; Pallister 1955b:7.

Ischyrus audbalus Skelley new species

(Figs. 6k, 7n, 9b, 25, 81)

Diagnosis: Both *I. audbalus* and *I. kovariki* are unique by having a pit-like groove in front of the prosternum (Fig. 9b), antennomere IX triangular, prosternal pinch lacking, metasternal coxal lines continuous around base of mesocoxa, and 9 visible elytral striae. *Ischyrus audbalus* is distinguished by its color pattern which has a humeral spot (Fig. 25) and by the unmodified flagellum of the male genitalia (Fig. 81).

Description: Length: 5.8-6.4 mm; Width: 2.8-3.9 mm. Body elongate, widest at basal third of elytra; microreticulate, feebly shining; yellow with black pattern.

Head yellow. Pronotum with central stripe, widest basally; stripe can have a longitudinal elongate yellow spot. Scutellum black. Each elytron with yellow epipleural fold; humeral spot connected to base; sutural edge black; anteriorly placed free central and apical spots; lateral spot appearing as a marginal swelling; lateral margin edged in black from lateral spot to apex. Prosternum yellow except for black sternal plate. Meso- and metathorax black except for yellow mid-lateral area on metasternum. Abdomen yellow except for black medial spots on the posterior edge of ventrites II to IV.

Head dorsal distance between eyes = 2.0 to 2.2 x eye width; ocular striae reaching 0.75 distance to anterior angle of eye; vertex and epistome puncture size = 1 x facet, separated by 0.5 to 1.0 diameters. Antenna reaching base of pronotum; antennomere III as long as next 2 antennomere combined; antennomeres IX to XI symmetrical; antennomere VIII elongate triangular, longer than wide; antennomere IX triangular, as long as wide; antennomere XI oval, transverse, as wide as antennomere X (Fig. 6k).

Maxillary palp terminal segment triangular, securiform, basally rounded, apical angles nearly 90°, length = 0.66 x width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = 0.5 x width. Labial palp width = maxillary palp width (Fig. 7n). Mentum with plate triangular, length = 0.75 x width, sides concave, apical angle rounded; ridge with medial extension projecting, blunt (similar to Fig. 8c).

Pronotal disc puncture size = 1 x facet, separated by 0.5 to 1.0 diameter. Scutellum pentagonal, length = 0.6 x width. Each elytron with 8 striae, stria IX visible on apical half; strial puncture size = pronotal disc puncture; intervals finely punctate, obscured by microreticulations.

Prosternum convex, lacking pinched anterior margin; deep pit-like groove with few enclosed setae in front of procoxa (Fig. 9b), pit as long as procoxa; coxal lines straight, length = 0.4 x sternal length, lines not surpassing coxae, length = 0.75 x basal width; prosternal plate flat, apical width = 0.5 x basal width; base shallowly concave.

Mesosternum basal width = 2.5 x mesocoxal line length; coxal lines straight; base evenly convex. Metasternum coxal lines not meeting at middle, continuous around coxa, not extending onto metasternum; sternum with medial punctures fine, few coarse lateral punctures.

First visible abdominal ventrite with coxal lines continuous around coxa; broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe straight, short, apically truncate; internal sac without noticeable sclerotized structures; flagellum narrow, length = 1.8 x median lobe length (Fig. 81a); base of flagellum straight and swollen, sclerite at base parallel-sided and fang-like (Fig. 81b-d) (1 dissected).

Female genitalia with spermathecal head ball-like; tail swollen, recurved on itself (Fig. 81e) (1 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). No external sexual dimorphism observed.

Variation: The specimens studied differ in the central pronotal stripe. The female, from Oaxaca, Mexico, has a solid stripe. The male, from Campeche, Mexico, has the stripe medially divided by an elongate yellow spot. This difference could be sexual, geographic, or simply normal variation within the species.

Type material: The male holotype of *Ischyrus audbalus* Skelley label data: "/MEXICO: Campeche, Chicana Ruins, 6mi. E. Xpujil, 13-14.VII.83, 700', R. Anderson, W. Maddison, Trop. seas. for./" [FSCA]. The female allotype label data: "/MEX.: Oax., Temascal, VI-29-64/ at light/ A. G. Raske collector/" [CNCI].

Distribution: Known only from southern Mexico, the states of Campeche and Oaxaca.

Etymology: aud-bal: an intentional phonetic misspelling of "odd-ball," a slang expression meaning strange, unusual, out of the ordinary. The name was chosen in reference to the many unusual characters of this species.

Taxonomic notes: With *I. kovariki*, this unique species is provisionally placed in *Ischyrus* because it possesses the diagnostic generic characters as stated in the generic account. They differ from typical members of *Ischyrus* in antennal club structure, prosternal pit, continuous coxal lines, and genitalic characters.

Ischyrus auriculatus Lacordaire

(Figs. 15a, 56-57, 82, 121)

Ischyrus auriculatus Lacordaire 1842:123.

Micrischyrus auriculatus (Lacordaire) 1842, Alvarenga 1994:12.

Episcaphula bellopicta Kuhnt 1910:222, **new synonymy**.

Amblyopus bellopictus (Kuhnt) 1910, Delkeskamp 1943:42.

Ischyrus bellopictus (Kuhnt) 1910, Delkeskamp 1957: 109.

Micrischyrus bellopictus (Kuhnt) 1910, Alvarenga 1994:12.

Ischyrus auriculatus var. "hamatus" Kuhnt [1914] [unpublished name].

Diagnosis: Characterized by its wide central elytral band, reduced basal elytral markings, black pronotum with orange sides or anterior angles, apical elytral spots, and weakly pinched prosternum.

Description: Length: 5.3-7.1 mm; Width: 2.7-3.7 mm. Body elongate, widest at basal third of elytra; weakly microreticulate, shining; orange-red with black pattern (Figs. 56-57).

Head black. Pronotum black except for lateral orange spot at anterior angle; spot variable in size and shape, often attaining base. Scutellum black. Each elytron with orange-red epipleural fold; small humeral spot connected to base; small free scutellar spot; suture with black margin; central band wide, can touch lateral edge; apical spot broadly connected to suture and apex. Venter black except for the orange lateral prothorax and lateral abdominal ventrites. Legs and antennae black; palpi and tarsi brown.

Head dorsal distance between eyes = 3 x eye width; ocular striae reaching 0.75 distance to anterior angle of eye; vertex puncture size = 0.75 x facet, separated by 2 to 3 diameters; epistome puncture size = 0.75 x facet, separated by 0.5 to 1.0 diameter. Antenna reaching basal 0.25 to 0.5 of pronotum; antennomere III as long as next 2 antennomere combined; antennomeres IX to XI symmetrical; antennomere XI oval, transverse (similar to Fig. 6i).

Maxillary palp terminal segment triangular, sides rounded, lateral angle acute, medial angle nearly 90°, width = 2 x length (similar to Fig. 7j). Labial palp terminal segment triangular, angles nearly 90°, length = width (similar to Fig. 7g). Labial palp width = 0.33 x maxillary palp width. Mentum with plate triangular, length = 0.8 x width, all sides nearly equal in length, sides convex, ridge medial extension pointed (similar to Fig. 8g).

Pronotal disc puncture size = 0.75 x facet, separated by 2 to 3 diameters; lateral puncture size = 1 x facet, separated by 1 to 2 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII weak, nearly complete; strial puncture size at base = pronotal disc puncture, impressed, gradually becoming finer posteriorly; intervals finely punctate, often obscured by microreticulations.

Prosternum keeled and weakly pinched anteriorly; without punctures or with few weakly impressed foveate punctures in front of procoxa; line in front of procoxa deep, groove-like; procoxal lines sinuate, slightly concave at

middle, length = 0.5 x sternal length, lines barely (if at all) surpassing coxae, length = 1.1 x basal width; prosternal plate narrowed anteriorly, flat, apical width = 0.6 x basal width; base shallowly concave.

Mesosternum basal width = 3 x mesocoxal line length; coxal lines straight, parallel; base truncate. Metasternum coxal lines not meeting at middle, not recurved (Fig. 15a); coxal lines fine, extend 0.33 distance to posterior lateral angle; sternum with medial punctures fine, few coarse lateral puncture.

First visible abdominal ventrite with coxal lines reaching 0.33 to 0.5 distance to posterior edge; rounded between metacoxae; with coarse punctures laterally, finer punctures medially.

Male genitalia with median lobe strongly arched, narrowed with apically rounded; internal sac without noticeable sclerotized structures; flagellum long and narrow, length = 1.7 x median lobe length (Fig. 82a); base of flagellum straight, sclerite at base elongate ring-shaped (Fig. 82b-d) (8 dissected).

Female genitalia with spermathecal head oval; tail thick, weakly curved, angled at end (Fig. 82e) (9 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Prosternal sexual dimorphism present but not constant. Males lack punctures in front of procoxae. Some females have foveate punctures on prosternum in front of procoxae, others apparently lack punctures.

Variation: *Ischyrus auriculatus* (Panama, Trinidad, Ecuador, Venezuela, Brazil) has lateral orange mark of pronotum restricted to anterior angle (Fig. 56). *Ischyrus bellopictus* (Mexico, Peru, Bolivia) has the lateral orange mark of the pronotum broadly connected with the base and connected to the lateral margin from the anterior angle nearly to the posterior angle (Fig. 57). *Ischyrus auriculatus* var. "hamatus" (Argentina, Bolivia) is identical to *I. auriculatus* and *I. bellopictus*, except the orange lateral pronotal marking is intermediate in size.

Type: The lectotype (here designated) of *Ischyrus auriculatus* Lacordaire label data: "/[blue paper] Type/ Type auriculatus Ch./ [red] LECTOTYPE Ischyrus auriculatus Lacordaire des. P. E. Skelley 1993/" [CUMZ, examined]. Sex not determined. Lacordaire stated the type locality is "Cayenne."

The lectotype (here designated) of *Ischyrus bellopictus* (Kuhnt) label data: "/[hand written] Motzor°./ 104629/ [orange] Typus/ [pale green with black border, folded] Episcaphula bellopicta Kuhnt/ Zool. Mus. Berlin/ [red] LECTOTYPE Episcaphula bellopicta Kuhnt des. P. E. Skelley 1993/" [ZMHB, examined]. Two specimens are on the pin, the bottom specimen is the lectotype. Sex not determined. Delkeskamp (1957: 109) stated that "Motzor." = Motzorongo, Veracruz, Mexico.

Kuhnt's undescribed type of *Ischyrus auriculatus* var. "hamatus" label data: "/[purple paper] [underlined] Coll.R.I.Sc.N.B., Argentina/ [green paper, glued to purple label] Entre-Rios./ [glued to purple label] Coll.Camille Van Voixem./ [white with black border] Typus/ [red with black border] TYPE/ [hand written, once folded] Ischyrus auriculatus var. hamatus Kuhnt/ P.KUHNT det., 1914: Ischyrus auriculatus Lac. var.: hamatus Kuhnt/" [ISNB, examined]. Sex not determined.

Specimens examined: The 3 "types" and 56 specimens, representing 38 collection records, were studied (see Appendix C for specific data).

Distribution: Widespread throughout southern Mexico, Central, and South America (Fig. 121).

Etymology: *auricula*: Latin = lobe of ear, little ear. Possibly the name refers to the pale pronotal marking behind the eyes, appearing like an ear.

Taxonomic notes: A lectotype was chosen for *I. auriculatus* Lacordaire because there was no indication that only one specimen was studied in the original description. The specimen chosen has the label data, "auriculatus Ch.", indicating it came from the Chevrolat collection, as stated in the original description.

A lectotype was chosen for *Episcaphula bellopictus* Kuhnt from the "Typus" specimens because Kuhnt made no mention that only one specimen was studied, and 2 specimens are present on the pin. The lower specimen was chosen as the lectotype because it was the more intact. The upper specimen and 3 separate additional specimens with identical locality labels are designated as paralectotypes. With these specimens are 6 others bearing similar locality labels, but with different ink and spelling. They could have been studied by Kuhnt, but this is not certain. They are not designated as paralectotypes.

The variety "hamatus" was recognized by Kuhnt who had a series of specimens (all in the ISNB), selected a type, but apparently never published the name. The date on one of the labels, "1914", indicated that Kuhnt's work was done at the beginning of World War I. His paper may have been lost in the war, never published, or simply never referenced. No publication or citation to the description of this variety has been located. The "type" label data are stated in case its publication was overlooked.

The "hamatus" variety is slightly different in color pattern, but no additional characters were found to separate it from the other varieties. All 3 color patterns

(*auriculatus*, *bellopictus*, and "hamatus") are from scattered, intermixed localities and are considered varieties of the same species.

Remarks: *Ischyrus auriculatus* superficially resembles *I. ephippiatus* in body shape and color pattern. *Ischyrus auriculatus* has an apical elytral spot, *I. ephippiatus* lacks this spot.

References: *Ischyrus auriculatus* Lacordaire: Blackwelder 1945:465; Crotch 1876:(57)433; Delkeskamp 1957:109; Gemminger & Harold 1876:3690; Gorham 1887:43; Kuhnt 1909:63; 1911:42; Mader 1942a:195; 1952:182-183.

Episcaphula bellopictus Kuhnt: Delkeskamp 1943: 42; 1957:109; Kuhnt 1911:77.

Ischyrus bogotae Crotch

(Figs. 7d, 8d, 32, 83, 122)

Ischyrus bogotae Crotch 1876:430(54).

Micrischyrus bogotae (Crotch) 1876, Alvarenga 1994: 12.

Diagnosis: Recognized by its single large basal spot and 2 free pronotal spots, and asymmetrical antennal club segments.

Description: Length: 7.2-9.5 mm; Width: 3.4-4.4 mm. Body elongate widest at elytral third; microreticulate, feebly shining; orange-red patterned with black (Fig. 32).

Head black. Pronotum with 2 anterior spots, occasionally connected to each other; 2 free spots, one on each side near middle; one large basal spot at middle. Scutellum black. Each elytron with black epipleural fold; subhumeral spot elongate, connected to base; large scutellar spot broadly connected to suture and base; suture black; central spot large, often free, may touch suture; apical spot free. Venter orange except around coxae; episterna and epimera black; abdomen orange with black sutures. Legs black; palpi and tarsi brown.

Head dorsal distance between eyes = 2 x eye width; ocular striae reaching 0.8 distance to anterior angle of eye; vertex puncture size = 1 x facet, separated by 1 to 2 diameters; epistome puncture size = 0.5 x facet, separated by 1 diameter. Antenna reaching basal 0.25 of pronotum; antennomere III as long as next 3 antennomere combined; club broad, 3 to 4 times wider than antennomere VIII; antennomeres X to XI asymmetrical; antennomere XI triangular, transverse (Fig. 6d).

Maxillary palp terminal segment triangular, narrowed, apical angles 90° or more, width = length. Labial palp terminal segment triangular, extended on medial side, length = width. Labial palp width = 0.5 x maxillary palp width (Fig. 7d). Mentum with plate broadly triangular, length = 0.6 x width, sides straight, ridge medial extension acutely pointed (Fig. 8d).

Pronotum puncture size = 1 x facet, separated by 2 to 3 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; strial puncture size = 1.5 x pronotal disc puncture; intervals finely punctate.

Prosternum weakly keeled and pinched anteriorly; with foveate punctures in front of procoxa, weakly impressed and obscure if present; coxal lines straight, length = 0.5 x sternal length, lines barely surpassing coxae, length = basal width; prosternal plate flat, apical width = 0.6 x basal width; base shallowly concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight to weakly curved; base sinuate, lobed medially. Metasternum coxal lines recurved, not meeting medially, ridge at suture with mesosternum gives appearance of lines meeting; coxal lines extend 0.33 to 0.5 distance to posterior lateral angle; sternum with medial punctures fine, few coarse lateral punctures weakly impressed.

First visible abdominal ventrite with coxal lines short, reaching 0.25 distance to posterior edge; broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe weakly arched, apically truncate, slightly constricted just before tip; internal sac with patch of setal-like structures at end near base of flagellum; flagellum long and narrow, flattened and ribbon-like for most of length, length = median lobe length (Fig. 83a); base of flagellum straight, sclerite at base claw-shaped (Fig. 83b-d) (2 dissected).

Female genitalia with spermathecal head oval; tail swollen, curved like an inverted question mark, "¿" (Fig. 83e) (8 dissected).

Stridulatory files on occipital region of head weakly developed on males; not present on females. No other sexual dimorphism observed.

Variation: The anterior pronotal spots often connected with each other forming a single bilobed spot. The basal pronotal spot often has a small anterior notch, indicating it could be a fusion of 2 spots. The central elytral spot touches the suture in specimens from Guatemala, but is free on the other specimens.

Type: The lectotype (here designated) of *Ischyrus bogotae* Crotch label data: "/[blue paper] Type/ Bog. [underside] Jans/ Type Bogotae/ [red] LECTOTYPE Ischyrus bogotae Crotch des. P. E. Skelley 1993/" [CUMZ, examined]. Sex not determined.

Specimens examined: The lectotype and 51 specimens, representing 33 collection records, were studied (see Appendix C for specific data).

Distribution: Mexico and Central America to Colombia and Ecuador (Fig. 122).

Etymology: Named after the type locality; Bogota, Colombia.

Taxonomic notes: A lectotype was chosen because Crotch made no mention in the original description that only one specimen was studied.

Remarks: *Ischyrus bogotae* is similar to *I. septemsignatus* in color pattern, but can be distinguished by the presence of the large basal pronotal spot; absent in *I. septemsignatus*.

References: Blackwelder 1945:465; Gemminger & Harold 1876:3690; Gorham 1887:40; Kuhnt 1909:63; 1911:42.

Ischyrus boucardi Crotch

(Figs. 41, 84, 123)

Ischyrus boucardi Crotch 1876:(53)429.

Micrischyrus boucardi (Crotch) 1876, Alvarenga 1994: 12.

Ischyrus peruvianus Gorham 1883:85-86, **new synonymy**.

Micrischyrus peruvianus (Gorham) 1883, Alvarenga 1994:15.

Diagnosis: Characterized by its broad terminal maxillary palp segment, 4 free pronotal spots in a transverse row, anterior pronotal spots, absence of basal and hind angle pronotal spots, complete band-like central elytral fascia, and orange-yellow legs with black knees.

Description: Length: 5.8-8.1 mm; Width: 2.7-3.8 mm. Body elongate, parallel-sided; widest at basal third of elytra; microreticulate; yellow-orange with black pattern (Fig. 41).

Head black; often with lateral orange mark at each eye. Pronotum with 2 anterior spots connected to margin; 4 free spots in transverse, anteriorly concave arch; occasionally with black basal margin. Scutellum black. Each elytron with black epipleural fold; elongate humeral spot, connected to base; subhumeral spot often free, may touch scutellar spot and/or humeral spot; scutellar spot broadly connected to base and suture; suture black; central band wide, often reaching lateral margin, widest at suture; apical spot small, broadly connected to apical margin. Ventral color variable, sclerites solid black to orange with black margins. Legs orange with black knee and coxa; palpi and tarsi brown.

Head dorsal distance between eyes = 2.0 to 2.2 x eye width; ocular striae reaching 0.5 distance to anterior angle of eye; vertex puncture size = 1 x facet, separated by 2 to 3 diameters; epistome puncture size = 1 x facet, separated by 0.5 to 1.0 diameter. Antenna reaching basal 0.25 pronotum; antennomere III as long as next 3 antennomere combined; club broad, segments transverse; antennomere IX narrower than X; antennomeres X to XI asymmetrical; antennomere XI transverse to subcircular (similar to Fig. 6e).

Maxillary palp terminal segment triangular, securiform, basally rounded, angles 90°, length = 0.5 x width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = 0.5 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7c). Mentum with plate broadly triangular, length = 0.6 width, sides straight, ridge medial extension pointed (similar to Fig. 8d).

Pronotal disc puncture size = 0.75 x facet, separated 2 to 4 diameters; lateral punctures same size, slightly denser, separated 1 to 2 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII weak, visible on apical half; strial puncture size = 1 x facet; intervals finely punctate.

Prosternum weakly keeled and pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa; coxal lines straight, length = 0.5 x sternal length, lines barely surpassing coxae, length = basal width; prosternal plate flat, apical width = 0.6 x basal width; base shallowly concave.

Mesosternum basal width = 1.5 x mesocoxal line length; coxal lines straight; base sinuate. Metasternum coxal lines often recurved, not meeting at middle; coxal lines short, barely surpassing coxa; line behind mesocoxa deep, groove-like; sternum with medial punctures fine, lacking lateral punctures.

First visible abdominal ventrite with coxal lines barely surpassing coxa or reaching up to 0.5 distance to posterior margin; rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe strongly arched, apically truncate, constricted just before tip; internal sac without noticeable sclerotized structures; flagellum long and narrow, length = 1.5 x median lobe length (Fig. 84a); base of flagellum angled, sclerite at base claw-shaped (Fig. 84b-d) (8 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail swollen, curved like an inverted question mark, "¿" (Fig. 84e) (7 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Females have foveate punctures on prosternum in front of procoxae; males lack these punctures.

Variation: Gorham's *I. peruvianus* differs from *I. boucardi* Crotch only in the head being entirely black and the subhumeral spot not connected to the scutellar spot. Both of these characters are variable and several intermediate specimens have been studied. The specimen illustrated (Fig. 41) is one of these intermediates.

Types: The lectotype (here designated) of *Ischyrus boucardi* Crotch label data: "/[blue paper] TYPE/ S.Cat. [underside] Bouc./ Type Boucardi/ [red] LECTOTYPE Ischyrus boucardi Crotch des. P. E. Skelley 1993/" [CUMZ, examined]. Sex not determined.

The lectotype (here designated) of *Ischyrus peruvianus* Gorham label data: "/[red circle on white paper] Type/ Peru Buckley/ Gorham Coll. BM. 1927-143/ [red] LECTOTYPE Ischyrus peruvianus Gorham des.

P. E. Skelley 1993/" [NHML, examined]. Sex not determined.

Specimens examined: The lectotypes plus 22 specimens, representing 14 collection records, were studied (see Appendix C for specific data).

Distribution: Widespread in South America from Panama to Argentina (Fig. 123).

Etymology: *Ischyrus boucardi* is named after A. Boucard, collector of the type specimen.

Taxonomic notes: A lectotype was chosen for *I. boucardi* Crotch because specimens from Santa Catarina and Amazonas were stated to have been studied in the original description.

The lectotype of *I. peruvianus* was chosen because Gorham made no indication that only one specimen was studied. The specimen chosen is from his collection, fits the description, and had previously been labeled as the type.

No difference, except for color pattern, was found between *I. boucardi* and *I. peruvianus*, with several specimens exhibiting intermediate color patterns. Based on this, *I. peruvianus* Gorham is placed in synonymy under *I. boucardi* Crotch.

References: *Ischyrus boucardi* Crotch: Blackwelder 1945:465; Gemminger & Harold 1876:3690; Guérin 1948: 19; Kuhnt 1909:64; 1911:42; Mader 1942a:171; 1951:209-210; 1952:159-160.

Ischyrus peruvianus Gorham: Blackwelder 1945:465; Fleutiaux 1886:222; Kuhnt 1909:63; 1911:43; Mader 1942a:171; 1951:209-210; 1952:159-160.

Ischyrus celatus Skelley new species

(Figs. 6b, 7b, 8b, 26, 85)

Diagnosis: Unique in the black pronotum with orange sides, large triangular central elytral marking, and asymmetrical antennal club segments.

Description: Length: 8.6-9.1 mm; Width 4.5-4.7 mm. Body elongate, widest at basal third of elytra; weakly microreticulate, shining; yellow-orange with black color pattern (Fig. 26).

Head solid black with dark orange base (hidden when head retracted). Pronotum edged in black; black triangular central mark broadly connected to base and anterior margin, anteriorly narrowed. Scutellum black. Each elytron with small free subhumeral spot; V-shaped scutellar spot, connected to suture, not to base; central spot large and triangular, widest anteriorly and angled forward, nearly reaching apical edge along suture; central spots form a V-shaped mark with elytra together; suture with fine black edge; black epipleural fold, base reddish. Ventral prothorax black; mes- and metepisterna and epipleura black; remainder of venter dark orange with black sutural margins. Appendages entirely black, palpi pale.

Head dorsal distance between eyes = 2 x eye width; ocular striae reaching 0.75 distance to anterior angle of eye, continued forward as row of coarse punctures; vertex puncture size = 1 x facet, separated by 2 to 4 diameters; epistome puncture size = 0.9 to 1.0 x facet, separated 0.5 to 1.0 diameter. Antenna reaching pronotal base; antennomere III as long as next 3 antennomere combined; antennomeres X to XI asymmetrical; antennomere XI subcircular (Fig. 6b).

Maxillary palp terminal segment triangular, securiform, basally rounded, apical angles nearly 90°, length = 0.75 x length. Labial palp terminal segment triangular, extended on medial side, rounded basally, length = 0.66 x width. Labial palp width = 0.75 x maxillary palp width (Fig. 7b). Mentum with plate triangular, length = 0.75 x width, apical sides inwardly curved, ridge medial extension blunt (Fig. 8b).

Pronotal puncture size = 1 x facet, separated by 1 to 2 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII weak, visible on apical half; strial puncture size = pronotal disc puncture; intervals finely punctate.

Prosternum keeled and strongly pinched anteriorly; without foveate punctures in front of procoxa; coxal lines inwardly arched, length = 0.5 x sternal length, lines barely surpassing coxae, line length = 0.75 x basal width; prosternal plate flat, apical width = 0.6 x basal width; base shallowly concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines arched inwardly; base sinuate, lobed medially. Metasternum coxal lines recurved, meet medially in a weak tooth; coxal line extends 0.5 distance to posterior lateral angle; sternum with medial punctures fine, coarse lateral punctures weakly impressed.

First visible abdominal ventrite with coxal lines reaching 0.25 to posterior edge; rounded between metacoxae.

Male genitalia with median lobe moderately arched, narrowed to a point; internal sac without noticeable sclerotized structures; flagellum gradually narrowing toward apex, length = 1.1 x median lobe length (Fig. 85a); base of flagellum straight, sclerite at base claw-shaped (Fig. 85b-d) (2 dissected).

Females not known.

Presence of stridulatory files on occipital region of heads unknown (heads retracted). Both males have the prosternum broadly expanded onto, and nearly covering, the pronotal epipleuron; possibly a sexual dimorphism.

Variation: One specimen has a faint elongate marking at the center of the pronotal disc. This pale spot is hardly discernable from the black central mark and may simply indicate that it is still teneral.

Type material: The male holotype of *Ischyrus celatus* Skelley label data: "/24 mi.NW Ocozocoautla,

Chis., Mex., VI-24-1965, H. R. Burke, J.R.Meyer, J.C.Schaffner/" [FSCA]. An additional male paratype with label data: *Mexico*, Veracruz, Omealca, 6-IV-1903, F. K. Knab [USNM].

Distribution: Known from the states of Chiapas and Veracruz, Mexico.

Etymology: *celo*: Latin = concealed. Named for the apparent male character having the prosternum expanded and nearly covering the pronotal epipleuron.

Remarks: Several other *Ischyrus* species have males with the prosternum expanded but not to the extent seen in this species.

Ischyrus chacojae Gorham

(Figs. 68-69, 86, 124)

Ischyrus chacojae Gorham 1887:43, t.3 f.5.

Ischyrus chalcojae Gorham, *in* Kuhnt 1909:63 [misspelling].

Micrischyrus chacojae (Gorham) 1887, Alvarenga 1994:12.

Diagnosis: Characterized by the black head base, scutellar spot broadly connected to elytral base, central elytral marking a single spot or band, 2 free pronotal spots, and lacking anterior pronotal spots.

Description: Length 4.8-5.7 mm; Width: 2.6-3.2 mm. Body elongate-oval, widest at basal third of elytra; weakly microreticulate, shining; orange with black color pattern (Figs. 68-69).

Head black, often with orange epistome and frons. Pronotum with 2 free spots, base can have 2 small spots. Scutellum orange, often with black edges. Each elytron with orange epipleural fold; subhumeral spot connected to base, broadly or narrowly connected to large scutellar spot, occasionally reaching lateral edge; scutellar spot broadly connected to base and suture; suture can have black margin; central markings vary in shape and size, from free spot to complete band connected to medial and lateral edges (see Variation below). Venter orange with black sutural margins. Appendages black; palpi and tarsi brown.

Head dorsal distance between eyes = 2.5 x eye width; ocular striae reaching anterior angle of eye; vertex puncture size = 1 x facet, separated by 2 diameters; epistome puncture size = 0.75 x facet, nearly coalescing. Antenna reaching base of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere XI subcircular, narrower than antennomere X (similar to Fig. 6l).

Maxillary palp terminal segment triangular, sides rounded, angles nearly 90°, length = 0.5 x width. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90°, length = 0.8 width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7o). Mentum with plate broadly triangular, length = 0.5 x width, sides concave (similar to Fig. 8h); medial extension short, rounded, projecting.

Pronotal disc puncture size = 1 x facet, separated by 2 to 3 diameters; laterally separated by 1 to 2 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII present at base and apical half, often obscured by interval punctation; strial puncture size at base = 2 x pronotal disc punctures, gradually becoming finer posteriorly; interval punctures fine, impressed, distinct.

Prosternum keeled and strongly pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa; coxal lines curved at ends, length = 0.6 x sternal length, lines barely surpassing coxae, length = basal width; prosternal plate flat, apical width = 0.6 to 0.8 x basal width; base concave.

Mesosternum basal width = 3 x mesocoxal line length; coxal lines straight; base broadly sinuate. Metasternum coxal lines meet at middle, often crenate, recurved; coxal lines extend 0.5 distance to posterior lateral angle; sternum shining, medial punctures fine, coarse lateral punctures often obscured by strong microreticulation.

First visible abdominal ventrite with coxal lines reaching 0.25 to 0.33 distance to posterior edge; broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe weakly arched, apically rounded; internal sac with pair of darkened patches near median lobe; flagellum thickened for most of its length, length = 1.2 x median lobe length (Fig. 86a); base of flagellum straight, sclerite at base elongate claw-shaped, almost ring-like (Fig. 86b-d) (3 dissected).

Female genitalia with spermathecal head elongate kidney-shaped; tail narrow, looped or coiled on itself (Fig. 86e) (4 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Females with foveate punctures on prosternum in front of procoxae; males lacking these punctures, or at most, with a few punctures near procoxae.

Variation: The color pattern of *I. chacojae* is quite variable, and specimens studied may encompass several taxa. No differences, outside of color pattern, were found that would support their separation. More specimens are needed to make confident conclusions, especially with the South American varieties where only females were studied.

Mexican specimens and the Guatemalan holotype (Fig. 68) have black heads, often with an orange spot on frons; base of pronotum lacking black spots; subhumeral and scutellar spots broadly connected, not reaching lateral margin; central elytral spot free; suture finely margined black.

Panamanian specimens have black head with orange epistome; base of pronotum without spots;

subhumeral and scutellar spots narrowly connected at base, nearly free from each other, not reaching lateral margin; central elytral spot free; suture finely margined with black.

The female Peruvian specimen (Fig. 69) has a black head; base of pronotum with 2 weak spots; subhumeral and scutellar spot narrowly connected at base, nearly free from each other, not reaching lateral margin; central elytral mark reduced to jagged line connected to suture, not connected to lateral margin; suture black.

The female Brazilian specimen has a black head with a large pale spot on frons; base of pronotum with 2 indistinct spots; subhumeral and scutellar spots broadly connected, reaching lateral margin; central elytral marking band-like, connected to both suture and lateral margin.

Type: The holotype (by monotypy) of *Ischyrus chacojae* Gorham label data: "/[red circle on white paper] Type/ Type, sp. figured/ Chacoj, Vera Paz., Champion/ Ischyrus chacojae, Gorh/ B.C.A., Col., VII, Ischyrus/" [NHML, examined]. The type locality is a settlement in Guatemala, on the Río Polochic, just west of La Tinta, about 15°19'N, 89°56'W (Selander & Vaurie 1962). Sex undetermined.

Specimens examined: The holotype and 10 specimens, representing 9 collection records, were studied. Label data: **Brazil**, Amazonas, 20 km S. Manaus, 13-XI-1966, Bologh, Soil Zoological Exp. no.539 [1, HNHM]; **Mexico**, Veracruz, Lake Catemaco, 8-16-VIII-1960, H. F. Howden [1, CNCI]; Veracruz, 6 mi.N Sontecomapan, 24-VIII-1982, C. W. & L. O'Brien, 100' elev. [1, PESC]; **Panama**, Panama Prov., Cerro Campana, 10-VIII-1961, J. M. Campbell, 3000' elev. [3, PESC]; Canal Zone, Barro Colorado Island, 14-IV-1978, H. Wolda [1, PESC]; same data as previous except 20-V-1978 [1, HPSC]; same data as previous except 4-V-1980 [1, UCDC]; **Peru**, Junin, Satipo, 10-VII-1940, P. Paprzycki [1, CASC].

Distribution: Mexico, Guatemala, Panama, Peru, and Brazil (Fig. 124).

Etymology: The name *chacojae* is based on the type locality, Chacoj.

Remarks: *Ischyrus chacojae* is similar in color pattern to *I. scutellaris*, *I. malleus*, *I. septemsignatus*, and *I. elegantulus*. Each differs from *I. chacojae* in color pattern characters: *I. elegantulus*, *I. malleus* and *I. scutellaris* have red heads and distinct subhumeral spots; *I. septemsignatus* has apical elytral spots and free subhumeral spots.

References: Blackwelder 1945:465; Gorham 1887:44; Kuhnt 1909:63; 1911:42.

Ischyrus collatinus Crotch

(Figs. 65, 87, 125)

Ischyrus collatinus Crotch 1876:(57)433.
Micrischyrus collatinus (Crotch) 1876, Alvarenga 1994:13.

Diagnosis: Unique in *Ischyrus* by its single transversely linear free pronotal spot.

Description: Length: 5.4-6.8 mm; Width: 2.8-3.8 mm. Body elongate-oval, widest at basal third of elytra; microreticulate, feebly shining; orange-yellow with black pattern (Fig. 65).

Head orange-yellow with black base. Pronotum with one free, transversely linear spot; base with medial 0.75 margin black, ends and middle with spot-like swelling. Scutellum black. Each elytron with orange epipleural fold; free subhumeral spot; transverse scutellar spot, not connected to base, sometimes connected to suture; subhumeral and scutellar spot occasionally connected forming band; central and lateral spots similar shape and pattern as subhumeral and scutellar spots; apical spot free, at apical third of elytra, arched anteriorly toward suture; suture with apical mark. Venter black, lateral prosternum and pronotal epipleuron orange. Appendages black; palpi, tarsi, and base of antennae brown.

Head dorsal distance between eyes = 2.5 x eye width; ocular striae reaching 0.5 distance to anterior angle of eye, weakly continued forward; vertex puncture size = 0.75 x facet, separated by 2 to 3 diameters; epistome puncture size = 0.5 x facet, nearly coalescing. Antenna reaching base of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere XI subcircular, narrower than antennomere X (similar to Fig. 6l).

Maxillary palp terminal segment triangular, sides rounded, lateral angle acute, medial angle nearly 90°, width = 2.5 x length. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90°, length = 0.6 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7o). Mentum with plate broadly triangular, length = 0.5 x width, sides concave (similar to Fig. 8h); ridge medial extension short, blunt, projecting.

Pronotal disc puncture size = 0.75 x facet, separated by 1 to 2 diameters; laterally puncture size = 1 x facet, separated by 1 to 2 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII present at base and apical half, often obscured by microreticulation and interval punctation; strial puncture size at base = pronotal disc puncture, gradually becoming finer posteriorly; interval punctures fine, often obscured by microreticulation.

Prosternum strongly keeled and pinched anteriorly; with (female) or without (male) foveate punctures in front of

procoxa; coxal lines slightly arched, length = 0.5 x sternal length, lines barely surpassing coxae, length = basal width; prosternal plate flat, apical width = 0.8 to 1.0 x basal width; base concave.

Mesosternum basal width = 3 x mesocoxal line length; coxal lines straight; base broadly sinuate. Metasternum coxal lines meet at middle, often crenate or punctate, recurved; coxal lines extend 0.5 distance to posterior lateral angle; sternum shining, medial punctures fine, coarse lateral punctures obscured by strong microreticulation.

First visible abdominal ventrite with coxal lines reaching 0.33 to 0.5 distance to posterior edge; broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe weakly arched, apically rounded; internal sac without noticeable sclerotized structures; flagellum swollen at basal half, narrow on apical half, tip flared, length = 2 x median lobe length (Fig. 87a); base of flagellum straight and swollen, sclerite at base elongate, parallel-sided (Fig. 87b-d) (4 dissected).

Female genitalia with spermathecal head arched, kidney-shaped; tail narrowed, angled onto itself (Fig. 87e) (2 dissected).

Stridulatory files not present on occipital region of female heads; males had heads retracted, presence unknown. Females with foveate punctures on prosternum in front of procoxae; males lack these punctures.

Variation: The size and amount of connection between the elytral spots vary. On some specimens the elytra are banded, others are spotted. The free pronotal spot remained consistent throughout the specimens studied. There was no indication that this spot is a fusion of 2 spots as seen on *I. episcaphulinus* Gorham.

On specimens from Guatemala and Panama, the elytral spots form a straight transverse line. On specimens from Colombia and one from Panama, the elytral spots form a transverse, anteriorly convex arch.

Type: The lectotype (here designated) *Ischyrus collatinus* Crotch label data: "/[blue paper] TYPE/ [green paper] Nova Gran/ Type collatinus/ [red] LECTOTYPE Ischyrus collatinus Crotch des. P. E. Skelley 1993/" [CUMZ, examined]. Sex not determined.

Specimens examined: The lectotype and 18 specimens, representing 16 collection records, were studied (see Appendix C for specific data).

Distribution: Guatemala, Nicaragua (Kuhnt 1909), Panama, and Colombia (Fig. 125).

Etymology: *collatus*: Latin = gathered together, collected. Possibly, this species was named for the single, transversely linear pronotal spot, unique to this species.

Taxonomic notes: The lectotype, from the Crotch Collection, was chosen because Crotch made no indication that he saw only one specimen.

Remarks: *Ischyrus collatinus* is similar to *I. episcaphulinus* and *I. pictus* in body shape and basic color pattern. The number and shape of the free pronotal spots will separate these species: *I. episcaphulinus* has 2 rectangular free pronotal spots; *I. pictus* has 2 circular free pronotal spots.

References: Blackwelder 1945:465; Gemminger & Harold 1876:3690; Gorham 1887:45; Kuhnt 1909:63; 1911:42.

Ischyrus cordiformis Skelley new species

(Figs. 76, 88, 126)

Diagnosis: Recognized by large triangular central elytral fascia, and heart-shaped central pronotal spot, bilobed posteriorly, pointed anteriorly.

Description: Length 6.2-7.9 mm; Width: 3.2-4.2 mm. Body elongate, widest at basal third of elytra; microreticulate, feebly shining; orange-red with black pattern (Fig. 76).

Head black, occasionally with orange-red epistome. Pronotum anteriorly with narrow black margin between eyes; base with black margin on medial half, each end of black margin with a spot; one free lateral spot on each side; disc with a pair of fused spots, connected with anterior margin, appearing like an inverted heart. Scutellum black. Each elytron with black epipleural fold; free subhumeral spot; large, trilobed scutellar spot connected broadly to base and suture; suture margined with black; large triangular central spot, from basal third nearly to apex, widest anteriorly, acute posteriorly at suture, sides undulate. Venter black, except for orange-red lateral prothorax and lateral abdominal ventrites. Legs orange-red, base of tibia dark; palpi brown.

Head dorsal distance between eyes = 2 x eye width; ocular striae reaching 0.75 to 1.0 distance to anterior angle of eye; vertex puncture size = 0.75 x facets, separated by 2 to 3 diameters; epistome puncture size = 0.5 x facet, separated by 1 diameter. Antenna reaching middle of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere X wider than antennomere IX, wider than antennomere XI (similar to Fig. 6l).

Maxillary palp terminal segment triangular, securiform, basally rounded, medial angle nearly 90°, lateral angle acute, length = 0.4 x width. Labial palp terminal segment elongate, almost triangular, extended on medial side, rounded base, length = 0.4 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7q). Mentum with plate triangular, length = 0.75 x width, apical sides straight or outwardly curved, ridge medial extension acute, projecting (similar to Fig. 8a).

Pronotal disc puncture size = 0.75 x facet, separated by 2 to 3 diameters; denser laterally, separated by 1 to 2 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII present at base and apical half; strial punctures at base = 2 x pronotal disc punctures, gradually becoming finer posteriorly; intervals finely punctate.

Prosternum strongly keeled and pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa; coxal lines straight, length = 0.4 to 0.5 x sternal length, lines barely surpassing coxae, length = 0.75 x basal width; prosternal plate slightly convex, apical width = 0.5 x basal width; base concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight; base sinuate. Metasternum coxal lines weakly meet at middle, if at all, recurved; coxal lines extend 0.25 to 0.33 distance to posterior lateral angle; sternum with medial punctures fine; few coarse lateral punctures weakly impressed, obscured by microreticulations.

First visible abdominal ventrite with coxal lines reaching 0.25 to 0.33 distance to posterior edge; rounded between metacoxae; medially with fine punctures; coarse punctures laterally.

Male genitalia with median lobe strongly arched, apically truncate, slightly constricted just before the tip; internal sac without noticeable sclerotized structures; flagellum hair-like, length = 1.7 x median lobe length (Fig. 88a); base of flagellum gradually curved, sclerite at base claw-shaped (Fig. 88b-d) (2 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail swollen, weakly curved to tightly curved like an inverted question mark, "¿" (Fig. 88c) (9 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Males with prosternum slightly expanded onto pronotal epipleuron, reaching 0.33 distance from prosternal-pronotal epipleuron suture to lateral edge; females with suture in front of coxae obscured for half distance to anterior margin, not expanded. Females with a few foveate punctures on prosternum in front of procoxae, weakly impressed, obscure; males lack these punctures.

Variation: The Brazilian specimen has the prosternum swollen above the pinch, and a red epistome. All other specimens studied have the prosternum weakly developed and the head entirely black. Only the Venezuelan specimen has the subhumeral spot large and touching the scutellar spot.

Type material: The male holotype of *Ischyrus cordiformis* Skelley label data: "/San Esteban Ven., nr. Puerto Cabelle, Nov. 30, 1933, P. J. Anduze/ Chicago Nat. Hist. Mus. purchase ex. Ross Arnett, Jr./" [FMNH]. The female allotype label data: "/Villavicencio, Meta, Colomb./ VII:14:38/ Col. & pres. by Henry S. Dybas/" [FMNH]. Including the holotype and allotype, a total of 19 specimens, representing 18 collection records, was studied (see Appendix C for specific data).

Distribution: Southern Central America and northern South America (Fig. 126).

Etymology: *cordate*: Latin = heart; *formis*: Latin = shape. This name refers to the inverted heart-shaped spot on the pronotum.

Remarks: *Ischyrus cordiformis* superficially resembles *I. tripunctatus*. *Ischyrus tripunctatus* lacks pronotal basal spots and has the central pronotal spot free; *I. cordiformis* has pronotal basal spots and the central spot is narrowly connected to the anterior margin.

Ischyrus distinguendus Lacordaire

(Figs. 6a, 7a, 8a, 15e, 27, 89, 125)

Ischyrus distinguendus Lacordaire 1842:111.

Episcaphula distinguenda Dupont, *in* Lacordaire 1842:111 [*nomen nudum*].

Micrischyrus distinguendus (Lacordaire) 1842, Alvarenga 1994:13.

Diagnosis: Unique in *Ischyrus* by the pronotum having only 3 basal spots, and a single large free spot on each elytron.

Description: Length: 7.2-9.3 mm; Width 4.2-5.1 mm. Body elongate, dorsally rounded, widest at basal third of elytra; shiny with weak microreticulations; yellow-tan to orange-red with black color pattern (Fig. 27).

Head edged in black, frons and vertex paler. Pronotum edged in black, with 3 large basal spots connected to each other at base; narrow black anterior margin between eyes. Scutellum black. Each elytron with fine black suture and lateral edge; epipleural fold basally orange and edged in black; small free scutellar spot well separated from base and suture; elongate subhumeral spot connected to base; large, free, anteriorly bilobed central spot. Venter pale except for black margins of sclerites; episterna and epimera of meso- and metathorax black. Appendages black; tarsi and palpi paler.

Head shining, width between eyes = 2.3 x eye width; ocular striae reaching anterior angle of eye; vertex puncture size = 0.5 to 0.75 x facet, separated by 1 to 3 diameters; epistome puncture size = 0.5 to 0.75 x facet, separated 0.5 to 1.0 diameter. Antenna reaching middle of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres X to XI asymmetrical; antennomere XI transversely circular, subtriangular (Fig. 6a).

Maxillary palp terminal segment triangular, securiform, basally rounded, apical angles nearly 90°, length = 0.66 x

width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = 0.75 x width. Labial palp width = 0.5 x maxillary palp width (Fig. 7a). Mentum with plate triangular, length = 0.75 x width, apical sides straight or outwardly curved, ridge medial extension blunt (Fig. 8a).

Pronotal disc puncture size = 0.5 to 0.75 x facet, separated by 1 to 3 diameters; lateral punctures smaller and denser, separated by 1 to 2 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII weak or absent, indicated by few fine punctures at base; strial puncture size = pronotal disc punctures; intervals finely punctate.

Prosternum weakly keeled and pinched anteriorly; with few obscure foveate punctures in front of procoxa; coxal lines straight, length = 0.5 x sternal length, barely surpassing coxae, line length = 0.8 x basal width; prosternal plate flat, apical width = 0.5 x basal width; base shallowly concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines divergent anteriorly; base sinuate, lobed medially. Metasternum coxal lines recurved, meeting medially in a tooth (Fig. 15e); coxal line extends 0.5 distance to posterior lateral angle; sternum with medial punctures fine, few scattered coarse lateral punctures.

First visible abdominal ventrite with coxal lines reaching 0.5 to posterior edge; broadly rounded between metacoxae, almost truncate; coarse lateral punctures, fine medially.

Male genitalia with median lobe moderately arched, apically truncate, slightly constricted just before tip; internal sac without noticeable sclerotized structures; flagellum long and narrow, flattened and ribbon-like at basal 0.5, length = median lobe length (Fig. 89a); base of flagellum straight, sclerite at base claw-shaped (Fig. 89b-d) (4 dissected).

Female genitalia with spermathecal head oval, often with top-knot; tail swollen, weakly curved like an inverted question mark, "¿" (Fig. 89e) (4 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Females have few weak foveate punctures on prosternum in front of procoxa; males, at most, with a couple of punctures near the procoxae.

Variation: The color pattern was constant in all specimens studied.

Type: The lectotype (here designated) of *Ischyrus distinguendus* Lacordaire label data: "/Mexique/ Distinguendus Lac./ Type/ Ex-Musaeo Mniszech/ [red] TYPE/ [pale blue] Muséum Paris ex Coll. R. Oberthür 1952/ [red] LECTOTYPE Ischyrus distinguendus Lacordaire des. P. E. Skelley 1993/" [MNHN, examined]. Sex not determined.

Specimens examined: The lectotype and 22 specimens, representing 17 collection records, were studied (see Appendix C for specific data).

Distribution: Known only from Honduras and Veracruz, Mexico (Fig. 125).

Etymology: *distinguo*: Latin = separate, discriminate. This species was probably named because of its unique, easily distinguished color pattern.

Taxonomic notes: A lectotype was designated because Lacordaire gave no indication that he studied only one specimen. In the description, Lacordaire stated that Dupont sent a specimen to him under the name "*Episcaphula distinguenda.*" He placed it in *Ischyrus*, retaining the species name. The combination, "*Episcaphula distinguenda*," does not occur elsewhere in the literature, and is considered to be a *nomen nudum*.

Remarks: One specimen labeled as Biologia Centrali-Americana material [NHML], was determined as "*Mycotretus ornatus* var." but was not mentioned in the Biologia Centrali-America (Gorham 1887).

References: Blackwelder 1945:465; Crotch 1876: (57) 433; Gemminger & Harold 1876:3690; Gorham 1887:45, t.2 f.23; Kuhnt 1909:63; 1911:42.

Ischyrus dunedinensis Blatchley

(Figs. 40, 90, 127)

Ischyrus dunedinensis Blatchley 1917:279, new name for *I. tripunctatus* Blatchley 1917.

Ischyrus tripunctatus Blatchley 1917:238, not *I. tripunctatus* Crotch 1873b:144.

Micrischyrus dunedinensis (Blatchley) 1917, Alvarenga 1994:13.

Diagnosis: Recognized by 3 free pronotal spots in a transverse row, and the linear free lateral elytral spot is longer than the central elytral spot.

Description: Length: 4.9-7.0 mm; Width: 2.4-3.1 mm. Body elongate, widest at basal third of elytra; dull, strongly microreticulate; punctures coarse to foveate and distinctly impressed; orange with black pattern (Fig. 40).

Head black with an orange spot at each eye; spot often enlarged making black central mark hourglass-shaped. Pronotum with 3 free spots in a transverse row; lateral spots 0.25 to 0.5 size of central spot; central spot large, diameter = 0.5 x or more pronotal length; base with narrow black margin on medial half. Scutellum dark orange to black. Each elytron with orange basal half of epipleural fold; subhumeral spot elongate, touching or nearly touching base; scutellar spot large, rounded, broadly attached to base and suture; sutural margin black; longitudinally elongate central spot connected to suture throughout length, widest anteriorly, truncate posteriorly; lateral spot longitudinally elongate, linear, as long or longer than central spot. Venter black with orange

anterior half of prothorax and lateral abdominal ventrites. Legs black; palpi and tarsi brown.

Head dorsal distance between eyes = 2.5 x eye width; ocular striae reaching 0.75 distance to anterior angle of eye, extended forward to apical angle as row of coarse punctures; vertex puncture size = 1.5 x facet, separated by 1 diameter; epistome puncture size = 0.75 to 1.0 x facet, separated by 1 diameter. Antenna reaching middle of pronotum; antennomere III as long as next 3 antennomere combined; antennomere IX can be narrower than X; antennomeres X to XI asymmetrical, often appearing symmetrical; antennomere XI elongate transversely (similar to Fig. 6e).

Maxillary palp terminal segment triangular to semicircular, securiform, basally rounded, apical angles 90°, length = 0.75 x width (similar to Fig. 7e). Labial palp terminal segment elongate, extended on medial side, rounded basally, length = width (similar to Fig. 7a). Labial palp width = 0.5 x maxillary palp. Mentum with plate broadly triangular, all sides straight and equal in length, ridge medial extension acutely pointed (similar to Fig. 8g).

Pronotal disc puncture size = 1 x facet, separated by 2 to 3 diameters; lateral punctures denser, separated by 1 diameter. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII weak, visible on apical half; strial puncture size = pronotal disc puncture; intervals finely punctate.

Prosternum not keeled and weakly pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa; coxal lines straight, length = 0.5 x sternal length, lines barely surpassing coxae, length = 0.75 x basal width; prosternal plate flat, apical width = 0.6 to 0.75 x basal width; base shallowly concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight; base shallowly sinuate. Metasternum coxal lines not or barely meeting at middle, weakly recurved; coxal lines extend 0.13 to 0.35 distance to posterior lateral angle; line behind mesocoxa deep, groove-like; sternum with medial punctures fine, few coarse lateral punctures weakly impressed.

First visible abdominal ventrite with coxal lines reaching 0.25 distance to posterior edge; broadly rounded between metacoxae; coarse punctures laterally, finely punctate medially.

Male genitalia with median lobe weakly arched, apically truncate, slightly constricted just before tip; internal sac without noticeable sclerotized structures; flagellum long and narrow, length = 1.5 x median lobe length (Fig. 90a); base of flagellum angled, sclerite at base claw-shaped (Fig. 90b-d) (4 dissected).

Female genitalia with spermathecal head kidney-shaped, with top-knot; tail swollen, weakly curved (Fig. 90e) (3 dissected).

Stridulatory files present on occipital region of male heads; absent on females. Females have foveate punctures on the prosternum in front of procoxae; males lack these punctures.

Variation: The pronotal free central spot is variable in shape; circular, hexagonal, quadrate, or triangular. The size of this spot varies from 0.5 to 0.9 pronotal length.

The central and lateral spots of the elytra occasionally touch at their ends. In one specimen the lateral elytral spot and humeral spot are connected forming a single linear spot.

Type: The holotype (by monotypy) of *Ischyrus dunedinensis* Blatchley label data: "/92/ Type/ Dunedin, Fla, W.S.B. Coll. 2-V-16/ *Ischyrus dunedinensis* sp.nov./" [PURC, examined]. Sex not determined.

Specimens examined: The holotype and 86 specimens, representing 60 collection records, were studied (see Appendix C for specific data).

Distribution: Known only from the U.S.A., Florida and extreme southeastern Georgia (Fig. 127).

Etymology: This species was originally described as *I. tripunctatus* for the 3 pronotal spots. A few pages following the description, Blatchley renamed the species *I. dunedinensis* meaning "from Dunedin", the type locality.

Taxonomic notes: The name *I. tripunctatus* was preoccupied by Crotch (1873b:144). Blatchley was informed of his mistake soon after his description, so he renamed it *I. dunedinensis*. Alvarenga (1994:13) incorrectly credits Leng (1920:201) with the name.

The Leng Catalog (1920:201) listed *I. dunedinensis* as occurring in Indiana, Texas, and Florida. The origin of the records for Indiana and Texas is unknown. They are most likely in error since no specimens have been studied from outside the extreme southeastern U.S.A., and there has been no other citation for these localities.

Biology: The type specimen was collected from a bromeliad, *Tillandsia utriculata* Linnaeus. Most of the known specimens have been collected in light traps at various localities in Florida, from the central ridge to the beach dunes. All known localities have scrub vegetation, which grows in sandy soils and is generally characterized as xeric. The fungal host of this species is unknown.

Remarks: *Ischyrus dunedinensis* is most similar to *I. frontalis*, and can be separated by the size of the lateral elytral spots: *I. frontalis* has the spot small and elongate, length less than half the central elytral spot length; *I. dunedinensis* has a linear lateral spot longer than the central spot.

References: Boyle 1956:133,136; Leng 1920:201; Skelley 1988b:61-63; 1990:illustration; 1994:490-491; Skelley & Goodrich 1989:349-354; Skelley *et al.* 1991:65.

Ischyrus elegantulus Lacordaire

(Figs. 66-67, 91)

Ischyrus elegantulus Lacordaire 1842:121-122.
Micrischyrus elegantulus (Lacordaire) 1842, Alvarenga 1994:13.

Diagnosis: Characterized by having 2 free pronotal spots, no basal pronotal spots, and scutellar spot narrowly connected to the elytral base, connection less than half the width of the spot.

Description: Length 4.2-4.9 mm; Width: 2.4-2.8 mm. Body elongate-oval, widest at basal third of elytra; microreticulate; orange-yellow with black pattern (Fig. 66).

Head orange with epistome edge black. Pronotum completely edged with black, width at base; 2 free spots on disc. Scutellum black. Each elytron with orange epipleural fold; scutellar and central spot elongate, obliquely angled forward to connect with suture; sutural margin black; subhumeral and lateral spots free, or connected with scutellar and central spots, respectively. Venter black, lateral prothorax occasionally orange. Appendages black; tarsi, palpi, and antennal base brown.

Head dorsal distance between eyes = 2.5 x eye width; ocular striae reaching 0.5 distance to anterior angle of eye, continue weakly forward as a row of punctures; vertex puncture size = 1 x facet, separated by 1 to 2 diameters; epistome puncture size = 0.5 x facet, nearly coalescing. Antenna reaching base of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere XI subcircular, narrower than antennomere X (similar to Fig. 6l).

Maxillary palp terminal segment triangular, sides rounded, lateral angle acute, medial angle nearly 90°, length = 0.5 x width. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90°, length = 0.8 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7o). Mentum with plate broadly triangular, length = 0.5 x width, sides concave (similar to Fig. 8e); ridge medial extension short, acutely rounded.

Pronotal disc puncture size = 1 x facet, separated by 1 to 2 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII present at base and apical half, often obscured by interval punctation; strial puncture size at base = 2 x pronotal disc punctures, gradually becoming finer posteriorly; intervals finely punctate, well defined laterally.

Prosternum strongly keeled and pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa, punctures often weakly impressed; coxal lines nearly straight, length = 0.6 to 0.75 x sternal length, lines barely surpassing coxae, length = basal width; prosternal plate flat, apical width = 0.8 to 1.0 x basal width; base concave.

Mesosternum basal width = 3 x mesocoxal line length; coxal lines straight; base broadly sinuate. Metasternum coxal lines meeting at middle, often crenate, recurved; coxal lines extend 0.5 distance to posterior lateral angle; sternum shining, medial punctures fine, few coarse lateral punctures obscured by strong microreticulation, dulled.

First visible abdominal ventrite with coxal lines reaching 0.5 distance to posterior edge; broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe short and straight, apically rounded; internal sac with paired dark patches near median lobe; flagellum weakly swollen at basal half, narrowed and thin apically, length = 2 x median lobe length (Fig. 91a); base of flagellum straight, sclerite at base elongate, nearly parallel-sided (Fig. 91b-d) (4 dissected).

Female genitalia with spermathecal head kidney-shaped; tail narrow, looped (Fig. 91e) (5 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Males lacking prosternal foveate punctures in front of procoxae; females with few punctures, often weakly impressed.

Variation: Little variation was observed in size, shape, and color pattern. Elytral spots are occasionally connected to form bands.

A female from Yucatan, Mexico, has coarser punctation, 2 basal pronotal spots, scutellar and central spots broadly connected to the suture, and the subhumeral spot elongate, connected to base laterally (Fig. 67). This specimen may represent a distinct taxon. More specimens and study of male genitalia are needed before any separation can be made. At present, it is considered a variety of *I. elegantulus*.

Type: The lectotype (here designated) of *Ischyrus elegantulus* Lacordaire label data: "/Colombie/ Elegantulus Lac./ Type/ Ex-Musaeo Mniszech/ [red] TYPE/ [pale blue] Muséum Paris ex Coll. R. Oberthür 1952/ [red] LECTOTYPE Ischyrus elegantulus Lacordaire des. P. E. Skelley 1993/" [MNHN, examined]. Sex apparently male, not dissected.

Specimens examined: The lectotype and 22 specimens, representing 23 collection records, were studied (see Appendix C for specific data).

Distribution: Colombia and Panama to Nicaragua (Crotch 1873b) and Mexico.

Etymology: *elegantulus*: Latin = very fine, elegant, having grace, beauty. This name refers to the beautiful color pattern of this species.

Taxonomic notes: A lectotype was chosen because Lacordaire made no indication that only one specimen was studied. The specimen chosen is in the Oberthür Collection, fits the description, and is re-

ported to have been studied by Lacordaire (N. Berti, pers. com.).

Remarks: Crotch (1873b) reported this species from Nicaragua. I have not been able to substantiate this record.

Ischyrus elegantulus is similar to *I. chacojae* and *I. malleus*. They can be distinguished from *I. elegantulus* by their large scutellar spot which is broadly connected to the elytral base.

References: Blackwelder 1945:465; Crotch 1873b: 144; 1876:(50)426; Gemminger & Harold 1876:3690; Gorham 1887:40; Guérin-Méneville 1829-1838[1844]:310; Kuhnt 1909:63; 1911:42.

Ischyrus ephippiatus Gorham

(Figs. 7p, 8j, 58, 92)

Ischyrus ephippiatus Gorham 1887:43.

Micrischyrus ephippiatus (Gorham) 1887, Alvarenga 1994:13.

Diagnosis: Recognized by having the basal half of pronotum black, anterior pronotal markings often connecting with black base, wide central eltyral band, no apical elytral spot, and strongly constricted prosternal pinch.

Description: Length: 4.4-5.5 mm; Width: 2.3-2.7 mm. Body elongate, parallel-sided, widest at basal third of elytra; weakly microreticulate, shining; body red to orange with black pattern; elytra yellow with black pattern (Fig. 58).

Head dark red to orange. Pronotum dark red with black basal half and 2 elongate, parallel spots connected to anterior margin; anterior spots may connect with the black basal half (spots fused to each other and basal half on the lectotype). Scutellum dark red. Each elytron with yellow-orange epipleural fold; scutellar spot small (lacking on the lectotype), broadly connected to base and suture; suture with wide black margin; central band appearing as 2 fused longitudinally elongate spots, not connected to lateral margin, occasionally free from suture. Venter black to dark red. Legs black, tarsi and palpi red-brown.

Head dorsal distance between eyes = 4.0 x eye width; ocular striae reaching anterior angle of eye; vertex medial puncture size = 0.5 x facet, separated by 1 to 2 diameters; vertex lateral puncture size = 0.75 to 1.0 x facet, separated by 1 to 2 diameters; epistome puncture size = 0.75 x facet, separated by 0.5 to 1.0 diameter. Antenna reaching base of pronotum; antennomere III as long as next 2 antennomere combined; antennomeres IX to XI symmetrical; antennomere XI oval, transverse (similar to Fig. 6i).

Maxillary palp terminal segment triangular, sides rounded, lateral angle acute, medial angle nearly 90°, width = 2 x length. Labial palp terminal segment narrowed, rounded laterally and obtusely angled, acutely angled medially, length = width. Labial palp width = 0.5 x maxillary palp width (Fig. 7p). Mentum with plate triangular, length = width, all sides nearly equal in length, sides straight; ridge rounded anteriorly, without medial extension; lateral pores well removed from base (Fig. 8j).

Pronotal disc puncture size = 0.5 x facet, separated by 2 to 3 diameters; lateral puncture size = 1 x facet, separated 1 to 2 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII nearly complete but indistinct at ends, visible at middle; strial puncture size at base = lateral pronotal disc puncture, impressed, gradually becoming finer posteriorly; intervals finely punctate.

Prosternum keeled and strongly pinched anteriorly, swollen above pinch; lateral prosternum-pronotum epipleural suture deep, groove-like; with (female) or without (male) foveate punctures in front of procoxa; coxal lines sinuate, slightly concave at middle, length = 0.6 x sternal length, lines surpassing coxae, length greater than or equal to basal width; prosternal plate narrowed anteriorly, slightly convex, apical width = 0.6 x basal width; base shallowly concave.

Mesosternum basal width = 3 x mesocoxal line length; coxal lines straight, parallel; base truncate to weakly sinuate. Metasternum coxal lines meeting at middle, often indistinct, not recurved; coxal lines extend 0.5 distance to posterior lateral angle; sternum shining, medial punctures fine, lateral microreticulation with few coarse punctures.

First visible abdominal ventrite with coxal lines reaching 0.5 distance to posterior edge; broadly rounded between metacoxae, nearly truncate; with coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe short, moderately arched, apically truncate, slightly constricted just before tip; internal sac without noticeable sclerotized structures; flagellum long and hair-like, length = 3.5 x median lobe length (Fig. 92a); base of flagellum straight, sclerite at base ring-shaped (Fig. 92b-d) (6 dissected).

Female genitalia with spermathecal head oval to cone-shaped; tail weakly swollen and curved (Fig. 92e) (5 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Males lack, or have a few, foveate punctures on prosternum in front of procoxae; females with many foveate punctures covering the surface of prosternum in front of procoxae.

Variation: The lectotype of *I. ephippiatus* differs from other specimens studied in lacking the scutellar spot and having a black pronotum with pale anterior angles.

The Bolivian specimen has the head dark red with an orange basal spot and the central elytral spots free from the sutural margin. In the other specimens the head is one color and the central elytral spots touch the sutural margin.

The series of specimens from Panama vary in the size and extent that the anterior pronotal spots connect with the black basal half. The majority of specimens have the spots touching the basal half, leaving a pale elongate mark between them. One specimen has the anterior spots free from the basal half.

Type: The lectotype (here designated) of *Ischyrus ephippiatus* Gorham label data: "/[red circle on white paper] Type/ Bugaba, Panama, Champion./ Ischyrus ephippiatus/ B.C.A., Col., VII, Ischyrus/ [red] LECTOTYPE Ischyrus ephippiatus Gorham des. P. E. Skelley 1993/" [NHML, examined]. Sex apparently male, not dissected.

Specimens examined: The lectotype and 13 specimens, representing 12 collection records, were studied (see Appendix C for specific data).

Distribution: Panama and Bolivia.

Etymology: *ephippium*: Latin = saddle. This species was named for the saddle-shaped central elytral spot.

Taxonomic notes: The lectotype of *Ischyrus ephippiatus* Gorham was chosen because Gorham stated he saw 2 specimens. Only one of these, the lectotype, was located and studied.

This group of specimens may represent separate taxa (see Variation). More material is needed to substantiate the differences observed. At present, they are considered varieties of the same species.

Remarks: *Ischyrus ephippiatus* is most similar to *I. auriculatus* in color pattern. *Ischyrus auriculatus* differs in having an apical elytral spot and lacks the strongly pinched prosternum.

References: Blackwelder 1945:465; Kuhnt 1909:63; 1911:42.

Ischyrus episcaphulinus Gorham

(Figs. 64, 93)

Ischyrus episcaphulinus Gorham 1887:44, t.3 f.7.
Micrischyrus episcaphulinus (Gorham) 1887, Alvarenga 1994:13.

Diagnosis: Characterized by having 2 free pronotal spots transverse and rectangular, 3 basal pronotal spots, lateral elytral spots connected to central spot, and scutellar spot not connected to elytral base.

Description: Length: 5.3-6.1 mm; Width: 3.0-3.4 mm. Body elongate-oval, widest at basal third of elytra; microreticulate, feebly shining; orange-yellow with black pattern (Fig. 64).

Head orange with black base and epistome margin. Pronotum with 2 free rectangular, transverse spots; 3 basal spots. Scutellum black. Each elytron with yellow epipleural fold yellow; elongate subhumeral spot connected to base; large scutellar spot broadly connected to suture, not connected to base; sutural margin black; central and lateral spots fused, band-like, sometimes connected to suture; apical spot free. Venter mostly orange with black sclerite margins, amount of black variable. Appendages black; palpi, tarsi, and base of antenna brown.

Head dorsal distance between eyes = 2.5 x eye width; ocular striae reaching 0.7 to 0.8 distance to anterior angle of eye; vertex puncture size = 1 x facet, separated by 1 diameter; epistome puncture size = 0.5 to 0.75 x facet, nearly coalescing. Antenna reaching base of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere XI subcircular narrower than antennomere X (similar to Fig. 6l).

Maxillary palp terminal segment triangular, sides rounded, lateral angle acute, medial angle nearly 90°, width = 2 x length. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90°, length = 0.8 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7o). Mentum with plate broadly triangular, length = 0.5 x width, sides concave (similar to Fig. 8h); medial extension short, blunt, projecting.

Pronotal disc puncture size = 1 x facet, separated by 0.5 to 1 diameter. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII present at base, obscured by interval punctation; strial punctures at base = 2 x pronotal disc punctures, gradually becoming finer posteriorly; interval punctures fine, impressed, distinct.

Prosternum strongly keeled and pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa; coxal lines weakly arched, length = 0.5 x sternal length, lines barely surpassing coxae, length = basal width; prosternal plate weakly convex, apical width = 0.75 x basal width; base concave.

Mesosternum basal width = 3 x mesocoxal line length; coxal lines straight; base broadly sinuate. Metasternum coxal lines meet at middle, weakly crenate, recurved; coxal lines extend 0.5 distance to posterior lateral angle; sternum shining medially, punctures finely impressed; few coarse lateral punctures obscured by strong microreticulation.

First visible abdominal ventrite with coxal lines short, weak, barely surpassing coxa; broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe weakly arched, apically rounded; internal sac without noticeable sclerotized structures; flagellum long and narrow, apex flared, length = 2 x median lobe length (Fig. 93a); base of flagellum straight, sclerite at base elongate claw-shaped, parallel-sided (Fig. 93b-d) (1 dissected).

Female genitalia with spermathecal head kidney-shaped; tail narrow, angled onto itself (Fig. 93e) (1 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Female with weakly impressed

foveate punctures on prosternum in front of procoxae; male lacked these punctures.

Variation: The holotype, illustrated by Gorham (1887), has the central elytral band broad, the other 2 specimens studied have the band much narrowed. This band is almost separated into 2 spots on the Mexican specimen.

Type: The holotype (by monotypy) of *Ischyrus episcaphulinus* Gorham label data: "/[red circle on white paper] Type/ Zapote, Guatemala, G.C.Champion/ Ischyrus episcaphulinus/ B.C.A., Col., VII, Ischyrus/" [NHML, examined]. Sex not determined.

Specimens examined: The holotype and 2 specimens, representing 3 collections, were studied. Label data: **Guatemala** [1, NHML]; **Mexico**, Chiapas, Mpio. Mapastepec, 11.5 mi. N. Mapastepec, 12-VIII-1991, P. W. Kovarik [1, PESC].

Distribution: Guatemala and Mexico.

Etymology: *epi*: Greek = upon, on; *scaphion*: Greek = cup-shaped like a boat. The name refers to the body shape of this species. As Gorham stated, it is "distinguished by the very convex oval form."

Remarks: Pronotal markings are intermediate between *I. collatinus* and the remainder of the species with the "2 free-3 basal" pronotal spot pattern. The shape of the free pronotal spots is consistently different between the species: 2 circular spots in *I. pictus*; 1 transversely linear spot in *I. collatinus*.

References: Blackwelder 1945:465; Kuhnt 1909:63; 1911:42.

Ischyrus erosus Skelley new species

(Figs. 78, 94)

Diagnosis: Characterized by having 4 free pronotal spots in a transverse row, a spot at each pronotal hind angle, 2 basal pronotal spots separated by distance greater than 2 free central pronotal spots, central elytral band completely divided by a transverse orange mark, and its genitalic characters.

Description: Length 7.0 mm; Width: 3.4 mm. Body elongate, widest at basal third of elytra; microreticulate, dull; orange-red and pale yellow with black pattern (Fig. 78).

Head orange-red. Pronotum completely edged with black, widest on base; 2 triangular anterior spots; 2 triangular basal spots widely separated; one small spot on each posterior angle, appearing as a thickening in the black margin; 4 free pronotal spots in anteriorly concave arch, lateral spots smaller than central spots. Scutellum orange-red with black margin. Each elytron with orange-red epipleural fold, edged in black; subhumeral spot free; free scutellar spot larger than subhumeral spot; suture finely edged in black; central band divided in middle by transverse orange-red band; apical spot connected to apical and sutural margin, separated from apical angle by orange-red spot. Venter orange-red. Legs orange-red, slightly darker than venter; tibia with black base; palpi pale brown.

Head dorsal distance between eyes = 2.5 x eye width; ocular striae reaching anterior angle of eye; vertex puncture size = 0.5 x facet, separated by 2 to 3 diameters; epistome puncture size = 0.25 x facet, separated by 1 diameter. Antenna reaching basal 0.5 of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere X wider than antennomere IX & XI; similar to Fig. 6m, except antennomere XI subcircular, wider than long.

Maxillary palp terminal segment triangular, securiform, basally rounded, apical angles nearly 90°, length = 0.66 x width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = 0.75 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7a). Mentum with plate triangular, length = 0.75 x width, apical sides straight (similar to Fig. 8a), ridge medial extension acute, weakly projecting.

Pronotal disc puncture size = 0.75 x facet, separated by 2 to 3 diameters. Scutellum pentagonal, length = 0.6 x width. Each elytron with 7 complete striae; stria VIII present at base and apical half; strial puncture size at base = 1.5 x pronotal disc punctures, gradually becoming finer posteriorly; intervals finely punctate, distinct.

Prosternum weakly keeled and pinched anteriorly; without foveate punctures in front of procoxa; coxal lines straight, arched inward at the ends, length = 0.6 x sternal length, lines barely surpassing coxae, length = basal width; prosternal plate flat, apical width = 0.75 x basal width; base concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight; base sinuate. Metasternum coxal lines not meeting at middle, recurved; coxal lines extend 0.5 distance to posterior lateral angle; sternum feebly shining, medial punctures fine; lacking coarse lateral punctures, strongly microreticulate.

First visible abdominal ventrite with coxal lines reaching 0.5 distance to posterior edge; broadly rounded between metacoxae; medially with fine obscure punctures, if any; coarse punctures laterally.

Male genitalia with median lobe weakly arched, narrowed and apically rounded; internal sac speckled and with paired dark patch midway between the median lobe and flagellar base; flagellum thick, gradually narrowing toward apex, length = median lobe length (Fig. 94a); base of flagellum weakly curved, sclerite at base rounded, blunt (Fig. 94b-d) (1 dissected).

Female unknown.

Presence of stridulatory files on occipital region of head unknown (head retracted).

Type material: The unique male holotype of *Ischyrus erosus* Skelley label data: "/La Chorrera, 12-V-12, Pan., Aug. Busck/ [folded label/ Ischyrus insolens Crotch/" [USNM].

Distribution: Known only from Panama Province, Panama.

Etymology: *erosus*: Latin = eaten away, corroded. This name was chosen because of the eroded black markings on the elytra.

Remarks: *Ischyrus erosus* is most similar to *I. insolens* and *I. fulmineus*. *Ischyrus erosus* has 2 basal pronotal spots, which are absent on *I. insolens*. *Ischyrus fulmineus* can be separated by the broad black connection of the central elytral marking between stria V & VI; the central elytral marking is completely divided in *I. erosus*.

Ischyrus frontalis Lacordaire

(Figs. 38-39, 95, 127)

Ischyrus frontalis Lacordaire 1842:127.
Micrischyrus frontalis (Lacordaire) 1842, Alvarenga 1994:14.
Ischyrus agnatus Crotch 1876:426-427(50-51), Gorham 1887:39.
Ischyrus agnathus Crotch 1876, *in* Kuhnt:1909:63 [misspelling].

Diagnosis: Recognized by having 3 free pronotal spots in transverse row, central elytral fascia broken into spots, and elongate lateral elytral spots less than half the length of the central spot.

Description: Length: 5.8-7.6 mm. Width: 2.8-3.7 mm. Body elongate, widest at basal third of elytra; microreticulate, dull; orange with black color pattern (Fig. 38-39).

Head orange with black basal spot. Pronotum with 3 free spots in transverse row; central spot larger than lateral spots, less than 0.5 total length of pronotum; often with fine black basal margin at medial half. Scutellum dark orange or black. Each elytron with orange epipleural fold; free subhumeral spot; large scutellar spot, broadly attached to base and suture; sutural margin black; longitudinally elongate central spot connected to suture throughout its length; longitudinally elongate lateral spot free, length = 0.5 x or less central spot length. Venter mostly orange with black margins, amount of black variable. Legs black, paler in teneral specimens; palpi and tarsi brown.

Head dorsal distance between eyes = 2.2 x eye width; ocular striae reaching 0.5 to 0.75 distance to anterior angle of eye, often finely extended forward to apical angle; vertex puncture size = 1 x facet, separated 1 to 3 diameters; epistome puncture size = 0.5 x facet, separated by 1 diameter. Antenna reaching middle of pronotum; antennomere III as long as next 3 antennomere combined; antennomere IX can be narrower than X; antennomeres X to XI asymmetrical, often weakly so and appearing symmetrical; antennomere XI transverse (similar to Fig. 6c).

Maxillary palp terminal segment triangular, securiform, basally rounded, angles nearly 90°, length = 0.66 x width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = 0.75 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7a). Mentum with plate triangular, length = 0.9 x basal width, sides convex, ridge medial extension acutely pointed (similar to Fig. 8g).

Pronotal disc puncture size = 1 x facet, separated by 1 to 2 diameters; lateral punctures separated by 0.5 diameter. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII weak, visible on apical half; strial puncture size = pronotal disc puncture; intervals finely punctate.

Prosternum keeled and pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa; coxal lines straight, length = 0.5 x sternal length, lines barely surpassing coxae, basal width = 0.8 to 1.0 x length; prosternal plate flat, apical width = 0.75 to 0.9 x basal width; base shallowly concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight; base shallowly sinuate. Metasternum coxal lines meet weakly at middle, if at all; coxal lines weakly recurved; line behind mesocoxa deep, groove-like; lines extend 0.33 distance to posterior lateral angle; sternum with medial punctures fine, few coarse lateral punctures.

First visible abdominal ventrite with coxal lines reaching 0.33 to 0.5 distance to posterior edge; rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe moderately arched, apically truncate, slightly constricted just before tip; internal sac without noticeable sclerotized structures; flagellum long and narrow, length = 2 x median lobe length (Fig. 95a); base of flagellum gradually curved, sclerite at base claw-shaped (Fig. 95b-d) (4 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail swollen, weakly curved (Fig. 95e) (4 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Females have foveate punctures on prosternum in front of procoxae; males lack these punctures.

Variation: There are 2 variations in the color pattern that are difficult to separate further. The first, including the lectotype, has the central elytral spot widest at the anterior end, and the lateral spot 2 times longer than wide (Fig. 38). The second has the central spot widest at the middle or posteriorly, and the lateral spot 3 times longer than wide (Fig. 39).

Some specimens have orange femora, others have black femora. Specimens with these variations are from scattered localities; some are from the same locality. This variation in color may simply be due to the specimen's age, some being teneral.

Type: The lectotype (here designated) of *Ischyrus frontalis* Lacordaire label data: "/[blue paper] TYPE/ TYPE frontalis Ch/ [red] LECTOTYPE Ischyrus frontalis Lacordaire des. P. E. Skelley 1993/" [CUMZ, examined]. The type locality is stated by Lacordaire to be Mexico. Sex not determined.

The lectotype (here designated) of *Ischyrus agnatus* Crotch label data: "/[blue paper] TYPE/ Nova Gr/ TYPE agnatus/ [red] LECTOTYPE Ischyrus agnatus Crotch des. P. E. Skelley 1993/" [CUMZ, examined]. Sex not determined.

Specimens examined: The 2 lectotypes and 14 specimens, representing 14 collection records, were studied (see Appendix C for specific data).

Distribution: Mexico through Central America to Colombia (Nova Granada) (Fig. 127).

Etymology: *frontalis*: Latin = frons, front, forehead. This species may have been named for the black basal spot on the forehead.

Taxonomic notes: A lectotype was chosen for both *I. frontalis* Lacordaire and *I. agnatus* Crotch because no indication was made in the original descriptions that only one specimen was seen. Gorham (1887: 39) stated he could not find any important differences between *I. frontalis* and *I. agnatus*. After studying the types of both species, I concur with his synonymy.

Remarks: *Ischyrus frontalis* is most similar to *I. dunedinensis* in color pattern. *Ischyrus dunedinensis* is distinguished by having the lateral elytral spots linear, and longer than the central spot.

References: *Ischyrus frontalis* Lacordaire: Blackwelder 1945:465; Crotch 1876:(50)426; Gemminger & Harold 1876:3690; Gorham 1887:39; Kuhnt 1909:63; 1911:42; Skelley & Goodrich 1989:349-354.

Ischyrus agnatus Crotch: Alvarenga 1994:14; Blackwelder 1945:465; Gemminger & Harold 1876:3690; Gorham 1887:39; Kuhnt 1909:63; 1911:42.

Ischyrus fulmineus Delkeskamp

(Figs. 77, 96, 128)

Ischyrus fulmineus Delkeskamp 1957:98, 107-108.
Micrischyrus fulmineus (Delkeskamp) 1957, Alvarenga 1994:14.

Diagnosis: Recognized by having 4 free pronotal spots in a transverse row, a spot at each pronotal hind angle, 2 basal elytral spots set farther apart than the 2 central free pronotal spots, and a central band transversely divided by pale markings except between stria V & VI.

Description: Length: 5.6-6.7 mm; Width: 2.9-3.4 mm. Body elongate, widest at basal third of elytra; weakly microreticulate, shining; pale yellow and orange-red with black pattern (Fig. 77).

Head orange-red with black lateral edge and base. Pronotum edged with black, black edge widest at base; 2 rounded anterior spots; 2 triangular basal spots, widely separated; one spot at each posterior angle as large as basal spot, connected at basal margin to basal spot; 4 free pronotal spots in anteriorly concave arch, 2 central spots often connected to anterior margin spots. Scutellum orange-red with black margin. Each elytron with orange-red epipleural fold, edged in black; dorsally with pale sections near suture orange-red, laterally fading into pale yellow (except as noted); subhumeral spot reaching lateral and basal margins, connected to scutellar spot, both divided by 2 to 3 orange-red basal spots; scutellar spot shape variable, sometimes connected to base and sutural margin; suture edged in black; central band divided in middle by transverse orange-red band, except at stria V to VI where black extension connects anterior and posterior part of black central band; apical spot connected to apical and sutural margin, separated from apical angle by orange-red spot. Venter orange-red; sclerites with black margins. Legs orange-red, except for black tibial base; antennal club black, base orange-red.

Head dorsal distance between eyes = 2.5 x eye width; ocular striae reaching anterior angle of eye; vertex puncture size = 1 x facet, separated by 1 to 2 diameters; epistome puncture size = 0.5 x facets, separated by 1 diameter. Antenna reaches middle of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere X wider than antennomere IX, wider than antennomere XI; similar to Fig. 6m except antennomere XI wider than long.

Maxillary palp terminal segment triangular, securiform, basally rounded, apical angles acute, length = 0.5 x width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = 0.75 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7a). Mentum with plate triangular, length = 0.75 x width, apical sides straight, ridge medial extension acute, projecting (similar to Fig. 8a).

Pronotal disc puncture size = 1 x facet, separated by 2 to 3 diameters. Scutellum pentagonal, length = 0.6 x width. Each elytron with 7 complete striae; stria VIII present at base and apical half; strial puncture size at base = 2 x pronotal disc punctures, gradually becoming finer posteriorly; intervals finely punctate, laterally impressed and distinct.

Prosternum weakly keeled and pinched anteriorly; lacking punctures in front of procoxa; coxal lines straight, length = 0.5 to 0.66 x sternal length, lines barely surpassing coxae, length = basal width; prosternal plate flat, apical width = 0.5 to 0.7 x basal width; base concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight; base sinuate. Metasternum coxal lines meeting at middle, weakly undulate, recurved; coxal lines extend 0.33 to 0.5 distance to posterior lateral angle; sternum shining, medial punctures fine; laterally with few coarse punctures, weakly impressed, obscured by microreticulations.

First visible abdominal ventrite with coxal lines reaching 0.33 distance to posterior edge; broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe weakly arched, narrowed and apically rounded; internal sac without noticeable sclerotized structures; flagellum thick with widened spearhead-like apex, widened part not sclerotized, length = 1.2 x median lobe length (Fig. 96a); base of flagellum straight, sclerite at base claw-like, sclerite V-shaped in dorsal view (Fig. 96b-d) (6 dissected).

Female genitalia with spermathecal head ball-shaped with flattened face; tail swollen, weakly curved (Fig. 96e) (1 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Prosternal punctation is similar in all specimens studied.

Variation: This species is widespread in South America, yet it has a uniform color pattern throughout, varying only in the size of the orange-red markings on the elytral bands.

The specimens from Bolivia, Brazil (Santarem), and Panama have the central pronotal spots free from the anterior margin spots, although they are close to each other. These spots are connected in the specimens from Rio Grande do Sul and Mato Grosso, Brazil.

Type: The holotype (original designation) of *Ischyrus fulmineus* Delkeskamp label data: "/Sarampiuni, San Carlos, 1000m, 6.9/ BOLIVIA 1950, leg.-W.Foster/ [orange] Type/ Ischyrus fulmineus n.sp.det-.Delkeskamp 1952/ Ischyrus fulmineus Delkeskamp HOLOTYPUS ["Holotypus" highlighted in pink]/" [ZSMC, examined]. Sex undetermined.

Specimens examined: The holotype and 9 specimens, representing 10 collections, were studied (see Appendix C for specific data).

Distribution: Panama, Brazil, and Bolivia (Fig. 128).

Etymology: *fulmineus*: Latin = of lightning. This specific name was probably chosen because of the resemblance of the jagged elytral markings to a lightning bolt.

Remarks: *Ischyrus fulmineus* is most similar to *I. insolens* and *I. erosus*; *I. insolens* lacks basal pronotal spots, *I. erosus* lacks the black connection between stria V & VI on the central elytral band.

Ischyrus goliai Skelley new species

(Figs. 142, 145)

Diagnosis: Similar only to *I. monochromatus* in having an ovoid body shape, prosternal plate wider than long, epistomal punctures nearly coalescing, and in its uniform brown color (no color pattern). *Ischyrus goliai* is recognized by its black legs and scutellum, and the epistome punctures being only slightly larger than the vertex punctures.

Description: Length: 5.2 mm; Width: 2.8 mm. Body ovoid, widest at basal third of elytra; microreticulate, weakly shining; body generally brown except as noted: basal margin of pronotum, scutellum, tibia, femora, antennae, prosternum, mesosternum, metepisternum, and ventral side of head black; tarsi and lateral pronotal disc pale brown (Fig. 142).

Head dorsal distance between eyes = 2.1 x eye width; ocular striae reaching antennal base; vertex shining, puncture size = 0.5 x facet, separated by 1 to 2 diameters; epistome puncture size = 1 x facet, nearly coalescing at apex. Antenna reaching base of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere X crescent shaped; antennomere XI subcircular, narrower than antennomere X (similar to Fig. 6j).

Maxillary and labial palps missing on holotype. Mentum with plate triangular, length = width, sides concave, apical angle rounded; apex projecting, ridge medial extension lacking (similar to Fig. 8h).

Pronotal disc puncture size = 0.5 x facet, separated by 2 to 4 diameters; lateral puncture size = 1 x facet, separated 1 to 2 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 visible striae; strial puncture size at base = 1 x facet, impressed, gradually decreasing in size towards apex; intervals finely punctate.

Prosternum keeled anteriorly, projecting, slightly swollen above pinch; lacking foveate punctures in front of procoxa; coxal lines convex, curve inwardly toward head, length = 0.5 x sternal length, lines not surpassing coxae, length = 0.5 x basal width; prosternal plate semicircular, flat, apical width = 0.5 x basal width; base shallowly concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight, divergent anteriorly; base sinuate, broadly lobed at middle. Metasternum coxal lines recurved, meet at middle; coxal lines extending 0.5 distance to posterior lateral angle; sternum with medial punctures fine, few coarse lateral punctures.

First visible abdominal ventrite coxal lines reaching 0.25 distance to posterior edge; rounded between metacoxae; lateral punctures 2 x larger than medial punctures.

Male genitalia with median lobe weakly arched, narrowed and apically pointed; internal sac without noticeable sclerotized structures; flagellum short and straight, length = 0.7 x median lobe length (Fig. 145a); base of flagellum straight and swollen, sclerite at base claw-shaped (Fig. 145b-d) (1 dissected).

Females not known.

Stridulatory file on occipital region of head weak.

Type material: The male holotype of *Ischyrus goliai* Skelley label data: "/ Maya Mountain Lodge, Cayo District, Belize, July 20, 1993, Vince Golia, Mercury Vapor Light/" [FSCA].

Distribution: Known only from Belize.

Etymology: Named for V. Golia, collector of the type specimen.

Remarks: Based on general morphology, *I. goliai* appears to be closely related to *I. monochromatus*.

Ischyrus ichnus Skelley new species

(Figs. 15d, 73, 118)

Diagnosis: Recognized by having 4 free pronotal spots in transverse row, large free central elytral spot on each elytron, and basal elytral marking resembling an inverted bell.

Description: Length 5.5 mm; Width: 2.8 mm. Body elongate, widest at basal third of elytra; weakly microreticulate, shining; orange with black pattern (Fig. 73).

Head with apical half orange, bilobed black base. Pronotum with 4 free spots in transverse line. Scutellum dark orange. Each elytron with dark brown epipleural fold; free subhumeral spot; large scutellar spot broadly connected to suture, expanded at base to humeral angle; free, transverse central spot; apical spot broadly connected to suture, narrowly separated from apical edge. Venter dark brown. Legs black; tarsi and palpi pale; antenna brown, club black.

Head dorsal distance between eyes = 3.5 x eye width; ocular striae reaching anterior angle of eye; vertex puncture size = 1 x facet, separated by 2 to 3 diameters; epistome puncture size = 0.75 to 1.0 x facet, separated by 1 diameter. Antenna reaching basal 0.25 of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres X to XI symmetrical; antennomere XI subcircular (similar to Fig. 6g).

Maxillary palp terminal segment triangular, securiform, base rounded, apical angles 90° or more, length = 0.66 x width, extended medially. Labial palp terminal segment triangular, extended on medial side, length = 0.66 x width. Labial palp width = 0.8 x maxillary palp width (similar to Fig. 7a). Mentum with plate broadly triangular, length = 0.5 x width, sides inwardly curved, ridge medial extension small and acutely pointed (similar to Fig. 8e).

Pronotal disc puncture size = 1 x facet, separated by 2 to 3 diameters; laterally separated by 1 to 2 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII present apical half; strial puncture size at base = 2 x pronotal disc punctures, gradually becoming finer posteriorly; intervals finely punctate, punctures obscure medially, weakly impressed laterally.

Prosternum keeled and pinched anteriorly; with few foveate punctures in front of procoxa; coxal lines straight, length = 0.5 x sternal length, lines not surpassing coxae, length = 0.75 x basal width; prosternal plate flat, apical width = 0.75 x basal width; base concave.

Mesosternum basal width = 3 x mesocoxal line length; coxal lines straight; base weakly sinuate. Metasternum coxal lines meet at middle, with 2 widely separated teeth (Fig. 15d), recurved; coxal lines extend 0.33 distance to posterior lateral angle; line behind mesocoxa deep groove, laterally pit-like; sternum shining, medial punctures fine, lacking coarse lateral punctures.

First visible abdominal ventrite with coxal lines fine, reaching 0.25 distance to posterior edge; broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male unknown.

Female genitalia with spermathecal head kidney-shaped; tail narrow, looped (Fig. 118) (1 dissected).

Presence of stridulatory files on occipital region of head unknown (head retracted).

Type material: The unique female holotype of *Ischyrus ichnus* Skelley label data: "/Porto Bello, Pan., Mar.10,11, E. A. Schwarz/" [USNM].

Distribution: Known only from Colon Province, Panama.

Etymology: *ichnos*: Greek = footprint. The name refers to the footprint-like pattern made by the pronotal spots and the basal elytral marking (noun in apposition).

Taxonomic notes: This unique beetle differs from other species in color pattern and morphological features. I have no doubt that this female represents a distinct species.

Ischyrus impressus Skelley new species

(Figs. 6i, 7j, 8g, 52, 97, 129)

Diagnosis: Characterized by having uniform dark brown color (no color pattern), elongate body, lateral pronotal punctures larger than on disc, labial palp terminal segment rounded or squared (length = width),

prosternal plate length = 2 x width, and 8 complete elytral striae.

Description: Length: 4.1-6.0 mm; Width: 2.7-3.2 mm. Body oval-elongate, coarsely punctate, widest at basal third of elytra; microreticulate, dull or shining; body dark brown to black; palpi, tarsi, apex of tibia, and antennae brown (Fig. 52).

Head dorsal distance between eyes = 3 x eye width; ocular striae reaching anterior angle of eye; vertex puncture size = 0.25 to 0.75 facet, separated by 1 to 3 diameters; epistome puncture size = 0.5 to 0.75 x facet, separated by 0.5 to 1.0 diameter. Antenna reaching base of pronotum; antennomere III as long as next 2 antennomere combined; antennomeres IX to XI symmetrical; antennomere XI oval, transverse (Fig. 6i).

Maxillary palp terminal segment triangular, sides rounded, lateral angle acute, medial angle nearly 90°, width = 2 x length. Labial palp terminal segment semicircular, symmetrical, angles 90°, length = width. Labial palp width = 0.33 x maxillary palp width (Fig. 7j). Mentum with plate triangular, length = 0.8 x width, sides nearly equal in length, sides convex, ridge medial extension bluntly pointed (Fig. 8g)

Pronotal disc punctures fine at base, becoming larger anteriorly, anterior puncture size = 0.5 x facet, separated by 1 to 2 diameters; lateral puncture size = 1 to 1.2 x facet, separated 0.5 to 1.0 diameter. Scutellum pentagonal, length = 0.6 x width. Each elytron with 8 complete striae; strial puncture size at base = 1 x facet, impressed, gradually becoming smaller posteriorly; intervals finely punctate.

Prosternum strongly keeled and pinched anteriorly, swollen above pinch; with (female) or without (male) foveate punctures in front of procoxa; coxal lines sinuate, slightly concave at middle, length = 0.5 to 0.6 x sternal length, lines surpassing coxae, length = basal width; prosternal plate narrowed anteriorly, slightly convex, apical width = 0.5 x basal width; base shallowly concave.

Mesosternum basal width = 3 x mesocoxal line length; coxal lines straight, parallel; base truncate or sinuate. Metasternum coxal lines not meeting at middle; coxal lines extend 0.5 distance to posterior lateral angle; sternum with medial punctures fine, few coarse lateral punctures size = pronotal punctures.

First visible abdominal ventrite with coxal lines reaching 0.33 to 0.5 distance to posterior edge; broadly rounded between metacoxae; with coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe moderately arched, apically truncate, slightly constricted just before tip; internal sac without noticeable sclerotized structures; flagellum hair-like, length = 2.3 x median lobe length (Fig. 97a); base of flagellum straight, sclerite at base elongate ring-shaped (Fig. 97b-d) (12 dissected).

Female genitalia with spermathecal head kidney-shaped to cone-shaped; tail narrow, weakly curved with swollen end (Fig. 97e) (4 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Females have foveate punctures in front of procoxae, covering the surface from coxae to anterior margin. Males lack these punctures or, at most, have a few punctures located near the procoxae.

Variation: Specimens from South America are more elongate (narrower) and duller (with stronger microreticulations) than the Central American specimens. The amount and strength of microreticulation varies tremendously across the geographic range of this species. A more detailed study may be necessary when more material is available.

Type material: The male holotype of *Ischyrus impressus* Skelley label data: "/Barro Colorado I., Canal Zone, PANAMA, Jan.26, 1959/ CHNM Panama Zool. Exped. (1959) H.S.Dybas leg./" [FMNH]. The female allotype label data: "/Barro Colorado I., Canal Zone, Panama, I-19-59, H.S. Dybas leg./" [FMNH]. Including the holotype and allotype, a total of 46 specimens, representing 43 collection records, was studied (see Appendix C for specific data).

Distribution: Bolivia, Brazil, and Central America (Fig. 129).

Etymology: impressed = sunk below the surface. Named for the coarse, impressed punctures scattered over its body.

Remarks: *Ischyrus impressus* appears most closely related to *I. joplini* in mophology. They differ in color: *I. impressus* lacks a color pattern, *I. joplini* has a pattern. Also, see the Remarks section under *I. parallelus*.

Ischyrus incertus Lacordaire

(Figs. 12, 33, 98, 130)

Ischyrus incertus Lacordaire 1842:118-119.

Mycotretus incertus Dejean 1836:429, 1837:453, [*nomen nudum*].

Micrischyrus incertus (Lacordaire) 1842, Alvarenga 1994:14.

var. A Lacordaire 1842:118.

Ischyrus gratiosus Guérin-Méneville 1829-1838[1844]:310, **new synonymy**.

Micrischyrus gratiosus (Guérin-Méneville) 1844, Alvarenga 1994:14.

Diagnosis: Characterized by having 2 anterior, 2 basal, and 2 free pronotal spots, 2 free spots set farther apart than the head width (including the eyes), subhumeral spot free, legs entirely black, central elytral spot solid and triangular, and antennomeres X & XI same size.

Description: Length: 5.1-7.2 mm; Width: 2.8-3.8 mm. Body elongate, widest at basal third of elytra; microreticulate, shining; yellow-orange with black pattern (Fig. 33).

Head solid black. Pronotum with 2 anterior spots connected to margin, often connected to each other along anterior margin, often squared; 2 basal spots connected to margin and to each other at base, often squared; 2 free spots widely separated, distance between centers wider than width of head including eyes. Scutellum black. Each elytron with black epipleural fold; small subhumeral spot, free or connected to scutellar spot; scutellar spot large, broadly connected to base and suture; suture finely margined in black; central spot large, triangular, broadly connected to suture, widest anteriorly, pointed posteriorly. Venter black, with lateral prothorax and lateral abdominal ventrites orange. Legs black; palpi and tarsi brown.

Head dorsal distance between eyes = 2.2 x eye width; ocular striae reaching 0.75 to 1.0 distance to anterior angle of eye; vertex puncture size = 1 x facet, separated 1 to 2 diameters; epistome puncture size = 0.5 x facet, separated by 1 diameter. Antenna reaching middle of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres X to XI symmetrical; antennomere XI transverse, narrower than antennomere X (similar to Fig. 6l).

Maxillary palp terminal segment triangular, securiform, basally rounded, apical angles less than 90°, length = 0.5 x width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = 0.5 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7c). Mentum with plate triangular, length = 0.75 x width, apical sides straight or outwardly curved, ridge medial extension acute (similar to Fig. 8a).

Pronotum puncture size = 1 x facet, separated 1 to 2 diameters; denser laterally, separated by 0.5 to 1.0 diameter. Scutellum pentagonal, length = 0.6 x width. Each elytron with 7 complete striae; stria VIII weak, visible on apical half; strial puncture size at base = 1.5 x pronotal disc puncture; intervals finely punctate.

Prosternum strongly keeled and pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa; coxal lines straight, length = 0.5 x sternal length, lines barely surpassing coxae, length = basal width; prosternal plate flat, apical width = 0.7 to 0.8 x basal width; base shallowly concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight to weakly curved; base sinuate, lobed medially. Metasternum coxal lines recurved, not meeting at middle; lines extend 0.33 to 0.5 distance to posterior lateral angle; sternum shining, with medial punctures fine; few coarse lateral punctures, twice the size of medial punctures.

First visible abdominal ventrite with coxal lines reaching 0.33 to 0.5 distance to posterior edge; rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe strongly arched, apically concave with slight constriction just before tip; internal sac without noticeable sclerotized structures; flagellum long and narrow, length = 2 x median lobe length (Fig. 98a); base of flagellum gradually curved, sclerite at base claw-shaped (Fig. 98b-d) (3 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail swollen, weakly curved (Fig. 98e) (7 dissected).

Stridulatory files present occipital region of male heads; absent on females. Males have a slight lateral extension of prosternum; extending 0.33 distance from sutural notch at anterior prosternal margin to lateral edge of prothorax (Fig. 12). Females have foveate punctures on prosternum in front of procoxae; males lack these punctures.

Variation: The basal and anterior pronotal spots are often squared and connected at the margin. The majority of specimens has the connection less than half the length of the spot. In a specimen from Panama and the lectotype of *I. gratiosus* these spots appear as single large spots.

Most specimens have the subhumeral spot free, and the scutellar and central spots well separated. In a few, the subhumeral spot touches the scutellar spot. One specimen, from Tobago, has the subhumeral spot fused with the scutellar spot. This specimen also has the scutellar and central spot broadly connected from the suture to stria III (Lacordaire's "variété A"). The other specimens studied have this connection narrowed to stria I or lacking.

Type: No specimen could be identified as a "type" of *Ischyrus incertus*. Lacordaire gave no indication where the "type" specimens were deposited, and their current location is unknown. Lacordaire stated in the original description that the species is from Cayenne (French Guiana) and Colombia.

The female lectotype (here designated) of *Ischyrus gratiosus* Guérin-Méneville label data: "/[hand written] Ischyrus gratiosus Guer. R. Z. 1843 (type) Colombia/ Type/ [red] Lectotipo/ [pale blue] MUSEUM PARIS COLL. J. THOMPSON 1952 coll./ coll. Sédillot/ [red] LECTOTYPE Ischyrus gratiosus Guérin-Méneville Des. P. E. Skelley 1995/" [MNHN, examined].

Specimens examined: A total of 54 specimens representing, 50 collection records, was studied (see Appendix C for specific data).

Distribution: Southern Mexico through Central America to Venezuela, Colombia, Trinidad, and Tobago (Fig. 130). Dejean (1836) indicated it was from "Brasilia". Lacordaire (1842) recorded it from Cayenne (French Guiana).

Etymology: *incertus*: Latin = doubtful. Perhaps Lacordaire used this name to indicate an uncertainty about its validity. Its color pattern is nearly identical to

I. proximus Lacordaire and *I. scriptus* (Olivier).

Taxonomic notes: The identity of this species is based on Lacordaire's description and a female specimen in the Crotch Collection, label data: "/[green] Cay./ TYPE [crossed out] incertus C. Reiche/" [CUMZ]. This specimen fits Lacordaire's description, except that the subhumeral spot touches the scutellar spot. Lacordaire states these spots are separated; a character found to be variable in this species.

The second label on this specimen indicates it came from Reiche's collection, which Lacordaire studied. Whether this specimen was actually studied by Lacordaire is not known. Since Lacordaire stated he had a specimen from Cayenne, the specimen was probably from his collection, not Reiche's. If it can be adequately shown that the specimens studied by Lacordaire are lost, or that Crotch's specimen was studied by Lacordaire, I recommend the specimen in the Crotch Collection be chosen as the "type".

A lectotype was designated for *I. gratiosus* Guérin-Méneville because no indication was made in the original description that only one specimen was studied. The "Lectotipo" label may have been placed on the specimen by Alvarenga (1994), who stated the type was in the MNHN. This specimen exhibits an extreme variation of the typical *I. incertus* color pattern, but it does not differ in any other character. Based on this information *I. gratiosus* Guérin-Méneville is synonymized under *I. incertus* Lacordaire.

Remarks: *Ischyrus incertus* Lacordaire is similar to *I. palliatus* Lacordaire, *I. scriptus* (Olivier), and *I. proximus* Lacordaire in color pattern. Despite the similarities and variability of color patterns, they can be separated by the combination of characters listed in the Remarks section of *I. scriptus* (Olivier).

Ischyrus incertus is most similar to *I. conductus* Kuhnt in morphological characters and basic color pattern. *Ischyrus incertus* has the central elytral spot complete and triangular; *I. conductus* has the central elytral marking broken into linear spots.

References: *Ischyrus incertus* Lacordaire: Blackwelder 1945:465; Crotch 1876:(55)431; Dejean 1836:429; 1837:453; Gemminger & Harold 1876:3690; Guérin-Méneville 1829-1838[1844]:310; Kuhnt 1909:62; 1911:42.

Ischyrus gratiosus Guérin-Méneville: Blackwelder 1945:465; Crotch 1876:(55)431; Gemminger & Harold 1876:3690; Kuhnt 1909:62; 1911:42.

Ischyrus insolens Crotch

(Figs. 6c, 7c, 8c, 28, 99, 131)

Ischyrus insolens Crotch 1876:53(429).

Micrischyrus insolens (Crotch) 1876, Alvarenga 1994: 14.

Diagnosis: Characterized by having 4 free pronotal spots in a transverse row, large anterior pronotal spots, a spot at each pronotal hind angle (often reduced), no basal pronotal spots, and central elytral band transversely divided by orange marking.

Description: Length: 7.3-8.5 mm; Width: 3.7-4.4 mm. Body elongate, widest at basal third of elytra; weakly microreticulate, shiny; yellow and red with black markings (Fig. 28).

Head solid black or red with basal black spot. Pronotum with 2 anterior spots, connected to each other and anterior margin; 4 free spots forming transverse arch, anteriorly concave, 2 central spots located at basal third (rarely touching base), 2 lateral spots at pronotal half; hind angle with spot, reduced in Central American specimens. Scutellum dark red with black edge. Each elytron pale yellow becoming red near suture; epipleural fold basally black or pale brown; scutellar and humeral spot connected basally (disrupted by pale marking on specimen from Paraguay); central band transversely divided by red marking; apical spot can connect with margin. Venter red and black, variable. Legs black or femur and tibia banded with red; tarsi and palpi brown; antenna brown, club black.

Head dorsal distance between eyes = 2.4 x eye width; ocular striae reaching anterior angle of eye; vertex puncture size = 1 x facet, impressed, separated by 1 to 3 diameters; epistome puncture size = 0.5 to 0.75 x facet, separated by 1 diameter. Antenna reaching middle of pronotum; antennomere III as long as next 3 antennomere combined; antennomere IX can be narrower than X; antennomeres X to XI asymmetrical; antennomere XI subcircular (Fig. 6c).

Maxillary palp terminal segment triangular, securiform, basally rounded, apical angles less than 90°, length = 0.5 x width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = 0.5 x width. Labial palp width = 0.5 x maxillary palp width (Fig. 7c). Mentum with plate broadly triangular, length = 0.5 x width, sides weakly concave, ridge medial extension acutely pointed (Fig. 8c).

Pronotum puncture size = 1 x facet, separated by 1 to 2 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII weak, indicated by a few punctures on apical half; strial puncture size = 2 x pronotal disc punctures; intervals finely punctate.

Prosternum keeled and pinched anteriorly; slightly expanded laterally in males; without foveate punctures in front of procoxa; coxal lines straight, length = 0.5 x sternal length, not surpassing coxae, length = 1.5 x basal width;

prosternal plate flat, apical width = 0.6 x basal width; base shallow V-shaped concavity.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight; base sinuate, lobed medially. Metasternum coxal lines recurved, arched as if to form a tooth, not or barely meeting medially; coxal lines faint, extend 0.33 to 0.5 distance to posterior lateral angle; sternum with medial punctures fine, few coarse lateral punctures weakly impressed.

First visible abdominal ventrite with coxal lines faint, reaching 0.33 distance to posterior edge; rounded between metacoxae; coarse lateral punctures encroaching upon middle, fine punctures medially.

Male genitalia with median lobe moderately arched, apically truncate, slightly constricted just before tip; internal sac without noticeable sclerotized structures; flagellum thickened at middle, gradually narrowing to apex, length = median lobe length (Fig. 99a); base of flagellum angled, sclerite at base claw-shaped (Fig. 99b-d) (3 dissected).

Female genitalia with spermathecal head kidney-shaped, with weak top-knot; tail swollen, weakly curved (Fig. 99e) (1 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Males with prosternum slightly expanded laterally, extend 0.5 distance from apical notch of suture to lateral margin of pronotum.

Variation: The specimens studied show a surprising amount of color and pattern variation. Some specimens are all orange. Other specimens have a red pronotum, elytral suture, and eltyral band with the remainder of the elytra orange (see cover illustration).

Mexican (Veracruz) specimens have black legs, red head with black base, small posterior pronotal angle spot, completely black elytral base, central elytral band smooth, apical elytral spot connected to margin, and black elytral epipleural fold. This pattern was illustrated by Gorham (1887).

Bolivian specimens have black legs, black head, large posterior pronotal angle spot, solid black elytral base, central elytral black band deeply cut (zig-zag), apical elytral spot connected to margin, and black elytral epipleural fold.

The Paraguay specimen has banded femora, red head with black central basal spot, large posterior pronotal angle spot, black basal elytral band broken by pale spots, central elytral band deeply cut almost into stripes, apical elytral spot free, and red elytral epipleural fold. Similar pattern differences indicate separate entities in other taxa and may indicate that this is distinct. The only specimen studied of this color pattern is a female, while dissected specimens of the other color patterns are males, making genitalic comparisons impossible. At present, I am maintaining it as a variation of *I. insolens*.

Type: The lectotype (here designated) of *Ischyrus insolens* Crotch label data: "/Toxpam, Mexico, Sallé Coll./ [green] 2393/ sp. figured/ Ischyrus insolens, Crotch, apud Sallé/ B.C.A., Col. VII Ischyrus/ [red] LECTOTYPE Ischyrus insolens Crotch des. P. E. Skelley 1993/" [NHML, examined]. Sex not determined. Selander & Vaurie (1962) did not locate "Toxpam", and stated that it is possibly a misspelling of Tuxpan, Veracruz, Mexico.

Specimens examined: With the lectotype, one paralectotype was studied. Paralectotype Label data: "/Toxpam/ Mexico, Sallé Coll./ Ischyrus insolens, Crotch, apud Sallé/ B.C.A., Col., VII, Ischyrus/ [yellow] PARALECTOTYPE Ischyrus insolens Crotch des. P. E. Skelley 1993/" [1, NHML]. Including the lectotype and paralectotype, 9 specimens, representing 9 collection records, were studied. Additional label data: **Bolivia**, Beni, Huachi, Rio Beni, IX, W. M. Mann [1, USNM]; La Paz, San Lorenzo, 12 km Caranavi, 1-2-I-1991, J. V. McHugh, JVM lot B91-11 [1, JVMC]; La Paz, Yungas La Paz, Puente Mururrata to Suapi, 24-28-XI-1984, L. Peña, 1200-1600m elev.[1, HNHM]; **Mexico**, B.C.A.,Col.,VII [1, NHML]; Veracruz, Cordoba, 29-VI-1966, J. S. Buckett [1, EMEC]; Veracruz, Fortin de las Flores, Sumidero, 22-23-V-1965, H. V. Weems, Jr., 2500-3000' elev., blacklight [1, FSCA]; **Paraguay**, P.Cantera, C. Schrottky [1, MACN].

Distribution: Mexico, Bolivia, and Paraguay (Fig. 131).

Etymology: *insolens*: Latin = proud, haughty. Crotch probably named this species because of the brilliant colors it bears.

Taxonomic notes: A lectotype was chosen because Crotch made no indication that only one specimen was seen. The specimen chosen matched the label data, origin (ex Sallé collection), and characters given in the original description. In addition, the specimen chosen was illustrated by Gorham (1887) in the Biologia Centrali-Americana.

Remarks: *Ischyrus* insolens is most similar to *I. fulmineus* and *I. erosus* in color pattern. They differ from *I. insolens* in having 2 basal pronotal spots.

References: Blackwelder 1945:465; Delkeskamp 1957:107-108; Gemminger & Harold 1876:3690; Gorham 1887:43, t.2 f.20; Kuhnt 1909:64, t.3 f.6; 1911:43.

Ischyrus joplini Skelley new species

(Figs. 143, 147)

Diagnosis: Characterized by the elongate body, lateral pronotal punctures same size as disc, prosternal plate length = 2 x width, 8 complete elytral striae, and in its unique color pattern: 2 free pronotal spots, and dark brown elytra with a pale lateral stripe (Fig. 143).

Description: Length: 5.7 mm; Width: 2.8 mm. Body oval-elongate, coarsely punctate, widest at basal third of elytra; microreticulate, dull or shining; body dark brown to black except as noted: head dorsally orange, pronotum and pronotal epipleuron orange; pronotum with 2 free spots; each elytron dark brown with a complete orange lateral stripe from humerus to apex; scutellum orange; abdominal sternites orange laterally; palpi, tarsi, tibia, apex of femora, and antennae brown (Fig. 143).

Head dorsal distance between eyes = 2 x eye width; ocular striae reaching anterior angle of eye; vertex puncture size = 0.50 to 0.75 facet, separated by 1 to 3 diameters; epistome puncture size = 0.5 to 0.75 x facet, separated by 0.5 to 1.0 diameter. Antenna reaching base of pronotum; antennomere III as long as next 2 antennomere combined; antennomeres IX to XI symmetrical; antennomere XI oval, transverse (similar to Fig. 6i).

Maxillary palp terminal segment triangular, sides rounded, lateral angle acute, medial angle nearly 90°, width = 2 x length (similar to Fig. 7j). Labial palp terminal segment triangular, extended on medial side, length = 0.75 x width (similar to Fig. 7i). Labial palp width = 0.5 x maxillary palp width. Mentum with plate triangular, length = width, all sides nearly equal in length, sides straight; ridge rounded anteriorly, with short medial extension (Fig. 8j).

Pronotal disc punctures size = 1 x facet, separated by 2 to 3 diameters on disc, denser laterally, separated by 0.5 to 1.0 diameter. Scutellum pentagonal, length = 0.6 x width. Each elytron with 8 complete striae; strial puncture size at base = 1 x facet, impressed, gradually becoming smaller posteriorly; intervals finely punctate.

Prosternum strongly keeled and pinched anteriorly, swollen above pinch; with foveate punctures in front of procoxa; coxal lines sinuate, slightly concave at middle, length = 0.6 x sternal length, lines surpassing coxae, length = basal width; prosternal plate narrowed anteriorly, slightly convex, apical width = 0.5 x basal width; base shallowly concave.

Mesosternum basal width = 3 x mesocoxal line length; coxal lines straight, parallel; base truncate. Metasternum coxal lines not meeting at middle; coxal lines extending 0.5 distance to posterior lateral angle; sternum with medial punctures fine, few coarse lateral punctures size = pronotal punctures.

First visible abdominal ventrite with coxal lines reaching 0.5 distance to posterior edge; broadly rounded between metacoxae; with coarse punctures throughout.

Male unknown.

Female genitalia with spermathecal head cone-shaped; tail narrow, weakly curved with swollen end (Fig. 147) (1 dissected).

Presence of stridulatory files on occipital region of head unknown (head retracted).

Type material: The female holotype of *Ischyrus joplini* Skelley label data: "/ PANAMA: Panama Prov. Chepo, Maje Is., Bayano Lk.; 1800-2100, 13-II-1978; K. Joplin, blacklight trap/" [FSCA].

Distribution: Known only from Panama.

Etymology: Named for K. Joplin, collector of the holotype.

Remarks: *Ischyrus joplini* is similar to *I. impressus* in many morphological characters, but is readily distinguished by its color pattern, which is lacking in *I. impressus*; and by the shape of the labial palpi. The holotype female of *I. joplini* has foveate punctures in front of procoxae, covering the surface from coxae to anterior margin. In *I. impressus*, this is sexually dimorphic between the sexes.

Ischyrus kovariki Skelley new species

(Figs. 144, 146)

Diagnosis: Both *I. kovariki* and *I. audbalus* are unique in *Ischyrus* by having a pit-like groove in front of the prosternum (Fig. 9b), antennomere IX triangular, prosternal pinch lacking, metasternal coxal lines continuous around base of mesocoxa, and 9 visible elytral striae. *Ischyrus kovariki* is distinguished by its color pattern which lacks a humeral spot (Fig. 144) and by the bizarre flagellum of the male genitalia (Fig. 146).

Description: Length: 3.7-6.1 mm; Width: 2.0-3.1 mm. Body elongate, widest at basal third of elytra; microreticulate, feebly shining; yellow with black pattern.

Head yellow. Pronotum with basal and lateral margins black; centrally with 2 black basal projections that almost reach the anterior margin; anterior margin with 2 small spots. Scutellum black. Each elytron with yellow epipleural fold; entire lateral and sutural edges black; anteriorly placed free central and apical spots; apical spot often touching suture. Prosternum yellow except for black sternal plate. Mesosternum mostly yellow; posterior edge black. Metasternum mostly yellow, black along mid-line. Abdomen yellow except for black medial spots on the posterior edge of all ventrites.

Head dorsal distance between eyes = 2.2 to 2.5 x eye width; ocular striae reaching 0.75 distance to anterior angle

of eye; vertex and epistome puncture size = 1 x facet, separated by 0.5 to 1.0 diameters. Antenna reaching base of pronotum; antennomere III as long as next 2 antennomeres combined; antennomeres IX to XI symmetrical; antennomere VIII elongate triangular, longer than wide; antennomere IX triangular, as long as wide; antennomere XI oval, transverse, as wide as antennomere X (similar to Fig. 6k).

Maxillary palp terminal segment triangular, securiform, basally rounded, apical angles nearly 90°, length = 0.66 x width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = 0.5 x width. Labial palp width = maxillary palp width (similar to Fig. 7n). Mentum with plate triangular, length = 0.75 x width, sides concave, apical angle rounded; ridge with medial extension projecting, blunt (similar to Fig. 8c).

Pronotal disc puncture size = 1 x facet, separated by 0.5 to 1.0 diameter. Scutellum pentagonal, length = 0.6 x width. Each elytron with 8 striae, stria IX visible on apical half; strial puncture size = pronotal disc puncture; intervals finely punctate, obscured by microreticulations.

Prosternum convex, lacking pinched anterior margin; deep pit-like groove with few enclosed setae in front of procoxa (as in Fig. 9b), pit as long as procoxa; coxal lines straight, length = 0.4 x sternal length, lines not surpassing coxae, length = 0.75 x basal width; prosternal plate flat, apical width = 0.5 x basal width; base shallowly concave.

Mesosternum basal width = 2.5 x mesocoxal line length; coxal lines straight; base evenly convex. Metasternum coxal lines not meeting at middle, continuous around coxa, not extending onto metasternum; sternum with medial punctures fine, few coarse lateral punctures.

First visible abdominal ventrite with coxal lines continuous around coxa; broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe straight, short, apically truncate; internal sac without noticeable sclerotized structures; flagellum swollen in appearance, with large dorsal accessory structure at middle, structure with distal cup and proximal hook; flagellum length = 1.8 x median lobe length (Fig. 146a); base of flagellum straight and swollen, sclerite at base parallel-sided and fang-like, (Fig. 146b-d) (3 dissected).

Female genitalia with spermathecal head ball-like; tail swollen, recurved on itself connecting duct tightly coiled (Fig. 146e) (3 dissected).

Stridulatory files on occipital region of head absent in both sexes. No external sexual dimorphism observed.

Variation: The apical elytral spots are generally free and the same size as the central spots. Some specimens have the apical spots are larger and broadly touch the sutural margin. Ventrally the size of the black markings varies, but they are always present.

Type material: The male holotype and female allotype of *Ischyrus kovariki* Skelley label data: "/BELIZE: Orange Walk Dist., Rio Bravo Cons. Area, Well Tr. vct. Well, 19-VII-1996; P. Kovarik, under bark of log/" [FSCA]. Including the holotype and allotype, a total of 22 specimens, representing 2 collection records, was studied. Paratype label data: same as holotype [8, PESC]; same as holotype only "... Rd. to Well Trail, 16.VII.1996, ..." [12, NHML, USNM, CMNC, PESC]. Both collections were from the same log (pers. comm., P. Kovarik).

Distribution: Known only from Belize.

Etymology: Named after my good friend, and collector of the type series, Peter W. Kovarik.

Taxonomic notes: With *I. audbalus*, this unique species is provisionally placed in *Ischyrus* because it possesses the diagnostic generic characters as stated in the generic account. They differ from typical members of *Ischyrus* in antennal club structure, prosternal pit, continuous coxal lines, and genitalic characters.

Remarks: The accessory structure on the male's flagellum is unlike anything I have seen in the family.

Ischyrus malleus Skelley new species

(Figs. 72, 100)

Diagnosis: Recognized by having only 2 free pronotal spots, central and lateral elytral spots elongate, leaving an hammer-shaped scutellar and sutural marking.

Description: Length 3.6 mm; Width: 2.6 mm. Body elongate-oval, widest at basal third of elytra; feebly microreticulate, shining; orange with black pattern (Fig. 72).

Head orange. Pronotum with 2 free spots, basally with narrow margin at medial half. Scutellum black. Each elytron with orange epipleural fold; free subhumeral spot; large scutellar spot broadly connected to base and suture; suture margined with black, swollen at basal third, gradually narrowing toward apex; central and lateral spots free, elongate, stripe-like. Venter black; except for orange anterior prothorax, lateral metasternum and posterior abdomen. Appendages black; tarsi, palpi, and base of antenna brown.

Head dorsal distance between eyes = 2.2 x eye width; ocular striae reaching 0.5 distance to anterior angle of eye, continue forward as row of punctures; vertex puncture size = 1 x facet, separated by 1 diameter; epistome puncture size = 0.5 x facet, nearly coalescing. Antenna reaching base of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere XI transverse, narrower than antennomere X (similar to Fig. 6l).

Maxillary palp terminal segment triangular, sides rounded, lateral angle acute, medial angle nearly 90°, length = 0.5 x width. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90°, length

= 0.8 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7o). Mentum with plate triangular, length = width, all sides nearly equal in length, sides straight; ridge rounded anteriorly, with medial extension acute.

Pronotal disc puncture size = 1 x facet, separated by 1 to 2 diameters; laterally separated by 0.5 to 1.0 diameter. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII present at base and apical half, often obscured by interval punctation; strial puncture size at base = pronotal disc puncture, gradually becoming finer posteriorly; intervals finely punctate, lateral punctures impressed and distinct.

Prosternum strongly keeled and pinched anteriorly; lacking foveate punctures in front of procoxa; coxal lines straight, length = 0.6 x sternal length, lines surpassing coxae, length = basal width; prosternal plate flat, apical width = 0.75 x basal width; base concave.

Mesosternum basal width = 2.5 x mesocoxal line length; coxal lines straight; base sinuate. Metasternum coxal lines meeting at middle, punctate, recurved; coxal lines extend 0.5 distance to posterior lateral angle; sternum shining, medial punctures fine, few coarse lateral punctures obscured by strong microreticulation.

First visible abdominal ventrite with coxal lines reaching 0.5 distance to posterior edge; broadly rounded between metacoxae; coarse punctures distributed across ventrite.

Male genitalia with median lobe weakly arched, apically rounded; internal sac with pair of dark patches near median lobe; flagellum swollen on basal 0.5, length = 1.6 x median lobe length (Fig. 100a); base of flagellum straight, sclerite at base elongate, thickened at connection to flagellum (Fig. 100b-d) (1 dissected).

Female unknown.

Presence of stridulatory files on occipital region of head unknown (head retracted).

Type material: The unique male holotype of *Ischyrus malleus* Skelley label data: "/MEX.: Oax., 10 mi. N Matias Romero, VII-3-1975/ LEWatrous colr./" [CUIC].

Distribution: Known only from the state of Oaxaca, Mexico.

Etymology: *malleus*: Latin = hammer, mallet. Named in reference to the sutural and scutellar spot, which resembles a hammer (noun in apposition).

Remarks: *Ischyrus malleus* superficially resembles *I. elegantulus*, *I. scutellaris*, and *I. chacojae*. It can be distinguished from these by the elongate, stripe-like, lateral and central elytral spots.

Ischyrus mimus Skelley new species

(Figs. 60, 101, 132)

Diagnosis: Recognized by having the pronotum almost entirely black (except for anterior angles), elytral free basal spots forming an anteriorly convex arch, and central elytral band triangular, extending nearly to apex.

Description: Length: 5.1-5.8 mm; Width: 2.9-3.3 mm. Body elongate-ovoid, widest at basal quarter of elytra; dorsum weakly microreticulate, shining, venter strongly microreticulate; body black with paler marking; elytra yellow with black markings (Fig. 60).

Head black with yellow epistome or entirely yellow. Pronotum black often with pale yellow spot on anterior angle. Scutellum black. Each elytron with yellow epipleural fold; small free subhumeral spot; scutellar spot divided, free part size = subhumeral spot, other part broadly connected to base and suture; scutellar spots and subhumeral spots in an anteriorly convex arch; suture with black margin, except at apex; central band triangular, widest anteriorly, narrowed posteriorly, often connected to lateral margin, nearly reaching apex, broadly connected to suture. Venter and appendages black; tarsi and palpi brown.

Head dorsal distance between eyes = 2 x eye width; ocular striae reaching 0.5 to 0.75 distance to anterior angle of eye; vertex puncture size = 0.75 x facet, separated by 1 to 2 diameters; epistome puncture size = 0.75 x facet, coalescing. Antenna reaching basal 0.25 of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere X crescent shaped; antennomere XI subcircular, transverse narrower than antennomere X (similar to Fig. 6l).

Maxillary palp terminal segment triangular, sides rounded, lateral angle acute, medial angle nearly 90°, width = 2 x length. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90°, length = 0.8 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7o). Mentum with plate triangular, length = width, sides concave, apical angle rounded; ridge medial extension lacking (similar to Fig. 8h).

Pronotal disc puncture size = 0.75 x facet, separated by 1 to 2 diameters; sightly denser laterally. Scutellum pentagonal, sides short, length = 0.6 x width. Each elytron with 7 complete striae; stria VIII present at base and apical half; strial puncture size at base = pronotal disc puncture, gradually becoming finer posteriorly; intervals finely punctate, impressed, distinct.

Prosternum strongly keeled and pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxae; coxal lines slightly arched or straight, length = 0.5 x sternal length, lines barely surpassing coxae, length = 0.6 to 0.75 x basal width; prosternal plate flat, apical width = 0.6 x basal width; base shallowly concave.

Mesosternum basal width = 3 x mesocoxal line length; coxal lines straight, parallel; base sinuate. Metasternum coxal lines meeting at middle, often crenate, recurved; coxal lines extend 0.5 distance to posterior lateral angle; sternum weakly shining medially, medial punctures fine, few coarse lateral punctures obscured by strong microreticulation.

First visible abdominal ventrite with coxal lines short, extending 0.25 to 0.5 distance to posterior margin; broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe weakly arched, apically rounded; internal sac with pair of darkened patches near median lobe; flagellum narrow, length = 1.8 x median lobe length (Fig. 101a); base of flagellum straight, sclerite at base elongate, claw-shaped (Fig. 101b-d) (3 dissected).

Female genitalia with spermathecal head elongate kidney-shaped; tail narrow, looped (Fig. 101e) (5 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Females with weakly impressed foveate punctures on prosternum in front of procoxae, obscured by strong microreticulations; males lack these punctures.

Variation: The Bolivian specimen has the head yellow, central band reaching lateral margin, and anterior pronotal angle spot distinct, delineated from the rest of pronotum. The other specimens have the head mostly black, central band not reaching the lateral margin, and the anterior pronotal angle spot gradually fading to black.

Type material: The male holotype and female allotype of *Ischyrus mimus* Skelley label data: "/Rio Frio, Colombia/ Feby 1924, WMMann/" [USNM]. Including the holotype and allotype, a total of 16 specimens, representing 14 collection records, was studied (see Appendix C for specific data).

Distribution: Panama, British Guiana, Trinidad, Colombia, and Bolivia (Fig. 132).

Etymology: *mimos*: Greek = actor. This species is named in reference to its "black and white" pattern, similar to the theatrical makeup of pantomines (noun in apposition).

Remarks: *Ischyrus mimus* superficially resembles *I. mystacis* in color pattern and body shape. *Ischyrus mimus* can be distinguished by the characters mentioned in the diagnosis and the genitalia.

Ischyrus monochromatus Skelley new species

(Figs. 6j, 7l, 8h, 14c, 51, 102)

Diagnosis: Similar only to *I. goliai* in having an ovoid body shape, prosternal plate wider than long, epistomal punctures large and coalescing, and in its uniform brown color (no color pattern). *Ischyrus monochromatus* is recognized by is pale brown legs, which are paler than the body, and the epistome punctures being 2 to 3 times larger than the vertex punctures.

Description: Length: 4.7-5.4 mm; Width: 2.8-3.2 mm. Body ovoid, widest at basal third of elytra; microreticulate, weakly shining; body light brown (possibly teneral); apical half of antennae black, palpi pale (Fig. 51).

Head dorsal distance between eyes = 3 x eye width; ocular striae reaching antennal base; vertex shining, puncture size = 0.5 x facet, separated by 2 to 3 diameters; epistome puncture size = 1 x facet, coalescing at apex. Antenna reaching base of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere X crescent shaped; antennomere XI subcircular, narrower than antennomere X (Fig. 6j).

Maxillary palp terminal segment triangular, transverse, basally rounded, apical angles acute, length = 0.4 x width. Labial palp terminal segment triangular, expanded medially, length = 0.5 x width. Labial palp width = 0.5 x maxillary palp width (Fig. 7l). Mentum with plate triangular, length = width, sides concave, apical angle rounded; apex projecting, ridge medial extension lacking (Fig. 8h).

Pronotal disc puncture size = 0.75 x facet, separated by 2 to 3 diameters; lateral puncture size = 1 x facet, separated 1 to 2 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 visible striae; strial puncture size at base = 1 x facet, impressed, nearly uniform size to apex; intervals finely punctate.

Prosternum keeled anteriorly, projecting, slightly swollen above pinch; lacking foveate punctures in front of procoxa; coxal lines convex, curve inwardly toward head (Fig. 14c), length = 0.4 x sternal length, lines not surpassing coxae, length = 0.5 x basal width; prosternal plate semicircular, flat, apical width = 0.5 x basal width; base shallowly concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight, divergent anteriorly; base sinuate, broadly lobed at middle. Metasternum coxal lines recurved, meet at middle with a shallow tooth; coxal lines extend 0.5 distance to posterior lateral angle; sternum with medial punctures fine, few coarse lateral punctures.

First visible abdominal ventrite coxal lines reaching 0.33 distance to posterior edge; rounded between metacoxae; lateral punctures slightly larger than medial punctures.

Male genitalia with median lobe weakly arched, narrowed and apically pointed; internal sac without noticeable sclerotized structures; flagellum short and straight, length = 0.7 x median lobe length (Fig. 102a); base of flagellum straight and swollen, sclerite at base claw-shaped (Fig. 102b-d) (1 dissected).

Females not known.

Presence of stridulatory file on occipital region of head unknown (head retracted).

Type material: The male holotype of *Ischyrus monochromatus* Skelley label data: "/Cocle Prov., El Valle, Pan., VI-14-67, D. M. DeLong & C. A. Triplehorn collectors/" [OSUC]. With the holotype, only one other specimen was studied. Paratype data: **Panama**, Colon Prov., Ft. Sherman, Mojinga Swamp, VI-9-1994, F. Andrews & A. Gilbert [1, CDAE].

Distribution: Only known from Panama.

Etymology: *mono*: Greek = one, single; *chromatos*: Greek = color of skin. This species is named in reference to the single body color, lacking a pattern.

Ischyrus mystacis Skelley new species

(Figs. 6l, 7o, 59, 103, 133)

Diagnosis: Recognized by having the pronotum almost entirely black (except for anterior angles), elytral free basal spots forming a straight transverse line, and central elytral band not extended beyond apical third of elytra.

Description: Length: 4.2-5.7 mm; Width: 2.6-3.4 mm. Body elongate-ovoid, widest at basal quarter of elytra; weakly microreticulate dorsally, shining; strongly microreticulate ventrally, dull; black with paler markings; elytra yellow-orange with black markings (Fig. 59).

Head black, epistome often yellow. Pronotum black, often with orange anterior angles. Scutellum black. Each elytron with orange epipleural fold; free humeral spot; scutellar spot divided, free part size = humeral spot, other part broadly connected to base and suture; scutellar spots and humeral spots in a transverse line; suture margined in black; central band restricted to central third of elytra, not extending to apex, laterally narrowed and zig-zagged, not reaching lateral margin. Venter and legs black; tarsi and palpi tan.

Head dorsal distance between eyes = 2 x eye width; ocular striae reaching 0.75 distance to anterior angle of eye; vertex puncture size = 0.75 x facet, separated by 1 to 3 diameters; epistome puncture size = 0.75 x facet, coalescing. Antenna reaching basal 0.25 of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere X crescent-shaped; antennomere XI subcircular, transverse narrower than antennomere X (Fig. 6l).

Maxillary palp terminal segment triangular, sides rounded, lateral angle acute, medial angle nearly 90°, length = 0.5 x width. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90°, length = 0.8 x width. Labial palp width = 0.5 x maxillary palp width (Fig. 7o). Mentum with plate triangular, length = width, sides concave, apical angle rounded; ridge medial extension lacking (similar to Fig. 8h).

Pronotal disc puncture size = 0.75 to 1.0 x facet, separated by 1 to 3 diameters. Scutellum pentagonal, sides short, length = 0.6 x width. Each elytron with 7 complete striae, stria VIII present at base and on apical half; strial puncture size at base = pronotal disc puncture, gradually becoming finer posteriorly; intervals finely punctate, impressed, distinct.

Prosternum strongly keeled and pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa; coxal lines arched or straight, length = 0.5 x sternal length, lines not surpassing coxae, length = 0.6 x basal width; prosternal plate flat, triangular to semicircular, apical width = 0.6 x basal width; base shallowly concave.

Mesosternum basal width = 3 x mesocoxal line length; coxal lines straight, parallel; base sinuate, medially lobed. Metasternum coxal lines meet at middle, often crenate; coxal lines extend 0.5 distance to posterior lateral angle; sternum shining, medial punctures fine; few coarse lateral punctures and strongly microreticulate laterally.

First visible abdominal ventrite coxal lines continuous around coxa or weak and short, not surpassing coxa; broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe straight, apically truncate; internal sac without noticeable sclerotized structures; flagellum narrow, length = 1.6 x median lobe length (Fig. 103a); base of flagellum straight, sclerite at base claw-shaped and thickened at connection with flagellum (Fig. 103b-d) (6 dissected).

Female genitalia with spermathecal head elongate kidney-shaped; tail narrow, coiled (Fig. 103e) (6 dissected).

Stridulatory files on occipital region of head not visible on males; heads retracted on all female specimens, presence unknown. Females with foveate punctures on prosternum in front of procoxae, obscured by microreticulation; males lack prosternal punctures.

Variation: The specimens from Panama have the anterior pronotal angle spot variable in size and distinctiveness, present or absent, and the humeral spot free. The Brazilian specimens have the anterior pronotal angle spot distinct, sharply delineated from the rest of the pronotum, and the humeral spot connected to the elytral base. The Brazilian male differs from the other males in that the sclerotized muscle attachment at the end of the internal sac is shorter and more arched. Otherwise, the genitalia are indistinguishable.

When the elytra are together, the central mark varies from W- to V-shaped, depending on the extent of the sutural connection.

Type material: The male holotype of *Ischyrus mystacis* Skelley label data: "/CANAL ZONE, night, Coco Solo Hospital, VII-2-1974, C.W.& L.O'Brien &

Marshall/" [FSCA]. The female allotype bears the same data except: not "night", and "VII-1-1974" [FSCA]. Including the holotype and allotype, a total of 40 specimens, representing 38 collection records, was studied (see Appendix C for specific data).

Distribution: Panama, Venezuela, Trinidad, and Brazil (Fig. 133).

Etymology: *mystax, mystakos*: Greek = mustache, hair on the upper lip. The name refers to the central elytral spot which is reminiscent to the mustache worn by the villian in silent movies.

Remarks: *Ischyrus mystacis* superficially resembles *I. mimus* in color pattern and body shape. *Ischyrus mystacis* can be distinguished by the characters mentioned in the diagnosis and the genitalia.

Ischyrus parallelus Skelley new species

(Figs. 7k, 10g-h, 11, 14b, 53, 104, 134)

Diagnosis: Characterized by having uniform dark brown color (no color pattern), parallel-sided body, pronotal punctures uniform in size, labial palp terminal segment rounded or squared (length = width), prosternal plate length = 3 x width, and 8 complete elytral striae.

Description: Length: 4.1-5.2 mm; Width: 1.9-2.4 mm. Body parallel-sided, coarsely punctate, widest at basal third of elytra; microreticulate, dull; body dark brown; mouthparts, antennal club and tarsi slightly pale brown (Fig. 53).

Head dorsal distance between eyes = 3 x eye width; ocular striae reaching 0.7 to 0.8 apical angle of eye; vertex puncture size = 0.5 to 0.75 x facet, separated by 2 to 3 diameters; epistome puncture size = 0.5 to 0.75 x facet, separated by 0.5 to 1.0 diameter. Antenna reaching base of pronotum; antennomere III as long as next 2 antennomere combined; antennomeres IX to XI symmetrical; antennomere XI oval, transverse (similar to Fig. 6i).

Maxillary palp terminal segment semicircular, swollen, sides rounded, apical angles obtuse, length = 0.75 x width. Labial palp terminal segment narrowed, elongate, symmetrical, sides rounded, angles obtuse, width = 0.75 x length. Labial palp width = 0.33 x maxillary palp width (Fig. 7k). Mentum with plate triangular, length = 0.8 x width, sides nearly equal in length, sides convex, ridge medial extension bluntly pointed (similar to Fig. 8g)

Pronotal disc puncture size = 0.5 to 0.75 x facet, separated by 2 to 3 diameters; lateral puncture size = 1 x facet, separated 0.5 to 1.0 diameter. Scutellum pentagonal, length = 0.6 x width. Each elytron with 8 complete striae; strial puncture size = 1 x facet, uniform in size almost to apical third; intervals finely punctate.

Prosternum strongly keeled and pinched anteriorly, sternum swollen above pinch (Fig. 10g-h); with (female) or without (male) foveate punctures in front of procoxa; coxal lines sinuate, nearly parallel, slightly concave at middle, length = 0.5 to 0.6 x sternal length, lines surpassing coxae (Fig. 14b), basal width = 0.5 x length; prosternal plate appearing swollen behind coxae, slightly convex, apical width = 0.9 to 1.0 x basal width; base shallowly concave.

Mesosternum basal width = 1.5 x mesocoxal line length; coxal lines straight, parallel; base truncate. Metasternum coxal lines meet weakly at middle in straight line, often obscure; coxal lines extend 0.33 to 0.5 distance to posterior lateral angle; sternum with medial punctures fine, coarse lateral punctures similar to pronotal punctures.

First visible abdominal ventrite with coxal lines reaching 0.33 to 0.5 distance to posterior edge; rounded between metacoxae; punctation similar to metasternum, coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe weakly arched, apically rounded; internal sac without noticeable sclerotized structures; flagellum hair-like, length = 2.3 x median lobe length (Fig. 104a); base of flagellum straight, sclerite at base claw-shaped to ring-shaped (Fig. 104b-d) (9 dissected).

Female genitalia with spermathecal head elongate-oval; tail narrow, weakly curved with swollen end (Fig. 104e) (6 dissected).

Stridulatory files present on occipital region of heads in both males and females. Females have foveate punctures in front of procoxae, covering the surface from coxae to anterior margin (Fig. 11); male prosternal punctures are obscure, not impressed.

Variation: The dorsal punctation varies in size and distinctiveness from specimen to specimen.

Type material: The male holotype and female allotype of *Ischyrus parallelus* Skelley label data: "/PANAMA: C.Z., Cardenas Village, May 22, 1980: E.Riley & D.LeDoux/" [FSCA]. Including the holotype and allotype, a total of 90 specimens, representing 23 collection records, was studied (see Appendix C for specific data).

Distribution: Brazil, Venezuela, Panama, and Costa Rica (Fig. 134).

Etymology: The name *parallelus* refers to the parallel-sided body shape of this species.

Remarks: *Ischyrus parallelus* is similar to *Ischyrus impressus* in many characters. *Ischyrus impressus* has an elongate body, lateral pronotal punctures larger than on the disc, and the prosternal plate length = 2 x widths; *I. parallelus* has a parallel-sided body, pronotal punctures of equal size, and the prosternal plate length = 3 x widths.

Ischyrus parcarum Skelley new species

(Figs. 55, 119)

Diagnosis: Characterized by its dull, uniformly orange-brown color with 3 small free spots on each elytron, and the weakly pinched prosternum.

Description: Length: 5.9-6.6 mm; Width: 3.1-3.5 mm. Body elongate, widest at basal third of elytra; strongly microreticulate, dull; orange-brown with black pattern (Fig. 55).

Head orange-brown. Pronotum with thin black margins. Scutellum dark orange-black. Each elytron with black epipleural fold, small amount of orange at base; elytra finely margined in black; scutellar, central and lateral spots free, lateral spot anterior to central, central and lateral spot occasionally connected. Venter orange, margins of sclerites darker. Antennal club black, base orange; legs slightly darker than venter.

Head dorsal distance between eyes = 3 x eye width; ocular striae reaching 0.75 distance to anterior angle of eye; vertex and epistome puncture size = 0.5 to 0.75 x facet, separated by 1 to 2 diameters. Antenna reaching basal 0.25 of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere XI oval, transverse (similar to Fig. 6i).

Maxillary palp terminal segment triangular, securiform, basally rounded, apical angles nearly 90°, length = 0.66 x width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = 0.75 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7a). Mentum with plate triangular, sides straight and equal in length, ridge medial extension short and projecting, acutely pointed (similar to Fig. 8i).

Pronotal disc puncture size = 1 x facet, separated 2 to 3 diameters. Scutellum pentagonal, length = 0.6 x width. Each elytron with 7 visible striae; strial puncture size at base = 1 x facet, gradually becoming finer at apex; intervals finely punctate, hidden by strong microreticulations.

Prosternum convex and weakly pinched anterior; with foveate punctures in front of procoxa; coxal lines straight, length = 0.4 x sternal length, lines not surpassing coxae, length = 0.75 basal width; prosternal plate flat, apical width = 0.75 x basal width; base shallowly concave.

Mesosternum basal width = 1.5 x mesocoxal line length; coxal lines straight, anteriorly diverging; base sinuate. Metasternum coxal lines weakly recurved, not meeting at middle; coxal lines extend 0.25 to 0.33 distance to posterior lateral angle; sternum with medial punctures fine, few coarse lateral punctures weakly impressed.

First visible abdominal ventrite coxal lines reaching 0.25 to 0.33 distance to posterior edge; rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male unknown.

Female genitalia with spermathecal head kidney-shaped, with strong top-knot; tail swollen, tightly curved like an inverted question mark, "¿" (Fig. 119) (3 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted).

Variation: The central and lateral elytral spots are connected on one of the paratypes, forming a single wavy spot. Otherwise, no notable variation was observed.

Type material: The female holotype of *Ischyrus parcarum* Skelley label data: "/MEXICO, Jal., UNAM Biol. Sta. Chamela, 200', 9 Aug.1982, CW & L.O'-Brien & G. Wibmer/ at night/" [FSCA]. The holotype and 2 specimens were studied, representing 2 collection records. Paratype label data: same data as holotype [1, PESC]; same data as holotype except "at light" [1, UNAM].

Distribution: Known only from the state of Jalisco, Mexico.

Etymology: *parca*: Latin = fate; *parcarum*: of the fates. "*Parca*" was a general Roman term for a fate who presided over human destiny (Brown 1985). This species (known from 3 females) is named for the three fates (Nona, Decuma, and Morta), for as fate would have it, no males are currently known.

Ischyrus pictus Gorham

(Figs. 62-63, 105, 135)

Ischyrus pictus Gorham 1887:42, t.3 f.4.

Micrischyrus pictus (Gorham) 1887, Alvarenga 1994: 15.

Diagnosis: Characterized by the pronotum having only 2 circular free spots with 3 basal spots, and the free lateral and apical elytral spots.

Description: Length: 4.7-7.2 mm; Width: 2.6-3.9 mm. Body elongate-oval, widest at basal third of elytra; microreticulate, shining; orange-yellow with black pattern (Fig. 62).

Head black with orange spot at each eye, orange spots often large and connected at middle forming one large central spot. Pronotum with 2 free spots; 3 basal spots connected to black basal margin. Scutellum black. Each elytron with epipleural fold entirely black or orange with black margins; humeral spot connected to base, rarely free; large scutellar spot broadly connected to base and suture, rarely free from base (see Variation); suture with black margin; central spot rarely free; free lateral spot located at elytral half; apical spot free. Venter mostly orange with black sclerite margins. Appendages black, palpi and tarsi brown.

Head dorsal distance between eyes = 2.5 x eye width; ocular striae reaching 0.75 distance to anterior angle of eye, often continued forward as a row of punctures; vertex puncture size = 1 x facet, separated by 1 to 2 diameters; epistome puncture size = 0.75 x facet, nearly coalescing. Antenna reaching basal 0.25 of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere XI subcircular, narrower than antennomere X (similar to Fig. 6l).

Maxillary palp terminal segment triangular, sides rounded, lateral angle acute, medial angle nearly 90°, width = 2 x length. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90°, length = 0.8 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7o). Mentum with plate broadly triangular, length = 0.5 x width, sides concave (similar to Fig. 8h); ridge medial extension short, blunt, projecting.

Pronotal disc puncture size = 1 x facet, separated by 1 to 2 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII faint, present at base and apical half; strial punctures at base = 2 pronotal disc punctures, gradually becoming finer posteriorly; intervals finely punctate, impressed and distinct.

Prosternum strongly keeled and pinched anteriorly; with or without foveate punctures in front of procoxa, weakly impressed and obscure when present; coxal lines slightly arched or straight, length = 0.6 x sternal length, lines barely surpassing coxae, length = 0.75 x basal width; prosternal plate weakly convex, apical width = basal width; base concave.

Mesosternum basal width = 3 x mesocoxal line length; coxal lines straight, parallel to divergent anteriorly; base sinuate. Metasternum coxal lines meeting at middle, strongly crenulate or punctured, recurved; coxal lines extend 0.33 to 0.5 distance to posterior lateral angle; sternum with medial punctures fine, impressed; few coarse lateral punctures often obscured by strong microreticulation.

First visible abdominal ventrite with coxal lines short, extending 0.33 to 0.5 distance to posterior margin; broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe weakly arched, apically rounded; internal sac without noticeable sclerotized structures; flagellum long and thick, apex flared, length = 1.6 x median lobe length (Fig. 105a); base of flagellum straight and swollen, sclerite at base elongate, claw-shaped (Fig. 105b-d) (3 dissected).

Female genitalia with spermathecal head elongate, kidney-shaped; tail narrow, looped (Fig. 105e) (3 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). No consistent sexual difference was observed in the presence or absence of prosternal punctures.

Variation: A specimen (Fig. 63) from Oaxaca, Mexico, is similar to the description above, even in the genitalic characters, but differs in having the head mostly orange, elytral suture with small subapical spot, free subhumeral spot, minute humeral spot, scutellar spot not connected to the base, and prosternum slightly longer than wide.

Type: The holotype (by monotypy) of *Ischyrus pictus* Gorham label data: "/[red circle on white paper] Type/ Type, sp. figured/ San Juan, Vera Paz., Champion/ Ischyrus pictus Gorh/ B.C.A., Col., VII, Ischyrus/" [NHML, examined]. Sex not determined. Gorham (1887) stated that the type locality is in Guatemala.

Specimens examined: The holotype and 18 specimens, representing 15 collection records, were studied (see Appendix C for specific data).

Distribution: Honduras, Guatemala, and southern Mexico (Fig. 135).

Etymology: *pictus*: Latin = painted, colored. Undoubtedly named for the distinctive color pattern.

Taxonomic notes: The variation mentioned above may represent a west Mexican variety or a distinct taxon. No conclusions can be made based on the single specimen studied.

Remarks: *Ischyrus pictus* is most similar to *I. episcaphulinus* and *I. collatinus* in color pattern. The circular free pronotal spots will separate *I. pictus* from these species which have transverse, rectangular, free pronotal spots.

References: Blackwelder 1945:465; Kuhnt 1909:63; 1911:43; Pallister 1955b:7.

Ischyrus poseidon Skelley new species

(Figs. 61, 106)

Diagnosis: Recognized by having pronotal markings consisting of 2 free, 3 basal and hind angle spots, and with the subhumeral spot located at the basal third, far from the base.

Description: Length: 5.5-6.4 mm; Width: 2.9-3.6 mm. Body elongate-oval, widest at basal quarter of elytra; microreticulate, weakly shining; orange-red to yellow with black pattern (Fig. 61).

Head black with orange-red spot near the anterior angle of each eye. Pronotum with 2 free spots, one spot on each posterior angle, and 3 basal tooth-like spots. Scutellum black. Each elytron with orange-red epipleural fold; free subhumeral spot at basal third of elytra; scutellar spot narrowly connected to base at scutellum, broadly connected to suture; sutural margin black, complete almost to apex or consisting of 2 swellings (basal third of elytra and near apex);

central and lateral spots free or connected to each other and suture; apical spot free. Appendages and venter black.

Head dorsal distance between eyes = 3 x eye width; ocular striae reaching anterior angle of eye; vertex puncture size = 1 x facet, separated by 1 to 2 diameters; epistome puncture size = 0.5 x facet, nearly coalescing. Antenna reaching basal 0.25 of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere XI subcircular, = width of antennomere X (similar to Fig. 6l).

Maxillary palp terminal segment triangular to semicircular, sides rounded, angles acute, width = 2 x length. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90°, length = 0.5 x width. Labial palp width = 0.75 x maxillary palp width (similar to Fig. 7i). Mentum with plate broadly triangular, length = 0.5 x width, sides concave (similar to Fig. 8e); ridge medial extension short, projecting, pointed but not acute.

Pronotal disc puncture size = 1 x facet, medially separated by 1 to 2 diameters, laterally separated by 0.5 to 1.0 diameter. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII present at base and apical half; strial puncture size at base = 1.0 to 1.2 x pronotal disc puncture, gradually becoming finer posteriorly; intervals finely punctate.

Prosternum strongly keeled and pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa; coxal lines slightly arched or straight, length = 0.5 x sternal length, lines not surpassing coxae, length = basal width; prosternal plate almost quadrate, weakly convex, apical width = basal width; base slightly concave.

Mesosternum basal width = 3 x mesocoxal line length; coxal lines straight; base sinuate. Metasternum coxal lines meet at middle, line often crenate-punctate, weakly recurved; coxal lines extend 0.25 to 0.33 distance to posterior lateral angle; line behind mesocoxa deep, groove-like, almost pit-like medially; sternum medially shining, medial punctures fine, few coarse lateral punctures obscured by strong microreticulation.

First visible abdominal ventrite with coxal lines short, extending 0.33 to 0.5 distance to posterior margin; rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe moderately arched, apically rounded; internal sac without noticeable sclerotized structures; flagellum hair-like, length = 5.3 x median lobe length (Fig. 106a); base of flagellum straight, sclerite at base claw-shaped (Fig. 106b-d) (2 dissected).

Female genitalia spermatheca not found (2 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Male with prosternum-pronotal epipleural suture obscure in front of coxae; lacking prosternal punctures. Females with prosternum-pronotal epipleural suture distinct; numerous foveate prosternal punctures in front of procoxae.

Variation: The Panama specimens have the sutural edge with a wide black margin, broadly connected to the central and scutellar spots (Fig. 61). The Colombian specimen has the black sutural marking reduced, thinly margined with 2 spot-like swellings; one at the basal third, the other at the apical quarter of the elytra.

Type material: The male holotype of *Ischyrus poseidon* Skelley label data: "/COLOMBIA: Pueblo Bello: Sierra de Santa Marta, Elev.1200m. IV:14-15:1968, leg. B. Malkin/ at light/" [FMNH]. The female allotype label data: "/PANAMA, Las Cumbres, 6-V-74, H. Wolda/" [OSUC]. Including the holotype and allotype, a total of 5 specimens, representing 5 collection records, was studied. Paratype label data: **Panama**, Tocuman, 6-I-1953, F. S. Blanton [1, USNM]; Canal Zone, Barro Colorado Island, 10-VIII-1981, R. B. Kimsey [1, UCDC]; Panama Prov., Cerro Campana, 11-15-V-1980, R. G. Riley [1, PESC].

Distribution: Panama and Colombia.

Etymology: *Poseidon*: Greek = god of the oceans, bearer of the trident. This name was chosen for the tridentate mark at the base of the pronotum (noun in apposition).

Ischyrus proximus Lacordaire

(Figs. 9a, 14a, 16a, 34, 107, 136)

Ischyrus proximus Lacordaire 1842:113.

Micrischyrus proximus (Lacordaire) 1842, Alvarenga 1994:15.

Ischyrus sexpunctatus Chevrolat, *in* Lacordaire 1842:113 [*nomen nudum*].

Diagnosis: Recognized by the pronotum having 2 anterior, 2 free, and 2 basal spots, 2 free pronotal spots set closer together than head width (including eyes), hind pronotal angles without spots, legs entirely black, subhumeral spot connected to scutellar spot, and orange elytral epipleural fold.

Description: Length: 6.0-8.2 mm; Width: 3.1-4.4 mm. Body elongate, widest at basal third of elytra; dull, microreticulate; yellow to orange with black color pattern (Fig. 34).

Head solid black or with varying amounts of orange on the epistome and vertex. Pronotum with 2 anterior spots and 2 basal spots connected to margin; 2 free spots set so the distance between centers is less than head width including eyes; all pronotal spots together form a longitudinally elongate circle; base with thin black margin on central half. Scutellum black. Each elytron with orange epipleural fold, rarely dark and appearing black; subhumeral spot connected

to large scutellar spot, rarely free; scutellar spot broadly connected to base and suture; suture black; central spot roughly triangular, broadly connected to suture from elytral half nearly to apex, anteriorly widened, posteriorly blunt, rarely swollen apically, with 2 indentations on anterior and posterior edges giving the spot the appearance of being formed from the fusion of 3 spots. Venter black with orange lateral margins of sclerites. Appendages black; palpi and tarsi brown.

Head dorsal distance between eyes = 2 x eye width; ocular striae reaching 0.5 distance to anterior angle of eye, continued forward as row of punctures; vertex puncture size = 1 x facet, separated by 1 to 3 diameters; epistome puncture size = 0.75 x facet, separated by 1 diameter. Antenna reaching basal 0.25 of pronotum; antennomere III as long as next 3 antennomere combined; antennomere IX narrow, nearly triangular; antennomeres X to XI asymmetrical (similar to Fig. 6c).

Maxillary palp terminal segment triangular, securiform, sides nearly straight, apical angles nearly 90°, length = 0.66 x width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = 0.75 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7a). Mentum with plate triangular, all sides of equal length, length = 0.6 x width, sides straight, ridge medial extension acutely pointed (similar to Fig. 8d).

Pronotum puncture size = 1 x facet, separated by 2 to 3 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; some specimens with stria VIII weak on apical half of elytra; strial puncture size at base = pronotal disc puncture; intervals finely punctate.

Prosternum keeled and pinched anteriorly; with few weakly impressed foveate punctures in front of procoxa; coxal lines straight, length = 0.5 x sternal length, lines barely surpassing coxae (Fig. 14a), length = basal width; prosternal plate flat, apical width = 0.5 x basal width; base shallowly concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight to weakly curved; base sinuate, lobed medially. Metasternum coxal lines weakly recurved, meeting medially (Fig. 16a); coxal lines extend 0.5 distance to posterior lateral angle (Fig. 9a); sternum with medial punctures fine, few coarse lateral punctures 3 x larger than medial punctures.

First visible abdominal ventrite with coxal lines reaching 0.5 distance to posterior edge; broadly rounded between metacoxae; coarse punctures laterally, fine medial punctures dense.

Male genitalia with median lobe moderately arched, apically truncate, slightly constricted just before tip; internal sac without noticeable sclerotized structures; flagellum long and narrow, length = 1.9 x median lobe length (Fig. 107a); base of flagellum curved, sclerite at base blunt claw to shaped and thickened at connection with flagellum (Fig. 107b-d) (5 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail swollen, tightly curved like an inverted question mark, "¿" (Fig. 107e) (13 dissected).

Stridulatory files on occipital region of head present in males; female specimens had heads retracted, presence unknown. Females with lateral patch of foveate punctures on prosternum in front of procoxae; males have, at most, 5 to 6 punctures immediately in front of procoxae.

Variation: Gorham (1887:40) comments on the differences in head color in this species, solid black or with orange epistome and vertex, and illustrated each form. In all of the specimens examined, the proportion of black heads to red heads is nearly 2:1. Most series of specimens show one or the other color; some bear both colors. The difference in color does not appear to correlate with geographic range or any other characteristics which would allow separation of the two.

Occasionally a specimen was studied in which the elytral epipleural fold appeared black. The subhumeral spot is rarely separated from the scutellar spot. These variations could be confused with other species (*I. scriptus* and *I. palliatus*). Characters used in the key will allow adequate separation of these species (see Remarks section under *I. scriptus*).

Type: The lectotype (here designated) of *Ischyrus proximus* Lacordaire label data: "/Mexico/ Type proximus Ch./ [blue paper] TYPE/ [red] LECTOTYPE Ischyrus proximus Lacordaire des. P. E. Skelley/" [CUMZ, examined]. Sex apparently male, not dissected.

Specimens examined: The lectotype and 131 specimens, representing 62 collection records, were studied (see Appendix C for specific data).

Distribution: Widespread from Mexico to Panama and Bolivia (Fig. 136).

Etymology: *proximus*: Latin = nearest. Maybe Lacordaire named it "proximus" because of its similarity to other species.

Taxonomic notes: Lacordaire stated that he received the specimen from Chevrolat under the name "6-punctatus." He proposed a different name because "6-punctatus" was already in use for another species in the "family."

The lectotype was designated because there is no indication that Lacordaire saw only one specimen. The specimen in Crotch's collection fits Lacordaire's description and is labeled "Ch.," indicating it came from Chevrolat's collection. This specimen, from Mexico, has the head entirely black.

Biology: A series of specimens from Costa Rica is labeled "an Pilzbelag und trocknem Holz", which means "on fungus covering dry wood". Other biologi-

cal label data: "at night on plants", "rain forest", and "lights, broad leaf forest".

One small series was collected on the fungus *Schizopora paradoxa* (Fr.)Donk in Costa Rica. This white rot fungus of wood is a white resupinate polypore when in fruit.

Remarks: *Ischyrus proximus* Lacordaire is similar to *I. palliatus* Lacordaire, *I. scriptus* (Olivier), and *I. incertus* Lacordaire in color pattern. Despite the similarities and variability of color patterns, they can be separated by the combination of characters listed in the Remarks section of *I. scriptus* (Olivier).

References: Blackwelder 1945:465; Crotch 1876: 430 (54); Gemminger & Harold 1876:3691; Gorham 1887:40, t.2 f.21-22; Kuhnt 1909:62; 1911:43; Pittier & Biolley 1895:37.

Ischyrus putei Skelley new species

(Figs. 6g, 7g, 8e, 15f, 16c, 48, 108)

Diagnosis: Recognized by its elongate-subcylindrical body shape, pit in the metasternum behind each mesocoxa, T-shaped central elytral marking, and central pronotal stripe with a longitudinally elongate spot on each side at base.

Description: Length: 4.3-5.4 mm; Width: 2.1-2.6 mm. Body elongate, subcylindrical, widest at basal third of elytra; weakly microreticulate, shining; orange-red with black pattern (Fig. 48).

Head orange. Pronotum with central stripe connecting base to apex, widest at base; one elongate spot connected to base near each posterior angle, converging anteriorly. Scutellum dark red. Each elytron with orange-red epipleural fold; large subhumeral spot well removed from base, as large or larger than, and occasionally touching scutellar spot; scutellar spot well removed from base, angled, only connected to suture at anterior half; central band narrow, edges straight, anterior extension short (if present) and rounded, posterior extension nearly reaching apical angle and acutely pointed; together elytral central bands form a T-shaped marking. Venter orange-red. Antennal base orange-red, club black. Legs orange-red.

Head dorsal distance between eyes = 4 x eye width; ocular striae reaching anterior angle of eye; vertex puncture size = 1 x facet, separated by 2 to 3 diameters; epistome puncture size = 1 x facet, separated by 1 to 2 diameters, flat in profile. Antenna reaching base of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres X to XI symmetrical; antennomere XI subcircular (Fig. 6g).

Maxillary palp terminal segment triangular, almost circular, basally rounded, apical angles 90°, width = length. Labial palp terminal segment triangular, extended on medial side, length = width. Labial palp width = 0.5 x maxillary palp width (Fig. 7g). Mentum with plate broadly triangular, length = 0.5 x width, sides inwardly curved, ridge medial extension short and acutely pointed (Fig. 8e)

Pronotal disc puncture size = 1 x facet, separated 3 to 4 diameters; laterally separated 2 to 4 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VII often weak and obscure; basal strial puncture size = 2 x pronotal disc punctures, rapidly decreasing in size posteriorly; intervals finely punctate.

Prosternum keeled and pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa; coxal lines straight, length = 0.5 x sternal length, lines barely surpassing coxae, length = 0.75 x basal width; prosternal plate slightly convex, apical width = 0.6 x basal width; base shallowly concave.

Mesosternum basal width = 3 x mesocoxal line length; coxal lines straight, parallel to converging anteriorly; base shallowly sinuate. Metasternum coxal lines often recurved, meet at middle in series of 2 to 6 tooth-like undulations (Fig. 15f), teeth occasionally weak, never with a single tooth; coxal lines extend 0.5 distance to posterior lateral angle; line behind mesocoxa deep, groove-like, deep pit in metasternum behind mesocoxa connected to middle of groove, not connected to coxa line (Fig. 16c); sternum finely punctate.

First visible abdominal ventrite with fine coxal lines reaching 0.33 distance to posterior edge; broadly rounded between metacoxae, almost truncate; fine punctures medially; coarse lateral punctures weakly impressed.

Male genitalia with median lobe straight, apically truncate; internal sac without noticeable sclerotized structures; flagellum narrow, not sclerotized on basal 0.5, length = 2 x median lobe length (Fig. 108a); base of flagellum straight, sclerite at base horseshoe-shaped (Fig. 108b-d) (6 dissected).

Female genitalia with spermathecal head kidney-shaped; tail narrow, angled and coiled (Fig. 108e) (4 dissected).

Stridulatory files present, but weak, on occipital region of male heads; absent on females. Females have a few, weakly impressed and obscure foveate punctures on prosternum in front of procoxae; males lack these punctures.

Variation: The subhumeral and scutellar spots are occasionally connected posteriorly forming a band-like spot.

Type material: The male holotype of *Ischyrus putei* Skelley label data: "/PANAMA: Barro Colorado Isl., 20-23.V.64. WD & SS Duckworth/" [USNM]. The female allotype bears the same data except: "10-17.V. 64" [USNM]. Including the holotype and allotype, a total of 45 specimens, representing 16 collection records, was studied (see Appendix C for specific data).

Distribution: Known only from Panama.

Etymology: *putei* - genitive of *puteus* : Latin = well, pit, hole. The name was chosen for this species in

reference to the large pit-like hole in the metasternum behind the mesocoxae.

Biology: The only biological data associated with specimens is "canopy fogging experiment in *Luehea seemanni*, Pyrethrin fog." The majority of specimens were collected in this manner on at least 10 occasions. This species may have arboreal habits.

Ischyrus pyropodus Skelley new species

(Figs. 6m, 75, 109)

Diagnosis: Recognized by having combination of 4 free pronotal spots in transverse row, 2 basal pronotal spots, scutellar and humeral elytral spots not touching, central elytral spot band-like, and free apical elytral spots.

Description: Length 6.9-8.3 mm; Width: 3.5-4.2 mm. Body elongate, widest at basal third of elytra; weakly microreticulate, shining; orange-yellow with black pattern (Fig. 75).

Head black with orange spot on frons. Pronotum with 2 small anterior spots; 2 larger triangular basal spots, widely separated, connected by narrow basal margin on medial half; 4 free spots in anteriorly concave arch, lateral spots smaller than central spots. Scutellum dark orange to black. Each elytron laterally margined in black; black epipleural fold with brown base; subhumeral spot elongate, connected to base; scutellar spot large, rounded, broadly connected to base and suture; suture completely margined with black; central band not reaching lateral margin; apical spot free. Venter orange, sclerites with black margins. Appendages black; palpi and base of antennae brown; tarsi reddish.

Head dorsal distance between eyes = 2.5 x eye width; ocular striae reaching anterior angle of eye; vertex puncture size = 1 x facet, separated by 1 to 2 diameters; epistome puncture size = 0.5 x facet, nearly coalescing. Antenna reaching basal 0.25 of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere X wider than antennomere IX, slightly wider than antennomere XI; antennomere XI circular (Fig. 6m).

Maxillary palp terminal segment triangular, securiform, basally rounded, apical angles nearly 90°, length = 0.66 x width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = 0.75 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7a). Mentum with plate triangular, length = 0.75 x width, apical sides straight (similar to Fig. 8a), ridge medial extension acute, projecting.

Pronotal disc puncture size = 1 x facet, separated 2 to 3 diameters; denser laterally, separated by 1 diameter. Scutellum pentagonal, length = 0.6 x width. Each elytron with 7 complete striae; stria VIII present on apical half; strial punctures = 1.5 x pronotal disc puncture, gradually becoming finer posteriorly; intervals finely punctate, distinct.

Prosternum keeled and pinched anteriorly; lacking distinct punctures in front of procoxa; coxal lines straight, length = 0.6 x sternal length, lines barely surpassing coxae, length = basal width; prosternal plate slightly convex, apical width = 0.6 x basal width; base concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight; base broadly sinuate. Metasternum coxal lines meet at middle, weakly undulate, recurved; coxal lines extend 0.33 to 0.5 distance to posterior lateral angle; sternum shining, medial punctures fine, few coarse lateral punctures weakly impressed.

First visible abdominal ventrite with coxal lines reaching 0.5 distance to posterior edge; broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe moderately arched, narrowed and apically rounded; internal sac with speckled surface midway between median lobe and flagellar base; flagellum thick, gradually narrowing to apex, length = 1.2 x median lobe length (Fig. 109a); base of flagellum thick, sclerite at base claw-shaped (Fig. 109b-d) (1 dissected).

Female genitalia with spermathecal head kidney-shaped, with top-knot; tail weakly swollen, angled and curved onto itself (Fig. 109e) (1 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Male prosternum smooth and without punctation. Female prosternum roughened-wrinkled; if punctures present, weakly impressed and obscure (difference possibly due to individual variation).

Variation: The only notable variation between the 2 specimens studied is the size of the orange mark on the frons. In the male specimen from "Sierra de Durango", Mexico, the orange spot occupies over half the face. The female from the state of San Luis Potosí, Mexico, has the spot smaller, covering less than a quarter of the face.

Type material: The female holotype of *Ischyrus pyropodus* Skelley label data: "/MEX. S. L. P., 6.9 mi. E. El Naranjo, Rte. 80, X.14.16/ George E. Ball, D. R. Whitehead Collectors/" [CUIC]. The male allotype label data: "/[green paper] 69638/ [olive paper] Sierra de Durango/ Mexico/ Fry Coll. 1905.100/" [NHML].

Distribution: Known only from the state of San Luis Potosí and "Sierra de Durango", Mexico. In the gazetteer to the Biologia Centrali-Americana, Selander and Vaurie (1962:57) stated that the locality "Sierra de

Durango" is part of the Sierra Madre Occidental and noted that "according to Champion (Coleoptera, vol.4, pt.4, p.210), specimens with this label obtained from Donckier are probably from Veracruz or Oaxaca rather than Durango." The exact origin of the "Sierra de Durango" specimen is uncertain.

Etymology: *pyr*: Greek = fire; *podos*: Greek = foot. The name *pyropodus* was chosen for this species because the specimens studied have reddish tarsi contasting with the black tibia; looking like their feet are on fire.

Remarks: This species is similar in color pattern to *I. grammicus* Gorham and *I. nigrolineatus* Crotch. It can be separated by having the central elytral marking unbroken. *Ischyrus grammicus* and *I. nigrolineatus* have the central elytral marking broken into stripe-like spots.

Ischyrus quadripunctatus (Olivier)

(Figs. 1, 6f, 7f, 10c-d, 17, 16b, 18, 19, 20, 21a, 22, 23, 110, 137)

Ischyrus quadripunctatus quadripunctatus (Olivier), Boyle 1954:39-41.

Erotylus quadripunctatus Olivier 1792:431, 437.

Mycotretus quadripunctatus (Olivier), Dejean 1836:429 (1837:453).

Ischyrus quadripunctatus (Olivier), Lacordaire 1842:127-128.

Ischyrus quadripunctatus Crotch 1873:144, Gemminger & Harold 1876:3690.

Micrischyrus quadripunctatus quadripunctatus (Olivier) 1792, Alvarenga 1994:16.

Engis variegata Dejean 1821:45 [*nomen nudum*], Gemminger & Harold 1876:3691.

Mycotretus variegata (Dejean), Dejean 1836:429 (1837:453).

Mycotretus humeralis Chevrolat [*nomen nudum*] *in* Dejean 1836:429 (1837:453), Sturm 1843:305.

Ischyrus subcylindricus Lacordaire 1842:117-118; **new synonymy**.

Mycotretus subcylindricus Chevrolat [*nomen nudum*] *in* Dejean 1836:429 (1837:453), Lacordaire 1842:117-118.

Micrischyrus subcylindricus (Lacordaire) 1842, Alvarenga 1994:16.

Ischyrus graphicus Lacordaire 1842:125-126; **new synonymy**.

Ischyrus quadripunctatus graphicus Lacordaire, Boyle 1954:41-43.

Micrischyrus quadripunctatus graphicus (Lacordaire) 1842, Alvarenga 1994:15.

Ischyrus quadripunctatus var. *alabamae* Schaeffer 1931:175, Mader 1938:19.

Ischyrus quadripunctatus var. *antedivisa* Mader 1938:19, Boyle 1954:39-41.

Ischyrus quadripunctatus Var. A Lacordaire 1842:127-128.

Ischyrus puncticollis Gorham 1887:44-45; **new synonymy**.

Micrischyrus puncticollis (Gorham) 1887, Alvarenga 1994:15.

Ischyrus quadripunctatus chiasticus Boyle 1954, **new status**.

Ischyrus chiasticus Boyle 1954:43-46.

Micrischyrus chiasticus (Boyle) 1954, Alvarenga 1994:13.

Diagnosis: Characterized by 4 free pronotal spots in transverse arch (rarely connecting with other markings), club antennomeres asymmetrical, and maxillary palp terminal segment narrowed (Figs. 7f, 20).

Description: Length: 4.8-8.8 mm; Width: 2.3-3.7 mm. Body elongate, widest at basal third of elytra; variably microreticulate, dull to shining; yellow-orange with black pattern (Figs. 42-47).

Head black; often with central orange spot. Pronotum with 4 free spots in transverse arch, anteriorly concave; base with black marking on median half, marking variously widened from narrow margin to 3 tooth-like spots, central tooth occasionally connected to free central spots; anterior margin narrowly black between eyes, rarely with 2 weak spots. Scutellum black. Each elytron with orange epipleural fold; subhumeral spot shape variable, sometimes connected to scutellar spot and base; scutellar spot large, shape variable, broadly connected to base and suture; central black band with margin toothed or smoothly rounded, wide or narrow, sometimes connected to lateral edge, broadly connected to suture; apical spot present, size variable from large spot to widened black margin. Venter mainly black, variable orange markings on lateral abdomen and prothorax. Legs entirely black or banded with orange; tarsi dark brown to black; palpi pale brown to black; antenna brown, club black.

Head dorsal distance between eyes = 2.0 to 2.5 x eye width; ocular striae reaching apical angle of eye; vertex puncture size = 1 x facet, separated 1 to 3 diameters; epistome puncture size = 0.5 to 0.75 x facet, separated by 1 diameter. Antenna reaching basal 0.25 of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres X to XI asymmetrical; antennomere X angled at base; antennomere XI transverse (Fig. 6f).

Maxillary palp terminal segment triangular, narrow; inner angle 90°, rounded; outer angle acute; longer than wide, width = 0.8 x length. Labial palp terminal segment triangular, extended on medial side, narrow, width = 0.8 x length. Labial palp width = 0.75 x maxillary palp width (Fig. 7f). Mentum with plate broadly triangular, length = 0.7 x basal width, sides straight, ridge medial extension acutely pointed (Figs. 8d, 20).

Pronotal disc puncture size = 1 x facet, separated by 1 to 3 diameters. Scutellum pentagonal, length = 0.5 x width.

Each elytron with 7 complete striae; stria VIII weak, visible near humerus and apex; strial puncture size = pronotal disc puncture; interval puncture size = 0.20 to 0.25 strial puncture.

Prosternum weakly keeled and pinched anteriorly (Fig. 10c-d); with foveate punctures in front of procoxa; coxal lines straight, length = 0.5 x sternal length, lines barely surpassing coxae, basal width = 0.8 x length; prosternal plate flat, apical width = 0.6 x basal width; base shallowly concave.

Mesosternum basal width = 1.5 x mesocoxal line length; coxal lines straight to slightly arched; base sinuate, medially lobed. Metasternal coxal lines not meeting at middle, weakly recurved; lines short, reaching less than 0.25 distance to posterior lateral angle; line behind mesocoxa deep, groove-like (Fig. 16b); sternum finely punctate medially, few shallow coarse lateral punctures.

First visible abdominal ventrite with coxal line not surpassing coxa, often continuous around coxa, at most reaching 0.5 distance to posterior edge; abdominal segment broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia (Fig. 18) with median lobe moderately arched, apically truncate, slightly constricted just before tip; internal sac without noticeable sclerotized structures; flagellum long and narrow, flattened and ribbon-like at basal 0.5, length = 1.6 x median lobe length (Fig. 110a); base of flagellum straight and swollen, sclerite at base claw-shaped (Fig. 110b-d) (30 dissected).

Female genitalia (Fig. 19) with spermathecal head kidney-shaped, often with a top-knot; tail swollen, curved like an inverted question mark, "¿" (Fig. 110e) (21 dissected).

Stridulatory files on occipital region of head visible on males; not found on females (Fig. 17). Compared to females, males have fewer, less impressed punctures on prosternum in front of procoxae.

Variation: This species shows variation in many of the characters as indicated above. The prosternal plate is variable in shape, from almost parallel-sided to nearly triangular. The palpi vary in general shape, but are always narrowed (Figs. 7f, 20); a character appearing in only a few species of *Ischyrus*.

The presence and number of prosternal punctures varies with no correlation to geographic range. The maximum number of punctures in males overlaps broadly with the minimum number seen in females. In this species, determination of the sexes based on this character is not reliable.

The distinctiveness of the prosternal anterior pinch varies as much from specimen to specimen as from population to population. Boyle (1954) discussed some of these, and other, variations in detail.

The elytral color pattern varies from smoothly banded in North America to jagged, zig-zag edged bands (nearly striped in some specimens) in South America. The pattern changes are clinal from north to south.

Types: See under subspecies accounts.

Specimens examined: See under subspecies accounts.

Distribution: Widespread throughout the Americas: from southeast Canada and North Dakota in the north; south through Arizona, Mexico, Central America, and the Lesser Antilles, into South America to northern Argentina (Fig. 137).

Etymology: *quadripunctatus*: Latin = 4-punctures; referring to the 4 pronotal spots.

Taxonomic notes: Despite the variation in morphological characters stated above, the amount of variation within any one population is similar and overlaps the variation seen in any other population. No consistent morphological differences were found, including genitalia, between any taxa listed in the above synonymy.

Color patterns seem to correlate with specific geographic ranges and led to the description of various taxa: *I. subcylindricus* Lacordaire, *I. graphicus* Lacordaire, *I. chiasticus* Boyle, *I. quadripunctatus* var. *alabamae* Schaeffer, *I. quadripunctatus* var. *antedivisa* Mader. A study of specimens from localities at the edges of their distribution uncovered many intermediates; occasionally with several forms from the same population. All but one of the color pattern differences proved to be clinal in nature, therefore not deserving nomenclatural status. Based on this information (see also the subspecies accounts), all but *I. chiasticus* Boyle, which is lowered to subspecific rank, are synonymized under *I. quadripunctatus* (Olivier).

The year Olivier published the description of *Erotylus quadripunctatus* has always been cited as 1791. Blackwelder (1949, 1957) stated that part 2 of Olivier's Encyclopédie Méthodique was printed in 1792, followed by Alvarenga (1994) and myself.

Biology: Many authors have published bits of information on the biology of this species, but little is actually known. The biological notes presented here are based on information published on North American material, and will probably apply to all populations.

Data from published catalogs or faunal studies give little insight into the beetle's habits: in summer on fungi (Blatchley 1910), winter beneath rubbish (Dillon & Dillon 1961), at lights, and feeds on fungi on logs and dead tree trunk (Kirk 1969), under bark (Loding 1945), etc. Boyle (1956) consolidated much of this information in his account for *I. quadripunctatus quadripunctatus*.

Large eye facets of this species suggest nocturnal activity. The majority of specimens with any collection data were collected at lights, substantiating the nocturnal hypothesis.

Skelley *et al.* (1991) compiled fungal host data on the erotylids north of Mexico. They listed 4 fungi as hosts: *Irpex lacteus* (Fr.:Fr.)Fr., *Oxyporus latemarginatus* (Dur.& Mont. ex Mont.)Donk, *Phellinus gilvus* (Schw.)Pat., and *Poria* sp. Only *Oxyporus latemarginatus* (= *Poria ambigua* Bres.) had more than one recorded collection for *I. q. quadripunctatus*, which included rearings. This fungus is a white prostrate polypore which grows on the underside of dead wood suspended above the ground. Deciduous trees with dead limbs, stumps, or dead wood not touching the ground for some of its length, are suitable substrates for this fungus. I have found large numbers of *Ischyrus q. quadripunctatus* in these situations, occasionally associated with larvae.

The larva of *I. q. quadripunctatus* was first described by Chapuis & Candeze (1853), later by Weiss (1920), and Skelley (1988b). Lawrence (1991) illustrated this species' larva, but provided no description. It has the dorsal shields darkened, nearly black, and the pronotum with false eye spots (Fig. 23). These characters are similar in *Epytus flavitarsis* (Lacordaire) (see Candeze 1861). They differ in the shape of the urogomphi: *E. flavitarsis* urogomphi are set on a single pedicel-like base; *I. quadripunctatus* urogomphi lack the pedicel base and are set separately on abdominal segment IX. These represent the only larvae described for species of *Ischyrus* and *Epytus*. Much work needs to be done on larval morphology and biology of this family.

Remarks: *Ischyrus quadripunctatus* is similar to *I. patruelis* Lacordaire in the narrowed maxillary palp terminal segment and the asymmetrical antennal club segments. They can be separated by the pronotal color pattern: *I. quadripunctatus* has 4 free spots in an arch; *I. patruelis* has 2 anterior, 2 basal, and 2 free pronotal spots forming a circle.

Ischyrus quadripunctatus is most similar to *I. tetrasticus* Gorham in color pattern, but the latter species has a red head with a basal black spot, and widened maxillary palp terminal segment (similar to Fig. 7e).

References: See under subspecies accounts.

Ischyrus quadripunctatus quadripunctatus (Olivier)

(Figs. 43-47, 137)

Diagnosis: Distinguished from *I. quadripunctatus chiasticus* by the apical elytral spot, pronotal basal spots present or absent, elytral scutellar spot rounded, or if X-shaped then with distinct pronotal basal spots, and in geographic range; eastern U.S.A. and Mexico (east of the Sierra Madre Occidental), the Lesser Antillies, Central, and South America.

Description: Length: 4.8-8.8 mm; Width: 2.3-3.7 mm. Similar to the description under *I. quadripunctatus*, except in the following color pattern specifics (Figs. 43-47).

Head black; often with orange spot. Pronotum with basal black margin of variable width, often bearing 1 to 3 tooth-like spots; central tooth can connect with 2 free central spots on disc. Each elytron has a subhumeral spot variable in shape, touching or nearly touching base, connected or not to scutellar spot; central band wide or narrow, with edges smoothly rounded or jagged; apical spot present, variable in size. Legs entirely black, or femora banded orange. Genitalia dissected; 24 males, 20 females.

Variation: Most populations in the U.S., and some in northern Mexico, have the head and legs entirely black, and the pronotal base narrowly margined in black. More northern and central U.S. populations have the scutellar and subhumeral spots separated ("Var. A" Lacordaire 1842; var. *antedivisa* Mader 1938). Populations from southeastern U.S. have these spots connected (*quadripunctatus* Olivier 1792; var. *alabamae* Schaeffer 1931). This difference is clinal, with the amount of spot separation variable within some populations (detailed by Boyle 1954), and not deserving of taxonomic rank. I refer to the U.S. color pattern, with a solid black head, as "quadripunctatus" (Fig. 43).

Populations from Mexico and Central America, and some individuals from extreme southern Texas, have the head black with an orange central spot, legs entirely black, and pronotum lacking spots on the anterior and posterior margins (*graphicus* Lacordaire 1842). The orange spot on the head is variable in size, almost absent to nearly covering the head. I refer to this color pattern as "graphicus" (Fig. 44).

Populations from most of South America and some individuals from southern Central America have a black head with an orange central spot, legs entirely black, and pronotal base with 1 to 3 spots (*subcylindricus* Lacordaire 1842). The size of the basal pronotal spots varies from small and indistinct to large and tooth-like. I refer to this color pattern as "subcylindricus" (Fig. 45).

Populations from the Lesser Antilles have the head with an orange central spot, legs entirely black, and base of the pronotum with 3 large tooth-like spots. The central tooth-like spot connects with the 2 "free" central spots on the pronotal disc. I refer to this color pattern as "Antillean" (Fig. 46).

Specimens from southeastern Peru, southwestern Brazil, and Bolivia have a black head with an orange central spot, pronotal base with 3 tooth-like spots, and legs banded red with black knees. I refer to this color pattern as "banded-leg" (Fig. 47).

Types: The "type" of *Erotylus quadripunctatus* Olivier was not located. Olivier stated that the specimen is in the "cabinet de M. Francillon." Its current location is unknown, possibly in the MacLeay Museum, University of Sydney, Australia. Boyle (1956) states "TYPE: Not seen; probably not extant (see Horn and Kahle, 1935-1937, vol. 3, p.197)." The identity if this species is based on the illustration in Olivier (1807) and the type locality, which was stated as "Amérique septentrionale, la Géorgie."

The lectotype (here designated) of *Ischyrus subcylindricus* Lacordaire label data: "/Cayenne/ subcylindricus Lac./ Type/ Ex-Musaeo Mniszech/ [red] TYPE/ [pale blue] Muséum Paris ex Coll. R. Oberthür 1952/ LECTOTYPE Ischyrus subcylindricus Lacordaire des. P. E. Skelley 1993/" [MNHN, examined]. Sex not determined.

The lectotype (here designated) of *Ischyrus graphicus* Lacordaire label data: "/[blue paper] TYPE/ TYPE graphicus Ch/ LECTOTYPE Ischyrus graphicus Lacordaire des. P. E. Skelley 1993/" [CUMZ, examined]. Sex not determined.

The holotype (by monotypy) of *Ischyrus puncticollis* Gorham label data: "/[red circle on white paper] Type/ Paso del Norte, Chihuahua, Höge/ Ischyrus puncticollis/ B.C.A., Col., VII. Ischyrus/" [NHML, examined]. The type locality is near Ciudad Juárez (Selander & Vaurie 1962), a city on the border just south of El Paso, Texas. Sex male.

The holotype (original designation) of *Ischyrus quadripunctatus* var. *alabamae* Schaeffer was not located. Schaeffer stated the type was deposited in his collection and paratypes in the Loding collection. Specimens determined as *alabamae*, collected by Loding, were studied [CASC]. There is no indication that these are paratypes.

Specimens examined: In addition to the types listed above, 2769 specimens, representing 1377 collection records were studied. Because of the voluminous data for *Ischyrus q. quadripunctatus* from the United States, I chose to abbreviate the data and list only state and county records below. A more detailed list of the collection data is available upon request. For countries other than the United States, complete data are presented in Appendix C.

United States of America: **Alabama** - Colb, Colbert, Dale, Dallas, Escambia, Fayette, Jefferson, Lee, Mobile, Shelby, Tallapoosa, Tuscaloosa, Walker; **Arkansas** - Benton, Faulkner, Hempstead, Johnson, Madison, Ouachita, Polk, Prairie, Sebastian, Washington; **Connecticut**; **District of Columbia**; **Florida** - Alachua, Broward, Calhoun, Columbia, Dade, Dixie, Gadsden, Gilchrist, Hernando, Highlands, Indian River, Jackson, La Fayette, Leon, Liberty, Madison, Marion, Orange, Osceola, Polk, St.Johns, Suwannee, Volusia, Wakulla; **Georgia** - Baker, Charlton, Clarke, Dekalb, Doughtery, Effingham, Henry, Lamar, Pike, Spalding, Upson, Ware; **Illinois** - Adams, Alexander, Calhoun, Champaign, Clark, Coles, Cook, Douglas, Franklin, Gallatin, Hancock, Hardin, Jackson, Jo Daviess, Johnson, LaSalle, Lasalle, Lasalle, Macon, Marion, Marshall, Mason, Massac, McDonough, McLean, Moultrie, Peoria, Piatt, Pope, Putnam, Rock Island, Sangamon, Shelby, Union, Vermillon, Wabash, Williamson; **Indiana** - Allen, Brown, Clark, Hamilton, Knox, Lagrange, Madison, Marion, Monroe, Owen, Parke, Perry, Porter, Posey, Scott, Tippecanoe, Vanderburgh, Wells; **Iowa** - Boone, Clayton, Decatur, Iowa, Johnston, Linn, Mills, Polk, Story; **Kansas** - Atchinson, Cherokee, Douglas, Labette, Pottawatomie, Shawnee; **Kentucky** - Christian, Green, Henderson, Jefferson, Laurel, Marshall, Meade, Pulaski, Rowan, Trigg; **Louisiana** - Bossier, Catahoula, Evangeline, Grant, Jefferson, Madison, West Feliciana; **Maryland** - Allegany, Baltimore, Calvert, Montgomery, Morcester, Prince Georges, St. Marys, Talbot; **Michigan** - Berrien, Ingham, Ingham, Kalamazoo, Kent, Lenawee, Livingston, Oakland, St. Clair, St. Joseph, Van Buren, Wayne; **Minnesota** - Houston, Winona; **Mississippi** - Adams, Amite, Baldwin, Barry, Bolivar, Chicksaw, Forrest, George, Hancock, Hinds, Jackson, Lafayette, Lamar, Lauderdale, Lefore, Neshoba, Oktibbeha, Perry, Pontotoc, Rankin, Smith, Tippah, Tishomingo, Yazoo; **Missouri** - Bollinger, Boone, Callaway, Cape Girardeau, Charles, Clay, Cole, Cooper, Jackson, Johnson, Newton, Nodaway, Phelps, Polk, Randolph, Ripley, Scott, St. Louis, Stoddard, Wayne; **Nebraska** - Adams, Call, Colfax, Dawson, Fillmore, Jefferson, Lancaster, Lincoln, Nemaha, Nuckolls, Sarpy; **New Jersey** - Bergen, Camden, Cape May, Mercer; **New Mexico** - Hidalgo; **New York** - Cayuga, Jefferson, Tompkins,

Wayne; **North Carolina** - Dare, Durham, Edgecombe, Haywood, Moore, Wake; **North Dakota** - Cass; **Ohio** - Athens, Clermont, Delaware, Fairfield, Franklin, Guernsey, Hamilton, Hocking, Knox, Licking, Muskingum, Ottawa, Paulding, Richland, Ross, Seneca, Tuscasawas, Wayne; **Oklahoma** - Choctaw, Cleveland, Johnston, Latimer, Marshall, Mayes, Okfuskee, Payne, Pottawatomie, Wagoner, Woods; **Pennsylvania** - Allegheny, Bucks, Dauphin, Greene, Lancaster, Lebanon, Westmoreland, York; **South Carolina** - Caleton, Calhoun, Florence, Greenwood, Murray, Pickens, Richland, Sumter; **South Dakota** - Bon Homme, Clay; **Tennessee** - Anderson, Cannon, Dekalb, Greene, Henderson, Lake, Monroe, Montgomery, Rutherford, Shelby, Warren; **Texas** - Anderson, Bastrop, Bexar, Bosque, Brazos, Caldwell, Cameroon, Cass, Colorado, Comal, Crosby or Bay, Dallas, Fannin, Galveston, Gonzales, Hardin, Harris, Hidalgo, Jasper, Jeff Davis, Kerr, Kimble, Limestone, Lubbock, Montgomery, Morris, Nacogdoches, Panola, Real, Reeves, San Patricio, Smith, Sterling, Travis, Tyler, Uvalde, Victoria, Walker, Williamson; **Virginia** - Alexandria, Montgomery, Nansemond, Nelson; **West Virginia** - Greenbrier, Kanawha, Logan, Mason, Nicolas, Ohio, Preston; **Wisconsin** - Door, Rock, Wood.

Specimens of *Ischyrus q. quadripunctatus* from the United States of America, examined for this revision, are deposited in the following collections: AMNH, ANSP, ASUT, AUEM, BYUC, CASC, CBBC, CDAE, CMNC, CNCI, CSCC, CSUC, CUCC, CUIC, DAPC, DENH, DEUN, DHHC, EGRC, EIUC, EJFC, EMEC, FMNH, FSCA, GHNC, HCCA, HNHM, HPSC, ICCM, INHS, ISMS, ISNB, ISUI, JEWC, JLCC, JMCC, JVMC, JWIC, LACM, MCTC, MCZC, MSUC, MUIC, NCSU, NHMB, NHML, OSUC, PESC, PKLC, PPCD, PURC, PWKC, RABL, RFMC, RHTC, RJBC, RPIC, RWLC, SDSU, SEMC, SIUC, SMCC, SMFC, TAMU, TKPC, UADE, UAIC, UASM, UCDC, UGCA, ULIC, UMIC, UMMZ, UMRM, USNM, UWEM, VPIC, WDSC, WIUC, WMUC, WSIC, ZMHB.

Distribution: The various color patterns have separate ranges with a large amounts of overlap between them.

Color pattern "quadripunctatus": eastern U.S. from western Texas and northern Mexico (Pallister 1955a) east to Florida; north to southeastern South Dakota and Canada. Within this range it is common and often collected in deciduous woodland habitats. Gorham's (1887) record from Guatemala is undoubtedly in error, and probably represents a misidentified "graphicus" (Pallister 1955a).

Color pattern "graphicus": southern and western Texas south through eastern Mexico and Central America to Panama.

Color pattern "subcylindricus": southern Central America south through South America to Argentina and Peru.

"Antillean" color pattern: known only from St. Vincent, St. Lucia, and Trinidad.

Color pattern "banded-leg": Bolivia, southeastern Peru, and southwestern Brazil.

Taxonomic notes: *Engis variegata* Dejean (1821: 45) is *Ischyrus subcylindricus* Lacordaire, according to Gemminger & Harold (1876:3691). Dejean (1836:429) placed these names together within the same bracket, possibly indicating synonymy. Since no description or citation to a description of this name was found, it is considered a *nomen nudum*.

Mycotretus humeralis Chevrolat (*in* Dejean 1836: 429) is *I. quadripunctatus* (Olivier) according to Sturm (1843:305) and Gemminger & Harold (1876:3691). Dejean (1836:429) placed these names together within the same bracket, possibly indicating synonymy. Since no description or citation to a description of this name was found, it is considered a *nomen nudum*.

Lectotypes of both *I. subcylindricus* Lacordaire and *I. graphicus* Lacordaire were chosen because there was no indication that only one specimen was studied in either of the original descriptions. Both designated specimens came from collections apparently studied by Lacordaire.

Various authors have commented on the similarities between *I. quadripunctatus* (Olivier), *I. graphicus* Lacordaire, and *I. subcylindricus* Lacordaire: Boyle (1954:39-43), Crotch (1873b:144; 1876:(51)427), Gorham (1887:39-40; 1898:335), and Pallister (1955-a:4-5). The only differences observed were in the color patterns, which proved to be clinal, with numerous intermediates found in the overlapping parts of their ranges.

Based on the testimony of previous authors, a lack of distinguishing morphological characters, the clinal nature of the color patterns, and previous studies on this complex, *I. graphicus* Lacordaire and *I. subcylindricus* Lacordaire are fully synonymized under *I. quadripunctatus* (Olivier). I refer to these 3 as color patterns of *I. q. quadripunctatus* simply for record-keeping purposes. They have no nomenclatural status.

The type of *Ischyrus puncticollis* Gorham is a malformed specimen. The name "puncticollis" refers to

the indentations on the pronotum mentioned by Gorham in the original description. Specimens from nearby localities in Texas are externally identical to *I. puncticollis*, except for these malformations. A genitalic study of Gorham's type proved my suspicions to be correct. *Ischyrus puncticollis* Gorham is here synonymized under *I. q. quadripunctatus* (Olivier).

Gemminger & Harold (1876:3690) indicated that "*Ischyrus quadripunctatus* var. Crotch (1873b:144)" is a synonym of *I. graphicus* Lacordaire (1842:125-126). They seemed to have misinterpreted Crotch, as no such variety was proposed. Crotch stated that *I. graphicus* from Nicaragua and "the Mexican exponents of this species, appear to be a southern form of *I. quadripunctatus* with the head more or less rufous."

Ischyrus quadripunctatus var. *alabamae* Schaeffer (1931:175) has the venter mostly red. Boyle (1954) stated "it is an aberrant specimen of the nominal form" which varies only in the ventral coloration. Boyle's statement implies that he studied the type, or type specimens.

Mader (1938:19) realized that Schaeffer's var. *alabamae* was actually the nominal pattern of *I. quadripunctatus* with the basal elytral band entire. He proposed the name "var. *antedivisa*" for Lacordaire's Var. A which has the basal elytral band separated into spots.

Boyle (1954) recognized that both Schaeffer's and Mader's varieties were part of a clinal change in the color pattern from north to south. He synonymized both under *I. q. quadripunctatus* (Olivier).

Specimens from Bolivia and southwestern Brazil have the legs banded with orange. All other color patterns have the legs entirely black. The geographic range of this "banded-leg" pattern appears to be isolated from those with solid black legs. No morphological differences, including genitalic characters, were found which correlated with leg color. Until more series of specimens are studied from additional localities, its distinctiveness is questionable. I cannot justify giving it subspecific status based on the available information.

Biology: This common subspecies appears in many regional checklists and occasionally in general texts. Additional references may be found in Hatch's (1928, 1929, 1941) indices to keys and local lists of Neartic Coleoptera. Its biology is discussed in the Biology section of the species account above.

References: *Ischyrus quadripunctatus* (Olivier): Beutenmuller 1891:11; Blackwelder 1939:46; 1945:465; Blatchley 1910:546, fig.205; Borror & White 1970:177; Boyle 1954:39-43; 1956:133-136,152-153,169, fig.126-130; Brimley 1938:180; Chagnon 1917:200; Chagnon & Roberts 1962:156,397; Chantal 1979:19; Chapuis 1876:7, 36; Chapuis & Candeze 1853 [1855]:622, t.9 f.8 [in separate p.282-284]; Crotch 1873a:353; 1873c:43; 1876:(50)426; Deelder 1942:82; Dejean 1836:429; 1837:453; Dillon & Dillon 1961:409 pl.XL no.10, 410; Duponchel 1825:175-176; Fattig 1937:253; Froeschner & Meiner 1953:21,23; Frost 1964:141; Gemminger & Harold 1876:3691; Gorham 1887:39; 1898:335; Haldeman & LeConte 1853:46; Henshaw 1885:50; Horn 1886:140; Hubbard & Schwarz 1878:652; Khalaf 1980:331; Kirk 1969:79; 1970:74; Kirk & Balsbaugh 1975:95; Kuhnt 1909:62; 1911:43; Lacordaire 1842:127-128; Lawrence 1991:474, fig.34.551; LeConte 1854:158; Leng 1920:201; 1928:383; Loding 1945:79; Mader 1938:19; Montgomery & Amos 1941:255; Olivier 1807:484, t.3 f.37; Pallister 1955a:4-5; Popenoe 1877:27; Roberts 1958:283; Say 1835:201; Schaeffer 1931:175; Schwarz 1878:445; Skelley 1988a:fig.3; 1988b:63-74,136-138 (figs.7, 18a, 19b, 19c, 29d, 31, 32); Skelley & Goodrich 1989:349-354, fig. 3; Skelley *et al.* 1991:65; Smith 1899:224; 1910:260; Sturm 1826:139; 1843:305; Summers 1874:99; Ulke 1902:16,44; Wade 1935:59; Weiss 1920a:14-15; Weiss & West 1920: 6,14,15; Wickham 1894:341, fig 61; Zesche & Reinecke 1883:6.

Engis variegata Dejean: Dejean 1836:429; 1837:453; Gemminger & Harold 1876:3691.

Mycotretus humeralis Chevrolat: Dejean 1836:429; 1837:453; Gemminger & Harold 1876:3691; Kuhnt 1909:62; Sturm 1843:305.

Ischyrus subcylindricus Lacordaire: Blackwelder 1945:465; Crotch 1876:428(52); Deelder 1942:82; Dejean 1836:429; 1837:453; Delkeskamp 1957:98; Gemminger & Harold 1876:3691; Gorham 1887:40; 1898:335; Guérin 1949:234; Kuhnt 1909:64; 1911:43; Pallister 1955a:4-5.

Ischyrus graphicus Lacordaire: Blackwelder 1945: 465; Boyle 1954:41-43; 1956:133,135,153; Crotch 1873b: 144; 1876:(51)427; Gemminger & Harold 1876:3690; Gorham 1887:39-40 t.2 f.17; 1898:335; Kuhnt 1909:63; 1911:42; Leng & Mutchler 1914:412; Pallister 1955a:4-5; Skelley *et al.* 1991:65.

Ischyrus puncticollis Gorham: Blackwelder 1945: 465; Kuhnt 1909:63; 1911:43.

Ischyrus quadripunctatus var. *alabamae* Schaeffer: Blackwelder 1939:46; Boyle 1954:39; Leng & Mutchler 1933:86; Loding 1933:146; 1945:79; Mader 1938:19.

Ischyrus quadripunctatus var. *antedivisa* Mader: Blackwelder 1939:46; Boyle 1954:39; Deelder 1942:82.

Ischyrus quadripunctatus chiasticus Boyle new status

(Figs. 42, 137)

Diagnosis: Characterized by the combination of reduced apical elytral spots, absent basal pronotal

spots, X-shaped scutellar spot, and geographic distribution.

Description: Length: 5.5-8.2 mm; Width: 2.5-3.7 mm. Similar to the description under *I. quadripunctatus*, except in the following color pattern specifics (Fig. 42).

Head black with orange epistome and frons. Pronotum with narrow black basal margin, lacking teeth. Each elytron with elongate subhumeral spot, connected to base, not connected to scutellar spot; scutellar spot large, laterally concave, both scutellar spots combined to form an X-shaped mark; central band with smooth rounded edges, extending along suture to apical angle; apical spot reduced to narrow margin at apex. Legs entirely black. Antenna club broad, antennomere X often with width = 2 x length. Genitalia dissected; 6 males, 1 female.

Variation: *Ischyrus quadripunctatus chiasticus* shows some variation in the overall width of the markings, but not enough to change the appearance of the color pattern. The apical elytral spot can be a smooth black marking or a thin, sharply angled spot.

Type: The male holotype (original designation) of *Ischyrus chiasticus* Boyle label data: "/Patagonia Ariz. 7-36, E.S.Ross/ [red paper, black border] HOLOTYPE Ischyrus chiasticus Boyle/" [CASC, type # 8370, examined].

Specimens examined: The holotype and 417 specimens, representing 204 collection records, were studied. Because of the voluminous data for *Ischyrus q. chiasticus* from the United States, I chose to abbreviate the data and list only state and county records below. A more detailed list of the collection data is available upon request. For countries other than the United States, complete data are presented in Appendix C.

United States of America: **Arizona**: Cochise, Coconino, Gila, Graham, Greenlee, Maricopa, Pima, Pinal, Santa Cruz, Yavapai.

Specimens of *Ischyrus q. chiasticus* from the United States of America, examined for this revision, are deposited in the following collections: AAIC, AMNH, ASUT, BYUC, CASC, CBBC, CDAE, CNCI, CUIC, DAPC, EIUC, EMEC, FMNH, FSCA, GHNC, ICCM, INHS, JEWC, JMCC, LACM, OSUC, PESC, PKLC, SEMC, SMCC, TAMU, UAIC, UASM, UCDC, USNM, VPIC, WDSC.

Distribution: This subspecies is found from the state of Morelos, Mexico, north and west of the Sierra Madre Occidental mountain range to southern Arizona (Fig. 137).

Etymology: *chiastos*: Greek = cross-wise, X-shape; referring to the X-shaped scutellar spot on the elytra.

Taxonomic notes: In the first paragraph of his description for *Ischyrus chiasticus*, Boyle (1954:43-46) stated:

> This form appears to be a possible subspecies of *Ischyrus quadripunctatus* (Olivier), yet both in color pattern and in geographical range, so far as is known, it constitutes a distinct population. It is known from the mountains of southern Arizona and from the Mexican State of Sinaloa (one specimen); thus it apparently ranges from southern Arizona into Mexico along the Sierra Madre Occidental for an unknown distance. Its closest relative, *I. quadripunctatus graphicus* Lacordaire, is found from extreme southern Texas south into Mexico (presumably along the Sierra Madre Oriental) and on into Central America. If intergrading populations of these two forms are eventually found, they will almost certainly occur in southern Mexico where the two cordilleras become confluent. The prairies and deserts of northern Mexico, western Texas, and southern New Mexico support few trees upon which grow the fungous food of these beetles.

Little information can be added to this, although specimens from further south into Mexico (state of Morelos) have been studied, with little or no notable variation in color pattern from the Arizona specimens.

No specimens were studied with intermediate color pattern. The ranges of these forms still appear to be distinct and isolated. Distinguishing morphological characters are apparently lacking, including the genitalia. Boyle (1956:135-136) mentioned a slight difference in the male median lobe between *I. chiasticus* and *I. q. quadripunctatus*, but stated "...the two must be placed side by side to see such differences, and even then positive identification would be hazardous."

Since *I. chiasticus* is apparently isolated from *I. q. quadripunctatus*, has a distinctive color pattern, and no distinguishing morphological characters, including genitalia, it is reduced in rank to a subspecies of *I. quadripunctatus* (Olivier). If future studies produce intermediate populations, then *I. chiasticus* should be considered another of the *I. quadripunctatus* color patterns.

Biology: Suspected biology as discussed under the species account.

Remarks: *Ischyrus quadripunctatus chiasticus* differs from "graphicus" in having a free comma-shaped subhumeral spot, scutellar spots laterally

concave together looking (as Boyle stated) like "a fat 'X' enclosed in single quotation marks", and the apical elytral spot greatly reduced or absent.

References: Boyle 1956:133,135-136, 153-154; Hoebeke 1978:11; Ruette 1970:53; Skelley *et al.* 1991:65.

Ischyrus sapphirus Skelley new species

(Figs. 6h, 7i, 8f, 50, 111)

Diagnosis: Unique in many characters including: pale white antennal club, elongate scutellum, foveate strial punctures at base of elytra, strial punctures lacking on elytral disc, metallic blue dorsal sheen, and short ovoid body shape. This is the only *Ischyrus* known to occur in the Greater Antilles, specifically Cuba.

Description: Length: 3.5-4.6 mm; Width: 2.0-2.7 mm. Body ovoid, widest at basal third of elytra; microreticulate, shining; black or dark brown, dorsally with metallic blue sheen; antenna black, terminal club segments pale white; legs black, palpi and tarsi brown (Fig. 50).

Head dorsal distance between eyes = 2.2 x eye width; eye raspberry-like, facets large; ocular striae strong, reaching base of antenna; vertex puncture size = 0.33 x facet, separated by 3 to 4 diameters; epistome puncture size = 0.5 to 0.75 x facet, separated by 1 diameter. Antenna reaching base of pronotum; antennomere III as long as next 2 antennomere combined; antennomeres IX to XI symmetrical, all equal in width; antennomere XI subcircular (Fig. 6h).

Maxillary palp terminal segment semicircular, sides slightly flattened, apical angles 90° or less, length = 0.8 x width. Labial palp terminal segment triangular, extended on medial side, length = 0.75 x width. Labial palp width = 0.6 x maxillary palp width (Fig. 7i). Mentum with plate triangular, length = 0.75 x width, sides straight to convex, ridge medial extension acutely pointed (Fig. 8f).

Pronotal disc medial puncture size = 0.33 x facet, separated by 3 to 4 diameters; lateral puncture size = 0.75 x facet, separated by 1 diameter. Scutellum elongate pentagonal, nearly triangular; length = 0.6 x width. Each elytron with sutural striae complete; striae II to V indicated basally by 2 to 4 foveate punctures, size = 1 to 2 x facets; disc lacking striae and strial punctures; surface with few fine interval punctures.

Prosternum convex, not pinched anteriorly; lacking foveate punctures in front of procoxa; coxal lines straight, almost parallel, length = 0.5 x sternal length, lines not surpassing coxae, length = 0.9 x basal width; prosternal plate flat or slightly convex, apical width = 0.9 to 1 x basal width; base shallowly concave.

Mesosternum basal width = 3 x mesocoxal line length; coxal lines straight, lines parallel to diverging anteriorly; base sinuate. Metasternum coxal lines not meeting at middle, recurved; coxal lines extend 0.33 distance to posterior lateral angle; sternum with medial punctures fine; lacking lateral punctures, dulled.

First visible abdominal ventrite with coxal lines reaching 0.25 to 0.33 distance to posterior edge; broadly rounded between metacoxae, almost truncate; lacking noticeable punctures.

Male genitalia with median lobe moderately arched, apically truncate slightly up-turned; internal sac without noticeable sclerotized structures; flagellum straight and narrow, length = 1.3 x median lobe length (Fig. 111a); base of flagellum straight, sclerite at base claw-shaped (Fig. 111b-d) (5 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail weakly swollen, recurved onto itself (Fig. 111e) (2 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). No sexual dimorphisms were observed.

Variation: No notable variation was observed in the specimens studied.

Type material: The male holotype of *Ischyrus sapphirus* Skelley label data: "/Soledad, Cuba, Cienfuegos, June 1929, Darlington/" [MCZC]. The female allotype bears the same data except: "X-24-25" [MCZC]. Including the holotype and allotype, a total of 14 specimens, representing 11 collection records, was studied (see Appendix C for specific data).

Distribution: Known only from Cuba, West Indies.

Etymology: Named in reference to the shinny, sapphire blue sheen present on this species, unique in the genus (noun in apposition).

Taxonomic notes: This species is different from all other *Ischyrus* in many characters (some listed in the Diagnosis), yet it possesses the generic characters listed in the Generic Account. The status of *I. sapphirus* in *Ischyrus* is provisional and needs to be reviewed in a revision of the Tritominae at the generic level.

Ischyrus scriptus (Olivier)

(Figs. 29-31, 112, 138)

Erotylus scriptus Olivier 1807:484-485, t.3 f.38.
Mycotretus scriptus (Olivier), Dejean 1836:429, 1837: 453.
Ischyrus scriptus (Olivier), Lacordaire 1842:119-120.
Micrischyrus scriptus (Olivier) 1807, Alvarenga 1994: 16.
Erotylus affinis Duponchel 1825:47, t.1 f.26, Lacordaire 1842:119-120.

Mycotretus affinis (Duponchel), Dejean 1836:429, 1837:453.

Dacne femoralis Chevrolat 1841:63-64, **new synonymy**.

Ischyrus femoralis (Chevrolat), Lacordaire 1842:114-115.

Micrischyrus femoralis (Chevrolat) 1841, Alvarenga 1994:13.

Ischyrus velatus Lacordaire 1842:115-116, **new synonymy**.

Micrischyrus velatus (lacordaire) 1842, Alvarenga 1994:17.

Ischyrus maculiventris Lacordaire 1842:120-121, Crotch 1876:(55)431.

Diagnosis: Recognized by the pronotum having 2 anterior, 2 free, and 2 basal spots, 2 free spots set as far apart as head width (including eyes), each pronotal hind angle with or without a spot, legs orange with black knees, black elytral epipleural fold, free subhumeral spot, and central elytral band posterior extension swollen at end.

Description: Length: 6.0-8.4 mm; Width: 3.9-4.1 mm. Body elongate, widest at basal third of elytra; microreticulate; yellow-tan to red-orange with black markings (Figs. 29-31).

Head color solid black to black with orange central spot. Pronotum with 2 anterior, 2 free and 2 basal spots forming a circle; anterior and posterior spots occasionally free; 2 free central spots with distance between centers = width of head including eyes; each posterior angle with a variable sized spot, narrowly connected to base, broadly connected to lateral margin. Scutellum dark red to black. Each elytron with black epipleural fold, paler in teneral specimens; subhumeral spot can touch scutellar spot; scutellar spot large, broadly connected to base and suture, occasionally broken by pale spots at base; suture finely margined in black; central band extends from basal third nearly to apex, laterally narrowed, reduced to zig-zag line in some specimens, can touch lateral margin, apically swollen at suture. Venter black; laterally pronotum and abdomen orange. Legs black with orange central femoral band, knee black; tibia often apically red; tarsi brownish or black; rarely legs entirely black.

Head dorsal distance between eyes = 2.0 to 2.3 x eye width; ocular striae reaching 0.5 to 0.75 distance to anterior angle of eye, continued forward as row of punctures; vertex puncture size = 0.75 to 1.0 x facet, separated by 1 to 2 diameters; epistome puncture size = 0.5 x facet, separated by 0.5 to 1 diameter. Antenna reaching basal 0.25 of pronotum; antennomere III as long as next 3 antennomere combined; antennomere IX narrowed and angled at base, almost triangular; antennomeres X-XI asymmetrical; antennomere XI rounded, transverse (similar to Fig. 6c).

Maxillary palp terminal segment triangular, securiform, basally rounded, angles less than 90°, width = 2 x length. Labial palp terminal segment elongate, extended on medial side, rounded basally, width = 2 x length. Labial palp width = 0.5 x maxillary palp width (as in Fig. 7c). Mentum with plate triangular, all sides equal in length, ridge medial extension acutely pointed (similar to Fig. 8d).

Pronotum puncture size = 0.75 to 1.0 x facet, separated by 1 to 2 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII weak, indicated at base and apical half by few punctures; strial punctures at base slightly larger in size than pronotal disc punctures, gradually becoming smaller apically; intervals finely punctate, often obscured by microreticulations.

Prosternum keeled and pinched anteriorly; with foveate punctures in front of procoxa, often weak and obscured by microreticulations; coxal lines straight to weakly sinuate, length = 0.5 x sternal length, barely surpassing coxae, length = basal width; prosternal plate flat, apical width = 0.5 x basal width; base shallowly concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines arched inwardly; base sinuate, lobed medially. Metasternum coxal lines sometimes recurved, not meeting medially; coxal line faint, extend 0.33 distance to posterior lateral angle; sternum medial punctures fine, coarse lateral punctures, both separated by 1 to 2 diameters.

First visible abdominal ventrite with coxal lines faint, reaching 0.33 distance to posterior edge; rounded between metacoxae; with coarse lateral punctures, fine medial punctures.

Male genitalia with median lobe moderately arched, apically truncate, slightly constricted just before tip; internal sac without noticeable sclerotized structures; flagellum long and narrow, length = 1.6 x median lobe length (Fig. 112a); base of flagellum weakly curved, sclerite at base blunt claw-shaped and sometimes thickened at connection with flagellum (Fig. 112b-d) (8 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail swollen, tightly curved like an inverted question mark, "¿" (Fig. 112e) (6 dissected).

Stridulatory files on occipital region of head present in male; weak or absent in female. No easily visible sexual dimorphism was found.

Variation: A few specimens from northern South America appear to have entirely black legs, which could be soiled.

The majority of specimens studied have orange marks on the head. The orange spots are variable in size and can be absent, leaving the head entirely black. The size variation does not correlate with any other observed character. Some populations are variable, with both black and spotted heads.

The elytral markings are variable in the degree of jaggedness. Some specimens have the markings smoothly rounded; some have the markings jaggedly cut, tooth-like; and others have the markings narrowed to a zig-zag line. This variability appears clinal, with the smoothly banded populations in the northern part of the range and the jaggedly edged populations in the southern parts of the range. Populations in the southern

part of the range also have the basal elytral marking broken by a number of pale spots.

The size of the pronotal spots varied greatly through the geographic range. On occasion, the anterior and basal spots are broadly joined to the margins. Most specimens have these spots constricted at the margin and, at most, simply touch the margin. A few specimens have the spots free.

The variation seen in the size of the posterior pronotal angle spot is clinal. Specimens from Mexico and Central America ("northern") have the spot reduced to a narrow black widening on the posterior lateral margin near the angle, or it is absent (Fig. 29). Specimens from South America ("southern") have the spot large and distinct (Figs. 30-31). Material from Panama and most specimens from northern South America are intermediate in spot development.

Types: The type of *Erotylus scriptus* Olivier was not studied. Olivier stated that it was in the collection of M. Richard, and came from French Guiana. Its current location is unknown.

The type of *Erotylus affinis* Olivier was not studied. Olivier stated that it was in the collection of Dejean, "M. le compte Dejean lui a donné dans sa collection," and was collected in Brazil. Its current location is unknown.

The lectotype (here designated) of *Ischyrus velatus* Lacordaire label data: "/Colombie/ Velatus Lac./ Type/ Ex. Musaeo Mniszech/ [red] Type/ [pale blue] Muséum Paris ex. Coll. R. Oberthür 1952/ [red] LECTOTYPE Ischyrus velatus Lacordaire des. P. E. Skelley 1993/" [MNHN, examined]. Sex not determined, not dissected.

The lectotype (here designated) of *Dacne femoralis* Chevrolat label data: "/[blue paper] TYPE/ Type femoralis Ch./ [red] LECTOTYPE Dacne femoralis Chevrolat des. P. E. Skelley 1993/" [CUMZ, examined]. Chevrolat stated in the original description that the species came from Mexico. Sex not determined, not dissected.

The lectotype (here designated) of *Ischyrus maculiventris* Lacordaire label data: "/[blue paper] TYPE/ Type maculivent-ris Ch./ [red] LECTOTYPE Ischyrus maculiventris Lacordaire des. P. E. Skelley 1993/" [CUMZ, examined]. Lacordaire stated in the original description that the species came from Brazil. Sex not determined, not dissected.

Specimens examined: The lectotypes and 190 specimens, representing 116 collection records, were studied (see Appendix C for specific data).

Distribution: Widespread from Mexico to northern Argentina (Fig. 138).

Etymology: *scriptus*: Latin = writing. Undoubtedly this name refers to the writing-like elytral markings.

Taxonomic notes: Lectotypes were chosen for *I. velatus* Lacordaire, *D. femoralis* Chevrolat, and *I. maculiventris* Lacordaire because the authors made no mention that they saw only one specimen. The specimens chosen for each have label and historical data indicating that they were studied by the appropriate describer.

Ischyrus femoralis (Chevrolat) is stated by Chevrolat to be from Mexico. Gorham (1887) stated that the specimen in Crotch's collection (the "type") was the only specimen he saw of the species. Specimens from Mexico and Central America lack the spot at the pronotal posterior angle; whereas the lectotype of *D. femoralis* has a prominent spot. It is possible that this specimen is mislabeled. Because of the difference between the lectotype and specimens from Mexico and Central America, the name "femoralis" cannot be used in reference to them. *Dacne femoralis* Chevrolat is placed in full synonymy under *I. scriptus* (Olivier).

Specimens from Mexico and Central America, lacking the posterior pronotal angle spot, are referred to as "northern". Specimens from South America with the posterior pronotal angle spot are referred to as "southern". These color pattern differences have no nomenclatural status.

The lectotype of *Ischyrus velatus* Lacordaire was found to differ from the description of *I. scriptus* Lacordaire only in head color, and in the type locality; *I. scriptus* with orange epistome and frons is from Brazil, *I. velatus* with black head is from Colombia. Head color was found to be variable even within the same population. Based on this, *I. velatus* Lacordaire is placed in synonymy under *I. scriptus* (Olivier).

The type of *Ischyrus maculiventris* Lacordaire was found to be a malformed specimen. The dimples alluded to by Lacordaire in the original description were found to be depressions in the pronotum caused by outside forces. Lacordaire even stated that they may be accidental. Crotch must have realized this when he synonymized *I. maculiventris* Lacordaire under *I. scriptus* (Olivier).

The type was not studied, nor any other specimen determined as *Erotylus affinis* Duponchel. The synonymy of *E. affinis* Olivier under *I. scriptus* (Olivier) is maintained.

Remarks: *Ischyrus scriptus* (Olivier) is similar to *I. palliatus* Lacordaire, *I. proximus* Lacordaire, and *I. incertus* Lacordaire in color pattern. Despite the similarities and variability of color patterns, they can be separated by the combination of characters listed below.

Ischyrus palliatus Lacordaire has the femora entirely orange; free pronotal spots set farther apart than eyes; black lateral markings of the head generally widest at anterior half of eye, base orange; scutellum orange; elytral epipleural fold generally black, base paler in teneral specimens; and male with prosternum slightly expanded laterally.

Ischyrus scriptus (Olivier) has orange femora with a dark knee; free pronotal spots set as far apart as eyes; when head with orange, the black lateral markings are widest at base of eye; scutellum orange; elytral epipleural fold generally black, base paler in teneral specimens; and no external sexual dimorphism.

Ischyrus proximus Lacordaire has the femora entirely black; the free pronotal spots closer together than eyes; when head with orange, the black lateral markings widest at base of eye; scutellum black; elytral epipleural fold generally orange, darker on soiled specimens; and no external sexual dimorphism.

Ischyrus incertus Lacordaire has the femora entirely black; the free pronotal spots farther apart than eyes; head entirely black; scutellum black; black elytral epipleural fold; and male with the prosternum expanded laterally.

References: *Ischyrus scriptus* (Olivier): Blackwelder 1945:465; Crotch 1876:(55)431; Dejean 1836:429; 1837:453; Duponchel 1825:47,175; Gemminger & Harold 1876:3691; Guérin 1948:19; 1949:235; 1953:77; Kuhnt 1909:64; 1911:43; Lacordaire 1842:119-120; Sturm 1826:-139; 1843:305.

Erotylus affinis Duponchel: Blackwelder 1945:465; Dejean 1836:429; 1837:453; Gemminger & Harold 1876:-3691; Kuhnt 1909:64; 1911:43; Lacordaire 1842:119.

Dacne femoralis Chevrolat: Blackwelder 1945:465; Crotch 1876:430(54); Gemminger & Harold 1876:3690; Girard 1873:820; Gorham 1887:40-41; Kuhnt 1909:64; 1911:42; Lacordaire 1842:114-115.

Ischyrus velatus Lacordaire: Blackwelder 1945:465; Crotch 1876:(55); Gemminger & Harold 1876:3691; Kuhnt 1909:63; 1911:44; Mader 1942a:171, 195, 196; 1951:209; 1952:159, 183.

Ischyrus maculiventris Lacordaire: Blackwelder 1945:465; Crotch 1876:(55)431; Gemminger & Harold 1876:3691; Kuhnt 1909:64; 1911:43.

Ischyrus scutellaris Gorham

(Figs. 10e-f, 13, 70-71, 113, 139)

Ischyrus scutellaris Gorham 1887:41-42, t.3 f.2.
Micrischyrus scutellaris (Gorham) 1887, Alvarenga 1994:16.

Diagnosis: Recognized by the pronotum with 2 free spots only, and small free central and lateral elytral spots.

Description: Length 4.5-6.4 mm; Width: 2.4-3.2 mm. Body elongate, widest at basal third of elytra; microreticulate, feebly shining; orange-yellow with black pattern (Fig. 70-71).

Head orange with blackened epistome margin. Pronotum with 2 free spots; base weakly margined in black on medial half, with or without 2 black spots each on base and anterior margin. Scutellum black or dark orange. Each elytron with black epipleural fold, often with orange (see Variation); free subhumeral spot; large scutellar spot, broadly connected to base and suture; sutural margin black, often with subapical swelling; central and lateral spots size = subhumeral spot, can touch each other, rarely touching suture (see Variation). Venter color variable, sclerites orange with black margins to entirely black with anterior prothorax and lateral abdominal edges orange. Legs black; palpi and tarsi brown.

Head dorsal distance between eyes = 2.5 x eye width; ocular striae reaching anterior angle of eye; vertex puncture size = 1 x facet, separated by 1 to 2 diameters; epistome puncture size = 0.75 x facet, nearly coalescing. Antenna reaching base of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical; antennomere XI transverse narrower than antennomere X (similar to Fig. 6g).

Maxillary palp terminal segment triangular, sides rounded, lateral angle acute, medial angle nearly 90°, width = 2 x length. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90°, length = 0.8 x width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7o). Mentum with plate broadly triangular, length = 0.5 x width, sides straight; ridge medial extension short, acutely pointed (similar to Fig. 8d).

Pronotal disc puncture size = 1 x facet, separated by 1 to 2 diameters; laterally separated by 1 diameter. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII faint, present at base and apical half, often obscured by interval punctation; strial punctures at base = 2 x pronotal disc punctures, gradually becoming finer posteriorly; intervals finely punctate, punctures impressed laterally.

Prosternum strongly keeled and pinched anteriorly (Fig. 10e-f); expanded laterally in male; with (female) or without (male) foveate punctures in front of procoxa; coxal lines straight, converging anteriorly, length = 0.5 x sternal length, lines barely surpassing coxae, length = basal width; proster-

nal plate slightly convex, apical width = 0.8 x basal width; base concave.

Mesosternum basal width = 2.5 x mesocoxal line length; coxal lines straight; base broadly sinuate. Metasternum coxal lines meet at middle, recurved; coxal lines extend 0.33 to 0.5 distance to posterior lateral angle; line behind mesocoxa laterally deep, groove-like; sternum feebly shining, medial punctures fine, few coarse lateral punctures obscured by strong microreticulation.

First visible abdominal ventrite with coxal lines reaching 0.25 distance to posterior edge (Mexico), or barely surpassing coxa (Panama); broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe weakly arched, apically rounded; internal sac without noticeable sclerotized structures; flagellum straight and narrow, length = 2 x median lobe length (Fig. 113a); base of flagellum straight, sclerite at base elongate claw-shaped (Fig. 113b-d) (3 dissected).

Female genitalia with spermathecal head elongate kidney-shaped, often with weak top-knot; tail narrow, weakly looped, recurved onto itself (Fig. 113e) (13 dissected).

Stridulatory files present on occipital region of male heads; absent on females. Male with lateral expansion of prosternum broad, covering most of pronotal epipleuron (Fig. 13). Females with foveate punctures on prosternum in front of procoxae; males lack these punctures.

Variation: Pronotal spots vary from small and obscure to large and prominent. Central and lateral elytral spots can touch, forming one spot. The variation discussed below appears to be clinal, with spot size and amount of connection varying over the known geographic range.

The Belize and Mexican specimens (Fig. 70) (2 males, 3 females dissected), including the type, lack the pronotal anterior and basal spots; lack the apical sutural swelling; have the lateral elytral spot anterior to the central spot; have the elytral epipleural fold orange basally; and the abdominal coxal lines surpass the coxae.

One specimen from Panama is similar to the Mexican specimens. Most Panamanian specimens (Fig. 71) (1 male, 10 females dissected) have pronotum with weak basal and anterior spots; sutural mark near apex, variable in size; central and lateral elytral spots at equal setting; epipleural fold of elytra solid black (orange in teneral specimens); and the abdominal coxal lines do not surpass the coxae.

The Colombian specimen (1 female dissected) has pronotum with weakly developed anterior and basal spots (2 each); apical sutural swelling large, connected to central spot; central and lateral elytral spots at equal setting; solid black epipleural fold of elytral; and the abdominal coxal lines surpass the coxa.

Type: The holotype (by monotypy) of *Ischyrus scutellaris* Gorham label data: "/[red circle on white paper] Type/ Type, sp.figured/ Bugaba Panama, Champion/ Ischyrus scutellaris Type Gorham/ B.C. A., Col., VII, Ischyrus/" [NHML, examined]. Sex not determined.

Specimens examined: The holotype and 38 specimens, representing 28 collection records, were studied (see Appendix C for specific data).

Distribution: Southern Mexico, Belize, Panama, and Colombia (Fig. 139).

Etymology: *Ischyrus scutellaris* Gorham was probably named for the large scutellar spot.

Remarks: *Ischyrus scutellaris* is most similar to *I. elegantulus*, *I. chacojae*, *I. septemsignatus*, and *I. malleus* in color pattern. *Ischyrus chacojae* and *I. septemsignatus* have only one free central elytral spot and black heads; *I. scutellaris* has 2 free central spots and a red head. *Ischyrus elegantulus* has the scutellar spot narrowly connected to the elytral base; *I. scutellaris* has this spot broadly connected. *Ischyrus malleus* has the free spots of the central elytral marking longitudinally elongate, linear; *I. scutellaris* has these spots small and circular.

References: Blackwelder 1945:465; Kuhnt 1909:63; 1911:43.

Ischyrus septemsignatus Gorham

(Figs. 7c, 36, 114, 140)

Ischyrus septemsignatus Gorham 1887:41, t.2 f.19.
Ischyrus septemsignatus var. α Gorham 1887:41.
Ischyrus septemsignatus var. β Gorham 1887:41.
Micrischyrus septemsignatus (Gorham) 1887, Alvarenga 1994:16.

Diagnosis: Recognized by the pronotum having only 2 free spots, and the elytra with free central and apical spots.

Description: Length: 5.5-6.9 mm: Width: 2.6-3.1 mm. Body elongate, widest at basal third of elytra; microreticulate; orange with black pattern (Fig. 36).

Head orange or black (see Variation). Pronotum with 2 free pronotal spots; medial half of base margined in black, occasionally with a black spot at ends of black margin. Scutellum black. Each elytron with orange epipleural fold; subhumeral spot free or touching base (see Variation); large scutellar spot, broadly connected to base and suture; suture margin black; free central spot, rarely touching black sutural edge; apical spot free. Venter black with orange lateral

abdominal ventrites and lateral prothorax. Legs black; tarsi and palpi brown.

Head dorsal distance between eyes = 2.5 x eye width; ocular striae reaching 0.7 to 0.8 distance to anterior angle of eye; vertex puncture size = 1 x facet, separated 1 to 3 diameters; epistome puncture size = 0.5 x facet, separated by 1 diameter. Antenna reaching basal 0.25 of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres X to XI asymmetrical; antennomere XI transverse (similar to Fig. 6e).

Maxillary palp terminal segment triangular, securiform, basally rounded, apical angles 90° or more, length = 0.66 x width. Labial palp terminal segment triangular, extended on medial side, length = 0.66 x width. Labial palp width = 0.8 x maxillary palp width (Fig. 7e). Mentum with plate broadly triangular, length = 0.6 x width, sides straight, ridge medial extension acutely pointed (similar to Fig. 8d).

Pronotum puncture size = 1 x facet, separated by 1 to 3 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII weak, visible on apical half; strial puncture size = 2 x pronotal disc punctures, gradually decreasing in size posteriorly; intervals finely punctate.

Prosternum keeled and pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa; coxal lines straight to weakly curved, length = 0.5 x sternal length, lines barely surpassing coxae, length = basal width; prosternal plate slightly convex, apical width = 0.6 x basal width; base shallowly concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight; base sinuate, lobed medially. Metasternum coxal lines almost meeting at middle, recurved; coxal lines extend 0.5 distance to posterior lateral angle; sternum medial punctures fine, few coarse lateral punctures.

First visible abdominal ventrite with coxal lines reaching 0.5 distance to posterior edge; rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe weakly arched, apically truncate, constricted just before tip; internal sac without noticeable sclerotized structures; flagellum long and narrow, length = 2 x median lobe length (Fig. 114a); base of flagellum straight, sclerite at base claw-shaped (Fig. 114b-d) (5 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail swollen, curved like an inverted question mark, "¿" (Fig. 114e) (5 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Females have foveate punctures on prosternum in front of procoxae; males lack these punctures.

Variation: Besides the typical specimens of *I. septemsignatus* with black heads, Gorham described varieties α and β from Guatemala which have red heads: α is smaller and more finely punctate than β. The majority of specimens studied have the head entirely black. Some have the epistome and frons brown, others have the head almost entirely orange. These variations do not correlate with any other characteristic.

Specimens from Costa Rica, Guatemala, Belize, and southern Mexico (Chiapas and Yucatan) have the subhumeral spot small, free from the base. Specimens from the rest of Mexico (Veracruz, San Luis Potosí, and Hidalgo) have the subhumeral spot elongate, narrowly connected to the base.

Type: The lectotype (here designated) of *Ischyrus septemsignatus* Gorham label data: "/[red circle on white paper] Type/ sp. figured/ Toxpam/ Mexico Salle Coll./ B.C.A., Col., VII, Ischyrus 7-signatus Gorham/ [red] LECTOTYPE Ischyrus septemsignatus Gorham des. P. E. Skelley 1993/" [NHML, examined]. Sex not determined. Selander & Vaurie (1962) did not locate "Toxpam", and stated that it is possibly a misspelling of Tuxpan, Veracruz, Mexico.

A paralectotype with data: "/Toxpam/ Mexico Salle Coll./ Ischyrus 7-signatus/ B.C.A., Col., VII, Ischyrus/ [yellow] PARALECTOTYPE Ischyrus septemsignatus Gorham des. P. E. Skelley 1993/" [NHML, examined]. Sex not determined.

The paralectotype of *Ischyrus septemsignatus* Var. α Gorham label data: "/Pantaleon, 1700 ft, Champion/ Ischyrus 7-signatus/ B.C.A., Col., VII, Ischyrus/ [yellow] PARALECTOTYPE Ischyrus septemsignatus Var. α Gorham des. P. E. Skelley 1993/" [NHML, examined]. Sex not determined.

The paralectotype of *Ischyrus septemsignatus* Var. β Gorham label data: "/Capetillo Guatemala, C.-Champion/ Ischyrus 7-signatus lg.var./ B.C.A., Col., VII, Ischyrus/ [yellow] PARALECTOTYPE Ischyrus septemsignatus Var. β Gorham des. P. E. Skelley 1993/" [NHML, examined]. Sex not determined.

Specimens examined: The lectotype, paralectotypes, and 18 specimens, representing 21 collection records, were studied (see Appendix C for specific data).

Distribution: Mexico to Costa Rica (Fig. 140).

Etymology: *Ischyrus septemsignatus*, or "7-signatus" was named for the 7 spots on the elytra.

Taxonomic notes: The lectotype was designated because Gorham made no indication that he saw only one specimen of the nominate variety. The specimen chosen was illustrated in the Biologia Centrali-Americana (Gorham 1887).

Gorham's varieties, α and β, differ from the black headed lectotype only in having a red head. As Gorham stated, "The variation in the colour of the head is not

unusual in this genus." The differences between the variety α and β are even smaller: β is larger and more coarsely punctate than α. Both specimens of these varieties studied by Gorham are deposited in the Natural History Museum, London, and are designated as paralectotypes.

Remarks: *Ischyrus septemsignatus* is most similar to *I. scutellaris* and *I. bogotae* in color pattern. *Ischyrus scutellaris* has 2 free spots at the center of each elytron; *I. septemsignatus* has only one. *Ischyrus bogotae* has a larger body size and a single large basal pronotal spot; *I. septemsignatus* is smaller and lacks large basal elytral markings.

References: Blackwelder 1945:465; Kuhnt 1909:63; 1911:43.

Ischyrus tetrasticus Gorham

(Figs. 74, 115, 141)

Ischyrus tetrasticus Gorham 1887:41, t.3 f.1.
Micrischyrus tetrasticus (Gorham) 1887, Alvarenga 1994:16-17.

Diagnosis: Recognized by pronotum having only 4 free pronotal spots in a transverse row, orange head with a black basal spot, broad maxillary palp terminal segment, and central elytral band broadly connected to the suture.

Description: Length 6.7-7.7 mm; Width: 3.0-3.8 mm. Body elongate, widest at basal third of elytra; microreticulate, feebly shining; orange with black pattern (Fig. 74).

Head orange with black epistome margin and spot on vertex. Pronotum with 4 free spots in anteriorly concave arch. Scutellum dark orange, often with blackened edges. Each elytron with orange epipleural fold; subhumeral spot elongate, connected to base, fused to scutellar spot or touching only at middle; scutellar spot large, broadly connected to base and suture; central band widest at suture, can touch lateral margin; apical spot large and well defined or small, broadly connected to suture and apex. Venter black; pronotal epipleuron and lateral abdominal ventrites orange. Legs black; palpi pale brown.

Head dorsal distance between eyes = 2.2 x eye width; ocular striae reaching 0.75 distance to anterior angle of eye; vertex puncture size = 1 x facet, separated by 1 to 2 diameters; epistome puncture size = 0.5 x facets, separated by 0.5 to 1 diameter. Antenna reaching base of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres IX to XI symmetrical, sometimes appearing asymmetrical; antennomere XI oval, transverse (similar to Fig. 6i).

Maxillary palp terminal segment triangular, swollen, securiform, basally rounded, apical angles 90° or more, length = 0.66 x width (see Variation). Labial palp terminal segment triangular, extended on medial side, length = 0.66 width. Labial palp width = 0.8 x maxillary palp width (similar to Fig. 7e). Mentum with plate triangular, length = 0.75 x width, apical sides straight or outwardly curved, ridge medial extension acute (similar to Fig. 8a).

Pronotal disc puncture size = 1 x facet, separated by 1 to 3 diameters; laterally separated by 0.5 to 1.0 diameter. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII present on apical half; strial punctures at base = 2 x pronotal disc punctures, gradually becoming finer posteriorly; intervals finely punctate, obscured by microreticulations.

Prosternum keeled and pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa; coxal lines straight, length = 0.5 x sternal length, lines barely surpassing coxae, length = basal width; prosternal plate slightly convex, apical width = 0.5 to 0.6 x basal width; base concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight; base sinuate. Metasternum coxal lines not meeting at middle, recurved; coxal lines extend 0.33 distance to posterior lateral angle; line behind mesocoxa deep groove; sternum shining, medial punctures fine, few coarse lateral punctures.

First visible abdominal ventrite with coxal lines reaching 0.5 distance to posterior edge; rounded between metacoxae; coarse punctures laterally, fine punctures medially.

Male genitalia with median lobe moderately arched, apically truncate, slightly constricted just before tip; internal sac without noticeable sclerotized structures; flagellum long and narrow, length = 1.4 x median lobe length (Fig. 115a); base of flagellum gradually curved, sclerite at base claw-shaped (Fig. 115b-d) (2 dissected).

Female genitalia with spermathecal head kidney-shaped, with top-knot; tail swollen, tightly curved like an inverted question mark, "¿" (Fig. 115e) (1 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Female with foveate punctures on prosternum in front of procoxae; males lack these punctures.

Variation: The amount of contact between the central elytral band and the lateral margin is variable: not touching in the Panama holotype and Brazil specimens; nearly touching in the Peru specimen; broadly connected in the Ecuador specimen.

The female from Brazil has the maxillary palp terminal segment wider (length = 0.5 x width), angles acute (similar to Fig. 7j); central elytral marking extended posteriorly along suture; apical elytral spot smaller than the pronotal spots. The other specimens studied have maxillary palp terminal segment narrower (length = 0.66 x width); angles nearly 90° (similar to Fig. 7e); central elytral marking band-like, not extending along the suture; the apical spot larger than the pronotal spots. The Brazilian female may represent a

distinct taxon, but without adequate material and a male, it is considered a variety of *I. tetrasticus*.

Type: The holotype (by monotypy) of *Ischyrus tetrasticus* Gorham label data: "/[red circle on white paper] Type/ David, Panama, Champion/ Type, sp. figured/ Ischyrus tetrasticus Gorh./ B.C.A., Col., VII, Ischyrus/" [NHML, examined]. Sex apparently female, not dissected.

Specimens examined: The holotype and 4 specimens, representing 5 collection records, were studied. Label data: **Brazil**, Espirito Santo [1, HNHM]; **Ecuador**, Pichincha, Sn. Rafael, 5-I-1973, J. Avila [1, USNM]; **Panama**, Canal Zone, Barro Colorado Island, 8-14-V-1985, H. Wolda, blacklight [1, UCDC]; **Peru**, Huanuco, Tingo Maria, 26-X- 1946, J. C. Pallister, 2200' elev. [1, AMNH].

Distribution: Panama, Ecuador, Peru, and Brazil (Fig. 141).

Etymology: *tetra*: Greek = 4; *sticus*: Greek = punctured, spotted. This name refers to the 4 spots on the pronotum.

Remarks: *Ischyrus tetrasticus* is most similar to *I. quadripunctatus* and *I. ichnus*. *Ischyrus quadripunctatus* has a black head often with red front and epistome, and narrow maxillary palp terminal segment; *I. tetrasticus* has a red head with a black basal spot, and a wide maxillary palp terminal segment. *Ischyrus ichnus* has the central elytral marking free from the suture; *I. tetrasticus* has the central elytral marking band-like, broadly connected to the suture.

References: Blackwelder 1945:465; Gorham 1887:44-45; Kuhnt 1909:64; 1911:43.

Ischyrus tripunctatus Crotch

(Figs. 7q, 37, 116, 141)

Ischyrus tripunctatus Crotch 1873b:144.

Micrischyrus tripunctatus (Crotch) 1873b, Alvarenga 1994:17.

Diagnosis: Characterized by having 3 free pronotal spots in transverse row, entirely black head and legs, scutellar and subhumeral spots fused, and central elytral marking broadly connected to suture.

Description: Length: 6.6-7.1 mm; Width: 3.0-3.7 mm. Body elongate, widest at basal third of elytra; finely microreticulate, shining; yellow-orange with black pattern (Fig. 37).

Head black. Pronotum with 3 free spots in a transverse row, middle spot larger than lateral spots; basal margin with weak black edge at median half. Scutellum dark orange to black. Each elytron with black epipleural fold, occasionally orange at base; subhumeral and scutellar spots broadly connected to each other and base, appearing as one large posteriorly lobed spot; scutellar spot broadly connected to suture; central spot large, triangular, widest anteriorly, broadly connected to suture, edges lobed; suture finely black from central spot to apex. Venter orange with black meso- and metepisterna and epimera. Legs black; palpi and tarsi brown.

Head dorsal distance between eyes = 2 x eye width; ocular striae reaching 0.8 distance to anterior angle of eye; vertex puncture size = 0.5 to 0.75 x facet, separated by 2 to 3 diameters; epistome puncture size = 0.5 to 0.75 x facet, separated by 1 diameter. Antenna reaching middle of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres X to XI symmetrical; antennomere XI transverse, narrower than antennomere X (similar to Fig. 6l).

Maxillary palp terminal segment triangular, securiform, basally rounded, medial angle nearly 90°, lateral angle acute, length = 0.4 x width. Labial palp terminal segment elongate, almost triangular, extended on medial side, rounded basally, length = 0.4 x width. Labial palp width = 0.5 x maxillary palp width (Fig. 7q). Mentum with plate broadly triangular, all sides straight and equal in length, ridge medial extension acutely pointed (similar to Fig. 8d).

Pronotal disc puncture size = 1 x facet, separated by 2 to 3 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII weak, visible on apical half; strial puncture size = 1.5 x pronotal disc puncture; intervals finely punctate.

Prosternum keeled and strongly pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa; coxal lines straight, length = 0.5 x sternal length, lines barely surpassing coxae, length = basal width; prosternal plate flat, apical width = 0.75 x basal width; base concave.

Mesosternum basal width = 2 x mesocoxal line length; coxal lines straight; base sinuate. Metasternum coxal lines recurved, not meeting at middle; coxal lines extend 0.33 to 0.5 distance to posterior lateral angle; line behind mesocoxa deep, groove-like; sternum with medial punctures fine, coarse lateral punctures weakly impressed.

First visible abdominal ventrite with coxal lines reaching 0.33 distance to posterior edge; broadly rounded between metacoxae; coarse punctures evenly distributed, often indistinct medially.

Male genitalia with median lobe strongly arched, apically truncate, slightly constricted just before tip; internal sac with rough darkened patch near flagellar base; flagellum hair-like, length = 1.7 x median lobe length (Fig. 116a); base of flagellum straight, sclerite at base claw-shaped (Fig. 116b-d) (1 dissected).

Female genitalia with spermathecal head kidney-shaped, with weak top-knot; tail greatly swollen, as large as head and kidney-shaped (Fig. 116e) (1 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Females have few foveate punctures on prosternum immediately in front of procoxae; males lack these punctures.

Variation: The Peruvian specimens differ from the remaining material in having the central elytral band touching the lateral elytral margin.

Type: The lectotype (here designated) of *Ischyrus tripunctatus* Crotch label data: "/[red circle on white paper] Type/ Chontales, E.M.Janson [underside] 1929-289/ Ischyrus tripunctatus Type Crotch/ [red] LECTOTYPE Ischyrus tripunctatus Crotch des. P. E. Skelley 1993/" [NHML, examined]. Sex not determined. Type locality was stated to be "the vicinity of Santo Domingo, Chontales, Nicaragua" (Crotch 1873b).

Specimens examined: The lectotype and 6 specimens, representing 5 collection records, were studied. Label data: **Bolivia**, La Paz, Yolsa, montane forest, 6-I-1991, J. V. McHugh, JVM lot B91-61 [1, JVMC]; **Costa Rica**, Hamburgfarm, Reventazon Ebene Limon, 25-V-1936, F. Nevermann F., an trocknem holz nachte [1, USNM]; **Mexico**, Veracruz, Los Tuxtlas, nr. Balzapote, 1-6-V-1989, E. Giesbert [1, FSCA]; **Peru**, Loreto, Rio Maranon & Rio Ucayali, 73.5°W 4.8°S, 6-20-VIII-1994, P. E. Skelley, on log with prostrate white fungus at night [3, PESC].

Distribution: Mexico, Nicaragua, Costa Rica, Peru, and Bolivia (Fig. 141).

Etymology: *tri*: Latin = 3; *punctatus*: Latin = punctures, spots. Undoubtedly this species was named for the 3 free spots on the pronotum.

Taxonomic notes: Some catalogers misinterpreted the type locality of "Santo Domingo" as meaning Santo Domingo, Dominican Republic, on the island of Hispaniola (Blackwelder 1945:465). Leng & Mutchler (1914:412) even reported it from Haiti. This is in error, as the type locality is stated to be Santo Domingo, Chontales, Nicaragua.

In the original description, Crotch did not state that only one specimen was studied, so a lectotype was designated. The lectotype chosen is from the Janson collection, has label data indicating it is from the type locality, and fits the original description.

Alvarenga (1994) cites the type repository as the Crotch Collection, Cambridge Univeristy. I found no specimens of *I. tripunctatus* in the collection. In general, the specimens from Crotch's (1873b) paper collected by Janson in Nicaragua are located in the Natural History Museum, London.

Remarks: *Ischyrus tripunctatus* is most similar to *I. pardalinus* Guérin and *I. impressopunctatus* Crotch in color pattern. *Ischyrus pardalinus* has a red head with black basal spot, and a free subhumeral spot; *I. tripunctatus* has an entirely black head, and fused subhumeral and scutellar spot. *Ischyrus impressopunctatus* has the basal and central elytral markings interrupted by orange, the central spot does not connect with the suture; *I. tripunctatus* has the basal and central elytral markings complete, broadly connected to the suture.

References: Blackwelder 1945:465; Crotch 1876:-(51)427; Gemminger & Harold 1876:3691; Gorham 1887:39; Harold 1875:180; Kuhnt 1909:63; 1911:44; Leng & Mutchler 1914:412.

Ischyrus undulatus Gorham

(Figs. 7h, 15c, 49, 117)

Ischyrus undulatus Gorham 1887:42, t.3. f.3.
Micrischyrus undulatus (Gorham) 1887, Alvarenga 1994:17.

Diagnosis: Recognized by having 4 free pronotal spots (2 anterior and 2 posterior), metasternum with a pit behind each mesocoxa, and free central, lateral and apical elytral spots.

Description: Length: 5.1-6.2 mm; Width: 3.2-3.5 mm. Body elongate, subcylindrical, widest at basal third of elytra; weakly microreticulate, shining; orange with black pattern (Fig. 49).

Head orange. Pronotum with 2 free anterior spots, closer together than the eyes; 2 free posterior spots, as far apart as eyes, posterior spots occasionally reduced. Scutellum orange. Each elytron with orange epipleural fold; humeral spot connected to base; scutellar spot broadly connected to base and suture; suture narrowly black, often swollen near apex; central spot usually free (see Variation), almost touching suture; lateral spot usually free (see Variation); apical spot free. Venter mostly black or dark orange with abdomen and prosternum orange. Antennal club and legs black or dark orange.

Head dorsal distance between eyes = 3 x eye width; ocular striae reaching anterior angle of eye; vertex puncture size = 1 x facet, separated by 2 to 3 diameters; epistome puncture size = 1 x facet, separated by 1 diameter. Antenna reaching basal 0.25 of pronotum; antennomere III as long as next 3 antennomere combined; antennomeres X to XI symmetrical; antennomere XI subcircular (similar to Fig. 6g).

Maxillary palp terminal segment semicircular, apical angles 90°, length = 0.7 x width. Labial palp terminal segment triangular, extended on medial side, length = 0.5 x width. Labial palp width = 0.75 x maxillary palp width (Fig.

7h). Mentum with plate broadly triangular, length = 0.5 x width, sides inwardly curved, ridge medial extension acutely pointed (similar to Fig. 8e).

Pronotal disc puncture size = 1 x facet, separated 3 to 5 diameters; same size laterally, separated 2 to 3 diameters. Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; basal strial puncture size = pronotal disc puncture, decreasing in size posteriorly; intervals finely punctate.

Prosternum keeled and broadly pinched anteriorly; with (female) or without (male) foveate punctures in front of procoxa; coxal lines straight, length = 0.6 x sternal length, lines barely surpassing coxae; length = 0.75 x basal width; prosternal plate slightly convex, apical width = 0.6 x basal width; base shallowly concave.

Mesosternum lines = 0.5 x basal width; lines straight, parallel to convergent anteriorly; base shallowly sinuate. Metasternum coxal lines meeting at middle in straight line often with shallow undulations or punctures (Fig. 15c), weakly recurved; coxal lines extend 0.25 to 0.33 distance to posterior lateral angle; line behind mesocoxa shallow externally, becoming deeper medially leading into a pit, not connected to coxa line; sternum with medial punctures fine, lacking coarse lateral punctures.

First visible abdominal ventrite with coxal lines reaching 0.33 distance to posterior edge; broadly rounded between metacoxae, almost truncate; fine punctures medially; coarse lateral punctures weakly impressed.

Male genitalia with median lobe weakly arched, narrowed and apically rounded; internal sac without noticeable sclerotized structures; flagellum long and narrow, length = 2 x median lobe length (Fig. 117a); base of flagellum gradually curved, sclerite at base claw-shaped (Fig. 117b-d) (4 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail small and narrow, looped (Fig. 117e) (3 dissected).

Presence of stridulatory files on occipital region of head unknown (heads retracted). Females have few foveate punctures on prosternum in front of procoxae; males lack these punctures.

Variation: Posterior free pronotal spots are small, almost lacking on one specimen from Panama. The others have the posterior pronotal spots nearly equal in size to the anterior spots.

The holotype has the central and lateral spot of the elytra fused, forming a wavy marking (illustrated in Gorham 1887). All other specimens studied have these spots separated. No additional differences were observed between the type and these specimens.

Type: The holotype (by monotypy) of *Ischyrus undulatus* Gorham label data: "/[red circle on white paper] Type/ Bugaba Panama Champion/ Ischyrus undulatus Gorham/ B.C.A., Col.,VII, Ischyrus/" [NHML, examined]. Sex not determined.

Specimens examined: The holotype and 16 specimens, representing 16 collection records, were studied (see Appendix C for specific data).

Distribution: Known only from Panama.

Etymology: *undulatus*: Latin = wavy. Gorham's name probably refers to the wavy central elytral band, as illustrated in the original description.

Remarks: *Ischyrus undulatus* is most similar to *I. bellus* Guérin and *I. nitidior* Crotch in pronotal color pattern and body form. Both *I. bellus* and *I. nitidior* have the elytra completely banded; in *I. undulatus* the elytral markings are broken into spots.

References: Blackwelder 1945:465; Gorham 1887:44; Kuhnt 1909:63; 1911:44.

Ischyrus vespertilio Lacordaire

(Fig. 24)

Ischyrus vespertilio Lacordaire 1842:112.

Micrischyrus vespertilio (Lacordaire) 1842, Alvarenga 1994:17.

Diagnosis: Distinguished by the triangular-shaped antennomere IX, pronotum with 2 free spots, basal elytral marking not connected to suture, large triangular central elytral spot, and robust dorsally convex body.

Description: Length: 9.9 mm; Width 5.3 mm. Body oval, dorsally convex, widest at basal third of elytra; microreticulation strong, surface dulled; dark orange with black color pattern (Fig. 24).

Head orange. Pronotum entirely edged in black, black edge thickest on anterior and posterior margins near middle; 2 large free spots. Scutellum orange with dark posterior edge. Each elytron with orange epipleural fold, edges black; scutellar and subhumeral spots fused forming one large bilobed spot; scutellar spot broadly connected to base, not connected to suture; suture with black margin; central marking large, triangular, connected to suture throughout its length, nearly reaching lateral margin and apical angle. Venter dark orange, edges of sclerites black. Femur orange with black apical quarter; tibia black; tarsi orange; palpi brown.

Head dorsal distance between eyes = 3 x eye width; ocular striae reaching base of antenna; vertex puncture size = 0.5 x facet, separated by 2 to 3 diameters; epistome puncture size = 0.5 x facet, separated by 1 to 2 diameters. Antenna reaching basal 0.25 of pronotum; segments narrowed; antennomere III as long as next 3 antennomere combined; antennomeres IX to X triangular, narrowed, length = width; antennomeres IX to XI symmetrical (similar to Fig. 6k); antennomere XI squared, length = width, sides flattened, parallel.

Maxillary palp terminal segment triangular, securiform, basally rounded, apical angles nearly 90°, length = 0.66 x width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = 0.75 width. Labial palp width = 0.5 x maxillary palp width (similar to Fig. 7a). Mentum with plate triangular, length = 0.7 x width, sides straight; ridge medial extension acute, projecting (similar to Fig. 8c).

Pronotum microreticulate; puncture size = 1 x facet, separated by 2 to 3 diameters. Scutellum pentagonal, length = 0.4 x width. Each elytron strongly microreticulate, dulled; strial punctures weak and obscure, distinct only at base of stria V; interval punctures absent.

Prosternum strongly keeled and broadly pinched anteriorly, projecting, pinch blunt and truncate in ventral view, covering mentum when head turned ventrally; few foveate punctures in front of procoxa; coxal lines straight, length = 0.5 x sternal length, lines barely surpassing coxae, line length = basal width; prosternal plate weakly convex, apical width = 0.5 x basal width; base slightly concave.

Mesosternum basal width = 3 x length lines; lines straight; base sinuate. Metasternum coxal lines recurved, meeting medially; coxal line extends 0.33 distance to posterior lateral angle; sternum without medial punctures, coarse lateral punctures weakly impressed.

First visible abdominal ventrite with coxal lines short, reaching 0.33 distance to posterior edge; rounded between metacoxae; finely punctate medially, coarsely punctate laterally.

Genitalia not studied, lectotype not dissected.

Presence of stridulatory files on occipital region of head unknown (head retracted).

Type: The lectotype (here designated) of *Ischyrus vespertilio* Lacordaire label data: "/Colombie/ Vespertilio Lac./ Type/ Ex-Musaeo Mniszech/ [red] TYPE/ [pale blue] Muséum Paris ex Coll. R. Oberthür 1952/ [red] LECTOTYPE Ischyrus vespertilio Lacordaire des. P. E. Skelley 1993/" [MNHN, examined]. Sex not determined.

Specimens examined: Only the lectotype was studied.

Distribution: Reported by Lacordaire to be from Colombia and Mexico, state of Tabasco. Gorham (1887:40) did not see any specimens of this species from Central America.

Etymology: *vespertilio*: Latin = bat. Perhaps some part of this species color pattern reminded Lacordaire of a bat.

Taxonomic notes: A lectotype was designated because Lacordaire stated that he saw specimens from 2 localities. The lectotype fits the original description and is reported to have been studied by Lacordaire.

Remarks: *Ischyrus vespertilio* is most closely related to *I. duponti* Lacordaire, in body shape, antennal structure, and pronotal color pattern (2 large free spots). *Ischyrus duponti* has a large free central spot on each elytron; *I. vespertilio* has the central elytral spot large, triangular, and broadly connected to the suture. These species are provisionally left in *Ischyrus* because they possess most of the diagnostic generic characters as currently understood. They differ from other *Ischyrus* by their convex body and triangular antennomere IX.

References: Blackwelder 1945:465; Crotch 1876: 426(50); Gemminger & Harold 1876:3691; Gorham 1887:40; Kuhnt 1909:63; 1911:44.

APPENDIX A
Ischyrus Species Names

This alphabetical list includes all specific names used in combination with the generic name *Ischyrus*; including valid names, names which have been moved to other genera, synonyms, homonyms, and *nomina nuda*. It is meant to serve as a guide in finding the current status of a name and help prevent the creation of nomenclatural problems in future research.

Citations are presented in the format: *name* describer year:page. *Original genus*. Statements on current status, citations to the place where any changes were made. Names in bold print are still considered valid names in *Ischyrus* Lacordaire.

This list presents the names in their correct combination, following the ICZN (1996) ruling to conserve *Ischyrus* Lacordaire and *Megischyrus* Crotch (see Alvarenga 1965, 1994, and Skelley & Goodrich 1994).

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affinis Duponchel 1825:47. *Erotylus*. Synonym of *Ischyrus scriptus* (Olivier) 1807:484, *fide* Lacordaire 1842:119.

agnatus Crotch 1876:426(50). *Ischyrus*. Variation of *I. frontalis* Lacordaire 1842:127, *fide* Gorham 1887: 39.

agnathus [sic] Crotch 1876. *Ischyrus*. Misspelling of *I. agnatus* in Kuhnt 1909:63.

alabamae Schaeffer 1931:175. *Ischyrus*. Described as a variety of *I. quadripunctatus* (Olivier) 1792:437. Synonym of *I. q. quadripunctatus* (Olivier), *fide* Mader 1938:19.

aleator Boyle 1954:46-48. *Ischyrus*.

amoenus Guérin-Méneville 1841:155. *Lybas*. Now *Callischyrus*, *fide* Crotch 1876:(59)435. *Ischyrus* in Gemminger & Harold 1876:3690 and Lacordaire 1842:107-108.

angularis Lacordaire 1842:126. *Ischyrus*.

angustatus Lacordaire 1842:96-97. *Ischyrus*. Now *Megischyrus*, *fide* Crotch 1876:(47)423.

antedivisa Mader 1938:19. *Ischyrus*. Described as a variety of *I. quadripunctatus* (Olivier) 1792:437. Synonym of *I. q. quadripunctatus* (Olivier), *fide* Boyle 1954:39-41.

audbalus Skelley, **new species**.

auriculatus Lacordaire 1842:123. *Ischyrus*.

bahiae Crotch 1876:428(52). *Ischyrus*.

balteatus Duponchel 1825:164. *Erotylus*. Synonym of *Megischyrus semipunctatus* (Germar) 1824:612, *fide* Lacordaire 1842:99. *Ischyrus* in Dejean 1836:428.

bartletti Gorham 1883:85. *Megischyrus*. Valid. *Ischyrus* only in Alvarenga 1994:8.

basiguttiger Kuhnt [unpublished name]. *Ischyrus*. The "Type" specimen is in the Institut Royal Sciences Naturelle Belgique.

bellicosus Lacordaire 1842:98. *Ischyrus*. Now *Megischyrus*, *fide* Crotch 1876:424(48).

bellopictus Kuhnt 1910:222. *Episcaphula*. Now *Ischyrus*, *fide* Delkeskamp 1957a:109. Synonym of *I. auriculatus* Lacordaire 1842:123, **new synonymy**.

bellus Guérin 1949:233-234, 231 fig.#6. *Ischyrus*.

bifasciatus Guérin 1952:180. *Megischyrus*. Valid. *Ischyrus* only in Alvarenga 1994:8

blandus Erichson 1847:180. *Ischyrus*. Synonym of *Callischyrus insignis* (Castelnau de Laporte) 1840:250, *fide* Crotch 1876:434(58).

bogotae Crotch 1876:430(54). *Ischyrus*.

bogotae Crotch 1876:424. *Megischyrus*. Valid. *Ischyrus* only in Alvarenga 1994:8. Not *Ischyrus bogotae* Crotch 1986:430.

boucardi Crotch 1876:429(53). Ischyrus.

brasiliensis Lacordaire 1842:91. *Ischyrus*. Now *Megischyrus*, *fide* Crotch 1876:422(46).

candezei Crotch 1876:58. *Callischyrus*. *Ischyrus* in Chapuis 1876:38 and Gemminger & Harold 1876:3690.

catenatus Crotch 1876:424. *Megischyrus*. Valid. *Ischyrus* only in Alvarenga 1994:9.

catenulatus Lacordaire 1842:97-98. *Ischyrus*. Now *Megischyrus*, *fide* Crotch 1876:424(48).

celatus Skelley, **new species**.

chacojae Gorham 1887:43, t.3 f.5. *Ischyrus*.

chalcojae [sic] Gorham 1887:43. *Ischyrus*. Misspelling of *Ischyrus chacojae* Gorham 1887 *in* Kuhnt 1909:63.

chevrolati Crotch 1876:423. *Megischyrus*. Valid. *Ischyrus* only in Alvarenga 1994:9.

chiasticus Boyle 1954:43-46. *Ischyrus*. Subspecies of *I. quadripunctatus* (Olivier) 1792:437, **new status**.

circumcinctus Delkeskamp 1957:98,108-109. *Ischyrus*.

circumscriptus Duponchel 1825:165, t.3 f.83. *Erotylus*. Now *Megischyrus*, *fide* Crotch 1876:(49)425. *Ischyrus* in Lacordaire 1842:102-103.

coccineipennis Motschulsky 1858:117. *Ischyrus*. Now *Mycolybas*, *fide* Crotch 1876:474(47).

collatinus Crotch 1876:57. *Ischyrus*.

columbianus Lacordaire 1842:95. *Ischyrus*. Now *Megischyrus*, *fide* Crotch 1876:(47)423.

conductus Kuhnt 1910:229-230. Ischyrus.

connexus Crotch 1876:423. *Megischyrus*. Valid. *Ischyrus* only in Alvarenga 1994:9.

consanguineus Duponchel *in litt.*, *fide* Lacordaire 1842:94. *Ischyrus*. Variety of *Megischyrus mexicanus* (Lacordaire) 1842:93-94, *fide* Gemminger & Harold 1876:3689.

consimilus Crotch 1876:53-54. *Ischyrus*.

cordiformis Skelley, **new species**.

cyanopterus Erichson 1847:180. *Ischyrus*. Now *Callischyrus*, *fide* Crotch 1876:434(58).

decempunctatus Guérin-Méneville 1841:154-155. *Ischyrus*. Now *Megischyrus*, *fide* Crotch 1876:(49)425.

decorus Guérin 1949:234-235, 231 fig.#7. *Ischyrus*.

dejeanii Chevrolat *in* Dejean 1836:428. *Ischyrus*. Synonym of *Megischyrus discipennis* (Lacordaire) 1842:101, *fide* Gemminger & Harold 1876:3689.

dentiferus Chevrolat *in* Dejean 1836:428. *Ischyrus*. Synonym of *Megischyrus brasiliensis* (Lacordaire) 1842:91-92, *fide* Gemminger & Harold 1876:3690.

discipennis Lacordaire 1842:101. *Ischyrus*. Now *Megischyrus*, *fide* Crotch 1873b:143.

disconiger Mader 1942 *in* Delkeskamp 1957:108-109. *Ischyrus*. A mandatory change in spelling for "*disconigrum*" which does not agree in gender with the generic name *Ischyrus*.

disconigrum Mader 1942a:195. *Ischyrus*. Now spelled *disconiger*, *fide* Delkeskamp 1957:108-109, a mandatory spelling change to agree in gender with the generic name *Ischyrus*.

distinguendus Lacordaire 1842:111. *Ischyrus*.

dunedinensis Blatchley 1917:279. *Ischyrus*.

duponti Lacordaire 1842:110-111. *Ischyrus*.

elegantulus Lacordaire 1842:121-122. *Ischyrus*.

elongatus Gorham 1883:85. *Megischyrus*. Valid. *Ischyrus* only in Alvarenga 1994:9.

ephippiatus Gorham 1887:43. *Ischyrus*.

episcaphulinus Gorham 1887:44, t.3 f.7. *Ischyrus*.

erosus Skelley, **new species**.

extricatus Crotch 1873a:354. *Ischyrus*. Now *Pseudischyrus*, *fide* Boyle 1956:130.

fasciato-dentatus Guérin-Méneville MSS. Synonym of *Megischyrus jurinei* (Lacordaire) 1842:94-95, *fide* Crotch 1876:422(46). Not known to have been used in direct combination with *Ischyrus*.

femoralis Chevrolat *in* Guérin-Méneville 1829-1838 [1844]:63, t.18 f.10. *Dacne*. Now *Ischyrus*, *fide* Lacordaire 1842:114-115. Synonym of *I. scriptus* (Olivier) 1807:484-485, **new synonymy**.

flavitarsis Lacordaire 1842:130. *Ischyrus*. Now *Epytus*, *fide* Alvarenga 1994:18.

flavus Motschulsky 1858:116. *Ischyrus*. Now *Rhodotritoma*, *fide* Chûjô & Chûjô 1990:5.

fraternus Lacordaire 1842:124. *Ischyrus*.

frontalis Lacordaire 1842:127. *Ischyrus*.

fulmineus Delkeskamp 1957:98,107-108. *Ischyrus*.

fulvitarsis Lacordaire 1842:129. *Ischyrus*. Now *Epytus*, *fide* Alvarenga 1994:18.

goliai Skelley, **new species**.

gorhami Mader 1942a:171. *Megischyrus*. Described as an variation of *M. elongatus* Gorham 1883. Not used in direct combination with *Ischyrus*, see Alvarenga 1994:9.

grammicus Gorham 1883:86. *Ischyrus*..

grammistes Lacordaire 1842:105-106. *Ischyrus*. Synonym of *Megischyrus lineatus* (Lacordaire) 1842:104-105, *fide* Crotch 1876:(49)425.

graphicus Lacordaire 1842:125-126. *Ischyrus*. Synonym of *I. quadripunctatus* (Olivier) 1792:437, **new synonymy**.

gratiosus Guérin-Meneville 1829-1838[1844]:310. *Ischyrus*. Synonym of *I. incertus* Lacordaire 1842:118-119, **new synonymy**.

gravis Chevrolat *in* Dejean 1836:428. *Ischyrus*. Synonym of *Megischyrus mexicanus* (Lacordaire) 1842:93-94, *fide* Gemminger & Harold 1876:3689.

guatemalae Crotch 1876:424. *Megischyrus*. Valid. *Ischyrus* only in Alvarenga 1994:10.

hamatus Kuhnt [unpublished name]. *Ischyrus*. The "Type" specimen is in the Institut Royal des Sciences Naturelles de Belgique, labeled as a variety of *I. auriculatus* Lacordaire 1842:123.

hieroglyphicus Duponchel 1825:46, t.1 f.24. *Erotylus*. Now *Callischyrus*, *fide* Crotch 1876:(59)435. *Ischyrus* in Gemminger & Harold 1876:3690 and Lacordaire 1842:106-107.

humeralis Chevrolat *in* Dejean 1836:429. *Mycotretus*. Synonym of *I. quadripunctatus* (Olivier) 1792:437, *fide* Gemminger & Harold 1876:3691. Not known to have been used in direct combination with *Ischyrus*.

ichnus Skelley, **new species**.

imarginata Schenkling 1919:85. *Ischyrus*. Described as an aberration of *M. zonalis* Lacordaire 1842. Not used in direct combination with *Ischyrus*, see Alvarenga 1994:12.

impressopunctatus Crotch 1876:426(50). *Ischyrus*.

impressus Skelley, **new species**.

incertus Lacordaire 1842:118-119. *Ischyrus*.

infernalis Chevrolat *in* Dejean 1836:428. *Ischyrus*. Synonym of *Megischyrus scaphinotus* (Lacordaire) 1842:96, *fide* Gemminger & Harold 1876: 3689.

insignis Castelnau de Laporte 1840:520. *Erotylus*. Now *Callischyrus*, *fide* Crotch 1876:434(58). *Ischyrus* in Gemminger & Harold 1876:3690 and Lacordaire 1842:108-109.

insolens Crotch 1876:53. *Ischyrus*.

interruptus Duponchel 1825:48, t.1 f.27. *Erotylus*. Now *Ischyrus*, *fide* Lacordaire 1842:116-117.

intersectus Duponchel 1825:49, t.2 f.29. *Erotylus*. Now *Brachysphaenus*, *fide* Crotch 1876:512 (136). In Lacordaire 1842:131, it is cited as *Erotylus* but is stated to be a member of *Ischyrus*.

joplini Skelley, **new species**.

jurinei Lacordaire 1842:94-95. *Ischyrus*. Now *Megischyrus*, *fide* Crotch 1876:422(46).

kempferi Alvarenga 1977:105. *Micrischyrus*. New name for *Ischyrus nigripes* Mader 1942a:195, not *Ischyrus nigripes* Motschulsky 1858:116 (now *Rhodotritoma*). Not known to have been used in direct combination with *Ischyrus*.

knochi Lacordaire 1842:100. *Ischyrus*. Now *Megischyrus*, *fide* Crotch 1876:(49)425.

kovariki Skelley, **new species**.

laetus Lacordaire 1842:122-123. *Ischyrus*.

laetus Schenkling 1919:85. *Megischyrus*. Valid. *Ischyrus* only in Alvarenga 1994:10, not *Ischyrus laetus* Lacordaire 1842.

lepidus Faldermann 1837:398, t.15 f.1. *Ischyrus*. Now *Triplax*, *fide* Chûjô & Chûjô 1990:19.

lineatus Kuhnt 1910:228-229. *Ischyrus*. Name change required; not *Ischyrus lineatus* Lacordaire 1842: 104-105. It will be changed in connection with a revision of South American *Ischyrus* [Skelley, in preparation].

lineatus Lacordaire 1842:104-105. *Ischyrus*. Now *Megischyrus*, *fide* Crotch 1876:(49)425.

lineolatus Crotch 1876:425. *Megischyrus*. Described as a var. of *M. zonalis* Lacordaire 1842. Not used in direct combination with *Ischyrus*, see Alvarenga 1994:12.

macularis Lacordaire 1842:128-129. *Ischyrus*..

maculiventris Lacordaire 1842:120-121. *Ischyrus*. Variety of *I. scriptus* (Olivier) 1807:484-485, *fide* Crotch 1876:(55)431.

malleus Skelley, **new species**.

melanogaster Guérin-Méneville 1829-1838[1844]:310. *Ischyrus*. Now *Callischyrus*, *fide* Crotch 1876: 433(58).

melanopus Guérin-Méneville 1841a:118. *Morphoides*. Now *Callischyrus*, *fide* Crotch 1876:434(58). *Ischyrus* in Gemminger & Harold 1876:3691 and Lacordaire 1842:109-110.

mesomelas Crotch 1876:423. *Megischyrus*. Valid. *Ischyrus* only in Alvarenga 1994:10.

mexicanus Lacordaire 1842:93-94. *Ischyrus*. Now *Megischyrus*, *fide* Crotch 1876:(47)423.

mimus Skelley, **new species**.

modestus Olivier 1807:483 t.3 f.35. *Erotylus*. Now *Epytus*, *fide* Alvarenga 1994:18. *Ischyrus* in Gemminger & Harold 1876:3691, Lacordaire 1842:130-131, and Crotch 1876:432(56).

monochromatus Skelley, **new species**.

mystacis Skelley, **new species**.

natalensis Guérin 1956:61-62 fig.24. *Ischyrus*.

nebulosus Guérin-Méneville 1841:155. *Erotylus* (*Ischyrus*). Now *Brachysphaenus*, *fide* Crotch 1876:504(128), (137)512.

nicaraguae Crotch 1873b:143. *Megischyrus*. Valid. *Ischyrus* only in Alvarenga 1994:10.

nigrans Crotch 1873a:354. *Ischyrus*. Now *Pseudischyrus*, *fide* Casey 1916:156 and Boyle 1956: 131.

nigripes Mader 1942a:195. *Ischyrus*. Not *Ischyrus nigripes* Motschulsky 1858:116 (now *Rhodotritoma*), new name *Micrischyrus kempferi* Alvarenga 1977:105.

nigripes Motschulsky 1858:116. *Ischyrus*. Now *Rhodotritoma*, *fide* Arrow 1925:117 and Chûjô & Chûjô 1990:6.

nigrolineatus Crotch 1876:56. *Ischyrus*.

nitidior Crotch 1876:54. *Ischyrus*.

nobilis Crotch 1876:53-54. *Ischyrus*.

oblongus Duponchel 1825:164-165, t.3 f.80. *Erotylus*. Synonym of *Megischyrus undatus* Olivier (1791: 434), *fide* Gemminger & Harold 1876:3689. *Ischyrus* in Dejean 1836:428.

oblongus Duponchel 1825:164, t.3 f.81. *Erotylus*. Variety of *Megischyrus brasiliensis* (Lacordaire) 1842:91-92, *fide* Gemminger & Harold 1876:3690. *Ischyrus* in Dejean 1836:428.

octostriatus Kuhnt 1910:227. *Megischyrus*. Valid. *Ischyrus* only in Alvarenga 1994:10.

ohausi Mader 1943:115. *Megischyrus*. Valid. *Ischyrus* only in Alvarenga 1994:10.

palliatus Lacordaire 1842:113-114. *Ischyrus*.

pallidior Crotch 1876:428(52). *Ischyrus*. Now *Mycotretus*, *fide* Gorham 1888:52.

panamae Schenkling 1919:85. *Megischyrus*. Described as a var. of *M. nicaraguae* Crotch 1873b. Not used in direct combination with *Ischyrus*, see Alvarenga 1994:10.

panamanus Mader 1942b:571. *Megischyrus*. Valid. *Ischyrus* only in Alvarenga 1994:10.

parallelus Skelley, **new species**.

parcarum Skelley, **new species**.

pardalinus Guérin 1949:235, 231 f.8. *Ischyrus*.

patruelis Lacordaire 1842:124-125. *Ischyrus*.

perizonatus Lacordaire 1842:103-104. *Ischyrus*. Synonym of *Megischyrus sicarius* (Lacordaire) 1842:101-102, *fide* Crotch 1876:(49)425.

peruae Mader 1942a:171,196. Ischyrus..

peruvianus Gorham 1883:85-86. *Ischyrus*. Synonym of *I. boucardi* Crotch 1876:429(53), **new synonymy**.

pictipennis Schenkling 1919:84. *Megischyrus*. Valid. *Ischyrus* only in Alvarenga 1994:11.

pictus Gorham 1887:42, t.3 f.4. *Ischyrus*.

planior Kirsch 1876:99. *Ischyrus*. Now *Megischyrus*, *fide* Gemminger & Harold 1876:3689.

poseidon Skelley, **new species**.

praeustus Sturm 1826:139. *Erotylus*. *Ischyrus* in Sturm 1843:305. *Nomen nudum*.

proximus Lacordaire 1842:113. *Ischyrus*.

puncticollis Gorham 1887:44-45. *Ischyrus*. Synonym of *I. quadripunctatus* (Olivier) 1792:437, **new synonymy**.

putei Skelley, **new species**.

pyropodus Skelley, **new species**.

quadripunctatus Olivier 1792:437. *Erotylus*. Now *Ischyrus*, *fide* Lacordaire 1842:127-128. With 2 subspecies; *I.q. quadripunctatus* (Olivier) 1792, and *I. quadripunctatus chiasticus* Boyle 1954.

quadripunctatus Crotch 1873b:144. *Ischyrus*. Variety of *I. graphicus* Lacordaire 1842:125-126, *fide* Gemminger & Harold 1876:3690. This is an incorrect interpretation of Crotch.

quinquepunctatus Gorham 1887:43-44, t.3 f.6. *Ischyrus*. Synonym of *I. angularis* Lacordaire 1842:126, **new synonymy**.

rubens Gistel 1848:124. *Ischyrus*. Current status unknown. Other than the original description, the only use known to me is Alvarenga 1994:16.

sanguinolentus Lacordaire 1842:97. *Ischyrus*. Now *Megischyrus*, *fide* Crotch 1873b:143.

sanguinosus Motschulsky 1858:116. *Ischyrus*. Now *Mycolybas*, *fide* Crotch 1876:474(98).

sapphirus Skelley, **new species**.

scaphinotus Lacordaire 1842:96. *Ischyrus*. Now *Megischyrus*, *fide* Crotch 1876:(47)423.

scriptus Olivier 1807:484-485, t.3 f.38. *Erotylus*. Now *Ischyrus*, *fide* Lacordaire 1842:119.

scutellaris Gorham 1887:41-42, t.3 f.2. *Ischyrus*.

sedecimguttatus Guérin-Méneville 1829-1838[1844]: 310. *Ischyrus*. Now *Mycotretus*, *fide* Crotch 1876: (64) 440.

semipunctatus Germar 1824:612. *Erotylus*. Now *Megischyrus*, *fide* Crotch 1876:(48)424. *Ischyrus* in Lacordaire 1842:99.

semitinctus Erichson 1847:180. *Ischyrus*. Now *Megishyrus*, *fide* Crotch 1876:(49)425.

septemsignatus Gorham 1887:41, t.2 f.19. *Ischyrus*.

sexpunctatus Chevrolat *in* Lacordaire 1842:113. *Ischyrus*. Synonym of *I. proximus* Lacordaire 1842:113, *fide* Gemminger & Harold 1876:3691.

sheppardi Crotch 1876:428(52). *Ischyrus*.

sicarius Lacordaire 1842:101-102. *Ischyrus*. Now *Megischyrus*, *fide* Crotch 1876:(49)425.

signaticollis Klug *in* Dejean 1836:429. *Mycotretus*. Synonym of *Oocyanus flavitarsis* (Lacordaire) 1842:130, *fide* Gemminger & Harold 1876:3690. Not known to have been used in direct combination with *Ischyrus*.

similior Crotch 1876:432(56). *Ischyrus*.

similis Chevrolat *in* Dejean 1836:429. *Mycotretus*. Synonym of *I. patruelis* Lacordaire 1842:124-125, *fide* Gemminger & Harold 1876:3691.

subcylindricus Lacordaire 1842:117-118. *Ischyrus*. Synonym of *I. quadripunctatus* (Olivier) 1792: 437, **new synonymy**.

tarsalis Lacordaire 1842:106. *Ischyrus*. Now *Epytus fide* Alvarenga 1994:18.

tarsatus Lacordaire 1842:196-197. *Oocyanus*. Synonym of *Oocyanus tarsalis* (Lacordaire) 1842:106, *fide* Curran 1944:4. Not known to have been used in direct combination with *Ischyrus*.

tetragrammus Kuhnt 1910:230-231, f.5. *Ischyrus*.

tetraspilotus Guérin-Méneville 1829-1838[1844]:310. *Ischyrus*.

tetrasticus Gorham 1887:41, t.3 f.1. *Ischyrus*.

thoracica Dejean 1836:429. *Mycotretus* (*Engis*). Synonym of *Oocyanus flavitarsis* (Lacordaire) 1842: 130, *fide* Gemminger & Harold 1876:3690. Not known to have been used in direct combination with *Ischyrus*.

tripunctatus Crotch 1873b:144. *Ischyrus*.

tripunctatus Blatchley 1917:238. *Ischyrus*. Not *I. tripunctatus* Crotch 1873b:144, new name *I. dunedinensis* Blatchley 1917:279.

undatus Olivier 1792:434. *Erotylus*. Now *Megischyrus*, *fide* Crotch 1873b:143. *Ischyrus* in Dejean 1836:428.

undulatus Gorham 1887:42, t.3 f.3. *Ischyrus*.

variabilis Duponchel 1825:46-47, t.1 f.25. *Erotylus*. Now *Ischyrus*, *fide* Lacordaire 1842:121.

variegata Dejean 1821:45. *Engis*. Synonym of *I. subcylindrus* Lacordaire 1842:117-118, *fide* Gemminger & Harold 1876:3691. Not known to have been used in direct combination with *Ischyrus*.

velatus Lacordaire 1842:115-116. *Ischyrus*. Synonym of *I. scriptus* (Olivier) 1807:484-485, **new synonymy**.

venustus Lacordaire 1842:109. *Ischyrus*. Now *Callischyrus*, *fide* Crotch 1876:434(58).

vespertilio Lacordaire 1842:112. *Ischyrus*.

vittatus Crotch 1876:(51)427. *Ischyrus*.

zonalis Lacordaire 1842:102. *Ischyrus*. Now *Megischyrus*, *fide* Crotch 1876:(49)425.

APPENDIX B
Collections Studied and Acronyms

This appendix is an alphabetical listing of the acronyms used in the text and the institution or personal collection for which they stand. Where possible, the acronyms follow those used by Arnett *et al.* (1993).

AAIC -A. Allen, Boise, ID, USA.
ABSC -Archbold Biological Station, Lake Placid, FL, USA.
AMNH -American Museum of Natural History, New York, NY, USA.
ANIC -Australian National Insect Collection, CSIRO, Canberra, Australia.
ANSP -Academy of Natural Sciences, Philadelphia, PA, USA.
ASUT -Arizona State University, Tempe, AZ, USA.
AUEM -Auburn University, Auburn, AL, USA
BYUC -Brigham Young University, Provo, UT, USA.
CASC -California Academy of Sciences, San Francisco, CA, USA.
CBBC -C. B. Barr, Berkeley, CA, USA.
CDAE -California Department of Food and Agriculture, California State Collection of Arthropods, Sacramento, CA, USA.
CEEF -Escuela Nacional de Ciencias Forestales, Siguatepeque, Honduras.
CMNC -Canadian Museum of Nature, Ottawa, Ontario, Canada.
CNCI -Canadian National Collection, Ottawa, Ontairo, Canada.
CSCC -Chadron State College, Laboratory of Arthropod Diversity, Chadron, NE, USA.
CSUC -Colorado State University, Fort Collins, CO, USA.
CUCC -Clemson University, Clemson, SC, USA.
CUIC -Cornell University, Ithaca, NY, USA.
CUMZ -University of Cambridge Museum of Zoology, Cambridge, United Kingdom.
DAPC -D. A. Pollock, Carnegie Museum of Natural History, Pittsburg, PA, USA.
DEIC -Deutches Entomologisches Institut, Eberswalde Finow, Germany.
DENH -University of New Hampshire, Durham, NH, USA.
DEUN -University of Nebraska State Museum, Lincoln, NE, USA.
DHHC -D. H. Habeck, Gainesville, FL, USA.
DHKC -D. H. Kavanaugh, San Francisco, CA, USA.
EGRC -E. G. Riley, College Station, TX, USA.
EIUC -Eastern Illinois Univeristy, Charleston, IL, USA.
EJFC -E. J. Ford, Woodbury, TN, USA.
EMEC -Essig Museum of Entomology, University of California, Berkeley, CA, USA.
FAMU -Florida A. & M. University, Tallahassee, FL, USA.
FIOC -Fundação Oswaldo Cruz, Rio de Janeiro, Rio de Janeiro, Brazil.
FMNH -Field Museum of Natural History, Chicago, IL, USA.
FSCA -Florida State Collection of Arthropods, Gainesville, FL, USA.
GHNC -G. H. Nelson, Pomona, CA, USA.
HCCA -Hastings College, Hastings, NE, USA.
HNHM -Hungarian Natural History Museum, Budapest, Hungary.
HPSC -H. P. Stockwell, Balboa, Panama.
ICCM -Carnegie Museum of Natural History, Pittsburg, PA, USA.
IMLA -Fundacion Miguel Lillo, Tucuman, Argentina.
INHS -Illinois Natural History Survey, Urbana, IL, USA.
ISMS -Illinois State Museum, Springfield, IL, USA.
ISNB -Institut Royal des Sciences Naturalles de Belgique, Brussels, Belgium.
ISUI -Iowa State University, Ames, IA, USA.
JEWC -J. E. Wappes, Bulverde, TX, USA.
JLCC -J. L. Carr, Calgary, Alberta, Canada.
JMCC -J. M. Cicero, Gainesville, FL, USA.
JVMC -J. V. McHugh, Athens, GA, USA.
JWIC -J. Watts, Houston, TX, USA.
KSUC -Kentucky State University, Frankfort, KY, USA.
LACM -Los Angeles County Museum, Los Angeles, CA, USA.
MACN -Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina.
MAIC -M. A. Ivie, Bozeman, MT, USA.
MCNZ -Museu de Ciencias Naturais, Porto Alegre, Rio Grande do Sul, Brazil.

MCTC -M. C. Thomas, Gainesville, FL, USA.
MCZC -Museum of Comparative Zoology, Cambridge, MA, USA.
MLPA -Universidad Nacional de La Plata, La Plata, Argentina.
MNHN -Museum National d'Histoire Naturelle, Paris, France.
MPEG -Museo Paraense Emílio Goeldi, Belem, Para, Brazil.
MSUC -Michigan State University, East Lansing, MI, USA.
MUIC -Mississippi State University, Mississippi, MS, USA.
NCSU -North Carolina State University, Raleigh, NC, USA.
NHMB -Naturhistorisches Museum, Basel, Switzerland.
NHML -Natural History Museum, London, United Kingdom.
OSUC -Ohio State Univeristy, Columbus, OH, USA.
PESC -P. E. Skelley, Gainesville, FL, USA.
PKLC -P. K. Lago, University, MS, USA.
PPCD -West Virginia Department of Agriculture, Charlestown, WV, USA.
PURC -Purdue University, West Lafayette, IN, USA.
PWKC -P. W. Kovarik, Tallahassee, FL, USA.
QCAZ -Pontifica Universidad Católica de Ecuador, Quito, Ecuador.
RABL -R. A. B. Leschen, Michigan State University, E. Lansing, MI, USA.
RDCC -R. D. Cave, Tegucigalpa, Honduras.
RFMC -R. F. Morris, Lakeland, FL, USA.
RHTC -R. H. Turnbow, Jr., Fort Rucker, AL, USA.
RJBC -R. J. Barney, Frankfort, KY, USA.
RPIC -R. Prange, Gainesville, FL, USA.
RWFC -R. W. Flowers, Tallahassee, FL, USA.
RWLC -R. W. Lundgren, Archer, FL, USA.
SDSU -South Dakota State University, Brookings, SD, USA.
SEMC -Snow Entomological Museum, University of Kansas, Lawrence, KS, USA
SIUC -Southern Illinois University, Carbondale, IL, USA.
SMCC -S. McCleve, Douglas, AZ, USA.
SMFC -S. M. Fullerton, Oviedo, FL, USA.
TAMU -Texas A. & M. University, Tallahassee, FL, USA.
TKPC -T. K. Philips, Columbus, OH, USA.
UADE -University of Arkansas, Fayetteville, AR, USA.
UAIC -University of Arizona, Tucson, AZ, USA.
UASM -University of Alberta, Strickland Museum, Edmonton, Alberta, Canada.
UCDC -Bohart Museum of Entomology, University of California, Davis, CA, USA.
UGCA -University of Georgia, Athens, GA, USA.
ULIC -University of Louisville, Louisville, KY, USA.
UMIC -University of Mississippi, University, MS, USA.
UMMZ -Univerity of Michigan, Ann Arbor, MI, USA.
UMRM -University of Missouri, Columbus, MO, USA.
UNAM -Universidad Nacionál Autonoma de México, México, México.
USNM -United States National Museum, Washington, DC, USA.
UWEM -University of Wisconsin, Madison, WI, USA
VPIC -Virginia Polytechnic Institute and State University, Blackburg, VA, USA.
WDSC -W. D. Shepard, Sacramento, CA.
WIUC -Western Illinois University, Macomb, IL, USA.
WMUC -Western Michigan University, Kalamazoo, MI, USA.
WSIC -W. Suter, Kenosha, WI, USA.
WSUC -Washington State University, Pullman, WA, USA.
ZMHB -Museum für Naturkunde der Humboldt-Universität zu Berlin, Berlin, Germany.
ZSMC -Zoologische Staatssammlung, München, Germany.

APPENDIX C
Specimen Label Data

Specimens and their label data are the basis for any revisionary study. Label data from adult specimens studied for this revision are presented here as a voucher record; to aid in future research or reconfirm these results. Species with less than ten records are listed in the text. Species with ten or more records are listed below. They are presented in tabular form, occasionally abbreviated, to accomodate the voluminous data, and to provide an easily usable format.

The species are arranged in alphabetical order. Under each species, data are organized alphabetically by country and state, then alphabetically by county and specific locality. These data are presented in the following order: state, county, specific locality, day-month-year of collection, collector, elevation, specific data (host or other important information), collection acronym where the specimen is deposited-number of specimens studied. See Appendix B for the full name of the acronym.

Heading abbreviations are as folows: Collr. = collector; Data = additional information; Rep.No. = repository, collection of deposition and number of specimens studied.

State	County	Locality	Date	Collr.	Data	Rep.No.
			***Ischyrus aleator* Boyle**			
El Salvador:						
		San Salvador	22-V-1953	Cartwright O.	at light	USNM-1
Guatemala:						
		San Vicente Pacaya, 8 km.W.	14-V-1966	Campbell J.M.	4500'	CNCI-1
Mexico:						
Chihuahua		Los Chincas, 4.mi.N.	9-10-VII-1989	McCleve S.	4910', UV light	SMCC-4
Chihuahua		Yecora, Sonora, 6 mi.S	2-3-VII-1990	McCleve S.	5740', UV light	SMCC-4
Guerrero		Iguala, 14 km W.	25-VII-1987	Turnbow R.H.		RHTC-1
Guerrero		Iguala, 38 km W.	25-VII-1987	Turnbow R.H.		PESC-1
Jalisco		Tecolotlan, 5.5 mi. NE	13-VII-1982	Andrews F.G.		CDAE-1
Mexico		Tejuplico, Temescaltepec	1932	Hinton H.E.	4000'	NHML-1
Morelos		Cuernavaca, 7 mi. E.	15-VII-1965	Campbell		CNCI-1
Morelos		Zacatepec, 3.2 mi. N.	19-V-1968	McFadden	3100'	CUIC-1
Nayarit		Tepic	6-VII-1982	Andrews F.G.	blacklight	CDAE-1
Sonora		Huicoche, 3.2 mi.NW.	11-13-VII-1989	McCleve S.	5170', UV light	SMCC-2
Sonora		Nacori Chico, 10 mi.NE.	14-VII-1988	Jump P.	UV light	SMCC-1
Sonora		Nacori Chico, 36 km NE	8-VIII-1982	McCleve S.	1848m, at light	SMCC-1
Sonora		Yecora, 4 mi. NE	30-VI-1990	McCleve S.	5400',UV light	SMCC-18
United States of America:						
Arizona	Cochise	Chiricahua Mts., Cave Creek	24-VI-1927	Kusche J.A.	7000', TYPE	CASC-1
Arizona	Cochise	Chiricahua Mts.,S.Fork Cyn.	14-VII-1964	Arnett R.H.,Jr.	blacklight	FSCA-1
Arizona	Cochise	Chiricahua Mts.,StewartCgd.	19-VII-1986	Nelson G.H.	UV light	GHNC-1
Arizona	Cochise	Chiricahua Mts.,Sunny Flats	28-29-VII-1989	Bousquet Y.		CNCI-1
Arizona	Cochise	Portal, 5 mi. W.	31-VII-1987	Morris R.	Hg light	RFMC-2
			***Ischyrus angularis* Lacordaire**			
Colombia:						
					TYPE	MNHN-1
Honduras:						
Atlantida		Lancetilla Bot.Garden, Tela	22-VI-1994	Ashe J.	10m, #181 ex.fogging fungusy log	SEMC-2
Panama:						
Canal Zone		Barro Colorado Island	18-28-IV-1964	Duckworth W.D.	9°10'N, 79°50'W	USNM-1
Canal Zone		Barro Colorado Island	10-17-V-1964	Duckworth W.D.	9°10'N, 79°50'W	USNM-1
Canal Zone		Barro Colorado Island	15-27-V-1972	Erwin T.	9°10'N, 79°50'W, at light	PESC-1
Canal Zone		Barro Colorado Island	10-VII-1973	Erwin T.	9°10'N, 79°50'W	USNM-1
Canal Zone		Barro Colorado Island	15-X-1980	Wolda H.		UCDC-1
Canal Zone		Barro Colorado Island	26-XI-1980	Wolda H.		PESC-1
Chiriqui		Bugaba		Champion	TYPE *I.quinquepunctatus*	NHML-1
Panama		Las Cumbres	26-VI-1975	Wolda H.		OSUC-1
Panama		Llano-Carti Rd., km.9	8-V-1991	Stockwell H.P.	350m	HPSC-1
			***Ischyrus auriculatus* Lacordaire**			
Country ?						
		Sa de Zongolica				ZMHB-1
Argentina:						
		Port Hora		Van Voixem C.		ISNB-1
	Entre Rios			Van Voixem C.		ISNB-5
Bolivia:						
		R.Japacani, e.Bolivia		Steinbach J.		ICCM-1
La Paz		San Lorenzo, 12 km Caranavi	1-2-I-1991	McHugh J.	JVM lot B91-24	JVMC-1

State	County	Locality	Date	Collr.	Data	Rep.No.
Brasil:						
Bahia						NHML-1
Bahia						NHML-1
Ecuador:						
Paramba				Rosenburg		NHML-1
Pichincha		Maquipucuna For.Res.,NW Quito	21-XII-1991	Carlton C.	1300m, at light	SEMC-1
Pichincha		Maquipucuna For.Res., NW Quito	23-XII-1991	Carlton C.	1300m, at light	SEMC-2
Pichincha		Santo Domingo, 8 mi.E.	5-12-V-1990	Smith N.J.	2000'	UCDC-1
French Guiana:						
					TYPE	CUMZ-1
Honduras:						
Atlantida		Lancetilla Botanical Gardens	29-V-1993	Thomas M.C.		PESC-1
Atlantida	Guaimas	Tela	10-V-1923	Hubbell H.		UMMZ-1
Mexico:						
Chiapas		Ocozocuautla, 11.6 mi. N	29-VIII-1967	Ball G.E.	3200', UV light	UASM-1
Chiapas		Palenque Ruins	20-V-1972	Meyer P.A.	300', UV light	UASM-1
Guerrero		Tepatlapa				FMNH-2
Veracruz		Est.Biol.Los Tuxtlas	7-X-1989	Colin J.	Tramp Colgante	UNAM-1
Veracruz		Fortin de las Flores	26-30-VI-1963	Whitehead		PESC-2
Veracruz		Fortin de las Flores	6-VII-1963	Doyen J.		EMEC-1
Veracruz		Fortin de las Flores	7-II-1966	Ball G.E.	2900', bromeliads	CUIC-1
Veracruz		Fortin de las Flores	7-18-VII-1974	Chemsak J.A.	1010m, at light	PESC-1
Veracruz		Fortin de las Flores	10-VII-1974	Chemsak J.A.	lights	EMEC-1
Veracruz		Motzorongo				FMNH-1
Veracruz		Motzorongo				ZMHB-13
Panama:						
			14-VIII-1937	Driver E.		USNM-1
Canal Zone		Barro Colorado Island	10-17-V-1964	Duckworth W.D.		USNM-1
Canal Zone		Barro Colorado Island	15-19-XII-1986	Wolda H.	trap 1A	UCDC-1
Canal Zone		Barro Colorado Island	13-17-IV-1987	Wolda H.	trap 2B	PESC-1
Canal Zone		Fort Gulick, Atlantic Area	18-V-1965			USNM-1
Panama		Altos de Majé	6-15-X-1975	Chandler D.S.	on various fungi	OSUC-2
Panama		Cerro Campana	11-15-V-1980	Riley E.		EGRC-2
Panama		La Chorrera, 3 mi.E.	8-IX-1952			PESC-1
Panama		Trinidad River	3-V-1911	Busck A.		USNM-1
Peru:						
Huanuco		Tingo Maria, 15km.S.	15-VII-1968	O'Brien C.& L.		PESC-1
Huanuco		Tingo Maria, 43 mi.E.	5-X-1954	Schlinger E.I.		FMNH-1
Trinidad:						
		Simla, Arima-Blanchisseuse Rd.	27-VII-1975	Price J.	blacklight	OSUC-1
Venezuela:						
Zulia		El Tucuco	20-23-IV-1981	Townes H.	200m, Malaise trap	CNCI-1

Ischyrus bogotae Crotch

Colombia:						
Cundinamarca			Bogota		TYPE	CUMZ-1
Costa Rica:						
		Tarrazu	29-VIII-1936	Marin E.	rotten trunk *Inga* sp.	USNM-8
Puntarenas		San Vito de Java, 6 km.S.	28-30-IX-1986	Eger J.E.	4200'	FSCA-1
Puntarenas		Monteverde	22-23-V-1974	Giesbert E.		LACM-1
Puntarenas		Monteverde	17-20-V-1985	Chemsak J.A.	blacklight	EMEC-1
Puntarenas		Monteverde	24-V-1985	Gilbert H.J.		CDAE-1
Puntarenas		Monteverde, Pens.Quetza.	18-V-1988	Ratcliffe B.C.	1380m	DEUN-1
Puntarenas		Monteverde, Pension Quetzel	4-VI-1992	Andrews F.G.	blacklight	CDAE-1
San José		San José	14-III-1911	Schmidt H.		ZMHB-1
Ecuador:						
Pichincha		Tinlandia, 12km.E.Sto.Domingo	11-17-V-1986	Eger J.E.	2500'	FSCA-1
Guatemala:						
		Moca, Sucha	25-VI-1947	Johnson F.	3000'	AMNH-3
Escuintla		Zapote		Champion G.C.	B.C.A.,Col.,VII.*Ischyrus*	NHML-4
San Marcos		El Tumbador	9-VIII-1911	Riedel S.G.		ZMHB-1
Honduras:						
		Lake Yojoa	7-VII-1978	Mankins J.V.		CEEF-1
Mexico:						
Chiapas		Union Juarez, 5.3 mi. S.	3-VIII-1972	Hemins B.S.	3000', UV light	UASM-1
Durango		Canelas				ZMHB-3
Hidalgo		Chapulhuacan, 3 mi.N on Hwy 85	25-29-V-1984	Thomas D.		DEUN-1
Nayarit		El Cora Tepic		Lûdecke A.		ZMHB-1
Veracruz		Cordoba	22-X-1963	Lau A.B.		PESC-3
Veracruz		Cordoba	3-VII-1964	Lau A.B.		USNM-1
Veracruz		Est.Biol.Los Tuxtlas	13-20-XI-1988	Mcjorada E.		UNAM-2
Veracruz		Est.Biol.Los Tuxtlas	22-30-XI-1988	Mcjorada E.		UNAM-1
Veracruz		Est.Biol.Los Tuxtlas	3-15-XII-1988	Mcjorada E.		UNAM-1
Veracruz		Est.Biol.Los Tuxtlas	9-IX-1989	Colin J.L.		UNAM-1
Veracruz		Est.Biol.Los Tuxtlas	14-17-VI-1989	Colin J.L.		PESC-1
Veracruz		Est.Biol.Los Tuxtlas	7-X-1989	Colin J.L.	Tramp Colgante	UNAM-2
Veracruz		Est.Biol.Los Tuxtlas	17-18-VI-1989	Colin J.L.		UNAM-2
Veracruz		Fortin de las Flores, Sumidero	22-23-V-1965	Weems H.V.	2500-3000', blacklight	FSCA-1
Veracruz		Los Tuxtlas	1-XI-1989	Zargoza S.		UNAM-1
Veracruz		Rio Metlac nr. El Fortin	15-XII-1948	Leech H.B.	pool in banana grove	CASC-1
Veracruz		San Andres Tuxtla	12-VII-1989	Colin J.		UNAM-1

State	County	Locality	Date	Collr.	Data	Rep.No.
Panama:						
Chiriqui		Boquete, 8°48'N 82°26'W	2-X-1976	Wolda H.		HPSC-1
Chiriqui		Sta.Clara, 2 km N.	24-25-V-1977	Howden H.& A.	1300m	CNCI-1

Ischyrus boucardi Crotch

Argentina:						
Misiones		San Ignacio		Bade B.& W.		MACN-1
Misiones	Concep.	Sta. Maria	X-1945	Vissa M.J.		MLPA-1
Brasil:						
		Jatchy				ZMHB-4
Santa Catarina					TYPE	CUMZ-1
Santa Catarina		Corupa (Hansa Humbolt)	XI-1948	Maller A.		AMNH-1
Colombia:						
Amazonas		Leticia	28-V-1979	Tidwel A.	insect flight trap	PESC-1
Panama:						
Canal Zone		Barro Colorado Island	16-17-V-1964	Duckworth W.D.		USNM-1
Peru:						
		Rio Toro				ZMHB-2
Junin		Chanchamayo [La Merced]			TYPE *I.peruvianus*	NHML-1
Junin		Chanchamayo [La Merced]		Schneider F.		ZMHB-1
Junin		Chanchamayo [La Merced]		Thamm		NHML-3
Loreto		R.Napo & R.Sucusari,NE.Iquitos	27-VIII-1992	Skelley P.E.	beating branchs at night	PESC-5
Madre de Dios		Puerto Maldonado, 30 km.SW.	4-19-XI-1984	Kavanaugh D.	12°50'S, 60°20'W	DHKC-1
Venezuela:						
Barinas		Altamira de Caceras, 5 km.E	30-XII-1985	Kovarik P.W.		TAMU-1

Ischyrus collatinus Crotch

Country ?						
[no data: NHML-1]						
Colombia:						
[no further data: ISNB-1, ZMHB-1]						
					TYPE	CUMZ-1
Cauca						ZMHB-1
Choco		Camp. Sautat, Puerto Libre	1968		Malaise trap	OSUC-1
Costa Rica:						
Cartago		Turrialba	12-I-1973	Kirk V.M.		PESC-1
Guatemala:						
						NHML-1
Nicaragua:						
Chontales					B.C.A.,Col.,VII.	NHML-2
Panama:						
		Tocuman	25-X-1952			USNM-1
Canal Zone		Barro Colorado Island	25-IV-1978	Wolda H.		HPSC-1
Canal Zone		Barro Colorado Island	29-V-1978	Wolda H.		HPSC-1
Canal Zone		Barro Colorado Island	28-XI-1984	Wolda H.	blacklight	UCDC-1
Canal Zone		Cano Saddle, Gatun Lake	12-V-1923	Shannon R.C.		USNM-2
Canal Zone		Gatun Tank Farm	XI-1978	Harlan H.J.	blacklight	PESC-2
Panama		Las Cumbres	6-V-1974	Wolda H.		OSUC-1

Ischyrus cordiformis Skelley, n.sp.

Brasil:						
Pará		Serra Norte, Est.do Faloca [?]	9-IX-1983	Ramon F.F.		MPEG-1
Colombia:						
Meta		Villavicencio	14-VII-1938	Dybas H.S.	allotype	FMNH-2
Costa Rica:						
Cartago		Turrialba	13-17-III-1965	Duckworth W.	light at field station	USNM-1
Ecuador:						
Pichincha		St.Domingo, 16 km.E.	19-21-XII-1987	Valentine B.D.	685m	PESC-1
Panama:						
Canal Zone		Barro Colorado Island	1-VII-1938	Williams E.C.Jr.		PESC-1
Canal Zone		Barro Colorado Island	10-17-V-1980	Wolda H.		UCDC-1
Canal Zone		Barro Colorado Island	14-V-1980	Wolda H.		PESC-1
Canal Zone		Barro Colorado Island	11-VIII-1980	Wolda H.		PESC-1
Canal Zone		Barro Colorado Island	13-VIII-1980	Wolda H.		UCDC-1
Canal Zone		Barro Colorado Island	1-4-XII-1984	Wolda H.		UCDC-1
Canal Zone		Barro Colorado Island	15-27-V-1972	Erwin T.	9°10'N, 79°50'W	USNM-1
Canal Zone		Cardenas Village	17-18-V-1980	Riley E.G.		EGRC-1
Canal Zone		Fort Howard	24-X-1973	Gerberg E.J.		FSCA-1
Panama		Las Cumbres	16-V-1975	Wolda H.	blacklight	OSUC-1
Panama		Las Cumbres	7-V-1975	Wolda H.		OSUC-1
Panama		Las Cumbres	20-21-X-1982	Wolda H.		UCDC-1
Trinidad:						
		Simla, Arima-Blanchisseuse Rd.	22-VII-1975	Price J.	blacklight trap	FSCA-1
Venezuela:						
Carabobo		San Esteban, nr. Puerto Cabello	30-XI-1939	Anduze P.J.	holotype	FMNH-1

State	County	Locality	Date	Collr.	Data	Rep.No.
			***Ischyrus distinguendus* Lacordaire**			
Country ?						
					Coll. Chevr	CUMZ-1
Honduras:						
		Copan, Vera Paz		Condradt	*Mycotretus ornatus* var.	NHML-1
Atlantida		Lancetilla Bot.Garden, Tela	22-VI-1994	Ashe J.	#181 ex fogging fungusy log	SEMC-4
Mexico:						
						ZMHB-1
					TYPE	MNHN-1
Veracruz		Cordoba		Fenyes A.		CASC-2
Veracruz		Cordoba	8-VII-1961	Janzen D.H.		EMEC-1
Veracruz		Cordoba	12-22-VI-1965	Lau A.B.		PESC-1
Veracruz		Cordoba	4-VIII-1965	Lau A.B.		USNM-3
Veracruz		Cordoba	27-IX-1966	Lau A.B.		UCDC-1
Veracruz		Cordoba	29-VI-1966	Buckett J.S.		EMEC-1
Veracruz		Cordoba	20-VII-1966	Buckett J.S.		PESC-1
Veracruz		Fortin de las Flores	30-VII-1964	Rabago D.	blacklight	PESC-1
Veracruz		Fortin de las Flores	28-VI-1975	Wheeler Q.D.		CUIC-1
Veracruz		Huatusco	19-X-1964	Lau A.B.		USNM-1
Veracruz		Orizaba				ZMHB-1
Veracruz		Toxpam			B.C.A., sp. figured.	NHML-1
			***Ischyrus dunedinensis* Blatchley**			
United States of America:						
Florida	Alachua		V-1968	Hetrick L.A.		MCZC-1
Florida	Broward	Ft.Lauderdale, Tamarac City	20-VII-1971	Ford E.J.	light trap	EJFC-2
Florida	Flagler	Palm Coast	30-V-1993	Skelley P.E.	blacklight in beach scrub	PESC-17
Florida	Flagler	Washington Oaks Gdns.St.Pk.,nr.	13-VI-1993	Skelley L.H.	light on beach	PESC-1
Florida	Highlands	Archbold Biol.Sta.,Lake Placid	27-IV-1981	Lampert L.L.	UV light	FSCA-2
Florida	Highlands	Archbold Biol.Sta., Lake Placid	10-IX-1981	Lampert L.L.	UV light	FSCA-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	25-V-1982	Brattain R.M.		ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	22-IX-1983	Deyrup M.		ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	21-VI-1983	Deyrup M.	Malaise T-2	PESC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	24-VI-1983	Deyrup M.	Malaise trap	ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	11-VII-1983	Deyrup M.	Malaise trap	ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	24-VII-1983	Deyrup M.	Malaise trap	ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	31-VII-1983	Deyrup M.	Malaise trap	ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	12-VIII-1983	Deyrup M.	Malaise trap	ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	25-V-1984	Deyrup M.	T-1	UCDC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	28-V-1984	Deyrup M.	T-1	UCDC-2
Florida	Highlands	Archbold Biol.Sta., Lake Placid	18-VI-1984	Deyrup M.	T-1	UCDC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	11-VII-1984	Deyrup M.	T-2	UCDC-2
Florida	Highlands	Archbold Biol.Sta., Lake Placid	11-12-VI-1985	Deyrup M.	Malaise T-1	PESC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	12-VI-1985	Deyrup M.	Malaise trap	ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	19-VI-1985	Deyrup M.	Malaise trap	ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	25-26-VI-1985	Deyrup M.	Malaise T-1	PESC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	15-VII-1985	Deyrup M.	Malaise trap	ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	16-17-VII-1985	Deyrup M.	Malaise T-2	PESC-2
Florida	Highlands	Archbold Biol.Sta., Lake Placid	10-11-VI-1986	Deyrup M.	insect flight trap	FSCA-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	17-18-VI-1986	Deyrup M.	insect flight trap	FSCA-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	21-23-VI-1986	Deyrup M.	insect flight trap	FSCA-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	5-IX-1987	Deyrup M.	Malaise trap	ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	15-VI-1987	Deyrup M.	Malaise trap	ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	22-VI-1987	Deyrup M.	Malaise trap	ABSC-2
Florida	Highlands	Archbold Biol.Sta., Lake Placid	26-VI-1987	Deyrup M.	Malaise trap	ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	1-VII-1987	Deyrup M.	Malaise trap	ABSC-3
Florida	Highlands	Archbold Biol.Sta., Lake Placid	17-VII-1987	Deyrup M.	Malaise trap	ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	3-VII-1987	Deyrup M.	Malaise trap	ABSC-3
Florida	Highlands	Archbold Biol.Sta., Lake Placid	6-VII-1987	Deyrup M.	window trap burned area	ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	8-VIII-1987	Deyrup M.	Malaise trap	ABSC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	12-16-VI-1988	Deyrup M.		PESC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	30-VI-1988	Skelley P.E.	blacklight	PESC-1
Florida	Highlands	Archbold Biol.Sta., Lake Placid	7-VII-1988	Skelley P.E.	blacklight	PESC-2
Florida	Hillsborough		7-VI-1968	Woods & Davidson		USNM-1
Florida	Hillsborough	Temple Terrace	7-VI-1968	Wood F.E.		USNM-1
Florida	Indian River	SR-512 0.5mi.W I-95	V-VII-1975	Thomas M.C.	dusk-dawn suction trap	FSCA-1
Florida	Indian River	SR-512 0.5mi.W I-95	5-VI-1975	Thomas M.C.	dusk-dawn suction trap	FSCA-1
Florida	Indian River	SR-512 0.5mi.W I-95	10-16-VII-1975	Thomas M.C.	dusk-dawn suction trap	FSCA-1
Florida	Indian River	SR-512 0.5mi.W I-95	4-7-VII-1975	Thomas M.C.	dusk-dawn suction trap	FSCA-1
Florida	Indian River	SR-512 0.5mi.W I-95	16-20-V-1976	Thomas M.C.	dusk-dawn suction trap	FSCA-1
Florida	Marian	Ocala Natl.For.,W.Grassy Pond	3-VI-1994	Woodruff R.E.	mercury vapor light	FSCA-1
Florida	Marion	Ocala Natl.For.	8-11-V-1979	Weems H.V.	insect flight trap	FSCA-1
Florida	Marion	Ocala N.F., T17S.R26E.Sec.22	25-VII-1938	Hubbell & Friaf	at light	GHNC-1
Florida	Orange	Oviedo, Univ.Central Fl.campus	30-V-1991	Fullerton S.M.	Malaise, scrub	SMFC-1
Florida	Orange	Oviedo, Univ.Central Fl.campus	23-VI-1991	Fullerton S.M.	Malaise, scrub	SMFC-1
Florida	Orange	Oviedo, Univ.Central Fl.campus	2-X-1991	Fullerton S.M.	Malaise, scrub	SMFC-1
Florida	Orange	Oviedo, Univ.Central Fl.campus	15-IX-1992	Fullerton S.M.	Malaise, scrub	SMFC-1
Florida	Orange	Oviedo, Univ.Central Fl.campus	21-IX-1992	Fullerton S.M.	Malaise, scrub	SMFC-1
Florida	Orange	Oviedo, Univ.Central Fl.campus	23-VIII-1992	Fullerton S.M.	Malaise, scrub	SMFC-1
Florida	Pinellas	Dunedin	2-V-1916	Blatchley W.S.	TYPE	PURC-1
Florida	Volusia	Daytona	1951	Rosenberg W.		USNM-1
Florida	Volusia	New Smyrna	23-VII	Wright M.	(det. Knull 1954)	OSUC-1
Florida	Walton	Eglin AFB, Hwy.331 & Rg.Rd.205	7-VI-1995	Skelley P.E.	under 2"oak limb on ground	PESC-1
Georgia	Charlton	Camp Cornelia	13-14-VI-1981	Smith C.L.	at light	UGCA-1

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Ischyrus elegantulus Lacordaire

Colombia:

[no further data: ISNB-1]					
				TYPE	MNHN-1
	Amaya Cispata Bay	19-V-1916	Martin B.		FMNH-1
Mexico:					
Yucatan	Chichen Itza, 2 km.E.	26-V-1981	Bellamy C.L.		CASC-1
Panama:					
Canal Zone		26-III-1940	Wood G.C.		PESC-1
Canal Zone	Barro Colorado Island	IV-X-1947	Zetek	Berlese funnel	USNM-1
Canal Zone	Barro Colorado Island	20-23-V-1964	Duckworth W.D.		PESC-1
Canal Zone	Barro Colorado Island	17-V-1978	Wolda H.		HPSC-1
Canal Zone	Barro Colorado Island	23-IV-1980	Wolda H.		PESC-1
Canal Zone	Barro Colorado Island	28-V-1980	Wolda H.		UCDC-1
Canal Zone	Barro Colorado Island	16-VI-1980	Wolda H.		UCDC-1
Canal Zone	Barro Colorado Island	28-11-1986	Wolda H.	window pans, forest; GPO 43	CNCI-1
Canal Zone	Carazal	27-IV-1911	Busck A.		USNM-1
Canal Zone	Cardenas Village	10-V-1980	Riley E.G.		EGRC-1
Canal Zone	Fort Gulick	19-III-1979	Harlan H.J.		OSUC-1
Canal Zone	Fort Gulick	II-1980	Harlan H.J.		OSUC-1
Canal Zone	Madden Dam	21-V-1978	O'Brien C.& L.		FAMU-1
Canal Zone	Paraiso	9-V-1911	Schwarz E.A.		USNM-1
Canal Zone	Pipeline Rd.	12-V-1978	O'Brien C.& L.		FAMU-1
Colon	Fort Espinar	14-V-1991	Turnbow R.H.	at light	RHTC-1
Colon	Santa Rita Ridge	29-V-1980	Riley E.G.		EGRC-1
Panama	Chepo, Altos de Maje	17-V-1975	Stockwell H.P.	at lights	HPSC-1
Panama	Las Cumbres	14-V-1979	Wolda J.	at light	PESC-1

Ischyrus ephippiatus Gorham

Bolivia:

			Steinback J.	450m	ICCM-1
Panama:					
Canal Zone	Arraijan, N.of on C-5	19-VII-1970	Clark W.E.		PESC-1
Canal Zone	Barro Colorado Island	2-4-VI-1986	Wolda H.	trap 1B	UCDC-1
Canal Zone	Gamboa	24-V-1944	Frick K.E.		FMNH-1
Canal Zone	Paraiso	19-I-1911	Busck A.		USNM-1
Chiriqui	Bugaba		Champion	TYPE	NHML-1
Colon	Santa Rita Ridge, base	21-V-1991	Turnbow R.H.		RHTC-1
Panama	La Chorrera	14-V-1912	Busck A.		USNM-1
Panama	La Chorrera	15-V-1912	Busck A.		USNM-1
Panama	Las Cumbres	8-V-1975	Wolda H.		OSUC-1
Panama	Parq. Nac. Soberania,	23-V-1993	Riley E.G.		EGRC-1
Panama	Parque Nacional Soberania	21-V-1991	Turnbow R.H.		RHTC-3

Ischyrus frontalis Lacordaire

Belize:

	Punta Gorda	V-1934	White J.J.		AMNH-1
Colombia:					
				TYPE *I.agnatus*	CUMZ-1
Costa Rica:					
Guanacaste	Sta.Rosa N.P., HQ area	17-VI-1988	Brown	280m, blacklight	EMEC-1
Heredia	La Selva Biol. Sta.	10-12-VI-1986	Ratcliffe B.C.		DEUN-2
Mexico:					
				TYPE	CUMZ-1
Guerrero	Gto.	4-III-1946		ex orchids, #46-2873	USNM-1
Oaxaca	Matias Romero, 10 mi.N.	3-VII-1975	Wheeler Q.D.		CUIC-1
Oaxaca	Sola de Vega, 27.3 mi.SW	18-VII-1986	McCleve S.	3360', UV light	SMCC-2
Oaxaca	Zopolite, 1.5 mi.E,	5-VII-1987	Warner W.B.	UV light	MAIC-1
San Luis Potasí	El Naranjo, 6.9 mi.W on Rte.80	14-X-1985	Ball G.E.		PESC-1
San Luis Potasí	Tamazunchala	10-VIII-1946		ex orchids, #46-14323	USNM-1
San Luis Potasí	Tamazunchala	8-VIII-1946		ex orchids, #46-12972	USNM-1
Panama:					
Canal Zone	Albrook Field, Tank Hill	29-IV-1977	Riley E.G.		EGRC-1
Chiriqui	La Caldera		Champion	1200',B.C.A.,Col.,VII	NHML-1

Ischyrus fulmineus Delkeskamp

Country ?

	S.Jerônimo, RS	8-X-1982	Arignot T.	Col.MCN.599964	MCNZ-1
	S.Jerônimo, RS	2-XI-1982	Becker C.J.	Col.McN.60513	MCNZ-1
Bolivia:					
	R.Japacani, e.Bolivia				ICCM-1
	Sarampiuni, San Carlos	6-IX-1950	Forster W.	1000m, TYPE	ZSMC-1
Santa Cruz	Buena Vista	18-25-X-1992	Giesbert E.		FSCA-1
Santa Cruz	Villa Tunari, 1 km.E.	18-25-X-1992	Giesbert E.		PESC-1
Brasil:					
Mato Grosso	12°49'S, 51°45'W	22-XI-1968	Knight W.J.	gallery forest	NHML-1
Mato Grosso	12°50'S, 51°47'W	5-X-1968	Richards O.W.		NHML-1
Para	Santarem	VI-1919	Klages S.M.		ICCM-1

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Panama:						
Canal Zone		Fort Gulick, Qtrs.40.A	1-9-XII-1979	Harlan H.J.	at lights	OSUC-1

Ischyrus impressus Skelley, n.sp.

Bolivia:						
Sara		Prov. del Sara [?]		Steinbach J.	450m	ICCM-1
Brasil:						
		Chapada	VIII			ICCM-1
Alagoas		Sao Miguel dos Campos	IV-1984	Oliveira F.M.		ICCM-1
Rio de Janeiro		Rio de Janeiro	I-1947	Wygodzinsky		USNM-1
Rondônia		Ariquemes, 62 km.SW	1-X-1994	Schmitz U.	blacklight	PESC-1
Costa Rica:						
Alajuela		Penas Blancas	9-V-1987	Cruz E.		CMNC-1
Alajuela		Upala, 20 km.S.	21-30-IV-1991	Parker F.D.		PESC-1
Alajuela		Upala, 20 km.S.	22-30-VI-1991	Parker F.D.		AAIC-1
Alajuela		Upala, 20 km.S.	11-20-VII-1991	Parker F.D.		AAIC-1
Cartago		Turrialba, CATIE	19-V-1979	Howden H.& A.	600m, at night	CNCI-1
Guanacaste		La Pacifica, 4 km.NW Canas	21-V-1971	Opler P.A.		EMEC-2
Heredia		Puerto Viejo, 3.2 km.SE.	30-I-1992	Bell W.	100m	SEMC-1
Puntarenas		Las Alturas Biol.Sta., Coton	27-V-1992	McHugh J.V.	at blacklight	JVMC-1
Puntarenas		Monteverde	1-3-VI-1984	Riley E.G.		EGRC-1
El Salvador:						
		San Salvador	1-5-V-1958	Cartwright O.	at light	USNM-1
Guatemala:						
		Olimpo, Cuyotenango Such.	10-IV-1965	Campbell J.M.	1700'	CNCI-1
Escuintla			8-9-VIII	Knab F.		USNM-1
Honduras:						
Fransisco Morazon		Cero Uyuca	24-V-1993	Turnbow R.H.	4500', MV & blacklight	RHTC-1
Santa Barbara		La Fe	10-X-1993	Turnbow R.		RHTC-1
Panama:						
Bocas del Toro		Almirante	30-III-1959	Dybas H.S.		FMNH-1
Canal Zone		Barro Colorado Island	28-VII-1938	Williamson E.		FMNH-1
Canal Zone		Barro Colorado Island	III-IV-1949	Zetek		USNM-1
Canal Zone		Barro Colorado Island	19-I-1959	Dybas H.S.	allotype	FMNH-1
Canal Zone		Barro Colorado Island	26-I-1959	Dybas H.S.	holotype	FMNH-1
Canal Zone		Barro Colorado Island	10-17-V-1964	Duckworth W.&S.		USNM-1
Canal Zone		Barro Colorado Island	1-5-II-1986	Wolda H.	trap 2A	UCDC-1
Canal Zone		Barro Colorado Island	18-23-IV-1986	Wolda H.	trap 3B	UCDC-1
Canal Zone		Barro Colorado Island	23-30-IV-1986	Wolda H.	trap 2A	UCDC-1
Canal Zone		Barro Colorado Island	25-30-IV-1986	Wolda H.	trap 3A	UCDC-1
Canal Zone		Barro Colorado Island	25-30-IV-1986	Wolda H.	trap 1B	PESC-3
Canal Zone		Barro Colorado Island	4-9-IV-1986	Wolda H.	trap 1B	UCDC-1
Canal Zone		Barro Colorado Island	20-25-VI-1986	Wolda H.	trap 1B	UCDC-1
Canal Zone		Barro Colorado Island	20-25-VI-1986	Wolda H.	trap 4A	UCDC-1
Canal Zone		Barro Colorado Island	14-18-VII-1986	Wolda H.	trap 3A	UCDC-1
Canal Zone		Barro Colorado Island	21-25-VII-1986	Wolda H.	trap 3B	UCDC-1
Canal Zone		Barro Colorado Island	27-29-IV-1987	Wolda H.	trap 3A	PESC-1
Canal Zone		Barro Colorado Island	6-10-IV-1987	Wolda H.	trap 3B	UCDC-1
Canal Zone		Barro Colorado Island	2-4-IX-1987	Wolda H.	trap 1A	UCDC-1
Canal Zone		Barro Colorado Island	28-VI-1973	Erwin T.	9°10'N, 79°50'W	USNM-1
Canal Zone		Frijoles	28-IV-1981	Gill B.		CNCI-1
Canal Zone		Madden Forest, 9°5'N 79°37'W	1-V-1976	Stockwell H.P.		HPSC-1
Panama		Trinidad River	VII-1911	Busck A.		USNM-1
Paraguay:						
		Pastorea	3-I-1972			PESC-1

Ischyrus incertus Lacordaire

Belize:						
		Rio Grande				ICCM-2
Brasil:						
Para		Santarem	II			ICCM-2
Para		Santarem	XII			ICCM-2
Colombia:						
					LECTOTYPE I.gratiosus	MNHN-1
		Amaya Cispata Bay	28-VI-1916	Martin B.		CASC-1
Amazonas		Leticia	9-13-V-1070	Malkin B.		FMNH-1
Amazonas		Leticia	19-25-II-1972	Howden H.& A.	700'	CMNC-1
Costa Rica:						
Alajuela		Atenas, 8 rd.km.W.	12-V-1985	Doyen J.T.	1000m	EMEC-1
Guanacaste		Hac.La Pacifica, 3 km.N.Canas	9-11-VIII-1987	Howden H.& A.	90m	CMNC-1
French Guiana:						
					Coll.Reiche	CUMZ-1
Guatemala:						
Alta Verapaz		Cacao, Trece Aguas	22-IV	Barber & Schwarz		USNM-1
Zacapa		La Palmilla, 6 km.W.Teculatán	5-VI-1991	Howden H.& A.		PESC-1
Honduras:						
Lempira		Mt.Celaque, 14°33'N 88°38'W	17-VI-1994	Ashe J.	1250m, #136 fungusy log	SEMC-1
Mexico:						
Campache		Campache Tenabo, km.37,Hwy.24	30-VII-1990	O'Brien C.& L.		PESC-1
Chiapas		El Aguacero Par.	22-VI-1990	Huether J.		JEWC-1

State	County	Locality	Date	Collr.	Data	Rep.No.
Chiapas		Fontera Comalapa, 4.9 mi.N.	17-VI-1966	Ball G.E.	blacklight	CUIC-1
Chiapas		Mirador Manos, Imploran	30-V-1987	Warner W.B.	at light	PESC-1
Tabasco		Teapa, 2 mi.N, Hwy.95	12-VI-1982	Streit B.D.	at light	PESC-1
Nicaragua:						
Rivas		Shimek, Ometepe	1933	Wickham		USNM-1
Panama:						
		Tocuman	4-II-1953	Blanton F.S.		USNM-1
Canal Zone		Barro Colorado Island	18-I-1959	Dybas H.S.	at light	FMNH-1
Canal Zone		Barro Colorado Island	30-I-1959	Dybas H.S.	at light	FMNH-1
Canal Zone		Barro Colorado Island	10-17-V-1964	Duckworth W.D.		USNM-2
Canal Zone		Barro Colorado Island	20-IV-1978	Wolda H.		HPSC-1
Canal Zone		Barro Colorado Island	14-V-1980	Wolda H.		UCDC-1
Canal Zone		Barro Colorado Island	18-V-1980	Wolda H.		PESC-1
Canal Zone		Barro Colorado Island	9-VII-1980	Wolda H.		UCDC-1
Canal Zone		Barro Colorado Island	28-31-II-1986	Wolda H.	trap 1B	UCDC-1
Canal Zone		Barro Colorado Island	9-21-V-1986	Wolda H.	trap 2A	UCDC-1
Canal Zone		Barro Colorado Island	31-V-1987	Wolda H.	GPO 2A, window pans	CNCI-1
Canal Zone		Barro Colorado Island	IV-1924	Bradley J.C.		CUIC-1
Canal Zone		Fort Gulick, Qtrs.40.A	6-11-V-1981	Harlan H.J.	blacklight	FMNH-1
Canal Zone		Fort Kobbe	24-VI-1976	Riley E.G.		EGRC-1
Canal Zone		Fort Kobbe	19-V-1980	Riley E.G.		EGRC-1
Canal Zone		Frijoles	15-V-1981	Gill B.		CNCI-1
Canal Zone		Margarita, 4 km.NE	20-IV-1971	Stockwell H.P.	light trap	HPSC-1
Chiriqui		Puerto Armuelles	26-I-1983	Rodriguez R.	blacklight	PESC-1
Panama		Altos de Maje, 9°8'N 78°49'W	15-V-1976	Stockwell H.P.		HPSC-1
Panama		Chepo, Altos de Maje	12-XII-1979	Joplin K.	75m, at light	PESC-1
Panama		Las Cumbres	6-V-1974	Wolda H.		OSUC-1
Panama		Las Cumbres	13-I-1975	Wolda H.		OSUC-1
Panama		Las Cumbres	12-IV-1975	Wolda H.	UV light	OSUC-1
Panama		Las Cumbres	26-VI-1975	Wolda H.		OSUC-1
Panama		Las Cumbres	5-VI-1975	Wolda H.	UV light	OSUC-1
Panama		Porto Bello	25-II-1911	Schwarz		USNM-1
Tobago:						
			13-15-VII-1962			USNM-1
Trinidad:						
		Mt. Curepe	22-25-XI-1977	Mason W.R.M.		CNCI-1
		Simla, 5 mi.N.Arima	20-VIII-1969	Howden H.& A.		CMNC-1
Venezuela;						
Bolivar		Ciudad Bolivar	29-V-1898	Klages E.A.		CUIC-1
Zulia		El Tucuco	20-23-IV-1981	Townes H.	200m, Malaise trap	CNCI-1

Ischyrus mimus Skelley, n.sp.

Bolivia:						
		R.Japacani, e.Bolivia		Steinbach J.		ICCM-1
Colombia:						
		Rio Frio	II-1924	Mann W.M.	holotype & allotype	USNM-3
Ecuador:						
Napo		Huahua Sumaco	17-XII-1989	Washbauer M.S.	Malaise trap	CDAE-1
Guyana:						
		Upper Courantyne R.	IX-1935	Hudson G.A.		NHML-1
Panama:						
Canal Zone		Barro Colorado Island	1-9-V-1964	Duckworth W.& S.		USNM-1
Canal Zone		Barro Colorado Island	26-30-IV-1986	Wolda H.	trap 4B	UCDC-1
Canal Zone		Barro Colorado Island	21-25-VII-1986	Wolda H.	trap 1B	PESC-1
Canal Zone		Barro Colorado Island	12-17-IV-1987	Wolda H.	trap 3A	UCDC-1
Canal Zone		Fort Clayton	V-1961	Yunker C.E.		CNCI-1
Canal Zone		Fort Kobbe	14-VI-1976	Riley E.G.		EGRC-1
Panama		Chepo, Altos de Maje	17-V-1975	Stockwell H.P.	at light	HPSC-1
Peru:						
Loreto		R.Maranon & R.Ucayali	6-20-VIII-1994	Skelley P.E.	prostrate white fungus at night	PESC-1
Trinidad:						
		Simla, 5 mi.N.Arima	18-VIII-1968	Howden H.& A.		CMNC-1
		Simla, Arima-Blanchisseuse Rd.	22-VII-1975	Price J.	blacklight	FSCA-1

Ischyrus mystacis Skelley, n.sp.

Country ?						
		Venejala El Limon Plaqua	VI-1978			AAIC-1
Brasil:						
Mato Grosso		R.Tapirape & R.Araguaia	20-30-XII-1960	Malkin B.	night sweeping along forest trail	FMNH-1
Rondônia		Ariquemes, 62 km.SW	15-X-1993	O'Brien C.W.	mercury vapor & UV light	PESC-1
Rondônia		Ariquemes, 62 km.SW	8-20-XI-1994	Eger J.E.		PESC-1
Panama:						
Canal Zone		Barro Colorado Island	26-IV-1967	Akre R.D.	Malaise trap	WSUC-1
Canal Zone		Barro Colorado Island	20-V-1978	Wolda H.		HPSC-1
Canal Zone		Barro Colorado Island	20-VI-1981	Kimsey R.B.		PESC-1
Canal Zone		Barro Colorado Island	7-10-III-1986	Wolda H.	trap 2B	UCDC-1
Canal Zone		Barro Colorado Island	1-2-IV-1986	Wolda H.	trap 2A	UCDC-1
Canal Zone		Barro Colorado Island	1-2-IV-1986	Wolda H.	trap 3A	UCDC-1
Canal Zone		Barro Colorado Island	11-16-IV-1986	Wolda H.	trap 4B	PESC-1

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Canal Zone		Barro Colorado Island	16-21-V-1986	Wolda H.	trap 4A	PESC-1
Canal Zone		Barro Colorado Island	2-7-V-1986	Wolda H.	trap 3B	UCDC-1
Canal Zone		Barro Colorado Island	13-18-VI-1986	Wolda H.	trap 2B	UCDC-1
Canal Zone		Barro Colorado Island	20-25-VI-1986	Wolda H.	trap 3B	UCDC-1
Canal Zone		Barro Colorado Island	21-23-VII-1986	Wolda H.	trap 2A	UCDC-1
Canal Zone		Barro Colorado Island	11-VIII-1986	Wolda H.		UCDC-1
Canal Zone		Barro Colorado Island	12-17-IV-1987	Wolda H.	trap 3A	UCDC-1
Canal Zone		Barro Colorado Island	27-29-IV-1987	Wolda H.	trap 2A	UCDC-1
Canal Zone		Barro Colorado Island	18-22-V-1987	Wolda H.	trap 4B	PESC-1
Canal Zone		Barro Colorado Island	8-12-VI-1987	Wolda H.	trap 1B	UCDC-2
Canal Zone		Barro Colorado Island	15-27-V-1972	Erwin T.& L.	light at field station	USNM-1
Canal Zone		Barro Colorado Island	6-VI-1972	Pine R.	light at field station	USNM-1
Canal Zone		Barro Colorado Island	27-VI-1973	Erwin T.		USNM-1
Canal Zone		Barro Colorado Island	2-VII-1973	Erwin T.& L.		USNM-1
Canal Zone		Barro Colorado Island	20-V-1981	Gill B.		CNCI-1
Canal Zone		Coco Solo Hospital	1-2-VII-1974	O'Brien C.& L.	holotype & allotype	FSCA-2
Canal Zone		Fort Gulick	19-III-1979	Harlan H.J.	at light	OSUC-1
Canal Zone		Pantera Island	29-IV-1981	Kimsey R.B.		PESC-1
Colon		Colon	16-V-1991	Turnbow R.H.	MV & blacklight	RHTC-1
Colon		Porto Bello	17-II-1911	Schwarz E.A.		USNM-1
Darien		Santa Fe	IV-V-1967	Delong & Triple.		OSUC-1
Panama		Altos de Maje (Isle)	28-30-V-1982	Ratcliffe B.C.	9°8'N, 78°49'W	DEUN-1
Panama		Cerro Campana	11-15-V-1980	Riley E.G.		EGRC-1
Peru:						
Loreto		Campamento San Jacinto	12-VII-1993	Leschen R.A.B.	175-215m, *Hypoxylon* sp., #91 ,2°18.75'S 75°51.77'W	SEMC-1
Trinidad:						
		Tunapuna	1-3-VIII-1969	Howden H.& A.		CMNC-1
St.Georges		Curepe	28-30-XI-1977	Mason W.R.M.		CNCI-1
Venezuela:						
		Santa Lucio	V-1922	Reynolds L.R.		FMNH-1

Ischyrus parallelus Skelley, n.sp.

Brasil:						
Rondônia		Ariquemes, 62 km.SW	27-IV-1992	Schmitz U.	blacklight trap	PESC-1
Rondônia		Ariquemes, 62 km.SW	18-IX-1992	Schmitz U.	blacklight trap	PESC-2
Rondônia		Ariquemes, 62 km.SW	20-IX-1992	Schmitz U.	blacklight trap	PESC-1
Rondônia		Ariquemes, 62 km.SW	22-XI-1992	Schmitz U.	blacklight trap	PESC-2
Rondônia		Ariquemes, 62 km.SW	25-X-1993	Schmitz U.	blacklight trap	PESC-5
Rondônia		Ariquemes, 62 km.SW	5-17-X-1993	Eger J.E.		PESC-3
Rondônia		Ariquemes, 62 km.SW	25-XI-1993	Schmitz U.	blacklight trap	PESC-2
Rondônia		Ariquemes, 62 km.SW	20-22-V-1994	Schmitz U.	blacklight trap	JEWC-1
Rondônia		Ariquemes, 62 km.SW	20-X-1994	Schmitz U.	blacklight trap	PESC-8
Rondônia		Ariquemes, 62 km.SW	8-20-XI-1994	Eger J.E.	MV & blacklight	JEWC-3
Sao Paulo		Faz.Campininas, Mogi Guacu.	23-31-VII-1969	Campbell J.M.& B.A.		CNCI-1
Sao Paulo		Piracicaba	11-VI-1965	Triplehorn C.	blacklight trap	OSUC-1
Sao Paulo		Piracicaba	14-VI-1965	Triplehorn C.	blacklight trap	OSUC-27
Sao Paulo		Ubatuba	22-X-1964	Moses		USNM-1
Costa Rica:						
		Rio Viejo	2-VII-1967	Spangler P.J.		USNM-1
Panama:						
Canal Zone		Cardenas Village	10-V-1980	Riley E.G.		EGRC-3
Canal Zone		Cardenas Village	17-18-V-1980	Riley E.G.		AAIC-1
Canal Zone		Cardenas Village	17-18-V-1980	Riley E.G.		EGRC-8
Canal Zone		Cardenas Village	17-18-V-1980	Riley E.G.		TAMU-2
Canal Zone		Cardenas Village	22-V-1980	Riley E.G.	holotype & allotype	FSCA-8
Canal Zone		Cardenas Village	26-V-1980	Riley E.G.		EGRC-6
Colon		Fort Espinar	14-V-1991	Turnbow R.H.	at light	RHTC-1
Venezuela:						
Aragua		Cagua	28-VI-1961	Bordon		MAIC-1
Aragua		Choroni, nr.	6-VIII-1984	Watts J.		PESC-1

Ischyrus pictus Gorham

Guatemala:						
Alta Verapaz			San Juan		TYPE, B.C.A.,Col.,VII	NHML-1
Honduras:						
		Lake Yojoa	21-VIII-1959	Dysart R.J.	at light	INHS-1
Atlantida		Lancetilla Bot.Garden, Tela	23-VI-1994	Ashe J.	10m, #200 crustose fungi on log	SEMC-1
Mexico:						
Chiapas		Palenque, 100 km SE	9-VII-1983	Peck S.	fleshy fungus, rainforest	CNCI-4
Oaxaca		Juchatengo, 4 mi.N.	7-VIII-1970	Fischer E.	3300'	LSCM-1
Quintana Roo		San Felipe Carr.Pte., N.	27-V-1984	Wappes J.E.		FSCA-1
Tabasco		Villahermosa, 59.4 mi.SE.	6-7-VI-1966	Ball G.E.	blacklight	CUIC-2
Veracruz		Est.Biol.Los Tuxtlas	19-VII-1989	Colin J.		UNAM-1
Veracruz		Est.Biol.Los Tuxtlas	22-23-X-1989	Colin J.		UNAM-1
Veracruz		Fortin de las Flores	30-VII-1964	Rabago D.	blacklight	PESC-1
Veracruz	Sierra de Las Tuxtlas, Sonte Comapan		2-9-VIII-1980	Bezark L.G.		PESC-1
Veracruz		Lake Catemaco	8-16-VIII-1960	Howden H.F.		CNCI-1
Veracruz		Microonolas San Juan, S.Fortin	7-VII-1992	Thomas M.C.	beating	PESC-1
Veracruz	Rio Quezalapan, 2 mi.E.Lago Catemaco		12-31-VII-1964	Meyer R.J.		TAMU-1
Yucatan		Colonia	12-VIII-1952	Pallister J.		AMNH-1

Ischyrus proximus Lacordaire

State	County	Locality	Date	Collr.	Data	Rep.No.
Belize:						
Cayo		Georgeville, 8 mi.S.	21-24-VI-1992	Rifkind J.	420m,lights, broadleaf for.	PESC-1
Bolivia:						
La Paz		San Lorenzo, 12 km Caranavi	1-2-I-1991	McHugh J.V.	JVM lot B91-24	JVMC-1
La Paz		San Lorenzo, 12 km Caranavi	1-2-I-1991	McHugh J.V.	JVM lot B91-11	JVMC-4
Costa Rica:						
	Hamburgfarm, Reventazon Ebene Limon		3-XII-1931	Nevermann F.	Pilsbelag an trocknem Holz	USNM-4
Puntarenas		Monteverde	5-7-VI-1983	Wappes J.E.		JEWC-1
Puntarenas		Monteverde	7-V-1985	Gilbert A.J.	blacklight	CDAE-1
Puntarenas		Monteverde	12-V-1989	Ashe J.	1520m,under bark	SEMC-1
Puntarenas		Monteverde	21-V-1989	Ashe J.	1550m,ex resupinate polypore, #329	SEMC-1
Puntarenas		Monteverde	22-V-1989	Ashe J.	1520m, ex *Schizopora paradoxa*, #445	SEMC-6
Puntarenas		Monteverde	25-V-1989	Ashe J.	1550m, ex *Schizopora paradoxa*, #449	SEMC-1
Puntarenas		Monteverde	25-V-1989	Ashe J.	1450m,ex *Schizopora paradoxa*, #472	SEMC-2
Puntarenas		Monteverde, Forest Reserve	1-2-V-1974	Opler P.	1380m	EMEC-3
Puntarenas		Monteverde, Forest Reserve	17-20-V-1985	Powell J.	1300m, under bark	EMEC-1
Puntarenas		Monteverde, Forest Reserve	18-V-1985	Doyen J.	1300m	EMEC-17
Puntarenas		Monteverde, Forest Reserve	18-19-V-1985	Doyen J.	1450m	EMEC-16
Puntarenas		Monteverde, Forest Reserve	19-V-1985	Chemsak J.A.	1300m,at light	EMEC-1
Puntarenas		Monteverde, Forest Reserve	8-10-VI-1986	Chemsak J.A.	1300m	EMEC-1
Puntarenas		Monteverde, Pens.Quetza.	18-V-1988	Ratcliffe B.C.	1380m	DEUN-2
Puntarenas		Monteverde.	6-14-VI-1973	Erwin & Hevel	1400-1700m	USNM-1
Puntarenas		Santa Elana, 6 km.N.	31-V-1979	Howden H.& A.	1400m	CNCI-2
Guatemala:						
					ex orchid 46-13253	USNM-1
		Moca., Such.	25-VI-1947	Vaurie C.& P.	3000'	AMNH-2
Honduras:						
		San Juan, Pueblo		Mann W.M.		USNM-3
		b. Yejoe	20-VIII-1977	Mankins J.V.		EMEC-1
Atlantida		Lancetilla Bot.Garden,Tela	22-VI-1994	Ashe J.	10m, #181 ex fogging fungusy log	SEMC-7
Olancho		La Muralla, 15°6'N 86°42'W	25-VI-1994	Ashe J.	1450m, #208 crustose fungi on log	SEMC-1
Mexico:						
[no further data: CUMZ-1]						
					TYPE	CUMZ-1
Chiapas		Mapastepec, 13.5 mi.E, Rte.200	19-20-VIII-1974	Whitehead	120m	UASM-1
Chiapas		Parque Laguna Belgica	19-VI-1990	Warner W.B.	970m	PESC-1
Chiapas		Simojovel	1-16-VIII-1958	Chemsak J.A.		EMEC-1
Chiapas		Vincente Guerro, 25 mi.SSW	9-VI-1987	Ratcliffe B.C.		DEUN-1
Durango						FMNH-1
Durango		Canelas				ZMHB-1
Guerrero		Tepetlapa				FMNH-1
Guerrero		Tierra, Colo.	15-VIII-1938	Lipovsky L.J.		SEMC-1
Hidalgo		Chapulhuacan, 3 mi.N on Hwy 85	28-29-V-1984	Thomas D.		DEUN-2
Mexico		Real de Arriba, Temescaltapec	VII-1933	Norland C.E.		LACM-3
Michoacan		Los Laurales, near Calcoman	1-3-VII-1994	Taylor T.W.		PESC-1
Morelos		Cuernavaca, 5.4 mi.E.	29-30-VI-1966	Ball G.E.	blacklight	CUIC-1
Nayarit		El Cora Tepic		Lûdecke A.		ZMHB-1
Nayarit		San Blas, E.of	21-VI-1965	Young F.N.	at nights on plants	UMMZ-1
Oaxaca		Puerto Escondido, 22.4 mi.N.	20-21-VII-1966	Ball G.E.	2100', blacklight	CUIC-1
Oaxaca		Valle Nacional, 6 mi.S.	18-V-1971	Bright		CNCI-1
Sinaloa		Venodia	16-VI-1918	Kusche		USNM-1
Tabasco		Villahermosa, 59.4 mi.SE.	6-7-VI-1966	Ball G.E.	blacklight	CUIC-1
Veracruz		Cordoba		Fenyas A.		CASC-2
Veracruz		Est.Biol.Los Tuxtlas	4-14-XI-1988	Majorado E.		UNAM-1
Veracruz		33km.NE.Catemaco, E.B.L.T.	VII-1983	Peck S.& J.	160m, flight intercept trap, ridge rainforest	CNCI-1
Veracruz		Fortin de las Flores, Sumidero	22-23-V-1965	Weems H.V.	2500-3000',blacklight	FSCA-1
Veracruz		Lake Catemaco, Cayame	1-15-VII-1963	Whitehead		USNM-1
Veracruz		Montepio, 2 mi.S.	23-VIII-1982	O'Brien C.&L.	100'	PESC-2
Veracruz		Motzorongo				FMNH-1
Veracruz		Motzorongo				ZMHB-7
Veracruz		Omealca				ZMHB-3
Veracruz		Orizaba				ZMHB-1
Veracruz		San Lorenzo, Flohter[?]				ZMHB-2
Nicaragua:						
		Chanti		Janson		NHML-1
Panama:						
Bocas del Toro		Almirante	23-III-1959	Dybas H.S.		FMNH-1
Chiriqui		Boquete	13-X-1976	Wolda H.		UCDC-1
Chiriqui		Cerro Punta, 3 km.W.,	2-VIII-1979	Joplin K.	1720m, 1600 1131	PESC-1
Chiriqui		Res. La Fortuna, Finca la Suiza	24-V-1998	Riley E.G.	UV light	EGRC-1

Ischyrus putei Skelley, n.sp.

Panama:						
Canal Zone		Barro Colorado Island	18-VII-1962	Botimer L.J.		CNCI-1
Canal Zone		Barro Colorado Island	1-9-V-1964	Duckworth W.		USNM-1

State	County	Locality	Date	Collr.	Data	Rep.No.
Canal Zone		Barro Colorado Island	10-17-V-1964	Duckworth W.	allotype	USNM-3
Canal Zone		Barro Colorado Island	20-23-V-1964	Duckworth W.	holotype	USNM-1
Canal Zone		Barro Colorado Island	7-V-1980	Wolda H.		UCDC-2
Canal Zone		Barro Colorado Island	6-VII-1980	Wolda H.		PESC-1
Canal Zone		Barro Colorado Island	8-14-V-1985	Wolda H.	blacklight	UCDC-1
Canal Zone		Coco Solo Hospital	1-VII-1974	O'Brien & Marshal		PESC-1
Canal Zone		Fort Kobbe	28-VIII-1970	Stockwell H.P.		HPSC-1
Canal Zone		Gamboa, 5 mi.NW.	12-VII-1976	Montgomery	100m, fogging *Luechea seemanni*, pyrethrin fog	USNM-24
Canal Zone		Gamboa, 5 mi.NW.	26-VII-1976	Montgomery	100m, fogging *Luechea seemanni*, pyrethrin fog	USNM-4
Canal Zone		La Pita Signal Station	2-V-1979	Riley E.G.		EGRC-1
Canal Zone		Paraiso	26-IV-1911	Schwarz E.A.		USNM-1
Colon		Escabol Rd.	8-VII-1983	Engleman D.		EGRC-1
Panama		Ipeti, 5 km.W.	3-VI-1983	Wappes J.E.		FSCA-1
Panama		Trinidad River	2-V-1911	Busck A.		USNM-1

Ischyrus quadripunctatus quadripunctatus (Olivier)

Country ?

[no data: ZMHB-1, NHML-6]

		Nova Valencia				ZMHB-2
		Nova Valeni, Montz.				ZMHB-1
Argentina:						
Chaco		Resistencia	2-XII-1939	Biraben		MLPA-2
Entre Rios		Concordia		Hayward		MLPA-1
Jujuy		El Quemado	III-V-1926	Harrington G.L.		USNM-1
Salta		General Ball.-ivian	1927	Harrington G.L.		USNM-1
Salta		Tabillas		Harrington G.L.		CASC-1
Salta		Tabillas	IX-1933	Harrinton W.C.		CASC-1
Tucuman			XI-1928	Bruch C.		MACN-1
Belize:						
		Rio Grande				ICCM-1
		Rio Grande	VIII-1935	White J.J.		NHML-1
		Rio Temas	VIII-1937	White A.J.		FMNH-1
		M-tee Dist.	VIII-1905			AMNH-1
Bolivia:						
Cochabamba		Chapare, Ville Tunari	5-9-I-1958	Wygodzinski M.		IMLA-1
La Paz		Junulo[?]				ZMHB-1
Santa Cruz			10-XI-1956	Picket G.		USNM-1
Santa Cruz		El Cidral	1-28-I-1962	Golbach R.		IMLA-1
Santa Cruz		Warnes, 9 mi.W, Colpa Gas Sta.	16-IV-1978	O'Brien & Marshall		FAMU-2
Brasil:						
[no futher data: AMNH-1, FMNH-1]						
Mato Grosso		Cacares, EMPA Res.Sta.	7-II-1985	Wojcik D.P.	blacklight	PESC-1
Para		Santarem				ICCM-2
Para		Santarem				ICCM-5
Paraiba		Santo Rita	VIII	Sahlberg F.		HNHM-3
Rondônia		Ariquemes, 62 km.SW	6-15-XII-1990	Rider D.A.	at light	FSCA-1
Rondônia		Ariquemes, 62 km.SW	12-22-XI-1991	Bezark L.	on foliage	PESC-1
Rondônia		Ariquemes, 62 km.SW	12-26-IV-1992	Schmidtz U.	blacklight	PESC-1
Rondônia		Ariquemes, 62 km.SW	12-IX-1992	Schmidtz U.	blacklight	PESC-3
Rondônia		Ariquemes, 62 km.SW	18-IX-1992	Schmidtz U.	blacklight	PESC-2
Rondônia		Ariquemes, 62 km.SW	20-IX-1992	Schmidtz U.	blacklight	PESC-10
Rondônia		Ariquemes, 62 km.SW	25-IX-1992	Schmidtz U.	blacklight	PESC-5
Rondônia		Ariquemes, 62 km.SW	28-IX-1992	Schmitz U.	blacklight trap	PESC-1
Rondônia		Ariquemes, 62 km.SW	6-V-1992	Schmidtz U.	blacklight	PESC-1
Rondônia		Ariquemes, 62 km.SW	22-XI-1992	Schmidtz U.	blacklight trap	PESC-1
Rondônia		Ariquemes, 62 km.SW	26-XII-1992	Schmidtz U.	blacklight trap	PESC-2
Rondônia		Ariquemes, 62 km.SW	3-VI-1993	Schmidtz U.	blacklight trap	PESC-1
Rondônia		Ariquemes, 62 km.SW	25-X-1993	Schmidtz U.	blacklight trap	PESC-1
Rondônia		Ariquemes, 62 km.SW	5-17-X-1993	Eger J.E.	blacklight trap	PESC-6
Rondônia		Ariquemes, 62 km.SW	25-XI-1993	Schmidtz U.	blacklight trap	PESC-1
Rondônia		Ariquemes, 62 km.SW	20-X-1994	Schmidtz U.	blacklight trap	PESC-2
Rondônia		Ariquemes, 62 km.SW	7-X-1994	Schmidtz U.	blacklight trap	PESC-1
Rondônia		Ariquemes, 62 km.SW	8-20-XI-1994	Eger J.E.	MV & blacklight	PESC-4
Santa Catarina		Corupa (Hansa Humbolt)	X-1945	Maller A.		AMNH-1
Canada:						
[no further data: NHML-1]						
Ontario						CNCI-3
Ontario		Chaffeya Locks Biol.Sta.	26-IX-1986	Smetana A.		CNCI-1
Ontario		Lanark, Kerr Lake	27-VI-1975	Hicks S.D.		CNCI-1
Ontario		Lanark, Kerr Lake	20-VIII-1976	Hicks S.D.		CNCI-1
Ontario		Ottawa				ICCM-1
Ontario		Ottawa		Simpson W.		CNCI-1
Ontario		Ottawa				NHML-4
Ontario		Ottawa				CNCI-5
Ontario		Ottawa	21-VI-1984		fungus	CNCI-4
Ontario		Wheatley	12-VI-1966	Rosenberg		USNM-1
Ontario	Kent	Tilbury	8-V-1967	Stephan K.		FSCA-1
Quebec		Montreal	15-VI-1968	Kiteley E.J.	UV light	CNCI-1
Quebec		Montreal	21-VIII-1980	Kiteley E.J.	UV light	CNCI-1
Quebec		Montreal	23-V-1981	Kiteley E.J.	UV light	CNCI-1
Quebec		Montreal	24-V-1982	Kiteley E.J.	UV light	CNCI-1
Quebec		Norway Bay	20-VIII-1938	Hobbs G.A.		CNCI-1
Quebec		Norway Bay	20-VI-1939	Lester E.G.		CNCI-1

State	County	Locality	Date	Collr.	Data	Rep.No.
Colombia:						
[no further data: ZMHB-1]						
		Cacagualito				ICCM-1
Cauca		Tierra Adentro, San Andres	11-13-IV-1979	Monsalve J.		FSCA-1
Cauca		Tierro Adentro, San Andres	11-13-IV-1979	Monsalve J.		FSCA-1
Choco		Quebrada, 110 km N. Palestina	20-25-I-1971	Malkin G.		FMNH-1
Menta		Villavicencio, M.I.	10-VII-1938	Seevers C.H.		FMNH-1
Costa Rica:						
	Hamburgfarm,	Reventazon Ebene Limon	31-X-1927	Neverman F.	at light	FMNH-2
	Hamburgfarm,	Reventazon Ebene Limon	31-X-1927	Nevermann	at light	CUIC-2
	Hamburgfarm,	Reventazon Ebene Limon	1-XII-1931	Neverman F.		USNM-1
	Hamburgfarm,	Reventazon Ebene Limon	29-I-1932		at light	USNM-1
	Hamburgfarm,	Reventazon Ebene Limon	29-I-1932	Neverman F.	at light	CNCI-1
	Hamburgfarm,	Santa Clara	3-XII-1925	Nevermann	at light	USNM-1
Alajuela		Alajuela Univ. Exp. Sta.	5-X-1966	Habeck D.H.	blacklight	FSCA-1
Alajuela	Volcan Mira	Valles, 2 mi.W Naranjo	27-VII-1973	Doyen J.		EMEC-11
Cartago		Turrialba	7-VII-1965	Eikwort G.& K.		SEMC-1
Guanacaste		Finca Tobago	15-VII-1970	Moore T.E.		UMMZ-1
Guanacaste		La Pacifica, 4 km NW Canas	19-V-1971	Opler P.	at light	EMEC-1
Guanacaste		Playa Hermosa	9-10-VI-1974	Giesbert E.		LACM-1
Guanacaste		Sta. Rosa N.P., HQ area	17-V-1988	Brown	280m, blacklight	EMEC-1
San José		San José		Bially P.	1161m	NHML-2
San José		San José	31-VIII-1911	Schmidt H.		ZMHB-1
San José		San José	XI-1921	Neverman F.		ICCM-1
San José		San José	3-XI-1925	Neverman F.	at light	ICCM-1
San José		San José	15-V-1928	Neverman F.	1000-1200m	USNM-1
San José		San Pedro, 9°56'N 84°3'W	27-VI-1968	Hespenheide H.		HPSC-1
Ecuador:						
Guayas		Balzar IIL				NHML-1
El Salvador:						
		Ciudad University	11-XII-1960	Virkki N.		CNCI-1
French Guiana:						
[no further data: ISNB-1]						
				Van Lansberg		ISNB-1
St. Laurent du Maroni				Moult L.E.		ZMHB-1
St. Laurent du Maroni		Charvein, Bas Maroni		Moult L.E.		ZMHB-1
Guyana:						
		Essequibo R., Moraballi Creek	1-IX-1929			NHML-1
		Essequibo R., Moraballi Creek	9-IX-1929			NHML-2
		Kartabo, Bartica	X-1920			CUIC-1
Honduras:						
		Siguot	24-VI-1978	Mankins J.V.		CEEF-1
Atlantida		Lancetilla Bot.Garden, Tela	22-VI-1994	Ashe J.	10', #181, fogging fungusy log	SEMC-1
Comayagua		Comayagua, 15 km.S.	22-I-1979	Tschinkel W.R.		EMEC-1
Mexico:						
[no further data: MACN-1]						
Chiapas		Comitan, 125.6 mi.W, Rt.190	31-VIII-1965	Ball & Whitehead	5300'	CUIC-1
Chiapas		El Chorreadora	26-VI-1990	Thomas M.C.		FSCA-1
Chiapas	Mpio.Cintalapa,	5mi.N.Nvo.Tenochtitian	31-VII-1991	Kovarik P.	900m	PESC-1
Chihuahua		Catarinas	25-VII-1947	Rockerfeller Exp.		AMNH-32
Chihuahua		Catarinas	26-VII-1947	Rockerfeller Exp.	5800'	AMNH-8
Chihuahua		Paso del Norte				ZMHB-1
Chihuahua		Paso del Norte			TYPE *I.puncticollis*	NHML-1
Durango		Rodeo, 5 mi.N, 6 mi.W, Hwy.45	16-VII-1984	McCleve S.	4980'	SMCC-1
Hidalgo		Zimapan, 3 mi.E.	31-VII-1963	Duckworth W.D.		USNM-1
Nuevo Leon		Jalapa		Schneider J.F.		ZMHB-2
Nuevo Leon		Lago la Laguna, 4 mi.SW.Galeana	26-V-1981	Doyen J.T.		EMEC-1
Nuevo Leon		Linares, 17.5 mi.W.	25-V-1981	Doyen J.T.	blacklight	EMEC-1
Nuevo Leon		Monterrey, 6 mi.S.	25-28-VIII-1962	Howden H.		CNCI-1
Nuevo Leon		Rancho Presa Nueva	VI-1934	Bolles E.A.		AMNH-1
Nuevo Leon	Santa Rosa	Canyon, 14.8mi.W.Linares	6-7-VII-1966	Ball & Whitehead	2400', blacklight	CUIC-1
Oaxaca		Matias Romaro, 10 mi.N.	3-VII-1975	Watrous L.E.		CUIC-1
Tamaulipas		Bocatoma, 7 km SSE.Gomez Farias	19-23-V-1979	Riley E.G.		EGRC-1
Tamaulipas		Victoria, canyon 5 mi.E.cd.	3-VI-1984	Ratcliffe B.C.		DEUN-1
Veracruz		Cordoba	17-V-1908	Knab F.		USNM-1
Veracruz		Cordoba	12-22-VI-1965	Lau A.B.		USNM-1
Veracruz		Cordoba	4-VIII-1965	Lau A.B.		USNM-1
Veracruz		El Palmar, 16 km.W.Tetzonapa	9-15-VI-1948		600',jungle-rubber,coffee	UAIC-1
Veracruz		Fortin de las Flores	25-VI-1963	Woodruff R.E.	blacklight	FSCA-1
Veracruz		Fortin de las Flores	19-VI-1964	Raske A.G.	at light	CNCI-1
Veracruz		Fortin de las Flores	7-12-VII-1974	Chemsak J.A.	1010m, at lights	EMEC-3
Veracruz		Fortin de las Flores, 2 mi.W.	27-VII-1962	Janzen D.H.		EMEC-1
Veracruz		Fortin de las Flores, Sumidero	22-23-V-1965	Weems H.V. jr.	blacklight	FSCA-2
Veracruz		Jalapa, 4.7 mi.E., Rt.140	9-IV-1966	Ball & Whitehead	3600', bromeliad	CUIC-1
Veracruz		Lake Catemaco, nr.		Robinson D.C.		TAMU-1
Veracruz		Motzorongo	7-II-1892	Osborn H.		USNM-2
Veracruz		Toxpam		Sallé coll.		NHML-3
Nicaragua:						
				Sallé coll.		NHML-1
		Chontales		Belt T.		NHML-2
Panama:						
Canal Zone		Barro Colorado Island	IV-1941	Zetek J.	at light	USNM-1
Canal Zone		Barro Colorado Island	10-17-V-1964	Duckworth W.D.		PESC-2

State	County	Locality	Date	Collr.	Data	Rep.No.
Canal Zone		Barro Colorado Island	6-VI-1972	Pine R.	at light, 9°10'N-79°50'W	USNM-2
Canal Zone		Barro Colorado Island	13-VIII-1980	Wolda H.		UCDC-1
Canal Zone		Fort Gulick	III-1979	Harlan H.J.		OSUC-1
Canal Zone		Gatun Tank Farm	XI-1978	Harlan H.J.	blacklight	OSUC-1
Canal Zone		Tabervilla	4-VI-1907	Busck A.		USNM-1
Canal Zone		Taberville	4-VI-1907	Busck A.		USNM-1
Darien		Santa Fe	25-V-1967	DeLong D.M.		OSUC-1
Panama		Las Cumbres	3-VII-1975	Wolda H.		OSUC-2
Panama		Trinidad River	2-V-1911	Busck A.		USNM-2
Panama		Trinidad River	3-V-1911	Busck A.		USNM-1
Panama		Trinidad River	7-V-1911	Busck A.		USNM-7
Panama		Trinidad River	9-V-1911	Busck A.		USNM-1
Panama		Trinidad River	10-VI-1912	Busck A.		USNM-2
Panama		Trinidad River	8-VI-1912	Busck A.		USNM-1
Paraguay:						
Alto Parana		Hohenau	IX-1935	Jacob H.		ZMHB-2
Peru:						
				Ob.		ZMHB-1
Ayacucho		La Mar, Santa Rosa	19-25-IX-1976	Gordon R.	640m	PESC-1
Huanuco		Tingo Maria	9-VII-1968	O'Brien C.& L.	at night	PESC-1
Huanuco		Tingo Maria, Huan	22-XI-1946	Pallister J.C.		AMNH-1
Huanuco		Tingo Maria, Monzon Valley	29-XI-1954	Schlinger E.I.		CASC-1
Madre de Dios		Rio Tambopata Res.	18-I-1987	Wheeler Q.D.	blacklight	CUIC-1
Madre de Dios		Rio Tambopata Res.	18-I-1987	Wheeler Q.D.	blacklight [one with banded femora]	JVMC-3
Madre de Dios		Rio Tambopata Res.	19-I-1987	Wheeler Q.D.	UV light	CUIC-1
Pasco		Pan de Azucar	18-VII-1961	Truxal F.S.		LACM-1
San Martin		Hera, 15 km SE Moyabamba	VII-1947	Woytkowski F.		AMNH-1
St. Lucia:						
		Union Agric. Sta.	25-V-1987	Woodruff R.E.	blacklight	FSCA-1
St. Vincent:						
				Smith H.H.		NHML-4
Surinam:						
		Kwakoegren Saramacca R.	7-VI-1927			CUIC-1
		Moengo, Boven Cottica R.	14-V-1927			PESC-1
Trinidad:						
		Petit Valley	17-VI-1970	Rogers T.E.		FSCA-1
		Simla, 5 mi.N.Arima	18-VIII-1969	Howden H.& A.		CNCI-1
		Tunapuna	14-17-VIII-1969	Howden H.& A.		CMNC-1
		Tunapuna	14-17-VIII-1969	Howden H.& A.		CNCI-1
United State of America:						
[Detailed data available upon request]						
Venezuela:						
[no further data: NHMB-1, NHML-1, ZMHB-1]						
Bolivar		Suapure, Caura R.	13-21-VI-1899	Klages E.A.		CUIC-4
Portuguesa		Guanare	12-IX-1957	Malking B.	at light	CASC-1
Zulia		Embalse Cachiri	18-VI-1976	Menke A.S.		USNM-1

Ischyrus quadripunctatus chiasticus Boyle

Mexico:						
Chihuahua		Cuiteco	1-IX-1969	Sears T.A.		UCDC-3
Chihuahua		Cuiteco	8-IX-1969	Sears T.A.		UCDC-1
Chihuahua		Cuiteco	27-VIII-1969	Sears T.A.		UCDC-1
Chihuahua		Los Chinacas, 4 mi.N.	9-10-VII-1989	McCleve S.	4910', UV light	PESC-13
Chihuahua		Tempris, 4 mi.SW.	1-VIII-1969	Sears T.A.		UCDC-1
Chihuahua		Tempris, 4 mi.SW.	7-VIII-1969	Sears T.A.		UCDC-1
Chihuahua		Yecora, Sonora, 6 mi.S	2-3-VII-1990	McCleve S.	5740', UV light	PESC-2
Morelos		Cuernavaca, 4.4 mi.E	27-29-VII-1976	Peigler et al.	at light	TAMU-1
Morelos		Ignacio Bastida, 2 km.S.	1-VIII-1981	Sears T.A.		UCDC-1
Nayarit		Compostela	27-VII-1954	Cazier M.		AMNH-1
Sinaloa		Venedio	17-VI-1918	Van Dyke		CASC-1
Sinaloa		Venodio	17-VI-1918			USNM-1
Sonora		Coyote, 7 km.N	26-VI-1981	McCleve S.	1200m, at light	SMCC-2
Sonora		Huicoche, 3.2 mi. NW	11-13-VII-1989	McCleve S.	5170', UV light	SMCC-1
Sonora		Imuris, 9 mi.NNE	7-11-VII-1958	Alcorn J.D.		SEMC-1
Sonora		Moctezuma, 17 km.SW	21-28-VII-1980	McCleve S.	944m, at light	SMCC-3
Sonora		Moctezuma, 17 km.SW	27-VI-1981	McCleve S.	944m, at light	SMCC-2
Sonora		Palm Canyon, 17 mi. E.Magdalena	4-VIII-1981	Thomas D.		UAIC-1
Sonora	Sierra los	Ajon, Canyon de Evans	28-VIII-1970	Roth V.		AMNH-2
Sonora		Yecora, 4 mi. NE	30-VI-1990	McCleve S.	5400', UV light	SMCC-4
United States of America:						
[Detailed data available upon request]						

Ischyrus sapphirus Skelley, n.sp.

Cuba:					
	Soledad (Cienfuegos)	24-X-1925	Darlington P.J.	allotype	MCZC-1
	Soledad (Cienfuegos)	31-X-1926	Darlington P.J.	swamp	PESC-1
	Soledad (Cienfuegos)	8-XI-1926	Darlington P.J.	(1-PESC)	MCZC-3
	Soledad (Cienfuegos)	VI-1929	Darlington P.J.	holotype	MCZC-1
	Soledad (Cienfuegos)	2-12-VIII-1934	Darlington P.J.		MCZC-2
	Soledad (Cienfuegos)	VIII-1936	Darlington P.J.		PESC-1

State	County	Locality	Date	Collr.	Data	Rep.No.
		[?]Cejanal P.del Rio	XII-1928			FMNH-1
Camaguey		Baragua	22-VII-1929	Scaramuzza L.C.	at light	MCZC-1
Camaguey		Baragua	26-V-1932	Christenson	at light	PESC-1
Camaguey		Baragua	31-V-1932	Christenson	at light	USNM-1
Camaguey		Baragua	11-VI-1932	Christenson	at light	USNM-1

Ischyrus scriptus (Olivier)

Country ?

[no data: ZMHB-7]

			12-VI-1930			FIOC-1
		San Lorenzo				ZMHB-1
Argentina:						
Jujuy				Bruch C.		MACN-1
Jujuy				Harrington		MLPA-1
Jujuy		Calilegua N.P., El Cortaderal	18-28-XII-1987	Peck S.& J.	800m, Malaise FIT	CMNC-1
Jujuy		San Pedro	IX-1921	Harrington G.L.		USNM-1
Misiones		Dos de Mayo	I-1961	Foerster J.	300m	IMLA-1
Misiones		Loreto	IV-1931	Bruch C.		MACN-1
Misiones		Loreto	IV-1981	Borg		MLPA-1
Misiones	Concep.	Sta. Maria				MLPA-1
Misiones	Concep.	Sta. Maria				MLPA-1
Misiones	Concep.	Sta. Maria	X-1947	Viana M.		MLPA-2
Salta		El Rey Nat.Park, Hosteria	15-XII-1987	Peck S.& J.	890m, UV light, humid thorn forest	CMNC-1
Salta		El Rey N.Pk., Pozo Verde Trail	9-10-XII-1987	Peck S.& J.	900m, UV light, Chaco thorn forest	CMNC-1
Salta		El Rey N.Pk., Pozo Verde Trail	10-XII-1987	Peck S.& J.	1200m, fungi on log	PESC-2
Salta		Finca El Rey	21-III-1957	Monros		IMLA-1
Salta		Macueta	X-XI-1933	Harrington W.C.		CASC-1
Salta		Orán Abra Grande	I-III-1967	Golbach R.		IMLA-2
Salta		Tablillas	I-IX-1933	Harrington G.L.		CASC-3
Salta		Tablillas	I-1934	Harrington G.L.		CASC-1
Tucuman				Bruch C.		MACN-2
Tucuman			I-1956	Golbach R.		CUIC-6
Tucuman		Cerro San Xavier	11-II-1951	Ross & Michelbacher		CASC-1
Tucuman		Cerro San Xavier	11-II-1951	Ross & Michelbacher		FMNH-1
Tucuman		Ciudad Universitaria	18-II-1959	Clark J.F.	800m	USNM-1
Tucuman		Cumbre de San Javier	XII-1946	Golbach R.		IMLA-2
Tucuman		Pallóa Blanca, Dpto.Burruyatú	7-8-II-1961	Golbach R.		IMLA-2
Tucuman		Horco Molle	1-27-VIII-1965	Porter C.		IMLA-1
Tucuman		Parque Aconquija	XII-1946	Golbach R.		IMLA-10
Tucuman		Rio Los Sosa	2-XI-1963	Weyruch	1100m	IMLA-1
Bolivia:						
		E.Warnes	30-XII-1983	Wilkerson R.	Malaise trap	PESC-1
		Tiguipa	III-1922			USNM-1
		Tunari Chapare	XI-1992	Pena L.		PESC-1
Chuquisaca		Chuguis area, Monteaguado	XII-1984	Pena L.E.	1300m	HNHM-2
La Paz		San Lorenzo, 12 km Caranavi	1-2-I-1991	McHugh J.V.	JVM lot B91-42	JVMC-1
La Paz		San Lorenzo, 12 km Caranavi	1-2-I-1991	McHugh J.V.	JVM lot B91-11	JVMC-3
La Paz		San Lorenzo, 12 km Caranavi	1-2-I-1991	McHugh J.V.	JVM lot B91-24	JVMC-7
La Paz	Yungas La Paz, Puenta Mururrato to Suapl		24-28-XI-1984	Pena L.E.	1200-1600m	HNHM-1
Brasil:						
[no further data: NHMB-1, ZMHB-1, NHML-2]						
				LECTOTYPE *I.maculiventris*		CUMZ-1
		Chapada	X			ICCM-1
Mato Grosso				Rohde S.		ZMHB-5
Mato Grosso		10°25'S, 59°28'W	17-22-III-1977	Engleman D.	300m	EGRC-1
Para		Santarem				ICCM-3
Paraná						NHML-1
Paraná		Foz do Iguazu	25-IV-1964	Ross C.E.& E.S.		CASC-2
Rio de Janeiro		Petropolis	I	Sahlburg T.		HNHM-3
Rio de Janeiro		Petropolis	II	Sahlburg T.		HNHM-1
Rio de Janeiro		Petropolis	XII	Sahlburg T.		HNHM-1
Rio de Janeiro		Rio de Janeiro				NHML-1
Santo Catarina	Nova Teutonia; 27°11'La., 52°23'Lo.		1-X-1944	Plauman F.		AMNH-1
Colombia:						
[no further data: ISNB-1, ZMHB-1, NHMB-2]						
					LECTOTYPE *I.velatus*	MNHN-1
Boyaca		Muzo				ZMHB-1
Boyaca		Muzo	X-XI-1877	Theime O.		ZMHB-1
Cundinamarca		Finca Bella Vista, nr.Sasaima	26-V-1965	Craig P.R.		CASC-1
Costa Rica:						
Alajuela		Volcan Miravalles, 2 mi.W.Naranjo		27-VII-1973	Doyen J.	EMEC-1
San José		San José		Valerio M.		USNM-1
Ecuador:						
Napo		Coca	III-1986	Martinez E.		QCAZ-3
Pichincha		Stanto Domingo, 15 km.E.	23-26-II-1981	Gill B.D.	700m	CNCI-1
French Guiana:						
[no further data: CUMZ-1, HNHM-1]						
Honduras:						
		San Juan, Pueblo		Mann W.M.		USNM-4
Atlantida		Lancetilla Bot.Garden, Tela	22-VI-1994	Ashe J.	10m, #181 ex fogging	

State	County	Locality	Date	Collr.	Data	Rep.No.
					fungusy log	SEMC-1
Comayagua		Comayagua, 15 km.S.	22-1-1978	Tschinkel W.R.		EMEC-3
Francisco Morazon		Talanga fina Archaga	3-VII-1993	Skillman F.W.Jr.	beating burned area	PESC-1
Mexico:						
					LECTOTYPE *Dacne femoralis*	CUMZ-1
Chiapas		Mpio.Cintalapa,5mi.N.Nvo.Tenochtitian, 31-VII-199,		Kovarik P.		PESC-1
Chiapas		Suchlapa	18-VII-1957	Hurd P.D.		EMEC-1
Jalisco		Estacion de Biol. Chamela, UNAM	9-14-VII-1993	Morris R.F.		PESC-1
Nayarit		El Cora Tepic		Lüdecke A.		ZMHB-1
San Luis Potasí		Tamazunchala	25-VI-1947	Malkin B.		AMNH-1
Tabasco		Villahermosa, 59.4 mi.SE.	6-7-VI-1966	Ball & Whitehead	blacklight	CUIC-1
Tamaulipas		Rio Sabinas, W.Encino	11-X-1965	Ball & Whitehead	river bands	CUIC-1
Veracruz		Cordoba		Fenyes A.		CASC-1
Panama:						
		Patino	16-VIII-1952	Blanton F.L.		USNM-1
Canal Zone		Fort Clayton	VIII-1944	Frick K.E.		CASC-1
Canal Zone		Fort Howard	24-X-1973	Gerberg E.J.		FSCA-1
Canal Zone		Fort Kobbe	9-VI-1976	Riley E.G.	blacklight trap	EGRC-1
Canal Zone		Obispo				AMNH-1
Panama		Las Cumbres		Wolda H.	UV light	PESC-1
Panama		Las Cumbres	8-II-1975	Wolda H.		OSUC-1
Panama		Las Cumbres	17-V-1975	Wolda H.	UV light	OSUC-1
Panama		Las Cumbres	8-V-1975	Wolda H.		OSUC-1
Panama		Las cumbres	1971	Daykin M.		UCDC-1
Panama		Llano-Carti Rd., km.9	4-IX-1982	Stockwell H.P.	350m	HPSC-1
Panama		Trinidad River	23-III-1912	Busck A.		USNM-1
Paraguay:						
[no further data: NHML-1]						
Alto Parana		Hohenau	XI-XII-1933	Jacob H.		ZMHB-1
Alto Parana		Hohenau	XII-1933	Jacob H.		ZMHB-2
Caaguazu		Paso Yabai	22-VIII-1951	Foerster J.		IMLA-7
Caaguazu		Paso Yabai	19-X-1951	Foerster J.		IMLA-1
Cordillera		Inst.Agr.Nac.Caacupe	12-XII-1980	Cave R.D.		RDCC-1
Cordillera		Inst.Agr.Nac.Caacupe	16-XI-1981	Cave R.D.		RDCC-1
Peru:						
		Rio Toro				ZMHB-11
Cuzco		Marcapata				HNHM-3
Huanuco		Pozuzo				HNHM-2
Huanuco		Tingo Maria, Monzon Valley	26-X-1954	Schlinger E.I.		FMNH-1
Junin		Chanchamayo [La Merced]				NHML-2
Madre de Dios		Rio Tambopata Res.	16-I-1987	Wheeler Q.	sheet fungus in slashburn	JVMC-2
Madre de Dios		Rio Tambopata Res., 30 km.SW.Maldonado 1-26-XI-1982		Ross E.S.	290m	CASC-1
Piura		Quiroz, Rio Paucartambo				ANSP-1
Piura		Quiroz, Rio Paucartambo	16-XI-1933			LACM-1
Trinidad:						
[no further data: NHML-1]						
St.Georges			11-VI-1977	Woodruff R.E.	blacklight trap	FSCA-1
Venezuela:						
Bolivar		San Igancio de Yuruani, 5 km.N	2-VII-1987	Ivie M.A.		MAIC-1
Miranda	Altagracia,	28 km N., Guatopa NP	1-7-VI-1987	Peck S.& J.	700m, ravine FIT	PESC-1
Monagas		Maturin, 42 km.SE.	4-VII-1958	Menke A.		LACM-2
Mérida			IV-V-1977	Smith D.A.		CNCI-1
Zulia		El Tucuco	20-23-IV-1981	Townes H.	200m, Malaise trap	CNCI-1

Ischyrus scutellaris Gorham

Belize:						
Cayo		San Ignacio	25-30-VI-1992	Rifkind J.	light, broadleaf forest	PESC-2
Colombia:						
[no furher data: ZMHB-1]						
Mexico:						
Campache		Escarcega	20-VI-1962	Islas F.	light trap	USNM-3
Campache		Escarcega	23-VIII-1983	Peck S.& J.	evergreen trop.litter & fungi	CNCI-1
Campache		Xpujil, 10 km.W, Chicanna	12-VII-1983	Peck S.& J.	UV light, trop seasonal for.	CNCI-1
Quintana Roo		Carillo Puerto, 18 km.N.	28-V-1984	Turnbow R.H.		RHTC-1
Veracruz		Est.Biol.Los Tuxtlas	6-X-1989	Colin J.L.		UNAM-1
Yucatan		Citzen Itza	24-25-V-1984	Wappes J.E.		JEWC-2
Yucatan		Kantunil, 3 km.E.	29-VII-1990	O'Brien C.& L.		PESC-1
Yucatan		Valladolid, 9 km.S.	28-VII-1990	O'Brien C.& L.		PESC-1
Panama:						
Canal Zone		Albrook Field, Tank Hill	29-IV-1977	Riley E.G.		EGRC-1
Canal Zone		Albrook Field, Tank Hill	8-V-1977	Riley E.G.		EGRC-1
Canal Zone		Barro Colorado Island	10-17-V-1964	Duckworth W.D.		USNM-1
Canal Zone		Curundu	15-VI-1982	Stockwell H.P.		HPSC-2
Canal Zone		Fort Kobbe	7-VI-1994	Stockwell H.P.		HPSC-1
Canal Zone		Paraiso	6-V-1911	Schwarz E.A.		USNM-1
Canal Zone		Summit Gardens	9-V-1977	Riley E.G.		EGRC-1
Panama		Las Cumbres	19-V-1974	Wolda H.	UV light	CUIC-2
Panama		Las Cumbres	21-V-1974	Wolda H.		OSUC-1
Panama		Las Cumbres	21-V-1974	Wolda H.	UV light	PESC-2
Panama		Las Cumbres	6-V-1974	Wolda H.		OSUC-3
Panama		Las Cumbres	12-VI-1974	Wolda H.		PESC-1
Panama		Las Cumbres	15-V-1975	Wolda H.		OSUC-1
Panama		Las Cumbres	21-V-1975	Wolda H.	UV light	OSUC-2
Panama		Las Cumbres	24-V-1975	Wolda H.		OSUC-1

State	County	Locality	Date	Collr.	Data	Rep.No.
Panama		Las Cumbres	7-V-1975	Wolda H.		OSUC-2
Panama		Las Cumbres	8-V-1975	Wolda H.		OSUC-1
Panama		Las Cumbres	2-VI-1975	Wolda H.		OSUC-1

Ischyrus septemsignatus Gorham

Belize:						
		Rio Grande				ICCM-1
Costa Rica:						
		Tarrazu	8-V-1936	Marin E.	Coffea arabica	USNM-1
		Tarrazu	8-VIII-1936	Marin E.	rotten trunk, *Inga* sp.	PESC-1
Guatemala:						
Baja Verapaz		Purulha, 6-9 km.E	15-25-IV-1990	Giesbert E.	1500'	FSCA-1
Escuintla		Pantaleon		1700', Paralectotype *I.septemsignatus* β		NHML-1
Sacatepequez		Capetillo		Paralectotype *I.septemsignatus* α		NHML-1
Mexico:						
Chiapas		Ocosingo, 9.8 km.N.	20-VI-1990	Thomas M.C.		FSCA-1
Chiapas	Palenque,	100 km SE on Bonampak Rd.	9-VII-1983	Peck S.	fresh fungus, rainforest	CNCI-1
Hidalgo		Chapulhuacan, 3 mi.N on Hwy 85	28-29-V-1984	Ratcliffe B.C.		DEUN-1
San Luis Potasí		Antiguo, Morelos, 31 mi.W.on Hwy.80	13-VII-1986	McCleve S.	2800', UV light	SMCC-1
Veracruz		Cordoba				ZMHB-2
Veracruz		Cordoba	16-V-1905	Fenyes A.E.		USNM-1
Veracruz		Cordoba	20-VII-1936	Seevers C.H.		FMNH-1
Veracruz		Cordoba	4-VIII-1965	Lau A.B.		USNM-1
Veracruz		El Palmar, 16 km.W.Tetzonapa	9-15-VI-1948	600', jungle, rubber, coffee		UAIC-1
Veracruz		Est.Biol.Los Tuxtlas	4-14-XI-1988	Mcjorada E.		UNAM-1
Veracruz		Fortin de las Flores	1-21-VI-1966	Ball & Whitehead 2900', blacklight		CUIC-1
Veracruz		Fortin de las Flores	7-12-VII-1974	Chemsak J.A.	1010m, light	EMEC-1
Veracruz		Toxpam			B.C.A.,Col., VII, *Ischyrus*	NHML-1
Veracruz		Toxpam			LECTOTYPE *I.septemsignatus*	NHML-1
Yucatan		Uxmal	16-18-VI-1959	Vaurie P.& C.		AMNH-1

Ischyrus undulatus Gorham

Panama:						
Canal Zone		Barro Colorado Island	1-9-V-1964	Duckworth		PESC-1
Canal Zone		Barro Colorado Island	20-23-V-1964	Duckworth		USNM-1
Canal Zone		Barro Colorado Island	15-27-V-1972	Erwin T.	light at field station	USNM-1
Canal Zone		Barro Colorado Island	11-VIII-1972	Wolda H.	lights	HPSC-1
Canal Zone		Barro Colorado Island	5-VI-1978	Wolda H.		HPSC-1
Canal Zone		Barro Colorado Island	12-V-1980	Wolda H.		UCDC-1
Canal Zone		Barro Colorado Island	4-VI-1980	Wolda H.		UCDC-1
Canal Zone		Barro Colorado Island	11-VIII-1980	Wolda H.		PESC-1
Canal Zone		Barro Colorado Island	1-4-XII-1984	Wolda H.	blacklight	UCDC-1
Canal Zone		Coco Solo Hospital, 9°21'N, 79°51'W, 9-VI-1972		Engleman		CSUC-1
Canal Zone		Frijoles	20-21-V-1981	Gill B.		CNCI-1
Canal Zone		Pantera Island	29-IV-1981	Kimsey R.B.		PESC-2
Canal Zone		Paraiso	1-V-1911	Schwarz E.A.		USNM-1
Chiriqui		Buguba			HOLOTYPE *I.undulatus*	NHML-1
Panama		Howard Air Force Base	21-V-1981	Turnbow R.H.		RHTC 1
Panama		Las Cumbres	26-VI-1975	Wolda H.		OSUC 1

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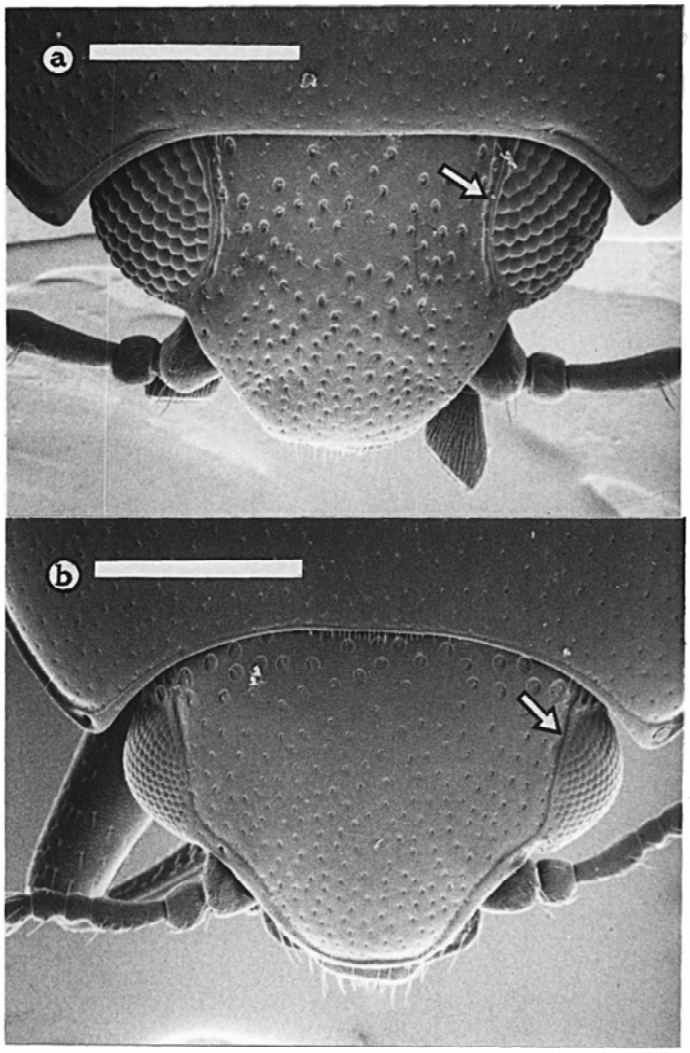


Figure 1. Dorsal view of heads showing eyes: a.) *Ischyrus q. quadripunctatus* (Olivier) with coarsely faceted eyes, line = 0.5 mm; b.) *Tritoma atriventris* Leconte with finely faceted eyes, line = 0.38 mm. The arrow points to the ocular stria.

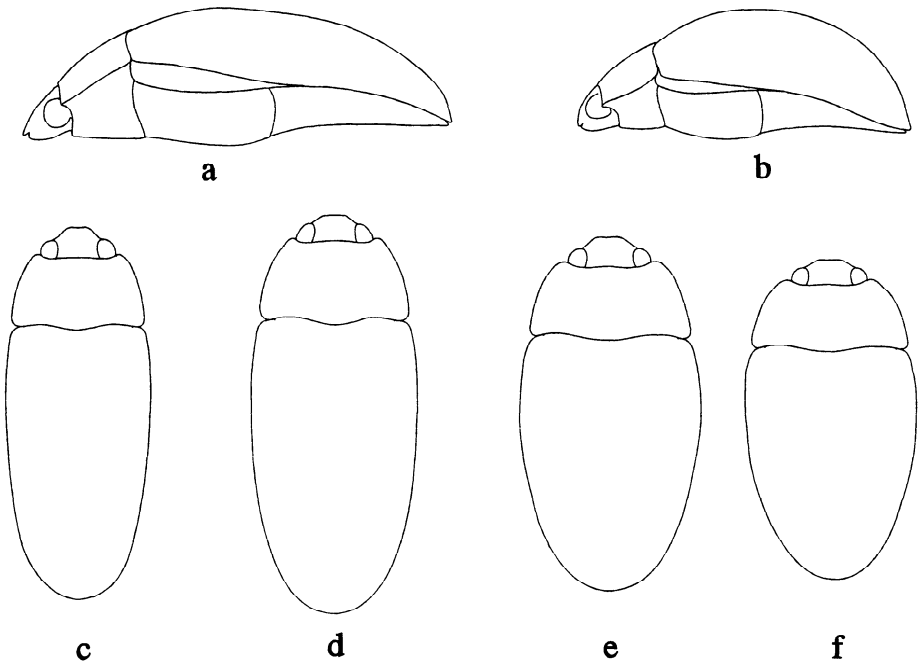


Figure 2. *Ischyrus* body shapes: a.) flattened; b.) convex; c.) parallel-sided; d.) elongate; e.) oval; f.) ovoid.

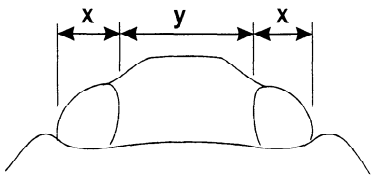


Figure 3. Diagrammatic head showing measurments used for ratio of head to eye width; head width between eyes = y/x times eye width.

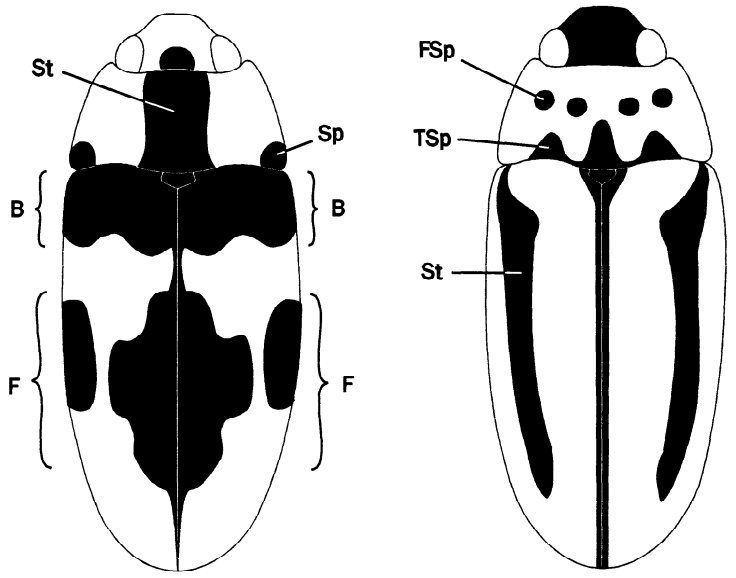


Figure 4. Diagrammatic representation of color pattern terms: B = band, F = fascia, FSp = free spot, Sp = spot, St = stripe, TSp = tooth-like spot.

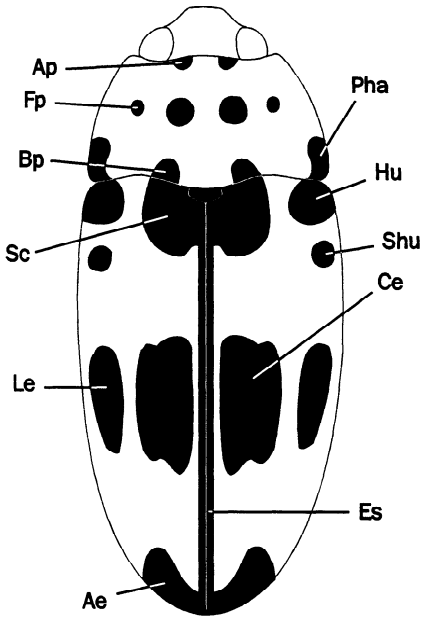


Figure 5. Diagrammatic representation of a generalized color pattern indicating spot names: Ae = apical elytral, Ap = anterior pronotal, Bp = basal pronotal, Ce = central elytral, Es = elytral suture, Fp = free pronotal, Hu = humeral, Le = lateral elytral, Pha = pronotal hind angle, Shu = subhumeral, Sc = scutellar, SC + Hu = basal elytral band, Ce + Le = central elytral band.

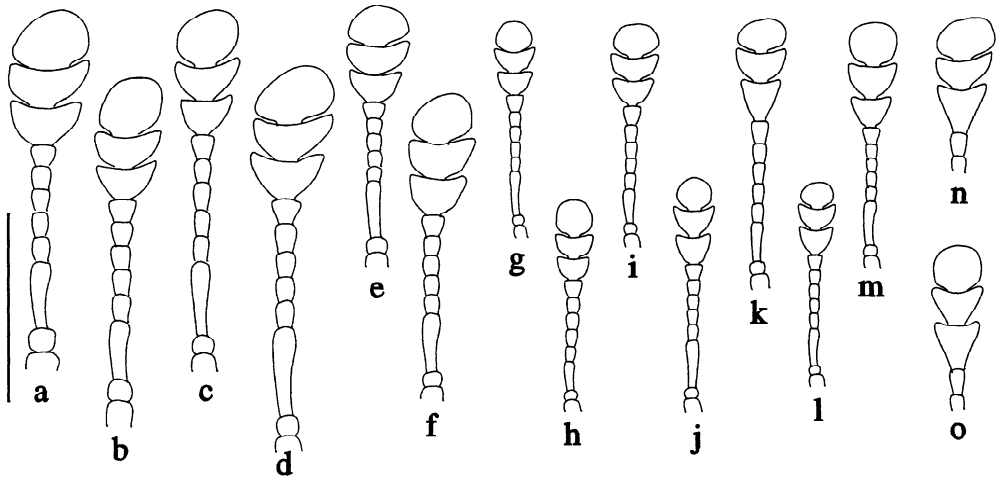
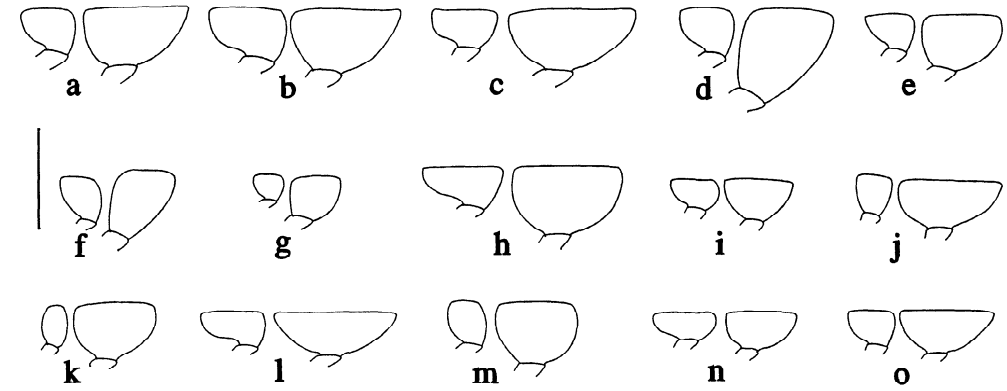


Figure 6. Antennae, line = 1.0 mm: a.) *Ischyrus distinguendus* Lacordaire; b.) *I. celatus* n. sp.; c.) *I. insolens* Crotch; d.) *I. bogotae* Crotch; e.) *I. angularis* Lacordaire; f.) *I. q. quadripunctatus* (Olivier); g.) *I. putei* n. sp.; h.) *I. sapphirus* n. sp.; i.) *I. impressus* n. sp.; j.) *I. monochromatus* n. sp.; k.) *I. audbalus* n. sp.; l.) *I. mystacis* n. sp.; m.) *I. pyropodus* n. sp.; n.) *Megischyrus zonalis* (Lacordaire); o.) *Megischyrus* sp.



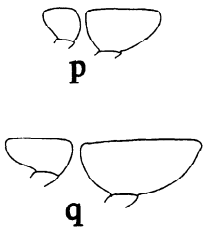


Figure 7. Terminal segments of labial palp (left) and maxillary palp (right), line = 0.33 mm: a.) *Ischyrus distinguendus* Lacordaire; b.) *I. celatus* n. sp.; c.) *I. insolens* Crotch; d.) *I. bogotae* Crotch; e.) *I. septemsignatus* Gorham; f.) *I. q. quadripunctatus* (Olivier); g.) *I. putei* n. sp.; h.) *I. undulatus* Gorham; i.) *I. sapphirus* n. sp.; j.) *I. impressus* n. sp.; k.) *I. parallelus* n. sp.; l.) *I. monochromatus* n. sp.; m.) *I. aleator* Boyle; n.) *I. audbalus* n. sp.; o.) *I. mystacis* n. sp.; p.) *I. ephippiatus* Gorham; q.) *I. tripunctatus* Crotch.

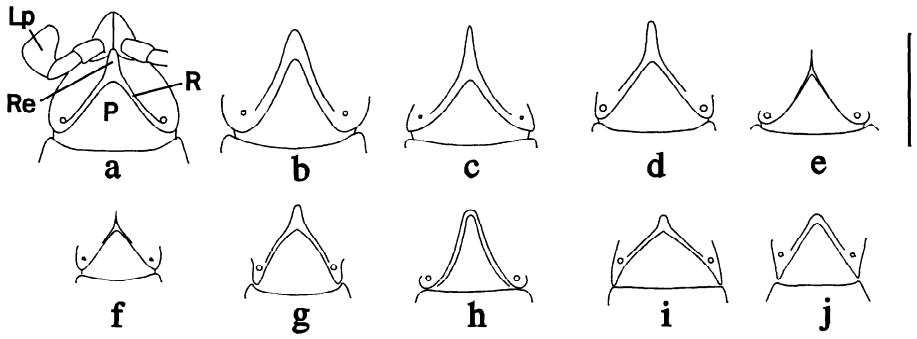


Figure 8. Menta, line = 0.33 mm: a.) *Ischyrus distinguendus* Lacordaire; b.) *I. celatus* n. sp.; c.) *I. insolens* Crotch; d.) *I. bogotae* Crotch; e.) *I. putei* n. sp.; f.) *I. sapphirus* n. sp.; g.) *I. impressus* n. sp.; h.) *I. monochromatus* n. sp.; i.) *I. aleator* Boyle; j.) *I. ephippiatus* Gorham; Lp = labial palp, P = mental plate, R = mental ridge, Re = mental ridge medial extension.

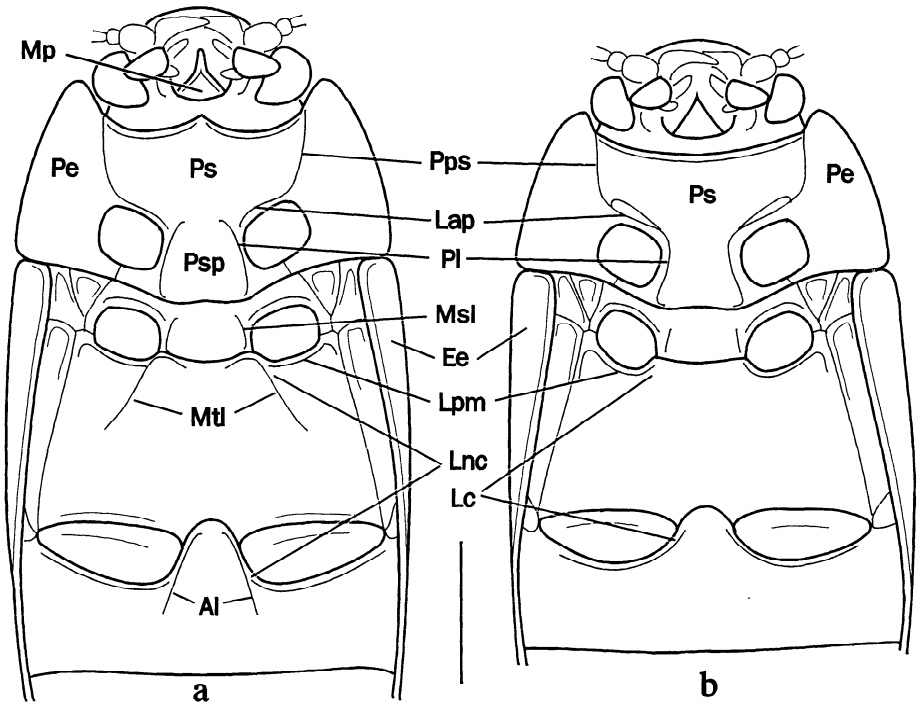


Figure 9. Ventral view of a.) *Ischyrus proximus* Lacordaire and b.) *I. audbalus* n. sp., line = 1.0 mm: Al = abdominal coxal line, Ee = epipleural fold of elytron, Lap = prosternal line anterior to procoxa, Lc = coxal line continuous around coxa, Lnc = coxal line not continuous around coxa, Lpm = metasternal line posterior to mesocoxa, Mp = mental plate, Msl = mesocoxal line, Mtl = metacoxal line, Pe = pronotal epipleuron, Pl = procoxal line, Pps = prosternal-pronotal epipleural suture, Ps = prosternum, Psp = prosternal plate.

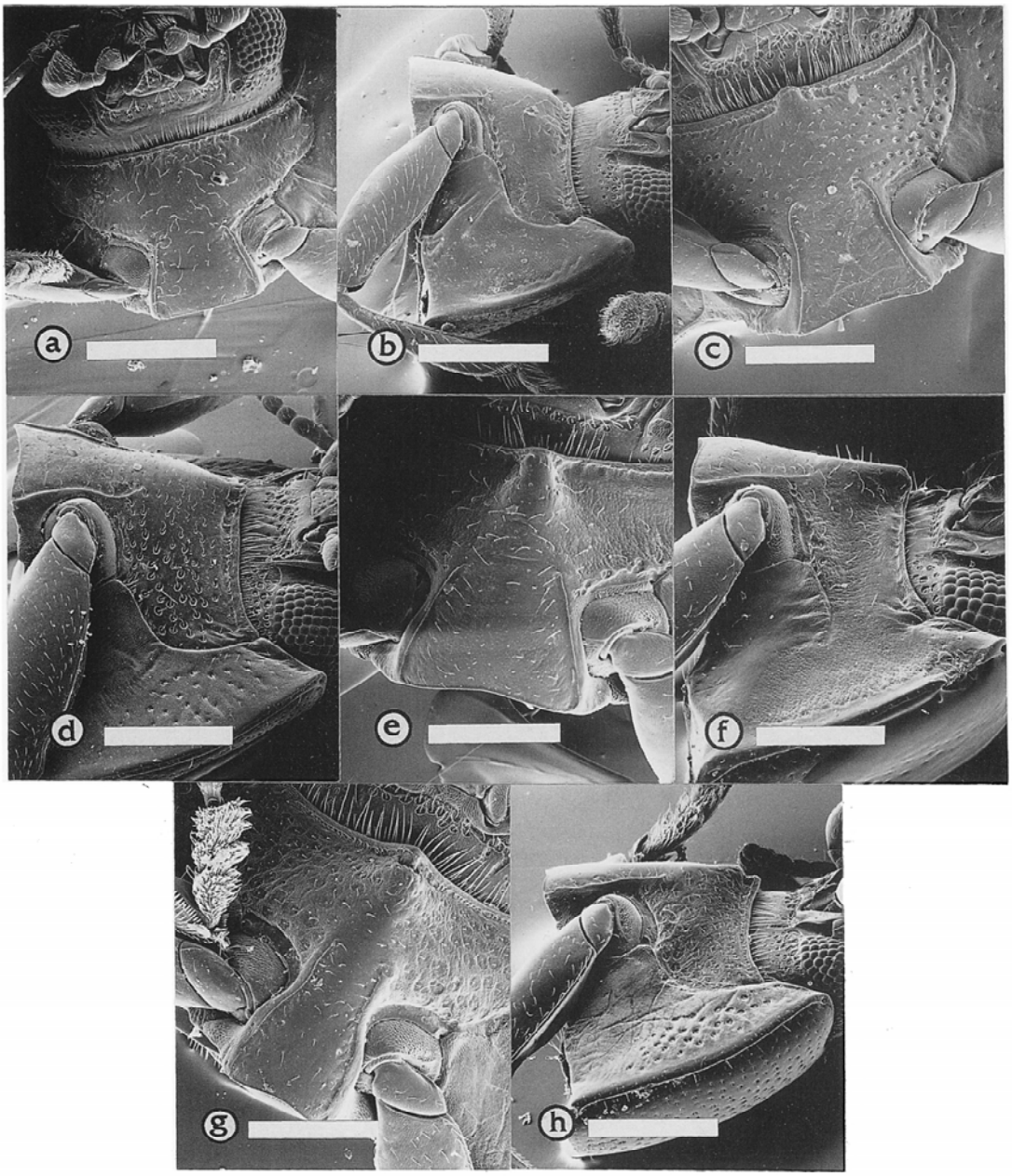


Figure 10. Prosternal development: a.) ventral and b.) lateral view of *Ischyrus aleator* Boyle [Mexico, Sonora] prothorax lacking anterior pinch, line = 0.60 mm; c.) ventral and d.) lateral view of *I. q. quadripunctatus* (Olivier) [USA, FL] prothorax with weakly developed prosternal keel and pinch, line = 0.60 mm; e.) ventral and f.) lateral view of *I. scutellaris* Gorham [Mexico, Yucatan] prothorax with strong keel and pinch, line = 0.40 mm; g.) ventral and h.) lateral view of *I. parallelus* n. sp. [Panama] prothorax with prosternal keel swollen above pinch, line = 0.44 mm.

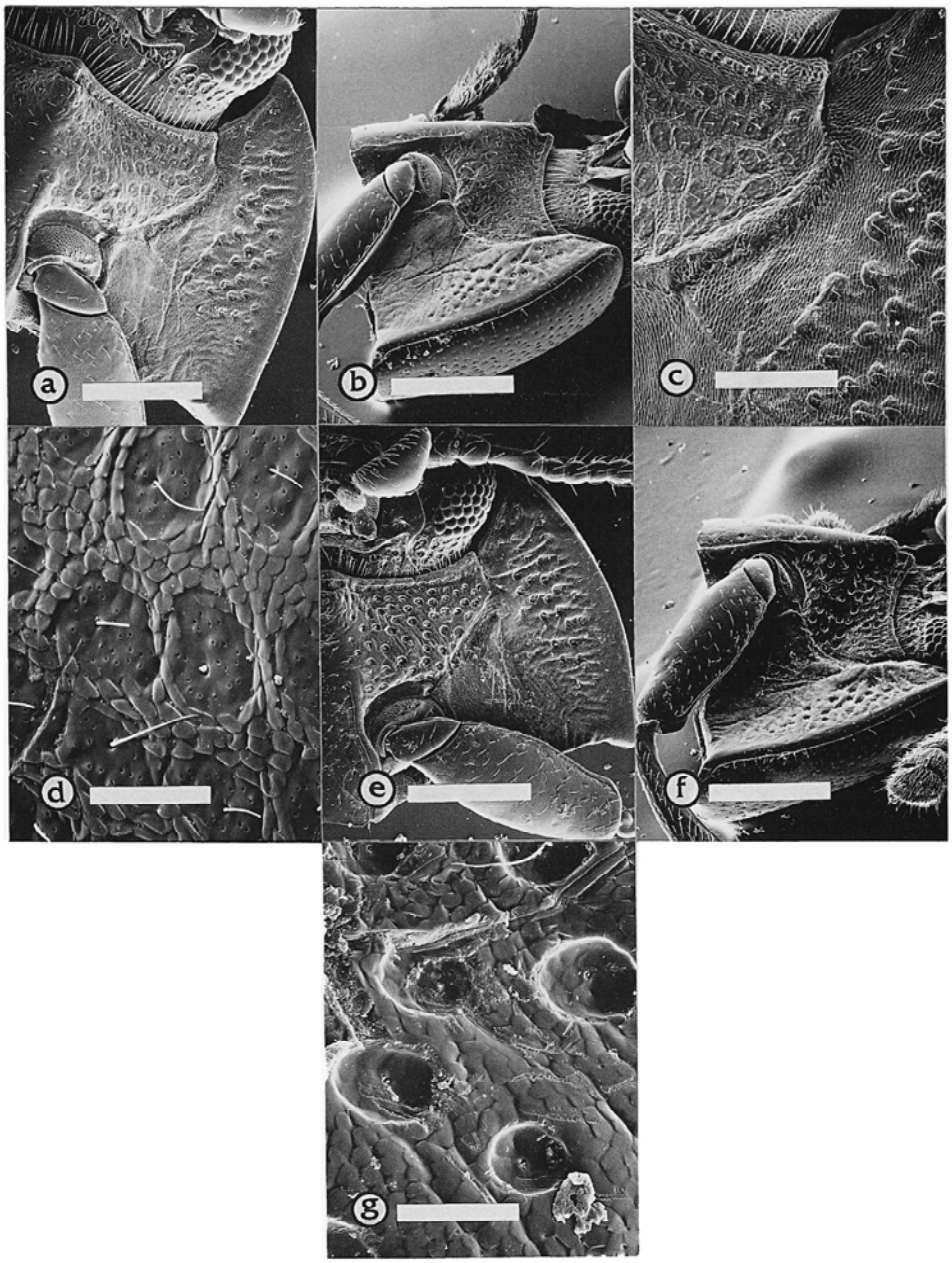


Figure 11. Prosternal sexual dimorphism in puncture development. Male *Ischyrus parallelus* n. sp. [Panama] prosternum: a.) ventral view, line = 0.38 mm; b.) lateral view, line = 0.50 mm; c.) ventral view of prosternal-pronotal epipleural suture, line = 0.17 mm; d. prosternal punctures in front of procoxa, line = 0.04 mm. Female *I. parallelus* n. sp. [Panama] prosternum: e.) ventral view, line = 0.43 mm; f.) lateral view, line = 0.50 mm; g.) prosternal punctures in front of procoxa, line = 0.04 mm.

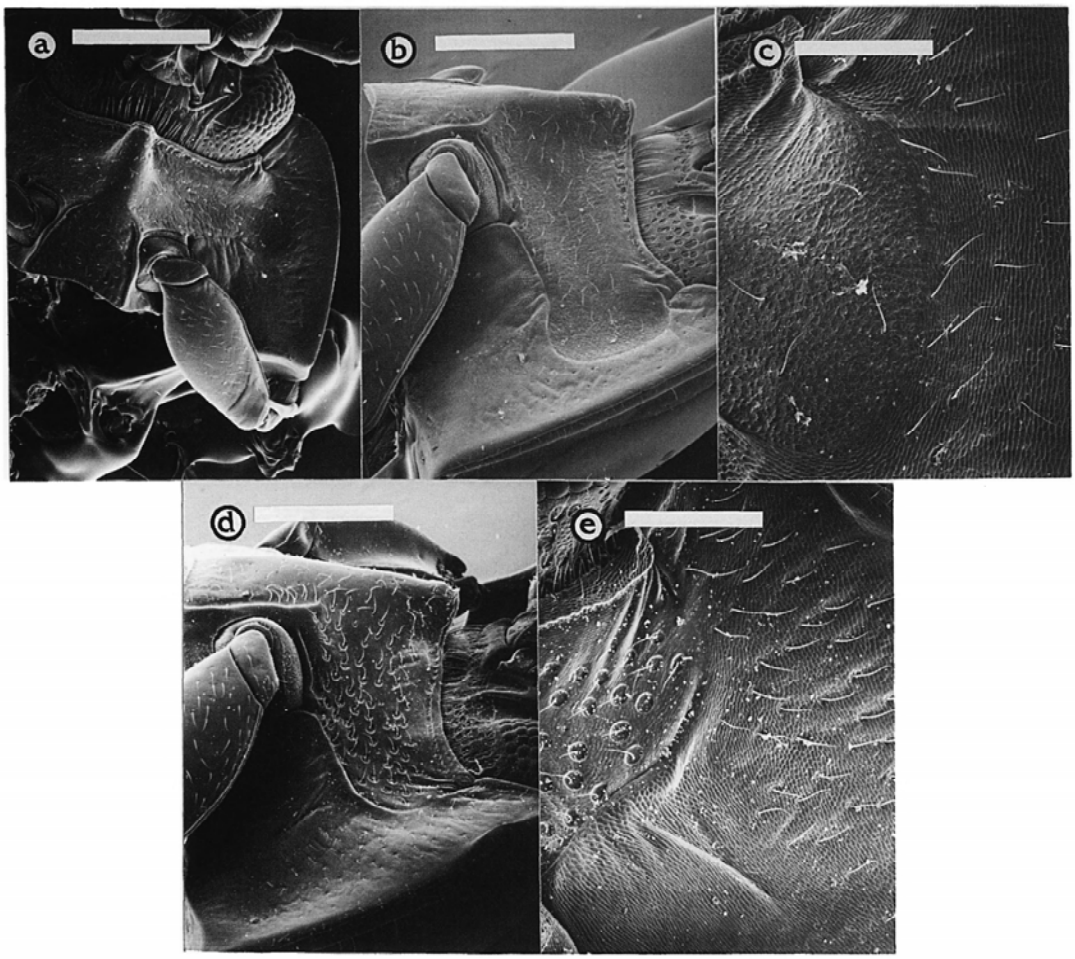


Figure 12. Prosternal sexual dimorphism in puncture development and lateral expansion. Male *Ischyrus incertus* Lacordaire [Mexico, Chiapas] prosternum: a.) ventral view, line = 0.75 mm; b.) lateral view, line = 0.50 mm; c.) ventral view of laterally expanded prosternal-pronotal epipleural suture, line = 0.17 mm. Female *I. incertus* Lacordaire [Panama] prosternum: d.) lateral view, line = 0.50 mm; e.) ventral view of prosternal-pronotal epipleural suture, line = 0.25 mm.

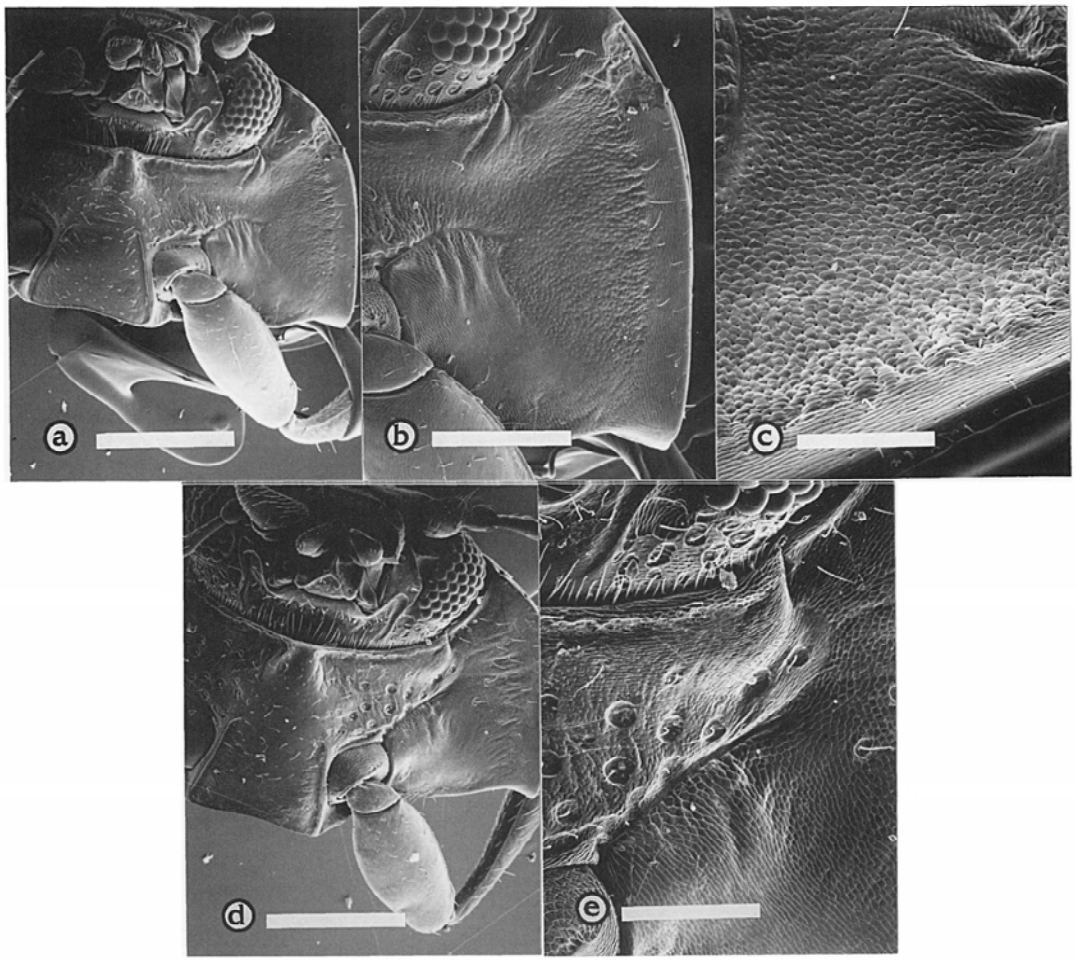


Figure 13. Prosternal sexual dimorphism in puncture development and lateral expansion. Male *Ischyrus scutellaris* Gorham [Mexico, Yucatan] prosternum: a.) ventral view, line = 0.60 mm; b.) ventral view, line = 0.30 mm; c.) lateral view of prosternal expansion, line = 0.12 mm. Female *I. scutellaris* Gorham [Mexico, Yucatan] prosternum: d.) ventral view, line = 0.50 mm; e.) ventral view of prosternal-pronotal epipleural suture, line = 0.17 mm.

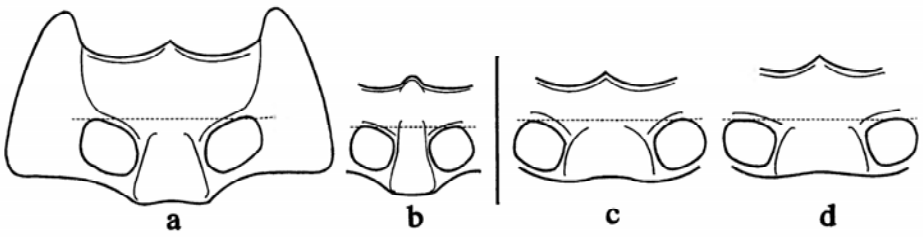


Figure 14. Prosternal plates showing procoxal line shapes and anterior development, line = 1.0 mm: a.) *Ischyrus proximus* Lacordaire, barely surpassing coxa; b.) *I. parallelus* n. sp., parallel-sided and surpassing coxa; c.) *I. monochromatus* n. sp., semicircular and barely surpassing coxa; d.) *I. duponti* Lacordaire, not surpassing coxa. A dashed line is included for reference to the anterior edge of the procoxae in determining the length of the procoxal line.

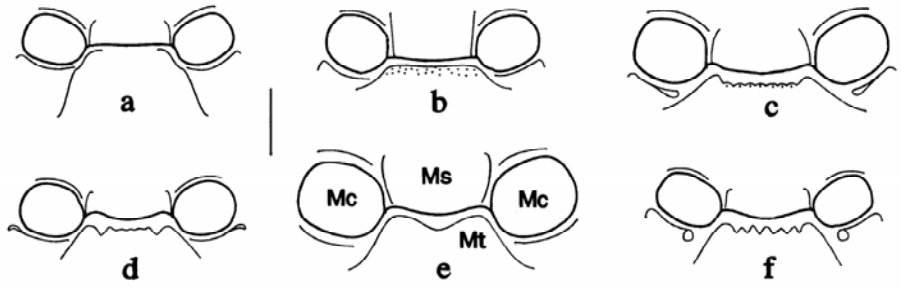


Figure 15. Meso and metasterna showing coxal line development, line = 0.5 mm.: a.) *Ischyrus auriculatus* Lacordaire, not recurved nor meeting at middle; b.) *I. aleator* Boyle, not recurved and meeting at middle; c.) *I. undulatus* Gorham, recurved and meeting at middle; d.) *I. ichnus* n. sp.; e.) *I. distinguendus* Lacordaire, Mc = mesocoxa, Ms = mesosternum, Mt = metasternum; f.) *I. putei* n. sp.

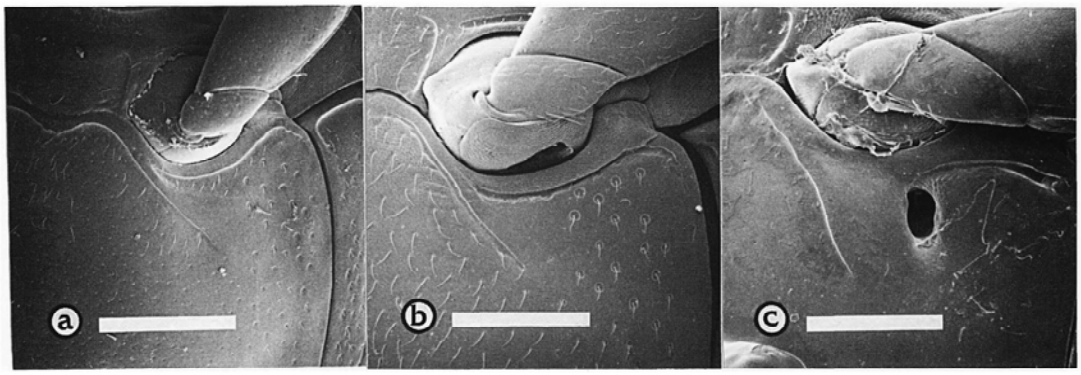


Figure 16. Metasternal lines posterior to mesocoxae: a.) simple line on *Ischyrus proximus* Lacordaire [Mexico, Chiapas], line = 0.75 mm; b.) groove on *I. q. quadripunctatus* (Olivier) [USA, FL], line = 0.38 mm; c.) groove with pit at the medial end on *I. putei* n. sp. [Panama], line = 0.28 mm.

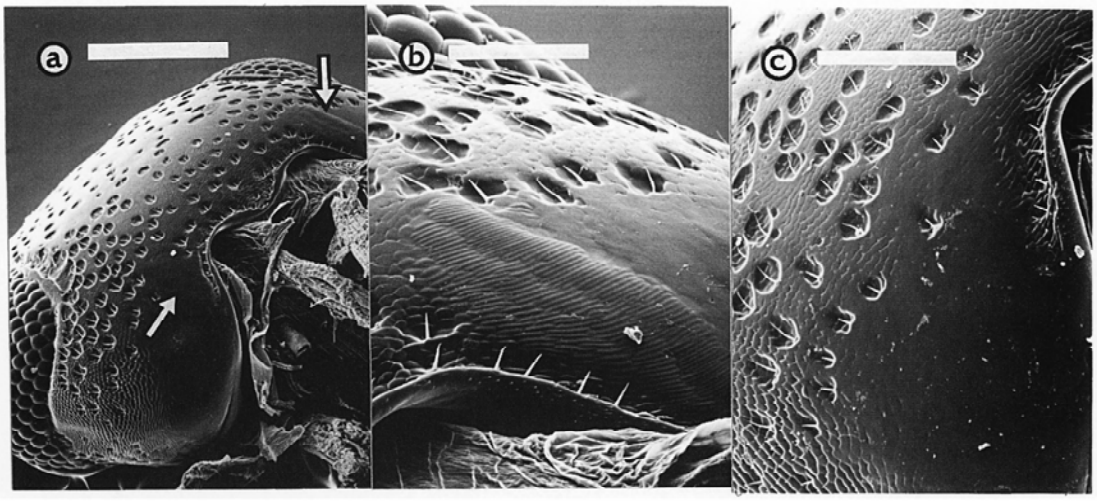


Figure 17. *Ischyrus q. quadripunctatus* (Olivier) [USA, FL] occiptial region of head showing stridulatory files (arrow): male with stridulatory file, a.) line = 0.38 mm, b.) line = 0.08 mm; c.) female lacking stridulatory file, line = 0.15 mm.

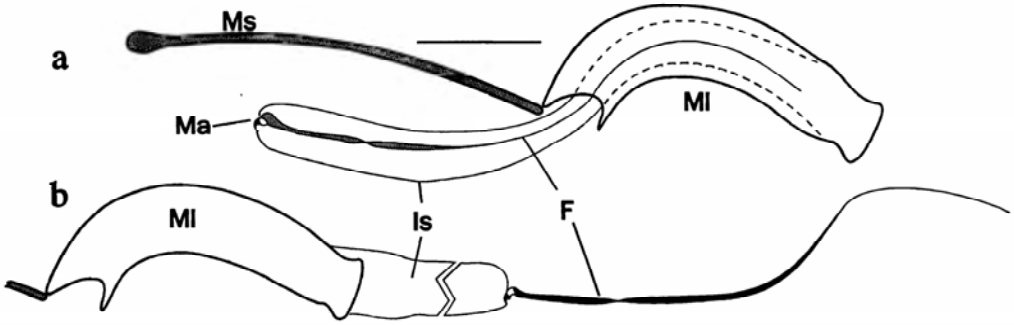


Figure 18. Male genitalia of *Ischyrus q. quadripunctatus* (Olivier), line = 0.66 mm: a.) internal sac invaginated as held within the body; b.) internal sac and flagellum everted as during copulation; F = flagellum, Is = internal sac, Ma = sclerite for muscle attachment at anterior end of flagellum, Ml = median lobe, Ms = median strut.

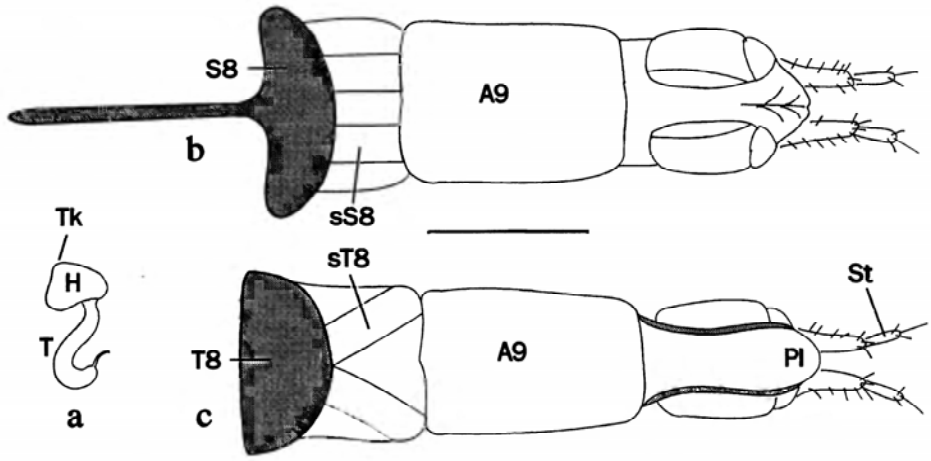


Figure 19. Female genitalia of *Ischyrus q. quadripunctatus* (Olivier), line = 1.0 mm: a.) spermatheca; b.) ventral view; c.) dorsal view; A9 = abdominal segment IX, H = head of spermatheca, Pl = proctigeral lobe, S8 = abdominal ventrite VIII, sS8 = straps appendant to abdominal ventrite VIII, sT8 = straps appendant to abdominal tergite VIII, St = styli, T8 = abdominal tergite VIII, T = tail of spermatheca, Tk = top-knot on head of spermatheca.

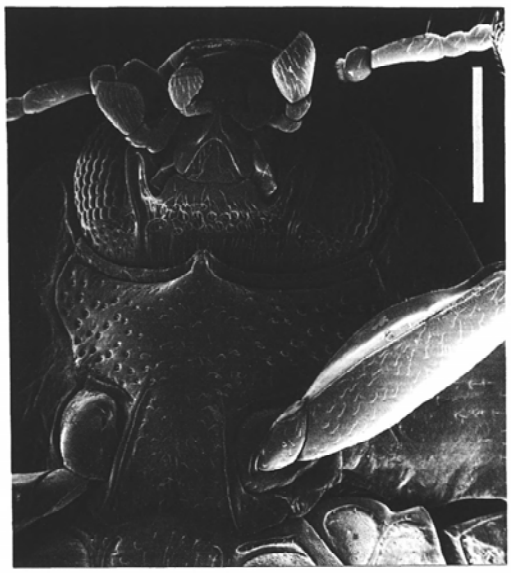


Figure 20. Ventral view of *Ischyrus q. quadripunctatus* (Olivier) [USA, FL] head and prosternum, line = 0.50 mm.

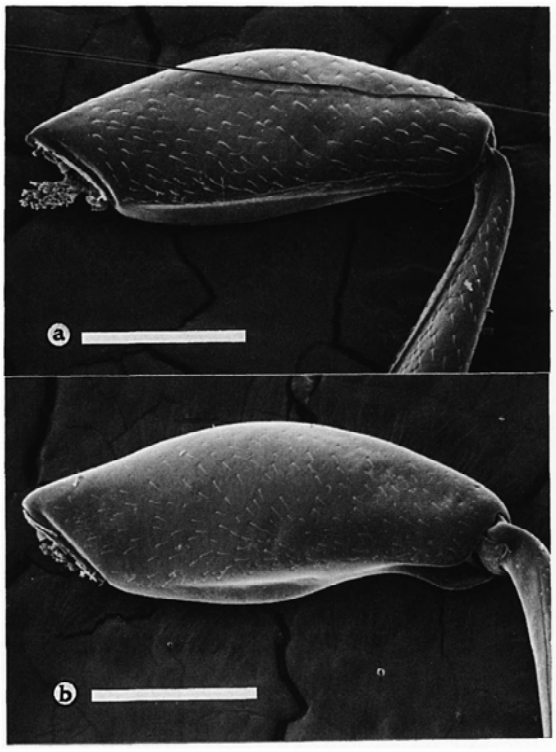


Figure 21. Ventral view of meso-femur: a.) *Ischyrus q. quadripunctatus* (Olivier) [USA, FL] with posterior margin, line = 0.50 mm; b.) *Epytus flavitarsis* (Lacordaire) [Cuba] lacking posterior margin, line = 0.60 mm.

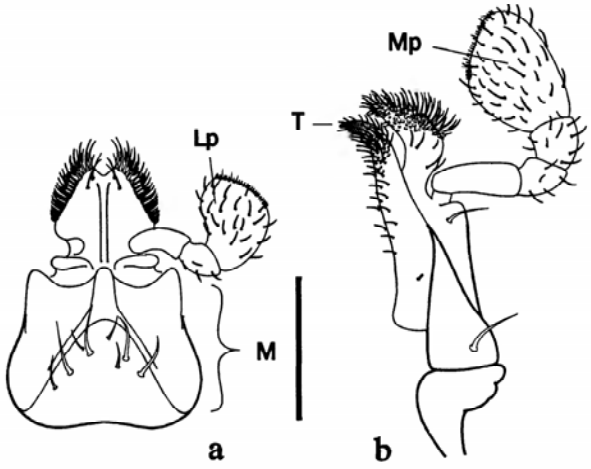
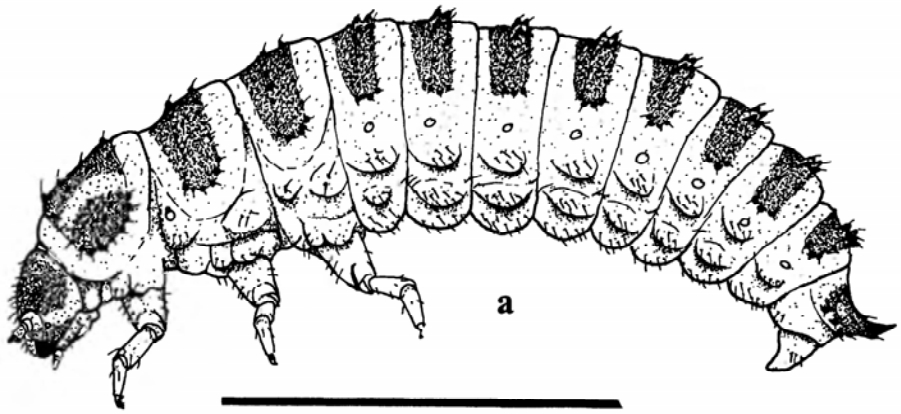


Figure 22. Adult *Ischyrus q. quadripunctatus* (Olivier) a.) labium and b.) left maxilla ventral view, line = 0.25 mm: M = mentum, Lp = labial palp, Mp = maxillary palp, T = bifid tooth of lacinia.



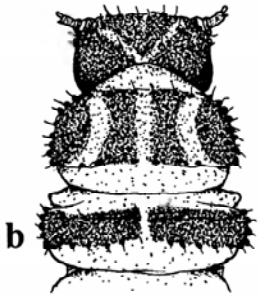
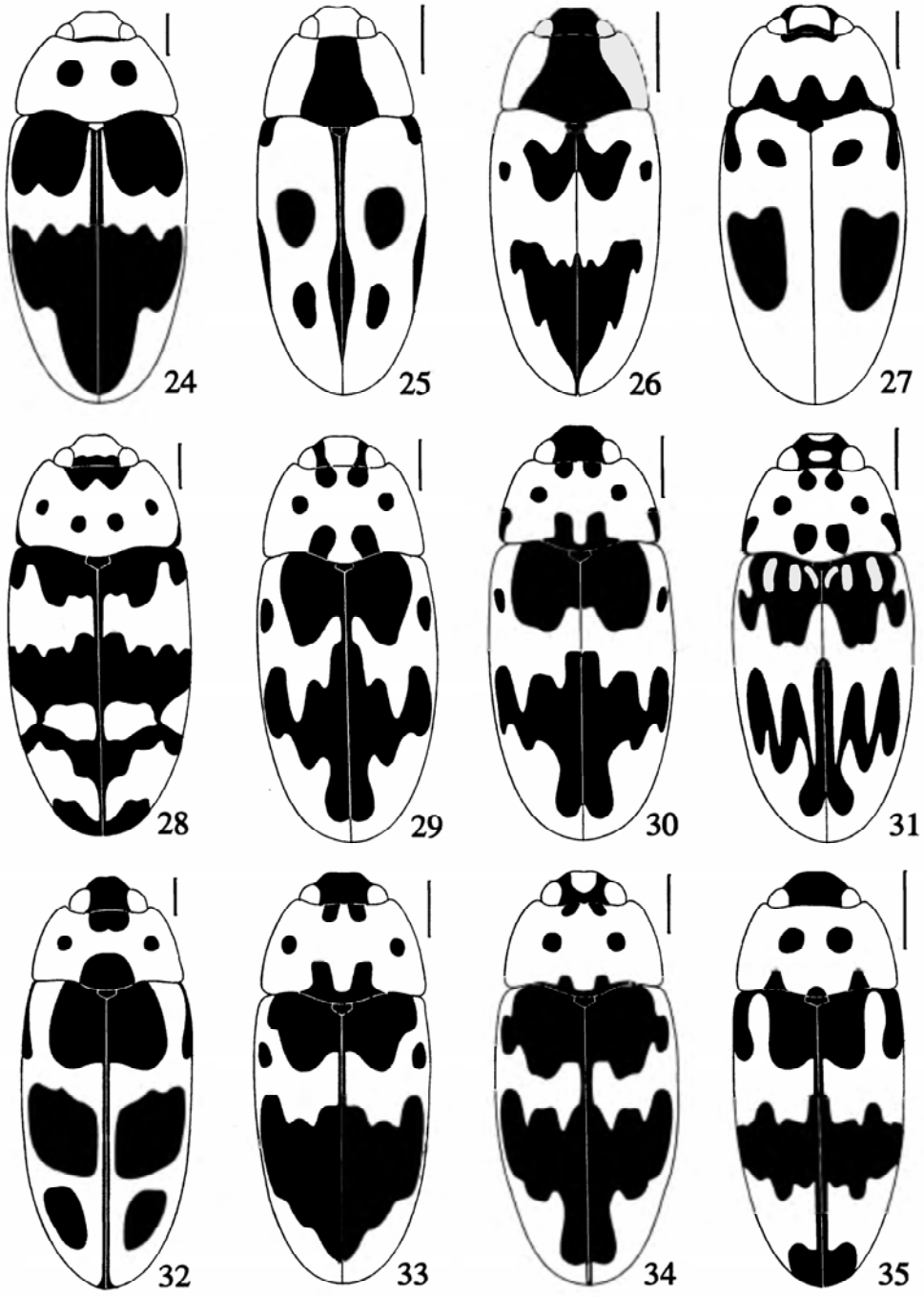
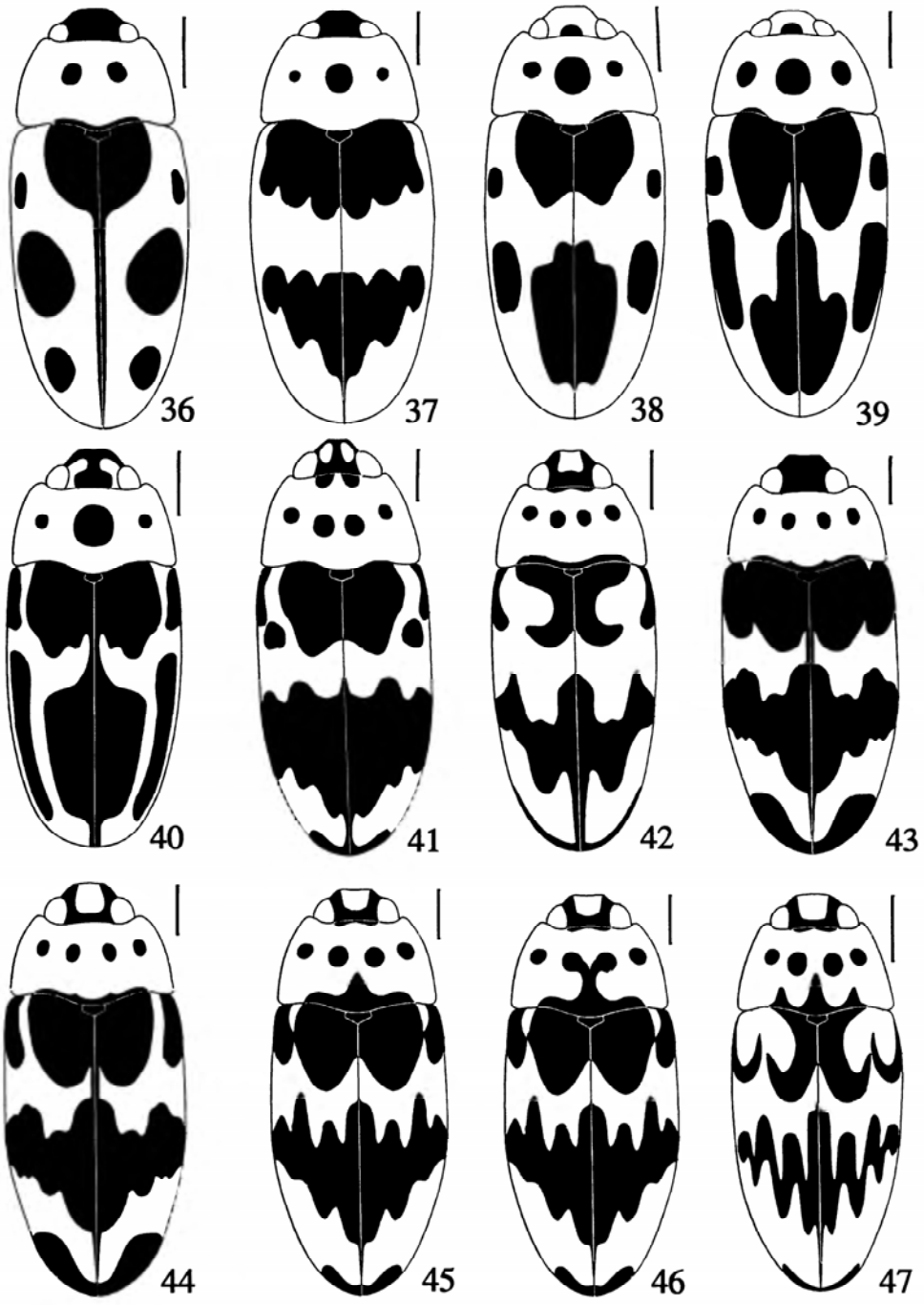


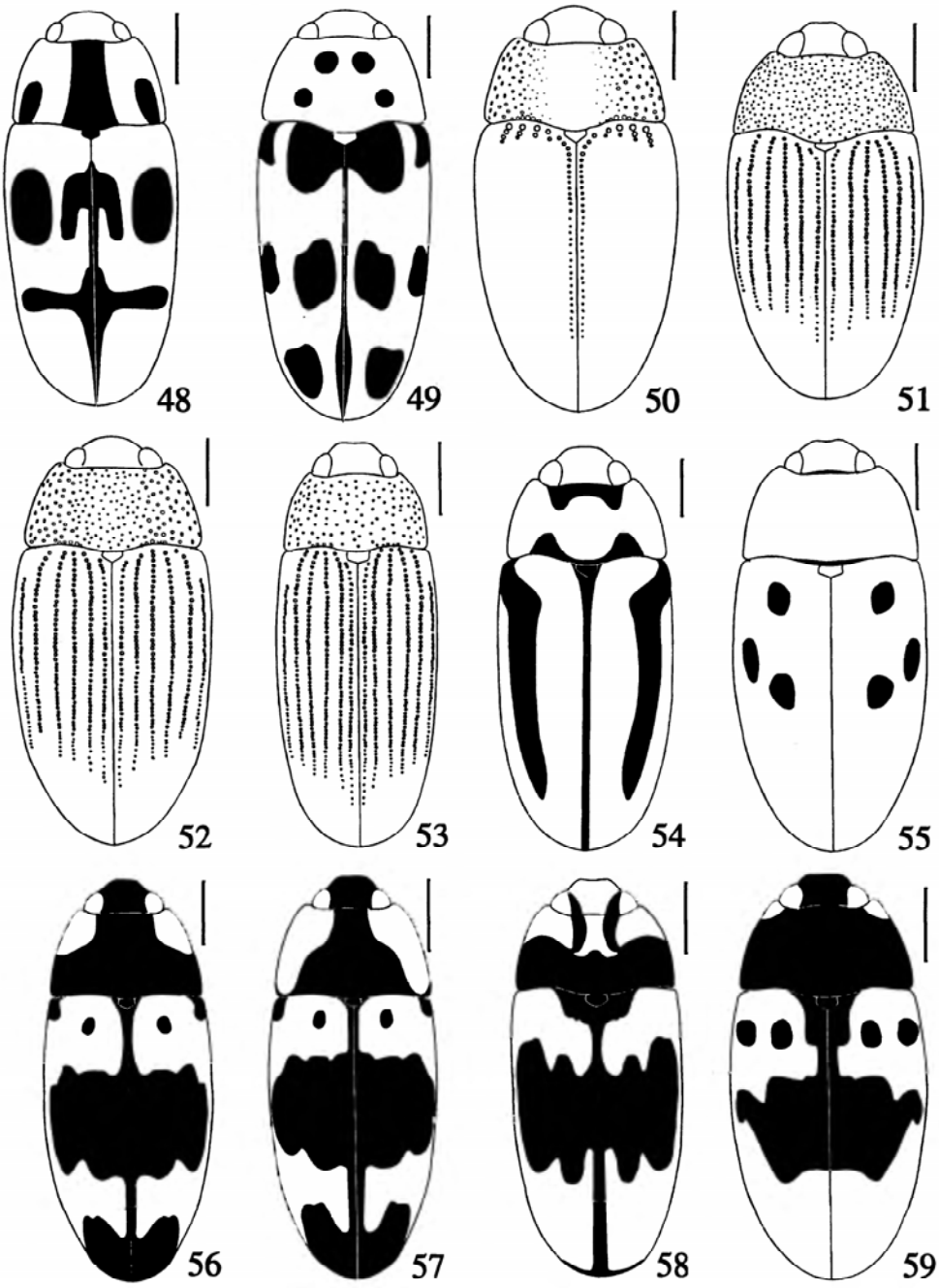
Figure 23. *Ischyrus q. quadripunctatus* (Olivier) larva [USA, FL], line = 4.0 mm.; a.) lateral view; b.) dorsal view of head and thorax.



Figures 24-35. Dorsal habitus, line = 1.0 mm: 24.) *Ischyrus vespertilio* Lacordaire; 25.) *I. audbalus* n. sp.; 26.) *I. celatus* n. sp.; 27.) *I. distinguendus* Lacordaire; 28.) *I. insolens* Crotch; 29.) *I. scriptus* (Olivier) "northern"; 30.) *I. scriptus* (Olivier) "southern"; 31.) *I. scriptus* (Olivier) "southern"; 32.) *I. bogotae* Crotch; 33.) *I. incertus* Lacordaire; 34.) *I. proximus* Lacordaire; 35.) *I. angularis* Lacordaire.



Figures 36-47. Dorsal habitus, line = 1.0 mm: 36.) *Ischyrus septemsignatus* Gorham; 37.) *I. tripunctatus* Crotch; 38.) *I. frontalis* Lacordaire; 39.) *I. frontalis* var.; 40.) *I. dunedinensis* Blatchley; 41.) *I. boucardi* Crotch; 42.) *I. quadripunctatus chiasticus* Boyle; 43-47.) *I. quadripunctatus quadripunctatus* (Olivier), 43.) *I. q. q. "quadripunctatus"*, 44.) *I. q. q. "graphicus"*, 45.) *I. q. q. "subcylindricus"*, 46. I. q. q. "antillean", 47.) I. q. q. "banded-leg".



Figures 48-59. Dorsal habitus, line = 1.0 mm: 48.) *Ischyrus putei* n. sp.; 49.) *I. undulatus* Gorham; 50.) *I. sapphirus* n. sp.; 51.) *I. monochromatus* n. sp.; 52.) *I. impressus* n. sp.; 53.) *I. parallelus* n. sp.; 54.) *I. aleator* Boyle; 55.) *I. parcarum* n. sp.; 56.) *I. auriculatus* Lacordarie; 57.) *I. auriculatus* var.; 58.) *I. ephippiatus* Gorham; 59.) *I. mystacis* n. sp.

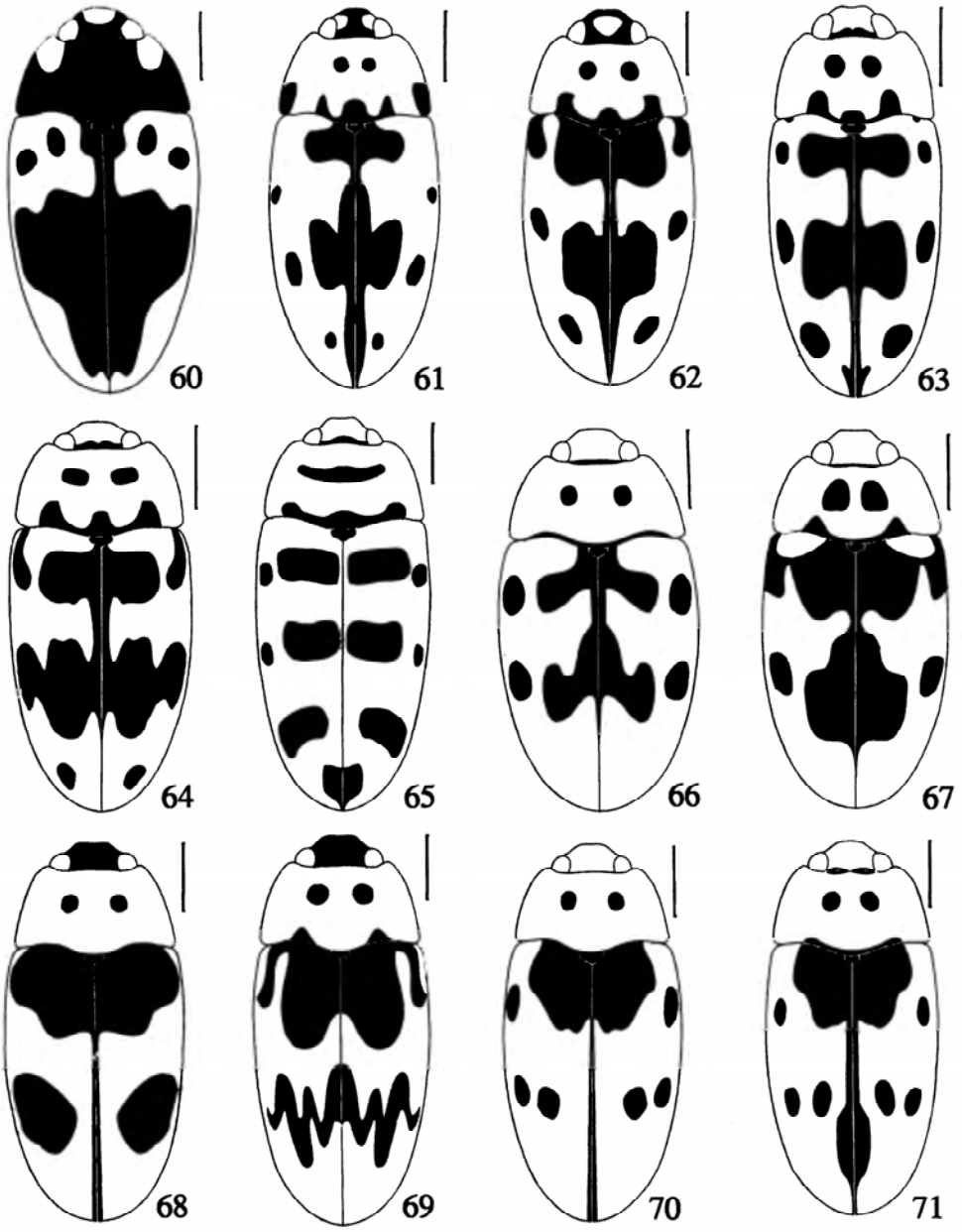
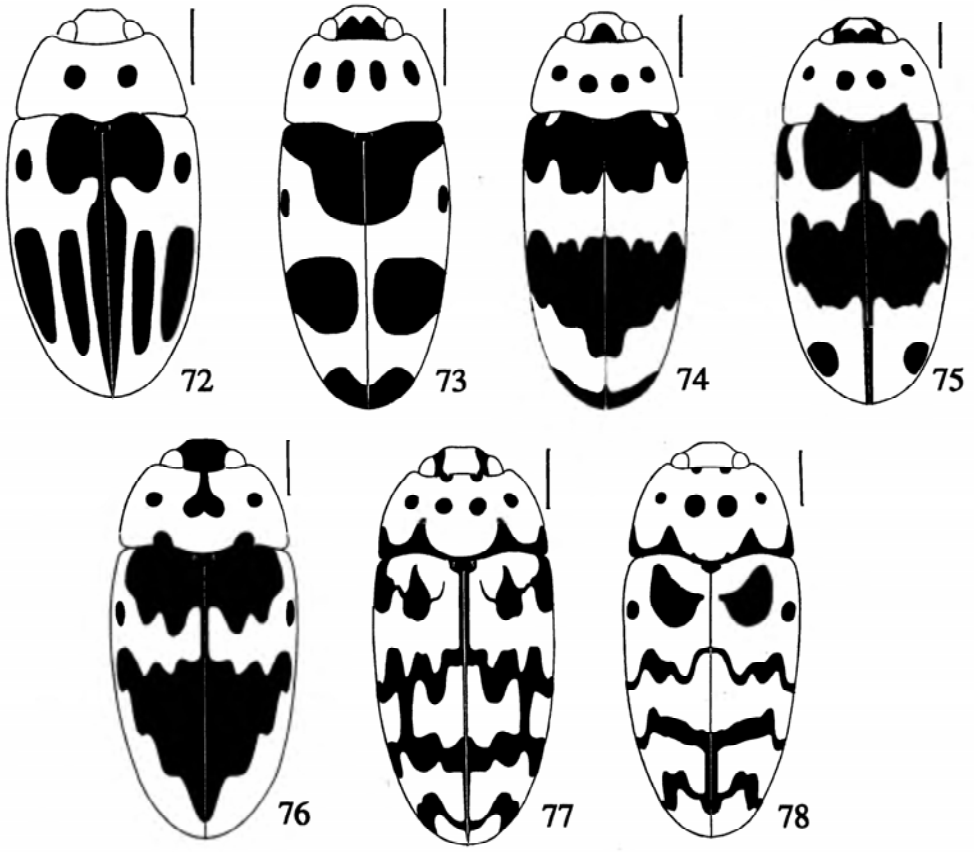
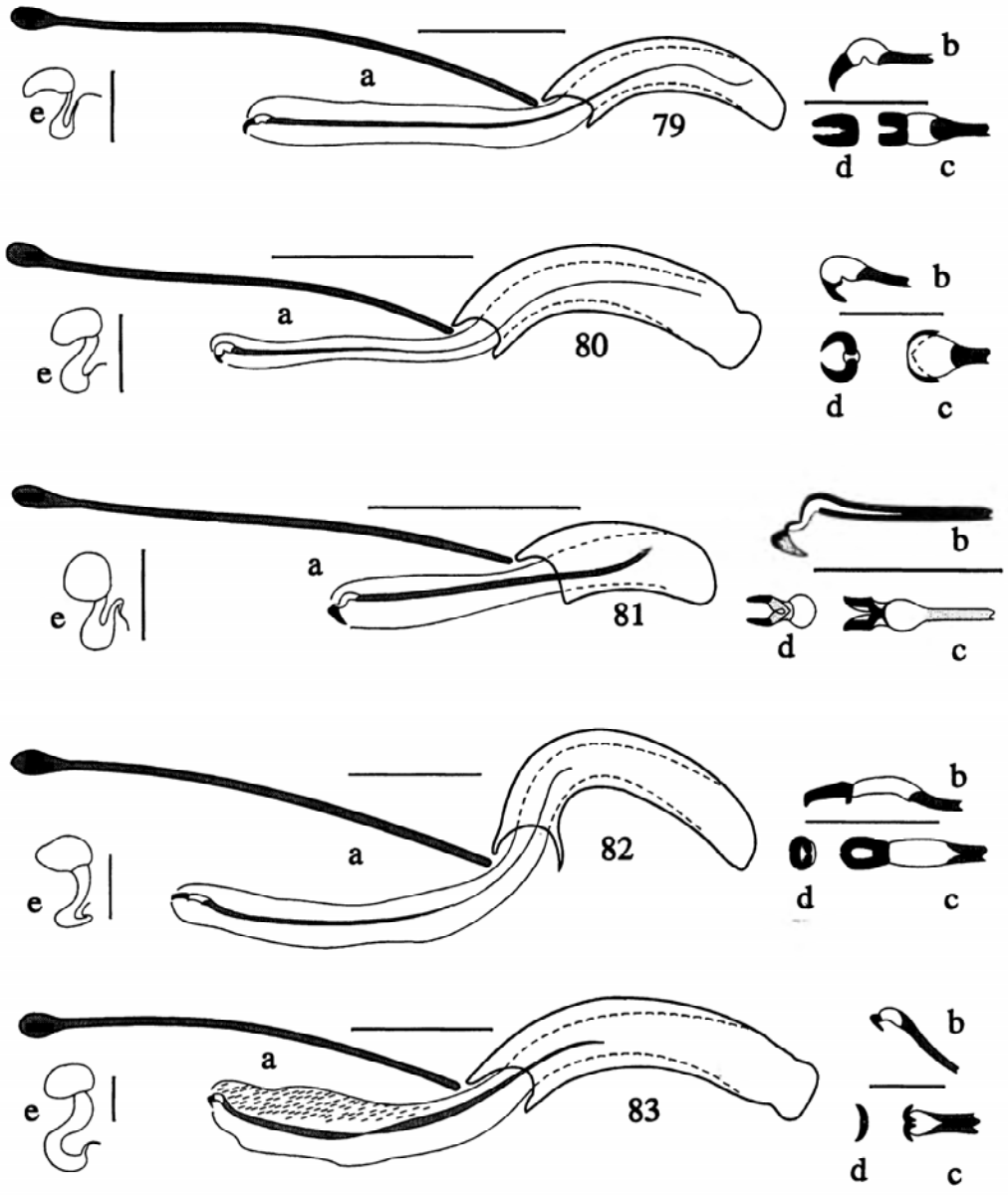


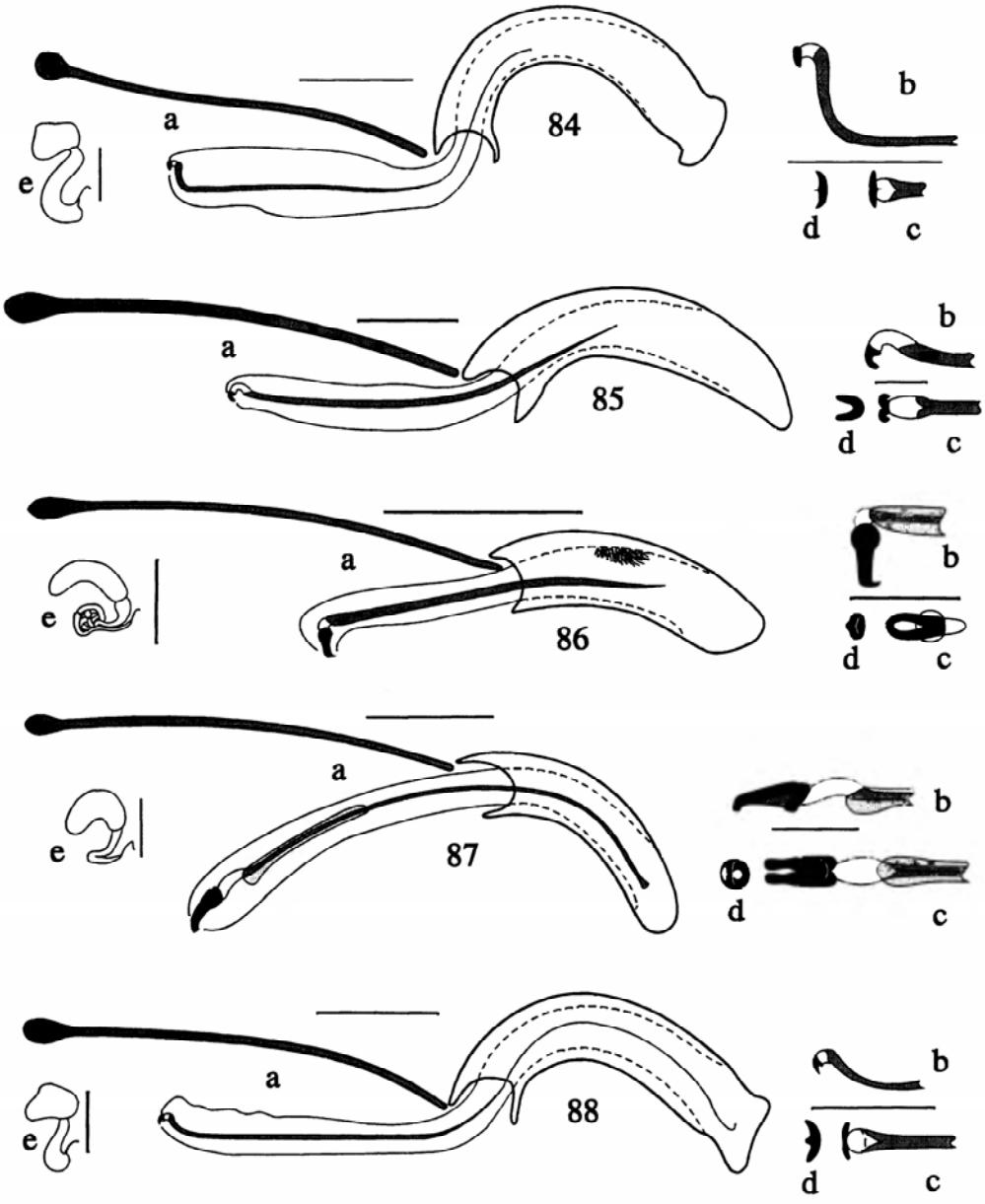
Figure 60-71. Dorsal habitus, line = 1.0 mm: 60.) *Ischyrus mimus* n. sp.; 61.) *I. poseidon* n. sp.; 62.) *I. pictus* Gorham; 63.) *I. pictus* var.; 64.) *I. episcaphulinus* Gorham; 65.) *I. collatinus* Crotch; 66.) *I. elegantulus* Lacordaire; 67.) *I. elegantulus* var.; 68.) *I. chacojae* Gorham; 69.) *I. chacojae* var.; 70.) *I. scutellaris* Gorham; 71.) *I. scutellaris* var.



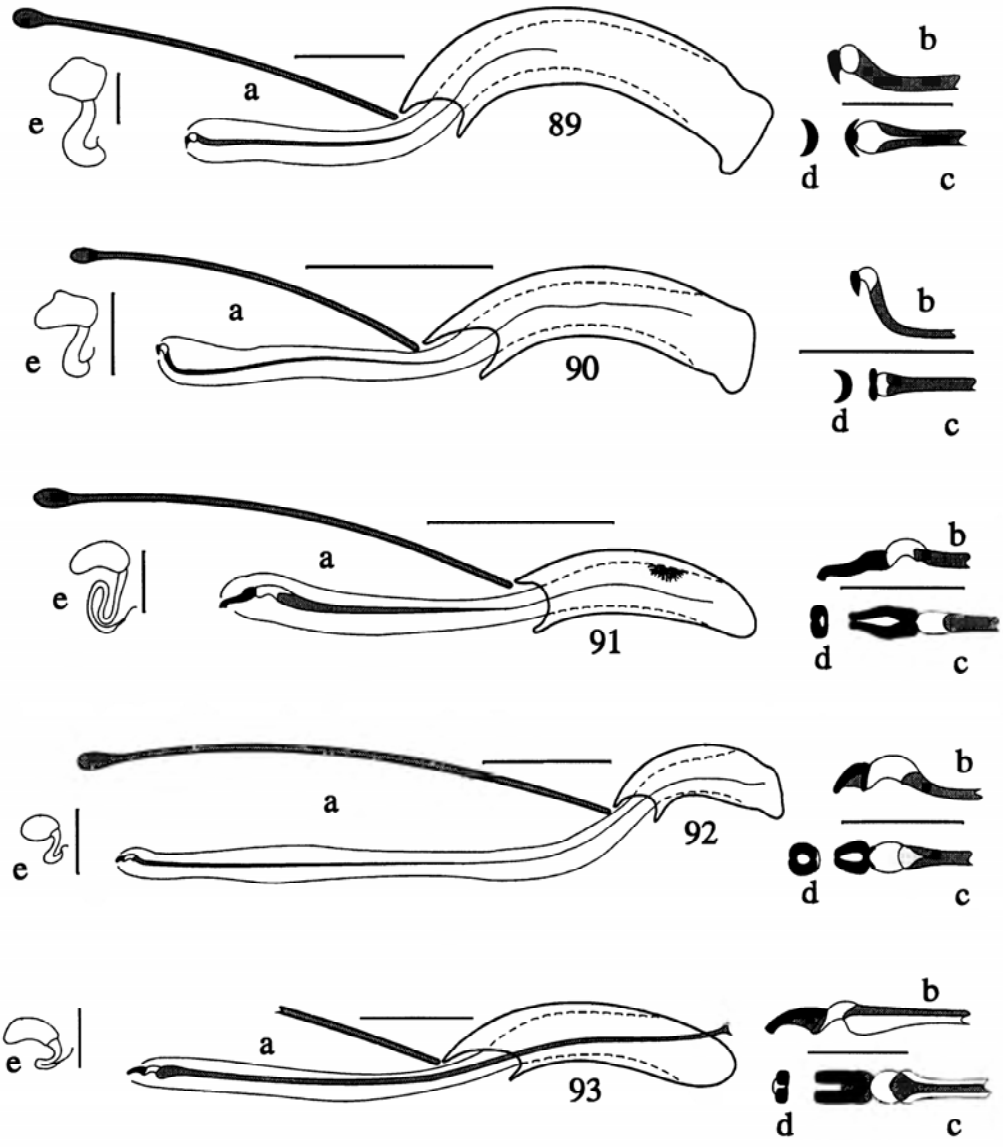
Figures 72-78. Dorsal habitus, line = 1.0 mm: 72.) *Ischyrus malleus* n. sp.; 73.) *I. ichnus* n. sp.; 74.) *I. tetrasticus* Gorham; 75.) *I. pyropodus* n. sp.; 76.) *I. cordiformis* n. sp.; 77.) *I. fulmineus* Delkeskamp; 78.) *I. erosus* n. sp.



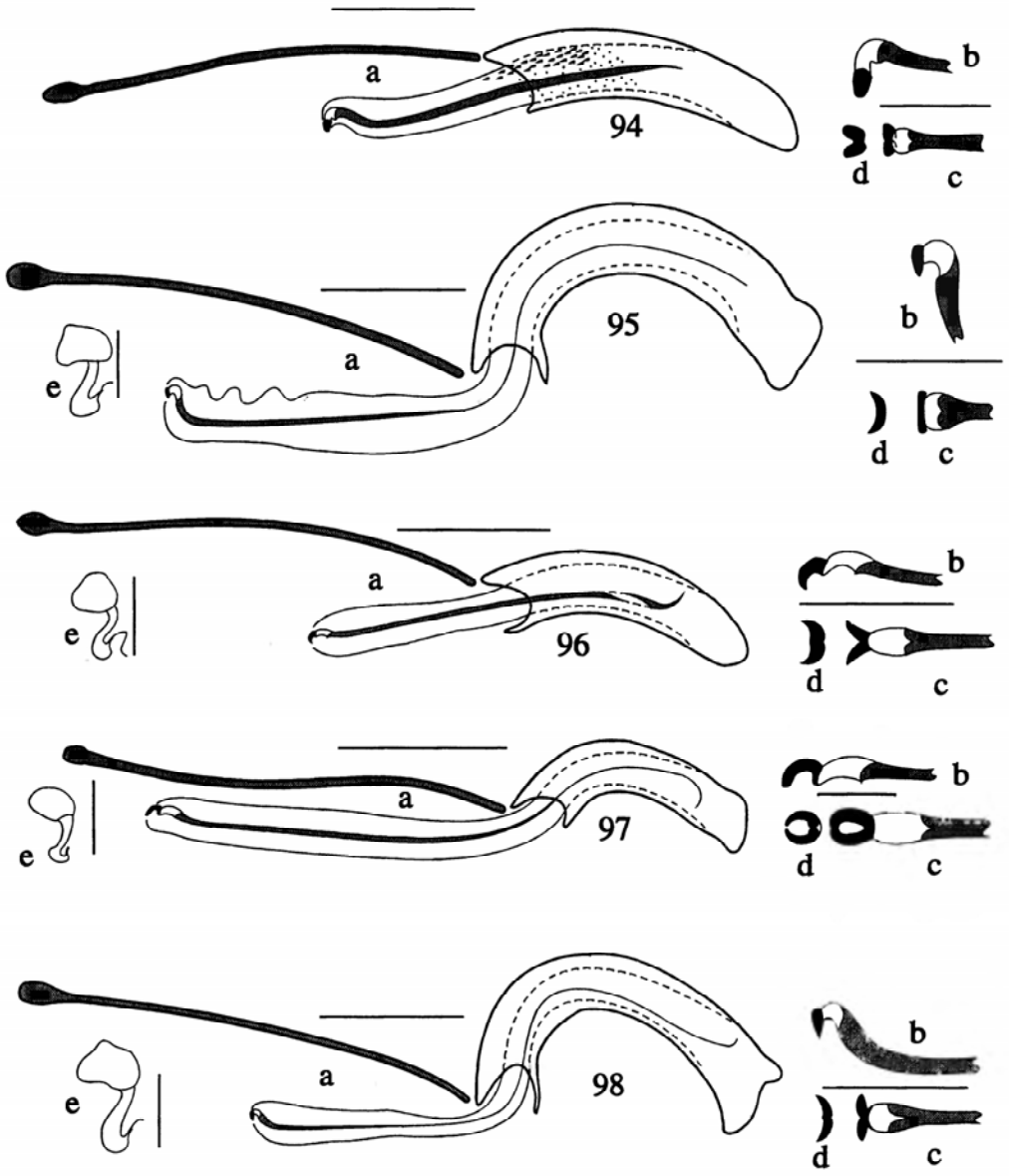
Figures 79-83. Genitalia: 79.) *Ischyrus aleator* Boyle (male Mexico, Chihuahua; female Mexico, Sonora); 80.) *I. angularis* Lacordaire (male & female Panama); 81.) *I. audbalus* n. sp. (male Mexico, Chiapas; female Mexico, Oaxaca); 82.) *I. auriculatus* Lacordaire male Mexico, Chiapas; female Mexico, Veracruz); 83.) *I. bogotae* Crotch (male Costa Rica, Puntarenas; female Equador, Pichincha); a.) male genitalia, line = 0.66 mm; b.) lateral view, c.) dorsal view, and d.) anterior view of the sclerotized muscle attachment at anterior end of male flagellum, line = 0.22 mm; e.) female spermatheca, line = 0.33 mm.



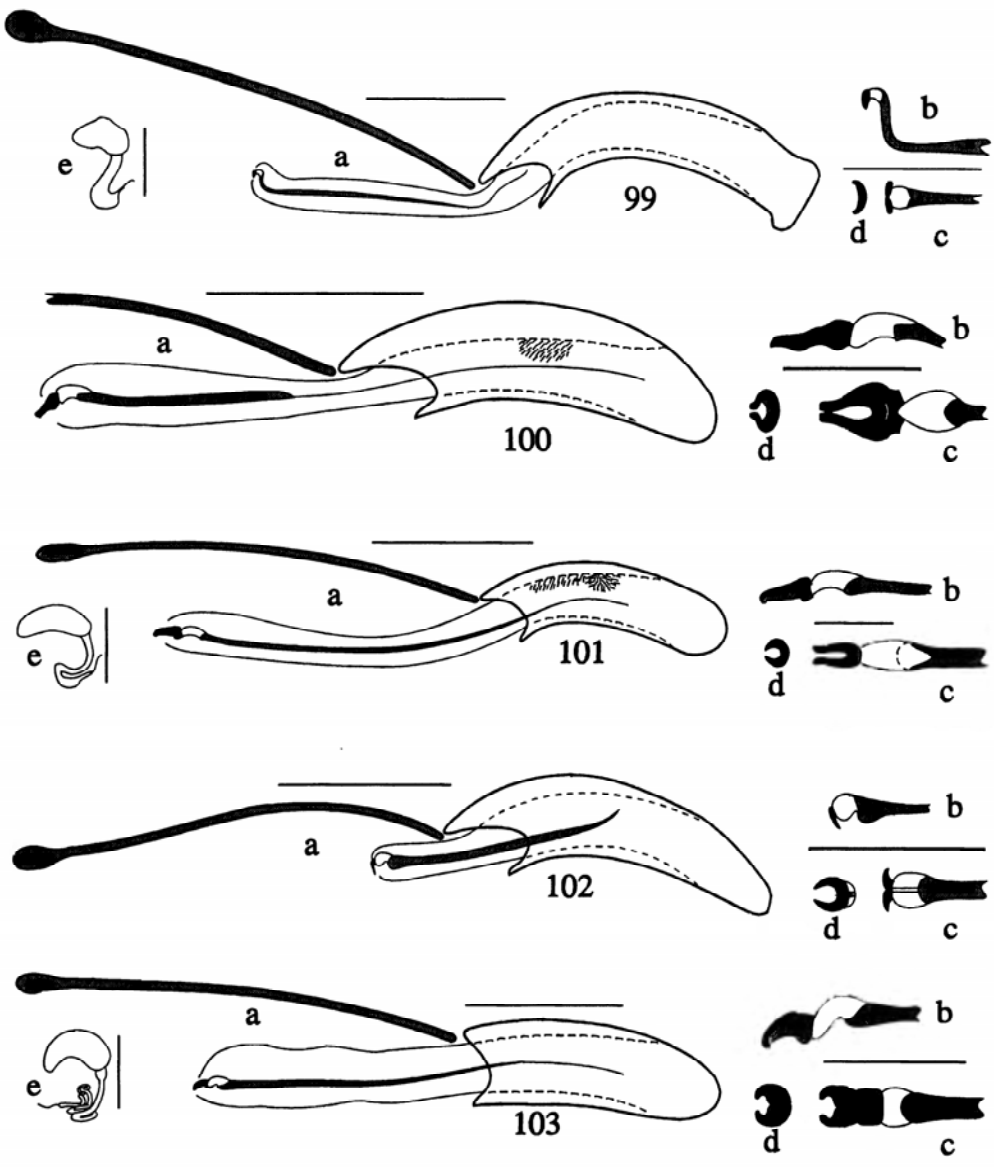
Figures 84-88. Genitalia: 84.) *Ischyrus boucardi* Crotch (male Panama; female Peru, Madre de Dios); 85.) *I. celatus* n. sp. (male Mexico, Chiapas; female unknown); 86.) *I. chacojae* Gorham (male & female Panama); 87.) *I. collatinus* Crotch (male & female Panama); 88.) *I. cordiformis* n. sp. (male Venezuela, Carabobo; female Panama); a.) male genitalia, line = 0.66 mm; b.) lateral view, c.) dorsal view, and d.) anterior view of the sclerotized muscle attachment at anterior end of male flagellum, line = 0.22 mm; e.) female spermatheca, line = 0.33 mm.



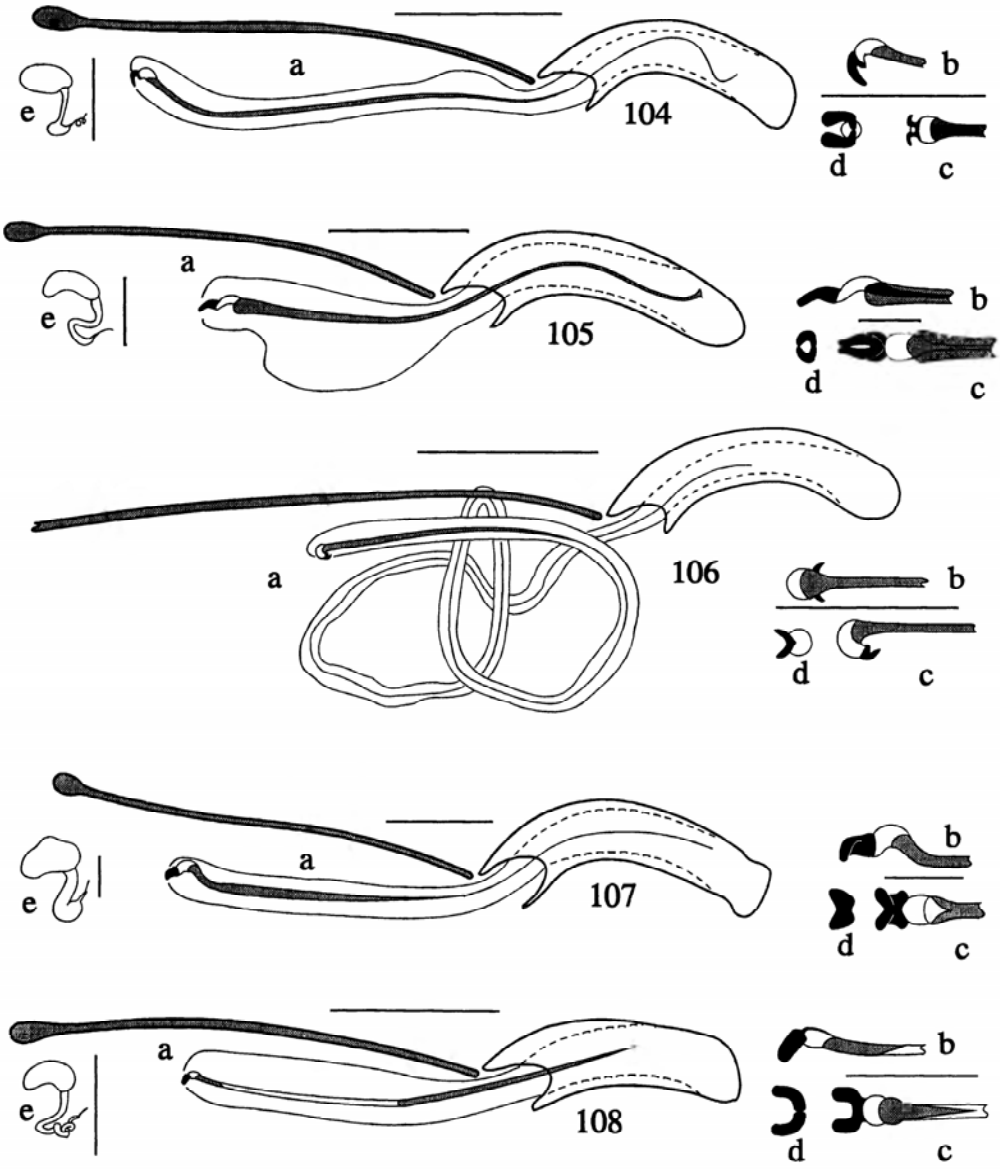
Figures 89-93. Genitalia: 89.) *Ischyrus distinguendus* Lacordaire (male & female Mexico, Veracruz); 90.) *I. dunedinensis* Blatchley (male & female USA, FL); 91.) *I. elegantulus* Lacordaire (male & female Panama); 92.) I. *ephippiatus* Gorham (male & female Panama); 93.) *I. episcaphulinus* Gorham (male Guatemala; female Mexico, Chiapas); a.) male genitalia, line = 0.66 mm; b.) lateral view, c.) dorsal view, and d.) anterior view of the sclerotized muscle attachment at anterior end of male flagellum, line = 0.22 mm; e.) female spermatheca, line = 0.33 mm.



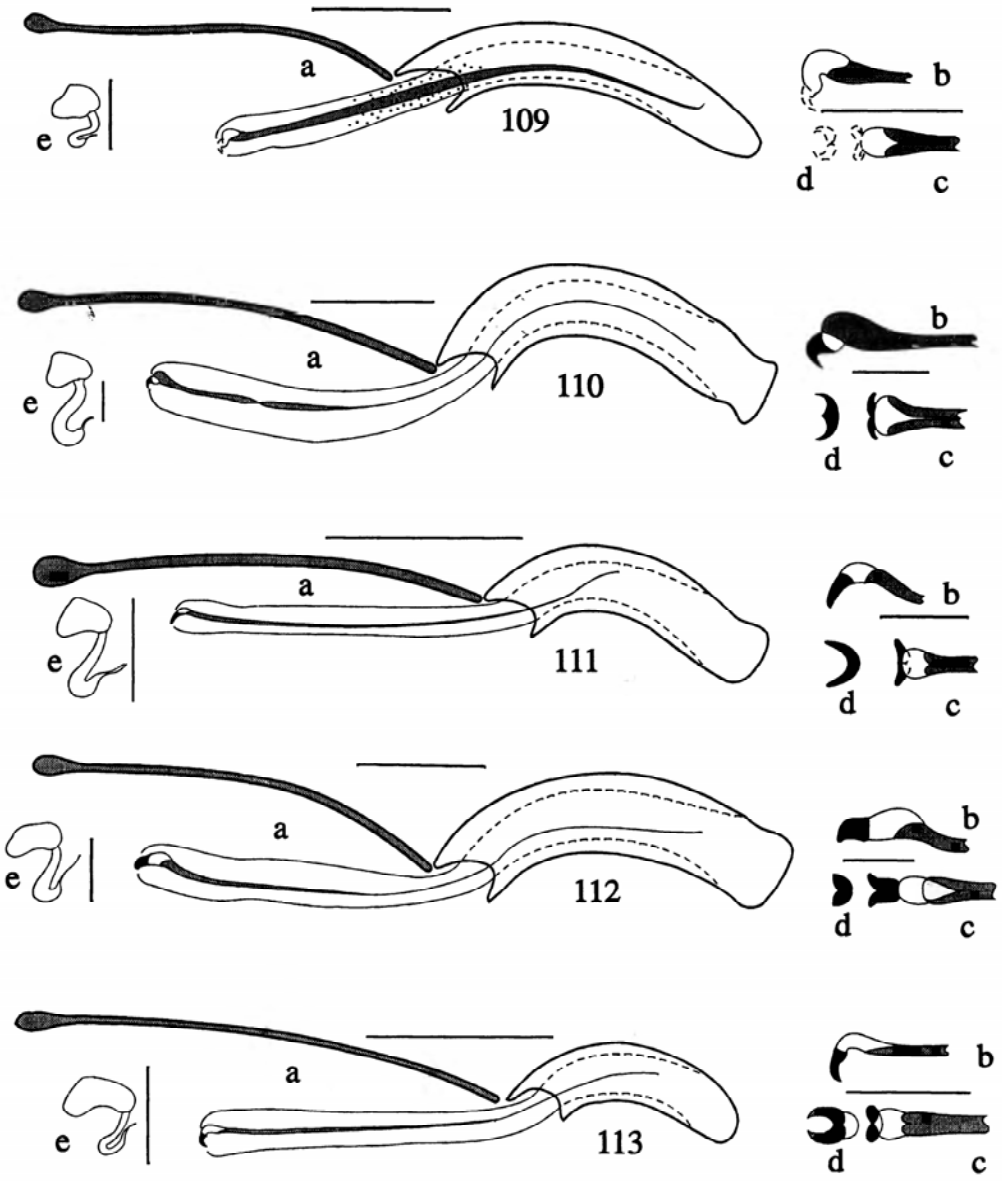
Figures 94-98. Genitalia: 94.) *Ischyrus erosus* n. sp. (male Panama; female unknown); 95.) *I. frontalis* Lacordaire (male Mexico, Guerrero; female Mexico); 96.) *I. fulmineus* Delkeskamp (male & female "S.Jeronimio, RS"); 97.) *I. impressus* n. sp. (male Panama; female El Salvador); 98.) *I. incertus* Lacordaire (male Mexico, Chiapas; female Mexico, Campache); a.) male genitalia, line = 0.66 mm; b.) lateral view, c.) dorsal view, and d.) anterior view of the sclerotized muscle attachment at anterior end of male flagellum, line = 0.22 mm; e.) female spermatheca, line = 0.33 mm.



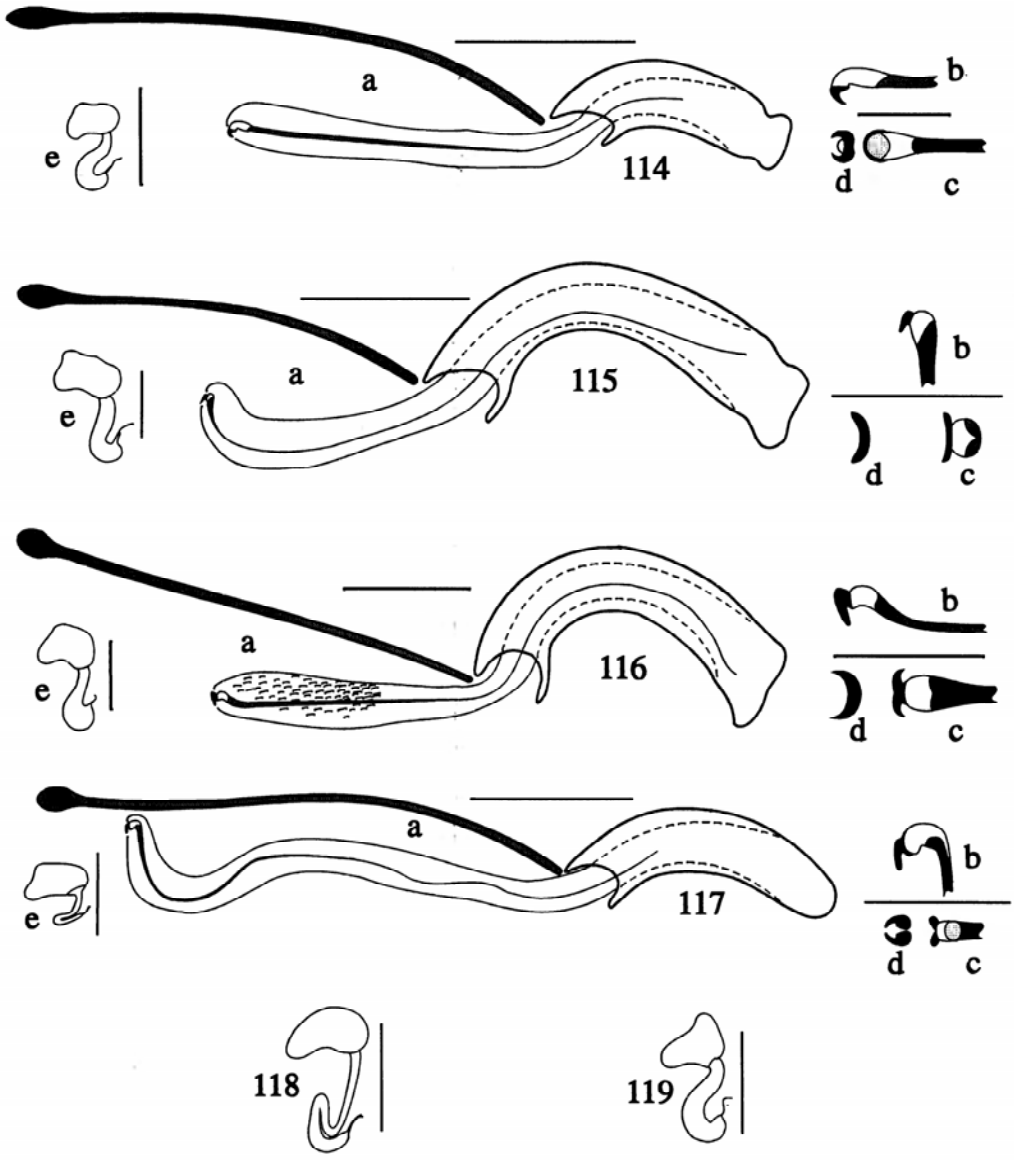
Figures 99-103. Genitalia: 99.) *Ischyrus insolens* Crotch (male Mexico, Veracruz; female Paraguay); 100.) *I. malleus* n. sp. (male Mexico, Oaxaca; female unkown); 101.) *I. mimus* n. sp. (male Colombia; female Panama); 102.) *I. monochromatus* n. sp. (male Panama, female unknown); 103.) *I. mystacis* n. sp. (male & female Panama); a.) male genitalia, line = 0.66 mm; b.) lateral view, c.) dorsal view, and d.) anterior view of the sclerotized muscle attachment at anterior end of male flagellum, line = 0.22 mm; e.) female spermatheca, line = 0.33 mm.



Figures 104-108. Genitalia: 104.) *Ischyrus parallelus* n. sp. (male Panama; female Venezuela, Aragua); 105.) *I. pictus* Gorham (male Mexico, Chiapas; female Mexico, Tabasco); 106.) *I. poseidon* n. sp. (male Panama; female spermatheca not found); 107.) *I. proximus* Lacordaire (male & female Costa Rica, Puntarenas); 108.) *I. putei* n. sp. (male & female Panama); a.) male genitalia, line = 0.66 mm; b.) lateral view, c.) dorsal view, and d.) anterior view of the sclerotized muscle attachment at anterior end of male flagellum, line = 0.22 mm; e.) female spermatheca, line = 0.33 mm.



Figures 109-113. Genitalia: 109.) *Ischyrus pyropodus* n. sp. (male Mexico, "Durango"; female Mexico, S.L.P.); 110.) *I. quadripunctatus* (Olivier) (male USA, FL; female USA, IL); 111.) *I. sapphirus* n. sp. (male & female Cuba); 112.) *I. scriptus* (Olivier) (male Venezuela, Bolivar; female Argentina, Salta); 113.) *I. scutellaris* Gorham (male & female Panama); a.) male genitalia, line = 0.66 mm; b.) lateral view, c.) dorsal view, and d.) anterior view of the sclerotized muscle attachment at anterior end of male flagellum, line = 0.22 mm; e.) female spermatheca, line = 0.33 mm.



Figures 114-119. Genitalia: 114.) *Ischyrus septemsignatus* Gorham (male Mexico, Veracruz; female Guatemala, Baja Verapaz); 115.) *I. tetrasticus* Gorham (male Peru, Huanuco; female Brasil, Espirito Santo); 116.) *I. tripunctatus* Crotch (male Costa Rica; female Mexico, Veracruz); 117.) *I. undulatus* Gorham (male & female Panana); 118.) *I. ichnus* n. sp. (male unknown; female Panama); 119.) *I. parcarum* n. sp. (male unknown; female Mexico, Jalisco); a.) male genitalia, line = 0.66 mm; b.) lateral view, c.) dorsal view, and d.) anterior view of the sclerotized muscle attachment at anterior end of male flagellum, line = 0.22 mm; e.) female spermatheca, line = 0.33 mm.

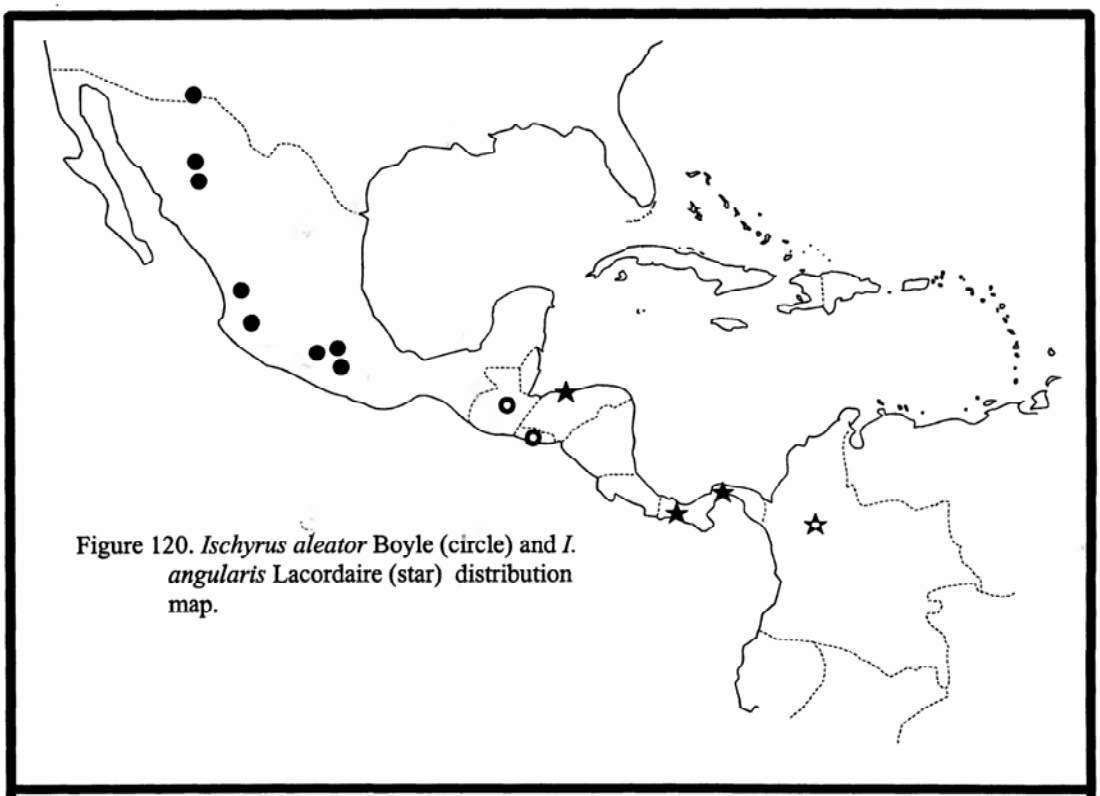


Figure 120. *Ischyrus aleator* Boyle (circle) and *I. angularis* Lacordaire (star) distribution map.

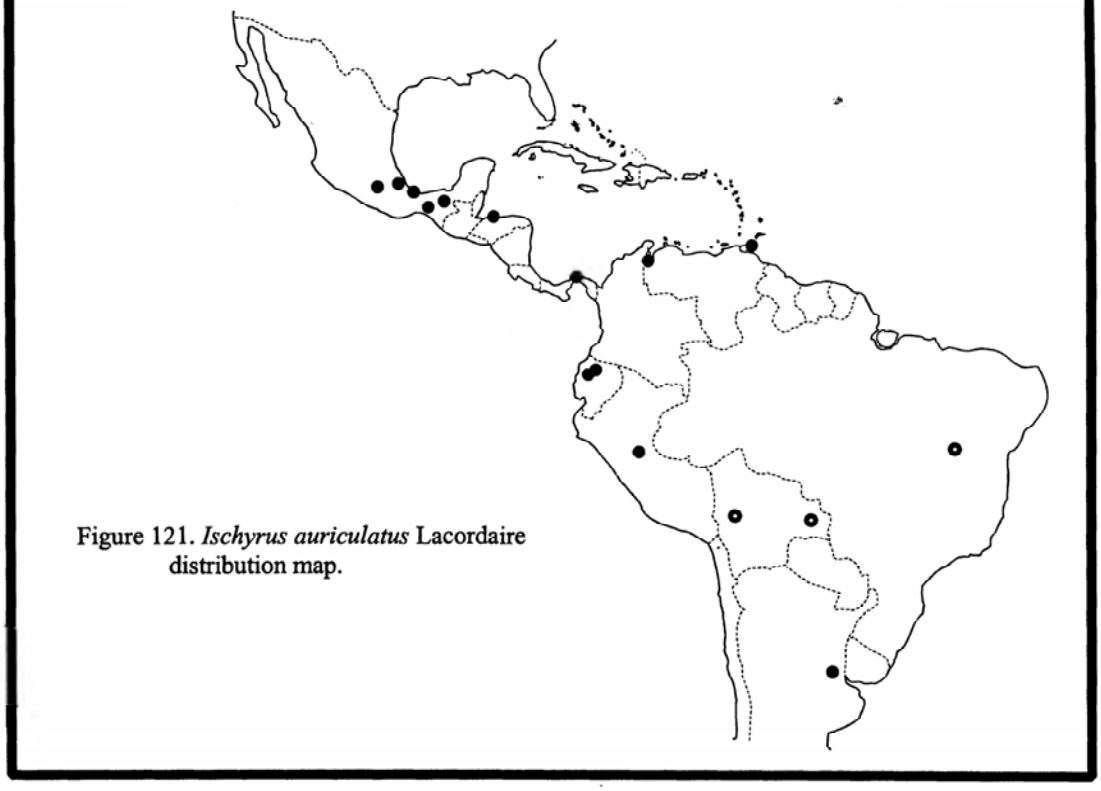


Figure 121. *Ischyrus auriculatus* Lacordaire distribution map.

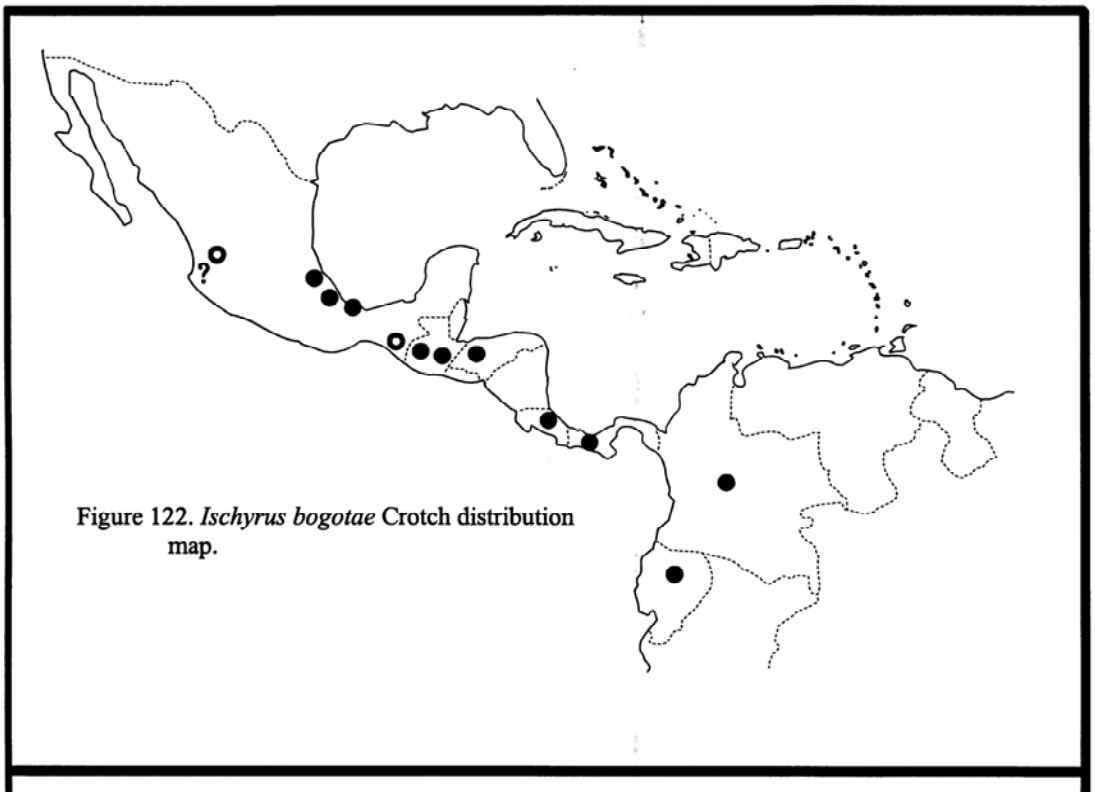


Figure 122. *Ischyrus bogotae* Crotch distribution map.

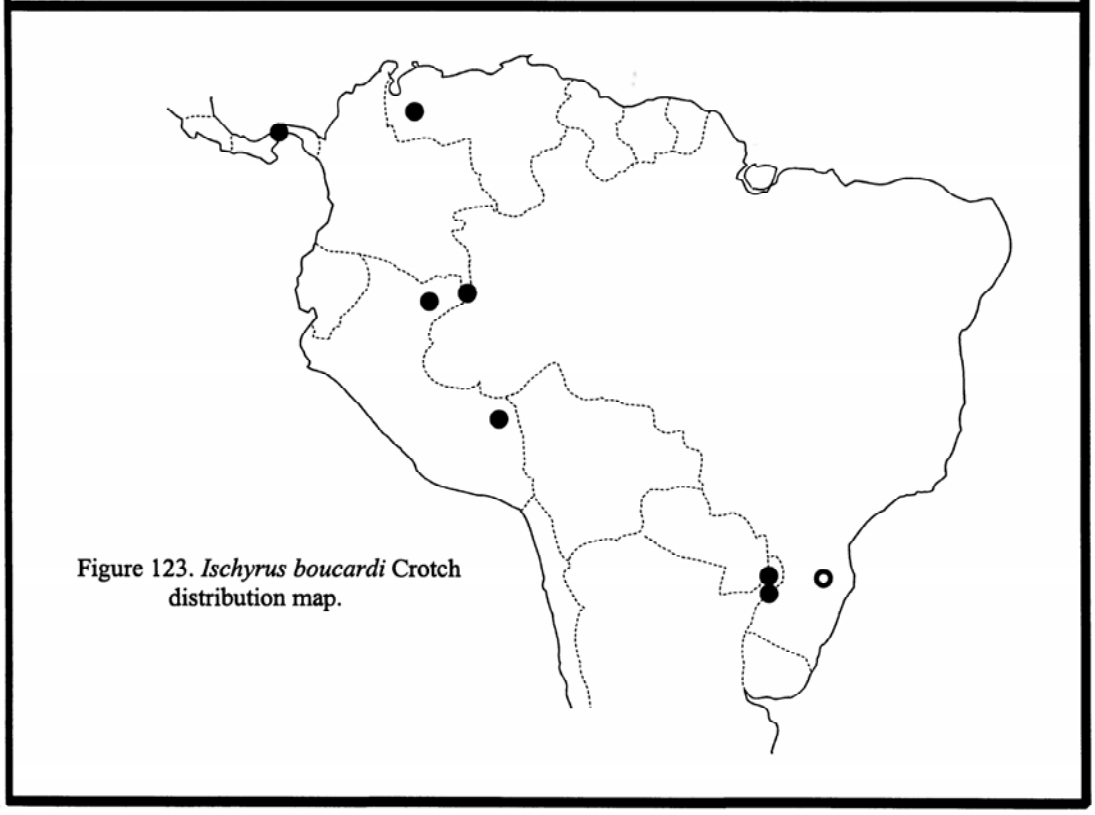


Figure 123. *Ischyrus boucardi* Crotch distribution map.

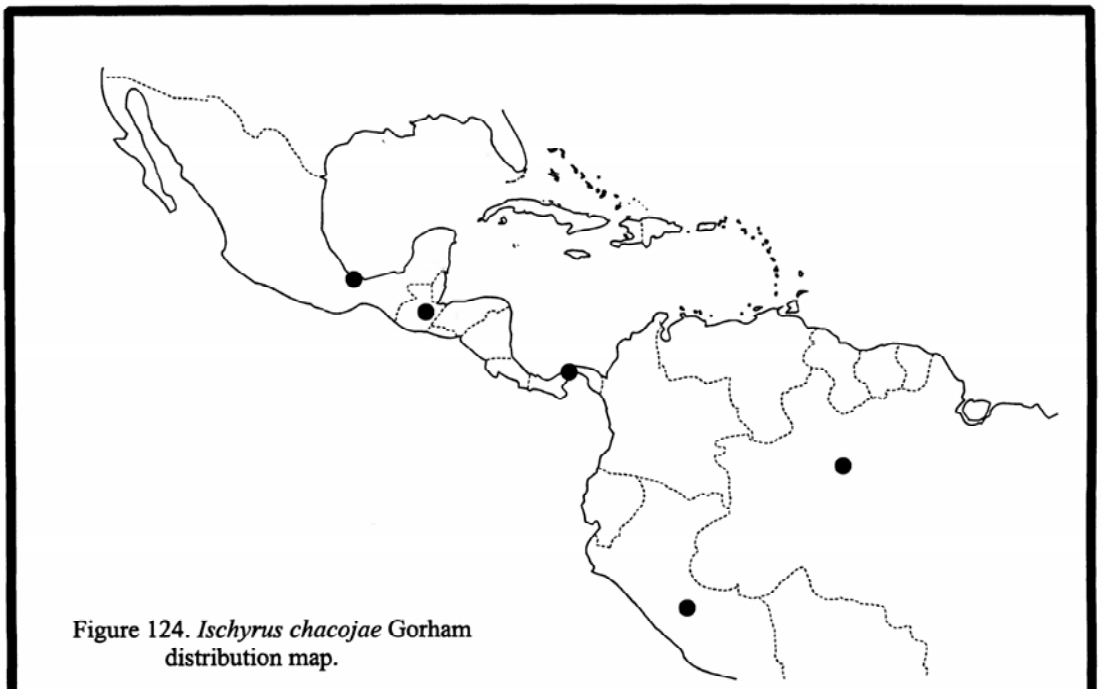


Figure 124. *Ischyrus chacojae* Gorham distribution map.

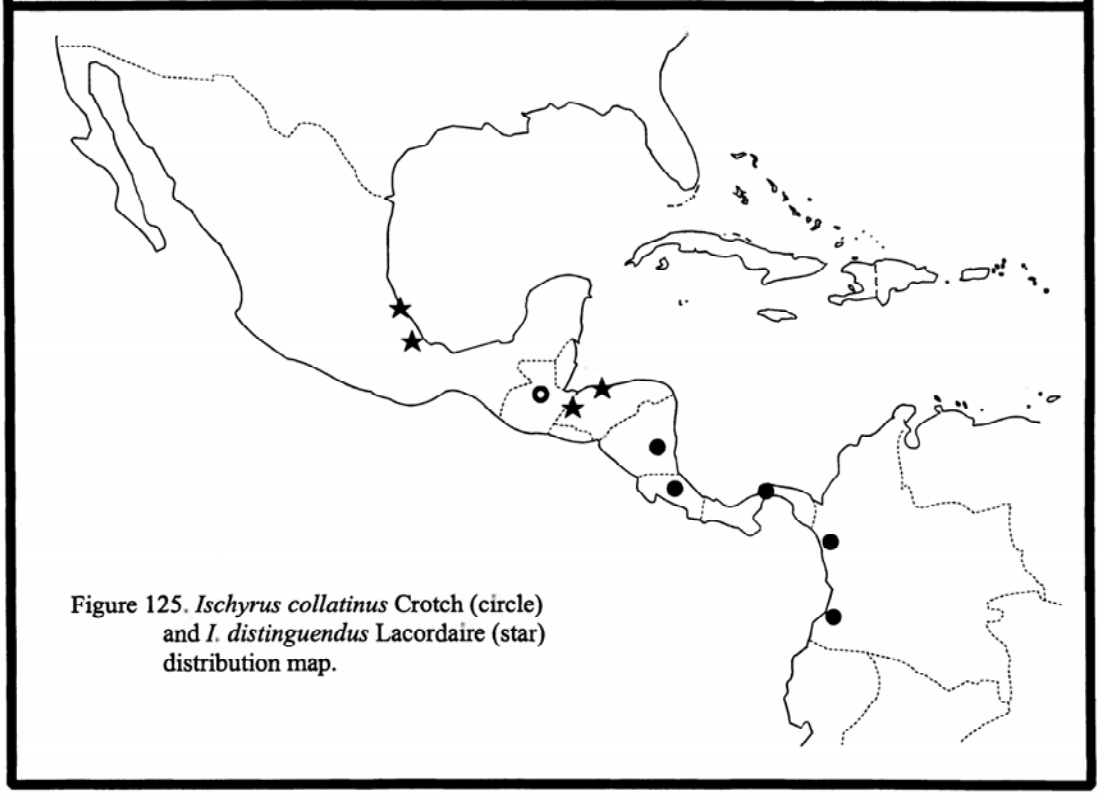


Figure 125. *Ischyrus collatinus* Crotch (circle) and *I. distinguendus* Lacordaire (star) distribution map.

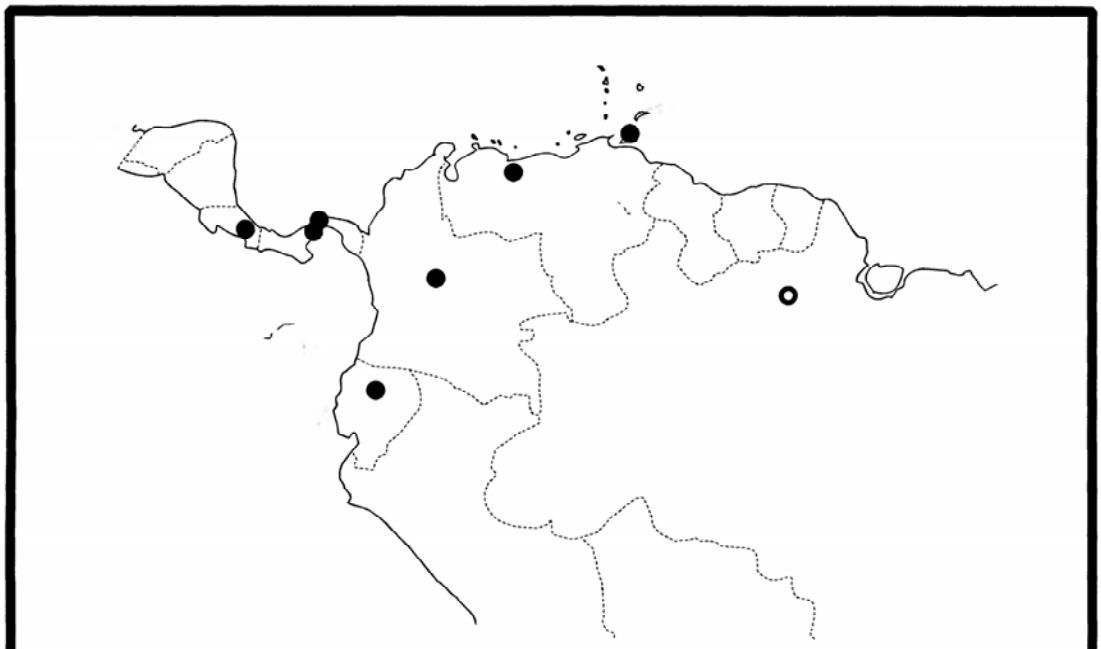


Figure 126. *Ischyrus cordiformis* n. sp. distribution map.

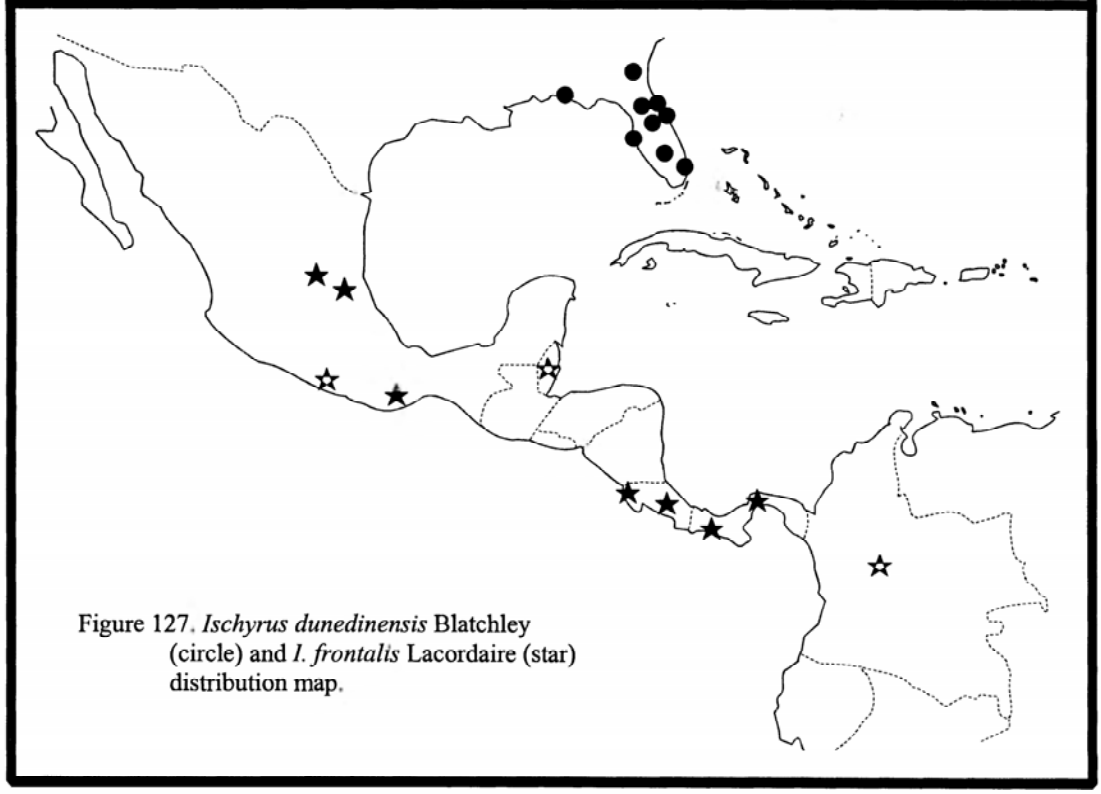


Figure 127. *Ischyrus dunedinensis* Blatchley (circle) and *I. frontalis* Lacordaire (star) distribution map.



Figure 128. *Ischyrus fulmineus* Delkeskamp distribution map.

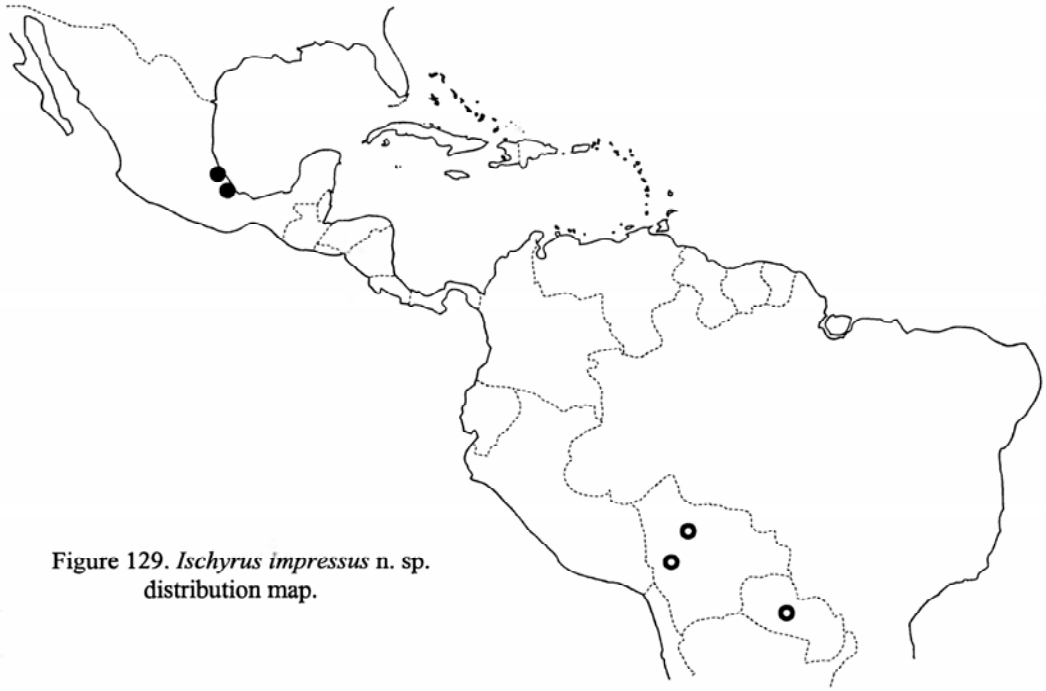


Figure 129. *Ischyrus impressus* n. sp. distribution map.

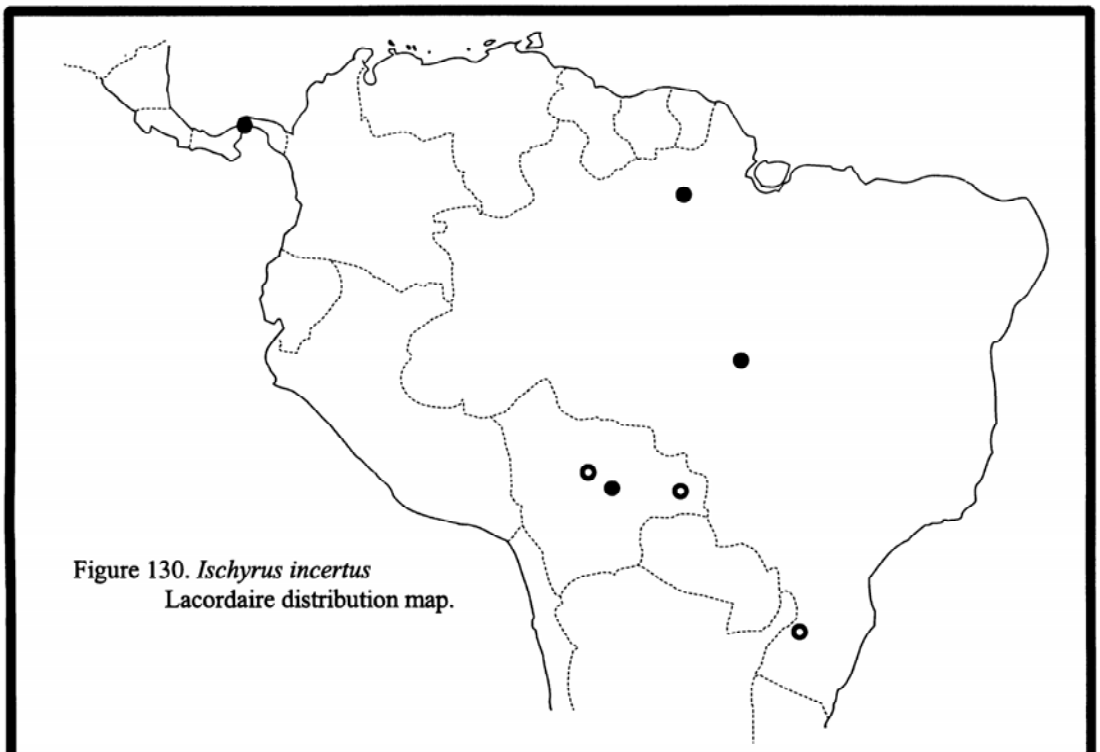


Figure 130. *Ischyrus incertus* Lacordaire distribution map.

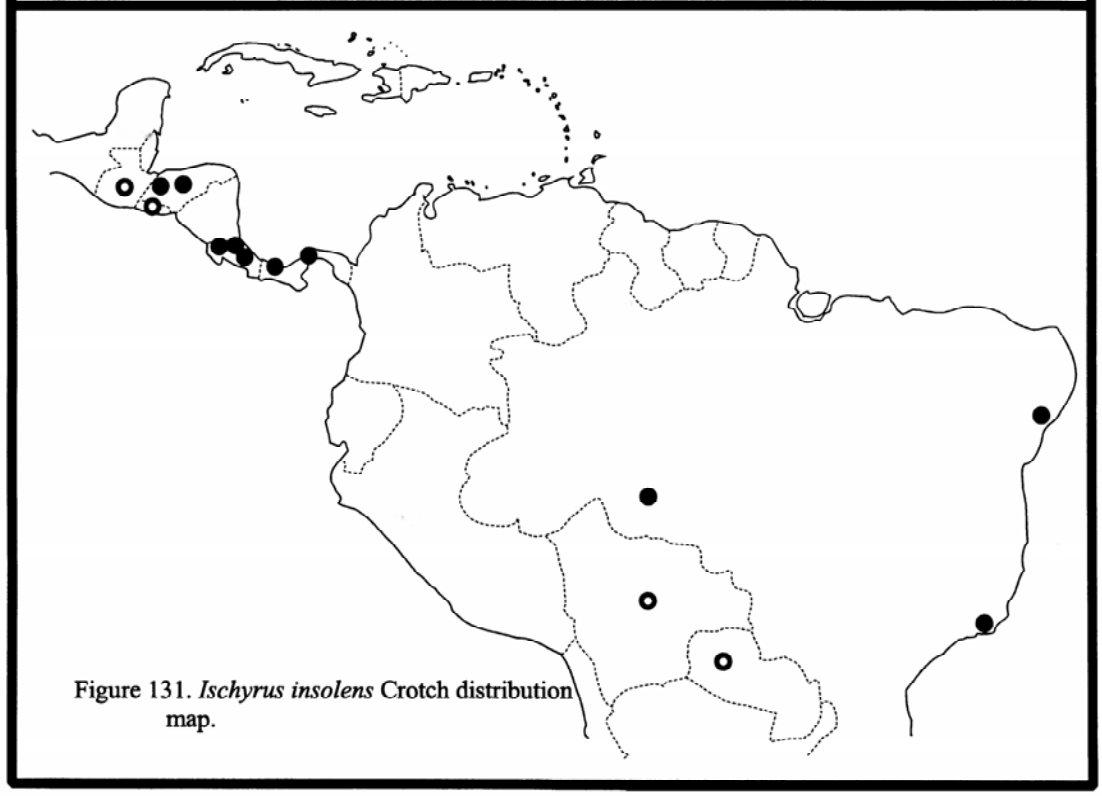


Figure 131. *Ischyrus insolens* Crotch distribution map.

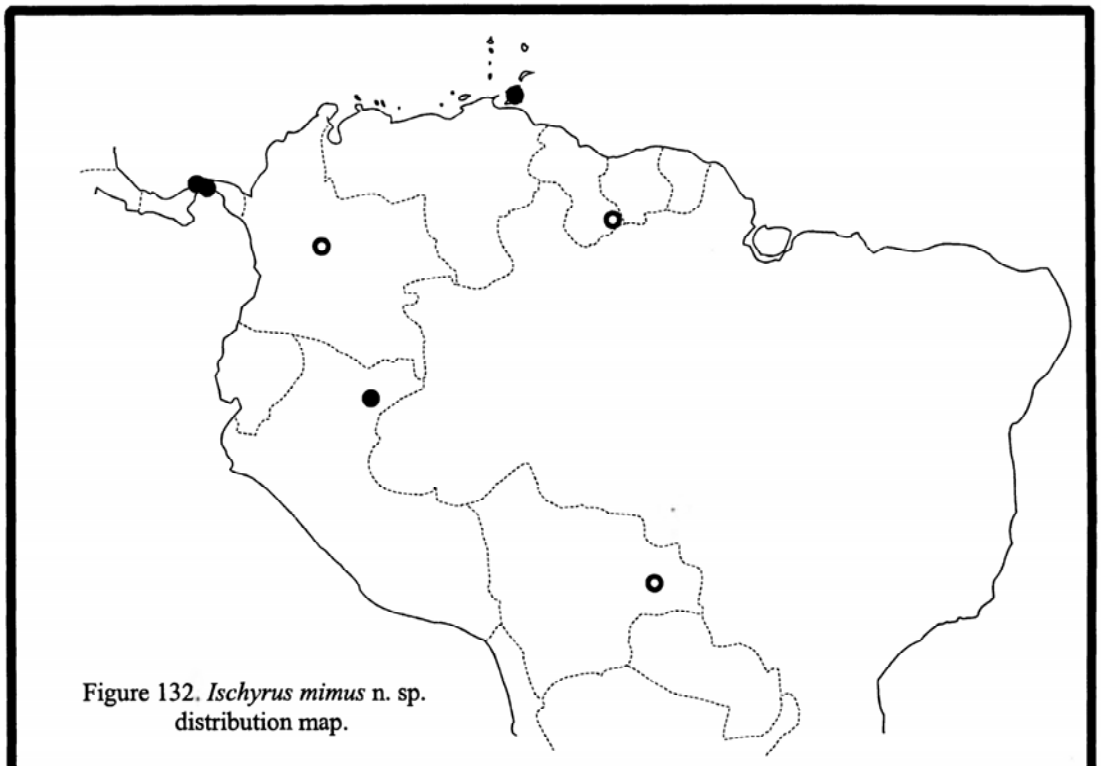


Figure 132. *Ischyrus mimus* n. sp. distribution map.

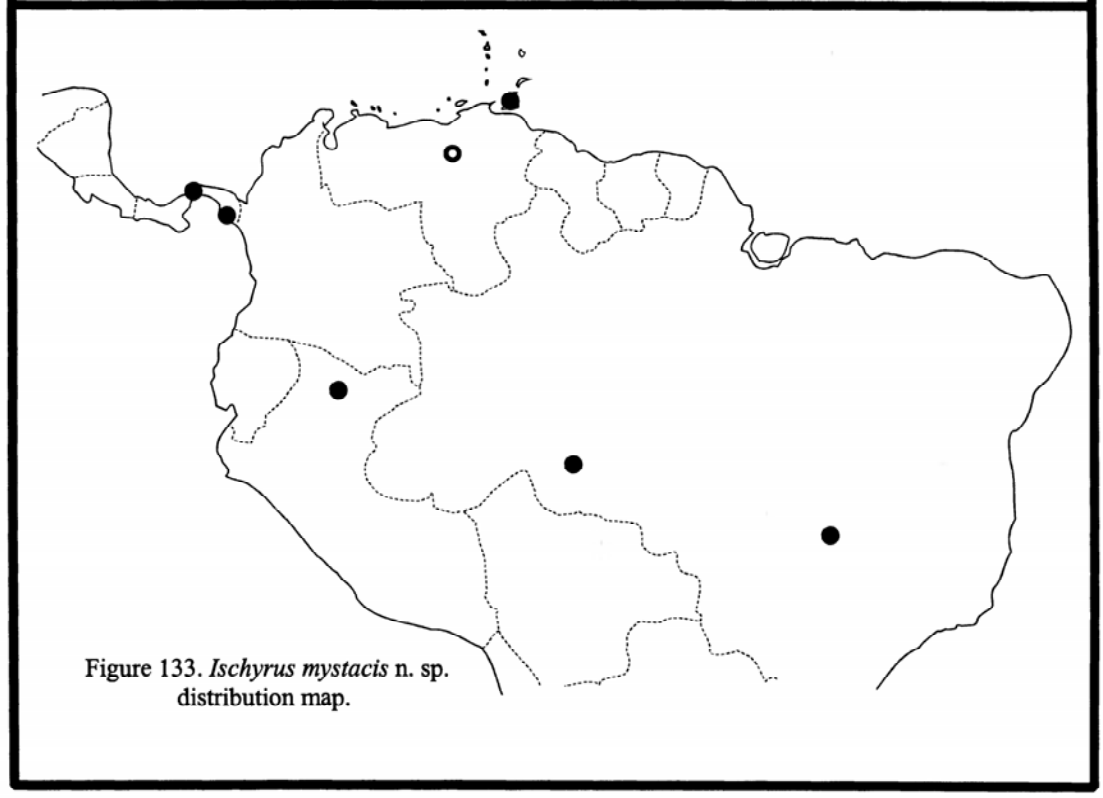


Figure 133. *Ischyrus mystacis* n. sp. distribution map.

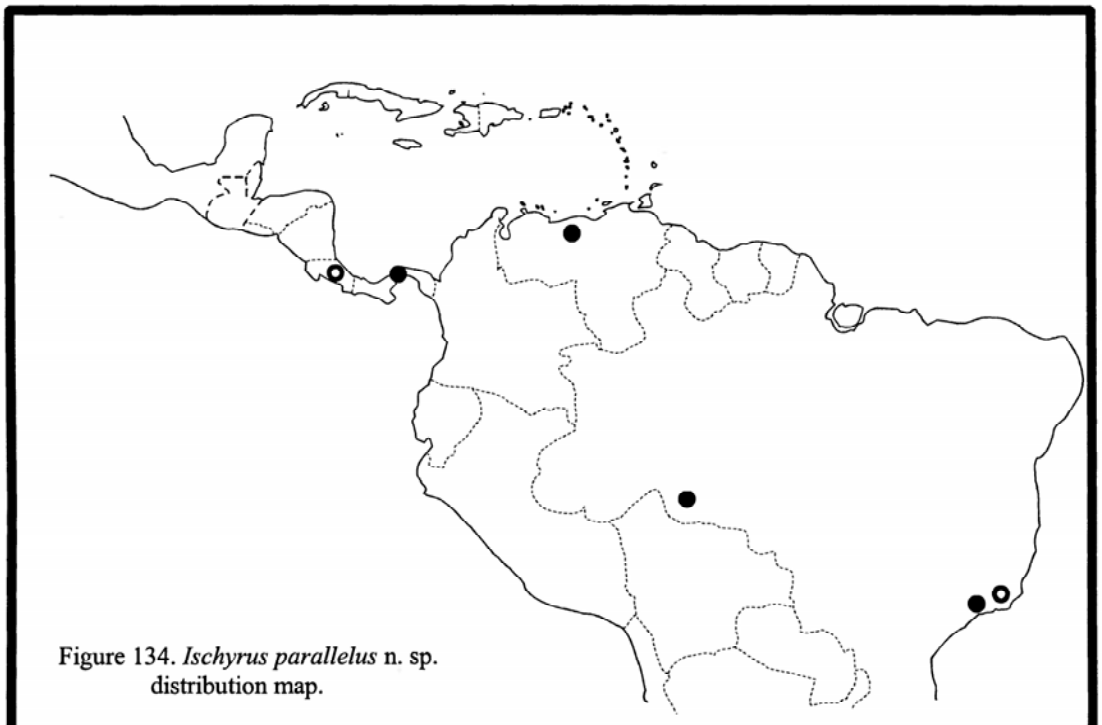


Figure 134. *Ischyrus parallelus* n. sp. distribution map.

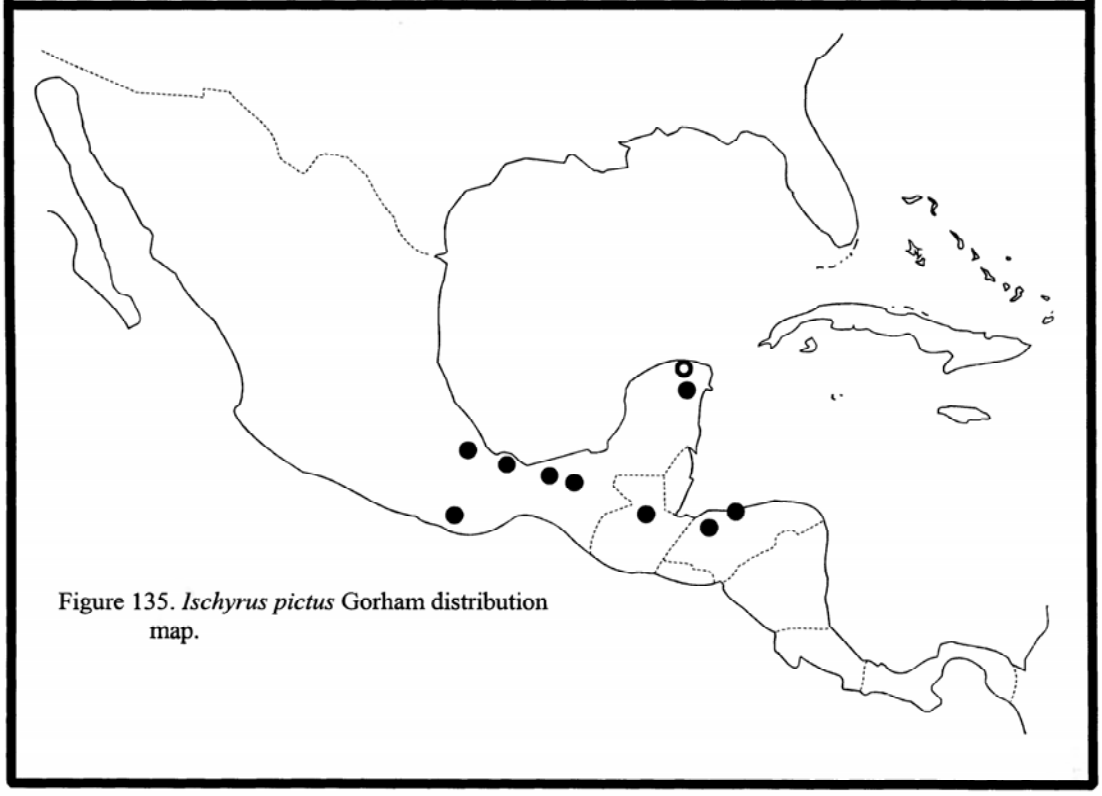


Figure 135. *Ischyrus pictus* Gorham distribution map.

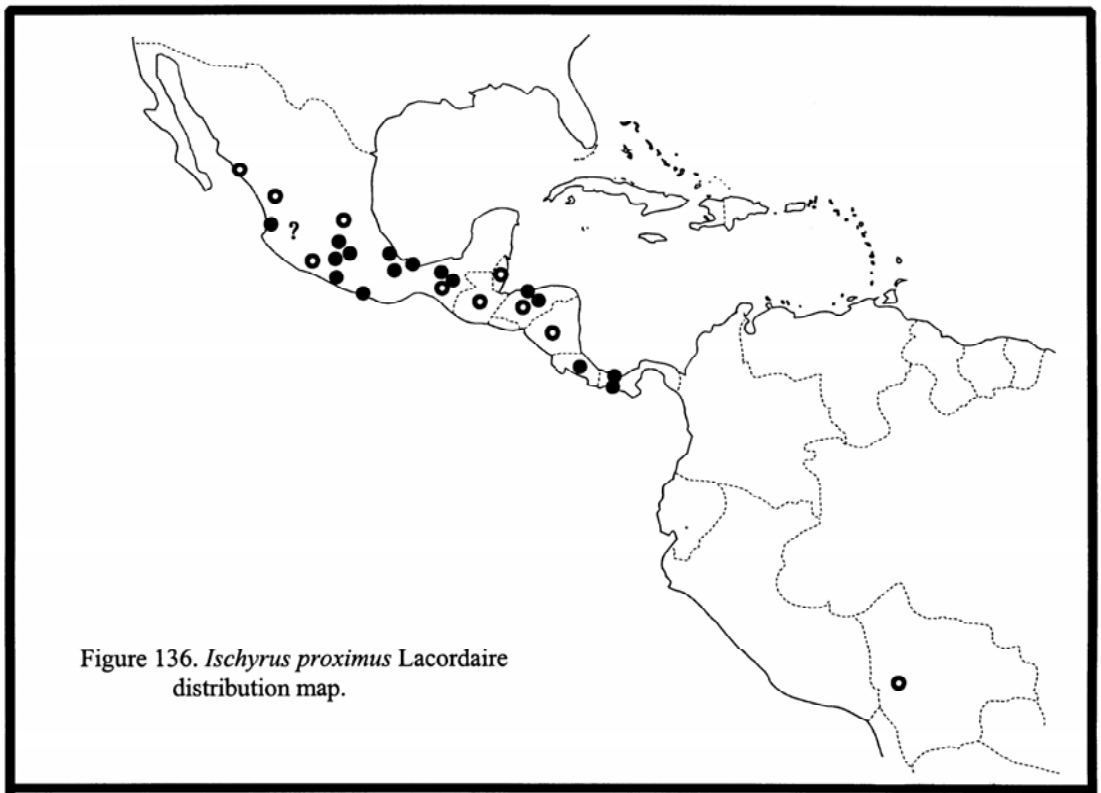


Figure 136. *Ischyrus proximus* Lacordaire distribution map.

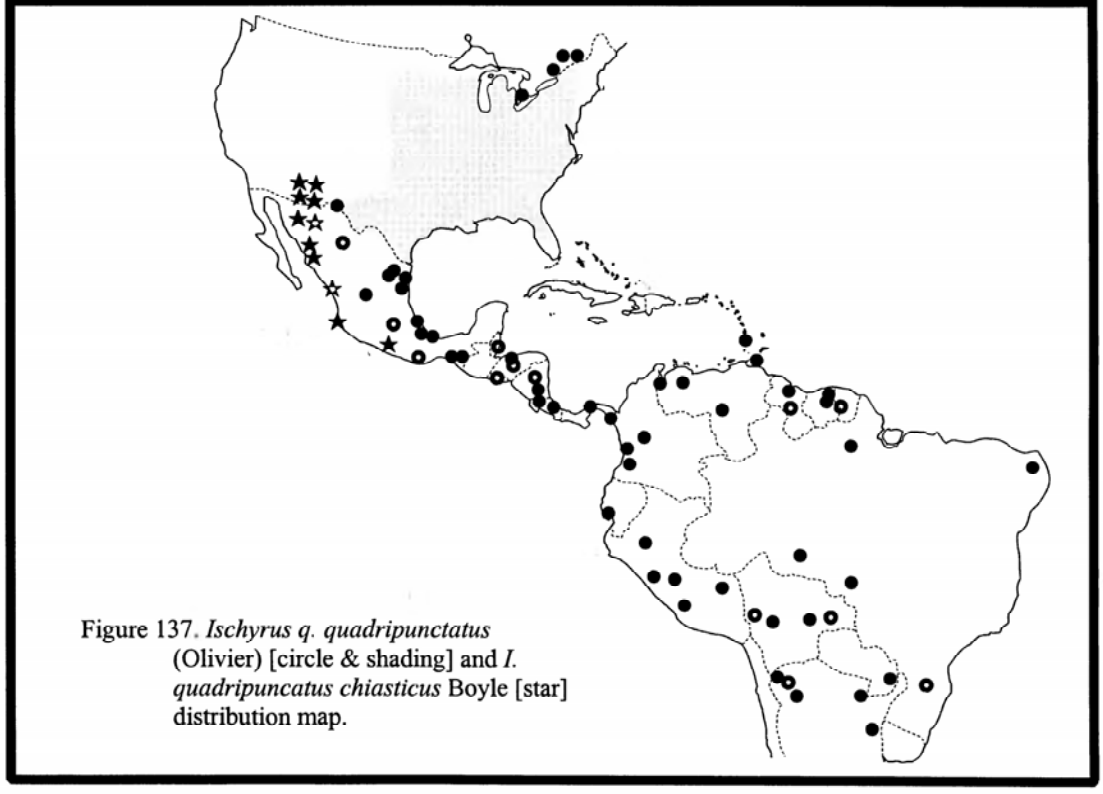


Figure 137. *Ischyrus q. quadripunctatus* (Olivier) [circle & shading] and *I. quadripuncatus chiasticus* Boyle [star] distribution map.

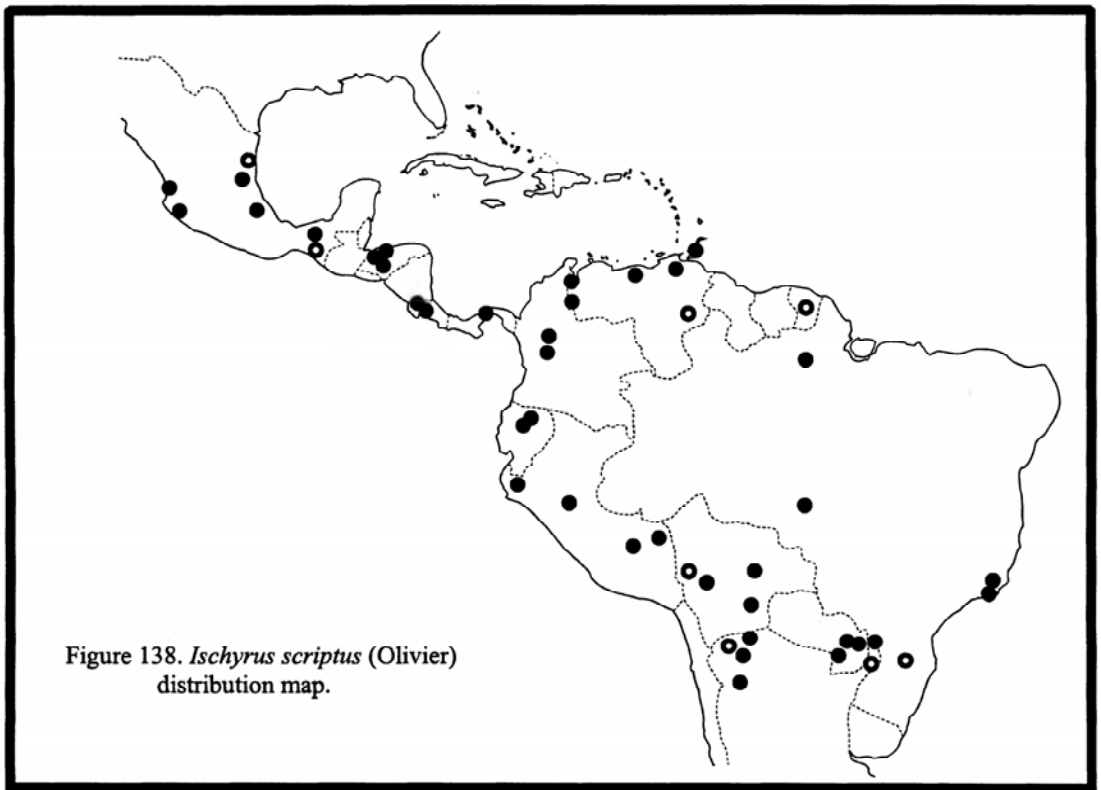


Figure 138. *Ischyrus scriptus* (Olivier) distribution map.

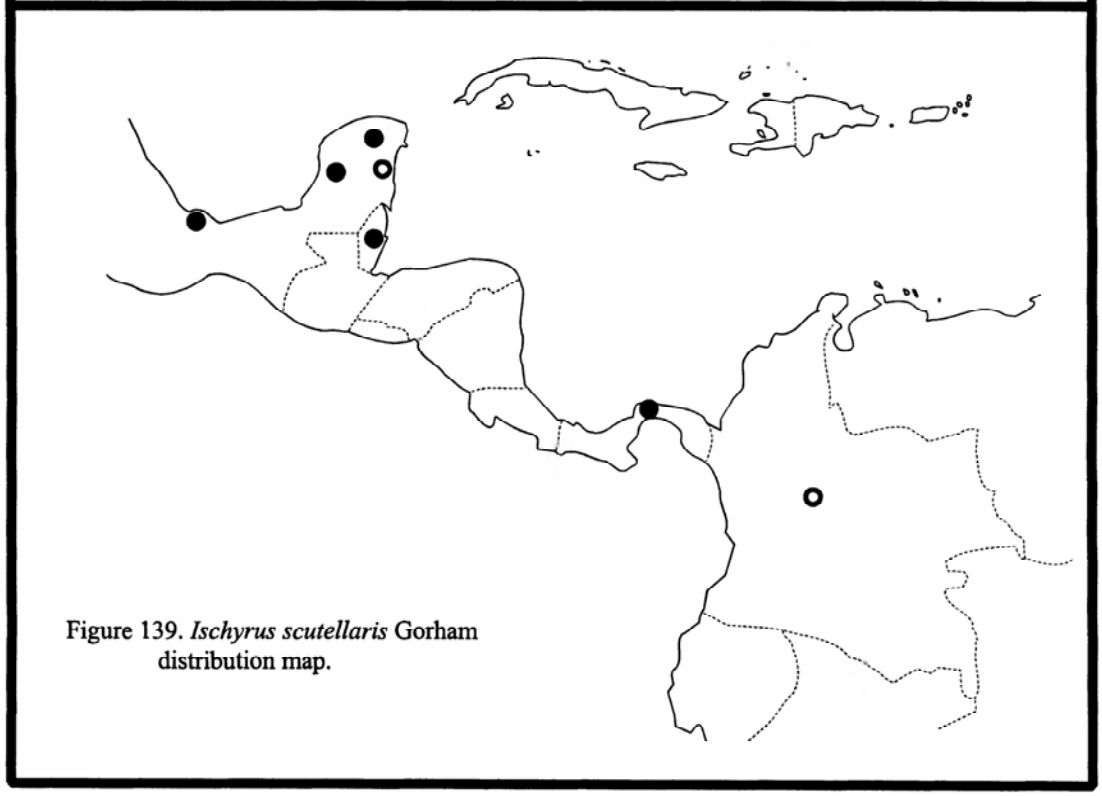


Figure 139. *Ischyrus scutellaris* Gorham distribution map.

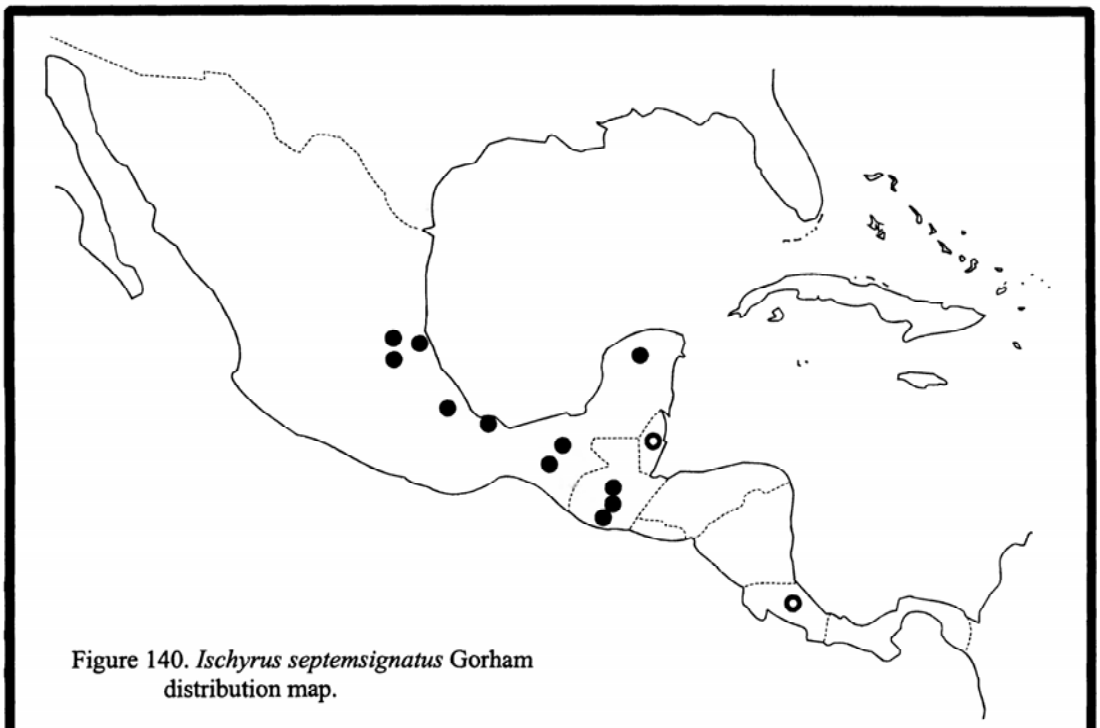


Figure 140. *Ischyrus septemsignatus* Gorham distribution map.

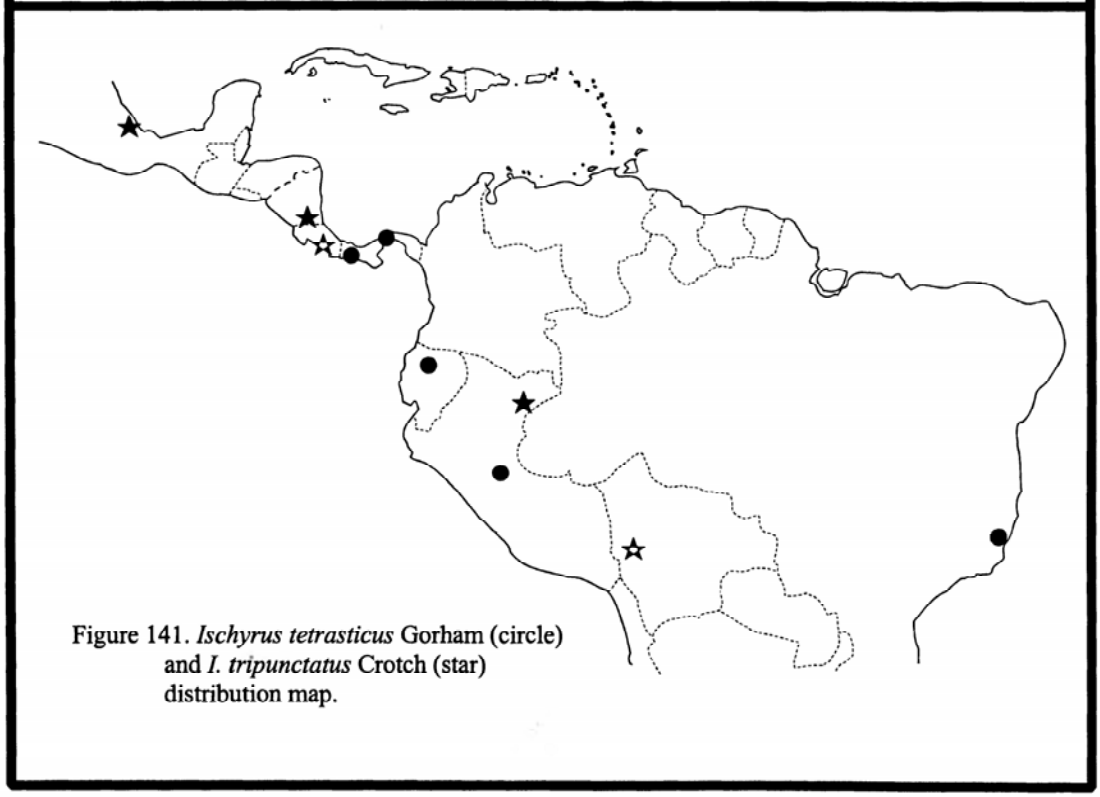
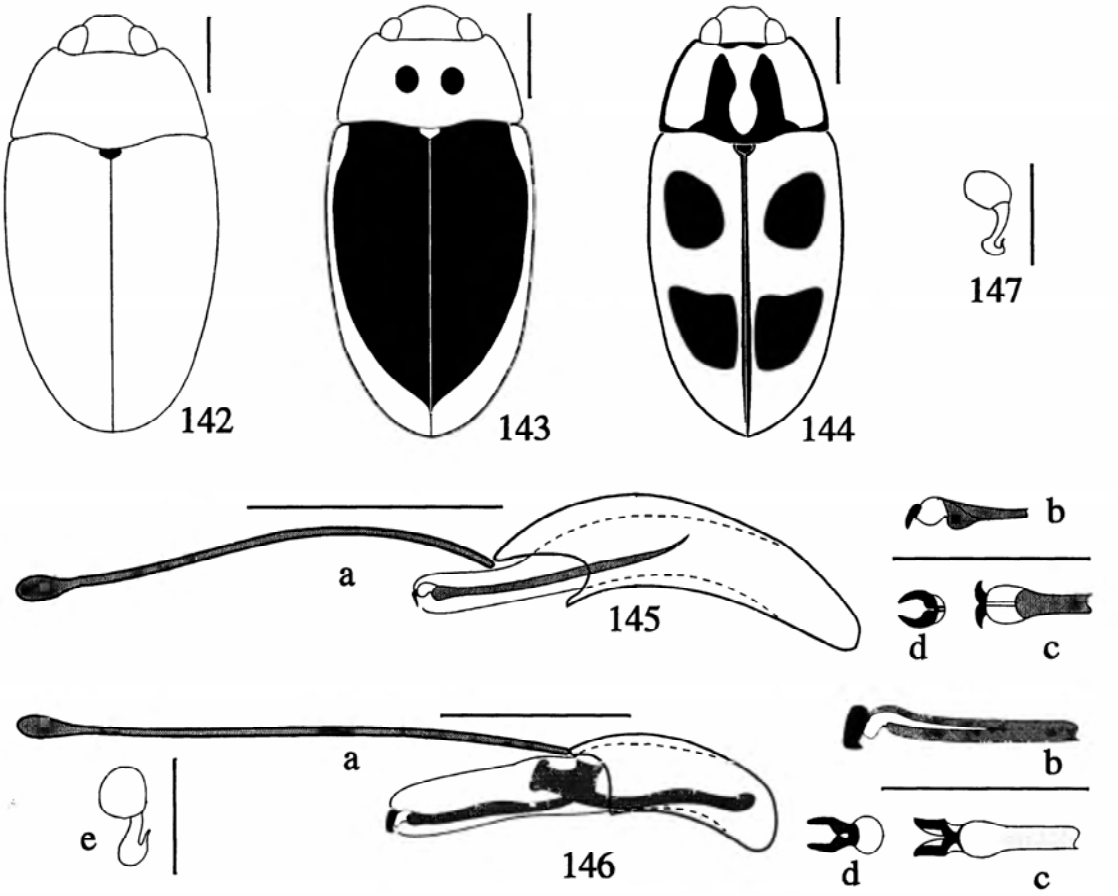


Figure 141. *Ischyrus tetrasticus* Gorham (circle) and *I. tripunctatus* Crotch (star) distribution map.



Figures 142-144. Dorsal habitus, line = 1.0 mm: 142.) *Ischyrus goliai* n.sp.; 143.) *I. joplini* n.sp.; 144.) *I. kovariki* n.sp.

Figures 145-147. Genitalia: 145.) *Ischyrus goliai* n.sp. [male Belize, female unknown]; 146.) *I. kovariki* n.sp. [male & female Belize]. 147.) *I. joplini* n.sp. [male unknown, female Panama]; a.) male genitalia, line = 0.66 mm; b.) lateral view, c.) dorsal view, and d.) anterior view of the sclerotized muscle attachment at anterior end of male flagellum, line = 0.22 mm; e.) female spermatheca, line = 0.33 mm.