

REVISION OF THE GENUS *ISCHYRUS* LACORDAIRE (1842)
(EROTYLIDAE: TRIPLACINAE)
OF NORTH AND CENTRAL AMERICA

By

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Abstract of Dissertation Presented to the Graduate School
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By

Paul Edward Skelley

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Chairman: Robert E. Woodruff

Major Department: Entomology and Nematology

This revision treats all known species of the genus *Ischyryus* Lacordaire occurring from Panama north. A key to the 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 to aid in the identification of specimens. A list of all names used in combination with *Ischyryus* and their current status is presented to prevent future homonyms. A total of 26, valid previously described species is addressed, nine new synonymies made, and 16 new species described.

INTRODUCTION

General Introduction

The family Erotylidae is composed of fungus-feeding beetles that vary in body size and color; many are elaborately patterned. Recently published catalogs detail the Old World species (Delkeskamp 1981; Chûjô & Chûjô 1988, 1989, 1990). In contrast, Crotch's (1876) world revision of the Erotylidae was the last study to cover the entire New World fauna, but it provided no keys or illustrations and few descriptions. Since Crotch's time, the New World erotylid fauna has been studied intermittently, with scattered regional studies, catalogs, 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 the results in a manner that will enable entomological students 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).

Nomenclatural changes and lectotype designations made in this dissertation are not to be considered valid until

they are published. Holotypes are not selected and names are not proposed for the new species to avoid potential nomenclatural problems.

History

The first described member of the genus *Ischyryus* Lacordaire is *Erotylus quadripunctatus* Olivier (1792). The first use of the name *Ischyryus* 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. (See Madge, 1988, for dates of publication and 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 *Ischyryus* Chevrolat containing large dull-black species, *Mycotretus* Chevrolat containing smaller species with yellow and black color patterns, and *Lybas* Chevrolat containing species that were oval and solid red. Dejean's catalogs were simply checklists of his collection in which many generic and specific names were proposed. Because the Dejean names lacked descriptions, they were often ignored by early taxonomists.

The next use of the name *Ischyryus* was by Falderman (1837) in describing *Ischyryus lepidus*, presently a member of *Triplax* Herbst (1793) (*fide* Chûjô & Chûjô 1990). The name *Ischyryus* was then used as a subgroup of *Erotylus* Fabricius (1775) by Guérin-Méneville (1841) in describing *E. (Ischyryus) nebulosus*, presently a member of *Brachysphaenus* Lacordaire (1842) (*fide* Crotch 1876). These uses of "Ischyryus" illustrate early workers' attempts at placing new species into taxa based on superficial characters.

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

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 *Ischyryus* 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 that had not been described [*nomina*

nuda]. With his descriptions, Lacordaire became the author of these names.

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

Crotch (1873b) separated Lacordaire's divisions into distinct genera. The first division, containing species of larger size, he named *Megischyus*. The second division, containing species of smaller size, he maintained as *Ischyus*, 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 *Ischyus* 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. Edward W. Janson put Crotch's manuscript into final form and published it. Numerous notes within the revision are undoubtedly those of Janson. Without Crotch's input, many of the species problems alluded to within the text were left unresolved. This "revision" is simply an annotated catalog of the species previously described, with brief descriptions of the new

species. Yet, it has been the basis for all subsequent studies of the family. The name *Ischyryus* Lacordaire, as cited and used in Crotch's revision, was accepted and used by all subsequent workers, with the exception of Alvarenga (1965, discussed below). Crotch (1876) listed 44 species of *Ischyryus*, 13 of which were new species.

Ischyryus 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 are worth noting. Gemminger and Harold's (1876) *Catalogus Coleopterorum* was published shortly after Crotch's revision and contains the names as used by Crotch. Gorham (1887-1899), in the *Biologia Centrali-Americana*, gave accounts for 22 species of *Ischyryus* that included 10 new species. Kuhnt (1909, 1911) provided two catalogs, the first of which contained a simple grouping of the species by various color pattern characters.

The most recent catalog of the genus *Ischyryus* Lacordaire is Blackwelder's (1945) *Checklist of the Coleopterous Insects of Mexico, Central America, the West Indies, and South America*, which lists 56 names. Boyle (1954, 1956) revised the family Erotylidae for America,

north of Mexico, thoroughly describing the genus *Ischyryus* and one new species.

The most recent paper of importance to the genus *Ischyryus* Lacordaire is Alvarenga (1965). Following current nomenclatural rules, Alvarenga realized that Crotch (1873b) had incorrectly applied the name *Ischyryus* and selected an invalid type species. Alvarenga made some major changes in the standing of the names *Ischyryus* and *Megischyryus*, which are discussed in the following section.

Before the present study, there were 65 valid species placed in the genus *Ischyryus* Lacordaire. This study addresses 26 of these, synonymizes 9, and describes 16 new species. This brings the total to 72 species. (See Appendix A for a list of all specific names used in association with *Ischyryus* and their current status.)

Nomenclatural Status

The early nomenclature of this genus is typical for many taxa, with names being proposed and ignored. The name *Ischyryus* Chevrolat in Dejean (1836) is a *nomen nudum* (name without description) and was not valid in the opinion of some early workers. Thus, the first use of the name to be accompanied by a description was the valid name. Crotch (1873b) undoubtedly had this in mind when he raised Lacordaire's divisions to full generic status. Crotch proposed the name *Megischyryus* for Lacordaire's first division, designating *Erotylus undatus* Olivier as the type species. Crotch retained the name *Ischyryus* for the second

division, crediting Lacordaire as the first describer of the genus, and designated *Erotylus quadripunctatus* Olivier as the type species. This was accepted and used by all subsequent workers until Alvarenga (1965) found some errors in the type designations and credits for these genera.

According to the current International Code of Zoological Nomenclature (1985) the first valid use of a name is to be followed--the Law of Priority. Before 1931, the first use of a generic name is valid if it is followed by a description or has a valid species name listed under it, an indication. Also, in designating a type species for a genus subsequent to its first use, the reviser designating the type must choose a species from those originally included within the genus (as indicated by Barber & Bidwell 1940). This makes the Dejean catalogs (1836, 1837) the first valid uses of the generic name *Ischyryus*, and the type species should have been chosen from the species listed within it.

According to these rules, Crotch (1873b) had incorrectly chosen the type species of *Ischyryus*, because *Erotylus quadripunctatus* was not listed in Dejean (1836) as *Ischyryus*. *Erotylus undatus* Olivier was listed under the name *Ischyryus* Chevrolat in Dejean (1836). Crotch chose *Erotylus undatus* as the type species of his genus *Megischyryus*. This makes *Megischyryus* Crotch an objective synonym of *Ischyryus* Chevrolat, leaving *Ischyryus* Lacordaire (*sensu* Crotch) without a valid name.

Discovering these problems, Alvarenga (1965) corrected them by synonymizing *Megischyus* Crotch under *Ischyus* Chevrolat, designating *Erotylus undatus* Olivier as the type species. For *Ischyus* Lacordaire (*sensu* Crotch) he proposed the name *Micrischyus*, designating *Erotylus quadripunctatus* Olivier as the type species. In essence, he discarded one name, moved another, and proposed a third.

In my opinion, Alvarenga's 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 *Megischyus* Crotch and *Ischyus* Lacordaire (*sensu* Crotch). Therefore, a proposal has been submitted to the International Commission of Zoological Nomenclature (Skelley & Goodrich, in press) to conserve these names by suppressing all uses and indications of the name *Ischyus* prior to *Ischyus* Lacordaire (1842). Pending the ruling of the Commission, I am using the name *Ischyus* Lacordaire (*sensu* Crotch), in preference to *Micrischyus* Alvarenga, as the name for the genus studied in this revision.

Format of Species Accounts

Title. This heading is the valid name for the species to be 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 known species in the genus.

Description. This section is a detailed description of the species being discussed. It is 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 that vary from specimen to specimen in the species.

Type. Here I list the type specimens for all species names appearing in the synonymy, their label data, type locality (if not on their labels), current location, sex, and if they were studied.

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, a coden is given in brackets, [XXXX], for the institution (see Appendix B) where the specimen it is currently located.

Many species needed lectotypes designated. A red "lectotype" label was placed on these specimens and dated when they were designated as the "type."

Type specimens of previously described species were dissected only if it was absolutely necessary to solve a species problem. Since this was such a rare occurrence, determining the sex of the types was accomplished using external characters. In some cases, where sexual dimorphism is distinct, the determination was easy. In most cases, when the sex was unclear, it is listed as "not determined."

Specimens examined. Here I list the label data for all specimens studied, if there were fewer than ten records. Species with more than ten collection records have their data presented in tabular form in Appendix C to help keep the text uncluttered and to present it in a more usable format.

Distribution. A brief account of the known geographic distribution of the species is presented. A map is provided for each species to illustrate the distribution.

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 that need clarification. I present some unsolved problems of taxonomic importance indicating that this revision is just a beginning.

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

Remarks. This section contains statements on similar species and how to separate them from other species being covered.

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 meaning presented in *The Torre-Bueno Glossary of Entomology* (Nichols & Schuh 1989). Terms for the genitalia follow Sharp and 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 Triplacinae. 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 that 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 *Ischyryus* 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 pinprick. Impressed punctures are deep punctures, usually with a rounded edge and bottom. Foveate punctures are large, shallow, flat-bottomed punctures, usually with a distinct edge.

Surface

The body is generally covered with a hexagonal micro-sculpturing. Variations in the strength of this microreticulation change the surface from shiny to dull and are visible to the naked eye.

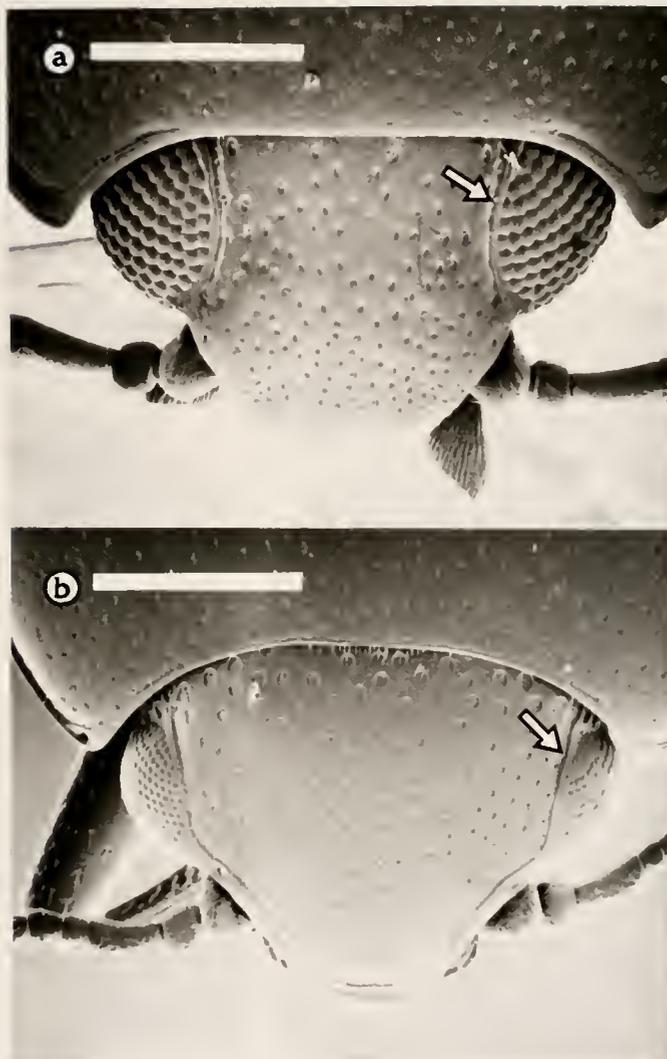


Figure 1. Dorsal view of heads showing eyes: a.) *Ischyrus q. quadripunctatus* (Olivier) with coarsely faceted eyes, line = 0.5 mm; b.) *Tritoma atriventris* LeConte with finely faceted eyes, line = 0.38 mm. The arrow points to the ocular stria.

Body Shape

Most of the species are flattened to slightly convex dorsally; *vespertilio* Lacordaire and *duponti* Lacordaire are convex dorsally (Fig. 2a, 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 (Fig. 3).

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 that 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 (Fig. 4): anterior pronotal, free pronotal, basal pronotal, pronotal hind angle, humeral, subhumeral, scutellar, elytral suture,

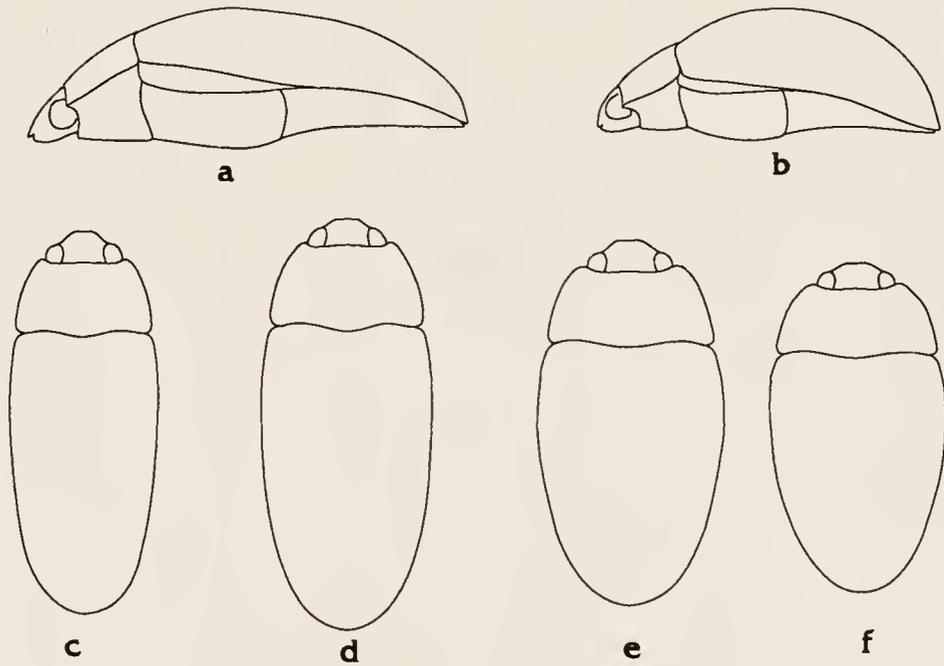


Figure 2. *Ischyryus* body shapes: a.) flattened; b.) convex; c.) parallel-sided; d.) elongate; e.) oval; f.) ovoid.

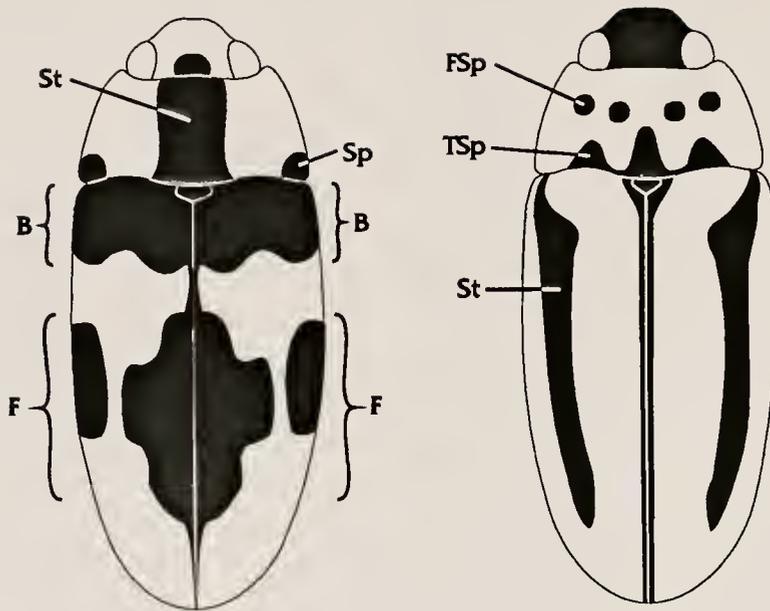


Figure 3. Diagrammatic representation of color pattern terms: B = band, F = fascia, FSp = free spot, Sp = spot, St = stripe, TSp = tooth-like spot.

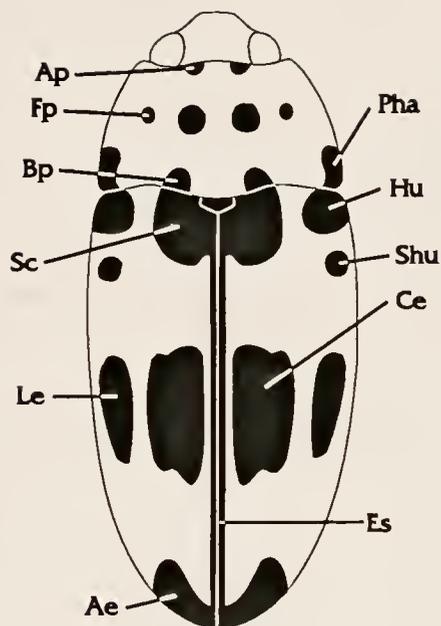


Figure 4. Diagrammatic representation of a generalized color pattern indicating spot names: Ae = apical elytral, Ap = anterior pronotal, Bp = basal pronotal, Ce = central elytral, Es = elytral suture, Fp = free pronotal, Hu = humeral, Le = lateral elytral, Pha = pronotal hind angle, Shu = subhumeral, Sc = scutellar, Sc + Hu = basal elytral band, Ce + Le = central elytral band.

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 that indicates how far forward the line reaches on the eye. For example, it could reach "0.75 distance to the anterior angle of the eye," which means the line stops 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" eye widths (Fig. 5). 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 spots under a dissecting microscope. Study with the scanning electron microscope shows them to

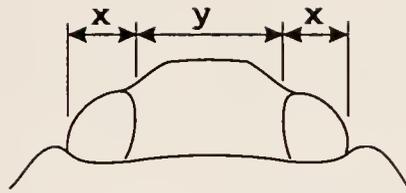


Figure 5. Diagrammatic dorsal view of a head showing the measurements used for determining the ratio of head to eye width; dorsal head width between eyes = y/x times eye width.

be patches of parallel ridges. Even though these have been called stridulatory, I have found no statement about the sound produced. They appear only on males in some species and on both sexes in others. The exact function of these structures is unknown.

Representative species' antennae are illustrated on a single plate for ease in comparison (Fig. 6). If a species antenna is not illustrated, a reference is given to the antenna that is most similar: "(similar to Fig. X)", where "X" is the figure number.

The shape and proportions of the maxillary and labial palp terminal segments are important for species distinctions. These are illustrated on a single plate (Fig. 7) for ease in comparing shapes and proportions. This plate illustrates the palpi of representative species to show the basic forms. The descriptions of species with similar palpi have the statement "(similar to Fig. X)," which refers to the figure "X" that is most similar to that seen in the species being discussed.

The "triangular mentum" is a characteristic of *Ischyrus*. The "triangle" is a sunken area of the mentum surrounded by a ridge (Fig. 8). The triangular sunken 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. As with palp terminal segments, representative menta are

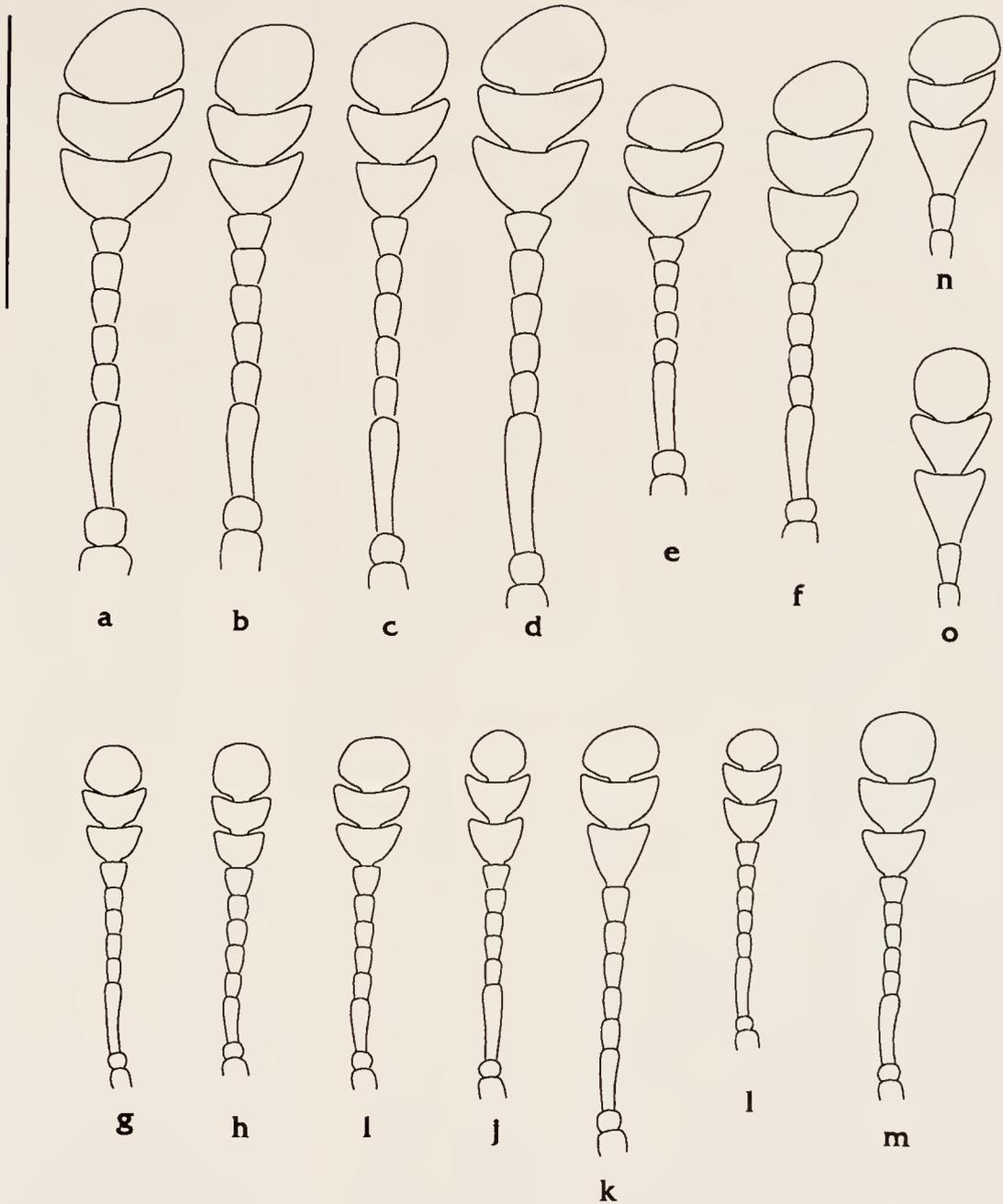


Figure 6. Antennae, line = 1.0 mm: a.) *Ischyryx distinguendus* Lacordaire; b.) *I. n. sp. 2*; c.) *I. insolens* Crotch; d.) *I. bogotae* Crotch; e.) *I. angularis* Lacordaire; f.) *I. q. quadripunctatus* (Olivier); g.) *I. n. sp. 3*; h.) *I. n. sp. 4*; i.) *I. n. sp. 6*; j.) *I. n. sp. 5*; k.) *I. n. sp. 1*; l.) *I. n. sp. 9*; m.) *I. n. sp. 14*; n.) *Megischyryx zonalis* (Lacordaire); o.) *Megischyryx* sp.

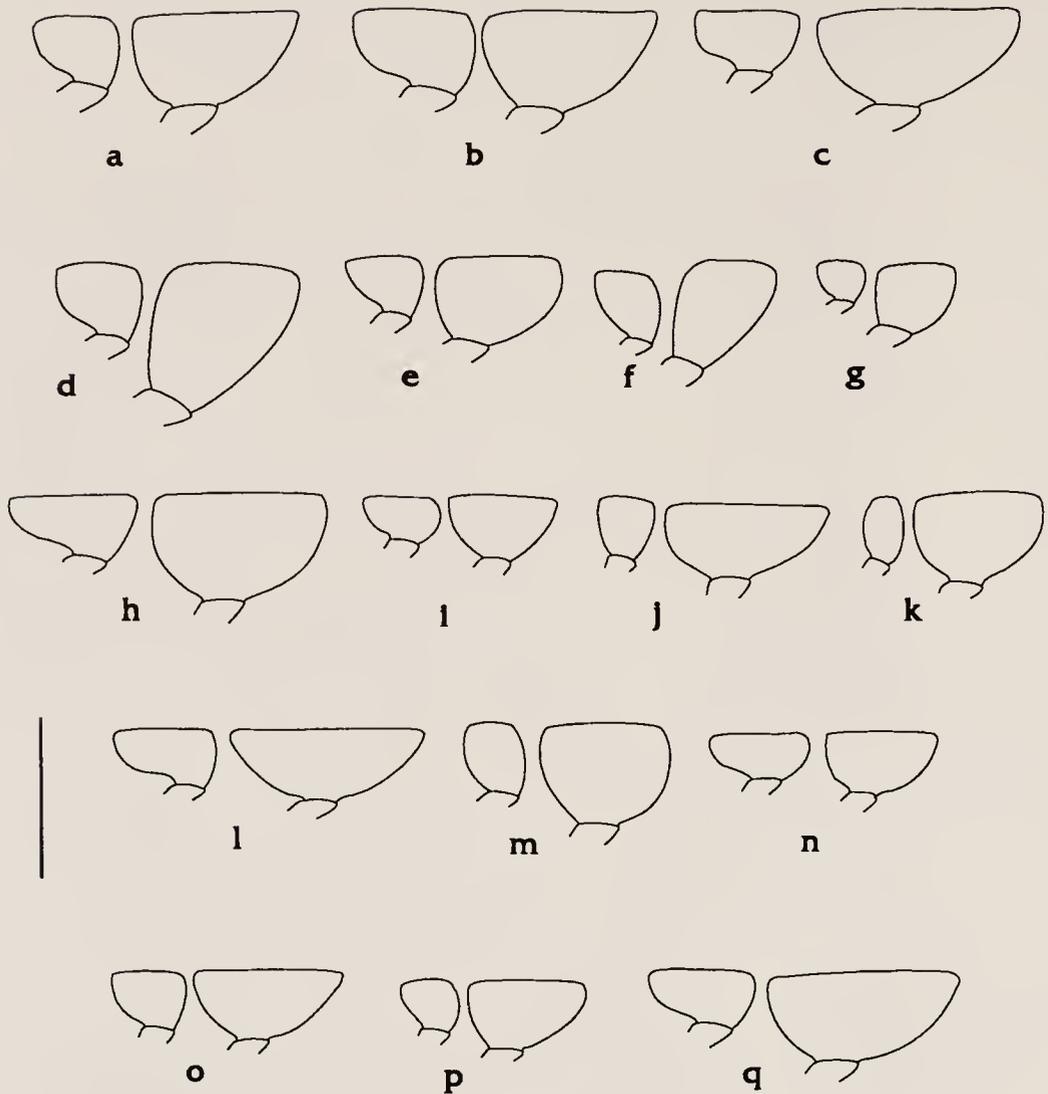


Figure 7. Terminal segments of labial palp (left) and maxillary palp (right), line = 0.33 mm: a.) *Ischyryus distinguendus* Lacordaire; b.) *I. n. sp. 2*; c.) *I. insolens* Crotch; d.) *I. bogotae* Crotch; e.) *I. septemsignatus* Gorham; f.) *I. q. quadripunctatus* (Olivier); g.) *I. n. sp. 3*; h.) *I. undulatus* Gorham; i.) *I. n. sp. 4*; j.) *I. n. sp. 6*; k.) *I. n. sp. 7*; l.) *I. n. sp. 5*; m.) *I. aleator* Boyle; n.) *I. n. sp. 1*; o.) *I. n. sp. 9*; p.) *I. ehippiatus* Gorham; q.) *I. tripunctatus* Crotch.

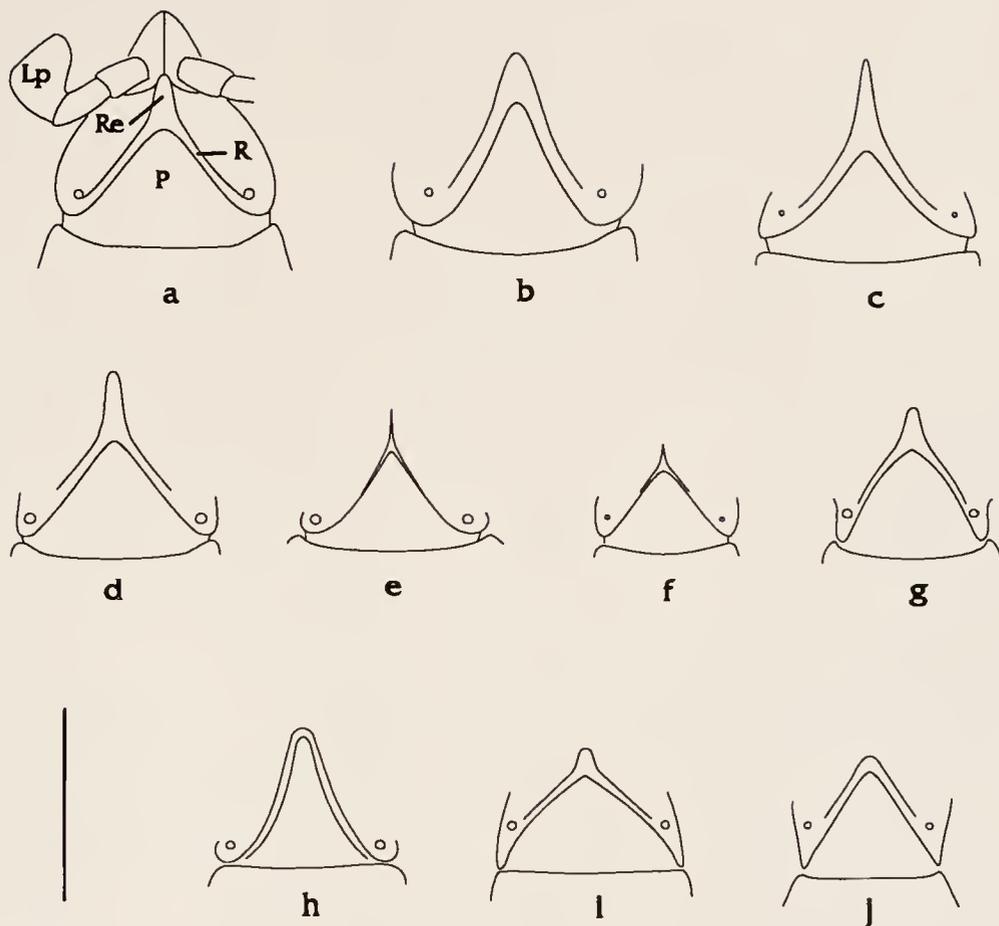


Figure 8. Menta, line = 0.33 mm: a.) *Ischyryus distinguendus* Lacordaire; b.) *I. n. sp. 2*; c.) *I. insolens* Crotch; d.) *I. bogotae* Crotch; e.) *I. n. sp. 3*; f.) *I. n. sp. 4*; g.) *I. n. sp. 6*; h.) *I. n. sp. 5*; i.) *I. aleator* Boyle; j.) *I. ephippiatus* Gorham; Lp = labial palp, P = mental plate, R = mental ridge, Re = mental ridge medial extension.

illustrated on a single plate (Fig. 8) and are often referred to in the text as "(similar to Fig. X)."

Elytra

Except for color patterns mentioned above, the elytra have few useful characters. One is the number of elytral striae and the strength of the strial punctures. Most species have seven complete striae; stria I next to the elytral suture, striae V and 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. Two species (*I. n. sp. 6* & *I. n. sp. 7*) have stria VIII complete, one species (*I. n. sp. 1*) has parts of stria IX visible.

The size of the strial interval punctures is variable from species to species. In the majority of species the punctures are small and obscured in the microsculpturing. In a few other species they are large and distinct, occasionally obscuring the strial punctures.

Ventral Lines

A "line" refers to a ridge or fine groove on a sclerite that is not a suture, but probably has some supportive function. These lines surround the coxae and often extend onto the sclerite (Fig. 9). The term "coxal line" is used in reference to the line on the median 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.,

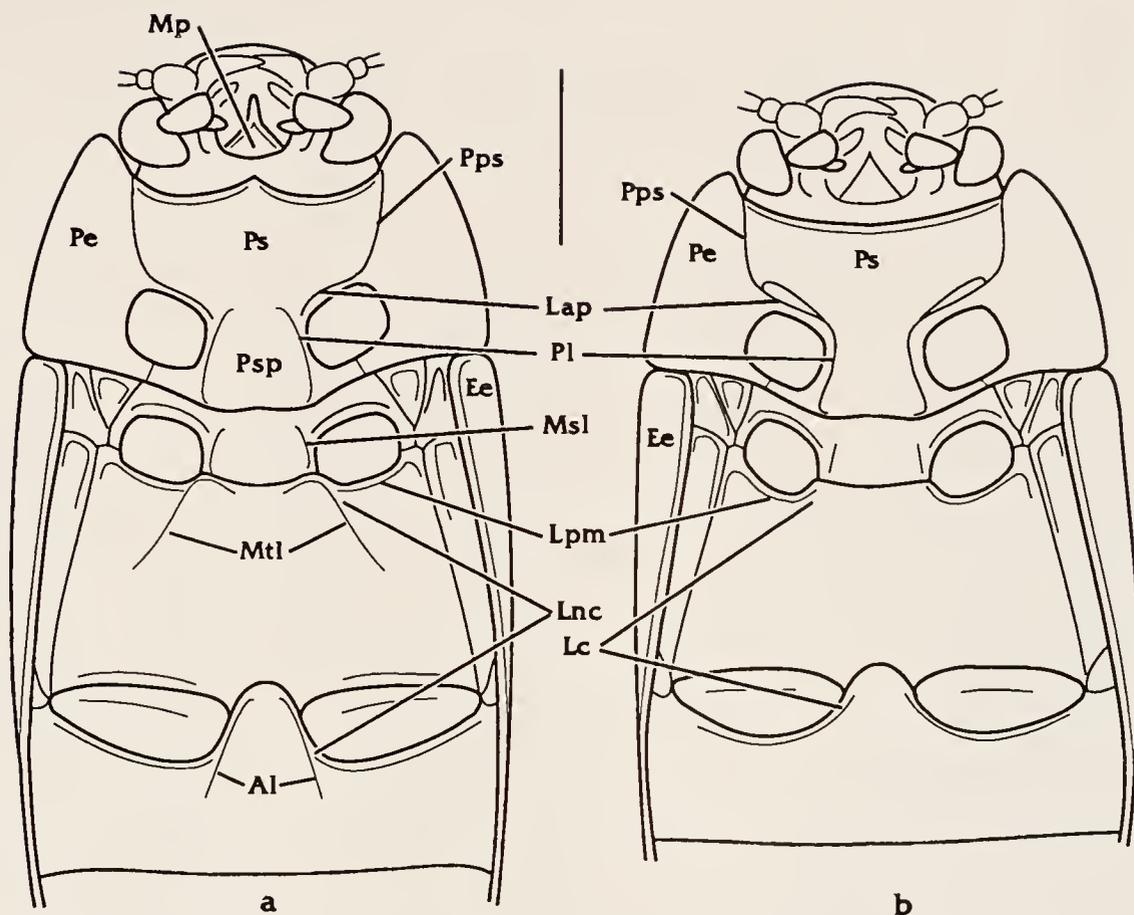


Figure 9. Ventral view of a.) *Ischyryx proximus* Lacordaire and b.) *I. n. sp. 1*, line = 1.0 mm: Al = abdominal coxal line, Ee = epipleural fold of elytron, Lap = prosternal line anterior to procoxa, Lc = coxal line continuous around coxa, Lnc = coxal line not continuous around coxa, Lpm = metasternal line posterior to mesocoxa, Mp = mental plate, Msl = mesocoxal line, Mtl = metacoxal line, Pe = pronotal epipleuron, Pl = procoxal line, Pps = prosternal-pronotal epipleuron suture, Ps = prosternum, Psp = prosternal plate.

the prosternal line in front of the procoxa or the metasternal line behind the mesocoxa.

In the majority of *Ischyryus* species the coxal lines 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. 9), 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" (according to 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 *Ischyryus* and can be absent (Fig. 10a, 10b), weak (Fig. 10c, 10d), or strong (Fig. 10e, 10f).

In a few species (for example, *I. n. sp. 5*, *I. n. sp. 6*, and *I. n. sp. 7*) the prosternal keel appears anteriorly swollen just behind the margin (Fig. 10g, 10h). I call this "swollen above the pinch."

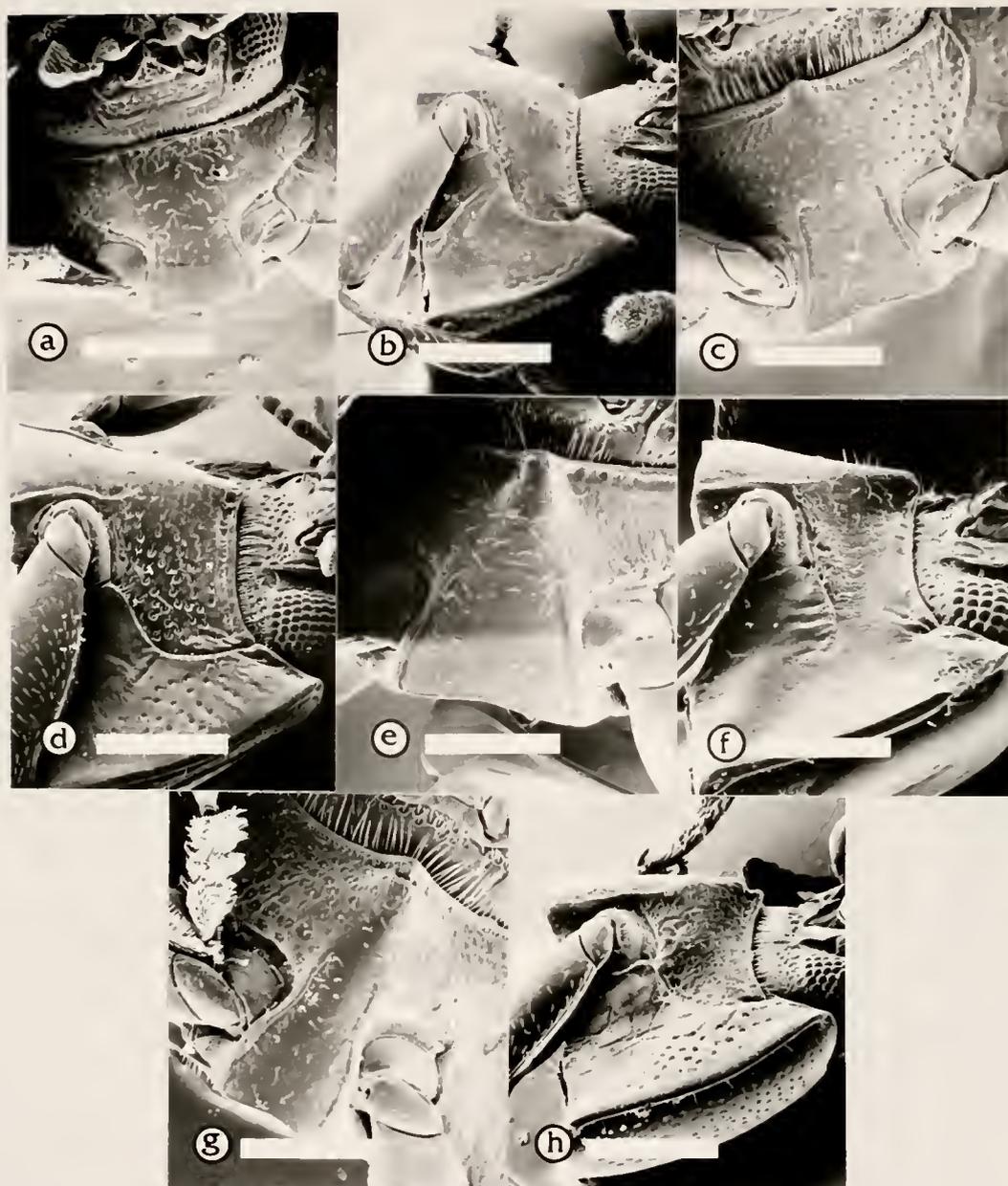


Figure 10. Prosternal development: a.) ventral and b.) lateral view of *Ischyryus aleator* Boyle [Mexico, Sonora] prothorax lacking anterior pinch, line = 0.60 mm; c.) ventral and d.) lateral view of *Ischyryus q. quadripunctatus* (Olivier) [USA, Florida] prothorax with weakly developed prosternal keel and pinch, line = 0.60 mm; e.) ventral and f.) lateral view of *Ischyryus scutellaris* Gorham [Mexico, Yucatan] prothorax with strong keel and pinch, line = 0.40 mm; g.) ventral and h.) lateral view of *Ischyryus n. sp. 7* [Panama] prothorax with prosternal keel swollen above pinch, line = 0.44 mm.

I use the term "prosternal plate" in reference to 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. 11), 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. 11b) indicates the line passes beyond an imaginary line drawn between the anterior edge of the procoxae. The phrase "barely surpassing coxa" (Fig. 11a, 11c) indicates the line passes beyond the point where the line in front of coxa begins, but does not pass beyond an imaginary line drawn between the anterior edge of the procoxae. The phrase "not surpassing coxa" (Fig. 11d) indicates where the line stops where the line in front of procoxae begins, well before the imaginary line.

Many species have sexual dimorphism on 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 distinct foveate punctures than the males (Figs. 12-14), the opposite of Delkeskamp's (1959) observations of certain African Dacninae.

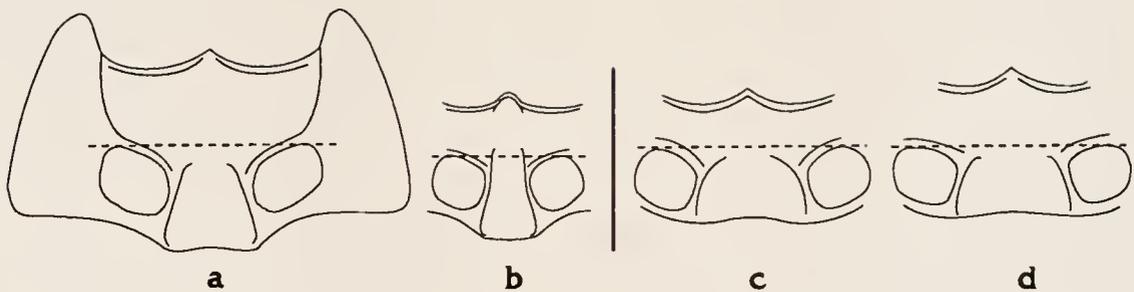


Figure 11. Prosternal plates showing procoxal line shapes and anterior development, line = 1.0 mm; a.) *Ischyryus proximus* Lacordaire, barely surpassing coxa; b.) *I. n. sp. 7*, parallel-sided and surpassing coxa; c.) *I. n. sp. 5*, semicircular and barely surpassing coxa; d.) *I. duponti* Lacordaire, not surpassing coxa. Imaginary line (dashed) included for referencing anterior edge of procoxae in determining procoxal line development.

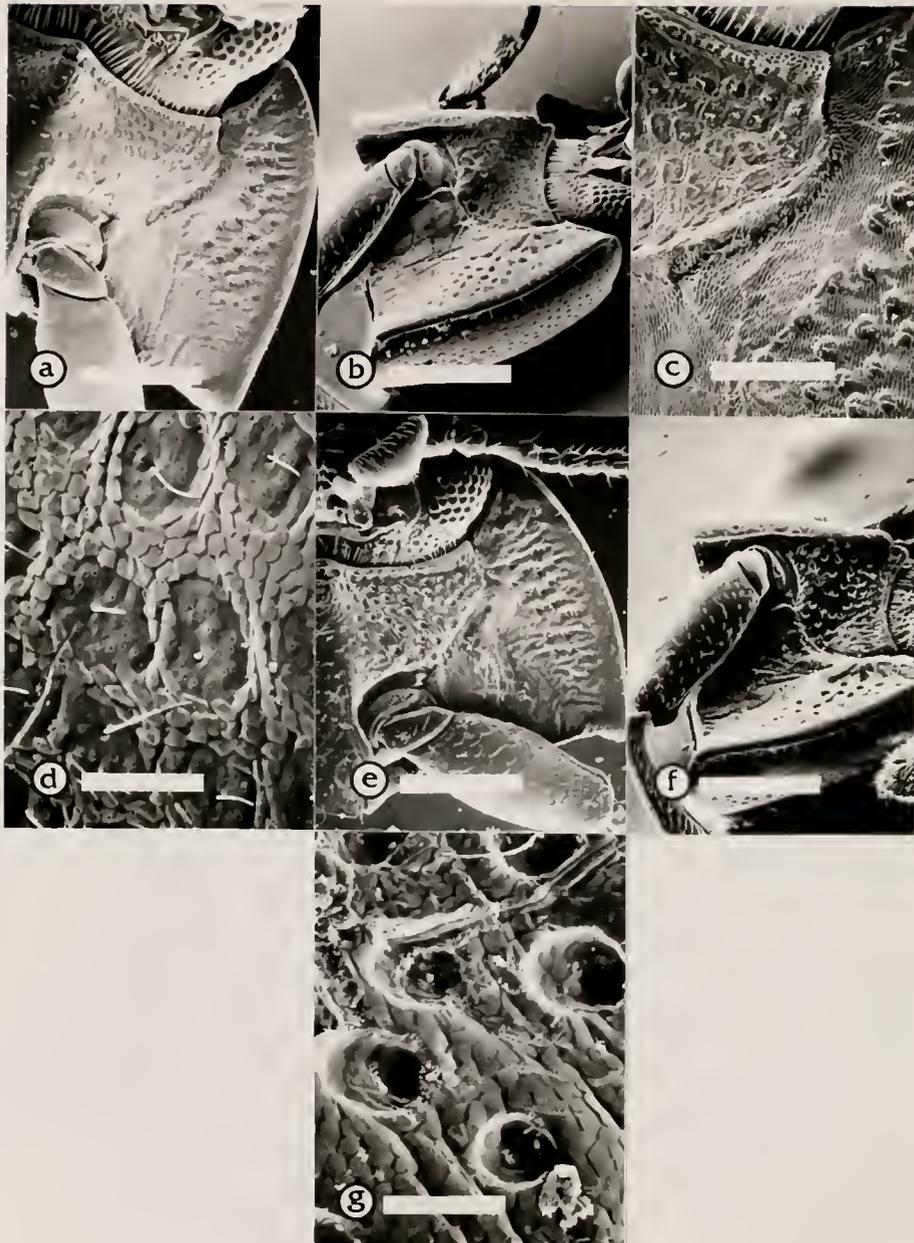


Figure 12. Prosteral sexual dimorphism in puncture development. Male *Ischyryus n. sp. 7* [Panama] prosteronum: a.) ventral view, line = 0.38 mm; b.) lateral view, line = 0.50 mm; c.) ventral view of prosteral-pronotal epipleural suture, line = 0.17 mm; d.) prosteral punctures in front of procoxa, line = 0.04 mm. Female *Ischyryus n. sp. 7* [Panama] prosteronum; e.) ventral view, line = 0.43 mm; f.) lateral view, line = 0.50 mm; g.) prosteral punctures in front of procoxa, line = 0.04 mm.

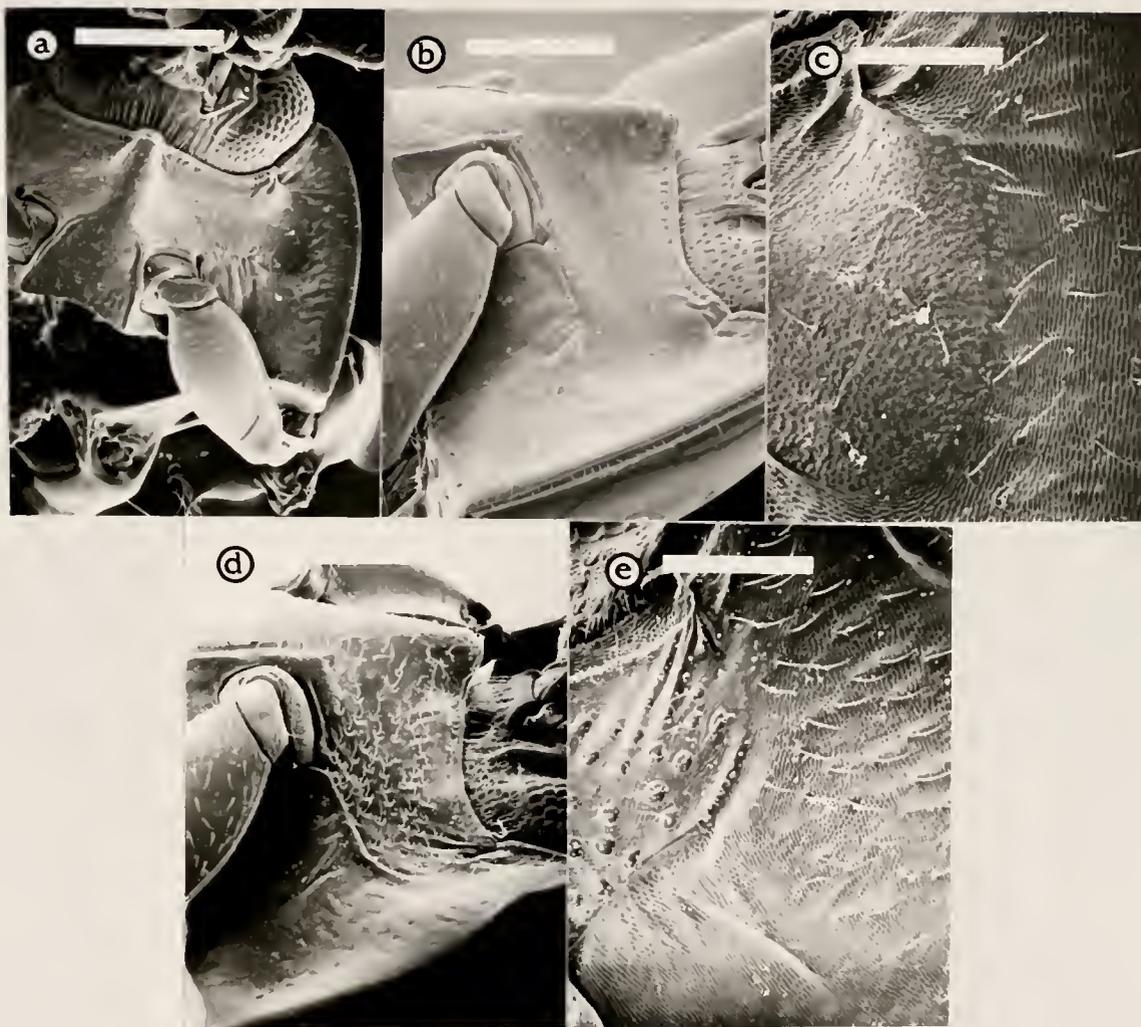


Figure 13. Prosternal sexual dimorphism in puncture development and lateral expansion. Male *Ischyryus incertus* Lacordaire [Mexico, Chiapas] prosternum: a.) ventral view, line = 0.75 mm; b.) lateral view, line = 0.50 mm; c.) ventral view of laterally expanded prosternal-pronotal epipleural suture, line = 0.17 mm. Female *Ischyryus incertus* Lacordaire [Panama] prosternum; d.) lateral view, line = 0.50 mm; e.) ventral view of prosternal-pronotal epipleural suture, line = 0.25 mm.

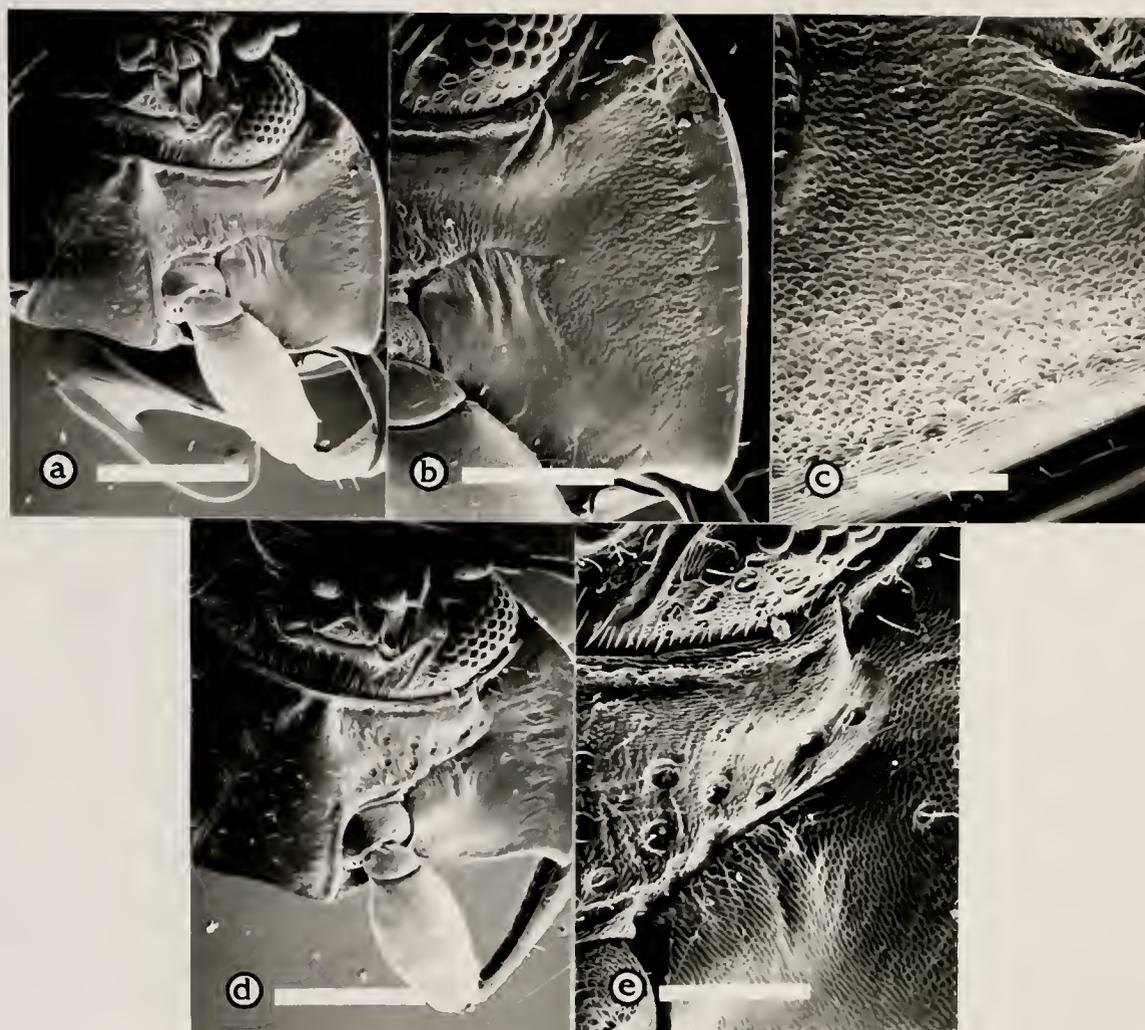


Figure 14. Prosteral sexual dimorphism in puncture development and lateral expansion. Male *Ischyryus scutellaris* Gorham [Mexico, Yucatan] prosterum: a.) ventral view, line = 0.60 mm; b.) ventral view, line = 0.30 mm; c.) lateral view of prosteral expansion, line = 0.12 mm. Female *Ischyryus scutellaris* Gorham [Mexico, Yucatan] prosterum; d.) ventral view, line = 0.50 mm; e.) ventral view of prosteral-pronotal epipleural suture, line = 0.17 mm.

In a few species, males have the prosternum expanded laterally, obscuring the prosternal-pronotal epipleural suture (Figs. 13-14). 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. 13), or it can nearly cover the entire pronotal epipleuron (Fig. 14).

Mesosternum

The mesosternum has few useful characters. The length of the mesosternal lines in relation to the distance between them, along with the meso-metasternal suture shape, 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 is useful in grouping related species. The term "recurved" is used to describe a line that curves away from the meso-metasternal suture (Fig. 15c-f). Medially, these lines can take several forms: absent, not recurved nor meeting medially

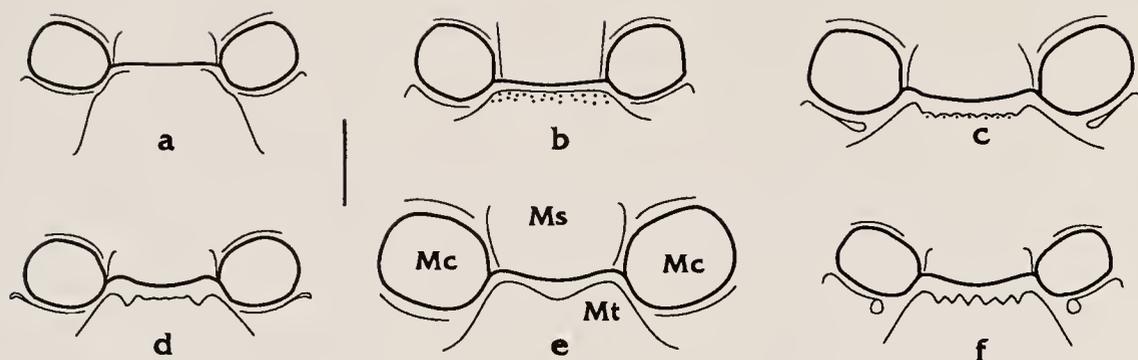


Figure 15. Meso- and metasternum showing coxal line development, line = 0.5 mm: a.) *Ischyryus auriculatus* Lacordaire, not recurved or meeting at middle; b.) *I. aleator* Boyle, not recurved and meeting at middle; c.) *I. undulatus* Gorham, recurved and meeting at middle; d.) *I. n. sp. 13*; e.) *I. distinguendus* Lacordaire, Mc = mesocoxa, Ms = mesosternum, Mt = metasternum; f.) *I. n. sp. 3*.

(Fig. 15a); not recurved meeting in a straight line (Fig. 15b); meeting with a series of punctures or undulations (Fig. 15c); meeting as a single tooth (Fig. 15e); meeting with two widespread teeth (Fig. 15d); or meeting with many teeth (Fig. 15f).

The mesosternal 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). This pit is most often present at the medial end of this line, but the groove can be deepened at the lateral end (for example, *I. n. sp. 13*).

First Visible Abdominal Sternite

The coxal lines on the first visible abdominal sternite 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.

This first visible abdominal sternite can be rounded, broadly rounded or truncate between the metacoxa at the junction with the metasternum.

Male Genitalia

The internal sac of the male genitalia is held inverted within the median lobe (Fig. 17a). During copulation, the internal sac is everted, exposing any microstructure and extending the flagellum (Fig. 17b). The median lobe, internal sac, and flagellum are the true

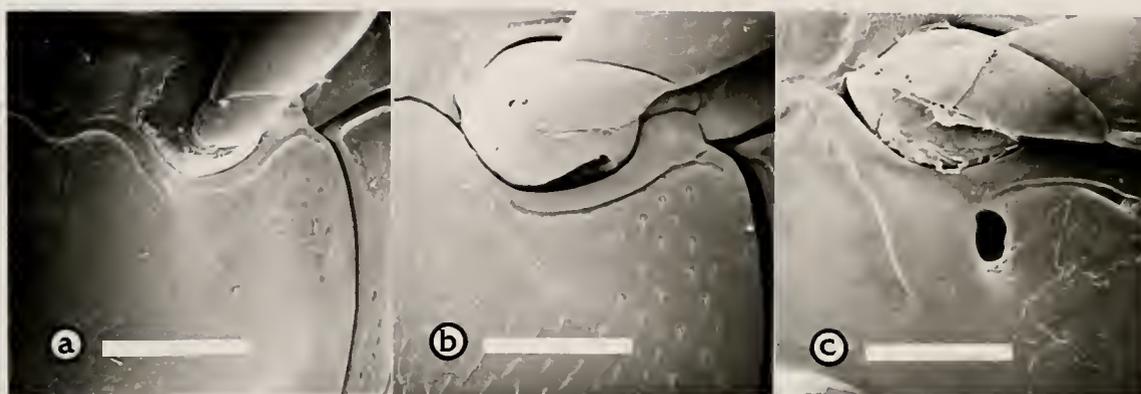


Figure 16. Metasternal line posterior to mesocoxa: a.) simple line on *Ischyryus proximus* Lacordaire [Mexico, Chiapas], line = 0.75 mm; b.) groove on *Ischyryus q. quadripunctatus* (Olivier) [USA, Florida] line = 0.38 mm; c.) groove with pit at medial end on *Ischyryus n. sp. 3* [Panama], line = 0.28 mm.

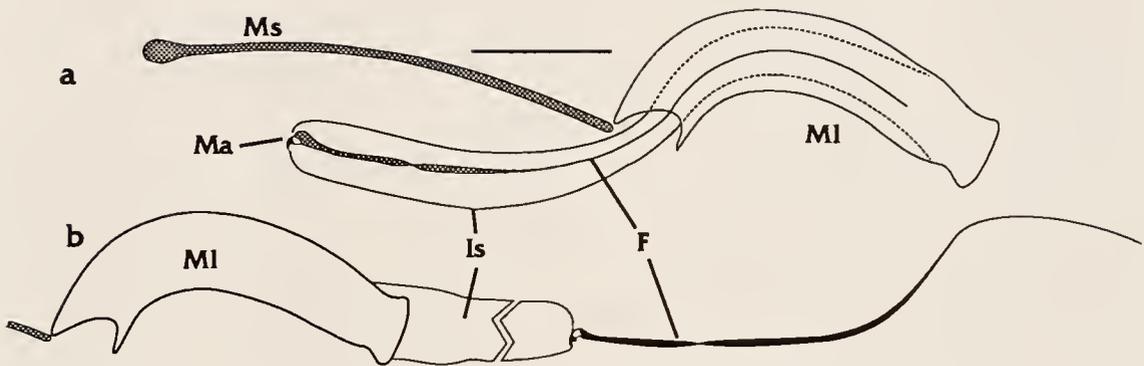


Figure 17. Male genitalia of *Ischyryus q. quadripunctatus* (Olivier), line = 0.66 mm; a.) internal sac inverted as held within the body; b.) internal sac and flagellum everted as during copulation; F = flagellum, Is = internal sac, Ma = sclerite for muscle attachment at anterior end of flagellum, MI = medial lobe, Ms = median strut.

intromittent organs and show the majority of species specific characters. For additional insight into the genitalia of Coleoptera, I recommend the following: Lindroth 1957; Sharp and Muir 1912; Skelley 1993; Snodgrass 1957; Tuxen 1970; Verhoeff 1895; Williams 1945; and Wood 1952.

The median lobe is a simple tubular structure that is curved and laterally flattened. The degree of curvature varies from species to species and can be slightly curved to arched. The shape of the median lobe's posterior end varies, and can be truncate, rounded, or narrowed and then rounded.

The internal sac occasionally has pigmented areas, which are patches of microspinules. These can be large lightly pigmented patches of widely scattered microspinules, or small dark paired patches. These patches are known in only a few species.

I found the shape of the sclerite for muscle attachment at the flagellum's base to be important in species recognition. The sclerites are all basically U-shaped, but with many variations. Just posterior to this sclerite is a pigmented section. This section of the flagellum is often variable in shape and curvature. A close study showed it to be flexible, like cartilage. The shape of 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. 18) varied little from species to species. Structures had proportions which varied, 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 in studies of higher categories.

The spermatheca 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 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 sources (institutions and individuals) during this revision. Appendix B lists these sources with their coden (mostly from Arnett et al., 1993) used throughout this study.

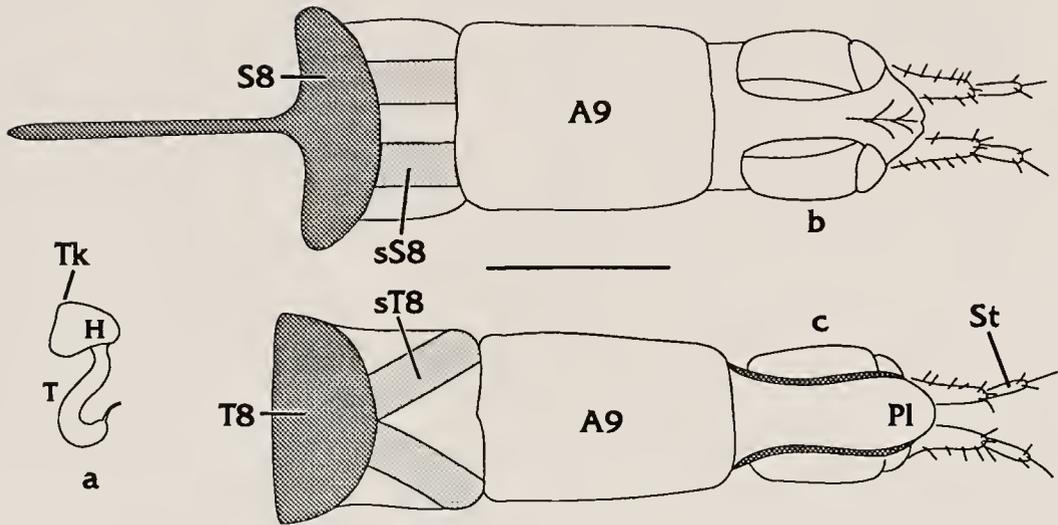


Figure 18. Female genitalia of *Ischyryus q. quadripunctatus* (Olivier), line = 1.0 mm: a.) spermatheca; b.) ventral view; c.) dorsal view; A9 = abdominal segment IX, H = head of spermatheca, Pl = proctigeral lobe, S8 = abdominal sternum VIII, sS8 = straps appendant to abdominal sternum VIII, sT8 = straps appendant to abdominal tergum VIII, St = styli, T8 = abdominal tergum VIII, T = tail of spermatheca, Tk = top-knot on spermathecal head.

Locating Types

In most taxonomic research the investigators must study material seen by the describer of a species in creating the description. These specimens are the reference point for the name. Many descriptions were poorly done, or lack specific details needed to identify additional specimens. The history of each "type" specimen becomes important in locating it or discovering if it still exists. Modern researchers must record the depository of specimens studied. Early researchers did not always do this. Horn and Kahle (1935-1937) and Sachtleben (1961) stated the location or fate of many collections and can be helpful in locating a specific specimen.

For New World Erotylidae the majority of early type material 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).

Many of the *nomina nuda* in Dejean's catalogs (1836, 1837) and collection, were validated by Lacordaire because he acquired Dejean's Erotylidae (Horn & Kahle 1935-1937) and used Dejean's names in his descriptions. Horn & Kahle indicate that Lacordaire's collection was divided and deposited in various European museums. I have been unable to find all of Lacordaire's Erotylidae, but he studied specimens of several other collectors whose material can be

found in two places: the Crotch collection (CUMZ); or the Oberthür collection (MNHN).

Many of Lacordaire's species were described from the Dupont collection. Horn & Kahle indicate that the Dupont collection was divided with some of the material being deposited in the collections of G. V. Mniszech and R. Oberthür. Nicole Berti at the Museum National d'Histoire Naturelle, Paris (*in litt.*), stated that the Oberthür collection, including the Mniszech collection, is at the MNHN, and that Oberthür indicated on the back of a box that specimens studied by Lacordaire are in the collection of Mniszech. For *Ischyryus*, the specimens labeled "Type" from this collection matched the original descriptions in both morphology and label data. Most specimens in this collection do not have "Type" labels, but they are potentially type material and should be considered in subsequent type designations for Lacordaire species.

Lacordaire also studied specimens from the collections of L. A. A. Chevrolat and L. J. Rieche. These erotylid collections, and others, were acquired by G. R. Crotch. Crotch's Erotylidae collection, at the Cambridge University Museum of Zoology, is rich in types. In this collection, label data indicate which specimens are types, and often from whose collection they came. The *Ischyryus* specimens labeled "Type" fit the original descriptions, label data, and collection of origin.

The Natural History Museum, London, (formerly known as the British Museum of Natural History) houses the specimens studied in the *Biologia Centrali-Americana* (Gorham 1887-1899).

Tracking one specimen illustrates that it is not always a simple matter. The type specimen of *Ischyryus quadripunctatus* (Olivier), the generotype of *Ischyryus*, was not studied by Boyle (1956) in his family revision of America north of Mexico. Olivier (1791) stated that the specimen was in the collection of M. Francillon. Horn and Kahle (1935-1937) state that the Francillon collection was divided and deposited in the Natural History Museum, London, and the Hope Entomological Collections, University of Oxford, U.K. I visited the Natural History Museum and found no specimen which could be the type. The curator of the Hope Entomological Collections, G. C. McGavin, wrote that the majority of their part of the Francillon collection was sent to the (Alexander) MacLeay Museum, Sydney, Australia, in 1818. The curator of the MacLeay Museum, D. S. Horning, Jr., wrote that they do have specimens from the Francillon collection, including some from the locality stated in Olivier's description. But, he would be unable to look for the specimen until his recent injury had healed. Thus, I still do not know if the specimen studied by Olivier exists.

Collecting

Specimens of the genus *Ischyryus* can be found feeding on their host fungus. Based on the number of specimens known for most 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 *Ischyryus* and related genera by using a beating square on dead sticks at night. Sticks, limbs, branches, etc., which produced the 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 seem to prefer dead suspended branches.

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

Equipment

Specimens were studied under a binocular dissection microscope, Unitron ZSB, with a zoom-magnification of 0.7x-4.5x and 20x ocular lenses. A Hitachi S-570 scanning electron microscope was used. Although useful in seeing and understanding many of the minute characters, it was not an essential part of this study. I made an effort to base species descriptions and key characters on those visible at low magnifications.

Techniques

Adult specimens often needed to be cleaned before surface structures could be studied. This was accomplished by brushing the specimen with a small soft-bristle brush dipped in ethyl acetate or alcohol. Ethyl acetate was also used to degrease badly soiled specimens. If the mouthparts were badly soiled, the specimen was dipped in warm water to loosen the dirt, and to relax the specimen before brushing the dirt away. On rare occasions specimens were so badly soiled that they were totally relaxed, cleaned, and remounted.

European-style card mounting made it impossible to study the ventral surfaces without removing the specimen from the card. The solvent used to soften the glue depended on what glue was used. The following series of chemicals was used until one dissolved the glue: water, 70% isopropanol, 80% ethanol; ethyl acetate. Rarely did the specimen require treatment with all of these, but occasionally a specimen needed to have the glue manually removed.

I dissected many genitalia for further study. Specimens were chosen from across the distributional range of the species and from those showing variation in external characters. Each specimen was put into a weak solution of hot detergent water and allowed to sit from one hour to overnight. Once relaxed, the specimen was carefully held between the thumb and forefinger under the dissecting

microscope. With a pair of jewelers forceps, the elytra were lifted just enough to slip one side of the forceps underneath and the abdomen was grasped on a side. In this way, the specimen was held and the remainder of the body was not effected by the dissection to follow.

The abdominal tergites (membranous) and underlying muscle masses were separated from the visible sternites on the side not held by the forceps. This was done with a bent-tipped minuten attached to a small wooden toothpick. Once loosened, the forceps were moved to hold only the sternites of the side just separated, and the same operation performed on the second side. After these separations were complete the tergites and underlying muscle masses were removed with a second pair of forceps. This technique allows the visible abdominal sternites to remain attached; the specimen appears intact.

The removed muscle masses containing the genitalia, and terminal segments of the abdomen, were cleaned and cleared in a warm 10% potassium hydroxide (KOH) solution, and the remaining unwanted tissues were removed manually with forceps. The genitalia were rinsed in 70% isopropanol or water and stored in glycerin in genitalia vials associated with the appropriate specimen. Genitalia vials are small plastic or glass vials that can be placed under the pinned specimen, with the pin piercing the stopper.

Detailed study of these genitalia rarely required more magnification than the dissecting microscope allowed. The

genitalia were studied in glycerin, and moved into various positions to see the shape of the muscle attachment at the anterior end of the internal sac. The shapes of this structure and the flagellum were important in solving many of the species problems. When finished, the genitalia were returned to the genitalia vial and pinned under the appropriate specimen.

The "stridulatory files" were not studied for many species since this required removing the head from the body. This type of dissection destroyed the specimen, and I was not willing to sacrifice the few specimens available for most species.

Illustrations were made with the use of a glass-grid insert placed in an ocular of the dissecting microscope. The imposed grid on the specimen was used as reference and the drawing was made on a piece of grid paper. It was necessary to make various adjustment to each of the drawings, because the curvature of the lenses produced distortions. This was most apparent when comparing the finished pencil drawing and the specimen without the aid of the microscope. The drawings were then traced in India ink onto tracing paper with a 000 Koh-i-nor Rapidograph® technical pen, scanned into electronic form using a Hewlett Packard Scanjet IIP, finished using CorelDRAW® 2.01 (a computer graphics program) on a Unisys 486 personal computer, and printed with an Apple LaserWriter® II.

Habitus drawings lack legs and antennae for several reasons. First, the legs are of little use in determining species. The antennae need to be illustrated side-by-side for close comparisons. Adding these structures doubles or triples the time to do an illustration. Lastly, by omitting these structures, the habitus drawings can be placed closer together, requiring less space and fewer pages.

In plotting distribution maps, many specific localities were not found because of poor label data. If the information was adequate enough 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. Questionable records are plotted with a question mark "?".

Color Pattern Problems

Species level decisions have historically been based simply on color and color patterns. Museum specimens vary in the shades of orange because of age, killing agent, and 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 care must be taken in analyzing differences. The specimen(s) in question must first be placed within the proper section of the genus. This was done by using morphological and genitalic characters. Many recently

described species were compared to an unrelated species in the original description. This made determinations based on the literature impossible, and the type specimens had to be studied.

A different appearing color pattern did not necessarily mean the specimen was a 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. Differences based on changes in pattern due to the spot size generally were not specific.

In other cases, a spot which varied in its location, generally indicated a specific difference. For example, in two closely related species the only color pattern difference is that one species has a humeral spot touching the base and the other has a subhumeral spot well removed from the base. 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.

Written descriptions cannot convey the exact details of these patterns the way an illustration does. Every species and many variations are here illustrated. In some cases the differences are subtle, but they are constant and correlate with other morphological differences. Care should be taken when comparing any specimen to these illustrations because of color pattern variations mentioned above, and ones not yet known.

Studying series of specimens from a large geographic range has allowed me to observe geographic 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. In only a few cases has this variation been more than a clinal or subspecific difference.

The term "pattern" was used for variations of a color pattern in situations where previously described species were found to be part of a cline. These "patterns" were maintained because they still had some relation to a geographic range. The "pattern" name is the specific name that once applied to that pattern, or a name was applied if that "pattern" was not previously described. New "pattern" names were applied only if specific names already existed for other patterns (see *I. quadripunctatus* and *I. scriptus*). 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. Some even develop into stripes as the sinuate edges on both sides of the band meet. Many species from mid-South America have striped patterns. In contrast, the majority of northern species have banded patterns. This is best illustrated with *I.*

quadripunctatus, *I. scriptus*, and their variations. This trend may indicate mimetic relationships among species.

Rules of Thumb

In determining the taxonomic status of various names, and in naming new taxa, several general rules were followed which require some explanation.

Many species are variable in color pattern over their geographic range. This is illustrated in several species where adequate series have been studied. Certain color patterns are known from only a few specimens, often from scattered localities. If two specimens have different, but basically similar color patterns and their morphology (including the genitalia) is similar, they are considered variations of a single species.

In other cases a radical color pattern difference is observed, but the genitalia are incomparable (i.e., male vs. female). These are considered variations of a single species, and are discussed under the most closely related described species, noting the variations and their taxonomic status.

If a previously described species was a member of several patterns in a cline, that name was synonymized under the senior name and discussed in the species account.

Consistent morphological differences correlated with color pattern differences are considered to be specific, and these taxa are described. New species are simply

numbered, because of problems with nomenclatural priority, and names will be proposed when published.

The lack of series in many species indicates that there is much to be discovered in this genus. Several of the species discussed here may actually represent complexes. Because of inadequate material these problem taxa are left unresolved and are discussed under the appropriate species account.

Results

The genus *Ischyryus* is composed of 42 North and Central American species, including 16 previously undescribed; leaving 30 additional described species in South America. A total of 3741 North and Central American specimens was studied (2890 *I. quadripunctatus*) and 363 were dissected. The 148 figures, key, appendices, and descriptions are provided to complete this revision.

ISCHYRUS LACORDAIRE

Ischyurus Lacordaire 1842:89-131.

Micrischyurus Alvarenga 1965:86.

Type Species. *Erotylus quadripunctatus* Olivier
1791:431,437. Subsequent designation by Crotch
1873a:353; 1873b:144.

Diagnosis. Characterized by having coarsely faceted eyes, triangular mentum, short ocular stria not surpassing anterior angle of eye, undilated tibia, 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), 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 rounded at ends; 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 trapezoidal, rarely triangular (Fig. 6); antennomere X crescent-shaped to trapezoidal; antennomere XI transversely elongate-oval to circular; antennomeres X-XI often asymmetrical.

Mandibles each with two finger-like teeth and a large prosthema bearing many inwardly pointing setae. Maxilla with lacinia bearing an apical tooth, often bifid (Fig. 19b); 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, 19a). Postmandibular lobes present, broadly rounded,

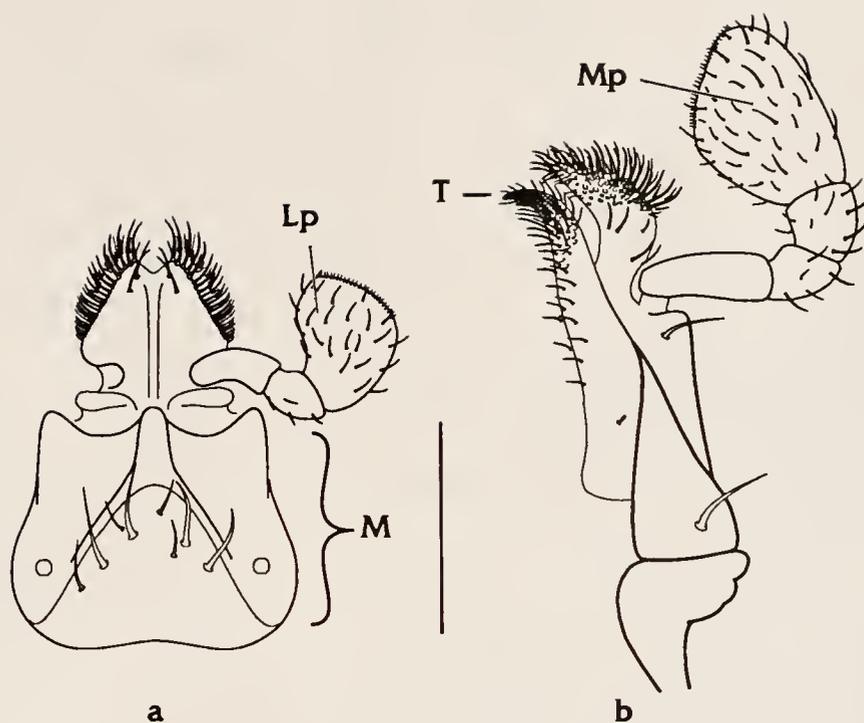


Figure 19. *Ischyryus q. quadripunctatus* (Olivier)
 a.) labium and b.) left maxilla ventral
 view, line = 0.25 mm: M = mentum, Lp =
 labial palp, Mp = maxillary palp, T = bifid
 tooth of lacinia.



Figure 20. Ventral view *Ischyryus q. quadripunctatus*
(Olivier) [USA, Florida] head and prothorax, line =
0.50 mm.

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. 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. 11); lines anteriorly converging or parallel, rarely surpassing front of procoxa, lines not continuous around coxae (except *n. sp. 1*); posteriorly 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. 21); tibia straight, almost parallel-sided, slightly widened toward apex; tarsi pseudotetramerous.

Abdominal coxal lines present, short; rarely continuous around metacoxae.

Male genitalia with median strut length variable, equal to or larger than median lobe; internal sac can bear patches of spinules; flagellum varying in length and thickness, with sclerotized muscle attachment at base, non-sclerotized 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. 18). Proportions of these structures vary little throughout the genus. Spermatheca sclerotized, shape of head and tail variable, occasionally with a top-knot (Fig. 18).

Stridulatory files often present at the base of the head (Fig. 22).

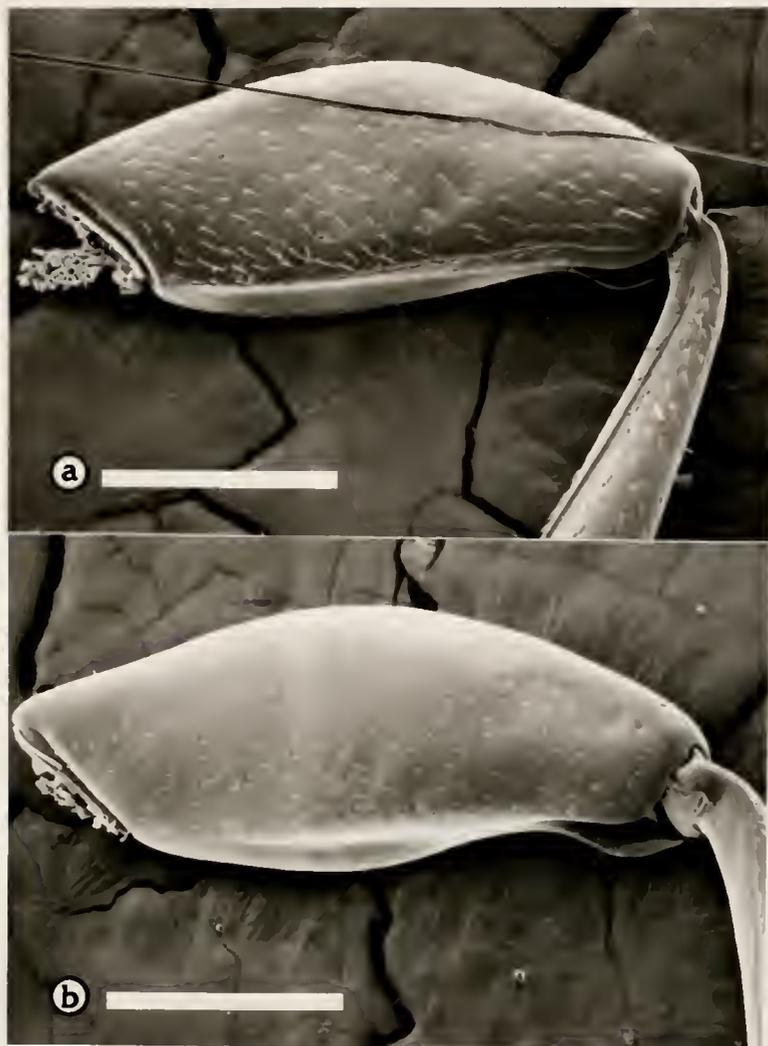


Figure 21. Ventral view of meso-femur: a.) *Ischyryus q. quadripunctatus* (Olivier) [USA, Florida] with posterior margin, line = 0.50 mm; b.) *Oocyranus flavitarsis* (Lacordaire) [Cuba] lacking posterior margin, line = 0.60 mm.

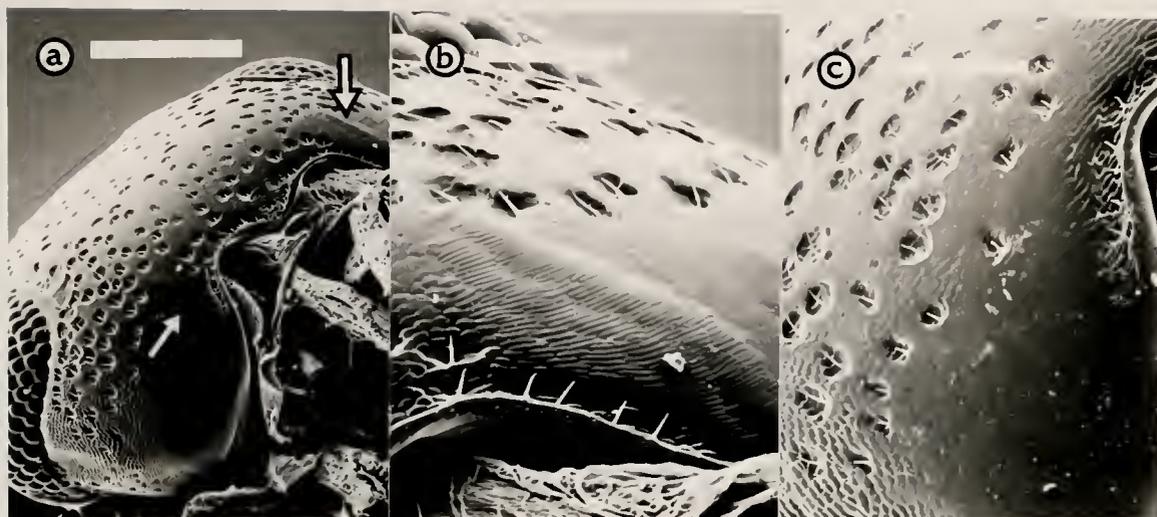


Figure 22. *Ischyryus q. quadripunctatus* (Olivier) [USA, Florida] occipital region of head showing stridulatory file (arrow): male with stridulatory file, a.) line = 0.38 mm, b.) line = 0.08 mm; c.) female lacking stridulatory file, line = 0.15 mm.

Sexual dimorphism often present. Males of some species have the prosternum laterally expanded onto the pronotal epipleuron; not expanded in females (Figs. 13-14). Males of many species have fewer, or less distinct, punctures on the prosternum in front of the procoxae (Figs. 12-14).

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.

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, *Oocyanus* Hope, have a similar set of "eye-spots". This peculiarity could be of adaptive significance in warding off predators. Both of these larvae have been found feeding exposed on prostrate white fungus growing on dead wood (personal observations). Other larvae of the

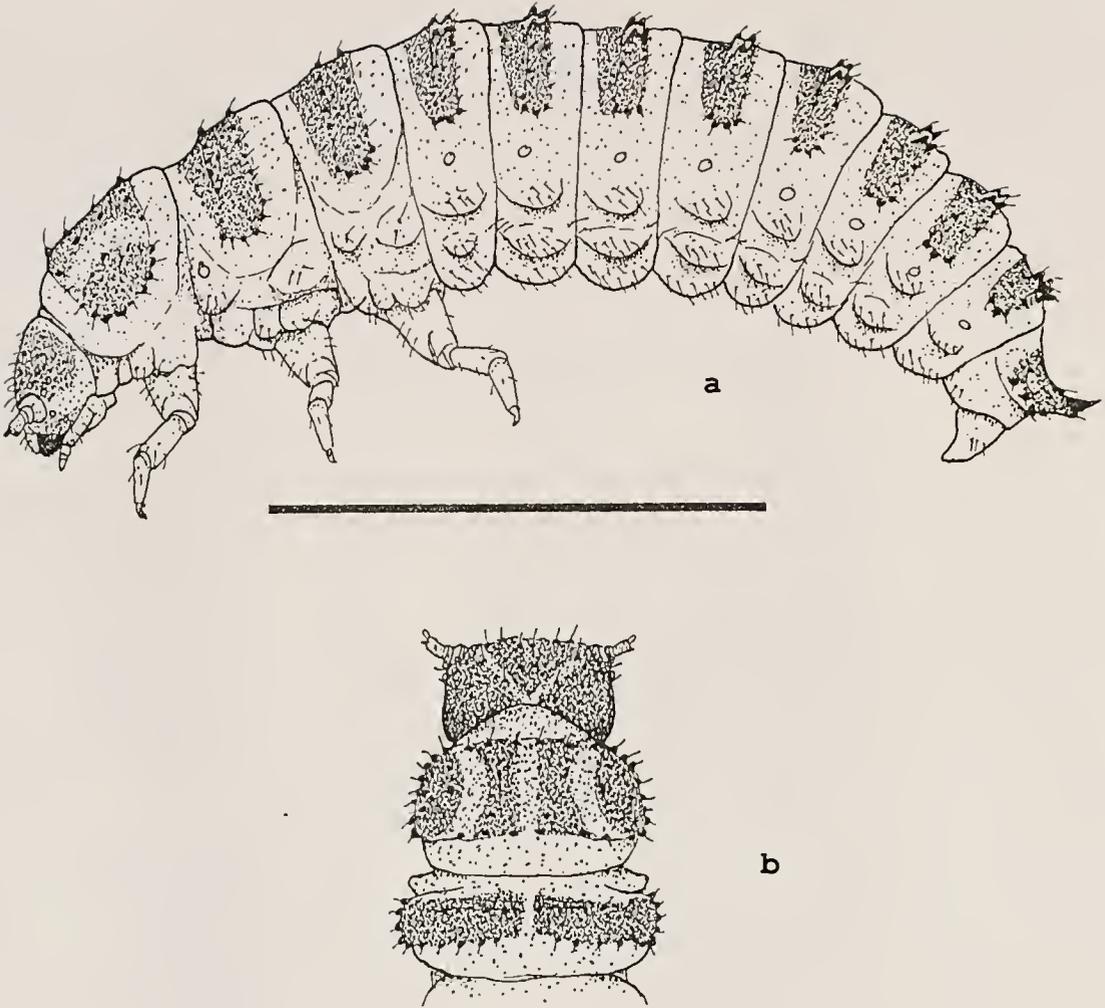


Figure 23. *Ischyryus q. quadripunctatus* (Olivier) larva
[USA, Florida], line = 4.0 mm.; a.) lateral view; b.)
dorsal view of head and thorax.

Erotylidae are burrowers in fungi (some Triplacinae, 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 lack these spines and patterns (see Roberts 1958; Costa, et al. 1988; and Lawrence 1991, for illustrations of various erotylid larvae).

Ischyryus 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). Richard Leschen (pers. comm.) collected *I. proximus* on *Schizopora paradoxa* (Fr.) Donk in Costa Rica, 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 at night, I collected several species of *Ischyryus* and other related genera on small dead limbs both on the ground and hanging from the trees.

Several species have pits on one of the thoracic sternites, for example; *I. undulatus* and *I. n. sp. 3* on the metasternum behind the mesocoxa, and *I. n. sp. 1* 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 secretion, 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 and Harold (1876) indicated that the name *Ischyros* means "validus".

Remarks. Although Boyle (1956:110) stated that *Ischyros* lacks teeth on the lacinia; this is incorrect. The tooth illustrated (Fig. 19) is located in a dense patch of setae and is difficult to see.

Ischyros Lacordaire appears most closely related to *Megischyros* Crotch, *Callischyros* Crotch, and *Oocyranus* Hope in having a triangular mentum, loose antennal club, strongly microreticulate body surface, and in basic color patterns.

Ischyros differs from *Oocyranus* in having the femora margined along the inner side where the tibiae meet the femora (Fig. 21a); this margin is lacking in *Oocyranus* (Fig. 21b). *Callischyros* differs from *Ischyros* in having the eyes finely faceted and the ocular stria surpassing the antennal base; in *Ischyros* the eyes are coarsely faceted and the ocular stria at most touch the antennal base. *Megischyros* differs from *Ischyros* in having a larger body size (greater than 11 mm) and in having antennomere IX triangular (Figs. 6n-o); in *Ischyros* the body size is smaller (less than 10

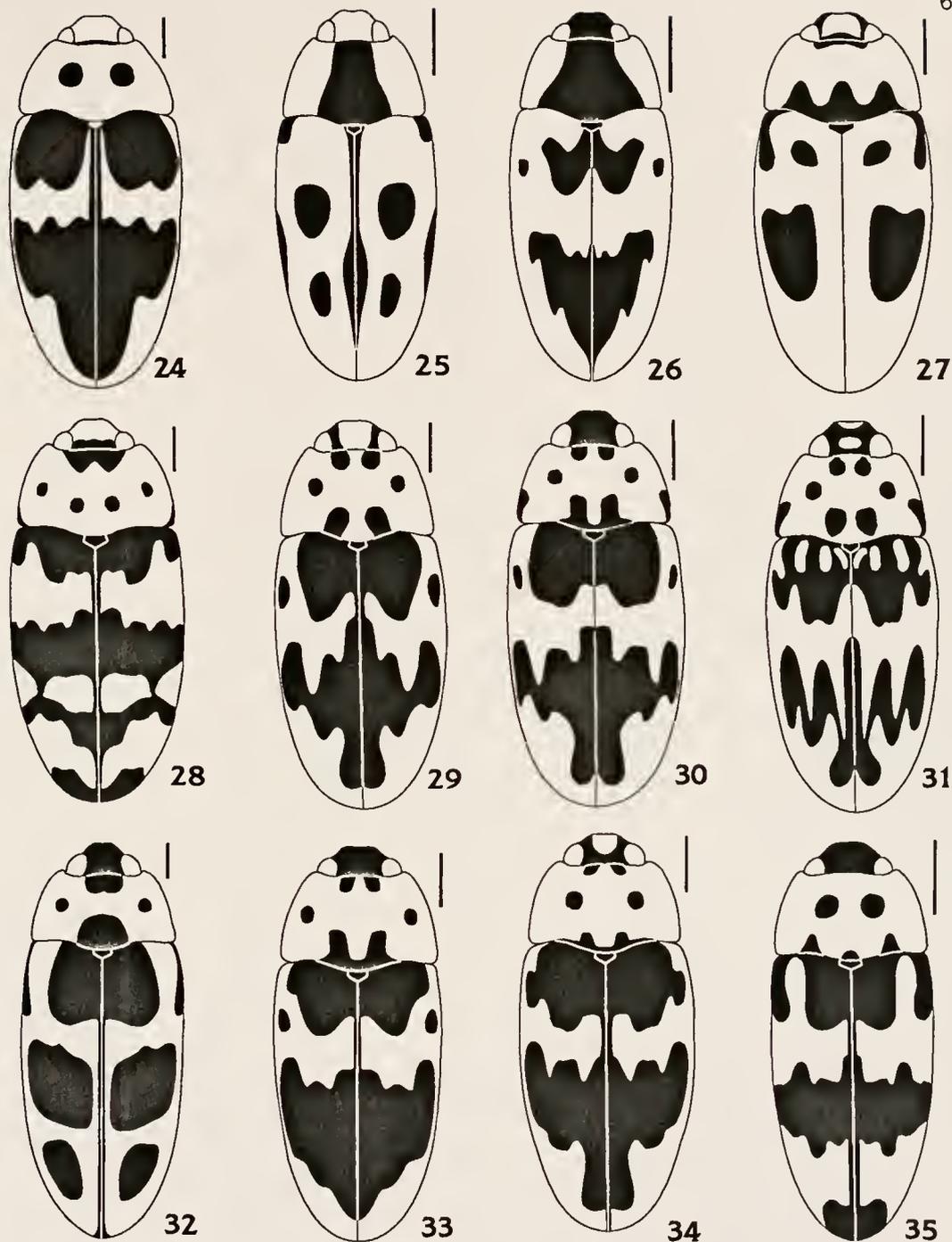
mm) and antennomere IX is semicircular or trapezoidal, rarely triangular.

References. Alvarenga 1965:85; 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 1942:171,195-196; 1951:209-210; Neave 1939-1940:790; Pallister 1955a:4; 1955b:6-7; Seidlitz 1891:288; Skelley 1988b:60.

ARTIFICIAL KEY TO SPECIES

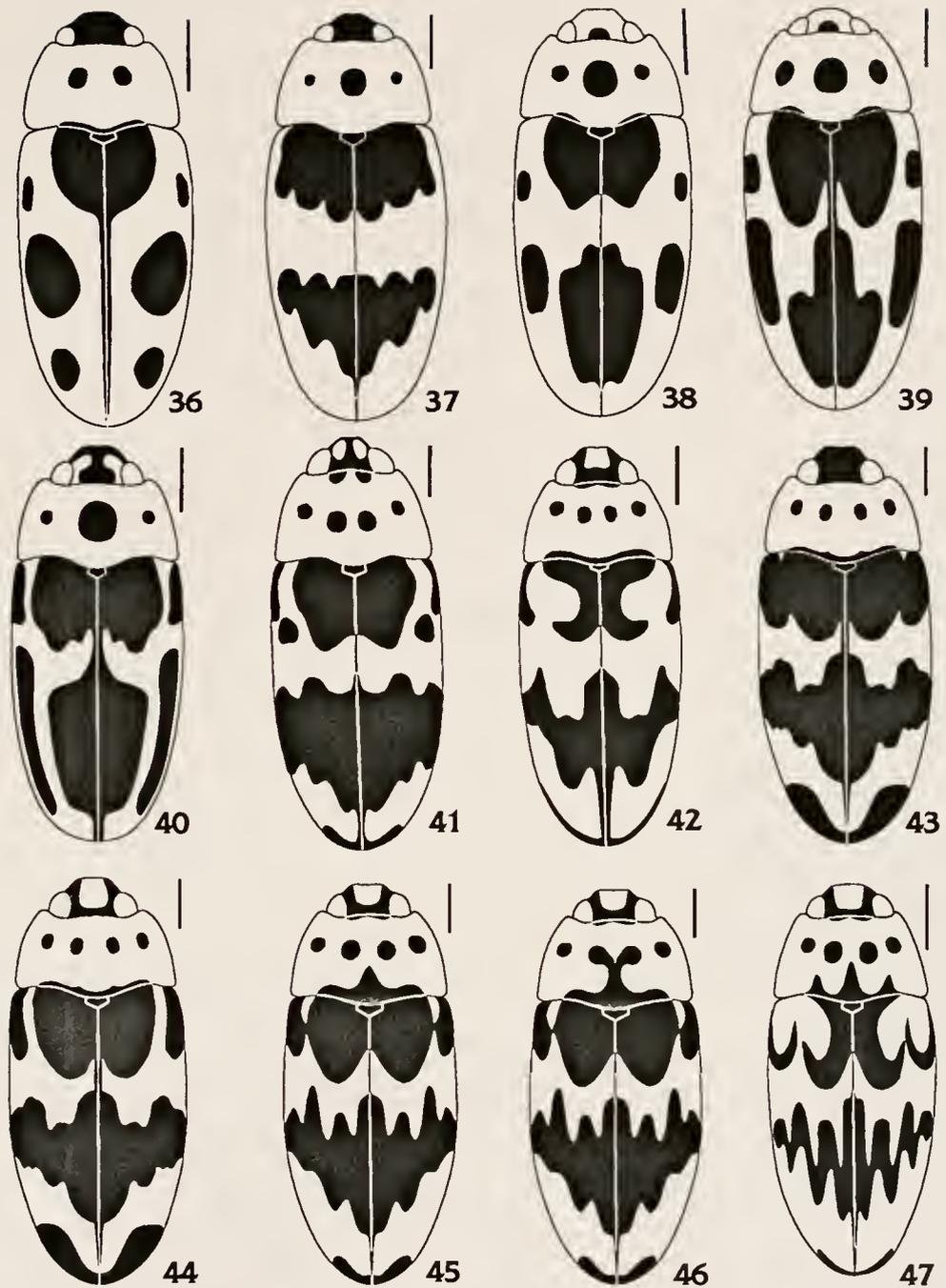
This key was built using characters visible under low magnification, without dissection. Several species appear in the key more than once, because some characters are variable or have an intermediate state on some species. Couplet 3 is the best example of a character that can be difficult to interpret. If a specimen does not adequately key, or does not match what it does key to, then try the other choice in the couplet.

- 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) 3
- 2.(1) Pronotum with 2 free spots (Fig. 24).
 *vesperilio* Lacordaire
- 2'. Pronotum with central stripe (Fig. 25). *n. sp.* 1
- 3.(1') Antennal club segments distinctly asymmetrical; antennomere XI larger (wider or longer) than antennomere X (Fig. 6a-f) 4
- 3'. Antennal club segments symmetrical; antennomere XI size variable; if appearing asymmetrical, antennomere XI



Figures 24-35. Dorsal habitus, line = 1.0 mm: 24.) *Ischyryus vespertilio* Lacordaire; 25.) *I. n. sp. 1*; 26.) *I. n. sp. 2*; 27.) *I. distinguendus* Lacordaire; 28.) *I. insolens* Crotch; 29.) *I. scriptus* (Olivier) "northern"; 30-31.) *I. scriptus* "southern"; 32.) *I. bogotae* Crotch; 33.) *I. incertus* Lacordaire; 34.) *I. proximus* Lacordaire; 35.) *I. angularis* Lacordaire.

equal in size or smaller than antennomere X (Fig. 6g-m).	19
4.(3) Pronotum without free spots	5
4'. Pronotum with free spots	6
5.(4) Pronotum with a central black stripe and red sides, no basal spots (Fig. 26).	<i>n. sp.</i> 2
5'. Pronotum red with three basal spots only (Fig. 27).	<i>distinguendus</i> Lacordaire
6.(4') Pronotal hind angles with a dark marking, black of lateral margin encroaches upon the side	7
6'. Pronotal hind angles without distinct dark markings ..	8
7.(6) Pronotum with 4 free spots in a transverse arc; 2 central spots well separated from the base (Fig. 28).	<i>insolens</i> Crotch
7'. 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)	<i>scriptus</i> (Olivier)
8.(6') Pronotum with 2 free spots; 2 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).	9
8'. Pronotum with 3-4 free spots; if 4, then central spots separated from base by more than their diameter (Figs. 37-47).	14
9.(8) Pronotum with spots on anterior margin.	10
9'. Pronotum without spots on anterior margin	13

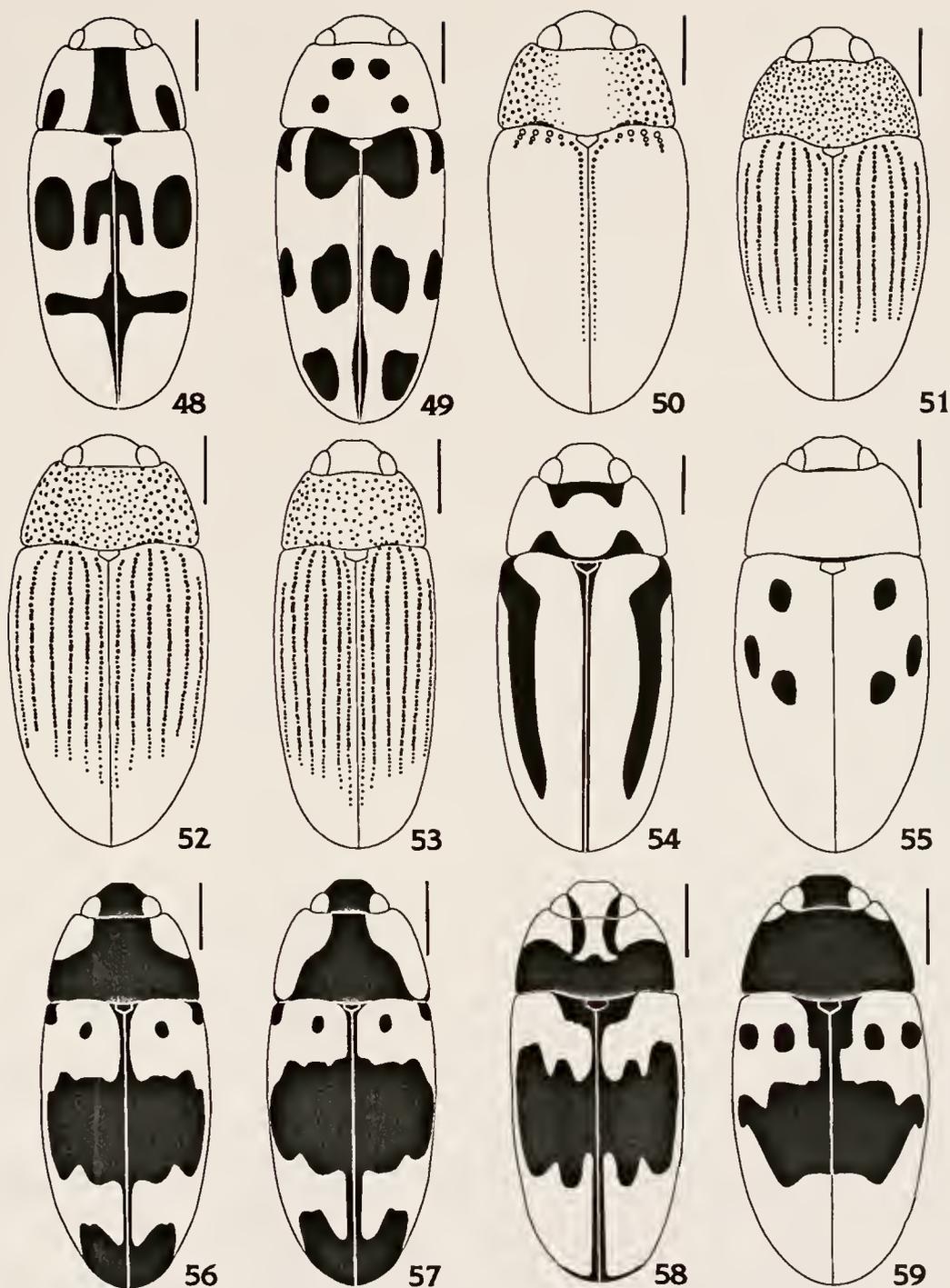


Figures 36-47. Dorsal habitus, line = 1.0 mm: 36.) *Ischyryus septemsignatus* Gorham; 37.) *I. tripunctatus* Crotch; 38.) *I. frontalis* Lacordaire; 39.) *I. frontalis* var.; 40.) *I. dunedinensis* Blatchley; 41.) *I. boucardi* Crotch; 42.) *I. quadripunctatus chiasticus* Boyle; 43-47.) *I. quadripunctatus 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".

- 10.(9) Pronotum with 1 large basal spot (Fig. 32).
 *bogotae* Crotch
- 10'. Pronotum with 2 basal spots 11
- 11.(10') Antennomere XI equal in size to antennomere X (Fig. 61); femur black; elytra with weak microreticulation, strongly shining; pronotal spots forming a transversely elongate ellipse (Fig. 33) *incertus* Lacordaire
- 11'. Antennomere XI larger than antennomere X (Fig. 6c); femur red or black; elytra with dulling microreticulations; pronotal spots forming a circle, longitudinally elongate circle, or rarely a weak transverse ellipse (Figs. 29-31, 34) 12
- 12.(11') Femur red 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)
- 12'. Femur and scutellum black; humeral spot connected to scutellar spot; elytral epipleural fold red, at least at base, rarely dark; pronotal spots forming a longitudinally elongate ellipse (Fig. 34)
 *proximus* Lacordaire
- 13.(9') Elytra with central band and apical spots connected to suture (Fig. 35) *angularis* Lacordaire
- 13'. Elytra with central band and apical spots not reaching the edge (Fig. 36) *septemsignatus* Gorham
- 14.(8') Pronotum with 3 free spots 15

- 14'. Pronotum with 4 free spots 17
- 15.(14) Central elytral band broken into spots 16
- 15'. Central elytral band complete (Fig. 37).
. *tripunctatus* Crotch
- 16.(15) Lateral spot of elytra small, circular; Central
America (Figs. 38-39). *frontalis* Lacordaire
- 16'. Lateral spot of elytra elongate, stripe-like; USA,
Florida (Fig. 40). *dunedinensis* Blatchley
- 17.(14') Maxillary palps narrow (Fig. 7f), longer than wide.
. *quadripunctatus* (Olivier). .18
- 17'. Maxillary palps wide (Fig. 7c), wider than long; (Fig.
41) *boucardi* Crotch
- 18.(17) Scutellar spots form an X-shaped mark; narrow band
of black at base of pronotum (Fig. 42).
. *quadripunctatus chiasticus* Boyle
- 18'. Scutellar spots not X-shaped, or if X-shaped then base
of pronotum with prominent tooth-like spots (Figs. 43-
47) *quadripunctatus quadripunctatus* (Olivier)
- 19.(3') Metasternal line behind mesocoxa impressed with a
distinct pit near middle (Figs. 15c, 15f, 16c);
epistome angled at side, flat and sharp in profile;
face flat, usually lacking impressions; body
cylindrical 20
- 19'. 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 .. 21

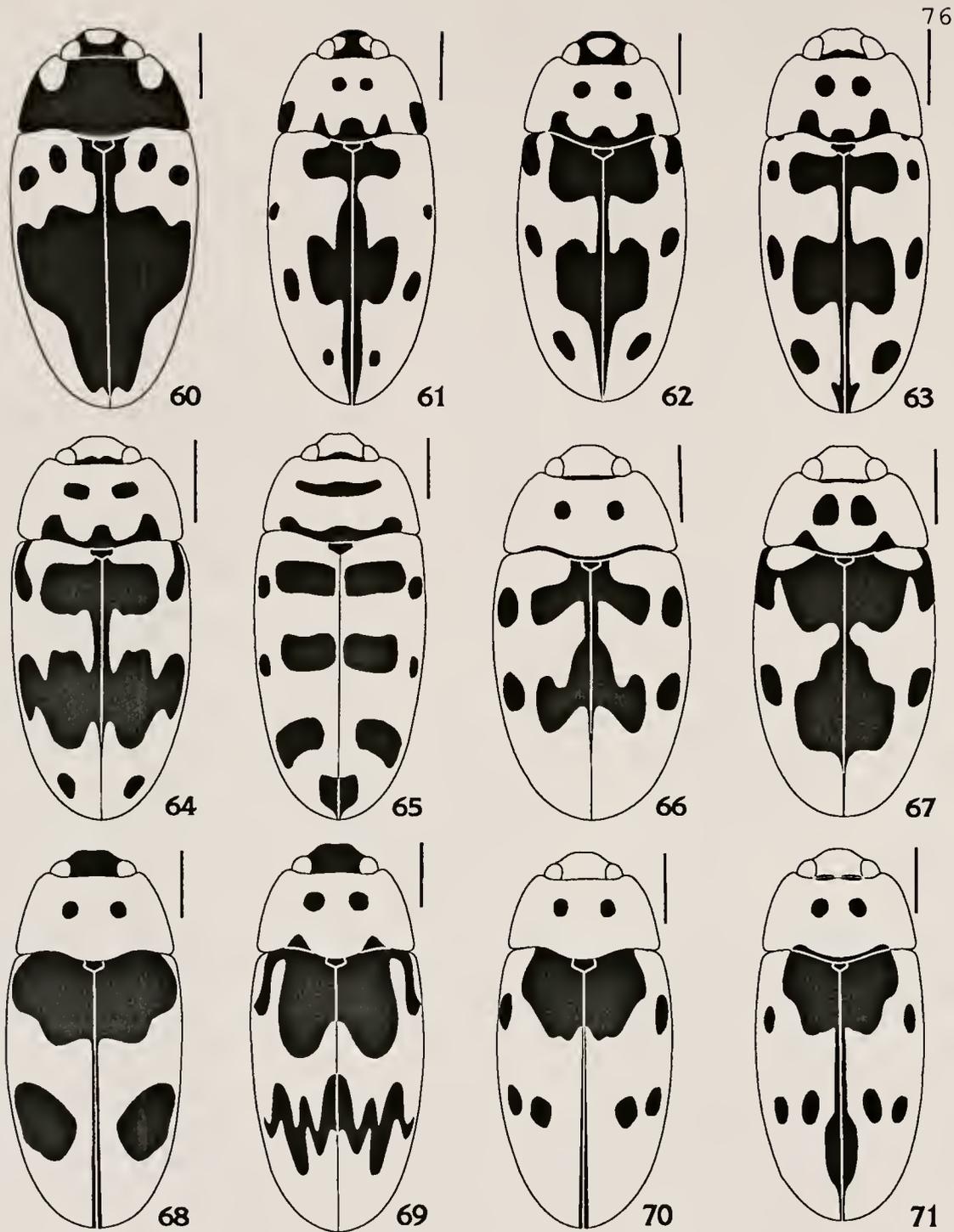
- 20.(19) Pronotum with 2 basal spots and a central stripe connecting the base and anterior margin (Fig. 48). *n. sp.* 3
- 20'. Pronotum without a central stripe, 4 free spots (Fig. 49). *undulatus* Gorham
- 21.(19') Color pattern lacking, uniformly colored, often paler at lateral margins. 22
- 21'. With distinct color pattern 25
- 22.(21) Body with metallic blue sheen; strial punctures present only at base and along sutural margin; Cuba (Fig. 50) *n. sp.* 4
- 22'. Body without metallic sheen; strial punctures present over entire elytral disc 23
- 23.(22') Prosternum 2-3 times longer than the distance between the procoxae (Fig. 11b); labial palps not expanded, squared or rounded (Fig. 7k) 24
- 23'. Prosternum at most 1.5 times longer than the distance between the procoxae; labial palps expanded, securiform (Fig. 7j); (Fig. 51) *n. sp.* 5
- 24.(23) Pronotal punctures distinctly larger laterally; shiny black; parabolically rounded at sides (Fig. 52) *n. sp.* 6
- 24'. Pronotal punctures same size throughout; dull brown; parallel-sided (Fig. 53). *n. sp.* 7
- 25.(21') Pronotum without free spots 26
- 25'. Pronotum with free spots 32



Figures 48-59. Dorsal habitus, line = 1.0 mm: 48.) *Ischyrus* n. sp. 3; 49.) *I. undulatus* Gorham; 50.) *I. n. sp. 4*; 51.) *I. n. sp. 5*; 52.) *I. n. sp. 6*; 53.) *I. n. sp. 7*; 54.) *I. aleator* Boyle; 55.) *I. n. sp. 8*; 56.) *I. auriculatus* Lacordaire; 57.) *I. auriculatus* var.; 58.) *I. ephippiatus* Gorham; 59.) *I. n. sp. 9*.

- 26.(25) Prosternum not strongly constricted at anterior margin, not produced in profile, not pinched (Fig. 10a). 27
- 26'. Prosternum strongly constricted at anterior margin, produced in profile, pinched (Fig. 10c-f). 30
- 27.(26) Each elytron with 1 central stripe-like spot (Fig. 54) *aleator* Boyle
- 27'. Elytra banded or spotted 28
- 28.(27') Pronotum entirely pale, elytra with small spots (Fig. 55) *n. sp.* 8
- 28'. Pronotum black or with black markings, elytral marking variable. 29
- 29.(28') Elytra with distinct free spots, not banded (Fig. 25); metasternal coxal lines continuous behind mesocoxae; line behind mesocoxa not impressed; prosternal line in front of coxa a pit-like groove (Fig. 9b) *n. sp.* 1
- 29'. Elytra distinctly banded (Figs. 56-57); metasternal coxal lines not continuous behind mesocoxae, long; line behind mesocoxa impressed, groove-like; prosternal line in front of coxa simply impressed.
. *auriculatus* Lacordaire
- 30.(26') Body stout, rounded laterally; pronotum entirely black, or with anterior angles pale; each elytron with a free basal spot 31
- 30'. Body parallel-sided, elongate; pronotum with pale anterior angles and often with central red markings;

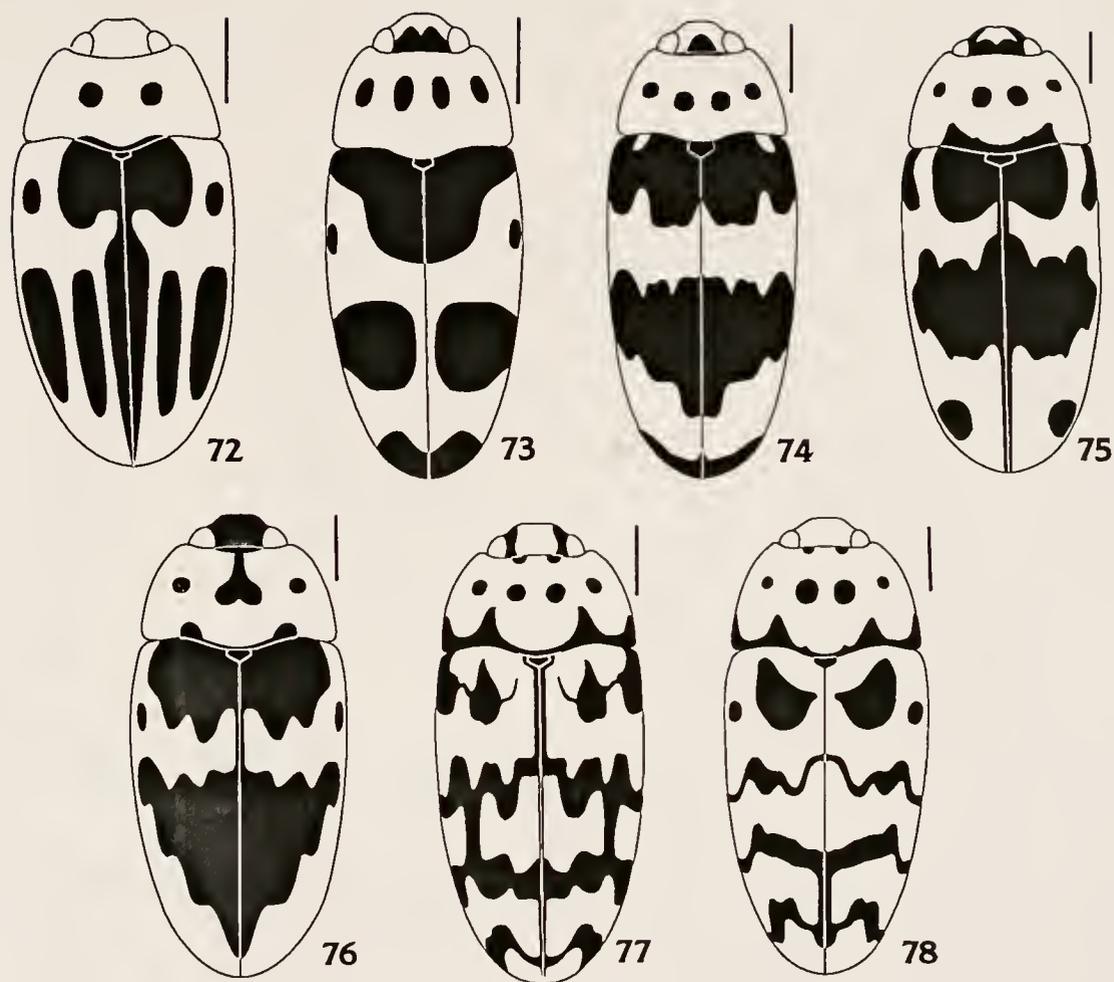
- elytra lacking free basal spots (Fig. 58)
 *ephippiatus* Gorham
- 31.(30) Free scutellar and humeral spots in transverse line,
 central elytral fascia not extended to apical quarter
 (Fig. 59) *n. sp. 9*
- 31'. Free humeral spot located behind free scutellar spot;
 central elytral fascia reaching apical quarter (Fig.
 60) *n. sp. 10*
- 32.(25') Pronotum with 2 free spots and three basal spots (1
 band-like free spot in *collatinus*), 3 basal spots not
 including possible posterior angle spots 33
- 32'. Pronotum with 2 or more free spots, possibly with three
 basal spots, but not with the above combination 37
- 33.(32) 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) *n. sp. 11*
- 33'. Pronotal hind angle without spot, lacking spots at
 pronotal anterior margin 34
- 34.(33') Two free pronotal spots circular; scutellar spot
 often broadly connected to elytral base 35
- 34'. Free pronotal spot(s) transversely elongate,
 rectangular; scutellar spot not connected to elytral
 base 36
- 35.(34) Apical elytral spot free; central band not reaching
 lateral margin (Figs. 62-63) *pictus* Gorham
- 35'. Apical elytral spot broadly connected to suture and
 apex; central band complete, reaching lateral margin
 (Fig. 35) *angularis* Lacordaire



Figures 60-71. Dorsal habitus, line = 1.0 mm: 60.) *Ischyryus* n. sp. 10; 61.) *I. n. sp. 11*; 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.

- 36.(34') Pronotum with 2 free rectangular spots; lacking sutural spot near elytral apex (Fig. 64).
 *episcaphulinus* Gorham
- 36'. Pronotum with 1 transverse spot; with a sutural spot near the elytral apex (Fig. 65) *collatinus* Crotch
- 37.(32') Pronotum with 2 free spots, base at most with thin black margin, rarely with anterior spots 38
- 37'. Pronotum variously marked with 2-4 discal spots, other markings variously connected to margins 42
- 38.(37) Scutellar spot narrowly connected to elytral base at scutellum, connection narrower than the spots' width (Figs. 66-67). *elegantulus* Lacordaire
- 38'. Scutellar spot broadly connected to elytral base, connection same width as spot 39
- 39.(38') Humeral and scutellar spots usually separated; scutellar spot broadly connected to suture; antennomere IX rounded or angled at base, not triangular 40
- 39'. Humeral and scutellar spots connected, appearing as one, separated from suture; antennomere IX triangular (Fig. 24). *vespertilio* Lacordaire
- 40.(39) Head entirely red; humeral spot not connected to elytral base 41
- 40'. Head with at least base black; humeral spot connected to elytral base, often connected to scutellar spot (Figs. 68-69). *chacojae* Gorham
- 41.(40) Central elytral band broken into round spots (Figs. 70-71) *scutellaris* Gorham

- 41'. Central elytral band broken into longitudinally
 elongate spots (Fig. 72) *n. sp.* 12
- 42.(37') Pronotum with 3 free spots 43
- 42'. Pronotum with 2 or 4 free spots 45
- 43.(42) Central elytral fascia complete (Fig. 37).
 *tripunctatus* Crotch
- 43'. Central elytral fascia broken into spots. 44
- 44.(43') Lateral spot of elytra small, circular; Central
 America (Figs. 38-39) *frontalis* Lacordaire
- 44'. Lateral spot of elytra elongate, stripe-like; USA,
 Florida (Fig. 40). *dunedinensis* Blatchley
- 45.(42') Pronotum with 2 free, 2 basal, and 2 anterior spots
 (Fig. 33). *incertus* Lacordaire
- 45'. 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 ... 46
- 46.(45') Pronotum with 4 free spots only; occasionally with
 dark base, but no distinct basal spots 47
- 46'. Pronotum with 4 free spots and additional markings
 connected to margins 48
- 47.(46) Elytral central spot not connected to suture (Fig.
 73) *n. sp.* 13
- 47'. Elytral central band complete, one continuous marking
 connected to suture, possibly reaching lateral margin
 (Fig. 74) *tetrasticus* Gorham



Figures 72-78. Dorsal habitus, line = 1.0 mm: 72.) *Ischyryus* n. sp. 12; 73.) *I. n. sp. 13*; 74.) *I. tetrasticus* Gorham; 75.) *I. n. sp. 14*; 76.) *I. n. sp. 15*; 77.) *I. fulmineus* Delkeskamp; 78.) *I. n. sp. 16*.

- 48.(46') With distinct anterior pronotal markings, or
 markings connecting discal spots to anterior margin 49
- 48'. Without distinct anterior pronotal marks, discal spots
 free (Fig. 75) *n. sp.* 14
- 49.(48) Each pronotal hind angle with a spot, occasionally
 reduced and appearing as dark swelling at margin of
 disc 50
- 49'. Pronotal hind angles without spots, lateral margin dark
 but not extending onto disc (Fig. 76) *n. sp.* 15
- 50.(49) Humeral spot connected to elytral base; central
 elytral band divided by orange except at stria V & VI
 (Fig. 77). *fulmineus* Delkeskamp
- 50'. Subhumeral spot not connected to elytral base; central
 elytral band completely divided by orange (Fig. 78). .
 *n. sp.* 16

SPECIES ACCOUNTS

Ischyryus aleator Boyle

Ischyryus aleator Boyle 1954:46-48.

Diagnosis. Unique in *Ischyryus* 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 antennomeres 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 = $0.75 \times$ basal width; base shallowly concave.

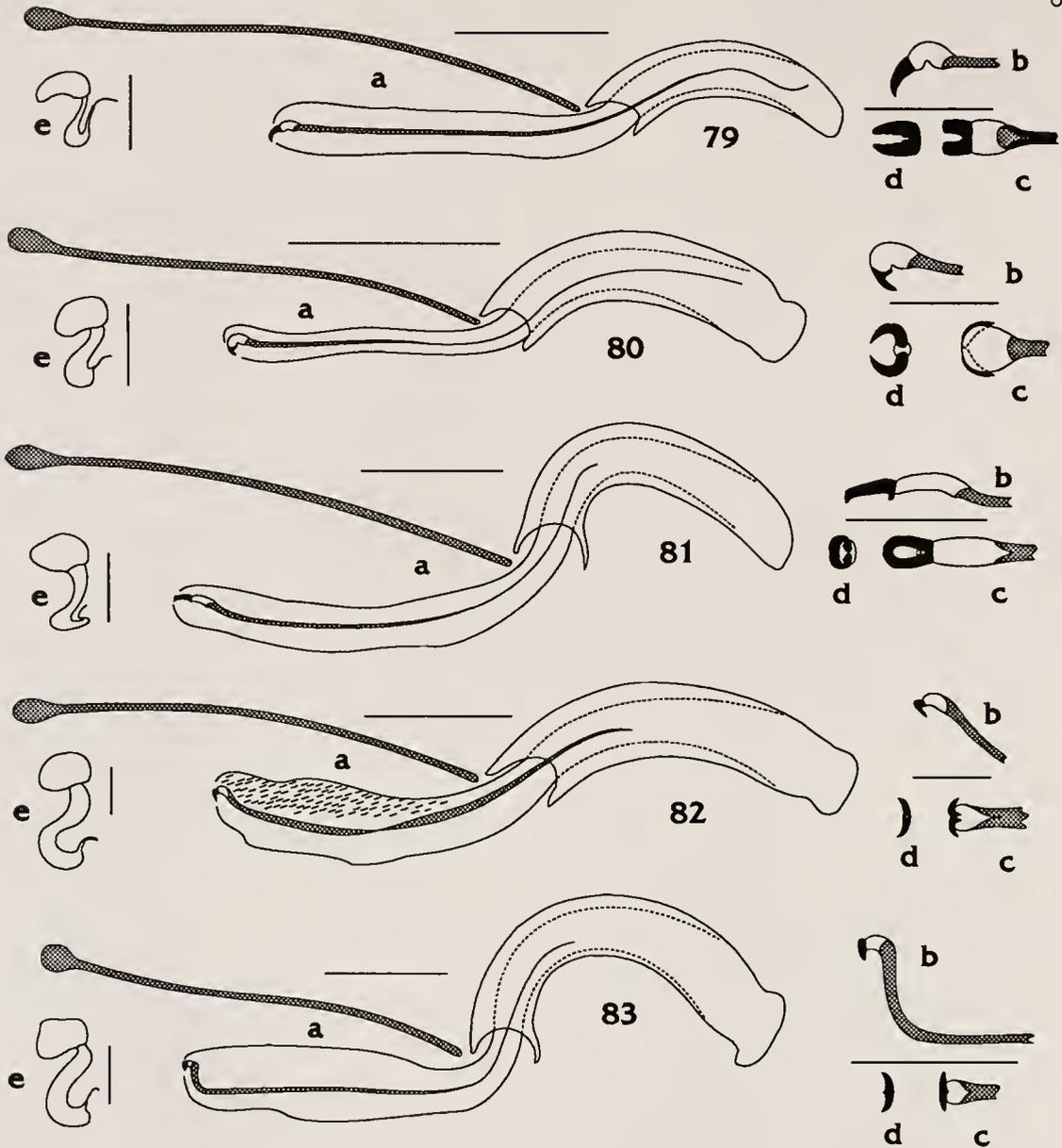
Mesosternum basal width = $2 \times$ mesocoxal line length; coxal lines straight, parallel to anteriorly divergent; base sinuate. Metasternum coxal lines meeting at middle in straight line with a row of punctures, often weak (Fig. 15b); coxal line length variable, continuous around coxae or reaching 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 sternite 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 = $2 \times$ 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 males' 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



Figures 79-83. Genitalia: 79.) *Ischyryx aleator* Boyle [male, Mexico, Chihuahua; female, Mexico, Sonora]; 80.) *I. angularis* Lacordaire [male & female, Panama]; 81.) *I. auriculatus* Lacordaire [male, Mexico, Chiapas; female, Mexico, Veracruz]; 82.) *I. bogotae* Crotch [male, Costa Rica, Puntarenas; female, Ecuador, Pichincha]; 83.) *I. boucardi* Crotch [male, Panama; female Peru, Madre de Dios]; 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.

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 type specimen, 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 coxae. 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 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 *Ischyurus aleator* Boyle/" [CASC, Type #8369, studied]. Sex male.

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

Distribution. Southeastern Arizona, Mexico, El Salvador, and Guatemala (Fig. 84).

Etymology. *aleator*: Latin = dice layer, gambler. Name alludes to the resemblance 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 this color variety is uncertain.

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

Ischyurus angularis Lacordaire

Ischyurus angularis Lacordaire 1842:126

Ischyurus quinquepunctatus Gorham 1887:43-44, t.3 f.6,
new synonymy.

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



Figure 84. *Ischyryus aleator* Boyle [circle]
and *I. angularis* Lacordaire [star]
distribution map.

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 sternites and pronotal epipleuron. Legs black, tarsi brown.

Head dorsal distance between eyes = $2.2 \times$ eye width; ocular striae reaching 0.8 to 1.0 distance to anterior angle of eye; vertex puncture size = $1 \times$ facet, separated by 1 to 2 diameters; epistome puncture size = $0.5 \times$ 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 = $0.75 \times$ width. Labial palp terminal segment triangular, extended on medial side, rounded basally, length = $0.66 \times$ width. Labial palp width = $0.75 \times$ 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 sternite 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 *Ischyryus angularis* Lacordaire label data: "/ Colombie/ Angularis Lac./ Type/ Ex-Musaeo Mniszech/ [red] TYPE/ [pale blue] Muséum Paris ex Coll. R. Oberthür 1952/ [red] LECTOTYPE *Ischyryus angularis* Lacordaire des.P.E.Skelley 1993/" [MNHN, studied]. Sex apparently female, abdomen missing.

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

Specimens examined. The 2 types and 5 specimens, representing 5 collection records, were studied. Label data: Panama, Canal Zone, Barro Colorado Island, 15-27-V-1972, T. Erwin, 9°10'N, 79°50'W, at light [1, USNM]; same data, 10-VII-1973 [1, USNM]; same locality, 18-28-IV-1964, W. D. Duckworth [1, USNM]; same data, 10-17-V-1964 [1, USNM]; Panama Prov., Las Cumbres, 26-VI-1975, H. Wolda [1, OSUC].

Distribution. Known only from Panama and Colombia (Fig. 84).

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

Taxonomic Note. No differences were found between the types of *I. angularis* Lacordaire, from Colombia, and *I. quinquepunctatus* Gorham, from Panama. *Ischyryus 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. This specimen 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. *Ischyryus angularis* Lacordaire: Blackwelder 1945:465; Crotch 1876:430 (54); Gemminger & Harold 1876:3690; Kuhnt 1909:62; 1911:42.

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

Ischyryus auriculatus Lacordaire

Ischyryus auriculatus Lacordaire 1842:123.

Episcaphula bellopecta Kuhnt 1910:222, new synonymy.

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

Ischyryus bellopectus (Kuhnt) 1910, Delkeskamp 1957:109

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

Mesosternum basal width = $3 \times$ 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 sternite 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 = $1.7 \times$ median lobe length (Fig. 81a); base of flagellum straight, sclerite at base elongate ring-shaped (Fig. 81b-d) (8 dissected).

Female genitalia with spermathecal head oval; tail thick, weakly curved, angled at end (Fig. 81e) (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. *Ischyryrus auriculatus* (Panama, Trinidad, Ecuador, Venezuela, Brazil) has lateral orange mark of pronotum restricted to anterior angle (Fig. 56). *Ischyryrus 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). *Ischyryrus auriculatus* var. "hamatus" (Argentina, Bolivia) is identical to *I. auriculatus* and *I. bellopictus*, except it is intermediate in the size of the orange lateral pronotal marking.

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

The lectotype (here designated) of *Ischyryrus 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 bellopecta* Kuhnt des.P.E.Skelley 1993" [ZMHB, studied]. 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 *Ischyryus auriculatus* var. "hamatus" label data: "[purple paper] 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] *Ischyryus auriculatus* var. hamatus Kuhnt/ P.KUHNT det., 1914: *Ischyryus auriculatus* Lac. var.: hamatus Kuhnt/" [ISNB, studied]. Sex not determined.

Specimens examined. The 3 "types" and 51 specimens, representing 32 collection records, were studied (see Appendix C for specific data).

Distribution. Widespread throughout Mexico, Central, and South America (Fig. 85).

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.



Figure 85. *Ischyryus auriculatus* Lacordaire
distribution map.

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. At present, they are considered varieties of the same species.

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

References. *Ischyryus 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 1942:195; 1952:182-183.

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

Ischyryus bogotae Crotch

Ischyryus bogotae Crotch 1876:430 (54).

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 sternite 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. 82a); base of flagellum straight, sclerite at base claw-shaped (Fig. 82b-d) (2 dissected).

Female genitalia with spermathecal head oval; tail swollen, curved like an inverted question mark, ";" (Fig. 82e) (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 *Ischyryus bogotae* Crotch label data: "/ [blue paper] Type/ Bog. [underside] Jans. / Type Bogotae/ [red] LECTOTYPE *Ischyryus bogotae* Crotch des.P.E.Skelley 1993/" [CUMZ, studied]. Sex not determined.

Specimens examined. The lectotype and 47 specimens, representing 29 collection records, were studied (see Appendix C for specific data).

Distribution. Mexico and Central America to Colombia and Ecuador (Fig. 86).

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. *Ischyryus bogotae* is similar to *I. septemsignatus* in color pattern. *Ischyryus septemsignatus* can be separated by the absence of the large basal pronotal spot, present in *I. bogotae*.

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



Figure 86. *Ischyryus bogotae* Crotch distribution map.

Ischyryus boucardi Crotch

Ischyryus boucardi Crotch 1876:(53)429.

Ischyryus peruvianus Gorham 1883:85-86, new synonymy.

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 marking, 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 sternite 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. 83a); base of flagellum angled, sclerite at base claw-shaped (Fig. 83b-d) (8 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail swollen, curved like an inverted question mark, "¿" (Fig. 83e) (7 dissected).

Stridulatory files on occipital region of head not visible, presence 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 *Ischyrys boucardi* Crotch label data: "/ [blue paper] TYPE/ S.Cat. [underside] Bouc./ Type Boucardi/ [red] LECTOTYPE *Ischyrys boucardi* Crotch des.P.E.Skelley 1993/" [CUMZ, studied]. Sex not determined.

The lectotype (here designated) of *Ischyrys peruvianus* Gorham label data: "/ [red circle on white paper] Type/ Peru Buckley/ Gorham Coll. BM. 1927-143/ [red] LECTOTYPE *Ischyrys peruvianus* Gorham des.P.E.Skelley 1993/" [NHML, studied]. Sex not determined.

Specimens examined. The lectotype 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. 87).

Etymology. *Ischyrys 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



Figure 87. *Ischyryus boucardi* Crotch
distribution map.

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

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

Ischyryus chacojae Gorham

Ischyryus chacojae Gorham 1887:43, t.3 f.5.
Ischyryus chacojae Gorham, in Kuhnt 1909:63
[misspelling].

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 = $2.5 \times$ eye width; ocular striae reaching anterior angle of eye; vertex puncture size = $1 \times$ facet, separated by 2 diameters; epistome puncture size = $0.75 \times$ 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. 61).

Maxillary palp terminal segment triangular, sides rounded, angles nearly 90° , length = $0.5 \times$ width. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90° , length = $0.8 \times$ width. Labial palp width = $0.5 \times$ maxillary palp width (similar to Fig. 70). Mentum with plate broadly triangular, length = $0.5 \times$ width, sides concave (similar to Fig. 8h); medial extension short, rounded, projecting.

Pronotal disc puncture size = $1 \times$ facet, separated by 2 to 3 diameters; laterally separated by 1 to 2 diameters.

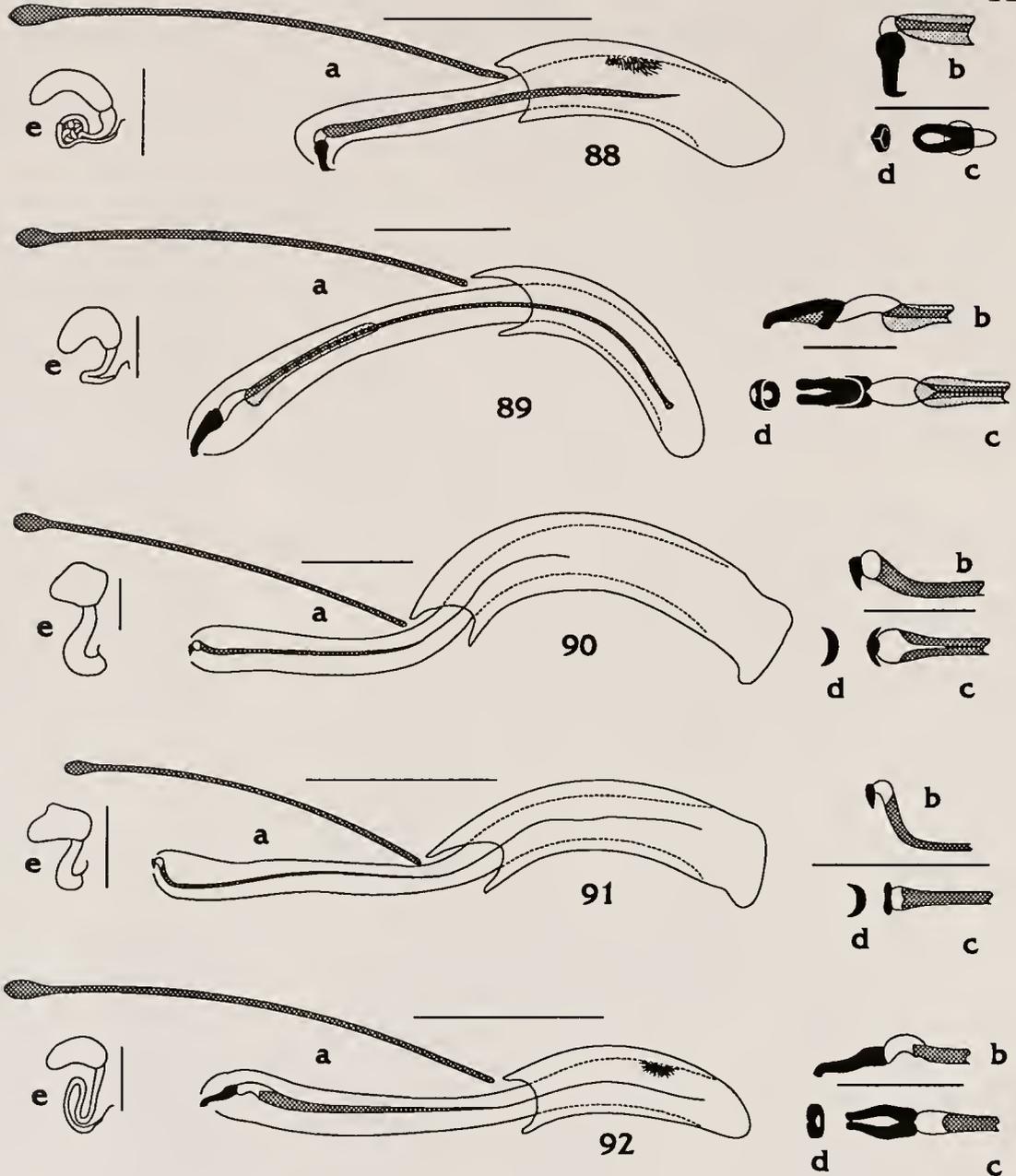
Scutellum pentagonal, length = 0.5 x width. Each elytron with 7 complete striae; stria VIII present at base and apical half, often obscured by interval punctation; strial puncture size at base = 2 x pronotal disc punctures, gradually becoming finer posteriorly; interval punctures fine, impressed, distinct.

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 sternite 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. 88a); base of



Figures 88-92. Genitalia: 88.) *Ischyryus chacojae* Gorham [male & female, Panama]; 89.) *I. collatinus* Crotch [male & female, Panama]; 90.) *I. distinguendus* Lacordaire [male & female, Mexico, Veracruz]; 91.) *I. dunedinensis* Blatchley [male & female, USA, Florida]; 92.) *I. elegantulus* Lacordaire [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.

flagellum straight, sclerite at base elongate, claw-shaped, almost ring-like (Fig. 88b-d) (3 dissected).

Female genitalia with spermathecal head elongate kidney-shaped; tail narrow, looped or coiled on itself (Fig. 88e) (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. *Ischyryus chacojae* color pattern is variable, and the 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 any confident conclusion, especially with the South American varieties where only female specimens 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 *Ischyryus chacojae* Gorham label data: "/ [red circle on white paper] Type/ Type, sp. figured/ Chacoj, Vera Paz., Champion/ Ischyryus chacojae, Gorch/ B.C.A., Col., VII, Ischyryus/" [NHML, studied]. 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 7 specimens, representing 5 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,

CNCI]; Peru, Junin, Satipo, 10-VII-1940, P. Paprzycki [1, CASC].

Distribution. Mexico, Guatemala, Panama, Peru, and Brazil (Fig. 93).

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

Remarks. *Ischyryus chacojae* is similar in color pattern to *I. scutellaris*, *I. n. sp. 12*, and *I. elegantulus*. Each differs from *I. chacojae* in color pattern characters: *I. n. sp. 12* and *I. septemsignatus* have 2 free central spots on each elytron; *I. elegantulus* has the scutellar spot not touching the elytral base.

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

Ischyryus collatinus Crotch

Ischyryus collatinus Crotch 1876:(57)433.

Diagnosis. Unique in *Ischyryus* 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



Figure 93. *Ischyryus chacojae* Gorham
distribution map.

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 = $2.5 \times$ eye width; ocular striae reaching 0.5 distance to anterior angle of eye, weakly continued forward; vertex puncture size = $0.75 \times$ facet, separated by 2 to 3 diameters; epistome puncture size = $0.5 \times$ 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 = $2.5 \times$ length. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90° , length = $0.6 \times$ width. Labial palp width = $0.5 \times$ maxillary palp width (similar to Fig. 7o). Mentum with plate broadly triangular, length = $0.5 \times$ width, sides concave (similar to Fig. 8h); ridge medial extension short, blunt, projecting.

Pronotal disc puncture size = $0.75 \times$ facet, separated by 1 to 2 diameters; laterally puncture size = $1 \times$ facet,

separated by 1 to 2 diameters. Scutellum pentagonal, length = $0.5 \times$ 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 = $0.5 \times$ sternal length, lines barely surpassing coxae, length = basal width; prosternal plate flat, apical width = 0.8 to $1.0 \times$ basal width; base concave.

Mesosternum basal width = $3 \times$ 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 sternite 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. 89a); base of flagellum straight and swollen, sclerite at base elongate, parallel-sided (Fig. 89b-d) (4 dissected).

Female genitalia with spermathecal head arched, kidney-shaped; tail narrowed, angled onto itself (Fig. 89e) (2 dissected).

Stridulatory files not present on occipital region of female head; males heads retracted, file 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. It is always one elongate spot.

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

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

Specimens examined. The lectotype and 14 specimens, representing 12 collection records, were studied (see Appendix C for specific data).

Distribution. Guatemala, Nicaragua (Kuhnt 1909), Panama, and Colombia (Fig. 94).

Etymology. *collatus*: Latin = gathered together, collected. Possibly, this species was named for the single, transversely linear, free 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. *Ischyryus 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. *Ischyryus episcaphulinus* has 2 rectangular free pronotal spots. In *Ischyryus pictus* the 2 free pronotal spots are circular.

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

Ischyryus distinguendus Lacordaire

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

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



Figure 94. *Ischyryus collatinus* Crotch [circle]
and *I. distinguendus* Lacordaire [star]
distribution map.

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 = $2.3 \times$ eye width; ocular striae reaching anterior angle of eye; vertex puncture size = 0.5 to $0.75 \times$ facet, separated by 1 to 3 diameters; epistome puncture size = 0.5 to $0.75 \times$ 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 = $0.66 \times$ width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = $0.75 \times$ 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 sternite 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. 90a); base of flagellum straight, sclerite at base claw-shaped (Fig. 90b-d) (4 dissected).

Female genitalia with spermathecal head oval, often with top-knot; tail swollen, weakly curved like an inverted question mark, "¿" (Fig. 90e) (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 *Ischyus distinguendus* Lacordaire label data: "/ Mexique/ Distinguendus Lac./ Type/ Ex-Musaeo Mniszech/ [red] TYPE/ [pale blue] Muséum Paris ex Coll. R. Oberthür 1952/ [red] LECTOTYPE *Ischyus distinguendus* Lacordaire des.P.E.Skelley 1993/" [MNHN, studied]. Sex not determined.

Specimens examined. The lectotype and 14 specimens, representing 12 collection records, were studied (see Appendix C for specific data).

Distribution. Known only from Veracruz, Mexico, and Honduras (Fig. 94).

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 *Ischyryus*, 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.

Ischyryus dunedinensis Blatchley

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

Ischyryus dunedinensis Blatchley 1917:279, new name for *I. tripunctatus* Blatchley 1917:238.

Diagnosis. Recognized by 3 free pronotal spots in a transverse row, and linear free lateral elytral spot, 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 sternites. 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 = $0.75 \times$ 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 = $0.5 \times$ 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 = $1 \times$ facet, separated by 2 to 3 diameters; lateral punctures denser, separated by 1 diameter. Scutellum pentagonal, length = $0.5 \times$ 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 = $0.5 \times$ sternal length, lines barely surpassing coxae, length = $0.75 \times$ basal width; prosternal plate flat, apical width = 0.6 to $0.75 \times$ basal width; base shallowly concave.

Mesosternum basal width = $2 \times$ 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 sternite 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. 91a); base of flagellum angled, sclerite at base claw-shaped (Fig. 91b-d) (4 dissected).

Female genitalia with spermathecal head kidney-shaped, with top-knot; tail swollen, weakly curved (Fig. 91e) (3 dissected).

Stridulatory files present on occipital region of male head; 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 *Ischyrys dunedinensis* Blatchley label data: "/ 92/ Type/ Dunedin, Fla, W.S.B. Coll. 2-V-16/ *Ischyrys dunedinensis* sp.nov./" [PURC, studied]. Sex not determined.

Specimens examined. The holotype and 72 specimens, representing 49 collection records, were studied (see Appendix C for specific data).

Distribution. Known only from extreme southeastern Georgia and the Florida peninsula (Fig. 95).

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 Note. 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*.

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.

Biology. The type specimen was collected from a bromeliad, *Tillandsia utriculata* L. 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



Figure 95. *Ischyryus dunedinensis* Blatchley
[circle] and *I. elegantulus* Lacordaire
[star] distribution map.

grows in sandy soils. This type of vegetation is generally characterized as xeric. The fungal host of this species is unknown.

Remarks. *Ischyryus dunedinensis* is most similar to *I. frontalis*, and can be separate 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; Skelley & Goodrich 1989:349-354; Skelley et al. 1991:65.

Ischyryus elegantulus Lacordaire

Ischyryus elegantulus Lacordaire 1842:121-122.

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 spots' width.

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 = $2.5 \times$ eye width; ocular striae reaching 0.5 distance to anterior angle of eye, continue weakly forward as a row of punctures; vertex puncture size = $1 \times$ facet, separated by 1 to 2 diameters; epistome puncture size = $0.5 \times$ 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 = $0.5 \times$ width. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90° , length = $0.8 \times$ width. Labial palp width = $0.5 \times$ maxillary palp width (similar to Fig. 7o). Mentum with plate broadly triangular, length = $0.5 \times$ width, sides concave (similar to Fig. 8e); ridge medial extension short, acutely rounded.

Pronotal disc puncture size = $1 \times$ facet, separated by 1 to 2 diameters. Scutellum pentagonal, length = $0.5 \times$ 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 = $2 \times$ 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 sternite 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. 92a); base of flagellum straight, sclerite at base elongate, nearly parallel-sided (Fig. 92b-d) (4 dissected).

Female genitalia with spermathecal head kidney-shaped; tail narrow, looped (Fig. 92e) (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 *Ischyryus elegantulus* Lacordaire label data: "/ Colombie/ Elegantulus Lac./ Type/ Ex-Musaeo Mniszech/ [red] TYPE/ [pale blue] Muséum Paris ex Coll. R. Oberthür 1952/ [red] LECTOTYPE Ischyryus elegantulus Lacordaire des.P.E.Skelley 1993/" [MNHN, studied]. Sex apparently male, not dissected.

Specimens examined. The lectotype and 16 specimens, representing 17 collection records, were studied (see Appendix C for specific data).

Distribution. Colombia and Panama to Nicaragua (Crotch 1873b) and Mexico (Fig. 95).

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 reported to have been studied by Lacordaire.

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

Ischyryus elegantulus is similar to *I. chacojae* and *I. n. sp. 12*. They can be distinguished from *I. elegantulus* by their large scutellar spot, 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.

Ischyryus ehippiatus Gorham

Ischyryus ehippiatus Gorham 1887:43.

Diagnosis. Recognized by having the basal half of pronotum black, anterior pronotal markings often connecting with black base, wide central elytral 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 = $4.0 \times$ eye width; ocular striae reaching anterior angle of eye; vertex medial puncture size = $0.5 \times$ facet, separated by 1 to 2 diameters; vertex lateral puncture size = 0.75 to $1.0 \times$ facet, separated by 1 to 2 diameters; epistome puncture size = $0.75 \times$ 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 = $2 \times$ 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 sternite with coxal lines reaching 0.5 distance to posterior edge; broadly rounded between metacoxae, nearly truncate; with coarse punctures laterally, fine punctures medially.

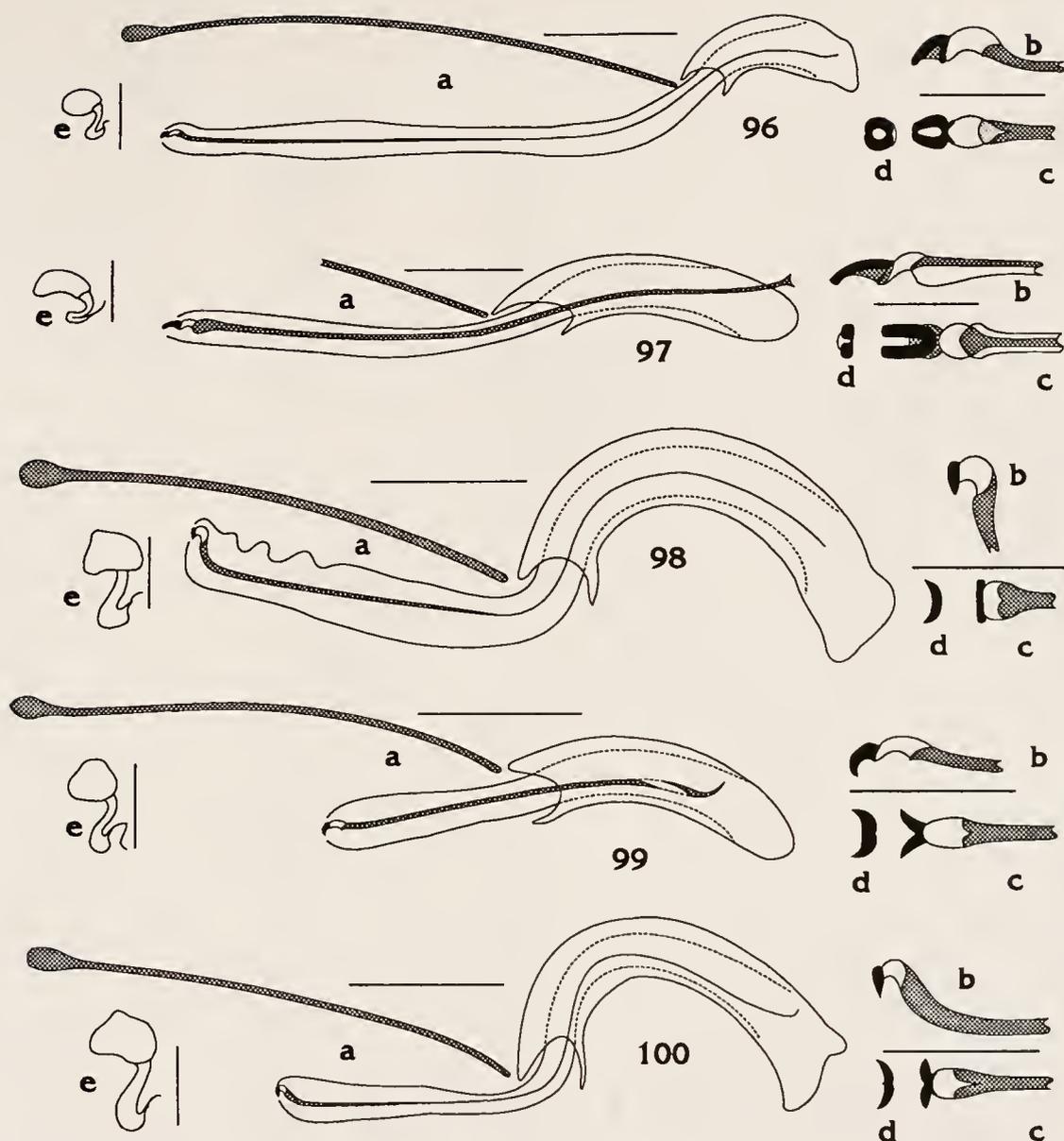
Male genitalia with median lobe short, moderately arched, apically truncate, slightly constricted just before tip; internal sac without noticeable sclerotized structures; flagellum long and hair-like, length = 3.5 x median lobe length (Fig. 96a); base of flagellum straight, sclerite at base ring-shaped (Fig. 96b-d) (6 dissected).

Female genitalia with spermathecal head oval to cone-shaped; tail weakly swollen and curved (Fig. 96e) (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. ehippiatus* 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



Figures 96-100. Genitalia: 96.) *Ischyryus ephippiatus* Gorham [male & female, Panama]; 97.) *I. episcaphulinus* Gorham [male, Guatemala; female, Mexico, Chiapas]; 98.) *I. frontalis* Lacordaire [male, Mexico, Guerrero; female, Mexico, Mexico]; 99.) *I. fulmineus* Delkeskamp [male & female, Brazil, Rio Grande do Sul]; 100.) *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.

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 ehippiatus* Gorham label data: "/ [red circle on white paper] Type/ Bugaba, Panama, Champion./ Ischyrus ehippiatus/ B.C.A., Col., VII, Ischyrus/ [red] LECTOTYPE Ischyrus ehippiatus Gorham des.P.E.Skelley 1993/" [NHML, studied]. Sex apparently male, not dissected.

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

Distribution. Panama and Bolivia (Fig. 101).

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

Taxonomic notes. The lectotype of *Ischyrus ehippiatus* 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.



Figure 101. *Ischyryus ehippiatus* Gorham [circle]
and *I. episcaphulinus* Gorham [star]
distribution map.

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

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

Ischyryus episcaphulinus Gorham

Ischyryus episcaphulinus Gorham 1887:44, t.3 f.7.

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 = $2.5 \times$ eye width; ocular striae reaching 0.7 to 0.8 distance to anterior angle of eye; vertex puncture size = $1 \times$ facet, separated by 1 diameter; epistome puncture size = 0.5 to $0.75 \times$ 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 = $2 \times$ length. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90° , length = $0.8 \times$ width. Labial palp width = $0.5 \times$ maxillary palp width (similar to Fig. 7o). Mentum with plate broadly triangular, length = $0.5 \times$ width, sides concave (similar to Fig. 8h); medial extension short, blunt, projecting.

Pronotal disc puncture size = $1 \times$ facet, separated by 0.5 to 1 diameter. Scutellum pentagonal, length = $0.5 \times$ width. Each elytron with 7 complete striae; stria VIII present at base, obscured by interval punctation; strial punctures at base = $2 \times$ 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 = $0.5 \times$ sternal

length, lines barely surpassing coxae, length = basal width; prosternal plate weakly convex, apical width = $0.75 \times$ basal width; base concave.

Mesosternum basal width = $3 \times$ 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 sternite 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 = $2 \times$ median lobe length (Fig. 97a); base of flagellum straight, sclerite at base elongate claw-shaped, parallel-sided (Fig. 97b-d) (1 dissected).

Female genitalia with spermathecal head kidney-shaped; tail narrow, angled onto itself (Fig. 97e) (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, studied]. Sex not determined.

Specimens examined. The holotype and 2 specimens, representing 2 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 (Fig. 101).

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. In *I. pictus*, the free pronotal spots are circular, and in *I. collatinus* the single free pronotal spot is transversely linear.

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

Ischyryus frontalis Lacordaire

Ischyryus frontalis Lacordaire 1842:127.

Ischyryus agnatus Crotch 1876:426-427(50-51), Gorham
1887:39.

Ischyryus 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 sternite 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. 98a); base of flagellum gradually curved, sclerite at base claw-shaped (Fig. 98b-d) (4 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail swollen, weakly curved (Fig. 98e) (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 *Ischyryus frontalis* Lacordaire label data: "/ [blue paper] TYPE/ TYPE frontalis Ch/ [red] LECTOTYPE *Ischyryus frontalis* Lacordaire des.P.E.Skelley 1993/" [CUMZ, studied]. The type locality is stated by Lacordaire to be Mexico. Sex not determined.

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

Specimens examined. The 2 lectotypes and 13 specimens, representing 13 collection records, were studied (see Appendix C for specific data).

Distribution. Mexico through Central America to Colombia (Nova Granada) (Fig. 102).

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



Figure 102. *Ischyryus frontalis* Lacordaire
distribution map.

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

References. *Ischyryus 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.

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

Ischyryus fulmineus Delkeskamp

Ischyryus fulmineus Delkeskamp 1957:98, 107-108.

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 = $2.5 \times$ eye width; ocular striae reaching anterior angle of eye; vertex puncture size = $1 \times$ facet, separated by 1 to 2 diameters; epistome puncture size = $0.5 \times$ 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 = $0.5 \times$ width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = $0.75 \times$ width. Labial palp width = $0.5 \times$ maxillary palp width (similar to Fig. 7a). Mentum with plate triangular, length = $0.75 \times$ width, apical sides straight, ridge medial extension acute, projecting (similar to Fig. 8a).

Pronotal disc puncture size = $1 \times$ facet, separated by 2 to 3 diameters. Scutellum pentagonal, length = $0.6 \times$ width. Each elytron with 7 complete striae; stria VIII present at base and apical half; strial puncture size at base = $2 \times$ 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 $0.66 \times$ 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 sternite 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. 99a); base of flagellum straight, sclerite at base claw-like, sclerite V-shaped in dorsal view (Fig. 99b-d) (6 dissected).

Female genitalia with spermathecal head ball-shaped with flattened face; tail swollen, weakly curved (Fig. 99e) (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, studied]. Sex undetermined.

Specimens examined. The holotype and 7 specimens, representing 7 collections, were studied. Label data: *Bolivia*, R.Japacani, e.Bolivia [1, ICCM]; *Brazil*, Mato Grosso, 12°50'S, 51°47'W, 5-X-1968, O. W. Richards [1, NHML]; Mato Grosso, 12°49'S, 51°45'W, 22-XI-1968, W. J. Knight, gallery forest [1, NHML]; Para, Santarem, VI-1919, S. M. Klages [1, ICCM]; Rio Grande do Sul, S.Jerónimo, 8-X-1982, T. Arignot, Col. MCN. 599964 [1, MCNZ]; same locality, 2-XI-1982, C. J. Becker, Col. MCN. 60513 [1, MCNZ]; *Panama*, Canal Zone, Fort Gulick, Qtrs.40.A, 1-9-XII-1979, H. J. Harlan, at lights [1, OSUC].

Distribution. Panama, Brazil, and Bolivia (Fig. 103).



Figure 103. *Ischyryus fulmineus* Delkeskamp
distribution map.

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. *Ischyryus fulmineus* is most similar to *I. insolens* and *I. n. sp. 16*; *I. insolens* lacks basal pronotal spots, *I. n. sp. 16* lacks the black connection between stria V and VI on the central elytral band.

Ischyryus incertus Lacordaire

Ischyryus incertus Lacordaire 1842:118-119.

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

Ischyryus graciosus Guérin-Méneville 1829-
1838[1844]:310, *new synonymy*.

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 sternites orange. Legs black; palpi and tarsi brown.

Head dorsal distance between eyes = $2.2 \times$ eye width; ocular striae reaching 0.75 to 1.0 distance to anterior angle of eye; vertex puncture size = $1 \times$ facet, separated 1 to 2 diameters; epistome puncture size = $0.5 \times$ 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. 61).

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

Pronotum puncture size = $1 \times$ facet, separated 1 to 2 diameters; denser laterally, separated by 0.5 to 1.0 diameter. Scutellum pentagonal, length = $0.6 \times$ width. Each elytron with 7 complete striae; stria VIII weak, visible on

apical half; strial puncture size at base = $1.5 \times$ 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 = $0.5 \times$ sternal length, lines barely surpassing coxae, length = basal width; prosternal plate flat, apical width = 0.7 to $0.8 \times$ basal width; base shallowly concave.

Mesosternum basal width = $2 \times$ 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 sternite 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 = $2 \times$ median lobe length (Fig. 100a); base of flagellum gradually curved, sclerite at base claw-shaped (Fig. 100b-d) (3 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail swollen, weakly curved (Fig. 100e) (7 dissected).

Stridulatory files present on 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. 13). 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 spot's length. In a specimen from Panama 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 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 *Ischyryus 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 "type" of *Ischyryus graciosus* Guérin-Méneville was not studied; its current location is unknown. Guérin-Méneville stated in the original description that the species came from Colombia.

Specimens examined. A total of 40 specimens, representing 36 collection records, was studied (see Appendix C for specific data).

Distribution. Southern Mexico through Central America to Venezuela, Colombia, Trinidad, and Tobago (Fig. 104). Dejean (1836) indicated it was from "Brasilia". Lacordaire 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 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 stated that 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



Figure 104. *Ischyryus incertus* Lacordaire
distribution map.

known. Since Lacordaire stated that he collected a specimen from Cayenne, the specimen from Cayenne was probably in 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".

No "type" nor any specimens determined as *Ischyryus gratiosus* Guérin-Méneville were studied. The description clearly indicated that *I. gratiosus* is a member of the *I. proximus*, *I. scriptus*, and *I. palliatus* color pattern complex. The description fits *I. incertus* and matches specimens studied from Colombia and Venezuela. Based on this information *I. gratiosus* Guérin-Méneville is synonymized under *I. incertus* Lacordaire.

Remarks. *Ischyryus 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, the 4 can be separated by the combination of characters listed in the Remarks section of *I. scriptus* (Olivier).

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

References. *Ischyryus 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.

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

Ischyryus insolens Crotch

Ischyryus insolens Crotch 1876:53(429).

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 = $2.4 \times$ eye width; ocular striae reaching anterior angle of eye; vertex puncture size = $1 \times$ facet, impressed, separated by 1 to 3 diameters; epistome puncture size = 0.5 to $0.75 \times$ 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 = $0.5 \times$ width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = $0.5 \times$ width. Labial palp width = $0.5 \times$ maxillary palp width (Fig. 7c). Mentum with plate broadly triangular, length = $0.5 \times$ width, sides weakly concave, ridge medial extension acutely pointed (Fig. 8c).

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

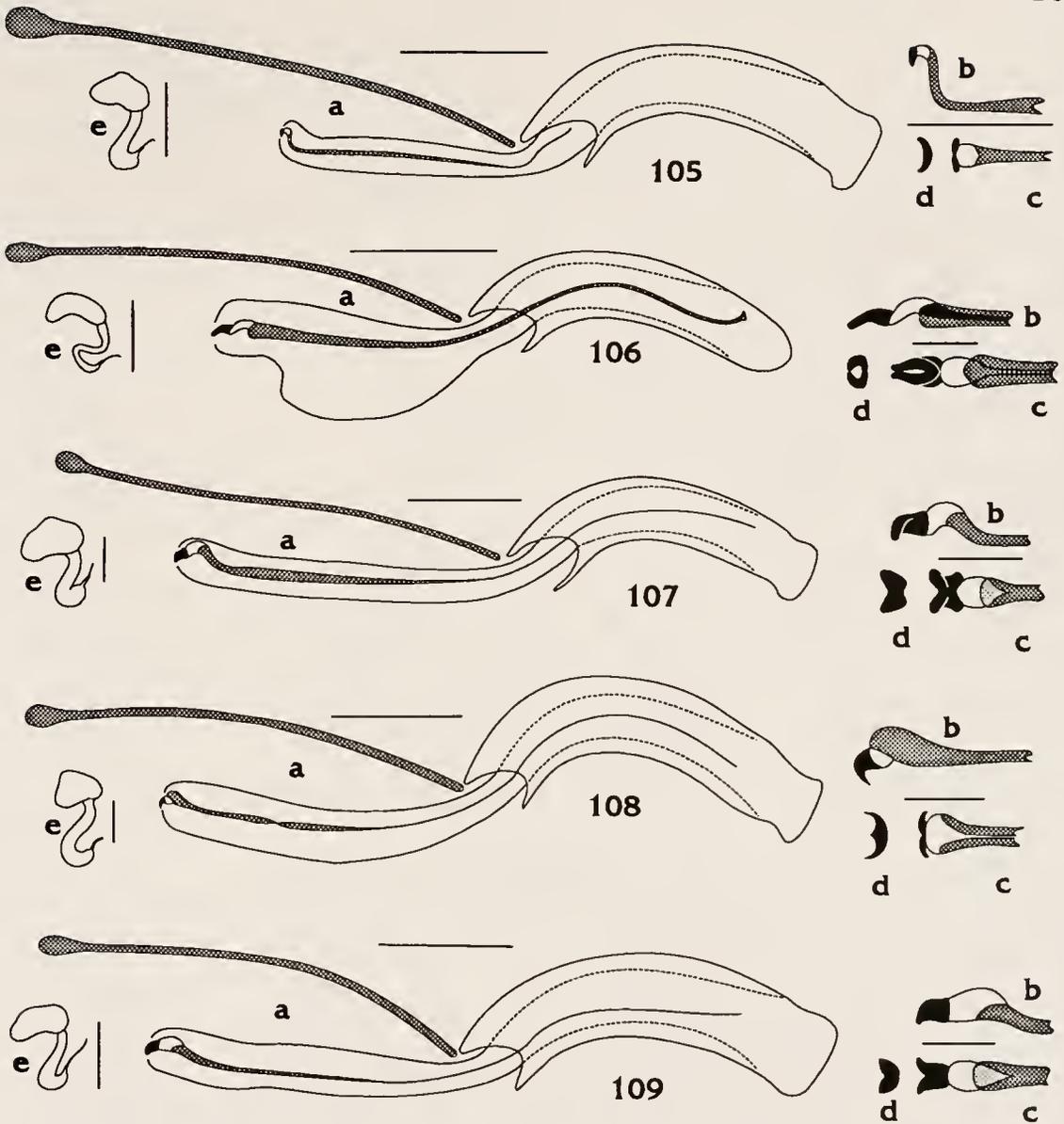
Prosternum keeled and pinched anteriorly; slightly expanded laterally in males; without foveate punctures in front of procoxa; coxal lines straight, length = 0.5 x sternal length, not surpassing coxae, length = 1.5 x basal width; prosternal plate flat, apical width = 0.6 x basal width; base shallow V-shaped 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 sternite 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. 105a); base of flagellum angled, sclerite at base claw-shaped (Fig. 105b-d) (3 dissected).

Female genitalia with spermathecal head kidney-shaped, with weak top-knot; tail swollen, weakly curved (Fig. 105e) (1 dissected).



Figures 105-109. Genitalia: 105.) *Ischyrys insolens* Crotch [male, Mexico, Veracruz; female, Paraguay]; 106.) *I. pictus* Gorham [male, Mexico, Chiapas; female, Mexico, Tabasco]; 107.) *I. proximus* Lacordaire [male & female, Costa Rica, Puntarenas]; 108.) *I. q. quadripunctatus* (Olivier) [male, USA, Florida; female, USA, Illinois]; 109.) *I. scriptus* (Olivier) [male, Venezuela, Bolivar; female, Argentina, Salta]; 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.

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 pattern variation.

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.

Type. The lectotype (here designated) of *Ischyurus insolens* Crotch label data: "/ Toxpam, Mexico, Sallé Coll./ [green] 2393/ sp. figured/ *Ischyurus insolens*, Crotch, apud Sallé/ B.C.A., Col. VII *Ischyurus*/ [red] LECTOTYPE *Ischyurus insolens* Crotch des.P.E.Skelley 1993/" [NHML, studied]. 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, label data: "/ Toxpam/ Mexico, Sallé Coll./ *Ischyurus insolens*, Crotch, apud Sallé/ B.C.A., Col., VII, *Ischyurus*/ [yellow] PARALECTOTYPE *Ischyurus insolens* Crotch des.P.E.Skelley 1993/" [1, NHML].

In addition to the types listed above, 6 specimens, representing 6 collection records, were studied. 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, 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. 110).



Figure 110. *Ischyryus insolens* Crotch
distribution map.

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. *Ischyryus insolens* is most similar to *I. fulmineus* and *I. n. sp. 16* 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.

Ischyryus pictus Gorham

Ischyryus pictus Gorham 1887:42, t.3 f.4.

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 = $2.5 \times$ eye width; ocular striae reaching 0.75 distance to anterior angle of eye, often continued forward as a row of punctures; vertex puncture size = $1 \times$ facet, separated by 1 to 2 diameters; epistome puncture size = $0.75 \times$ 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. 61).

Maxillary palp terminal segment triangular, sides rounded, lateral angle acute, medial angle nearly 90° , width = $2 \times$ length. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90° , length = $0.8 \times$ width. Labial palp width = $0.5 \times$ maxillary palp width (similar to Fig. 7o). Mentum with plate broadly triangular, length = $0.5 \times$ 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 sternite 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. 106a); base of flagellum straight and swollen, sclerite at base elongate, claw-shaped (Fig. 106b-d) (3 dissected).

Female genitalia with spermathecal head elongate, kidney-shaped; tail narrow, looped (Fig. 106e) (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. It 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, studied]. Sex not determined. Gorham (1887) stated that the type locality is in Guatemala.

Specimens examined. The holotype and 16 specimens, representing 13 collection records, were studied (see Appendix C for specific data).

Distribution. Honduras, Guatemala, and southern Mexico (Fig. 111).

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. *Ischyryus 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.

Ischyryus proximus Lacordaire

Ischyryus proximus Lacordaire 1842:113.

Ischyryus 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.



Figure 111. *Ischyryus pictus* Gorham
distribution map.

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 distance between centers is less than head width including eyes; all pronotal spots together form 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 = $0.66 \times$ width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = $0.75 \times$ width. Labial palp width = $0.5 \times$ maxillary palp width (similar to Fig. 7a). Mentum with plate triangular, all sides of equal length, length = $0.6 \times$ width, sides straight, ridge medial extension acutely pointed (similar to Fig. 8d).

Pronotum puncture size = $1 \times$ facet, separated by 2 to 3 diameters. Scutellum pentagonal, length = $0.5 \times$ 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 = $0.5 \times$ sternal length, lines barely surpassing coxae (Fig. 11a), length = basal width; prosternal plate flat, apical width = $0.5 \times$ basal width; base shallowly concave.

Mesosternum basal width = $2 \times$ 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 sternite 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-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. These 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*).

The subhumeral spot is rarely separated from the scutellar spot. In these specimens, the other color characteristics will serve to distinguish them (see Remarks section under *I. scriptus*).

Type. The lectotype (here designated) of *Ischyryus proximus* Lacordaire label data: "/ Mexico/ Type proximus Ch./ [blue paper] TYPE/ [red] LECTOTYPE *Ischyryus proximus* Lacordaire des.P.E.Skelley/" [CUMZ, studied]. Sex apparently male, not dissected.

Specimens examined. The lectotype and 78 specimens, representing 46 collection records, were studied (see Appendix C for specific data).

Distribution. Widespread from Mexico to Panama and Bolivia (Fig. 112).

Etymology. *proximus*: Latin = nearest. Maybe Lacordaire named it "proximus" because of its similarity to other species.



Figure 112. *Ischyryx proximus* Lacordaire
distribution map.

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 4 specimens from Costa Rica is labeled "an Pilzbelag und trockenem Holz", which basically means "on fungus covering dry wood". Other biological 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. *Ischyryus 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.

Ischyryus quadripunctatus (Olivier)

- Erotylus quadripunctatus* Olivier 1792:431, 437.
Mycotretus quadripunctatus (Olivier), Dejean
 1836:429 (1837:453).
Ischyryus quadripunctatus (Olivier),
 Lacordaire 1842:127-128.
Ischyryus quadripunctatus Crotch 1873:144,
 Gemminger & Harold 1876:3690.
Ischyryus quadripunctatus quadripunctatus
 (Olivier), Boyle 1954:39-41.
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.
Ischyryus subcylindricus Lacordaire 1842:117-118;
new synonymy.
Mycotretus subcylindricus Chevrolat [*nomen*
nudum] in Dejean 1836:429 (1837:453),
 Lacordaire 1842:117-118.
Ischyryus graphicus Lacordaire 1842:125-126.
Ischyryus quadripunctatus graphicus
 Lacordaire, Boyle 1954:41-43; *new*
synonymy.
Ischyryus quadripunctatus var. *alabamae* Schaeffer
 1931:175, Mader 1938:19.
Ischyryus quadripunctatus var. *antedivisa* Mader
 1938:19, Boyle 1954:39-41.
Ischyryus quadripunctatus Var. A Lacordaire
 1842:127-128.
Ischyryus puncticollis Gorham 1887:44-45; *new*
synonymy.
Ischyryus chiasticus Boyle 1954:43-46.
Ischyryus quadripunctatus chiasticus Boyle, *new*
status.

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 = $0.8 \times$ length. Labial palp terminal segment triangular, extended on medial side, narrow, width = $0.8 \times$ length. Labial palp width = $0.75 \times$ maxillary palp width (Fig. 7f). Mentum with plate broadly triangular, length = $0.7 \times$ basal width, sides straight, ridge medial extension acutely pointed (Figs. 8d, 20).

Pronotal disc puncture size = $1 \times$ facet, separated by 1 to 3 diameters. Scutellum pentagonal, length = $0.5 \times$ 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 = $0.5 \times$ sternal length, lines barely surpassing coxae, basal width = $0.8 \times$ length; prosternal plate flat, apical width = $0.6 \times$ basal width; base shallowly concave.

Mesosternum basal width = $1.5 \times$ 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 sternite 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. 17) 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. 108a); base of flagellum straight and swollen, sclerite at base claw-shaped (Fig. 108b-d) (30 dissected).

Female genitalia (Fig. 18) with spermathecal head kidney-shaped, often with a top-knot; tail swollen, curved like an inverted question mark, "¿" (Fig. 108e) (21 dissected).

Stridulatory files on occipital region of head visible on males; not found on females (Fig. 22). 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. 113).

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



Figure 113. *Ischyryus q. quadripunctatus* (Olivier) [circle and shading] and *I. quadripunctatus chiasticus* Boyle [star] distribution map.

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 usually been cited as 1791. Blackwelder (1949, 1957) stated that part 2 of Olivier's *Encyclopédie Méthodique* was printed in 1792, which I follow.

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 material from eastern United States 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 5 fungi as hosts: *Irpex lacteus* (Fr.:Fr.)Fr., *Oxyporus latemarginatus* (Dur.& Mont. ex Mont.)Donk, *Phellinus gilvus* (Schw.)Pat., *Polyporus gilvus* (Schw.)Fr., and *Poria* sp. Only *Oxyporus latemarginatus* (= *Poria ambigua* Bres.) had more than one recorded collection for *I. q. quadripunctatus*, including 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 *Ischyryus 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 *Oocyranus flavitarsis* (Lacordaire) (see Candeze 1861). They differ in the shape of the urogomphi: *O. 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 *Ischyryus* and *Oocyranus*. Much work needs to be done on larval morphology and biology of this family.

Remarks. *Ischyryus 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.

Ischyryus 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.

Ischyryus quadripunctatus quadripunctatus (Olivier)

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 Antilles, 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 (see Locating Types). The type locality was stated as "Amérique septentrionale, la Géorgie."

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

The lectotype (here designated) of *Ischyryus graphicus* Lacordaire label data: "/ [blue paper] TYPE/ TYPE graphicus Ch/ LECTOTYPE *Ischyryus graphicus* Lacordaire des.P.E.Skelley 1993/" [CUMZ, studied]. Sex not determined.

The holotype (by monotypy) of *Ischyryus puncticollis* Gorham label data: "/ [red circle on white paper] Type/ Paso del Norte, Chihuahua, Höge/ *Ischyryus puncticollis*/ B.C.A., Col., VII. *Ischyryus*/" [NHML, studied]. 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 *Ischyryus 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, 2618 specimens, representing 1306 collection records, were studied (see Appendix C for specific data).

Distribution. The various color patterns have separate ranges with a large amount of overlap between their ranges.

Color pattern "quadripunctatus": eastern U.S. from western Texas and northern Mexico (Pallister 1955a) east to Florida; north to southeastern North 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 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 *Ischyryus 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 should be 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 should be 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 (see Locating Types).

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 (1955a:4-5). The only differences observed were in the color patterns. These differences proved to be clinal, as numerous intermediates were 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 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 *Ischyryus 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. *Ischyryus puncticollis* Gorham is here synonymized under *I. q. quadripunctatus* (Olivier).

Gemminger & Harold (1876:3690) indicated that "*Ischyryus 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."

Ischyryus 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 Nearctic 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.

Ischyryus 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.

Ischyryus 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.

Ischyryus puncticollis Gorham: Blackwelder 1945:465;

Kuhnt 1909:63; 1911:43.

Ischyryus quadripunctatus var. *alabamae* Schaeffer:

Blackwelder 1939:46; Boyle 1954:39; Leng & Mutchler 1933:86; Loding 1933:146; 1945:79; Mader 1938:19.

Ischyryus quadripunctatus var. *antedivisa* Mader:

Blackwelder 1939:46; Boyle 1954:39; Deelder 1942:82.

Ischyryus quadripunctatus chiasticus Boyle, New Status

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 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, studied]. Sex male.

Specimens examined. The holotype and 372 specimens, representing 186 collection records, were studied (see Appendix C for specific data).

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. 113).

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 *Ischyryus chiasticus* Boyle (1954:43-46) stated:

This form appears to be a possible subspecies of *Ischyryus 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. *Ischyryus 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; Ruetter 1970:53; Skelley et al. 1991:65.

Ischyryus scriptus (Olivier)

- Erotylus scriptus* Olivier 1807:484-485, t.3 f.38.
Mycotretus scriptus (Olivier), Dejean 1836:429, 1837:453.
Ischyryus scriptus (Olivier), Lacordaire 1842:119-120.
- 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.
Ischyryus femoralis (Chevrolat), Lacordaire 1842:114-115.
- Ischyryus velatus* Lacordaire 1842:115-116, new synonymy.
Ischyryus 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' 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 = $2.0-2.3 \times$ eye width; ocular striae reaching $0.5-0.75$ distance to anterior angle of eye, continued forward as row of punctures; vertex puncture size = $0.75-1.0 \times$ facet, separated by 1-2 diameters; epistome puncture size = $0.5 \times$ facet, separated by $0.5-1$ 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 = $2 \times$ length. Labial palp terminal segment elongate, extended on medial side, rounded basally, width = $2 \times$ length. Labial palp width = $0.5 \times$ 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 = $0.75-1.0 \times$ facet, separated by 1 to 2 diameters. Scutellum pentagonal, length = $0.5 \times$ 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 sternite 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. 109a); base of flagellum weakly curved, sclerite at base blunt claw-shaped and sometimes thickened at connection with flagellum (Fig. 109b-d) (8 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail swollen, tightly curved like an inverted question mark, "¿" (Fig. 109e) (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. These 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 comte Dejean lui a donné dans sa collection", and was found in Brazil. Its current location is unknown.

The lectotype (here designated) of *Ischyryus velatus* Lacordaire label data: "/ Colombie/ Velatus Lac./ Type/ Ex. Musaeo Mniszech/ [red] Type/ [pale blue] Muséum Paris ex. Coll. R. Oberthür 1952/ [red] LECTOTYPE *Ischyryus velatus* Lacordaire des.P.E.Skelley 1993/" [MNHN, studied]. 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, studied]. Chevrolat stated in

the original description that the species came from Mexico. Sex not determined, not dissected.

The lectotype (here designated) of *Ischyurus maculiventris* Lacordaire label data: "/ blue paper] TYPE/ Type maculivent-ris Ch./ [red] LECTOTYPE *Ischyurus maculiventris* Lacordaire des.P.E.Skelley 1993/" [CUMZ, studied]. Lacordaire stated in the original description that the species came from Brazil. Sex not determined, not dissected.

Specimens examined. The lectotype and 177 specimens, representing 106 collection records, were studied (see Appendix C for specific data).

Distribution. Widespread from Mexico to northern Argentina (Fig. 114).

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 describer.

Ischyurus 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;



Figure 114. *Ischyryus scriptus* (Olivier)
distribution map.

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 *Ischyryus 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 *Ischyryus 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. *Ischyryus 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, the 4 can be separated by the combination of characters listed below.

Ischyryus 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.

Ischyryus 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.

Ischyryus 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.

Ischyryus 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. *Ischyryus 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.

Ischyryus velatus Lacordaire: Blackwelder 1945:465; Crotch 1876:(55); Gemminger & Harold 1876:3691; Kuhnt 1909:63; 1911:44; Mader 1942:171, 195, 196; 1951:209; 1952:159, 183.

Ischyryus maculiventris Lacordaire: Blackwelder 1945:465; Crotch 1876:(55)431; Gemminger & Harold 1876:3691; Kuhnt 1909:64; 1911:43.

Ischyryus scutellaris Gorham

Ischyryus scutellaris Gorham 1887:41-42, t.3 f.2.

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 = $2 \times$ length. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90° , length = $0.8 \times$ width. Labial palp width = $0.5 \times$ maxillary palp width (similar to Fig. 7o). Mentum with plate broadly triangular, length = $0.5 \times$ width, sides straight; ridge medial extension short, acutely pointed (similar to Fig. 8d).

Pronotal disc puncture size = $1 \times$ facet, separated by 1 to 2 diameters; laterally separated by 1 diameter. Scutellum pentagonal, length = $0.5 \times$ width. Each elytron with 7 complete striae; stria VIII faint, present at base and apical half, often obscured by interval punctation; striae punctures at base = $2 \times$ 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 = $0.5 \times$ sternal length, lines barely surpassing coxae, length = basal width; prosternal plate slightly convex, apical width = $0.8 \times$ 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.

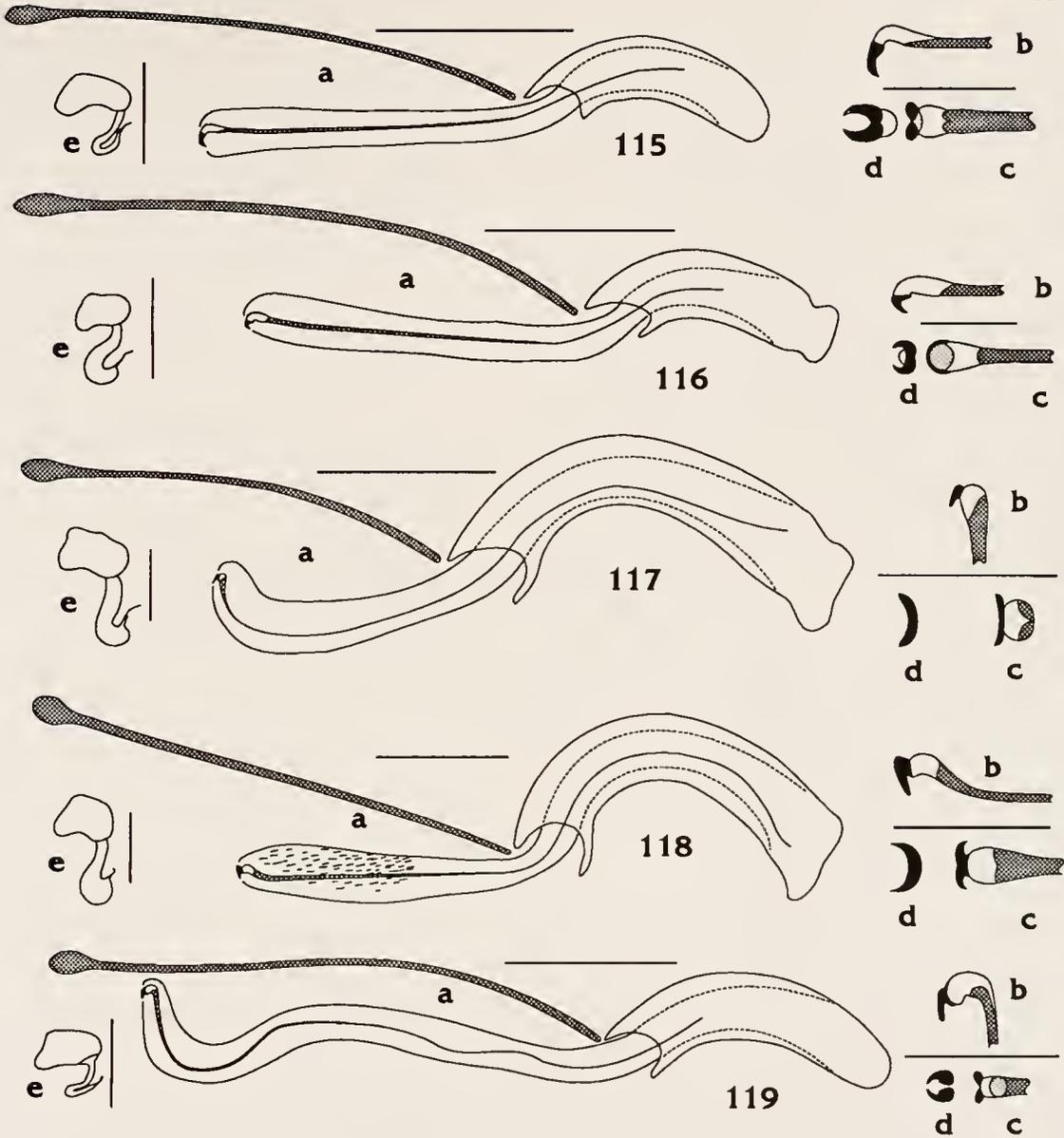
First visible abdominal sternite with coxal lines reaching 0.25 distance to posterior edge (Mexico), or barely surpassing coxa (Panama); broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

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. 115a); base of flagellum straight, sclerite at base elongate claw-shaped (Fig. 115b-d) (3 dissected).

Female genitalia with spermathecal head elongate kidney-shaped, often with weak top-knot; tail narrow, weakly looped, recurved onto itself (Fig. 115e) (13 dissected).

Stridulatory files present on occipital region of males' head; absent on females. Male with lateral expansion of prosternum broad, covering most of pronotal epipleuron (Fig. 14). 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



Figures 115-119. Genitalia: 115.) *Ischyryx scutellaris* Gorham [male & female, Panama]; 116.) *I. septemsignatus* Gorham [male, Mexico, Veracruz; female, Guatemala, Baha Verapaz]; 117.) *I. tetrasticus* Gorham [male, Peru, Huanuco; female, Brasil, Espirito Santo]; 118.) *I. tripunctatus* Crotch [male, Costa Rica; female, Mexico, Veracruz]; 119.) *I. undulatus* 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.

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 *Ischyus scutellaris* Gorham label data: "/ [red circle on white paper] Type/ Type, sp. figured/ Bugaba Panama, Champion/

Ischyryus scutellaris Type Gorham/ B.C.A., Col., VII,
Ischyryus/" [NHML, studied]. Sex not determined.

Specimens examined. The holotype and 34 specimens,
 representing 26 collection records, were studied (see
 Appendix C for specific data).

Distribution. Southern Mexico, Belize, Panama, and
 Colombia (Fig. 120).

Etymology. *Ischyryus scutellaris* Gorham was probably
 named for the large scutellar spot.

Remarks. *Ischyryus scutellaris* is most similar to *I.*
elegantulus, *I. chacojae*, *I. septemsignatus*, and *I. n. sp.*
 12 in color pattern. *Ischyryus chacojae* and *I.*
septemsignatus have only one free central elytral spot; *I.*
scutellaris has 2 free central spots. *Ischyryus elegantulus*
 has the scutellar spot narrowly connected to the elytral
 base; *I. scutellaris* has this spot broadly connected.
Ischyryus n. sp. 12 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.

Ischyryus septemsignatus Gorham

Ischyryus septemsignatus Gorham 1887:41, t.2 f.19.

Ischyryus septemsignatus var. α Gorham 1887:41.

Ischyryus septemsignatus var. β Gorham 1887:41.

Diagnosis. Recognized by the pronotum having only 2
 free spots, and the elytra with free central and apical
 spots.

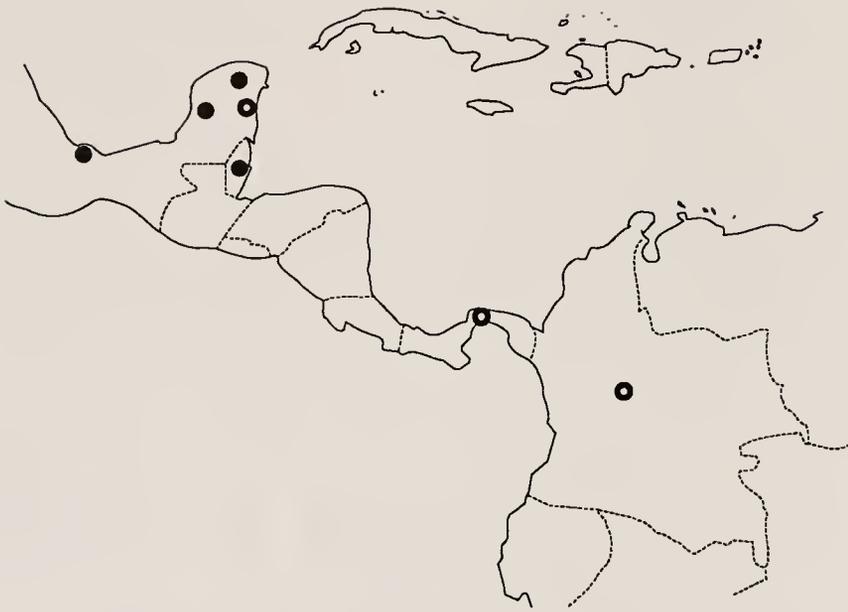


Figure 120. *Ischyryus scutellaris* Gorham
distribution map.

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 sternites and lateral prothorax. Legs black; tarsi and palpi brown.

Head dorsal distance between eyes = $2.5 \times$ eye width; ocular striae reaching 0.7 to 0.8 distance to anterior angle of eye; vertex puncture size = $1 \times$ facet, separated 1 to 3 diameters; epistome puncture size = $0.5 \times$ 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 = $0.66 \times$ width. Labial palp terminal segment triangular, extended on medial side, length = $0.66 \times$ width. Labial palp width = $0.8 \times$ maxillary palp width (Fig. 7e). Mentum with plate broadly

triangular, length = $0.6 \times$ width, sides straight, ridge medial extension acutely pointed (similar to Fig. 8d).

Pronotum puncture size = $1 \times$ facet, separated by 1 to 3 diameters. Scutellum pentagonal, length = $0.5 \times$ width. Each elytron with 7 complete striae; stria VIII weak, visible on apical half; strial puncture size = $2 \times$ 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 = $0.5 \times$ sternal length, lines barely surpassing coxae, length = basal width; prosternal plate slightly convex, apical width = $0.6 \times$ basal width; base shallowly concave.

Mesosternum basal width = $2 \times$ 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 sternite 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 = $2 \times$ median lobe length (Fig. 116a); base of

flagellum straight, sclerite at base claw-shaped (Fig. 116b-d) (5 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail swollen, curved like an inverted question mark, "¿" (Fig. 116e) (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 *Ischyryus septemsignatus* Gorham label data: "/ [red circle on white paper] Type/ sp. figured/ Toxpam / Mexico Salle Coll./ B.C.A., Col., VII, Ischyryus 7-signatus Gorham/ [red] LECTOTYPE *Ischyryus septemsignatus* Gorham des.P.E.Skelley

1993/" [NHML, studied]. Sex not determined. Selander & Vaurie (1962) did not locate "Toxpam", and stated that it is possibly a misspelling of Tuxpan, Veracruz, Mexico.

Specimens examined. The lectotype, paralectotypes, and 17 specimens, representing 20 collection records, were studied (see Appendix C for specific data).

A paralectotype with data: "/ Toxpam/ Mexico Salle Coll./ Ischyryus 7-signatus/ B.C.A., Col., VII, Ischyryus/ [yellow] PARALECTOTYPE Ischyryus septemsignatus Gorham des.P.E.Skelley 1993/" [NHML, studied]. Sex not determined.

The paralectotype of *Ischyryus septemsignatus* Var. α Gorham label data: "/ Pantaleon, 1700 ft, Champion/ Ischyryus 7-signatus/ B.C.A., Col., VII, Ischyryus/ [yellow] PARALECTOTYPE Ischyryus septemsignatus Var. α Gorham des.P.E.Skelley 1993/" [NHML, studied]. Sex not determined.

The paralectotype of *Ischyryus septemsignatus* Var. β Gorham label data: "/ Capetillo Guatemala, C.Champion/ Ischyryus 7-signatus lg.var./ B.C.A., Col., VII, Ischyryus/ [yellow] PARALECTOTYPE Ischyryus septemsignatus Var. β Gorham des.P.E.Skelley 1993/" [NHML, studied]. Sex not determined.

Distribution. Mexico to Costa Rica (Fig. 121).

Etymology. *Ischyryus 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).



Figure 121. *Ischyryus septemsignatus* Gorham
distribution map.

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 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. *Ischyryus septemsignatus* is most similar to *I. scutellaris* and *I. bogotae* in color pattern. *Ischyryus scutellaris* has 2 free spots at the center of each elytron; *I. septemsignatus* has only one. *Ischyryus 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.

Ischyryus tetrasticus Gorham

Ischyryus tetrasticus Gorham 1887:41, t.3 f.1.

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 sternites orange. Legs black; palpi pale brown.

Head dorsal distance between eyes = $2.2 \times$ eye width; ocular striae reaching 0.75 distance to anterior angle of eye; vertex puncture size = $1 \times$ facet, separated by 1 to 2 diameters; epistome puncture size = $0.5 \times$ 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 = $0.66 \times$ width (see Variation). Labial palp terminal segment triangular, extended on medial side, length = 0.66 width. Labial palp width = $0.8 \times$ 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; stria 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 sternite 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. 117a); base of flagellum gradually curved, sclerite at base claw-shaped (Fig. 117b-d) (2 dissected).

Female genitalia with spermathecal head kidney-shaped, with top-knot; tail swollen, tightly curved like an inverted question mark, "¿" (Fig. 117e) (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 *Ischyryus tetrasticus* Gorham label data: "/ [red circle on white paper] Type/ David, Panama, Champion/ Type, sp. figured/ *Ischyryus tetrasticus* Gorh./ B.C.A., Col., VII, *Ischyryus*/" [NHML, studied]. Sex apparently female, not dissected.

Specimens examined. The holotype and 3 specimens, representing 3 collection records, were studied. Label data: *Brazil*, Espirito Santo [1, HNHM]; *Ecuador*, Pichincha, Sn. Rafael, 5-I-1973, J. Avila [1, USNM]; *Peru*, Huanuco, Tingo Maria, 26-X-1946, J. C. Pallister, 2200' elev. [1, AMNH].

Distribution. Panama, Ecuador, Peru, and Brazil (Fig. 122).

Etymology. *tetra*: Greek = 4; *sticus*: Greek = punctured, spotted. This name refers to the 4 spots on the pronotum.

Remarks. *Ischyryus tetrasticus* is most similar to *I. quadripunctatus* and *I. n. sp. 13*. *Ischyryus 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. *Ischyryus n. sp. 13* 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.



Figure 122. *Ischyryus tetrasticus* Gorham [circle]
and *I. tripunctatus* Crotch [star]
distribution map.

Ischyryus tripunctatus Crotch

Ischyryus tripunctatus Crotch 1873b:144.

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 = $0.4 \times$ width. Labial palp terminal segment elongate, almost triangular, extended on medial side, rounded basally, length = $0.4 \times$ width. Labial palp width = $0.5 \times$ 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 = $1 \times$ facet, separated by 2 to 3 diameters. Scutellum pentagonal, length = $0.5 \times$ width. Each elytron with 7 complete striae; stria VIII weak, visible on apical half; strial puncture size = $1.5 \times$ 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 = $0.5 \times$ sternal length, lines barely surpassing coxae, length = basal width; prosternal plate flat, apical width = $0.75 \times$ basal width; base concave.

Mesosternum basal width = $2 \times$ 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 sternite 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. 118a); base of flagellum straight, sclerite at base claw-shaped (Fig. 118b-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. 118e) (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. No notable variation was observed in the specimens studied.

Type. The lectotype (here designated) of *Ischyryus tripunctatus* Crotch label data: "/ [red circle on white paper] Type/ Chontales, E.M.Janson [underside] 1929-289/ *Ischyryus tripunctatus* Type Crotch/ [red] LECTOTYPE *Ischyryus tripunctatus* Crotch des.P.E.Skelley 1993/" [NHML, studied]. Type locality was stated to be "the vicinity of Santo

Domingo, Chontales, Nicaragua" (Crotch 1873b). Sex not determined.

Specimens examined. The lectotype and 3 specimens, representing 3 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, an trocknem holz nachte [1, USNM]; *Mexico*, Veracruz, Los Tuxtlas, nr. Balzapote, 1-6-V-1989, E. Giesbert [1, FSCA].

Distribution. Mexico, Nicaragua, Costa Rica, and Bolivia (Fig. 122).

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 is from 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, from the type locality, and fits the original description.

Remarks. *Ischyryus tripunctatus* is most similar to *I. pardalinus* Guérin and *I. impressopunctatus* Crotch in color pattern. *Ischyryus 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. *Ischyryus 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.

Ischyryus undulatus Gorham

Ischyryus undulatus Gorham 1887:42, t.3. f.3.

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 = $0.6 \times$ sternal length, lines barely surpassing coxae; length = $0.75 \times$ basal width; prosternal plate slightly convex, apical width = $0.6 \times$ basal width; base shallowly concave.

Mesosternum lines = $0.5 \times$ 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 sternite 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 = $2 \times$ median lobe length (Fig. 119a); base of flagellum gradually curved, sclerite at base claw-shaped (Fig. 119b-d) (4 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail small and narrow, looped (Fig. 119e) (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 *Ischyryus undulatus* Gorham label data: "/ [red circle on white paper] Type/ Bugaba Panama Champion/ *Ischyryus undulatus* Gorham/ B.C.A., Col.,VII, *Ischyryus*/" [NHML, studied]. Sex not determined.

Specimens examined. The holotype and 8 specimens, representing 8 collection records, were studied. Label data: *Panama*, Canal Zone, Barro Colorado Island, 1-9-V-1964, W. D. Duckworth [1, USNM]; same data, 20-23-V-1964 [1, USNM]; same locality, 15-27-V-1972, T. Erwin, light at field station [1, USNM]; Canal Zone, Coco Solo Hospital, 9°21'N, 79°51'W, 9-VI-1972, Engleman [1, CSUC]; Canal Zone,

Frijoles, 20-21-V-1981, B. Gill [1, CNCI]; Canal Zone, Paraiso, 1-V-1911, E. A. Schwarz [1, USNM]; Panama Prov., Howard Air Force Base, 21-V-1981, R. H. Turnbow [1, RHTC]; Panama Prov., Las Cumbres, 26-VI-1975, H. Wolda [1, OSUC].

Distribution. Known only from Panama (Fig. 123).

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

Ischyrus vespertilio Lacordaire 1842:112.

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;



Figure 123. *Ischyryus undulatus* Gorham [circle],
I. vespertilio Lacordaire [star and "?"],
and *I. n. sp. 1* [triangle] distribution
map.

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; stria 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 sternite 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 *Ischyryus vespertilio* Lacordaire label data: "/ Colombie/ Vespertilio Lac./ Type/ Ex-Musaeo Mniszech/ [red] TYPE/ [pale blue] Muséum Paris ex Coll. R. Oberthür 1952/ [red] LECTOTYPE *Ischyryus vespertilio* Lacordaire des.P.E.Skelley 1993/" [MNHN, studied]. Sex not determined.

Specimens examined. Only the lectotype was studied.

Distribution. Reported by Lacordaire to be from Colombia and Mexico (Tabasco) (Fig. 123). Gorham (1887:40) did not see any specimens of this species from Central America.

Etymology. *vespertilio*: Latin = bat. Perhaps some part of this specie's 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 (see Locating Types).

Remarks. *Ischyryus vespertilio* is most closely related to *I. duponti* Lacordaire, in body shape, antennal structure, and pronotal color pattern (2 large free spots). *Ischyryus 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 *Ischyryus* because they possess most of

the generic characters. They differ from other *Ischyryus* 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.

Ischyryus n. sp. 1

Diagnosis. 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, 9 visible elytral striae, and color pattern (Fig. 25).

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 sternites 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. 8h).

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 sternite with coxal lines continuous around coxa; broadly rounded between metacoxae; coarse punctures laterally, fine punctures medially.

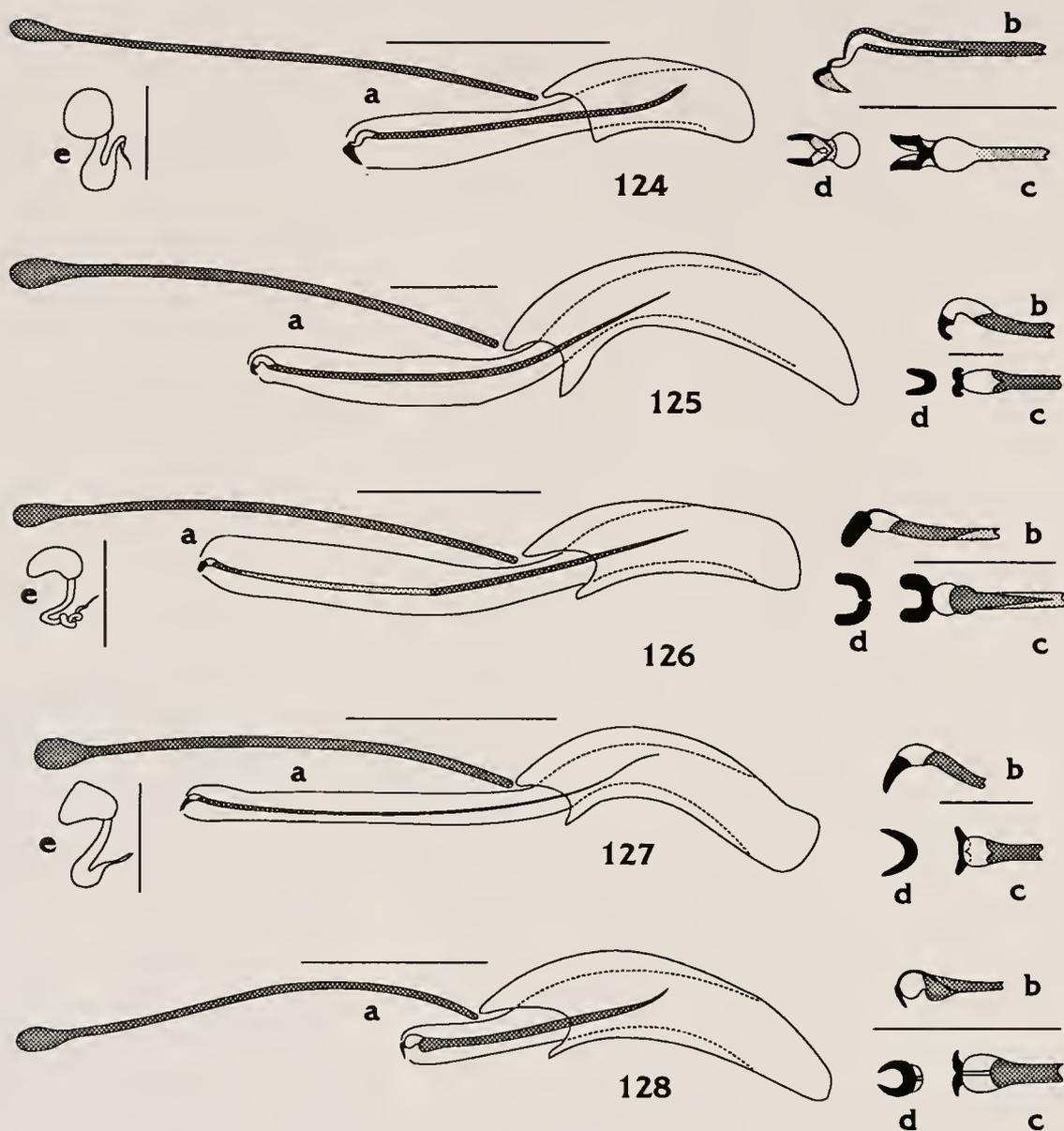
Male genitalia with median lobe straight, short, apically truncate; internal sac without noticeable sclerotized structures; flagellum narrow, length = 1.8 x median lobe length (Fig. 124a); base of flagellum straight and swollen, sclerite at base parallel-sided and fang-like (Fig. 124b-d) (1 dissected).

Female genitalia with spermathecal head ball-like; tail swollen, recurved on itself (Fig. 124e) (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 the stripe solid. 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 population.

Specimens examined. Only 2 specimens, representing 2 collection records, were studied. Label data: *Mexico,*



Figures 124-128. Genitalia: 124.) *Ischyryus n. sp. 1* [male, Mexico, Campache; female, Mexico, Oaxaca]; 125.) *I. n. sp. 2* [male, Mexico, Chiapas; female unknown]; 126.) *I. n. sp. 3* [male & female, Panama]; 127.) *I. n. sp. 4* [male & female, Cuba]; 128.) *I. n. sp. 5* [male, Panama; female unknown]; 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.

Campeche, Chicana Ruins, 6mi. E. Xpujil, 13-14-VII-1983, 700' elev., R. M. Anderson, W. Maddison, trop. seas. for. [1, UASM]; Oaxaca, Temascal, 29-VI-1964, A. G. Raske, at light [1, CNCI].

Distribution. Known only from Mexico (Fig. 123).

Taxonomic notes. This unique species is provisionally placed in *Ischyrus* because it possesses most of the generic characters as stated in the Generic Account. It differs from other *Ischyrus* in its antennal club structure, prosternal pit, and genitalic characters.

Ischyrus n. sp. 2

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 = $0.5 \times$ sternal length, lines barely surpassing coxae, line length = $0.75 \times$ basal width; prosternal plate flat, apical width = $0.6 \times$ basal width; base shallowly concave.

Mesosternum basal width = $2 \times$ 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 sternite 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 = $1.1 \times$ median lobe length (Fig. 125a); base of flagellum straight, sclerite at base claw-shaped (Fig. 125b-d) (2 dissected).

Female unknown.

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

Specimens examined. Only 2 specimens, representing 2 collection records, were studied. Label data: Mexico, Chiapas, 24 mi. NW Ocozocoautla, 24-VI-1965, H. R. Burke, et al. [1, USNM]; Veracruz, Omealca, 6-IV-1903, F. K. Knab [1, USNM].

Distribution. Known from Mexico (Fig. 129).

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

Ischyryus n. sp. 3

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



Figure 129. *Ischyryus* n. sp. 2 [circle], *I. n. sp. 3* [star), *I. n. sp. 4* [triangle), and *I. n. sp. 5* [square] distribution map.

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 = $4 \times$ eye width; ocular striae reaching anterior angle of eye; vertex puncture size = $1 \times$ facet, separated by 2 to 3 diameters; epistome puncture size = $1 \times$ 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 = $0.5 \times$ maxillary palp width (Fig. 7g). Mentum with plate broadly triangular, length = $0.5 \times$ width, sides inwardly curved, ridge medial extension short and acutely pointed (Fig. 8e)

Pronotal disc puncture size = $1 \times$ facet, separated 3 to 4 diameters; laterally separated 2 to 4 diameters. Scutellum pentagonal, length = $0.5 \times$ width. Each elytron with 7 complete striae; stria VII often weak and obscure; basal strial puncture size = $2 \times$ 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 = $0.5 \times$ sternal length, lines barely surpassing coxae, length = $0.75 \times$ basal width; prosternal plate slightly convex, apical width = $0.6 \times$ basal width; base shallowly concave.

Mesosternum basal width = $3 \times$ 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 sternite 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 = $2 \times$ median lobe length (Fig. 126a); base of

flagellum straight, sclerite at base horseshoe-shaped (Fig. 126b-d) (6 dissected).

Female genitalia with spermathecal head kidney-shaped; tail narrow, angled and coiled (Fig. 126e) (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.

Specimens examined. A total of 39 specimens, representing 11 collection records, was studied (see Appendix C for specific data).

Distribution. Known only from Panama (Fig. 129).

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.

Ischyryus n. sp. 4

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 *Ischyryus* 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 = $2.2 \times$ eye width; eye raspberry-like, facets large; ocular striae strong, reaching base of antenna; vertex puncture size = $0.33 \times$ facet, separated by 3 to 4 diameters; epistome puncture size = 0.5 to $0.75 \times$ 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 = $0.8 \times$ width. Labial palp terminal segment triangular, extended on medial side, length = $0.75 \times$ width. Labial palp width = $0.6 \times$ maxillary palp width (Fig. 7i). Mentum with plate triangular, length = $0.75 \times$ width, sides straight to convex, ridge medial extension acutely pointed (Fig. 8f).

Pronotal disc medial puncture size = $0.33 \times$ facet, separated by 3 to 4 diameters; lateral puncture size = $0.75 \times$ facet, separated by 1 diameter. Scutellum elongate pentagonal, nearly triangular; length = $0.6 \times$ 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 = $0.5 \times$ sternal length, lines not surpassing coxae, length = $0.9 \times$ basal width; prosternal plate flat or slightly convex, apical width = 0.9 to $1 \times$ basal width; base shallowly concave.

Mesosternum basal width = $3 \times$ 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 sternite 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 = $1.3 \times$ median lobe length (Fig. 127a); base of flagellum straight, sclerite at base claw-shaped (Fig. 127b-d) (5 dissected).

Female genitalia with spermathecal head kidney-shaped, often with top-knot; tail weakly swollen, recurved onto itself (Fig. 127e) (2 dissected).

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

Variation. No notable variation was observed in the specimens studied.

Specimens examined. A total of 14 specimens, representing 11 collection records, was studied (see Appendix C for specific data).

Distribution. Known only from Cuba, West Indies (Fig. 129).

Taxonomic notes. This species is different from all other *Ischyryus* in many characters (some listed in the Diagnosis), yet it possesses the generic characters listed in the Generic Account. *Ischyryus n. sp. 4* is provisionally placed in *Ischyryus* pending a revision of the Triplacinae at the generic level.

Ischyryus n. sp. 5

Diagnosis. Unique in having an ovoid body shape, uniform brown color (no color pattern), prosternal plate wider than long, labial palp terminal segment wider than long, and the epistome punctures 2 to 3 times larger than the vertex punctures.

Description. Length: 5.4 mm; Width: 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. 11c), 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 sternite 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. 128a); base of flagellum straight and swollen, sclerite at base claw-shaped (Fig. 128b-d) (1 dissected).

Female unknown.

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

Specimens examined. The only known specimen has the following label data: *Panama*, Cocle Prov., El Valle, 14-VI-67, D. M. DeLong & C. A. Triplehorn [1, OSUC].

Distribution. Only known from Panama (Fig. 129).

Ischyryus n. sp. 6

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 sternite 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.

130a); base of flagellum straight, sclerite at base elongate ring-shaped (Fig. 130b-d) (12 dissected).

Female genitalia with spermathecal head kidney-shaped to cone-shaped; tail narrow, weakly curved with swollen end (Fig. 130e) (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.

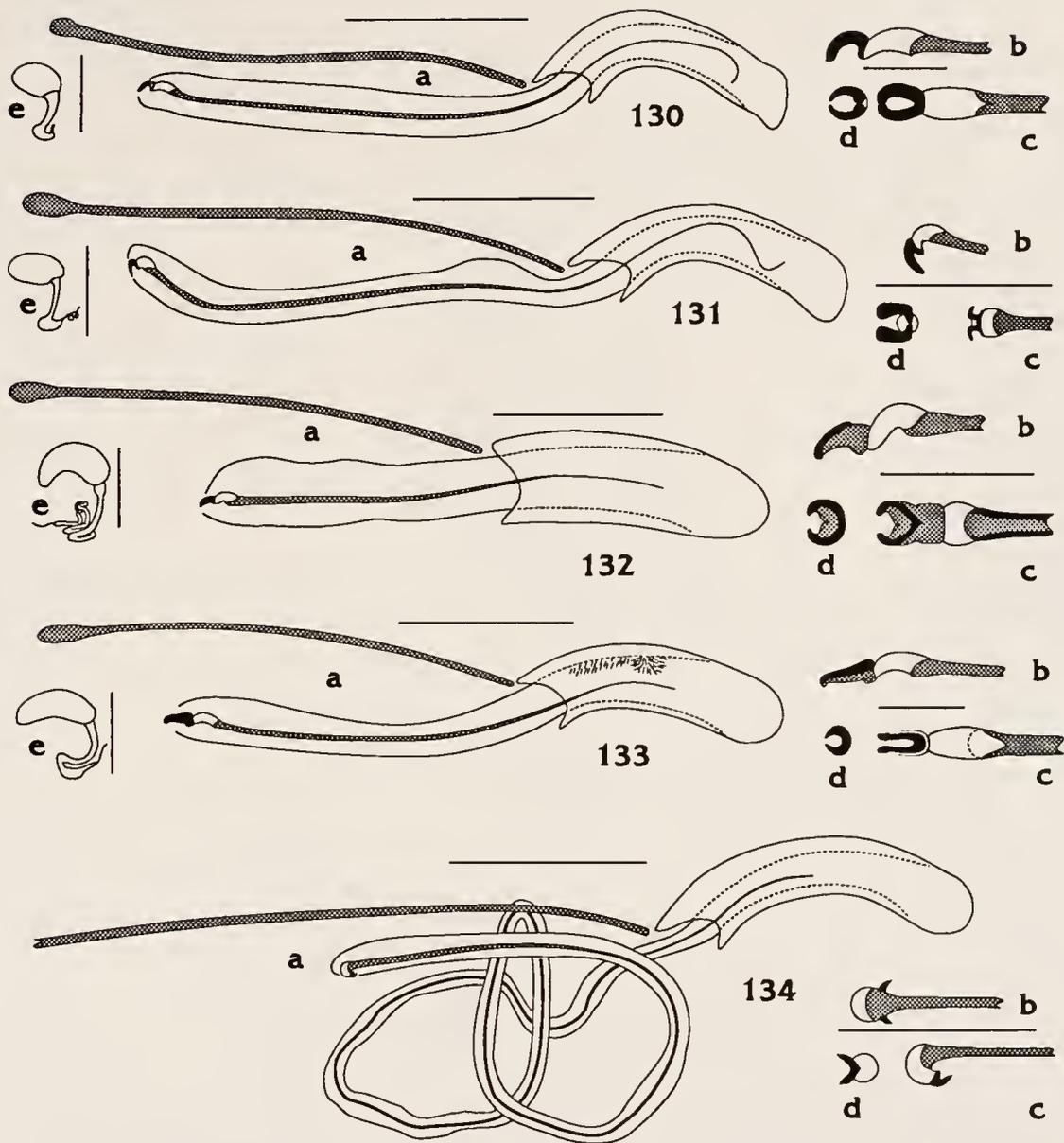
Specimens examined. A total of 21 specimens, representing 21 collection records, was studied (see Appendix C for specific data).

Distribution. Bolivia, Brazil, and Central America (Fig. 135).

Remarks. See Remarks under *Ischyryus n. sp. 7*.

Ischyryus n. sp. 7

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.



Figures 130-134. Genitalia: 130.) *Ischyryus n. sp. 6* [male, Panama; female, San Salvador]; 131.) *I. n. sp. 7* [male, Panama; female, Venezuela, Aragua]; 132.) *I. n. sp. 9* [male & female, Panama]; 133.) *I. n. sp. 10* [male, Colombia; female, Panama]; 134.) *I. n. sp. 11* [male, Panama; female spermatheca not found]; 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 135. Map. n. sp. 6



Figure 135. *Ischyryus n. sp. 6*
distribution map.

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. 11b), 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 sternite 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. 131a); base of flagellum straight, sclerite at base claw-shaped to ring-shaped (Fig. 131b-d) (9 dissected).

Female genitalia with spermathecal head elongate-oval; tail narrow, weakly curved with swollen end (Fig. 131e) (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. 12); male prosternal punctures are obscure, not impressed.

Variation. The dorsal punctation varies in size and distinctiveness from specimen to specimen.

Specimens examined. A total of 67 specimens, representing 16 collection records, was studied (see Appendix C for specific data).

Distribution. Brazil, Venezuela, Panama, and Costa Rica (Fig. 136).

Remarks. *Ischyryus n. sp. 7* is similar to *Ischyryus n. sp. 6* in many characters. *Ischyryus n. sp. 6* has an elongate body, lateral pronotal punctures larger than on the disc, and the prosternal plate length = 2 x widths; *I. n. sp. 7* has a parallel-sided body, pronotal punctures of equal size, and the prosternal plate length = 3 x widths.

Ischyryus n. sp. 8

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).



Figure 136. *Ischyryus n. sp. 7* [circle] and *I. n. sp. 8* [star] distribution map.

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 sternite 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. 144) (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.

Specimens examined. Only 3 specimens were studied, representing 2 collection records. Label data: Mexico, Jalisco, UNAM Biol. Sta. Chamela, 9-VIII-1982, C. W. & L. O'Brien, & G. Wibmer, 200' elev., at night [2, PESC]; same data, at light [1, PESC].

Distribution. Known only from Mexico (Fig. 136).

Ischyrus n. sp. 9

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 sternite 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. 132a); base of flagellum straight, sclerite at base claw-shaped and thickened at connection with flagellum (Fig. 132b-d) (5 dissected).

Female genitalia with spermathecal head elongate kidney-shaped; tail narrow, coiled (Fig. 132e) (6 dissected).

Stridulatory files on occipital region of head not visible on males; presence of file unknown on females (heads

retracted). 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 female Brazilian specimen has the anterior pronotal angle spot distinct, sharply delineated from the rest of the pronotum, and the humeral spot connected to the elytral base.

When the elytra are together, the central mark varies from W- to V-shaped, depending on the extent of the sutural connection.

Specimens examined. A total of 18 specimens, representing 17 collection records, was studied (see Appendix C for specific data).

Distribution. Panama, Venezuela, Trinidad, and Brazil (Fig. 137).

Taxonomic notes. The Brazilian specimen may represent a separate taxon. Only additional material and study of male genitalia will solve this question.

Remarks. *Ischyryus n. sp. 9* superficially resembles *I. n. sp. 10* in color pattern and body shape. *Ischyryus n. sp. 9* can be distinguished by the characters mentioned in the diagnosis and the genitalia.

Ischyryus n. sp. 10

Diagnosis. Recognized by having the pronotum almost entirely black (except for anterior angles), elytral free



Figure 137. *Ischyryus n. sp. 9* distribution map.

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, transversely elongate, narrower than antennomere X (similar to Fig. 61).

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; slightly 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 sternite 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. 133a); base of flagellum straight, sclerite at base elongate, claw-shaped (Fig. 133b-d) (3 dissected).

Female genitalia with spermathecal head elongate kidney-shaped; tail narrow, looped (Fig. 133e) (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 into the black.

Specimens examined. A total of 10 specimens, representing 8 collection records, was studied. Label data:

Bolivia, R. Japacani, e. Bolivia, J. Steinbach [1, ICCM]; *British Guiana*, Upper Courantyne R., IX-1935, G. A. Hudson [1, NHML]; *Colombia*, Rio Frio, II-1924, W. M. Mann [3, USNM]; *Panama*, Canal Zone, Barro Colorado Island, 1-9-V-1964, W. D. & S. S. Duckworth [1, USNM]; Canal Zone, Fort Clayton, V-1961, C. E. Yunker [1, CNCI]; Canal Zone, Fort Kobbe, 14-VI-1976, E. G. Riley [1, EGRC]; *Trinidad*, Simla, 5 mi.N.Arima, 18-VIII-1968, H. & A. Howden [1, CMNC]; Simla, Arima-Blanchisseuse Rd., 22-VII-1975, J. Price, blacklight [1, FSCA].

Distribution. Panama, British Guiana, Trinidad, Colombia, and Bolivia (Fig. 138).

Remarks. *Ischyryus n. sp. 10* superficially resembles *I. n. sp. 9* in color pattern and body shape. *Ischyryus n. sp. 10* can be distinguish by the characters mentioned in the diagnosis and the genitalia.

Ischyryus n. sp. 11

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



Figure 138. *Ischyryus n. sp. 10* distribution map.

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 sternite 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. 134a); base of flagellum straight, sclerite at base claw-shaped (Fig. 134b-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.

Specimens examined. A total of 4 specimens, representing 4 collection records, was studied. Label data: *Colombia*, Pueblo Bello, Sierra de Santa Marta, 14-15-IV-1968, B. Malkin, at light [1, FMNH]; *Panama*, Panama Prov., Cerro Campana, 11-15-V-1980, R. G. Riley [1, EGRC]; Panama Prov., Las Cumbres, 6-V-1974, H. Wolda [1, OSUC]; Tocuman, 6-I-1953, F. S. Blanton [1, USNM].

Distribution. Panama and Colombia (Fig. 139).



Figure 139. *Ischyryus n. sp. 11* [circle] and
I. n. sp. 12 [star] distribution map.

Ischyryus n. sp. 12

Diagnosis. Recognized by having only 2 free pronotal spots, central and lateral elytral spots elongate, leaving an axe-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 = $2.2 \times$ eye width; ocular striae reaching 0.5 distance to anterior angle of eye, continue forward as row of punctures; vertex puncture size = $1 \times$ facet, separated by 1 diameter; epistome puncture size = $0.5 \times$ 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. 61).

Maxillary palp terminal segment triangular, sides rounded, lateral angle acute, medial angle nearly 90° , length = $0.5 \times$ width. Labial palp terminal segment triangular, extended medially, sides rounded, angles nearly 90° , length = $0.8 \times$ width. Labial palp width = $0.5 \times$ 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 = $1 \times$ facet, separated by 1 to 2 diameters; laterally separated by 0.5 to 1.0 diameter. Scutellum pentagonal, length = $0.5 \times$ 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 = $0.6 \times$ sternal length, lines surpassing coxae, length = basal width; prosternal plate flat, apical width = $0.75 \times$ basal width; base concave.

Mesosternum basal width = $2.5 \times$ 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 sternite with coxal lines reaching 0.5 distance to posterior edge; broadly rounded between metacoxae; coarse punctures distributed across sternite.

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. 140a); base of flagellum straight, sclerite at base elongate, thickened at connection to flagellum (Fig. 140b-d) (1 dissected).

Female unknown.

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

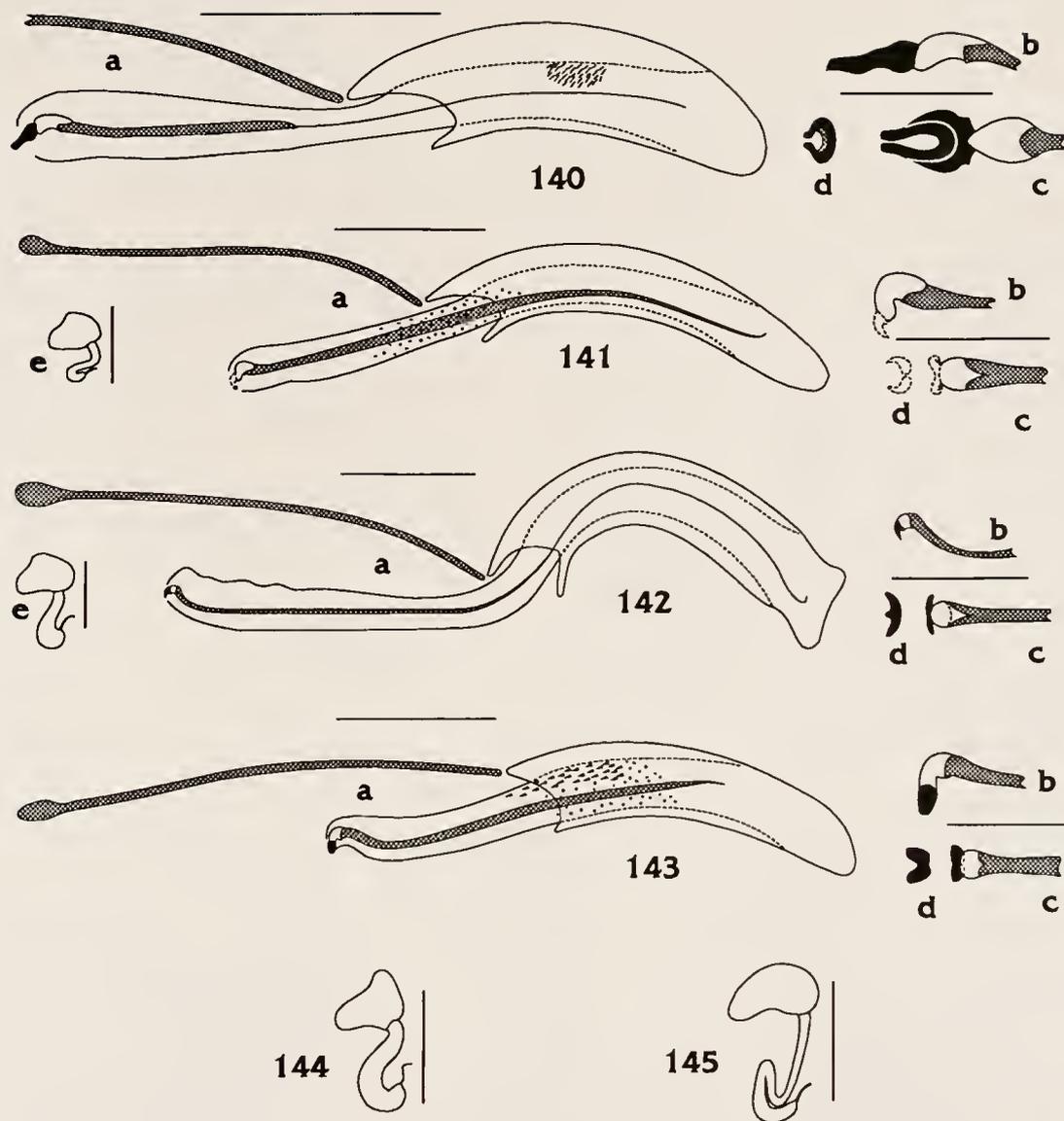
Specimens examined. Known only from one specimen, label data: Mexico, Oaxaca, 10 mi. N Matias Romaro, 3-VII-1975, L. E. Watrous [1, CUIC].

Distribution. Known only from Mexico (Fig. 139).

Remarks. *Ischyryus n. sp. 12* 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.

Ischyryus n. sp. 13

Diagnosis. Recognized by having 4 free pronotal spots in transverse row, large free central elytral spot on each



Figures 140-145. Genitalia: 140.) *Ischyryus n. sp. 12* [male, Mexico, Oaxaca; female unknown]; 141.) *I. n. sp. 14* [male, Mexico, Durango; female, Mexico, San Luis Potosi]; 142.) *I. n. sp. 15* [male, Venezuela, Carabobo; female, Panama]; 143.) *I. n. sp. 16* [male, Panama; female unknown]; 144.) *I. n. sp. 8* [male unknown; female, Panama]; 145.) *I. n. sp. 13* [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

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 = $3.5 \times$ eye width; ocular striae reaching anterior angle of eye; vertex puncture size = $1 \times$ facet, separated by 2 to 3 diameters; epistome puncture size = 0.75 to $1.0 \times$ 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 = $0.66 \times$ width, extended medially. Labial palp terminal segment triangular, extended on medial side, length = $0.66 \times$ 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 sternite 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. 145) (1 dissected).

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

Specimens examined. The only known specimen has label data: *Panama*, Colon Prov., Porto Bello, 10-III-1911, E. A. Schwarz [1, USNM].

Distribution. Known only from Panama (Fig. 146).

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

Ischyryus n. sp. 14

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



Figure 146. *Ischyryus n. sp. 13* [circle]
and *I. n. sp. 14* [star and "?"]
distribution map.

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 = $2.5 \times$ eye width; ocular striae reaching anterior angle of eye; vertex puncture size = $1 \times$ facet, separated by 1 to 2 diameters; epistome puncture size = $0.5 \times$ 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 = $0.66 \times$ width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = $0.75 \times$ width. Labial palp width = $0.5 \times$ maxillary palp width (similar to Fig. 7a). Mentum with plate triangular, length = $0.75 \times$ width, apical sides straight (similar to Fig. 8a), ridge medial extension acute, projecting.

Pronotal disc puncture size = $1 \times$ 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 sternite 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. 141a); base of flagellum thick, sclerite at base claw-shaped (Fig. 141b-d) (1 dissected).

Female genitalia with spermathecal head kidney-shaped, with top-knot; tail weakly swollen, angled and curved onto itself (Fig. 141e) (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.

Specimens examined. Only 2 specimens were studied, representing 2 collection records. Label data: Mexico, San Luis Potosí, 6.9 mi. W. El Naranjo, Rte. 80, 14-X-1965, G. E. Ball & D. R. Whitehead [1, CUIC]; Sierra de Durango, Fry Coll. 1905-100 [1, NHML].

Distribution. Known only from the state of San Luis Potosí and "Sierra de Durango", Mexico (Fig. 146). 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 unknown.

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. *Ischyryus grammicus* and *I. nigrolineatus* have the central elytral marking broken into stripe-like spots.

Ischyryus n. sp. 15

Diagnosis. Recognized by large triangular central elytral marking, and heart-shaped central pronotal marking, 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 sternites. 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 sternite 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. 142a); base of flagellum gradually curved, sclerite at base claw-shaped (Fig. 142b-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. 142e) (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. The subhumeral spot is free on the remaining specimens.

Specimens examined. A total of 12 specimens, representing 11 collection records, was studied (see Appendix C for specific data).

Distribution. Southern Central America and northern South America (Fig. 147).

Remarks. *Ischyrus n. sp. 15* superficially resembles *I. tripunctatus*. *Ischyrus tripunctatus* lacks pronotal basal spots and has the central pronotal spot free; *I. n. sp. 15* has pronotal basal spots and the central spot is narrowly connected to the anterior margin.



Figure 147. *Ischyryus n. sp. 15*
distribution map.

Ischyryus n. sp. 16

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 = $0.5 \times$ facet, separated by 2 to 3 diameters; epistome puncture size = $0.25 \times$ 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 = $0.66 \times$ width. Labial palp terminal segment elongate, extended on medial side, rounded basally, length = $0.75 \times$ width. Labial palp width = $0.5 \times$ maxillary palp width (similar to Fig. 7a). Mentum with plate triangular, length = $0.75 \times$ width, apical sides straight (similar to Fig. 8a), ridge medial extension acute, weakly projecting.

Pronotal disc puncture size = $0.75 \times$ facet, separated by 2 to 3 diameters. Scutellum pentagonal, length = $0.6 \times$ width. Each elytron with 7 complete striae; stria VIII present at base and apical half; strial puncture size at base = $1.5 \times$ 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 = $0.6 \times$ sternal length, lines barely surpassing coxae, length = basal width; prosternal plate flat, apical width = $0.75 \times$ 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 sternite 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. 143a); base of flagellum weakly curved, sclerite at base rounded, blunt (Fig. 143b-d) (1 dissected).

Female unknown.

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

Specimens examined. Known only from a single specimen.

Label data: Panama, Panama Prov., La Chorrera, 12-V-1912, Aug. Busck [1, USNM].

Distribution. Known only from La Chorrera, Panama (Fig. 148).

Remarks. This specie's color pattern most closely resembles *I. insolens* Crotch and *I. fulmineus* Kuhnt.

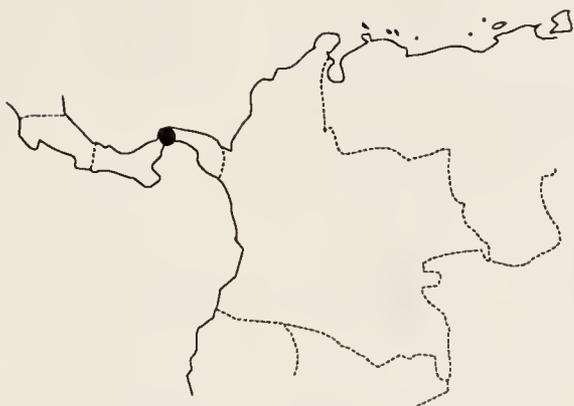


Figure 148. *Ischyryus n. sp. 16*
distribution map.

Ischyryus insolens can be separated by the lack of 2 basal pronotal spots, which are present in *I. n. sp. 16*. *Ischyryus 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. n. sp. 16*.

APPENDIX A
ISCHYRUS SPECIES NAMES

This alphabetical list includes all specific names used in combination with the generic name *Ischyryus*; 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 name problems in future research.

Citations are presented in the format: *name* describer year:page. *Original genus*. Statements on current status and citations to the place where any changes were made.

Alvarenga (1965) changed many of the generic names listed in this Appendix. A proposal has been submitted to the International Commission of Zoological Nomenclature to conserve the generic names changed by Alvarenga (see Nomenclatural Status and Skelley & Goodrich [1994]). Pending the ruling of the Commission, the species names are listed below in their current usage. This list does not reflect the generic changes made by Alvarenga.

affinis Duponchel 1825:47. *Erotylus*. Synonym of *Ischyryus scriptus* (Olivier) 1807:484, *fide* Lacordaire 1842:119.

agnatus Crotch 1876:426(50). *Ischyryus*. Variation of *I. frontalis* Lacordaire 1842:127, *fide* Gorham 1887:39.

alabamae Schaeffer 1931:175. *Ischyryus*. 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. *Ischyryus*. Valid.

amoenus Guérin-Méneville 1841:155. *Lybas*. Now *Callischyryus*, *fide* Crotch 1876:(59)435. *Ischyryus* in Gemminger & Harold 1876:3690 and Lacordaire 1842:107-108.

angularis Lacordaire 1842:126. *Ischyryus*. Valid.

angustatus Lacordaire 1842:96-97. *Ischyryus*. Now *Megischyryus*, *fide* Crotch 1876:(47)423.

antedivisa Mader 1938:19. *Ischyryus*. Described as a variety of *I. quadripunctatus* (Olivier) 1792:437. Synonym of *I. q. quadripunctatus* (Olivier), *fide* Boyle 1954:39-41.

- auriculatus* Lacordaire 1842:123. *Ischyryus*. Valid.
- bahiae* Crotch 1876:428(52). *Ischyryus*. Valid.
- balteatus* Duponchel 1825:164. *Erotylus*. Synonym of *Megischyryus semipunctatus* (Germar) 1824:612, *fide* Lacordaire 1842:99. *Ischyryus* in Dejean 1836:428.
- basiguttiger* Kuhnt [unpublished name]. *Ischyryus*. The "Type" specimen is in the Institut Royal Sciences Naturelle Belgique.
- bellicosus* Lacordaire 1842:98. *Ischyryus*. Now *Megischyryus*, *fide* Crotch 1876:424(48).
- bellopictus* Kuhnt 1910:222. *Episcaphula*. Now *Ischyryus*, *fide* Delkeskamp 1957a:109. Synonym of *I. auriculatus* Lacordaire 1842:123, *new synonymy*.
- bellus* Guérin 1949:233-234, 231 fig.#6. *Ischyryus*. Valid.
- blandus* Erichson 1847:180. *Ischyryus*. Synonym of *Callischyryus insignis* (Laporte) 1840:250, *fide* Crotch 1876:434(58).
- bogotae* Crotch 1876:430(54). *Ischyryus*. Valid.
- boucardi* Crotch 1876:429(53). *Ischyryus*. Valid.
- brasilensis* Lacordaire 1842:91. *Ischyryus*. Now *Megischyryus*, *fide* Crotch 1876:422(46).
- candezei* Crotch 1876:58. *Callischyryus*. *Ischyryus* in Chapuis 1876:38 and Gemminger & Harold 1876:3690.
- catenulatus* Lacordaire 1842:97-98. *Ischyryus*. Now *Megischyryus*, *fide* Crotch 1876:424(48).
- chacojae* Gorham 1887:43, t.3 f.5. *Ischyryus*. Valid.
- chalcojae* [sic] Gorham 1887:43. *Ischyryus*. Misspelling of *I. chacojae* Gorham 1887 *in* Kuhnt 1909:63.
- chiasticus* Boyle 1954:43-46. *Ischyryus*. Subspecies of *I. quadripunctatus* (Olivier) 1792:437, *new status*.
- circumcinctus* Delkeskamp 1957:98,108-109. *Ischyryus*. Valid.
- circumscripatus* Duponchel 1825:165, t.3 f.83. *Erotylus*. Now *Megischyryus*, *fide* Crotch 1876:(49)425. *Ischyryus* in Lacordaire 1842:102-103.

- coccineipennis* Motschulsky 1858:117. *Ischyryus*. Now *Mycolybas*, *fide* Crotch 1876:474(47).
- collatinus* Crotch 1876:57. *Ischyryus*. Valid.
- columbianus* Lacordaire 1842:95. *Ischyryus*. Now *Megischyryus*, *fide* Crotch 1876:(47)423.
- conductus* Kuhnt 1910:229-230. *Ischyryus*. Valid.
- consanguineus* Duponchel *in litt.*, *fide* Lacordaire 1842:94. *Ischyryus*. Variety of *Megischyryus mexicanus* (Lacordaire) 1842:93-94, *fide* Gemminger & Harold 1876:3689.
- consimilus* Crotch 1876:53-54. *Ischyryus*. Valid.
- cyanopterus* Erichson 1847:180. *Ischyryus*. Now *Callischyryus*, *fide* Crotch 1876:434(58).
- decempunctatus* Guérin-Méneville 1841:154-155. *Ischyryus*. Now *Megischyryus*, *fide* Crotch 1876:(49)425.
- decorus* Guérin 1949:234-235, 231 fig.#7. *Ischyryus*. Valid.
- dejeanii* Chevrolat *in* Dejean 1836:428. *Ischyryus*. Synonym of *Megischyryus discipennis* (Lacordaire) 1842:101, *fide* Gemminger & Harold 1876:3689.
- dentiferus* Chevrolat *in* Dejean 1836:428. *Ischyryus*. Synonym of *Megischyryus brasiliensis* (Lacordaire) 1842:91-92, *fide* Gemminger & Harold 1876:3690.
- discipennis* Lacordaire 1842:101. *Ischyryus*. Now *Megischyryus*, *fide* Crotch 1873b:143.
- disconiger* Mader 1942 *in* Delkeskamp 1957:108-109. *Ischyryus*. Valid. A mandatory change in spelling for "*disconigrum*" which does not agree in gender with the generic name *Ischyryus*.
- disconigrum* Mader 1942:195. *Ischyryus*. Now spelled *disconiger*, *fide* Delkeskamp 1957:108-109, a mandatory spelling change to agree in gender with the generic name *Ischyryus*.
- distinguendus* Lacordaire 1842:111. *Ischyryus*. Valid.
- dunedinensis* Blatchley 1917:279. *Ischyryus*. Valid.
- duponti* Lacordaire 1842:110-111. *Ischyryus*. Valid.
- elegantulus* Lacordaire 1842:121-122. *Ischyryus*. Valid.

- ephippiatus* Gorham 1887:43. *Ischyryus*. Valid.
- episcaphulinus* Gorham 1887:44, t.3 f.7. *Ischyryus*. Valid.
- extricatus* Crotch 1873a:354. *Ischyryus*. Now *Pseudischyryus*,
fide Boyle 1956:130.
- fasciato-dentatus* Guérin MSS. Synonym of *Megischyryus*
jurinei (Lacordaire) 1842:94-95, fide Crotch
1876:422 (46).
- femoralis* Chevrolat in Guérin-Ménéville 1829-1838[1844]:63,
t.18 f.10. *Dacne*. Now *Ischyryus*, fide Lacordaire
1842:114-115. Synonym of *I. scriptus* (Olivier)
1807:484-485, new synonymy.
- flavitaris* Lacordaire 1842:130. *Ischyryus*. Now *Oocyranus*,
fide Curran 1944:3.
- flavus* Motschulsky 1858:116. *Ischyryus*. Now *Rhodotritoma*,
fide Chûjô & Chûjô 1990:5.
- fraternus* Lacordaire 1842:124. *Ischyryus*. Valid.
- frontalis* Lacordaire 1842:127. *Ischyryus*. Valid.
- fulmineus* Delkeskamp 1957:98,107-108. *Ischyryus*. Valid.
- fulvitaris* Lacordaire 1842:129. *Ischyryus*. Now *Oocyranus*,
fide Curran 1944:3.
- grammicus* Gorham 1883:86. *Ischyryus*. Valid.
- grammistes* Lacordaire 1842:105-106. *Ischyryus*. Synonym of
Megischyryus lineatus (Lacordaire) 1842:104-105, fide
Crotch 1876:(49)425.
- graphicus* Lacordaire 1842:125-126. *Ischyryus*. Synonym of *I.*
quadripunctatus (Olivier) 1792:437, new synonymy.
- gratiosus* Guérin-Ménéville 1829-1838[1844]:310. *Ischyryus*.
Synonym of *I. incertus* Lacordaire 1842:118-119, new
synonymy.
- gravis* Chevrolat in Dejean 1836:428. *Ischyryus*. Synonym of
Megischyryus mexicanus (Lacordaire) 1842:93-94, fide
Geminger & Harold 1876:3689.
- hamatus* Kuhnt [unpublished name]. *Ischyryus*. 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. *Ischyryus* 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.
- impressopunctatus* Crotch 1876:426(50). *Ischyryus*. Valid.
- incertus* Lacordaire 1842:118-119. *Ischyryus*. Valid.
- infernalis* Chevrolat in Dejean 1836:428. *Ischyryus*. Synonym of *Megischyryus scaphinotus* (Lacordaire) 1842:96, *fide* Gemminger & Harold 1876:3689.
- insignis* Laporte 1840:520. *Erotylus*. Now *Callischyrus*, *fide* Crotch 1876:434(58). *Ischyryus* in Gemminger & Harold 1876:3690 and Lacordaire 1842:108-109. Author often cited as Castelnau.
- insolens* Crotch 1876:53. *Ischyryus*. Valid.
- interruptus* Duponchel 1825:48, t.1 f.27. *Erotylus*. Now *Ischyryus*, *fide* Lacordaire 1842:116-117. Valid.
- 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 *Ischyryus*.
- jurinei* Lacordaire 1842:94-95. *Ischyryus*. Now *Megischyryus*, *fide* Crotch 1876:422(46).
- kempferi* Alvarenga 1977:105. *Micrischyryus*. New name for *Ischyryus nigripes* Mader 1942:195, not *I. nigripes* Motschulsky 1858:116 (now *Rhodotritoma*). Valid.
- knochii* Lacordaire 1842:100. *Ischyryus*. Now *Megischyryus*, *fide* Crotch 1876:(49)425.
- laetus* Lacordaire 1842:122-123. *Ischyryus*. Valid.
- lepidus* Faldermann 1837:398, t.15 f.1. *Ischyryus*. Now *Triplax*, *fide* Chûjô & Chûjô 1990:19.
- lineatus* Kuhnt 1910:228-229. *Ischyryus*. Valid species, but name change required; not *I. lineatus* Lacordaire 1842:104-105.
- lineatus* Lacordaire 1842:104-105. *Ischyryus*. Now *Megischyryus*, *fide* Crotch 1876:(49)425.

- macularis* Lacordaire 1842:128-129. *Ischyryus*. Valid.
- maculiventris* Lacordaire 1842:120-121. *Ischyryus*. Variety of *I. scriptus* (Olivier) 1807:484-485, *fide* Crotch 1876:(55)431.
- melanogaster* Guérin-Méneville 1829-1838[1844]:310. *Ischyryus*. Now *Callischyryus*, *fide* Crotch 1876:433(58).
- melanopus* Guérin-Méneville 1841a:118. *Morphoides*. Now *Callischyryus*, *fide* Crotch 1876:434(58). *Ischyryus* in Gemminger & Harold 1876:3691 and Lacordaire 1842:109-110.
- mexicanus* Lacordaire 1842:93-94. *Ischyryus*. Now *Megischyryus*, *fide* Crotch 1876:(47)423.
- modestus* Olivier 1807:483 t.3 f.35. *Erotylus*. Now *Oocyanus*, *fide* Curran 1944:2-3. *Ischyryus* in Gemminger & Harold 1876:3691, Lacordaire 1842:130-131, and Crotch 1876:432(56).
- natalensis* Guérin 1956:61-62 fig.24. *Ischyryus*. Valid.
- nebulosus* Guérin-Méneville 1841:155. *Erotylus* (*Ischyryus*). Now *Brachysphaenus*, *fide* Crotch 1876:504(128), (137)512.
- nigrans* Crotch 1873a:354. *Ischyryus*. Now *Pseudischyryus*, *fide* Casey 1916:156 and Boyle 1956:131.
- nigripes* Mader 1942:195. *Ischyryus*. Not *I. nigripes* Motschulsky 1858:116 (now *Rhodotritoma*), new name *Micrischyryus kempferi* Alvarenga 1977:105.
- nigripes* Motschulsky 1858:116. *Ischyryus*. Now *Rhodotritoma*, *fide* Arrow 1925:117 and Chûjô & Chûjô 1990:6.
- nigrolineatus* Crotch 1876:56. *Ischyryus*. Valid.
- nitidior* Crotch 1876:54. *Ischyryus*. Valid.
- nobilis* Crotch 1876:53-54. *Ischyryus*. Valid.
- oblongus* Duponchel 1825:164-165, t.3 f.80. *Erotylus*. Synonym of *Megischyryus undatus* Olivier (1791:434), *fide* Gemminger & Harold 1876:3689. *Ischyryus* in Dejean 1836:428.
- oblongus* Duponchel 1825:164, t.3 f.81. *Erotylus*. Variety of *Megischyryus brasiliensis* (Lacordaire) 1842:91-92, *fide* Gemminger & Harold 1876:3690. *Ischyryus* in Dejean 1836:428.

- palliatus* Lacordaire 1842:113-114. *Ischyryus*. Valid.
- pallidior* Crotch 1876:428(52). *Ischyryus*. Now *Mycotretus*,
fide Gorham 1888:52.
- pardalinus* Guérin 1949:235, 231 f.8. *Ischyryus*. Valid.
- patruelis* Lacordaire 1842:124-125. *Ischyryus*. Valid.
- perizonatus* Lacordaire 1842:103-104. *Ischyryus*. Synonym of
Megischyryus sicarius (Lacordaire) 1842:101-102, fide
Crotch 1876:(49)425.
- peruae* Mader 1942:171,196. *Ischyryus*. Valid.
- peruvianus* Gorham 1883:85-86. *Ischyryus*. Synonym of *I.*
boucardi Crotch 1876:429(53), new synonymy.
- pictus* Gorham 1887:42, t.3 f.4. *Ischyryus*. Valid.
- planior* Kirsch 1876:99. *Ischyryus*. Now *Megischyryus*, fide
Gemminger & Harold 1876:3689.
- praeustus* Sturm 1826:139. *Erotylus*. *Ischyryus* in Sturm
1843:305. *Nomen nudum*.
- proximus* Lacordaire 1842:113. *Ischyryus*. Valid.
- puncticollis* Gorham 1887:44-45. *Ischyryus*. Synonym of *I.*
quadripunctatus (Olivier) 1792:437, new synonymy.
- quadripunctatus* Olivier 1792:437. *Erotylus*. Now *Ischyryus*,
fide Lacordaire 1842:127-128. Valid. With 2
subspecies: *I. q. quadripunctatus* (Olivier) and *I.*
quadripunctatus chisaticus Boyle 1954.
- quadripunctatus* Crotch 1873b:144. *Ischyryus*. 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. *Ischyryus*.
Synonym of *I. angularis* Lacordaire 1842:126, new
synonymy.
- sanguinolentus* Lacordaire 1842:97. *Ischyryus*. Now
Megischyryus, fide Crotch 1873b:143.
- sanguinosus* Motschulsky 1858:116. *Ischyryus*. Now *Mycolybas*,
fide Crotch 1876:474(98).
- scaphinotus* Lacordaire 1842:96. *Ischyryus*. Now *Megischyryus*,
fide Crotch 1876:(47)423.

- scriptus* Olivier 1807:484-485, t.3 f.38. *Erotylus*. Now *Ischyryus*, *fide* Lacordaire 1842:119. Valid.
- scutellaris* Gorham 1887:41-42, t.3 f.2. *Ischyryus*. Valid.
- sedecimguttatus* Guérin-Méneville 1829-1838[1844]:310. *Ischyryus*. Now *Mycotretus*, *fide* Crotch 1876:(64)440.
- semipunctatus* Germar 1824:612. *Erotylus*. Now *Megischyryus*, *fide* Crotch 1876:(48)424. *Ischyryus* in Lacordaire 1842:99.
- semitinctus* Erichson 1847:180. *Ischyryus*. Now *Megishyryus*, *fide* Crotch 1876:(49)425.
- septemsignatus* Gorham 1887:41, t.2 f.19. *Ischyryus*. Valid.
- sexpunctatus* Chevrolat in Lacordaire 1842:113. *Ischyryus*.
Synonym of *I. proximus* Lacordaire 1842:113, *fide* Gemminger & Harold 1876:3691.
- sheppardi* Crotch 1876:428(52). *Ischyryus*. Valid.
- sicarius* Lacordaire 1842:101-102. *Ischyryus*. Now *Megischyryus*, *fide* Crotch 1876:(49)425.
- signaticollis* Klug in Dejean 1836:429. *Mycotretus*. Synonym of *Oocyanus flavitarsis* (Lacordaire) 1842:130, *fide* Gemminger & Harold 1876:3690.
- similior* Crotch 1876:432(56). *Ischyryus*. Valid.
- 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. *Ischyryus*. Synonym of *I. quadripunctatus* (Olivier) 1792:437, *new synonymy*.
- tarsalis* Lacordaire 1842:106. *Ischyryus*. Now *Oocyanus*, *fide* Curran 1944:4.
- tarsatus* Lacordaire 1842:196-197. *Oocyanus*. Synonym of *Oocyanus tarsalis* (Lacordaire) 1842:106, *fide* Curran 1944:4.
- tetragrammus* Kuhnt 1910:230-231, f.5. *Ischyryus*. Valid.
- tetraspilotus* Guérin-Méneville 1829-1838[1844]:310. *Ischyryus* Valid.
- tetrasticus* Gorham 1887:41, t.3 f.1. *Ischyryus*. Valid.

- thoracica* Dejean 1836:429. *Mycotretus* (Engis). Synonym of ³¹⁶
Oocyaneus flavitarsis (Lacordaire) 1842:130, *fide*
Gemminger & Harold 1876:3690.
- tripunctatus* Crotch 1873b:144. *Ischyryus*. Valid.
- tripunctatus* Blatchley 1917:238. *Ischyryus*. Not *I.*
tripunctatus Crotch 1873b:144, new name *I. dunedinensis*
Blatchley 1917:279.
- undatus* Olivier 1791:434. *Erotylus*. Now *Megischyryus*, *fide*
Crotch 1873b:143. *Ischyryus* in Dejean 1836:428.
- undulatus* Gorham 1887:42, t.3 f.3. *Ischyryus*. Valid.
- variabilis* Duponchel 1825:46-47, t.1 f.25. *Erotylus*. Now
Ischyryus, *fide* Lacordaire 1842:121. Valid.
- variegata* Dejean 1821:45. *Engis*. Synonym of *I.*
subcylindrus Lacordaire 1842:117-118, *fide* Gemminger &
Harold 1876:3691.
- velatus* Lacordaire 1842:115-116. *Ischyryus*. Synonym of *I.*
scriptus (Olivier) 1807:484-485, new synonymy.
- venustus* Lacordaire 1842:109. *Ischyryus*. Now *Callischyryus*,
fide Crotch 1876:434 (58).
- vesperilio* Lacordaire 1842:112. *Ischyryus*. Valid.
- vittatus* Crotch 1876:(51)427. *Ischyryus*. Valid
- zonalis* Lacordaire 1842:102. *Ischyryus*. Now *Megischyryus*,
fide Crotch 1876:(49)425.

APPENDIX B
COLLECTIONS STUDIED AND CODENS

This appendix is an alphabetical listing of the codens used in the text and the institution or personal collection for which they stand. Where possible, the codens 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.
- 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, Ontario, 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, Edmonton, Alberta, Canada.
- DEIC - Deutsches 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.
 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.
 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, Chadds Ford, PA, USA.
 JLCC - J. L. Carr, Calgary, Alberta, Canada.
 JMCC - J. M. Cicero, Gainesville, FL, USA.
 JVMC - J. V. McHugh, Ithaca, NY, USA.
 JWIC - J. Watts, Gainesville, FL, 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, Columbus, OH, USA.
QCAZ - Pontifica Universidad Católica de Ecuador,
Quito, Ecuador.
RABL - R. A. B. Leschen, Lawrence, KS, 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 Univeristy, 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.
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 Nacional 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.
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 my findings. Species with less than 10 records are listed in the text. Species with 10 or more records are listed below. They are presented in tabular form to accommodate 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: number of specimens studied, county, specific locality, day-month-year of collection, collector, elevation, specific data (host or other important information), collection coden where specimen is deposited. See Appendix B for the codens full name.

Heading abbreviations are as follows: No. = number of specimens studied; Collr. = collector; El. = elevation; Data = additional information; Rep. = repository, collection of deposition.

<u>No.</u>	<u>County</u>	<u>Locality</u>	<u>Date</u>	<u>Collr.</u>	<u>El.</u>	<u>Data</u>	<u>Rep.</u>
<u><i>Ischyurus aleator</i> Boyle</u>							
<u>Guatemala</u>							
1		San Vicente Pacaya, 8 km.W.	14-V-1966	Campbell J.M.	4500'		CNCI
<u>Mexico: Chihuahua</u>							
4		Los Chincas, 4.mi.N	9-10-VII-1989	McCleve S.	4910'	UV light	SMCC
4		Yecora, Sonora, 6 mi.S	2-3-VII-1990	McCleve S.	5740'	UV light	SMCC
<u>Mexico: Guerrero</u>							
1		Iguala, 14 km W.	25-VII-1987	Turnbow R.H.			RHTC
1		Iguala, 38 km W.	25-VII-1987	Turnbow R.H.			PESC
<u>Mexico: Jalisco</u>							
1		Tecolotlan, 5.5 mi. NE	13-VII-1982	Andrews F.G.			CDAE
<u>Mexico: Mexico</u>							
1		Tejupilco, Temescaltepec	1932	Hinton H.E.	4000'		NHML
<u>Mexico: Morelos</u>							
1		Cuernavaca, 7 mi. E.	15-VII-1965	Campbell			CNCI
1		Santa Rosa, 3.2 mi. N. Zacatepec	19-V-1968	McFadden	3100'		CUIC
<u>Mexico: Sonora</u>							
2		Huicoche, 3.2 mi. NW	11-13-VII-1989	McCleve S.	5170'	UV light	SMCC
1		Nacori Chico, 10 mi.NE, El Riito R.	14-VII-1988	Jump P.		UV light	SMCC
1		Nacori Chico, 36 km NE	8-VIII-1982	McCleve S.	1848m	at light	SMCC
18		Yecora, 4 mi. NE	30-VI-1990	McCleve S.	5400'	UV light	SMCC
<u>El Salvador</u>							
1		San Salvador	22-V-1953	Cartwright O.L.		at light	USNM
<u>USA: Arizona</u>							
1	Cochise	Chiricahua Mts., Cave Creek	24-VI-1927	Kusche J.A.	7000'	TYPE	CASC
1	Cochise	Chiricahua Mts., S. Fork Canyon	14-VII-1964	Arnett R.H.Jr.		blacklight	FSCA
1	Cochise	Chiricahua Mts., Stewart Campground	19-VII-1986	Nelson G.H.		UV light	GHNC
1	Cochise	Chiricahua Mts., Sunny Flats	28-29-VII-1989	Bousquet Y.			CNCI
2	Cochise	Portal, 5 mi. W.	31-VII-1987	Morris R.		Hg light	RFMC

No. County Locality Date Collr. El. Data Rep.

Ischyryus bogotae Crotch (Cont.)Mexico: Veracruz (Cont.)

1	Fortin de las Flores, Sumidero	22-23-V-1965	Weems H.V.Jr.	2500-3000'	blacklight	FSCA
1	Los Tuxtlas	1-XI-1989	Zargoza S.			UNAM
1	Rio Metlac nr. El Fortin	15-XII-1948	Leech H.B.		pool in grove	CASC
1	San Andres Tuxtla	12-VII-1989	Colin J.			UNAM

Panama: Chiriqui

1	Hartmann's Finca, 2 km N.Sta.Clara	24-25-V-1977	Howden H. & A.	1300m		CNCI
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Ischyryus boucardi CrotchArgentina: Misiones

1	San Ignacio		Bade B. & W.			MACN
1	Concep. Sta. Maria	X-1945	Vissa M.J.			MLPA

Brasil

4	Jatchy					ZMHB
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Brasil: Santa Catarina

1	Corupa (Hansa Humbolt)	XI-1948	Maller A.		TYPE	CUMZ AMNH
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Colombia: Amazonas

1	Leticia	28-V-1979	Tidwel A.		flight trap	PESC
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Panama: Canal Zone

1	Barro Colorado Island	16-17-V-1964	Duckworth W.D.			USNM
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Peru

1	Chanchamago		Schneider F.			ZMHB
3	Chanchamago		Thamm			NHML
1	Chanchamago				TYPE of <i>I.peruvianus</i>	NHML
2	Rio Toro					ZMHB

Peru: Loreto

5	160 km NE Iquitos	27-VIII-1992	Skelley P.E.		beating at night	PESC
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Peru: Madre de Dios

1	30 km.SW.Puerto Maldonado	4-19-XI-1984	Kavanaugh D.		12°50'S, 60°20'W	DHKC
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Venezuela: Barinas

1	Altamira de Caceras, 5 km.E	30-XII-1985	Kovarik P.W.			TAMU
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Ischyryus collatinus CrotchCountry ?

1						NHML
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Colombia [Nova Granada]

1						ISNB
1						ZMHB
1					TYPE	CUMZ

Colombia: Cauca

1						ZMHB
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Colombia: Choco

1	Camp. Sautat, Puerto Libre	1968			Malaise trap	OSUC
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Guatemala

1						NHML
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Nicaragua: Chontales

2						B.C.A., Col., VII. NHML
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Panama

1	Tocuman	25-X-1952				USNM
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Panama: Canal Zone

2	Cano Saddle, Gatun Lake	12-V-1923	Shannon R.C.			USNM
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2	Gatun Tank Farm	XI-1978	Harlan H.J.		blacklight	OSUC
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Panama: Panama

1	Las Cumbres	6-V-1974	Wolda H.			OSUC
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Ischyryus distinguendus LacordaireCountry ?

1					Coll. Chevr	CUMZ
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Mexico

1					TYPE	ZMHB MNHN
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Mexico: Veracruz

2	Cordoba		Fenyas A.			CASC
1	Cordoba	12-22-VI-1965	Lau A.B.			USNM
3	Cordoba	4-VIII-1965	Lau A.B.			USNM
1	Fortin de las Flores	30-VII-1964	Rabago D.		blacklight	PESC
1	Fortin de las Flores	28-VI-1975	Wheeler Q.D.			CUCI
1	Huatusco	19-X-1964	Lau A.B.			USNM
1	Orizaba					ZMHB
1	Toxpan					B.C.A., Col, sp. figured. NHML

Honduras ?

1	Copan, Vera Paz		Condradt		B.C.A., Mycotretus ornatus var.	NHML
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Ischyryus dunedinensis BlatchleyUSA: Florida

1	Alachua	V-1968	Herrick L.A.			MCZC
2	Broward	20-VII-1971	Ford E.J.		light trap	EJFC
17	Flagler	30-V-1993	Skelley P.E. & L.H.		light, beach scrub	PESC
1	Highlands	10-IX-1981	Lampert L.L.Jr.		UV light	FSCA
2	Highlands	27-IV-1981	Lampert L.L.Jr.		UV light	FSCA
1	Highlands	25-V-1982	Brattain R.M.			ABSC
1	Highlands	24-VI-1983	Deyrup M.		Malaise trap	ABSC
1	Highlands	11-VII-1983	Deyrup M.		Malaise trap	ABSC
1	Highlands	24-VII-1983	Deyrup M.		Malaise trap	ABSC
1	Highlands	31-VII-1983	Deyrup M.		Malaise trap	ABSC
1	Highlands	12-VIII-1983	Deyrup M.		Malaise trap	ABSC
1	Highlands	22-IX-1983	Deyrup M.		Malaise trap	ABSC

No. County Locality Date Collr. El. Data Rep.

Ischyryus dunedinensis Blatchley (Cont.)

USA: Florida (Cont.)

1	Highlands	Archbold Biological Station		12-VI-1985	Deyrup M.		Malaise trap	ABSC
1	Highlands	Archbold Biological Station		19-VI-1985	Deyrup M.		Malaise trap	ABSC
1	Highlands	Archbold Biological Station		15-VII-1985	Deyrup M.		Malaise trap	ABSC
1	Highlands	Archbold Biological Station		10-11-VI-1986	Deyrup M.		flight trap	FSCA
1	Highlands	Archbold Biological Station		17-18-VI-1986	Deyrup M.		flight trap	FSCA
1	Highlands	Archbold Biological Station		21-23-VI-1986	Deyrup M.		flight trap	FSCA
1	Highlands	Archbold Biological Station		15-VI-1987	Deyrup M.		Malaise trap	ABSC
3	Highlands	Archbold Biological Station		22-26-VI-1987	Deyrup M.		Malaise trap	ABSC
6	Highlands	Archbold Biological Station		1-3-VII-1987	Deyrup M.		Malaise trap	ABSC
1	Highlands	Archbold Biological Station		6-VII-1987	Deyrup M.		window trap burn area	ABSC
1	Highlands	Archbold Biological Station		17-VII-1987	Deyrup M.		Malaise trap	ABSC
1	Highlands	Archbold Biological Station		8-VIII-1987	Deyrup M.		Malaise trap	ABSC
1	Highlands	Archbold Biological Station		5-IX-1987	Deyrup M.		Malaise trap	ABSC
1	Highlands	Archbold Biological Station		12-16-VII-1988	Deyrup M.			PESC
1	Highlands	Archbold Biological Station		30-VI-1988	Skelley P.E.		blacklight	PESC
2	Highlands	Archbold Biological Station		7-VII-1988	Skelley P.E.		blacklight	PESC
1	Hillsborough			7-VI-1968	Woods & Davidson			USNM
1	Hillsborough	Temple Terrace		7-VI-1968	Wood F.E.			USNM
1	Indian River	Fl.Med.Ent.Lab, SR-512	0.5mi.W I-95	5-VI-1975	Thomas M.C.		dusk-dawn suction trap	MCTC
1	Indian River	Fl.Med.Ent.Lab, SR-512	0.5mi.W I-95	5-VII-1975	Thomas M.C.		dusk-dawn suction trap	MCTC
1	Indian River	Fl.Med.Ent.Lab, SR-512	0.5mi.W I-95	4-7-VII-1975	Thomas M.C.		dusk-dawn suction trap	FSCA
1	Indian River	Fl.Med.Ent.Lab, SR-512	0.5mi.W I-95	10-16-VII-1975	Thomas M.C.		dusk-dawn suction trap	FSCA
1	Indian River	Fl.Med.Ent.Lab, SR-512	0.5mi.W I-95	16-20-V-1976	Thomas M.C.		dusk-dawn suction trap	MCTC
1	Marion	Ocala Nat'l.Forest, Hopkins Prairie		8-11-V-1979	Weems H.V.Jr.		flight trap	FSCA
1	Marion	Ocala Nat'l.Forest, T17S.R26E.Sec.22		25-VII-1938	Hubbell & Frief		at light	GNHC
1	Orange	Oviedo, Univ.Central Fl.campus		30-V-1991	Fullerton S.M.		Malaise trap, scrub	SMFC
1	Orange	Oviedo, Univ.Central Fl.campus		23-VI-1991	Fullerton S.M.		Malaise trap, scrub	SMFC
1	Orange	Oviedo, Univ.Central Fl.campus		2-X-1991	Fullerton S.M.		Malaise trap, scrub	SMFC
1	Orange	Oviedo, Univ.Central Fl.campus		23-VIII-1992	Fullerton S.M.		Malaise trap, scrub	SMFC
2	Orange	Oviedo, Univ.Central Fl.campus		15-21-IX-1992	Fullerton S.M.		Malaise trap, scrub	SMFC
1	Pinellas	Dunedin		2-V-1916	Blatchley W.S.		TYPE	PURC
1	Volusia	Daytona		1951	Rosenberg W.			USNM
1	Volusia	New Smyrna		23-VII	Wright M.		(det. Knull 1954)	OSUC
1	Charlton	Camp Cornelia		13-14-VI-1981	Smith C.L.		at light	UGCA

Ischyryus elegantulus Lacordaire

Colombia								
1								ISNB
1							TYPE	MNHN
1		Amaya Cispata Bay		19-V-1916	Martin B.			FMNH
Mexico: Yucatan								
1		Chichen Itza, 2 km.E.		26-V-1981	Bellamy C.L.			CASC
Panama: Canal Zone								
1				26-III-1940	Wood G.C.			USNM
1		Barro Colorado Island		1V-X-1947	Zetek		Berlese funnel	USNM
1		Barro Colorado Island		20-23-V-1964	Duckworth W.D.			USNM
1		Carazal		27-IV-1911	Busck A.			USNM
1		Cardenas Villages		10-V-1980	Riley E.G.			EGRC
1		Fort Gulick		19-III-1979	Harlan H.J.			OSUC
1		Fort Gulick		11-1980	Harlan H.J.			OSUC
1		Madden Dam		21-V-1978	O'Brien C.W. & L.B.			FAMU
1		Paraiso		9-V-1911	Schwarz E.A.			USNM
1		Pipeline Rd.		12-V-1978	O'Brien C.W. & L.B.			FAMU
Panama: Colon								
1		Fort Espinar		14-V-1991	Turnbow R.H.		at light	RHTC
1		Santa Rita Ridge		29-V-1980	Riley E.G.			EGRC
Panama: Panama								
1		Las Cumbres		14-V-1979	Wolda J.		at light	PESC

Ischyryus ephippiatus Gorham

Bolivia								
1					Steinback J.	450m		ICCM
Panama								
3		Parque Nacional Soberania		21-V-1991	Turnbow R.H.			RHTC
Panama: Canal Zone								
1	Canal Zone	Arraijan, N.of on C-5		19-VII-1970	Clark W.E.			USNM
1	Canal Zone	Gamboa		24-V-1944	Frick K.E.			FMNH
1	Canal Zone	Paraiso		19-I-1911	Busck A.			USNM
Panama: Chiriqui								
1		Bugaba			Champion		TYPE	NHML
Panama: Colon								
1		Santa Rita Ridge, base		21-V-1991	Turnbow R.H.			RHTC
Panama: Panama								
2		La Chorrera		14-15-V-1912	Busck A.			USNM
1		Las Cumbres		8-V-1975	Wolda H.			OSUC

Ischyryus frontalis Lacordaire

Belize [British Honduras]								
1		Punta Gorda		V-1934	White J.J.			AMNH
Colombia [Nova Granada]								
1							TYPE I.agnatus	CUMZ
Costa Rica: Heredia								
2		La Selva Biol. Sta.		10-12-VI-1986	Ratcliffe B.C.			DEUN
Mexico								
1							TYPE	CUMZ
Mexico: Guerrero								
1		Gto.		4-III-1946			ex orchids, #46-2873	USNM

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Ischyryus frontalis Lacordaire (Cont.)

<u>Mexico: Oaxaca</u>						
1	Oaxaca	Matias Romero, 10 mi.N.	3-VII-1975	Wheeler O.D.		CUIC
2	Oaxaca	Sola de Vega, 27.3 mi.SW on Hwy.131	18-VII-1986	McCleve S.	3360'	UV light SMCC
1	Oaxaca	Zopolite, 1.5 mi.E, nr.Pan Am.Hwy	5-VII-1987	Warner W.B.		UV light MAIC
<u>Mexico: San Luis Potaai</u>						
1		El Naranjo, 6.9 mi.W on Rte.80	14-X-1985	Ball G.E.		PESC
1		Tamazunchala	8-VIII-1946			ex orchids, #46-12972 USNM
1		Tamazunchala	10-VIII-1946			ex orchids, #46-14323 USNM
<u>Panama: Canal Zone</u>						
1		Albrook Field, Tank Hill	29-IV-1977	Riley E.G.		EGRC
<u>Panama: Chiriqui</u>						
1		La Caldera		Champion	1200'	B.C.A., Col. NHML

Ischyryus incertus Lacordaire

<u>Belize [British Honduras]</u>						
2		Rio Grande				ICCM
<u>Brasil: Para</u>						
4		Santarem	II & XII			ICCM
<u>Colombia</u>						
1		Amaya Cispatá Bay	28-VI-1916	Martin B.		CASC
<u>Colombia: Amazonas</u>						
1		Leticia	9-13-V-1970	Malkin B.		FMNH CMNC
1		Leticia	19-25-II-1972	Howden H. & A.	700'	
<u>Costa Rica: Guanacaste</u>						
1		Hac.La Pacifica, 3 km.N.Canas	9-11-VIII-1987	Howden H. & A.	90m	CMNC
<u>French Guiana [Cayenne]</u>						
1						Coll.Reiche CUMZ
<u>Guatemala: Alta Verapaz</u>						
1		Cacao, Trece Aguas	22-IV	Barber & Schwarz		USNM
<u>Guatemala: Zacapa</u>						
1		La Palmilla, 6 km.W.Teculután	5-VI-1991	Howden H. & A.		PESC
<u>Mexico: Campache</u>						
1		Campache Tenabo, km.37,Hwy.24	30-VII-1990	O'Brien C.W. & L.B.		PESC
<u>Mexico: Chiapas</u>						
1		Fontera Comalapa, 4.9 mi.N.	17-VI-1966	Ball G.E.		blacklight CUIC
1		Mirador Manos, Imploran (nr.Chicoasen)	30-V-1987	Warner W.B.		at light PESC
<u>Mexico: Tabasco</u>						
1		Teapa, 2 mi.N, Hwy.95	12-VI-1982	Streit B.D.		at light PESC
<u>Nicaragua: Rivas</u>						
1		Shimek, Ometepe	1933	Wickham		USNM
<u>Panama</u>						
1		Tocuman	4-II-1953	Blanton F.S.		USNM
<u>Panama: Canal Zone</u>						
1		Barro Colorado Island	18-I-1959	Dybas H.S.	at light	FMNH
1		Barro Colorado Island	30-I-1959	Dybas H.S.	at light	FMNH
2		Barro Colorado Island	10-17-V-1964	Duckworth W.D.		USNM
1		Barro Colorado Island, Gatun Lake	IV-1924	Bradley J.C.		CUIC
1		Fort Gulick, Qtrs.40.A	6-11-V-1981	Harlan H.J.	blacklight	FMNH
1		Fort Kobbe	24-VI-1976	Riley E.G.		EGRC
1		Fort Kobbe	19-V-1980	Riley E.G.		EGRC
1		Frijoles	15-V-1981	Gill B.		CNCI
<u>Panama: Chiriqui</u>						
1		Puerto Armuelles	26-I-1983	Rodriguez R.	blacklight	PESC
<u>Panama: Panama</u>						
1		Las Cumbres	6-V-1974	Wolda H.		OSUC
1		Las Cumbres	13-I-1975	Wolda H.		OSUC
1		Las Cumbres	12-IV-1975	Wolda H.	UV light	OSUC
1		Las Cumbres	5-VI-1975	Wolda H.	UV light	OSUC
1		Las Cumbres	26-VI-1975	Wolda H.		OSUC
1		Porto Bello	25-II-1911	Schwarz		USNM
<u>Tobago LT</u>						
1			13-15-VII-1962			USNM
<u>Trinidad</u>						
1		Mt. Curepe	22-25-XI-1977	Mason W.R.M.		CNCI
1		Simla, 5 mi.N.Arma	20-VIII-1969	Howden H. & A.		CMNC
<u>Venezuela: Bolivar</u>						
1		Ciudad Bolivar	29-V-1898	Klages E.A.		CUIC
<u>Venezuela: Zulia</u>						
1		El Tucuco	20-23-IV-1981	Townes H.	200m	Malaise trap CNCI

Ischyryus pictus Gorham

<u>Guatemala: Alta Verapaz</u>						
1		San Juan			TYPE, B.C.A., Col., VII	NHML
<u>Honduras</u>						
1		Lake Yojoa	21-VIII-1959	Dysart R.J.	at light	INHNS
<u>Mexico: Chiapas</u>						
4		Palenque, 100 km SE on Bonampak Rd.	9-VII-1983	Peck S.	fleshy fungus	CNCI
<u>Mexico: Oaxaca</u>						
1		Juchatengo, 4 mi.N.	7-VIII-1970	Fischer E.	3300'	LSCM
<u>Mexico: Tabasco</u>						
2		Villahermosa, 59.4 mi.SE.	6-7-VI-1966	Ball G.E.	blacklight	CUIC
<u>Mexico: Veracruz</u>						
1		Est.Biol.Los Tuxtlas	19-VII-1989	Colin J.		UNAM
1		Est.Biol.Los Tuxtlas	22-23-X-1989	Colin J.		UNAM
1		Fortin de las Flores	30-VII-1964	Rabago D.	blacklight	FSCA
1		16 km N.Sonte Comapan	2-9-VIII-1980	Bezark L.G.		PESC
1		Lake Catemaco	8-16-VIII-1960	Howden H.F.		CNCI
1		Microonolas San Juan, S.Fortin	7-VII-1992	Thomas M.C.	beating	PESC
1		Rio Quezalan, 2 mi.E.Lago Catemaco	12-31-VII-1964	Meyer R.J.		TAMU
<u>Mexico: Yucatan</u>						
1		Colonia	12-VIII-1952	Pallister J.		AMNH

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Ischyry proximus Lacordaire

Country ?	Locality	Date	Collr.	El.	Data	Rep.
1	Canelas					ZMHB
1	<u>Belize: Cayo</u>					
1	Georgeville, 8 mi.S, Chiquibul Rd.	21-24-VI-1992	Rifkind J.	420m	lights	PESC
4	<u>Bolivia: La Paz</u>					
4	San Lorenzo, 12 km Caranavi	1-2-I-1991	McHugh J.V.		JVM lot B91-11	JVMC
1	San Lorenzo, 12 km Caranavi	1-2-I-1991	McHugh J.V.		JVM lot B91-24	JVMC
4	<u>Costa Rica</u>					
4	Hamburgfarm, Reventazon Ebene Limon	3-XII-1931	Nevermann F.		Pilsbelag an trockenem Holz	USNM
1	<u>Costa Rica: Puntarenas</u>					
1	Monte Verde	12-V-1989	Ashe J.	1520m	under bark	SEMC
1	Monte Verde	21-V-1989	Ashe J.	1550m,	resupinate polypore, #329	SEMC
6	Monte Verde	22-V-1989	Ashe J.	1520m,	Schizopora paradoxa, #445	SEMC
2	Monte Verde	25-V-1989	Ashe J.	1450m,	Schizopora paradoxa, #472	SEMC
1	Monte Verde	25-V-1989	Ashe J.	1550m,	Schizopora paradoxa, #449	SEMC
2	Monte Verde, Pens. Quetza.	18-V-1988	Ratcliffe B.C.	1380m		DEUN
1	Monte Verde, nr.	6-14-VI-1973	Erwin & Hevel	1400-1700m		USNM
2	Santa Elana, 6 km.N., Atlantic Slope	31-V-1979	Howden H. & A.	1400m		CNCI
1	<u>Guatemala</u>					
2	Moca., Such.	25-VI-1947	Vaurie C. & P.	3000'	ex orchid 46-13253	USNM AMNH
3	<u>Honduras</u>					
3	San Juan, Pueblo		Mann W.M.			USNM
1	<u>Mexico</u>					
1					TYPE	CUMZ CUMZ
1	<u>Mexico: Chiapas</u>					
1	Mapastepec, 13.5 mi.E, Rte.200	19-20-VIII-1974	Whitehead, et al.	120m		UASM
1	Parque Laguna Belgica	19-VI-1990	Warner W.B.	970m		PESC
1	Vincente Guerrero, 25 mi.SSW	9-VI-1987	Ratcliffe B.C.			DEUN
1	<u>Mexico: Durango</u>					
1						FMNH
1	<u>Mexico: Guerrero</u>					
1	Tepetlapa					FMNH
1	Tierra, Colo.	15-VIII-1938	Lipovsky L.J.			SEMC
2	<u>Mexico: Hidalgo</u>					
2	Chapulhuacan, 3 mi.N, Hwy.85	28-29-V-1984	Thomas D.			DEUN
3	<u>Mexico: Mexico</u>					
3	Real de Arriba, Temescaltapec	VII-1933	Norland C.E.			LACM
1	<u>Mexico: Morelos</u>					
1	Cuernavaca, 5.4 mi.E.	29-30-VI-1966	Ball G.E.		blacklight	CUIC
1	<u>Mexico: Nayarit</u>					
1	San Blas, E.of	21-VI-1965	Young F.N.		at nights	UMMZ
1	El Cora Tepic		Lüdecke A.			ZMHB
1	<u>Mexico: Oaxaca</u>					
1	Puerto Escondido, 22.4 mi.N.	20-21-VII-1966	Ball G.E.	2100'	blacklight	CUIC
1	Valle Nacional, 6 mi.S.	18-V-1971	Bright			CNCI
1	<u>Mexico: Sinaloa</u>					
1	Venodia	16-VI-1918	Kusche			USNM
1	<u>Mexico: Tabasco</u>					
1	Villahermosa, 59.4 mi.SE.	6-7-VI-1966	Ball G.E.		blacklight	CUIC
2	<u>Mexico: Veracruz</u>					
1	Cordoba		Fenyas A.			CASC
1	Est.Biol.Los Tuxtlas	4-14-XI-1988	Majorado E.			UNAM
1	Est.Biol.Los Tuxtlas, 33 km NE Catemaco	VII-1983	Peck S. & J.	160m,	flight intercept trap	CNCI
1	Fortin de las Flores, Sumidero	22-23-V-1965	Weems H.V.Jr.	2500-3000'	blacklight	FSCA
1	Lake Catemaco, Cayame	1-15-VII-1963	Whitehead			USNM
2	Montepio, 2 mi.S.	23-VIII-1982	O'Brien C.W.	100'		PESC
1	Motzorongo					FMNH
7	Motzorongo					ZMHB
3	Omealca					ZMHB
1	Orizaba					ZMHB
2	San Lorenzo Flohter[?]					ZMHB
1	<u>Nicaragua</u>					
1	Chanti		Janson			NHML
1	<u>Panama: Bocas del Toro</u>					
1	Almirante	23-III-1959	Dybas H.S.			FMNH

Ischyry quadripunctatus quadripunctatus (Olivier)

Country ?	Locality	Date	Collr.	El.	Data	Rep.
2	Nova Valencia					ZMHB
6						NHML
1						ZMHB
2	<u>Argentina: Chaco</u>					
2	Resistencia	2-XII-1939	Biraben			MLPA
1	<u>Argentina: Entre Rio</u>					
1	Concordia		Hayward			MLPA
1	<u>Argentina: Jujuy</u>					
1	El Quemado	III-V-1926	Harrington G.L.			USNM
1	<u>Argentina: Salta</u>					
1	General Ball.-ivian	1927	Harrington G.L.			USNM
2	Tabillas	IX-1933	Harrington G.L.			CASC
1	<u>Argentina: Tucuman</u>					
1		XI-1928	Bruch C.			MACN
1	<u>Belize [British Honduras]</u>					
1	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

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Ischyrys quadripunctatus quadripunctatus (Olivier) (Cont.)

<u>Bolivia: Cochabamba</u>					
1	Chapare, Ville Tunari	5-9-I-1958	Wygodzinski M.		IMLA
<u>Bolivia: La Paz</u>					
1	Junulo[?]				2MHB
<u>Bolivia: Santa Cruz</u>					
1		10-XI-1956	Picket G.		USNM
1	El Cidral	1-28-I-1962	Golbach R.		IMLA
2	Warnes, 9 mi.W, Colpa Gas Sta.	16-IV-1978	O'Brien & Marshall		FAMU
<u>Brasil</u>					
1					AMNH
1					FMNH
<u>Brasil: Mato Grosso</u>					
1	Cacares, EMPA Res.Sta.	7-II-1985	Wojcik D.P.	blacklight	PESC
<u>Brasil: Para</u>					
7	Santarem				ICCM
<u>Brasil: Paraiba</u>					
3	Santo Rita	VIII	Sahlberg F.		HNHM
<u>Brasil: Rondônia</u>					
1	Ariquemes, 62 km SW	6-15-XII-1990	Rider D.A.	at light	FSCA
1	Ariquemes, 62 km SW	12-22-XI-1991	Bezark L.	on foliage	PESC
1	Ariquemes, 62 km SW	12-26-IV-1992	Schmidtz U.	blacklight	PESC
1	Ariquemes, 62 km SW	6-V-1992	Schmidtz U.	blacklight	PESC
3	Ariquemes, 62 km SW	12-IX-1992	Schmidtz U.	blacklight	PESC
2	Ariquemes, 62 km SW	18-IX-1992	Schmidtz U.	blacklight	PESC
10	Ariquemes, 62 km SW	20-IX-1992	Schmidtz U.	blacklight	PESC
5	Ariquemes, 62 km SW	25-IX-1992	Schmidtz U.	blacklight	PESC
<u>Brasil: Santa Catarina</u>					
1	Corupa (Hansa Humbolt)	X-1945	Maller A.		AMNH
<u>Canada</u>					
1					NHML
<u>Canada: Ontario</u>					
3					CNCI
1	Chaffeya Locks Biol.Sta.	26-IX-1986	Smetana A.		CNCI
1	Lanark, Kerr Lake	27-VI-1975	Hicks S.D.		CNCI
1	Lanark, Kerr Lake	20-VIII-1976	Hicks S.D.		CNCI
5	Ottawa				CNCI
1	Ottawa				ICCM
4	Ottawa				NHML
1	Ottawa		Simpson W.		CNCI
4	Ottawa	21-VI-1984		fungus	CNCI
1	Wheatley	12-VI-1966	Rosenberg		USNM
1	Kent Tilbury	8-V-1967	Stephan K.		FSCA
<u>Canada: Quebec</u>					
1	Montreal	15-VI-1968	Kiteley E.J.	UV light	CNCI
1	Montreal	21-VIII-1980	Kiteley E.J.	UV light	CNCI
1	Montreal	23-V-1981	Kiteley E.J.	UV light	CNCI
1	Montreal	24-V-1982	Kiteley E.J.	UV light	CNCI
1	Norway Bay	20-VI-1939	Lester E.G.		CNCI
1	Norway Bay	20-VIII-1938	Hobbs G.A.		CNCI
<u>Colombia</u>					
1					2MHB
1	Cacagualito				ICCM
<u>Colombia: Cauca</u>					
1	Tierra Adentro, San Andres	11-13-IV-1979	Monsalve J.		FSCA
1	Tierro Adentico, San Andres de Pisimbala	11-13-IV-1979	Monsalve J.		FSCA
<u>Colombia: Choco</u>					
1	Choco 110 km N. Palestina, Rio San Juan	20-25-I-1971	Malkin G.		FMNH
<u>Colombia: Menta</u>					
1	Villavicencio, M.I.	10-VII-1938	Seevers C.H.		FMNH
<u>Costa Rica</u>					
2	Hamburgfarm, Reventazon Ebene Limon	31-X-1927	Nevermann F.	at light	FMNH
2	Hamburgfarm, Reventazon Ebene Limon	31-X-1927	Nevermann F.	at light	CUIC
1	Hamburgfarm, Reventazon Ebene Limon	1-XII-1931	Nevermann F.		USNM
1	Hamburgfarm, Reventazon Ebene Limon	29-I-1932		at light	USNM
1	Hamburgfarm, Reventazon Ebene Limon	29-I-1932	Nevermann F.	at light	CNCI
1	Hamburgfarm, Santa Clara	3-XII-1925	Nevermann F.	at light	USNM
<u>Costa Rica: Alajuela</u>					
1	Alajuela Univ. Exp. Sta.	5-X-1966	Habeck D.H.	blacklight	FSCA
<u>Costa Rica: Cartago</u>					
1	Turrialba	7-VII-1965	Eikwort G. & K.		SEMC
<u>Costa Rica: Guanacaste</u>					
1	Finca Tobago	15-VII-1970	Moore T.E.		UMM2
1	Playa Hermosa	9-10-VI-1974	Giesbert E.		LACM
<u>Costa Rica: San José</u>					
2	San José		Bially P.	1161m	NHML
1	San José	31-VIII-1911	Schmidt H.		2MHB
1	San José	XI-1921	Nevermann F.		ICCM
1	San José	3-XI-1925	Nevermann F.	at light	ICCM
1	San José	15-V-1928	Nevermann F.	1000-1200m	USNM
<u>Ecuador: Guayas</u>					
1	Balzar IIL				NHML
<u>El Salvador</u>					
1	Ciudad University	11-XII-1960	Virkki N.		CNCI
<u>French Guiana (Cayenne)</u>					
1			Van Lansberg		ISNB
1					ISNB
<u>French Guiana: St. Laurent du Maroni</u>					
1			Moult L.E.		2MHB
1	Charvein, Bas Maroni		Moult L.E.		2MHB

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Ischyryus quadripunctatus quadripunctatus (Olivier) (Cont.)

<u>Guyana (British Guiana)</u>					
1	Essequibo R., Moraballi Creek	1-IX-1929			NHML
2	Essequibo R., Moraballi Creek	9-IX-1929			NHML
1	Bartica, Kartabo	X-1920			CUIC
<u>Honduras</u>					
1	Siqoot	24-VI-1978	Mankins J.V.		CEEF
<u>Mexico</u>					
<u>Mexico: Chiapas</u>					
1	Comitan, 125.6 mi.W, Rt.190	31-VIII-1965	Ball & Whitehead	5300'	CUIC
1	El Chorreadora	26-VI-1990	Thomas M.C.		FSCA
1	Mpio.Cintalapa, 5 mi.N.Nvo.Tenochtitlan	31-VII-1991	Kovarik P.	900m	PESC
<u>Mexico: Chihuahua</u>					
32	Catarinas	25-VII-1947	Rockefeller Exp.		AMNH
8	Catarinas	26-VII-1947	Rockefeller Exp.	5800'	AMNH
1	Paso del Norte				2MHB
1	Paso del Norte				TYPE <i>I.puncticollis</i> NHML
<u>Mexico: Durango</u>					
1	Rodeo, 5 mi.N, 6 mi.W, Hwy.45	16-VII-1984	McCleve S.	4980'	SMCC
<u>Mexico: Hidalgo</u>					
1	Zimapan, 3 mi.E.	31-VII-1963	Duckworth W.D.		USNM
<u>Mexico: Nuevo Leon</u>					
2	Jalapa		Schneider JF.		ZMHB
1	Monterrey, 6 mi.S.	25-28-VIII-1962	Howden H.		CNCI
1	Rancho Presa Nueva	VI-1934	Bolles E.A.		AMNH
1	Santa Rosa Canyon, 14.8 mi. W. Linares	6-7-VII-1966	Ball & Whitehead	2400'	CUIC
<u>Mexico: Oaxaca</u>					
1	Matias Romaro, 10 mi.N.	3-VII-1975	Watrous L.E.		CUIC
<u>Mexico: Tamaulipas</u>					
1	Bocatoma, 7 km SSE.Gomez Farias	19-23-V-1979	Riley E.G.		EGRG
1	Victoria, canyon 5 mi.E.cd.	3-VI-1984	Ratcliffe B.C.		DEUN
<u>Mexico ? : Veracruz ?</u>					
1	Nova Valeni, Montz.				ZMHB
<u>Mexico: Veracruz</u>					
1	Cordoba	17-V-1908	Knab F.		USNM
1	Cordoba	12-22-VI-1965	Lau A.B.		USNM
1	Cordoba	4-VIII-1965	Lau A.B.		USNM
1	El Palmar, 16 km.W.Tetzonapa	9-15-VI-1948		600'	UAIC
1	Fortin de las Flores	25-VI-1963	Woodruff R.E.		FSCA
1	Fortin de las Flores	19-VI-1964	Raske A.G.		CNCI
2	Fortin de las Flores, Sumidero	22-23-V-1965	Weems H.V.Jr.		FSCA
1	Jalapa, 4.7 mi.E., Rt.140	9-IV-1966	Ball & Whitehead	3600'	CUIC
1	Lake Catemaco, nr.		Robinson D.C.		TAMU
2	Motzorongo	7-II-1892	Osborn H.		USNM
3	Toxpan		Sallé coll.		NHML
<u>Nicaragua</u>					
1			Sallé coll.		NHML
<u>Nicaragua: Chontales</u>					
2			Belt T.		NHML
<u>Panama: Canal Zone</u>					
1	Barro Colorado Island	IV-1941	Zetek J.	at light	USNM
2	Barro Colorado Island	10-17-V-1964	Duckworth W.D.		USNM
2	Barro Colorado Island	6-VI-1972	Pine R.	at light, 9°10'N-79°50'W	USNM
1	Fort Gulick	III-1979	Harlan H.J.		OSUC
1	Gatun Tank Farm	XI-1978	Harlan H.J.	blacklight	OSUC
2	Taberville	4-VI-1907	Busck A.		USNM
<u>Panama: Darien</u>					
1	Santa Fe	25-V-1967	DeLong D.M.		OSUC
<u>Panama: Panama</u>					
2	Las Cumbres	3-VII-1975	Wolda H.		OSUC
2	Trinidad River	2-V-1911	Busck A.		USNM
1	Trinidad River	3-V-1911	Busck A.		USNM
7	Trinidad River	7-V-1911	Busck A.		USNM
1	Trinidad River	9-V-1911	Busck A.		USNM
1	Trinidad River	8-VI-1912	Busck A.		USNM
2	Trinidad River	10-VI-1912	Busck A.		USNM
<u>Paraguay: Alto Parana</u>					
2	HOhenan	IX-1935	Jacob H.		ZMHB
<u>Peru</u>					
1	Ob.				ZMHB
<u>Peru: Ayacucho</u>					
1	La Mar, Santa Rosa	19-25-IX-1976	Gordon R.	640m	USNM
<u>Peru: Huanuco</u>					
1	Tingo Maria	9-VII-1968	O'Brien C.W. & L.B.	at night	PESC
1	Tingo Maria, Huan	22-XI-1946	Pallister J.C.		AMNH
1	Tingo Maria, Monzon Valley	29-XI-1954	Schlinger E.I.		CASC
<u>Peru: Madre de Dios</u>					
1	Rio Tambopata Res.	18-I-1987	Wheeler Q.D.	blacklight	CUIC
1	Rio Tambopata Res.	19-I-1987	Wheeler Q.D.	UV light	CUIC
<u>Peru: Pasco</u>					
1	Pan de Azucar	18-VII-1961	Truxal F.S.		LACM
<u>Peru: San Martin</u>					
1	Hera, 15 km SE Moyabamba	VII-1947	Woytkowski F.		AMNH
<u>St. Lucia</u>					
1	Union Agric. Sta.	25-V-1987	Woodruff R.E.	blacklight	FSCA
<u>St. Vincent</u>					
4			Smith H.H.		NHML
<u>Surinam</u>					
1	Kwakoeqren Saramacca R.	7-VI-1927			CUIC
1	Moengo, Boven Cottica R.	14-V-1927			CUIC

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Ischyry quadripunctatus quadripunctatus (Olivier) (Cont.)

<u>Trinidad</u>					
1		Petit Valley	17-VI-1970	Rogers T.E.	FSCA
1		Simla, 5 mi.N.Arima	18-VIII-1969	Howden H.& A.	CNCI
2		Tunapuna	14-17-VIII-1969	Howden H.& A.	CMNC
<u>United States of America</u>					
1					ANSP
10					FMNH
1					FSCA
10					INHS
4					MCZC
1					USNM
1					2MHB
2				Haynard R.	MCZC
1				Laurent P.	ANSP
1				Simanton W.A.	ICCM
1			21-V-1933		UMH2
1		Alma College	7-VII-1940		2MHB
1		A. Bor.			NHML
3		Am.Bor.			2MHB
2		Amer. Bor.		Oberndorfer	coll.G.Hauser
1		America		LeConte	2MNB
3		Amerique du Nord			coll. Chapuis
1		Amerique du Nord			coll.H.d'Udekem d'Acoz
15		Burlington			coll. Thieme
8		N. Amer.			2MHB
1		S.States			2MHB
2		Western States			AMNH
7	Douglas		13-VII-1950	Agassiz A.	MCZC
4	Jackson		VI-1955	Pine R.H.	USNM
				Pine R.H.	USNM
<u>USA: Alabama</u>					
3					2MHB
1				Doubleday E.	NHML
1		Calvert	4-VIII-1923		UASM
1		Lake Martin	19-VII-1963	Pollard D.R.	AUEM
2		Seddon		Bowman J.R.	ICCM
1		northern Alabama	VIII		H. Klages coll.
2	Colb	Wilson Dam	5-VI-1942	Belkin J.N.	LACM
1	Colb	Wilson Dam	14-VI-1942		USNM
1	Colb	Wilson Dam	10-VII-1953	Schick R.X.	LACM
1	Colb	Wilson Dam FQ	1-VI-1941	Belkin J.N.	FSCA
1	Colbert	Muscle Shoals	5-VIII-1953	Schick R.X.	LACM
1	Dale	Enterprise	15-19-VI-1992	Turnbow R.H.Jr.	blacklight
1	Dallas	Hazen	X-1921	Woodruff L.B.	AMNH
1	Dallas	Hazen	2-V-1923	Woodruff L.B.	AMNH
1	Escambia	Solon Dixon Unit	17-V-1980		AUEM
1	Fayette	Carbon Hill	9-IX-1959	Suter W.	WSIC
1	Jefferson		26-VI-1937	Loding H.P.	<i>Ischyryr alabamae</i> Schff.coll.
1	Jefferson	Birmingham	14-VI-1953		FMNH
1	Jefferson	Birmingham	11-VII-1953		FMNH
1	Jefferson	Birmingham	18-VII-1953		FMNH
1	Jefferson	Birmingham	2-VI-1955	Steeves H.R.	at light
1	Jefferson	Birmingham	2-IV-1956	Steeves H.R.Jr.	FMNH
1	Jefferson	Birmingham	3-IV-1956	Steeves H.R.Jr.	FMNH
1	Jefferson	Birmingham	26-IV-1956	Steeves H.R.Jr.	at light
1	Lee		26-VI-1965	Folkerts G.W.	at light
1	Lee	Auburn	6-VII-1949		AUEM
5	Lee	Auburn	4-IV-1951		AUEM
1	Lee	Auburn	16-V-1952	Parson A.M.	AUEM
1	Mobile	Mobile	29-IV	Jones	LACM
1	Mobile	Mobile	10-I-1909	Loding H.P.	CASC
1	Mobile	Mobile	16-IV-1910	Loding H.P.	CASC
1	Mobile	Mobile	23-XII-1939	Van Dyke	CASC
1	Mobile	Mobile	2-IV-1957	Dozier B.K.	at light
1	Mobile	Mt. Vernon	10-VII-1957	Dozier B.K.	fungus
1	Shelby	Helena	2-VII-1954	Steeves H.R.Jr.	FMNH
1	Shelby	Helena	24-VI-1955	Steeves H.R.	at light
1	Tallapoosa	Smith Mt. Tower	19-IV-1959		light trap
1	Tuscaloosa	Tuscaloosa	VI-1954	Ball G.E.	AUEM
2	Walker	Jasper	17-VII-1979	King T.	at light
<u>USA: Arizona</u>					
4					(prob.mis-labeled)
<u>USA: Arkansas</u>					
2					FMNH
2				Bowditch F.C.	MCZC
4		southwest		Palm C.	AMNH
1	Benton	Bentonville	14-IX-1928	Summerland S.A.	USNM
1	Benton	Bentonville	8-VIII-1930	Summerland S.A.	UADE
4	Benton	Bentonville	15-VII-1932		UASM
1	Benton	Bentonville	4-V-1936	Summerland S.A.	UADE
1	Benton	Siloam Springs	27-V-1907		USNM
1	Faulkner	T.5N R.14W Sec.1	VI-1975	Carlton C.	at light
1	Hempstead	Hope		H.C.Fall coll.	AMNH
1	Hempstead	Hope	1926	Mank E.W.	AMNH
1	Johnson		26-VI-1956		UADE
2	Madison	Springdale, Blue Springs St.Pk.	3-IV-1968	Heitzman R.L.	FSCA
1	Ouschits	Camden, 8 mi.NE	11-IV-1969	Suter W.	under bark
1	Riley		10-III-1946	Barret	UADE
1	Sebastian	Huntington	15-VI-1948	McDermot B.T.	UASM
1	Washington		28-VI-1946		UADE
11	Washington		V-1953	Rolston L.H.	UADE
1	Washington		IX-1960		UADE

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USA: Arkansas (Cont.)

1	Washington		24-IV-1973	Wylie W.D.		UADE
1	Washington		13-VI-1974		light trap	UADE
1	Washington		27-VI-1975	Wylie W.D.		UADE
1	Washington	Fayetteville	13-V-1965		light trap	UADE
2	Washington	Fayetteville, 12 mi.W on Hwy.16	14-VII-1986	Leschen R.A.B.	<i>Ipex lacteus</i>	RABL
1	Washington	Mt. Sequoyah	19-VI-1938	Sanderson M.W.	at light	INHS
1	Washington	U.of Ark. Exp.Sta.	30-V-1973	Haddox A.W.	blacklight	UADE

USA: Connecticut

1				Bowditch F.C.		MCZC
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USA: District of Columbia

1	Washington		9-VI-1903	Burdon C.E.		USNM
1	Washington		28-VII-1923	Crealey J.R.		AUEM
2	Washington	2 mi.NNW	18-VI-1932	Barber H.S.		USNM
1	Washington	Rock Creek	24-VI-1905			USNM

USA: Florida

5						ANSP
1						NHML
1						ZMHB
2				Bowditch F.C.		MCZC
1			6-VI-1903	Eddy F.A.		MCZC
6		Crewsville	2-IV-1941	Dekle G.W.	on Citrus X paradisi	FSCA
15		Pablo Beach	4-XI-1911			AMNH
1	Alachua		IV-1947			FSCA
1	Alachua		6-V-1969	May M.L.		FSCA
1	Alachua	Gainesville	26-V-1947	Weems H.V.Jr.	at light	FSCA
1	Alachua	Gainesville	25-IV-1952	McGillis J.P.		CNCI
1	Alachua	Gainesville	5-IV-1956	Denmark H.A.		FSCA
1	Alachua	Gainesville	IV-1965	Hetrick L.A.		FSCA
1	Alachua	Gainesville	IX-1966	Dickens T.H.		VPIC
2	Alachua	Gainesville	9-I-1968	Watve C.M.	tree fungus	DHHC
6	Alachua	Gainesville	13-I-1968	Farnsworth E.G.	tree fungus	DHHC
10	Alachua	Gainesville	13-I-1968	Habeck D.H.	fungus on log	DHHC
1	Alachua	Gainesville	12-IX-1972	Mead F.W.	blacklight trap	FSCA
2	Alachua	Gainesville	9-16-V-1976	Schuh J.		AMNH
1	Alachua	Gainesville	2-VIII-1976	Davis L.R.Jr.		FSCA
1	Alachua	Gainesville	25-II-1978	Rivera N.	rotten corn	RABL
1	Alachua	Gainesville	25-IX-1978	Thomas M.C.	at light	MCTC
4	Alachua	Gainesville	1-3-VII-1980	Stange L.A.	blacklight trap	FSCA
1	Alachua	Gainesville	18-VI-1983	O'Conner B.M.		UMMZ
1	Alachua	Gainesville	18-VI-1986	Mead F.W.	blacklight trap	FSCA
1	Alachua	Gainesville	7-III-1987	McCullogh	at light	PESC
1	Alachua	Gainesville, Doyle Conner Building	28-III-1970	Mead F.W.	blacklight trap	FSCA
5	Alachua	Gainesville, Hogtown Creek	8-VII-1987	Skelley P.E.	<i>Poria ambigua</i>	FSCA
27	Alachua	Gainesville, Paynes Prairie	23-VIII-1987	Habeck D.H.	prostrate white fungus	PESC
2	Alachua	Gainseville, 2 mi.W.	1-IV-1967	Bachelor J.S.	in fungus	FSCA
1	Alachua	Newberry	11-VII-1983	Vick K.W.	blacklight trap	FSCA
1	Alachua	San Felasco Hammock	22-XI-1975	Heppner J.B.	blacklight trap	FSCA
80	Alachua	Santa Fe R. at Rt.441	14-VII-1989	Skelley P.E.	log with fungus	PESC
1	Broward	Andytown	30-VI-1964	Dozier B.K.	at light	FSCA
4	Calhoun	Chipola Park	20-VI-1965	Lawrence J.F.	<i>Poria ambigua</i>	MCZC
1	Columbia	Lake City	6-V-1899			FSCA
1	Columbia	O'Leno St.Pk.	22-VII-1981	Ford E.J.	light trap	EJFC
3	Columbia	O'Leno St.Pk.	23-XII-1987	Skelley P.E.	reared <i>Poria ambigua</i>	FSCA
1	Columbia	O'Leno St.Pk.	23-XII-1987	Skelley P.E.	reared <i>Poria ambigua</i>	PESC
1	Dade	Matheson Hammock	11-IV-1951	Howden H. & A.		MCZC
1	Dade	Matheson Hammock	17-X-1956	Paulson D.R.		FSCA
1	Dade	Miami	1-VI-1960	Briggs P.E.	blacklight trap	FSCA
1	Dixie	Suwannee River	11-I-1940	Van Dyke		CASC
1	Gadsden	1-10 at Appalachianicola R.	11-VI-1988	Turnbow R.T.	at light	RHTC
2	Gadsden	Quincy	1-15-VIII-1971	rreid J.		FSCA
5	Gilchrist	Ginnie Springs	27-V-1976	Perun P.	white fungus on log	DHHC
1	Hernando	Withalacooche St.For.	12-VIII-1992	Skelley P.E.		PESC
2	Highlands	Archbold Biol.Sta.	13-IV-1983	Downie N.M.		FSCA
1	Highlands	Archbold Biol.Sta., 8 mi.S Lake Placid	2-VII-1988	Skelley P.E.	blacklight trap	PESC
130	Highlands	Highlands Hammock St. Pk.	15-XII-1957	Weems H.V.Jr.	under bark of <i>Pinus</i>	FSCA
1	Highlands	Highlands Hammock St.Pk.	14-III-1977	Platt E.	blacklight	UMRM
1	Indian River	SR-512, 0.5 mi.W I-95	16-21-VII-1975	Thomas M.C.	dusk-dawn suction trap	MCTC
1	Indian River	SR-512, 0.5 mi.W I-95	3-9-IX-1975	Thomas M.C.	dusk-dawn suction trap	MCTC
2	Indian River	SR-512, 0.5 mi.W I-95	16-20-V-1976	Thomas M.C.		MCTC
1	Indian River	SR-512, 0.5 mi.W I-95	20-28-V-1976	Thomas M.C.		MCTC
21	La Fayette	Rt.250 & Suwannee R.	22-VII-1977	Davis L.R.Jr.		FSCA
1	Leon	Tall Timbers Research Station	1-8-VII-1972	Jacques R.L.		FSCA
6	Leon	Tall Timbers Research Station	16-22-VII-1972	Jacques R.L.		FSCA
1	Leon	Tall Timbers Research Station	29-30-IX-1989	Skelley P.E.		PESC
1	Liberty		11-IV-1967	Moore F.J.		OSUC
2	Liberty	Torreya St.Pk.	1-V-1952	Peck O.		CNCI
1	Liberty	Torreya St.Pk.	17-V-1963	Weems H.V.Jr.	blacklight trap	FSCA
2	Liberty	Torreya St.Pk.	20-V-1966	Weems H.V.Jr.	blacklight trap	FSCA
1	Liberty	Torreya St.Pk.	8-IX-1967	Moore F.J.		OSUC
1	Liberty	Torreya St.Pk.	18-IX-1968	Weems H.V.Jr.	blacklight trap	FSCA
1	Liberty	Torreya St.Pk.	11-IV-1978	Stange L.A.		FSCA
3	Liberty	Torreya St.Pk.	12-IV-1980			JWIC
1	Liberty	Torreya St.Pk.	21-IV-1984	Turnbow R.H.	blacklight trap	RHTC
3	Liberty	Torreya St.Pk.	25-III-1986	Hoebcke E.R.	flood plain	CUIC
1	Liberty	Torreya St.Pk.	25-III-1986	Parkinson J.		CUIC
27	Liberty	Torreya St.Pk.	25-III-1986	Wheeler O.D.	fungi & under bark	JVMC
1	Liberty	Torreya St.Pk.	16-VII-1987	Skelley P.E.	at light	PESC
3	Liberty	Torreya St.Pk.	27-II-1988	Skelley P.E.	at light	PESC
1	Madison	Madison, 12 mi.SE	28-29-VIII-1949	Dybas H.S.		FMNH

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USA: Florida (Cont.)

1	Marion	Citra, NW 24th Ave.	15-VI-1991	Skillman F.W.Jr.		PESC
2	Marion	Ocala Forest	4-II-1978	Menezes E.B.	white fungus on log	DHHC
1	Orange	Oviedo, Univ. Central Fl. campus	7-XII-1979	Fullerton S.		SMFC
1	Osceola	Kissimmee		Thaxter R.		MCZC
1	Polk	Lakeland	16-III-1948	Hussey R.F.	at light	UMHZ
1	St. Johns	St. Augustine	4-III-1940	Van Dyke		CASC
3	Suwannee	Suwannee R. St. Pk., 20 km NW Live Oak	10-IV-1987	Steiner W.E.		USNM
2	Volusia	Deland	III-1953	Ramstadt H.		FMNH
1	Volusia	Enterprise			Schff. coll.	CASC
2	Wakulla	Panacea	24-31-VII-1967	Hilfiker C.		USNM

USA: Georgia

1				Weyers		ISNB
2				Bowditch F.C.		MCZC
3				Morrison		ZMHB
1		Bennington				DENH
1		Dunwoody		Menhinick E.F.		OSUC
1	Baker	Newton, Emory Univ. Field Stn.	12-VI-1957			CMNC
1	Charlton	Camp Cornelia, Suwanee Canal Rec. Area	21-V-1988	Turnbow R.H.	MV & blacklight	RHTC
1	Clarke	Athens	27-V-1924			AMNH
2	Clarke	Athens	10-IV-1964	Thewke S.E.		UMRM
1	Clarke	Athens	26-28-IV-1981	Brown S.N.	blacklight	UGCA
1	Clarke	Athens	6-V-1986	McKinney J.		RFMC
1	Dekalb		16-IV-1969			TAMU
1	Dekalb		7-VI-1969			TAMU
1	Dekalb		4-VII-1970			TAMU
1	Dekalb		26-VII-1970			TAMU
1	Dekalb		1-VIII-1971	Wappes J.E.		TAMU
1	Dekalb		8-V-1972	Wappes J.E.	UV light	TAMU
1	Dekalb	Stone Mountain area	16-IV-1969	Wappes J.E.		JEWC
2	Dekalb	Stone Mountain area	15-IV-1972	Wappes J.E.		JEWC
2	Effingham		21-VII-1984	Morris R.F.		RFMC
1	Lamar		29-III-1978	Morris R.F.		RFMC
1	Lamar		20-VIII-1984	Morris R.F.		RFMC
1	Lismon [?]		1-V-1983	Morris R.F.		RFMC
1	Pike		23-V-1983	Morris R.F.		RFMC
1	Upson		24-IV-1983	Morris R.F.		RFMC
1	Upson	Flint River	5-IV-1986	Morris R.F.		RFMC
1	Ware	Okefenokee St. Pk.	27-V-1990	Ford E.J.	light trap	EJFC

USA: Illinois

6						INHS
1						UMRM
3						ZMHB
1						USNM
3				Blanchard		MCZC
1				Laurent P.		ANSP
1		Maunie	9-VIII-1937	Dybas H.		FMNH
2		northern				INHS
1		northern		Blanchard		MCZC
1		southern		Blanchard		MCZC
3	Adams	Quincy				MCZC
1	Adams	Quincy	29-III-1885			INHS
3	Alexander	Cairo	21-VI-1939	Burks & Riegel		INHS
2	Alexander	Horseshoe Lake	19-IV-1986	Skelley P.E.		EIUC
1	Calhoun	Kampsville	25-VI-1931	Frison et al.		INHS
1	Champaign		23-IV-1960	Campbell J.M.	under bark	CNCI
1	Champaign		1-VII-1977	Barney R.J.		RJBC
1	Champaign		5-VI-1965	Lawson H.R.		CSCC
1	Champaign	Homer	19-VII-1924			INHS
1	Champaign	Homer	11-VI-1931	Mohr		INHS
5	Champaign	Urbana				INHS
2	Champaign	Urbana			H. Kahl coll.	AMNH
2	Champaign	Urbana			H. Kahl coll.	ICCM
1	Champaign	Urbana		Kahl H.		AMNH
1	Champaign	Urbana	3-VIII-1926	Frankenfeld J.C.		FSCA
1	Clark	Clarksville, N. of, Rocky Branch Creek	4-VIII-1988	Skelley P.E.	blacklight	PESC
1	Coles		21-IV-1967	DeHollander		EIUC
1	Coles		1-VIII-1968	Mertz C.J.	student coll.	EIUC
1	Coles		20-XI-1970	Corrigan J.	student coll.	EIUC
1	Coles	Charleston	7-V			EIUC
1	Coles	Charleston	2-VII-1939	Lowrie D.C.		FMNH
1	Coles	Charleston	V-1954	Hebert P.		EIUC
1	Coles	Charleston	26-VII-1989	Funk R.C.	at light	EIUC
1	Coles	Charleston	15-16-VIII-1990	Goodrich M.A.	UV light trap	EIUC
1	Coles	Embarras R. bluff	12-V-1970	Decker		EIUC
1	Coles	Embarras R. bluff	15-VI-1970	Decker		EIUC
1	Coles	Embarras R. floodplain	28-IV-1970	Decker		EIUC
1	Coles	Embarras R. floodplain	1-VI-1970	Decker		EIUC
1	Coles	Embarras R. floodplain	10-VIII-1970	Decker		EIUC
1	Cook	Chicago		Dunicel J.		FMNH
1	Cook	Chicago	6-XII-1927			INHS
1	Cook	Des Plaines, Carle Woods	11-VII-1964	Suter W.		WSIC
1	Cook	Palos Hills	31-V-1981	Watrous L.E.	drift at stream edge	FMNH
1	Cook	Palos Park	8-VII-1911	Gerhard W.J.	at light	FMNH
1	Cook	Thatcher Woods, River Forest	23-X-1980		under loose bark	FMNH
1	Douglas		28-V-1965	Lawson H.R.		CSCC
1	Franklin	Zeigler	12-VI-1932	Karlovic J.		USNM
1	Gallatin	Pound's Hollow	14-VI-1990	Goodrich M.A.	blacklight trap	EIUC
2	Hancock	A.L.Kibbe Life Sci. Sta.	14-16-VI-1971	Sedman Y.		WIUC
2	Hancock	A.L.Kibbe Life Sci. Sta.	26-28-VI-1971	Sedman Y.		WIUC

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USA: Illinois (Cont.)

3	Hancock	A.L.Kibbe Life Sci.Sta.	16-VII-1971	Sedman Y.		WIUC
5	Hancock	A.L.Kibbe Life Sci.Sta.	19-24-VI-1978	Sedman Y.		WIUC
3	Hancock	A.L.Kibbe Life Sci.Sta.	30-VI-1978	Mattson J.		WIUC
4	Hancock	A.L.Kibbe Life Sci.Sta.	1-VII-1978	student coll.		WIUC
2	Hancock	A.L.Kibbe Life Sci.Sta.	5-VII-1978	student coll.		WIUC
1	Hancock	A.L.Kibbe Life Sci.Sta.	7-VII-1978	Mattson J.		WIUC
2	Hancock	A.L.Kibbe Life Sci.Sta.	11-VII-1978	Sedman Y.		WIUC
1	Hancock	A.L.Kibbe Life Sci.Sta.	26-VII-1978	Sedman Y.		WIUC
2	Hancock	A.L.Kibbe Life Sci.Sta.	28-VI-1979	Sedman Y.		WIUC
1	Hancock	A.L.Kibbe Life Sci.Sta.	5-VII-1979	Sedman Y.		WIUC
4	Hancock	A.L.Kibbe Life Sci.Sta.	9-13-VII-1979	Sedman Y.		WIUC
1	Hancock	A.L.Kibbe Life Sci.Sta.	21-V-1980	student coll.		WIUC
3	Hancock	A.L.Kibbe Life Sci.Sta.	27-28-V-1980	student coll.		WIUC
1	Hancock	A.L.Kibbe Life Sci.Sta.	4-VI-1980	student coll.		WIUC
3	Hardin	Elizabethtown	22-VI-1922	T.F. & R.D.G.	at light	INHS
1	Jackson		VIII-1971	Adolphson P.		SIUC
1	Jackson	Carbondale	23-IV-1957	Garrison J.D.		SIUC
1	Jackson	Carbondale	29-IV-1957	Downer J.C.		SIUC
1	Jackson	Carbondale	21-V-1957	Thomas D.		SIUC
1	Jackson	Carbondale	1-V-1958	Yates R.W.		SIUC
1	Jackson	Carbondale	9-V-1958	Holz B.		SIUC
1	Jackson	Carbondale	16-IV-1960	Fulk B.R.		SIUC
1	Jackson	Carbondale	22-IV-1960	Bender M.		SIUC
1	Jackson	Carbondale	20-IV-1960			SIUC
1	Jackson	Carbondale	8-V-1960	Bender M.		SIUC
1	Jackson	Carbondale	15-II-1962	O'Dell D.		SIUC
1	Jackson	Carbondale	14-V-1962	Helm F.E.		SIUC
1	Jackson	Carbondale	11-V-1963	Cole V.		SIUC
2	Jackson	Carbondale	21-VI-1963	Marek J.E.		SIUC
1	Jackson	Carbondale	2-V-1964	Ziech K.		SIUC
1	Jackson	Carbondale	17-IV-1971	Wortham E.		SIUC
1	Jackson	Giant City St.Pk.	5-VII-1962	Campbell J.M.		CNCI
1	Jo Daviess	Apple River Canyon St.Pk.	14-16-VIII-1946	Dybas H.S.		FMNH
1	Johnson	Vienna	16-V-1964	Montgomery R.A.		SIUC
1	LaSalle	Peru	15-VI-1963	Suter W.	old field sweep	WSIC
2	Lasalle	Ottawa	5-V-1946	Werner F.G.		UAIC
1	Lasalle	Starved Rock	14-VI-1932	Doier & Pork		INHS
1	Macon		11-V-1980	Skelley P.E.	at light	PESC
1	Macon		3-V-1982	Auten R.		PESC
1	Macon		30-VI-1982	Auten T.		PESC
1	Macon		9-VII-1984	Skelley P.E.	at light	EIUC
1	Marion	Kinmundy	4-V-1962	Helm F.E.		SIUC
1	Marshall	Lacon	13-VI-1929	Barnes R.M.		ISMS
2	Marshall	Lacon	4-VII-1938	Barnes R.M.		ISMS
1	Marshall	Lacon	9-VII-1938	Barnes R.M.		ISMS
1	Marshall	Lacon	10-VII-1938	Barnes R.M.		ISMS
1	Marshall	Lacon	4-VIII-1938	Barnes R.M.		ISMS
2	Marshall	Lacon	4-VIII-1938	Barnes R.M.		ISMS
1	Marshall	Lacon	30-V-1939	Barnes R.M.		ISMS
2	Marshall	Lacon	6-VII-1939	Barnes R.M.		ISMS
1	Marshall	Lacon	1-VI-1940	Barnes R.M.		ISMS
1	Marshall	Lacon	29-IV-1941	Barnes R.M.		ISMS
1	Mason	Chautaugua Nat.Wldlf.Ref.	28-VI-1978	Lundgren R.W.	sandy lake shore	RWLC
14	Mason	Havana	11-VIII		under bark	INHS
1	Mason	Havana	3-VI-1905			INHS
12	Mason	Havana	11-VIII-1907			INHS
2	Mason	Havana	11-VIII-1907			USNM
2	Massac	Ft.Massac St.Pk.	3-V-1976	Lundgren R.W.	under bark of dead tree	RWLC
1	McDonough	Macomb	25-VII-1967	student coll.		WIUC
1	McDonough	Macomb	7-VI-1970	Sedman Y.		WIUC
1	McDonough	McComb	11-V-1971	student coll.		NCSU
4	McDonough	Macomb	5--1972	student coll.		WIUC
1	McDonough	Macomb	24-V-1972	student coll.		WIUC
6	McDonough	Macomb	3-VI-1972	Sedman Y.		WIUC
1	McDonough	Macomb	9-IV-1975	Sedman Y.		WIUC
1	McDonough	Macomb	15-IV-1976	student coll.		WIUC
1	McDonough	Macomb	15-V-1976	Sedman Y.		WIUC
1	McLean	Funks Grove	17-X-1979	Lundgren R.W.	fungus covered log	RWLC
3	Moultrie		16-V-1978	Quinn K.P.	student coll.	EIUC
1	Peoria	Peoria, airport region	3-VIII-1941	Hasbrouck F.F.	under bark	INHS
1	Piatt	Monticello, Allerton Park	25-IV-1964	Yamamoto T.		INHS
2	Pope		1-3-V-1970	Funk R.C.		INHS
1	Pope	Herod, 0.8 mi.NW	3-VI-1986	Lisowski E.A.		INHS
1	Putnam		23-IV-1933	Glenn M.O.		INHS
2	Putnam		29-VI-1931	Glenn M.O.		INHS
3	Rock Island	Rock Island	3-VI-1930	Frison & Ross		INHS
1	Sangamon	Springfield	22-V-1974	Suter W.	at light	WSIC
1	Shelby		20-IX-1985	Faalang K.	student coll.	EIUC
1	Union	Giant City St.Pk.	24-VI-1958	Dybas H.	at light	INHS
1	Union	Pine Hills	6-V-1961	Landewe J.E.		SIUC
1	Union	Pine Hills	13-VII-1966	Parsons D.		SIUC
2	Union	Pine Hills	14-16-VIII-1966	Parsons D.		SIUC
1	Union	Pine Hills	26-VII-1966	Parsons D.		SIUC
2	Union	Pine Hills	5-V-1972	McPherson J.E.		SIUC
1	Union	Pine Hills Rec.Area	7-VIII-1987	Skelley P.E.	at light	PESC
6	Union	Wolf Lake, 1.7 mi.E.	4-VI-1986	Lisowski E.A.		INHS
5	Union	Wolf Lake, Pine Hills	22-V-1958	Dybas H.S.	<i>Poria ambigua</i> on beech	FMNH
3	Union	Wolf Lake, Pine Hills	22-VI-1958	Dybas H.S.	<i>Poria ambigua</i> on beech	FMNH
14	Union	Wolf Lake, Pine Hills	26-VI-1958	Dybas H.S.	<i>Poria ambigua</i> on beech	FMNH

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Ischyryus quadripunctatus quadripunctatus (Olivier) (Cont.)

USA: Illinois (Cont.)

1	Vermillion	Oakwood	4-V-1930	Frison		INHS
9	Vermillion	Oakwood	11-VII-1933			FMNH
1	Vermillion	Westville, 5 mi. SW,	19-20-IV-1977	Webb D.W.		INHS
2	Wabash	Beale Woods Cons. Area	13-14-VIII-1979	Cashatt E.D.		ISMS
1	Williamson	Cartersville	20-IV-1957	Cole V.		SIUC
1	Williamson	Cartersville	3-V-1958	Cole V.		SIUC
2	Williamson	Cartersville	16-VIII-1958	Cole V.		SIUC
2	Williamson	Crab Orchard Lake	17-IV-1958	Roberson B.		SIUC
1	Williamson	Crab Orchard Lake	22-VIII-1974	Spinello R.		SIUC
1	Tyler		18-VI-1930			INHS

USA: Indiana

1						INHS
2		Metamora	10-V-1936			UMMZ
2		Osborne	31-V-1909	Liljeblad E.		UMMZ
1		Vinita	7-8-VI-1899	Wickham		FSCA
2		Vinita	7-8-VI-1899	Wickham		MCZC
4		Vinita T.	7-8-VI-1899	Wickham		HNHM
1	Allen	New Haven	25-VII-1981	Downie N.M.		FSCA
2	Allen	New Haven	15-V-1982	Downie N.M.		FSCA
1	Allen	New Haven	3-VIII-1983	Downie N.M.	UV light	FSCA
1	Allen	New Haven	15-VIII-1983	Downie N.M.	UV light	FSCA
1	Brown	Belmont, N.of	16-18-VIII-1984	Hagen C.W.Jr.	blacklight	FSCA
1	Clark	Memphis, 2 mi.E.	19-VI-1983	Vick K.W.	blacklight	FSCA
1	Hamilton		5-X-1944	Kingsolver J.M.	in log	INHS
1	Hamilton		5-V-1947	Kingsolver J.M.	under bark	INHS
1	Knox		13-VI-1940	Green J.W.		CASC
1	Lagrange		28-V-1959	Scott R.		NHML
1	Lagrange		30-VI-1960	Scott R.		NHML
3	Madison		25-VI-1976	Brattain R.M.		USNM
12	Marion			Blatchley W.S.		NHML
1	Marion	Indianapolis	6-VIII-1958	White D.S.		FSCA
5	Marion	Indianapolis	25-IV-1959	White C.E.		FSCA
1	Marion	Indianapolis	20-V-1960	White D.S.		FSCA
1	Marion	Indianapolis	16-VI-1962	White C.E.		FSCA
3	Monroe	Bloomington	28-31-V-1980	Young F.N.	blacklight	FSCA
1	Monroe	Bloomington	17-18-VII-1982	Young F.N.	blacklight	FSCA
1	Monroe	Bloomington	16-17-VIII-1982	Young F.N.	blacklight	FSCA
1	Monroe	Bloomington	12-13-IX-1982	Young F.N.	blacklight	FSCA
1	Monroe	Bloomington	23-26-IV-1985	Young F.N.	blacklight	FMNH
1	Monroe	Bloomington	26-28-IV-1985	Young F.N.	blacklight	FMNH
1	Monroe	Bloomington	25-27-V-1985	Young F.N.	blacklight	FSCA
2	Monroe	Bloomington	10-VI-1985	Young F.N.	blacklight	FSCA
3	Monroe	Bloomington	4-9-VI-1986	Young F.N.	blacklight	CDAE
1	Monroe	Bloomington	14-15-VI-1986	Young F.N.	blacklight	trap
1	Monroe	Bloomington	20-21-VI-1986	Young F.N.	blacklight	CDAE
1	Monroe	Bloomington	14-V-1987	Young F.N.	blacklight	FSCA
1	Monroe	Bloomington	15-V-1987	Young F.N.	blacklight	FSCA
1	Owen	McCormick's Creek St. Pk.	24-VI-1950	Byers B.W.	at light	UMMZ
3	Parke	Sugar Creek	18-V-1969	O'Brien C.W. & L.		NHMB
1	Parke	Turkey Run St.Pk.	10-VI-1967	O'Brien C.W. & L.		NHMB
1	Perry	T.4S R.1W S.36	24-IV-1978	Liebherr J.K.	under bark	CUIC
1	Porter	Dunes St.Pk.	21-V-1983	Downie N.M.		FSCA
1	Porter	Lake Station	10-V-1908	Liljeblad E.		UMMZ
1	Posey	Hovey Lake, 37°50'N, 87°55'W	30-IV-1979	Goulet H.		CNCI
2	Posey	Hovey, 1.5 mi.S, Hwy 69	20-V-1973	Kavanaugh D.H.		CNCI
7	Scott		29-VI-1981	Schrock J.R.	at light	SEMC
1	Scott		30-V-1980	Schrock J.R.		SEMC
1	Tippecanoe			Downie N.M.		UADE
4	Tippecanoe		6-VIII-1961	Downie N.M.		USNM
6	Tippecanoe		12-V-1965	Downie N.M.		UADE
1	Tippecanoe		22-IX-1968	Downie N.M.		UADE
1	Tippecanoe		VII-1975	Downie N.M.		USNM
1	Tippecanoe		19-V-1972	Downie N.M.	blacklight	FSCA
1	Tippecanoe		11-VII-1972	Downie N.M.	blacklight	FSCA
1	Tippecanoe		20-V-1974	Downie N.M.	blacklight	FSCA
1	Tippecanoe		11-VIII-1975	Downie N.M.	blacklight	FSCA
1	Tippecanoe		25-VII-1977	Brattain R.M.		AMNH
2	Tippecanoe		25-VII-1977	Brattain R.M.		SMCC
1	Tippecanoe	ERA Marsh Mal	6-9-VI-1979	MacDonald J.F.		RPIC
1	Tippecanoe	Lafayette	29-VI-1940	Green J.W.		CASC
2	Tippecanoe	Lafayette	6-V-1964	Kiteley E.J.		CNCI
5	Tippecanoe	Lafayette	4-7-V-1969	Arnett R.H.Jr.	blacklight	FSCA
1	Tippecanoe	Lafayette	13-VII-1982	Downie N.M.	blacklight	trap
1	Tippecanoe	Lafayette	15-VII-1985	Downie N.M.	UV light	DENH
2	Vanderburgh		17-IV-1976			CSCC
1	Wells	Bluffton	22-VI-1929	Clench W.J.		UMMZ
1	Wells	Bluffton, 2 mi.W.	28-VIII-1971	Wilkey R.	ex fungus	CDAE

USA: Iowa

1						ISUI
3						UWEM
2				Blanchard		MCZC
1				Dietz W.G.		MCZC
1			4-V-1935	Bagnall S.		DENH
2		Gilbert, 4 mi.E.	8-VII-1949	Hobart O.		ISUI
1		Gilbert, 4 mi.E.	8-VII-1949	Sparkling S.		ISUI
1		Gilbert, 4 mi.E.	13-V-1961	Ryan S.C.		ISUI
1		Herold	21-VIII-1919	Quirsfeld E.D.		AMNH
2		Johnston Saylorville Lake	15-V-1983	Wappes J.E.		FSCA
5		Ledges St.Pk.	16-V-1947	Laffoon J.		ISUI

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Ischyrys quadripunctatus quadripunctatus (Olivier) (Cont.)

USA: Iowa (Cont.)

1	Boone	Madrid	19-VII-1964	Baldwin R.	ISUI
1	Clayton	Guttenberg		Soltau H.	FSCA
1	Decatur	Leon	8-V-1932	Haas L.	DENH
1	Iowa				CSUC
1	Iowa	Marengo, 3 mi.S.	11-X-1962	Olson L.G.	ISUI
2	Johnston	Saylor Lake	15-V-1983	Wappes J.E.	JEWC
1	Johnston	Saylor Lake	1-5-VI-1983	Schieferstein R.H.	JEWC
1	Johnston	Saylor Lake	16-30-VI-1983	Schieferstein R.H.	JEWC
1	Johnston	Saylor Lake	1-5-VII-1983	Schieferstein R.H.	JEWC
3	Linn	Cedar Rapids	4-VIII-1926	Harris H.M.	ISUI
1	Mills	Malvern	12-VII-1971		ISUI
1	Polk	Saylor Lake	25-V-1985	Wappes & Schieferstein	JEWC
1	Polk	Saylor Lake, west	15-VI-1985	Wappes J.E.	JEWC
2	Story	Ames			ISUI
1	Story	Ames			USNM
1	Story	Ames	7-IV-1924		ISUI
1	Story	Ames	20-IV-1925		ISUI
1	Story	Ames	15-VI-1925	G.W.M.	ISUI
1	Story	Ames	22-V-1927		ISUI
1	Story	Ames	20-IV-1928	T.A.R.	ISUI
1	Story	Ames	V-1930	Harris H.M.	ISUI
1	Story	Ames	11-V-1930	Ferguson F.P.	ISUI
4	Story	Ames	15-VII-1931	Knight H.H.	CNCI
5	Story	Ames	15-VII-1931	Knight H.H.	ISUI
1	Story	Ames	16-VII-1931		ISUI
1	Story	Ames	11-IV-1932	Hixson H.	ISUI
2	Story	Ames	16-V-1932	Murphy M.	ISUI
4	Story	Ames	16-V-1932	Roudabush R.L.	DEUN
1	Story	Ames	5-V-1941	Smith L.F.	ISUI
1	Story	Ames	31-V-1947	Hicks E.A.	ISUI
1	Story	Ames	19-IV-1948	Tate W.H.	ISUI
1	Story	Ames	6-V-1948	Farrier	ISUI
1	Story	Ames	1-VII-1948	Torgeason D.	ISUI
2	Story	Ames	7-V-1949	Ruhr C.E.	ISUI
1	Story	Ames	14-V-1950	Klonglan E.	ISUI
1	Story	Ames	16-V-1950	Eckbreck W.J.	UASM
1	Story	Ames	12-VI-1950	Downes W.M.L.	AMNH
1	Story	Ames	14-V-1952	Madsen J.B.	ISUI
1	Story	Ames	19-IV-1955	Aburto S.	ISUI
1	Story	Ames	21-V-1955	Aburto S.	ISUI
1	Story	Ames	26-V-1958	King E.	ISUI
3	Story	Ames	6-V-1963	Hannah J.	ISUI
1	Story	Ames	4-VI-1963	Richards L.	ISUI
1	Story	Ames	15-V-1966	Bradley R.	ISUI
1	Story	Ames	22-V-1975	Stewart A.	ISUI
1	Story	Ames	13-VI-1975	Stewart A.	ISUI
1	Story	Ames, Osborn			ISUI

USA: Kansas

1					FMNH
2					ICCM
1				Ashton	PURC
2				Hauser G.	2MHB
1		Needsha	16-V-1959	Willis H.	FSCA
3		Osaga	19-V-1923	Crevecoeur	CASC
1	Atchinson	Atchinson	17-VI-1956	McReynolds J.W.	FSCA
1	Atchinson	Atchinson	28-VI-1957	McReynolds J.W.	FSCA
4	Cherokee	Columbus, 12mi.W, 5mi.S	8-9-VI-1976	Hevel G.F.	USNM
3	Douglas			Dyche L.L.	CSUC
1	Douglas		13-VII-1950	Pine R.H.	TAMU
1	Douglas	Lawrence	7-V-1961	Funk R.C.	EIUC
1	Douglas	Lawrence	30-V-1961	Funk R.C.	EIUC
1	Douglas	Lawrence	18-V-1967		FSCA
1	Douglas	Lawrence, 6 mi.NE	24-V-1959	McFarland N.	LACM
1	Labette	Oswego	2-VII-1961	Hevel G.F.	USNM
1	Labette	Oswego	29-III-1963	Hevel G.F.	USNM
3	Labette	Parsons	20-IV-1962	Hevel G.F.	USNM
1	Pottawatomie		18-IV-1955	McReynolds J.W.	FSCA
1	Shawnee	Topeka			2MHB
2	Shawnee	Topeka		Hayward R.	MC2C

USA: Kentucky

1				Bowditch F.C.	MC2C
1				Malkin	FMNH
1		Wycliffe	11-VI-1907		USNM
2	Christian		25-V-1960	Campbell J.M.	AMNH
2	Christian		15-VI-1960	Campbell J.M.	CNCI
1	Green	Crailhope	7-IV-1947	Cook C.	MSUC
1	Henderson	Henderson	3-IV-1923	Marshall W.V.	CUIC
3	Henderson	Henderson	8-IV-1923	Marshall M.Y.	CNCI
1	Jefferson	Valley Station	15-V-1987	Nichols B.C.	at light
12	Laurel	Bald Rock	11-VI-1978	Fischer R.L.	MSUC
1	Marshall	Aurora	23-VI-1982	Goddara G.	UMIC
1	Meade	Otter Creek Park	8-V-1987	Nichols B.C.	at light
1	Rowan	Morehead	21-VI-1962	Freeman & Lewis	CNCI
1	Fayette		29-IV-1970		KSUC
1	Fayette		13-VI-1970		KSUC
2	Pulaski		5-V-1970		KSUC
1	Trigg	Land between the Lakes, Devils Elbow	6-V-1986	Pollock D.A.	DAPC

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USA: Louisiana

1						MCZC
1						UMRM
1		Corney Lake	26-VI-1983	Carr B.F. & J.L.	UV light	JLCC
1	Bossier	Bossier City	26-VIII-1971	Robin		TAMU
1	Grant	Dry Prong	7-V-1954	Dybas H.S.		FMNH
1	Jefferson	Harahan	19-VII-1944	Werner F.G.		MCZC
1	Madison	Tallulah	VI-1930	Glick P.A.	light trap in woods	MCZC
1	Madison	Tallulah	14-VI-1930	Frost C.A.		CASC
1	Madison	Tallulah	16-VI-1930	Glick P.A.		DENH
1	Madison	Tallulah	19-VI-1930	Glick P.A.		FMNH
1	Madison	Tallulah	27-VI-1930			TAMU
3	Madison	Tallulah	10-VII-1930	Glick P.A.		UASM
4	Madison	Tullulah	8-VIII-1930	Glick P.A.	at light	CNCI

USA: Maryland

17		Bear Island, W. of C. & O. Canal	6-VI-1971	Hevel G.F.		USNM
1		Bladensburg	24-III			USNM
1		Butler	17-VI-1981	Ford E.J.	light trap	EJFC
1		Chn Bdrge [?]	5-V-1910	Barber H.S.		FSCA
1		Edgewater	25-V-1982	Staines C.L.Jr.	blacklight	CNCI
1		Edgewater	19-20-IV-1985	Staines C.L.Jr.	blacklight	CNCI
1		Edgewater	22-23-IV-1985	Staines C.L.Jr.	blacklight	CNCI
1		Granite	27-V-1966	Ford E.J.	light trap	EJFC
1		Hancock	23-VIII-1967	Gordon R.		USNM
1		Hebville	22-VI-1967	Ford E.J.	light trap	EJFC
1		Plummers Island	7-VI			USNM
1		Plummers Island	1-VIII-1902			USNM
1		Plummers Island	24-IX-1902			USNM
1		Plummers Island	20-V-1903			USNM
1		Plummers Island	28-IV-1905		at light	USNM
1		Plummers Island	2-VIII-1914	McAtee W.L.		USNM
1		Plummers Island	VI-1919			USNM
1		Plummers Island	2-VI-1919	Schwarz & Barber		USNM
2		Plummers Island	11-VII-1922		at light	USNM
1		Plummers Island	6-8-VII-1969	Spangler P.J.		USNM
1		Plummers Island	18-V-1972	Hevel G.S. & E.		USNM
1		Silver Springs, 2 mi. E., NW Branda	30-VI-1950	Nelson G.H.	powdery fungus on log	GHNC
1		Frostburg	14-VI-1949	Chermock F.		ICCM
1	Allegany	Frostburg				MCZC
1	Baltimore	Baltimore	25-VII-1947	Dieke	at light	USNM
1	Baltimore	Baltimore	28-XII-1984	Guarnieri F.	under loose bark	CUIC
1	Baltimore	Baltimore	20-V-1982	Hardy H.R.		CDAE
1	Baltimore	Baltimore, Cylborn Pk.	12-II-1950	Dozier B.K.	under oak bark	FSCA
1	Calvert	Chesapeake bay	21-IV-1982	Steiner W.E.		USNM
5	College Park		17-VI-1985	Ford E.J.	light trap	EJFC
3	Montgomery	Plummers Island	12-IV-1970	Druckenbrod M.	under bark	USNM
1	Morchester	Whiteburg	21-VII-1951	Nelson G.H.		AMNH
1	Prince Georges	Beltsville	21-VII-1951	Nelson G.H.		CNCI
6	Prince Georgea	College Park	21-VII-1951	Nelson G.H.	powder fungi, black oak	GHNC
1	Prince Georges	College Park	21-VIII-1951	Nelson G.H.	black oak fungus	JMCC
6	Prince Georgea	College Park	21-VII-1952	Nelson G.H.	powder fungi, black oak	CNCI
6	Prince Georgea	College Park	21-VII-1957	Nelson H.G.		CNCI
3	Prince Georges	College Park	21-V-1983	Ford E.J.	light trap	EJFC
1	Prince Georges	College Park	4-VII-1982	Steiner W.E.		USNM
1	St. Marya	Lexington Pk.				
1	Talbot	Wittman				

USA: Michigan

2		Ag. Coll.		C.F.B.		INHS
1		Detroit		Hubbard & Schwarz		USNM
1		Detroit	23-V-1907			UMM2
1		Detroit	4-VIII-1938	Steyskal G.		UMM2
1		Saginaw Bay, Charity Is.	21-VI-1910	Andrews A.W.		UMM2
1	Berrien		9-VI-1973	Giesbert E.		LACM
1	Berrien	Bainbridge Twp.	21-24-VI-1977	Liebherr J.K.	UV light	CUIC
1	Berrien	E.K. Warren Pres., Warren Woods	1-VII-1919	Hubbell T.H.		UMM2
1	Berrien	Harbert	23-V-1985	Giesbert E.		FSCA
1	ingham	E. Lansing	30-IV-1948			MSUC
1	ingham	E. Lansing	20-V-1959	Fischer R.L.		MSUC
1	ingham	T.2N R.1W Sec.13	28-IV-1970	Donahue J.P.		MSUC
1	Kalamazoo	Gull Lake Biol. Sta.	19-VI-1955	Dawson A.D.		MSUC
1	Kalamazoo	Gull Lake Biol. Sta.	21-VI-1966	Evans E.D.		AMNH
1	Kalamazoo	Gull Lake Biol. Sta.	27-VI-1966	Fischer R.L.		MSUC
1	Kalamazoo	Gull Lake Biol. Sta.	22-VIII-1968	Fischer R.L.		MSUC
1	Kalamazoo	Gull Lake Biol. Sta.	14-VIII-1969	Fischer R.L.		MSUC
1	Kalamazoo	T.35 R.10W Sec.22	30-VII-1980	Cowen C.P.		WMUC
1	Kent	Grand Rapids		Wolcott R.H.		DEUN
2	Kent	Grand Rapids		Wolcott R.H.		DEUN
1	Lenawee	Adrian	19-V-1975	Ruesink L.	blacklight	CUIC
1	Livingston	George Reserve	12-IX-1936	Moore S.		UMM2
1	Oakland		26-V-1921	Andrews A.W.		UMM2
1	Oakland		8-VI-1939	Andrews A.W.		UMM2
1	St. Clair	Avoca	1-VIII-1942	Moore S.	at light	UMM2
1	St. Joseph		7-VIII-1947			UMM2
1	St. Joseph	Klinger Lake	10-V-1953	Goaling D.C.L.		UMM2
1	Van Buren	Paw Paw Lake	27-VII-1909	Liljeblad E.		UMM2
1	Wayne	Grasse Island	7-IV-1947	Steyskal G.		CNCI
1	Wayne	Grosse Island	2-IX-1947	Steyskal G.		LACM
1	Wayne	Grosse Island	25-VII-1948	Steyskal G.		LACM
1	Wayne	Grosse Island	16-VIII-1948	Steyskal G.		LACM

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Ischyrys quadripunctatus quadripunctatus (Olivier) (Cont.)

USA: Missouri

1		Bunker	6-VII-1972	Thewke S.A.		UMRM
1		Lk. Pomme De Terr St.Pk. [?]	29-V-1972	Thewke S.E.		UMRM
2		Mun...?				AMNH
1		Shpp [?]	23-XI-1954	Davis P.D.		UMRM
1		Willard	26-VI-1927	Brower A.E.		AMNH
1	Bollinger	Duck Creek Wldlf.Area	11-VI-1975	Swadener S.O., et al.		UMRM
1	Bollinger	Duck Creek Wldlf.Area	10-VII-1975	Swadener S.O., et al.		UMRM
1	Bollinger	Marble Hill	12-XII-1934	Swackhammer		UMRM
1	Boone		19-X-1940	Robertts I.		UMRM
1	Boone		6-IV-1975	Gillespie		WIUC
2	Boone	Ashland	28-VII-1968		light trap	UMRM
1	Boone	Ashland	29-VII-1968		light trap	UMRM
1	Boone	Ashland	4-VIII-1968		light trap	UMRM
1	Boone	Ashland	17-VIII-1968		light trap	UMRM
5	Boone	Columbia				2MHB
1	Boone	Columbia	8-V-1938			UMRM
1	Boone	Columbia	15-V-1938			UMRM
1	Boone	Columbia	20-VII-1951	Haseman L.		UMRM
1	Boone	Columbia	11-V-1953	Ross R.D.		UMRM
1	Boone	Columbia	24-IV-1954	Enns W.R.	at light	UMRM
1	Boone	Columbia	11-VII-1954	Enns W.R.	at light	UMRM
1	Boone	Columbia	6-V-1959	Woodson A.M.		UMRM
3	Boone	Columbia	10-VII-1963	Wood F.E.		USNM
1	Boone	Columbia	V-1964	Wiobley R.	under bark	UMRM
1	Boone	Columbia	2-V-1964	Wood F.E.		USNM
1	Boone	Columbia	20-V-1964	Truelsen K.	grass	UMRM
1	Boone	Columbia	1-IX-1964	Chandler J.		UMRM
1	Boone	Columbia	12-VIII-1965	Stryker R.G.		UMRM
1	Boone	Columbia	9-IX-1965	Parshall A.E.	fungus	UMRM
1	Boone	Columbia	10-IX-1965	Schmidt G.T.		UMRM
1	Boone	Columbia	21-IX-1965	Freeman M.E.		UMRM
1	Boone	Columbia	10-VII-1966	Riddle D.D.		UMRM
1	Boone	Columbia	27-XII-1967		light trap	UMRM
1	Boone	Columbia	28-XII-1967		light trap	UMRM
1	Boone	Columbia	24-IV-1972	Riley T.J.		EGRC
3	Boone	Columbia	21-V-1974	Thewke S.E.	light trap	UMRM
1	Boone	Columbia	20-VI-1977	Thewke S.E.	blacklight trap	UMRM
1	Boone	Columbia	28-VI-1977	Thewke S.E.	blacklight trap	UMRM
2	Boone	Columbia	10-IV-1978	Thewke S.E.		UMRM
1	Boone	Columbia, 5 mi.W on Perche Creek	11-V-1964	Wood F.E.		UMRM
2	Boone	Columbia, 5 mi.W on Perche Creek	16-V-1964	Wood F.E.		UMRM
1	Boone	Columbia, nr.Rick Bridge on Rt.K.	22-V-1978	Rice M.E.		UMRM
1	Callaway	Fulton	10-VI-1947	Thomas G.E.	over ripe strawberry	UMRM
2	Callaway	Fulton	29-V-1949	Thomas G.W.		UMRM
1	Cape Girard.	Cape Girardeau	1-V-1938	Wingo C.		UMRM
1	Charles	Dardeen Slough	30-XI-1954	Charles B.		UMRM
1	Clay	Coolie Lake	2-V-1968	Heitzman R.		FSCA
1	Cole	Jefferson City	19-IV-1968	Allen R.P.		CDAE
1	Cooper	Boonville	26-XIII-1957	Wood F.E.	light trap	UMRM
1	Cooper	Boonville, Bell's Orchard	24-XII-1957	Wood F.E.		UMRM
2	Cooper	Boonville, Bell Orchard	18-VIII-1959	Enns W.R.	light trap	UMRM
1	Jackson		VI-1955	Pine R.H.		TAMU
1	Jackson	Independence	12-VII-1969	Heitzman R.		FSCA
1	Jackson	Independence	21-V-1970	Heitzman R.L.		FSCA
1	Jackson	Independence, Adair Pk.	3-V-1968	Heitzman J.R.		FSCA
2	Jackson	Rayton	15-V-1972	Nelson G.H.	at light	GHNC
1	Jackson	Rayton	13-VIII-1974	Nelson G.H.	UV light	GHNC
12	Johnson	Warrensburg	19-V-1946	Malkin B.		FMNH
1	Newton	Neosho			intercepted at Yermo, CA	CDAE
4	Nodaway	Maryville	21-VI-1933			FMNH
1	Phelps	Rolla, SW of, Mill Creek	26-V-1979	Peck S.& J.	UV light	CNCI
2	Polk		VII-1915			VPIC
1	Randolph	Moberly, 1 mi.E.	22-VI-1972	Riley R.G.		EGRC
2	Randolph	Moberly, 1 mi.E.	29-VII-1972	Riley T.J.		EGRC
1	Randolph	Moberly, 1 mi.E.	23-VII-1973	Riley R.G.		EGRC
3	Randolph	Moberly, 1 mi.E.	24-VII-1973	Riley R.G.		EGRC
2	Randolph	Moberly, 1 mi.E.	25-VIII-1973	Riley R.G.		EGRC
2	Randolph	Moberly, 1 mi.E.	29-VI-1975	Riley E.G.	blacklight	UMRM
1	Ripley	Doniphon	17-VI-1972	Hardy H.R.	white light	CDAE
1	Scott	Chaffee	21-VI-1919	Painter H.R.		USNM
1	Scott	Chaffee	21-VI-1919	Painter H.R.	fungus covered stump	CNCI
1	St. Louis	Howard Bend	22-VI-1937	Gordon W.M.		CUIC
10	St. Louis	Ranken	23-VI-1935	Meiner E.P.		UMRM
3	St. Louis	St. Louis				ICCM
2	St. Louis	St. Louis	24-VI-1936		USDA trapa	UMRM
4	St. Louis	Jefferson Barracks	14-IV-1919	Roelofs P.J.		ISNB
1	Stoddard	Puxico, 4 mi.W, Mingo Wldlf.Ref.	15-IV-1982	Heitzman R.L.	blacklight	FSCA
2	Wayne	Williamsville	24-IV-1947	Becker E.C.	under bark	UMRM

USA: Nebraska

1		Malcolm	12-VII-1909	Oertal C.R.		MC2C
2	Adams		14-VII-1986	Springer C.A.	UV light	ETUC
1	Adams		5-VII-1985	Milligan W.		ETUC
1	Adams		4-VII-1987	Springer C.A.	UV light	ETUC
8	Call	Louisville, Camp Kitaki	4-V-1987			DEUN
3	Colfax	Schuyler, 4 mi.W	8-VII-1992	Schmidt D.A.	under bark of rotten log	DEUN
13	Dawson		5-VIII-1989	Springer C.A.		HCCA
7	Dawson	Gothenburg	11-VIII-1988	Springer C.A.	UV light	HCCA
3	Dawson	Lexington	28-IV-1968	Ratcliffe B.C.	under bark	UAIC
7	Dawson	Lexington	28-VI-1968	Ratcliffe B.C.		LACH

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USA: Nebraska (Cont.)					
5	Fillmore	Fairmont	4-VIII-1912	Demming G.W.	DEUN
5	Fillmore	Fairmont	4-VIII-1912	Demming G.W.	DEUN
2	Jefferson		11-13-VI-1989	Springer C.A.	HCCA
4	Lancaster	Hickman	19-VI-1969	Ratcliffe B.C.	LACM
1	Lancaster	Lincoln			DEUN
1	Lancaster	Lincoln	XII-1911		DEUN
1	Lincoln	North Platte	3-IX-1966	Ratcliffe B.C.	LACM
4	Nemaha	Peru	V-1907		DEUN
4	Nemaha	Peru	V-1967		DEUN
4	Nuckolls	Superior, 4 mi.E.	26-VII-1990	Springer C.A.	HCCA
2	Sarpy	Fontenelle Forest	11-VII-1969	Ratcliffe B.C.	LACM
USA: New Jersey					
1		Springfield	VII-1910		AMNH
1		Springfield	IX-1913	Weiss H.B.	AMNH
1		Westville	IV-1924	Liebeck	MCZC
1	Bergen		2-VII-1968		TAMU
1	Cape May	Avalon		Kamp	ANSP
1	Mercer	Princeton	7-IX	Doolittle	USNM
USA: New Mexico					
1	Hidalgo	Animas Mts., Godfrey Place	8-VII-1981	Dobrott S.	1706m SMCC
3	Hidalgo	Guadalupe Canyon	7-VIII-1967	Smith J.W.	TAMU
10	Hidalgo	Guadalupe Canyon	19-VIII-1967	Andrews F.G.	CDAE
USA: New York					
1					AMNH
5					HNHM
16					LACM
1		Bridgeport	13-VII-1915		USNM
1		Chaffee	17-VII-1939	Franclemont J.G.	FSCA
1	Cayuga	Fair Haven Beach St.Pk.	8-VI-1968	Eickwort G. & K.	CUIC
1	Jefferson	Picton Island, Clayton	15-VII-1958	Heineman B.	AMNH
4	Tompkins	McLean Bogs Reserve	18-VI-1953	Spilman T.J.	CUIC
2	Tompkins	McLean Bogs Reserve	20-VI-1953	Spilman T.J.	CUIC
1	Tompkins	McLean Bogs Reserve	21-VI-1953	Spilman T.J.	CUIC
4	Wayne	Newark	1962	Lency	USNM
2	Wayne	Newark	1963	Lency	HNHM
USA: North Carolina					
1		Fletcher	13-V-1970	Lampert L.L.	light JMCC
1		Southern Knotlis Island	12-VII-1959	Morris J.P.E.	grass clumps on boards USNM
1	Dare	Kill Devil Hills	23-26-V-1952	Arnett R.H.Jr.	woods at light FSCA
1	Durham	Durham	VI-1971	Hughes S.	blacklight CDAE
6	Edgecombe	Tarboro 10 km NNE	7-VII-1983	Steiner E.	USNM
1	Waywood	Lake Junalaska	6-VII-1983	Weems H.V.Jr.	FSCA
6	Moore	Southern Pines			INHS
1	Moore	Southern Pines	17-XI-1928	Manee	INHS
1	Wake		20-IV-1955	Habeck D.H.	FSCA
USA: North Dakota					
1	Cass		3-V-1962	Gordon R.	USNM
7	Cass		16-IX-1962	Gordon R.	USNM
USA: Ohio					
1		John Bryan St.Pk.	24-VIII-1969	Pool G.J.	NHML
1		St. Marys		O'Brien L. & C.W.	USNM
3	Athens	Athens	25-III-1936	H.B.	FMNH
2	Clermont		23-VII-1937	Wright J.	OSUC
1	Delaware		VI-1921	Knoll D.J. & J.N.	UMMZ
1	Fairfield	Lancaster, 10 mi.S., Clear Creek	10-V-1974	Janus C.A.	OSUC
2	Franklin	Canal Winchester	23-VII-1985	Clark S.M.	PWKC
1	Franklin	Columbus	5-V-1924	Everly R.T.	UAIC
1	Franklin	Columbus	2-VI-1937	Markos B.G.	DENH
1	Franklin	Columbus	14-III-1961		LACM
1	Franklin	Columbus	21-VII-1986	Clark S.M.	PWKC
1	Franklin	Westerville	4-V-1949	Sleeper E.L.	OSUC
1	Guernaey		6-IX-1963		OSUC
3	Hamilton		3-VI-1935	Everly R.T.	OSUC
1	Hamilton	Cincinnati			Schff. coll. CASC
4	Hamilton	Cincinnati			Holland coll. ICCM
4	Hamilton	Cincinnati		Braun	ANSP
1	Hamilton	Cincinnati	29-IV-1901	Braun	ANSP
2	Hamilton	Cincinnati	22-VIII-1901	Braun	ANSP
1	Hamilton	Cincinnati	IV-1934		UMMZ
1	Hamilton	Cincinnati	VII-1935		UMMZ
1	Hocking		6-II-1961	Robertson J.	LACM
1	Knox		5-VI-1942	Stroecker H.F.	FSCA
1	Knox	Gambier	17-VII-1940		CNCI
4	Knox	Gambier	17-VII-1940		FSCA
1	Knox	Gambier	17-VII-1940		LACM
1	Licking	Reynoldsburg	16-IV-VI-1983	Miller R.S.	blacklight TKPC
1	Licking	Reynoldsburg	14-IV-VI-1989	Miller R.S.	blacklight TKPC
1	Muskingum				OSUC
1	Muskingum		15-V-1935		OSUC
6	Ottawa	S.Basa Island, Put-in-Bay	5-VII-1983	Nichols S.W.	reared ex fungus CUIC
1	Paulding	Paulding Twp.Sec.28, Flat Rock Creek	21-V-1934	Everly R.T.	OSUC
1	Richland		6-VIII-1968		OSUC
1	Ross		23-V-1967	Moore F.J.	OSUC
1	Seneca		7-IV-1964		OSUC
1	Tusasawas		11-VI-1974	Wheeler Q.D.	CUIC
1	Wayne	Wooster	27-V-1899		OSUC

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USA: Oklahoma

1		Oklahoma City	10-VIII-1953	Deonier C.E.		AMNH
1	Choctaw	Sawyer, Kiamichi floodplain	17-VI-1968	Suter W.	subcortical log	WSIC
1	Cleveland	Norman, Oliver Woods	30-VI-1969	Suter W.	under bark	WSIC
1	Johnston	Tishomingo	26-IV-1975	Shepard W.D.	bracket fungus	JLCC
1	Latimer		VIII-1982	Stephan K.		FSCA
2	Latimer		IV-1983	Stephan K.	mushroom on log	FSCA
1	Latimer		VI-1983	Stephan K.		FSCA
1	Latimer		VII-1983	Stephan K.	blacklight	FSCA
2	Latimer		X-1983	Stephan K.	under oak bark	FSCA
2	Latimer		IV-1985	Stephan K.	mushroom on log	FSCA
1	Latimer		IV-1986	Stephan K.		FSCA
2	Latimer		V-1986	Stephan K.		FSCA
13	Latimer	Red Oak, 3.5 mi.W.	19-21-V-1989	Kovarik & Stephen		PESC
1	Latimer	Red Oak, 5 mi.W.	2-IV-1978	Stephan K.		FSCA
3	Latimer	Red Oak, 5 mi.W.	27-IV-1978	Stephan K.		FSCA
1	Marshall	Enos	26-VII	Miller G.A.		UMRM
1	Marshall	Lake Texoma St.Pk.	18-20-VI-1989	Morris R.F.		RFMC
1	Marshall	UOBS, Lake Texoma (Willis)	18-IV-1968	Suter W.	at light	WSIC
1	Marshall	UOBS, Lake Texoma (Willis)	16-VI-1968	Suter W.	at light	WSIC
1	Marshall	UOBS, Lake Texoma (Willis)	11-VI-1969	Arnett R.H.Jr.	at light	WSIC
1	Marshall	UOBS, Lake Texoma (Willis)	30-VI-1969	Suter W.	at light	WSIC
1	Okfuskee	Okemah, 7 mi.NE	5-VII-1972	Johnson J.		AMNH
3	Okfuskee	Okemah, 7 mi.NE, Buckeye Creek	7-IX-1972	Johnson J.		AMNH
1	Payne		1962	Reinert J.		USNM
1	Pottawatomie		2-VI-1974			ICCM
1	Woods	Alva	7-V-1965	Cochran J.	on dead tree	ASUT

USA: Pennsylvania

1						CASC
1						MCZC
2		Angora	20-VI	Green J.W.		CASC
1		Atglen	19-VII-1977	Weaver J.S.		DENH
2		Philadelphia	XI-1928	Wenzel R.W.		OSUC
2		Philadelphia	23-VI-1980	Taylor P.	blacklight	CUIC
10	Allegheny					ICCM
6	Allegheny		9-VI-1989	Klages E.A.		CUIC
2	Allegheny	Pittsburg	VIII		Klages coll.	ICCM
12	Allegheny	Pittsburg	IX		Klages coll.	ICCM
1	Allegheny	Pittsburg	12-VI		Klages coll.	ICCM
1	Allegheny	Pittsburg	VI-1902		Klages coll.	ICCM
1	Bucks		22-IX	Bowman J.R.		ICCM
1	Bucks	New Hope	14-V-1949	Cazier M.H.		AMNH
1	Dauphin	Harrisburg	14-VIII-1910	Kirk H.B.		FMNH
1	Dauphin	Harrisburg	14-VIII-1910	Kirk H.B.		MCZC
1	Dauphin	Harrisburg	14-VIII-1916	Kirk H.B.		CUIC
3	Greene	5 mi.SSW Finley Enlow Fork	18-V-1989	Rawlins J.E.	260m	ICCM
1	Lancaster	Welsh Mt., New Holland watershed area	20-VI-1978	Weaver J.S.		DENH
1	Lebanon	Palmyra	28-V-1988	Yackley W.H.		ICCM
2	Westmoreland	Jeanette	10-VI	Klages H.G.	Klages coll.	ICCM
1	Westmoreland	Jeanette	20-VI		Klages coll.	ICCM
1	Westmoreland	Jeanette	6-VII		Klages coll.	ICCM
2	Westmoreland	Jeanette	10-VII	Klages H.G.	Klages coll.	ICCM
3	Westmoreland	Jeanette	21-VII		Klages coll.	ICCM
3	Westmoreland	Jeanette	28-VII	Klages H.G.	Klages coll.	ICCM
2	Westmoreland	Jeanette	2-IX	Klages H.G.	Klages coll.	ICCM
5	Westmoreland	Jeanette	4-IX	Klages H.G.	Klages coll.	ICCM
3	Westmoreland	Jeanette	6-IX	Klages H.G.	Klages coll.	ICCM
1	Westmoreland	Jeanette	7-IX		Klages coll.	ICCM
5	Westmoreland	Jeanette	9-IX		Klages coll.	ICCM
2	Westmoreland	Jeanette	10-IX	Klages H.G.	Klages coll.	ICCM
1	Westmoreland	Jeanette	11-IX	Klages H.G.	Klages coll.	ICCM
2	Westmoreland	Jeanette	14-IX		Klages coll.	ICCM
2	Westmoreland	Jeanette	21-IX		Klages coll.	ICCM
1	Westmoreland	Jeanette	10-X	Klages H.G.	Klages coll.	ICCM
4	Westmoreland	Jeanette	VII		Klages coll.	ICCM
2	Westmoreland	Jeanette	IX-1921	Klages H.G.		CNCI
1	York	Davidsburg, 5 mi.NW	23-VII-1971	Spangler P.J.	at light	USNM
3	York	Picketts, Wash.Twp.	22-VII-1951	Spangler P.J.	at light	USNM
3	York	Picketts, Wash.Twp.	26-VII-1951	Spangler P.J.		USNM
1	York	Wash.Twp.	23-VI-1951	Spangler P.J.		USNM
1	York	Wash.Twp.	24-VI-1951	Spangler P.J.		USNM

USA: South Carolina

1		Jalapa	12-V-1968	Lampert L.L.	light	JMCC
1	Florence	Florence	24-VII-1930	Cartwright O.L.		CUCC
8	Greenwood	Ware Shoals	12-VI-1943	Nicolay A.		USNM
1	Murray		2-IX	Bowman J.R.		ICCM
1	Pickens	Cherry Farm Insec.	27-VI-1984	Hoffman K.	blacklight trap	CUCC
1	Pickens	Clemson	30-IV-1956	Donavan D.	light trap	CUCC
2	Pickens	Clemson	30-V-1958	Fox R.C.		MSUC
1	Pickens	Clemson	24-VII-1960		light trap	CUCC
1	Pickens	Clemson	30-IV-1975	Ables J.R.	UV light	TAMU
1	Pickens	Clemson College	21-V-1928	Berly J.A.		CUCC
1	Pickens	Clemson College	VI-1931	Dunavan D.		CUCC
1	Pickens	Clemson College	14-VI-1933	Cartwright O.L.		CUCC
1	Pickens	Clemson College	25-VII-1933	Cartwright C.L.		USNM
1	Richland	Columbia	18-III-1946	Cartwright O.L.		CUCC
1	Sumter	Sumter	20-X-1926			CUIC
1	Sumter	Sumter	20-IV-1973	Choate P.M.		DENH

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No.	County	Locality	Date	Collr.	El. Data	Rep.
<u>USA: South Dakota</u>						
1		Vermillion	28-V-1946	Severin H.C.		SDSU
3		Springfield	18-VI-1930	Gilbertson G.I.		SDSU
<u>USA: Tennessee</u>						
1	Anderson	Oak Ridge	4-V-1962	Lindsley D.		CDAE
1	Cannon	Weedbury	27-IV-1990	Ford E.J.	light trap	EJFC
1	Dekalb		1-VIII-1975	Kondratieff B.		VPIC
1	Greene	Greeneville	20-IV-1955	Dozier B.K.	light trap	FSCA
1	Henderson	Natchez Trace St.For.	12-V-1968	Baker N.T.		MSUC
1	Lake	Reelfoot Lake	2-VI-1954	Knoll D.J. & J.N.		OSUC
2	Lake	Tiptonville	20-IV-1935			FSCA
6	Monroe	Jackson	7-VI-1970	Wharton B.		TAMU
1	Montgomery	Clarksville	13-VII-1915			OSUC
1	Rutherford	Murphreesboro, Todd Lake	20-V-1945	Wright M.		NHML
1	Shelby	Shelby For.St.Pk.	7-VI-1971	Wildie B.		MSUC
1	Warren	Morrison	9-IV-1921	Bottimer L.J.		CNCI
<u>USA: Texas</u>						
2						ANSP
1						CUIC
1						FMNH
2						LACM
8						MCZC
1		Armstrong Ranch	16-IX-1960			CNCI
2		Camp Bullis	19-VI-1963	Reinert J.F.		USNM
3	Anderson		27-XI-1959	Burke H.R.		TAMU
1	Anderson	Tennessee Colonys	4-5-III-1967	Blanchard A.		USNM
1	Anderson	Tennessee Colony	12-V-1969	Blanchard A. & M.E.		USNM
1	Bastrop	Smithfield, 5 km N.	31-III-1983	Rawlings J.E.		ICCM
2	Bexar	San Antonio	22-III-1958	Lawrence J.F.		MCZC
1	Bexar	San Antonio	22-III-1958	Lawrence J.F.		TAMU
1	Bexar	San Antonio	31-III-1979	Hoebeke & Carter		CUIC
2	Bexar	San Antonio	22-V-1981	Thomas R.R.		TAMU
1	Bosque	Clifton	31-V-1907			UASM
2	Brazos		20-III-1957			TAMU
1	Brazos		8-VII-1959	Burke H.R.	light trap	TAMU
1	Brazos		22-VII-1960			TAMU
1	Brazos		9-IX-1960	Welso S.G.		MSUC
2	Brazos	Bryan	8-IV-1968	Schaffner J.R.	at light	TAMU
1	Brazos	Bryan	25-V-1974	Schaffner J.C.	at light	TAMU
4	Brazos	Bryan, 1.5 mi.W.	28-31-III-1980	Turnbow R.H.	blacklight trap	RHTC
4	Brazos	College Station	11-IV-1928			TAMU
1	Brazos	College Station	9-V-1930	Jones S.E.	light trap	TAMU
1	Brazos	College Station	19-V-1933	Rienhard H.J.	light trap	TAMU
1	Brazos	College Station	12-IV-1960	Welso S.G.		MSUC
1	Brazos	College Station	21-XI-1962	Sterling W.L.		TAMU
1	Brazos	College Station	26-X-1963	Schaffner J.C.	blacklight	TAMU
2	Brazos	College Station	1-VI-1970	Board V.V.	blacklight	TAMU
1	Brazos	College Station	10-V-1970	Murray R.R.		TAMU
1	Brazos	College Station	16-III-1974	Ashe J.S.		TAMU
1	Brazos	College Station	12-18-IV-1975	Jackman J.A.	at light	TAMU
2	Brazos	College Station	15-III-1977	Jackman J.A.		TAMU
1	Brazos	College Station	3-IX-1978	Peigler R.S.	at light	TAMU
1	Brazos	College Station	18-III-1979	Agnew C.W.		TAMU
1	Brazos	College Station	31-III-1979	Agnew C.W.		TAMU
1	Brazos	College Station	2-12-III-1982	Wharton R.	Malaise trap	TAMU
1	Brazos	College Station	16-IV-1982	Kovarik P.W.	incandescent light	TAMU
1	Brazos	Edge	27-X-1974	Brooks G.W.		PWKC
1	Brazos	Edge	16-IV-1978	Bagar D.S.		TAMU
2	Caldwell	Luling, Palmetto Swamp St.Pk.	15-IX-1942	Ross E.S.		CASC
1	Cameroon		19-X-1961	Eads R.B.		CSUC
1	Cameroon	Brownsville	15-V-1935	Knoll J.N.		OSUC
1	Cameroon	Brownsville	12-VI-1968	Board V.V.		TAMU
3	Cameroon	Brownsville	15-III-1972	Graham H.M.	light trap	MSUC
1	Cameroon	Los Fresnos	15-III-1972	Graham H.M.	light trap	MSUC
1	Cameroon	Sabal Palm Grove Sanct., nr.S most	19-20-VI-1981	Turnbow R.H.	blacklight	TAMU
1	Cass	Atlanta	26-V-1964	Stephan K.		FSCA
3	Colorado		14-IV-1922	Wiley B.		SEMCC
1	Comal	Honey Creek Nat. Conservancy	18-III-1984	Cicero J.M.		JMCC
1	Comal	New Braunfels			Schff.coll.	CASC
1	Crosby		29-30-IV-1963	Beamer R.B. & L.O.		SEMCC
2	Dallas		12-III-1939	Maxwell R.E.		INHS
1	Dallas		12-III-1939	Maxwell R.E.		UASM
10	Dallas	Dallas				MCZC
1	Dallas	Dallas				2MHB
6	Fannin		10-IV-1938	Strandtmann R.W.		OSUC
1	Gonzales	Gonzales	4-IV-1920	D.B.		ISUI
1	Gonzales	Palmetto St.Pk.	14-V-1985	Rawlins J.E.		ICCM
2	Gonzales	Gonzales, Palmetto St.Pk.	1-IV-1979	Hoebeke & Carter		CUIC
1	Hardin	Beech Creek	19-III-1978	Hagen & Andow		CUIC
1	Hardin	Beech Creek	23-III-1978	Hagen & Andow		CUIC
10	Harris	Houston	22-V-1905	Shoemaker F.H.		DEUN
1	Harris	Katy	II-1971	Stephan K.		FSCA
1	Hidalgo	Bentsen Rio Grande St.Pk.	17-V-1972	Giesbert E.		LACM
2	Hidalgo	Bentsen Rio Grande St.Pk.	18-24-VII-1972			FMNH
1	Hidalgo	Bentsen Rio Grande St.Pk.	26-28-VI-1973			NCSU
2	Hidalgo	Bentsen Rio Grande St.Pk.	VII-1975			USNM
2	Hidalgo	Bentsen Rio Grande St.Pk.	16-VII-1975	Wheeler Q.D.		CUIC
1	Hidalgo	Bentsen Rio Grand St.Pk.	17-IV-1984	Nelson C.H.	UV light	GRNC
1	Hidalgo	Mercedes	22-23-I-1974	Moody S.	leaf litter	TAMU
1	Jasper	B.A.Stenhagen Lake	28-V-1977	Riley R.G.	blacklight	EGRC

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Ischyry quadripunctatus quadripunctatus (Olivier) (Cont.)

USA: Texas (Cont.)

1	Jasper	Town Bluff (Dam B)	6-VI-1967	Blanchard A. & M.E.		USNM
1	Jeff Davis	Davis Mt. St. Pk.	18-21-VII-1973	Hovore F.T.		FSCA
2	Jeff Davis	Ft. Davis	4-VI-1950	Johnston E.C.		CNCI
2	Jeff Davis	Ft. Davis	30-V-1959	Howden & Becker		CNCI
1	Jeff Davis	Ft. Davis, Limpia Canyon St. Pk.	16-VII-1969	Suter W.	at light	WSIC
1	Jeff Davis	Ft. Davis, Limpia Canyon	26-VII-1979	Wappes J.E.		JEWC
1	Jeff Davis	Prude Ranch	16-VI-1988	Morria R.F.		RFMC
1	Kerr	Kerrville, Guadeloupe River	25-V-1983	Olson C.		UAIC
1	Kimble	Junction	24-VIII-1958	Weems H.V. Jr.	at light	FSCA
1	Limestone	Mexia	2-VII-1937		light trap	TAMU
1	Limestone	Mexia, St. Pk. Sur. [?]	15-X-1937		light trap	TAMU
3	Lubbock	Lubbock	3-IX-1975	Bush F.		PESC
1	Montgomery	The Woodlands	18-VI-1977	Wappes J.E.		JEWC
1	Montgomery	The Woodlands	1-6-VII-1977	Wappes J.E.		FSCA
1	Montgomery	The Woodlands	1-6-VII-1977	Wappes J.E.		JEWC
1	Montgomery	The Woodlands	20-26-VII-1977	Wappes J.E.		FSCA
1	Montgomery	The Woodlands	4-7-IX-1977	Wappes J.E.		JEWC
1	Montgomery	The Woodlands	19-III-1978	Wappes J.E.		TAMU
1	Montgomery	The Woodlands	20-23-IV-1978	Wappes J.E.		TAMU
1	Montgomery	The Woodlands	12-XI-1978	Wappes J.E.		JEWC
1	Montgomery	The Woodlands	31-III-1979	Wappes J.E.		JEWC
1	Montgomery	The Woodlands	31-III-1979	Wappes J.E.		TAMU
1	Montgomery	The Woodlands	19-V-1979	Wappes J.E.		FSCA
1	Montgomery	The Woodlands	1-IV-1980	Wappes J.E.		JEWC
1	Morris	Daingerfield	13-VII-1937			TAMU
1	Morris	Daingerfield	14-VII-1937			TAMU
1	Morris	Daingerfield	18-VII-1937			TAMU
6	Nacogdoches	Lufkin, 15.4 mi. E. Etoile Pk.	28-VII-1975	Ashe J.S.		TAMU
1	Panola	Carthage	8-V-1952	Cazier M.		AMNH
2	Real	Leakey, 6 mi. SE	1-VII-1971	Nelson G.H.		GHNC
1	San Patricio	Sinton, Welder Refuge	18-V-1976	Gordon R.	at light	USNM
1	Smith	Tyler St. Pk.	9-VII-1968	Heitzman R.	UV light	FSCA
1	Sterling	Water City, 8 mi. W.	14-VI-1987	Morris R.F.		RFMC
2	Travis	Austin				USNM
1	Travis	Austin	X-1900			USNM
1	Travis	Austin	11-16-X-1985	Rawlins & Davidson	140m	ICCM
1	Tyler	Town Bluff (Dam B)	11-III-1966			LACM
3	Tyler	Town Bluff (Dam B)	3-III-1967	Blanchard A.	blacklight	USNM
20	Tyler	Warren	17-IV-1971	Blanchard A. & M.E.		USNM
2	Uvalde	Concan	6-VII-1936	Beamer J.D.		UASM
4	Victoria	Victoria	29-IV-1916	Mitchel J.D.	rotten log	USNM
1	Walker	Stubblefield Lake	3-IV-1977	Peigler R.S.		TAMU
2	Walker	Stubblefield Lake St. Rec Area	10-XII-1980	Kovarik P.W.		TAMU
1	Williamson	Georgetown	17-IV-1937	Milne L.J.		DENH
1	Williamson	Georgetown	28-IV-1937	Milne L.J.		DENH
1	Williamson	Taylor	25-III-1963	Hafernik J.E.		TAMU
1	Williamson	Taylor	12-V-1965	Hafernik J.E.		TAMU
1	Williamson	Taylor	18-V-1968	Hafernik J.E.		TAMU

USA: Virginia

4						MC2C
4		Glencarlyn	14-VI-1910			USNM
1	Fairfax	Alexandria	14-VI-1910			CUIC
2	Fairfax	Alexandria	14-VI-1910	Shoemaker E.		AMNH
3	Fairfax	Alexandria	18-VI-1910			AMNH
3	Fairfax	Alexandria	18-VI-1910			CUIC
4	Fairfax	Mt. Vernon	23-VI-1916			UASM
1	Fairfax	Mt. Vernon	26-VI-1916			CUIC
1	Fairfax	Mt. Vernon	15-VI-1917	Nicolay A.		USNM
1	Fairfax	Mt. Vernon	11-VII-1942	Nicolay A.		USNM
1	Isle Wright	Holland	2-VIII-1924	Burt J.G.	blacklight trap	VPIC
1	Isle Wright	Holland	25-VII-1955			VPIC
11	James City	Norge	9-VIII-1942	Schwab E.M.		USNM
1	Montgomery	Longshop	29-V-1962	Vockerth J.R.		CNCI
1	Nansemond	Lake Drummond, Dismal Swamp	7-8-VII-1962	Gurney A.B.		USNM
4	Nelson		27-VI-1919	Robinson W.		USNM

USA: West Virginia

2	Kanawha	Charleston	23-V-1987	Thomas M.C.	at light	PPCD
1	Kanawha	Charleston	29-V-1987	Thomas M.C.	at light	PPCD
3	Kanawha	Guthrie	15-V-1990	Clark S.M.		PPCD
1	Kanawha	Kanawha	22-V-1992	Clark S.M.		PPCD
2	Kanawha	Saint Albans	15-V-1970	Cole A.E.	blacklight	PPCD
1	Logan	Chief Logan St. Pk.	14-IX-1990	Clark S.M.		PPCD
2	Mason	Lakin	19-V-1989	Hagenbuch B.E.	blacklight	PPCD
1	Mason	McClintic Wldlf. Sta.	6-VIII-1980	Coffman C.C.	malaise trap	PPCD
1	Ohio	Valley Grove	29-V-1989	Hagenbuch B.E.		PPCD
1	Preston		16-V-1974	Miller A.R.	blacklight	PPCD

USA: Wisconsin

1	Door		23-VI-1933			UWEM
1	Rock		1896	Chope E.B.		FMNH
1	Wood	Griffith St. Nursery	28-VI-1947	Shenefelt R.D.		UWEM
1	Wood	Griffith St. Nursery	11-VII-1947	Shenefelt R.D.		UWEM
1	Wood	Griffith St. Nursery	29-VII-1947	Shenefelt R.D.		UWEM

Venezuela

1						NHMB
1						NHML
1						ZMHB

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Venezuela: Bolivar							
4		Suapure, Cañra R.	13-21-VI-1899	Klages E.A.			CUIC
Venezuela: Portuguesa							
1		Guanare	12-IX-1957	Malking B.		at light	CASC
Venezuela: Zulia							
1		Embalse Cachiri	18-VI-1976	Menke A.S.			USNM
<i>Ischyry quadripunctatus chiasticus</i> Boyle							
Mexico: Chihuahua							
13		Los Chinacas, 4 mi.N.,	9-10-VII-1989	McCleve S.	4910'	UV light	PESC
2		Yecora, Sonora, 6 mi.S	2-3-VII-1990	McCleve S.	5740'	UV light	PESC
Mexico: Morelos							
1		Cuernavaca, 4.4 mi.E	27-29-VII-1976	Peigler et al.		at light	TAMU
Mexico: Nayarit							
1		Compostela	27-VII-1954	Cazier M.			AMNH
Mexico: Sinaloa							
1		Venedio	17-VI-1918	Van Dyke			CASC
1		Venodio	17-VI-1918				USNM
Mexico: Sonora							
2		Coyote, 7 km.N	26-VI-1981	McCleve S.	1200m	at light	SMCC
1		Huicoche, 3.2 mi. NW	11-13-VII-1989	McCleve S.	5170'	UV light	SMCC
1		Imuris, 9 mi.NNE	7-11-VII-1958	Alcorn J.D.			SEMCC
3		Moctezuma, 17 km.SW	21-28-VII-1980	McCleve S.	944m	at light	SMCC
2		Moctezuma, 17 km.SW	27-VI-1981	McCleve S.	944m	at light	SMCC
1		Palm Canyon, 17 mi. E.Magdalen	4-VIII-1981	Thomas D.			UAIC
2		Sierra los Ajon, N.end, Canyon de Evana	28-VIII-1970	Roth V.			AMNH
4		Yecora, 4 mi. NE	30-VI-1990	McCleve S.	5400'	UV light	SMCC
USA: Arizona							
1		Huachuca Mts.	1-VIII-1927	Readio P.A.			CNCI
1		Huachuca Mts.	19-VIII-1950	Knull D.J.			OSUC
2		Huachuca Mts., Sunnyside Canyon	1-IX-1970	Stephan K.			FSCA
1		Santa Catalina Mts., Molino Canyon	20-IX-1969	Stephan K.			FSCA
1		Santa Catalina Mts., Pepper Sauce Canyon	17-VIII-1924	Martin J.O.			CNCI
4	Cochise	Aravaipa Canyon	16-19-VII-1973	Goodrich M.A.			EIUC
1	Cochise	Chiricahua Mts, Portal	13-VIII-1971	Knull D.J.			OSUC
1	Cochise	Chiricahua Mts, nr. Portal	9-VIII-1966	Beard R.G.		UV light	CUIC
1	Cochise	Chiricahua Mts., Paradise	22-VIII-1927	Kusche J.A.	5000-6000'		CASC
1	Cochise	Chiricahua Mts., Stewart Campground	6-VII-1977	Nelson G.H.		UV light	GHNC
1	Cochise	Chiricahua Mts., Stewart Campground	19-VII-1986	Nelson G.H.		UV light	GHNC
1	Cochise	Chiricahua Mts., Sunnyflat	28-29-VII-1989	Bousquet Y.			CNCI
1	Cochise	Douglas	30-VIII-1959	Russell J.H.		at light	USNM
1	Cochise	Guadalupe Mts., Guadalupe Canyon	24-VIII-1978	Olson C.		blacklight	UAIC
1	Cochise	Guadalupe Canyon	VIII-1972				USNM
14	Cochise	Guadalupe Canyon	1-VII-1976	Jump P.	4300'		LACM
1	Cochise	Guadalupe Canyon	1-VII-1976	McCleve S.		at light	UAIC
1	Cochise	Guadalupe Canyon	8-VII-1976	McCleve S.		at light	AMNH
1	Cochise	Guadalupe Canyon	15-VII-1976	McCleve S.		at light	AMNH
1	Cochise	Guadalupe Canyon	30-VI-1977	McCleve S.		at light	AMNH
1	Cochise	Guadalupe Canyon	1-VII-1977	McCleve S.		at light	AMNH
1	Cochise	Guadalupe Canyon	2-VIII-1977	McCleve S.		at light	AMNH
3	Cochise	Guadalupe Canyon	2-VIII-1977	McCleve S.		at light	SMCC
1	Cochise	Guadalupe Canyon	8-VIII-1983	Olson C.			UAIC
4	Cochise	Guadalupe Canyon, 30 mi.E.Douglas	25-VII-1985	Lago P.			PKLC
3	Cochise	Guadalupe Canyon, 32 mi.E.Douglas	14-VIII-1967	Beard R.G.		UV light	CUIC
1	Cochise	Guadalupe Canyon, 1.3 mi.NE of entry	12-VII-1966	Beard R.G.	4200'	UV light	CUIC
8	Cochise	Huachuca Mts., Bear Canyon	8-IX-1958	Menke & Stange			LACM
1	Cochise	Huachuca Mts., Ash Canyon	7-VIII-1991	Valentine B.D.			CDAE
1	Cochise	Huachuca Mts., Ash Canyon	10-VIII-1991	Valentine B.D.	5100'		CDAE
1	Cochise	Huachuca Mts., Ash Canyon Rd.	2-5-VIII-1989	Bousquet Y.			CNCI
1	Cochise	Peloncilla Mts.	31-VII-1975	McCleve S.		at light	SMCC
10	Cochise	Peloncilla Mts.	1-VII-1976	McCleve S.		at light	SMCC
1	Cochise	Peloncilla Mts.	26-VI-1977	McCleve S.		at light	SMCC
1	Cochise	Peloncilla Mts.	15-VII-1978	McCleve S.	1300m	at light	SMCC
1	Cochise	Peloncilla Mts.	6-VIII-1981	McCleve S.	1300m	at light	SMCC
2	Cochise	Peloncilla Mts.	17-VIII-1981	McCleve S.	1300m	at light	SMCC
6	Cochise	Portal	3-VIII-1964	Puckle J.	4700'	at light	ASUT
1	Cochise	Portal	20-VII-1965	Rosenberg			USNM
1	Cochise	Portal	VII-1968	Lency			USNM
1	Cochise	Portal, 5 mi.W.	25-VII-1969	Kosztarab M.	5400'	blacklight	VPIC
1	Cochise	Sierra Vista	29-VII-1963	Sternitzky R.F.			CNCI
1	Coconino	Sedona	26-VI-1957	Butler G.			UAIC
1	Gila	Globe	8-VIII-1949	Werner F.G.			UAIC
1	Gila	Globe	12-VIII-1952	Parker F.H.		at light	UAIC
1	Gila	Globe	14-VIII-1952	Parker F.H.		at light	UAIC
3	Gila	Globe	17-VIII-1952	Parker F.H.		at light	UAIC
1	Gila	Globe	23-VIII-1952	Parker F.H.		at light	UAIC
1	Gila	Globe	24-VII-1955	Parker F.S.			UAIC
1	Gila	Globe	23-VIII-1957	Parker F.M.		at light	UAIC
1	Gila	Globe	31-VII-1983	Parker F.S.			UAIC
1	Gila	Roosevelt, 12 mi.NE, Tonto Nat. For.	VII-1972	Rosenburg			USNM
1	Gila	San Carlos	11-VII-1936	Parker			UAIC
1	Graham	Aravaipa Canyon	8-12-VIII-1975	McCleve S.		at light	AAIC
2	Graham	Aravaipa Canyon	12-VIII-1975	McCleve S.		at light	SMCC
3	Graham	Aravaipa Canyon	24-VII-1976	Campbell J.M.	900m		CNCI
3	Graham	Aravaipa Canyon	24-VII-1976	Chandler D.S.	3050'	UV light	UAIC
1	Graham	Aravaipa Canyon, 17.7 km.N.Klondyke	24-VII-1976	Ball G.E.		UV light	UASM
10	Graham	Aravaipa Canyon, Turkey Creek	24-27-VII-1989	Bousquet Y.			CNCI
2	Graham	Turkey Creek 1 mi. S. Arav.Ck.	11-VIII-1975	McCleve S.		at light	SMCC

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USA: Arizona (Cont.)

1	Greenlee	Eagle Creek, Honeymoon Cpqd.	27-VIII-1979	Olson C.		UAIC
2	Maricopa	Sunflower, Sycamore Creek	18-VII-1985	Lago P.		PKLC
3	Pima	Arivaca, 4 mi.S., Fraguita Wash	10-VII-1977	McCleve S.	at light	SMCC
1	Pima	Arivaca, 5 mi.W.	4-IX-1965	Jump P.M.		LACM
6	Pima	Baboquivari Mts.		Snow F.H.		SEMC
3	Pima	Baboquivari Mts.	1924	Poling O.C.		CUIC
1	Pima	Baboquivari Mts., Brown's Canyon	8-VI-1952	Cazier M.		AMNH
1	Pima	Baboquivari Mts., Brown's Canyon	28-VII-1952	Leech H.B.		CASC
1	Pima	Baboquivari Mts., Brown's Canyon	29-VII-1952	Leech H.B.		CASC
1	Pima	Baboquivari Mts., Brown's Canyon	30-VII-1952	Leach H.B.		UASM
1	Pima	Baboquivari Mts., Brown's Canyon	30-VII-1952	Leech H.B.		AMNH
1	Pima	Baboquivari Mts., Brown's Canyon	30-VII-1952	Leech H.B.		CASC
1	Pima	Baboquivari Mts., Brown's Canyon	4-VIII-1962	Werner F.G.		UAIC
1	Pima	Baboquivari Mts., Sabino Canyon	31-VII-1979	McCleve S.	1143m at light	SMCC
2	Pima	Madera Canyon	1-2-IX-1954	Menke & Stange		LACM
1	Pima	Madera Canyon	7-11-VII-1973	Wappes J.E.		JEWC
8	Pima	Madera Canyon	VII-1975	Lencyz		USNM
1	Pima	Madera Canyon	VII-1979	Lencyz		USNM
1	Pima	Madera Canyon	VII-1982	Lencyz		USNM
1	Pima	Santa Rita Mts.	24-VII-1927	Beamer R.H.		SEMC
1	Pima	Santa Rita Mts., Box Canyon	25-VIII-1949	Martin L.M.		LACM
1	Pima	Santa Rita Mts., Madera Canyon	1-5-IX-1957	Martin L.M.		LACM
1	Pima	Santa Rita Mts., Madera Canyon	9-VIII-1961	Nelson G.H.	at light	GHNC
1	Pinal	Devils Canyon & US-60	26-VII-1989	Warner W.B.	at light	PESC
1	Santa Cruz	Atasco Mts.	6-VIII-1961	Andrews F.G.		CDAE
2	Santa Cruz	Atascosa Mts., Sycamore Canyon	12-VII-1977	McCleve S.	at light	SMCC
1	Santa Cruz	Canelo	23-VIII-1956	Morley	at light	UAIC
1	Santa Cruz	Lochiel, 2 mi.E	8-IX-1958	Menke & Stange		LACM
5	Santa Cruz	Madera Canyon	1-VIII-1960	Wood K.L.	blacklight	BYUC
1	Santa Cruz	Madera Canyon	4-VII-1975	Cicero J.		JMCC
1	Santa Cruz	Madera Canyon	9-VII-1975	Cicero J.		JMCC
1	Santa Cruz	Madera Canyon	11-VII-1975	Cicero J.		JEWC
1	Santa Cruz	Madera Canyon	18-VII-1978	Gilbert A.J.	blacklight	CDAE
2	Santa Cruz	Nogales	12-VIII-1906	Nunenmacher F.W.		FMNH
1	Santa Cruz	Nogales	22-VIII-1906	Nunenmacher F.W.		FMNH
2	Santa Cruz	Nogales	29-VIII-1959			UAIC
2	Santa Cruz	Nogales	30-VIII-1906	Nunenmacher F.W.		FMNH
2	Santa Cruz	Nogales	1-IX-1906	Nunenmacher F.W.		FMNH
1	Santa Cruz	Nogales	5-IX-1906	Koebele		ICCM
1	Santa Cruz	Nogales	6-IX-1906	Nunenmacher F.W.		FMNH
1	Santa Cruz	Nogales	8-IX-1906			INHS
2	Santa Cruz	Nogales	9-IX-1906	Nunenmacher F.W.		FMNH
1	Santa Cruz	Pajarito Mts., Pena Blanca Canyon	19-VII-1959	Arnett R.H.Jr.	at light	FSCA
2	Santa Cruz	Pajarito Mts., Pena Blanca Canyon	21-22-VII-1959	Arnett R.H.Jr.	at light	FSCA
5	Santa Cruz	Pajarito Mts., Pena Blanca Canyon	8-VIII-1959	Arnett R.H.Jr.	at light	FSCA
5	Santa Cruz	Pajarito Mts., Pena Blanca Canyon	22-26-VII-1961	Arnett R.H.Jr.	at light	FSCA
1	Santa Cruz	Pajarito Mts., Pena Blanca Canyon	31-VII-1961	Arnett R.H.Jr.	at light	FSCA
3	Santa Cruz	Pajarito Mts., Pena Blanca Canyon	5-9-VIII-1961	Arnett R.H.Jr.	at light	FSCA
1	Santa Cruz	Pajarito Mts., Pena Blanca Canyon	14-VIII-1961	Arnett R.H.Jr.	at light	FSCA
3	Santa Cruz	Pajarito Mts., Pena Blanca Canyon	28-VI-1962	Arnett R.H.Jr.	at light	FSCA
2	Santa Cruz	Pajarito Mts., Pena Blanca Canyon	3-VII-1962	Arnett R.H.Jr.	at light	FSCA
2	Santa Cruz	Pajarito Mts., Pena Blanca Canyon	1-5-VIII-1962	Arnett R.H.Jr.	at light	FSCA
3	Santa Cruz	Pajarito Mts., Pena Blanca Canyon	28-VII-1970	Stephan K.		FSCA
1	Santa Cruz	Pajarito Mts., Pena Blanca Canyon	27-VII-1978	McCleve S.	1191m at light	SMCC
1	Santa Cruz	Pajarito Mts., Pena Blanca Canyon	2-VII-1980	McCleve S.	1191m at light	SMCC
9	Santa Cruz	Pajarito Mts., Sycamore Canyon	24-VIII-1968	Stephan K.		FSCA
1	Santa Cruz	Pajarito Mts., Sycamore Canyon	24-VIII-1968	Stephan K.		GHNC
2	Santa Cruz	Pajarito Mts., Walker Canyon	28-VII-1978	McCleve S.	1191m at light	AMNH
2	Santa Cruz	Pajarito Mts., Walker Canyon	28-VII-1978	McCleve S.	1191m at light	SMCC
1	Santa Cruz	Patagonia	2-VIII-1924	Van Duzee E.P.		CASC
4	Santa Cruz	Patagonia	VII-1936	Ross E.S.		CASC
2	Santa Cruz	Patagonia	18-VII-1948	Vaurie C. & P.		AMNH
1	Santa Cruz	Patagonia	9-VII-1954	Schmitt R.	NJ light trap	UAIC
1	Santa Cruz	Patagonia	8-VIII-1954	Schmitt R.	NJ light trap	UAIC
1	Santa Cruz	Patagonia	25-VIII-1954	Schmitt R.	NJ light trap	UAIC
1	Santa Cruz	Patagonia	14-IX-1954	Schmitt R.	NJ light trap	UAIC
3	Santa Cruz	Patagonia	15-VII-1955	Werner F.G.	at light	UAIC
2	Santa Cruz	Patagonia	6-VII-1976	Cazier M.		AMNH
30	Santa Cruz	Patagonia, 1 mi.S.	29-30-VII-1964	Davis D.R.		USNM
3	Santa Cruz	Patagonia, 2 mi.SW	30-VII-1948		4050'	UAIC
10	Santa Cruz	Patagonia, 2 mi.SW	6-VII-1958	Alcorn J.R.		SEMC
1	Santa Cruz	Patagonia, 4.3 mi.SW	3-IX-1969	Noonan B.R.	blacklight	CDAE
1	Santa Cruz	Patagonia, 5 mi.SW	25-VIII-1950	Cohn T.	3500'	ASUT
1	Santa Cruz	Patagonia, 5 mi.SW	25-VIII-1950	Cohn T.	3700'	AMNH
1	Santa Cruz	Patagonia, Senoita River	18-VII-1948	Vaurie C. & P.		AMNH
5	Santa Cruz	Pena Blanca	11-VIII-1960	Ball G.E.	4000' at light	USNM
1	Santa Cruz	Pena Blanca	27-VIII-1960	Ball G.E.	4000' at light	USNM
4	Santa Cruz	Pena Blanca	31-VIII-1966	Andrews F.G.		CDAE
1	Santa Cruz	Pena Blanca	VII-1970			USNM
1	Santa Cruz	Pena Blanca	1-VII-1970	Triplehorn C.A.		OSUC
2	Santa Cruz	Pena Blanca	26-VIII-1971	Petty J.L.		BYUC
1	Santa Cruz	Pena Blanca	12-VIII-1972	Gordon R.	UV light	USNM
1	Santa Cruz	Pena Blanca	27-VII-1979	Cicero J.		JMCC
1	Santa Cruz	Pena Blanca Canyon	27-28-VII-1964	Davis D.R.		USNM
1	Santa Cruz	Pena Blanca Lake	20-VII-1985	Lago P.		PKLC
2	Santa Cruz	Pena Blanca Lake, 0.5 mi.NE.Castle Rock	23-VIII-1971	Kolner M.A.	4000'	ASUT
2	Santa Cruz	Pena Blanca Lake, 3.2 km S.	28-VII-1989	Anderson R.S.	UV light	TAMU
1	Santa Cruz	Pena Blanca, 10 mi.W.Nogales	1-VIII-1961	Werner F.G.	UV light	UAIC
1	Santa Cruz	Santa Rita Mts., Madera Canyon	8-VII-1959	Franclemont J.G.		TAMU

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Ischyry quadripunctatus chiasticus Boyle (Cont.)

USA: Arizona (Cont.)

2	Santa Cruz	Pena Blanca, 10 mi.W.Nogales	3-VIII-1959	Roever K.		blscklight	UAIC
1	Santa Cruz	Santa Rita Mts., Madera Canyon	5-VIII-1919	Arnett R.H.Jr.		at light	FSCA
1	Santa Cruz	Santa Rita Mts., Madera Canyon	24-VIII-1946	Nicolay S.S.			FMNH
1	Santa Cruz	Santa Rita Mts., Madera Canyon	11-VIII-1959	Franclemont J.G.			TAMU
2	Santa Cruz	Santa Rita Mts., Madera Canyon	10-26-VII-1964	Davis D.R.			USNM
1	Santa Cruz	Santa Rita Mts., Madera Canyon	14-VIII-1989	Pollock D.A.			DAPC
1	Santa Cruz	Washington Mts., nr.Nogales	7-IX-1927	Kusche J.A.			ICCM
1	Santa Cruz	Washington Mts., nr.Nogales	7-IX-1927	Kusche J.A.			CASC
1	Yavapai	Clarkdale, 4 mi.N	16-VII-1985	Zuccaro H.E.Jr.			PKLC
1	Yavapai	Kirkland	31-VII-1970	May J.E.		UV light	UAIC

Ischyry scriptus (Olivier)

Country ?

1							ZMHB
6							ZMHB
1			12-VI-1930				FIOC
1		San Lorenzo					ZMHB
<u>Argentina: Jujuy</u>							
1				Bruch C.			MACN
1				Harrington			MLPA
1		Calileguas Nat.Park, El Cortaderal km.6	18-28-XII-1987	Peck S.& J.	800m	Malaise FIT	CMNC
1		San Pedro	IX-1921	Harrington G.L.			USNM
<u>Argentina: Misiones</u>							
1		Dos de Mayo	I-1961	Foerster J.	300m		IMLA
1		Loreto	IV-1931	Bruch C.			MACN
1		Loreto	IV-1981	Borg			MLPA
1	Concep.	Sta. Maria					MLPA
1	Concep.	Sta. Maria					MLPA
2	Concep.	Sta. Maria	X-1947	Viana M.			MLPA
<u>Argentina: Salta ?</u>							
1		El Rey Nat.Park, Hosteria	15-XII-1987	Peck S.& J.	890m	UV light, thorn forest	CMNC
1		El Rey Nat.Park, Pozo Verde Trail km.1	9-10-XII-1987	Peck S.& J.	900m	UV light, thorn forest	CMNC
1		El Rey Nat.Park, Pozo Verde Trail km.10	10-XII-1987	Peck S.& J.	1200m	fungi on log	CMNC
<u>Argentina: Salta</u>							
1		Finca El Rey	21-III-1957	Monros			IMLA
1		Macueta	X-XI-1933	Harrington W.C.			CASC
2		Orán Abra Grande	I-III-1967	Golbach R.			IMLA
3		Tablillas	I-IX-1933	Harrington G.L.			CASC
1		Tablillas	I-1934	Harrington G.L.			CASC
<u>Argentina: Tucuman</u>							
2				Bruch C.			MACN
6			I-1956	Golbach R.			CUIC
1		Cerro San Xavier	11-II-1951	Ross & Michelbacher			CASC
1		Cerro San Xavier	11-II-1951	Ross & Michelbacher			FMNH
1		Ciudad Universitaria	18-II-1959	Clark J.F.	800m		USNM
2		Cumbre de San Javier	XII-1946	Golbach R.			IMLA
2		Fall6a Blanca, Dpto.Burruyat6	7-8-II-1961	Golbach R.			IMLA
1		Horco Molle	1-27-VIII-1965	Porter C.			IMLA
10		Parque Aconquija	XII-1946	Golbach R.			IMLA
1		Rio Los Sosa	2-XI-1963	Weyruch	1100m		IMLA
<u>Bolivia</u>							
1		Tiguipa	III-1922				USNM
<u>Bolivia: Chuguisaca</u>							
2		Chuquis ares, Monteaguado	XII-1984	Pena L.E.	1300m		HNHM
<u>Bolivia: Cochabamba ?</u>							
1		Tunari Chapare	XI-1992	Pena L.			PESC
<u>Bolivia: La Paz</u>							
3		San Lorenzo, 12 km Caranavi	1-2-I-1991	McHugh J.V.		JVM lot B91-11	JVMC
7		San Lorenzo, 12 km Caranavi	1-2-I-1991	McHugh J.V.		JVM lot B91-24	JVMC
1		San Lorenzo, 12 km Caranavi	1-2-I-1991	McHugh J.V.		JVM lot B91-42	JVMC
1		Yungas La Paz, Puente Mururrato to Suapl	24-28-XI-1984	Pena L.E.	1200-1600m		HNHM
<u>Brasil</u>							
1							NHMB
2							NHML
1							ZMHB
1						LECTOTYPE I.maculiventris	CUMZ
1		Chapada	X				ICCM
<u>Brasil: Mato Grosso</u>							
1		10°25'S, 59°28'W	17-22-III-1977	Engleman D.	300m		EGRC
5				Rohde S.			ZMHB
<u>Brasil: Para</u>							
3		Santarem					ICCM
<u>Brasil: Parana</u>							
1							NHML
2		Foz do Iguazu	25-IV-1964	Ross C.E. & E.S.			CASC
<u>Brasil: Rio de Janeiro</u>							
3		Petropolis	I	Sahlburg T.			HNHM
1		Petropolis	II	Sahlburg T.			HNHM
1		Petropolis	XII	Sahlburg T.			HNHM
1		Rio de Janeiro					NHML
<u>Brasil: Santa Catarina</u>							
1		Nova Teutonia, 27°11'La., 52°23'Lo.	1-X-1944	Plauman F.			AMNH
<u>Colombia [Nova Grsnada]</u>							
1							ZMHB
1							ISNB
2							NHMB
1						LECTOTYPE I.velatus	MNHN
<u>Colombia: Boyaca</u>							
1		Muzo					ZMHB
1		Muzo	X-XI-1877	Theime O.			ZMHB

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Ischyryus scutellaris Gorham (Cont.)

<u>Mexico: Quintana Roo</u>				
1	Carillo Puerto, 18 km N.	28-V-1984	Turnbow R.H.	RHTC
<u>Mexico: Veracruz</u>				
1	Est. Biol. Los Tuxtlas	6-X-1989	Colin J.L.	UNAM
<u>Mexico: Yucatan</u>				
1	Kantunil, 3 km.E.	29-VII-1990	O'Brien C.W. & L.B.	PESC
1	Valladolid, 9 km.S.	28-VII-1990	O'Brien C.W. & L.B.	PESC
<u>Panama: Canal Zone</u>				
1	Albrook Field, Tank Hill	29-IV-1977	Riley E.G.	EGRC
1	Albrook Field, Tank Hill	8-V-1977	Riley E.G.	EGRC
1	Barro Colorado Island	10-17-V-1964	Duckworth W.D.	USNM
1	Paraiso	6-V-1911	Schwarz E.A.	USNM
1	Summit Gardena	9-V-1977	Riley E.G.	EGRC
<u>Panama: Panama</u>				
2	Las Cumbres	19-V-1974	Wolda H.	UV light
1	Las Cumbres	21-V-1974	Wolda H.	OSUC
1	Las Cumbres	12-VI-1974	Wolda H.	PESC
2	Las Cumbres	21-V-1974	Wolda H.	UV light
3	Las Cumbres	6-V-1974	Wolda H.	OSUC
2	Las Cumbres	7-V-1975	Wolda H.	OSUC
1	Las Cumbres	8-V-1975	Wolda H.	OSUC
1	Las Cumbres	15-V-1975	Wolda H.	OSUC
2	Las Cumbres	21-V-1975	Wolda H.	UV light
1	Las Cumbres	24-V-1975	Wolda H.	OSUC
1	Las Cumbres	2-VI-1975	Wolda H.	OSUC

Ischyryus septemsignatus Gorham

<u>Belize [British Honduras]</u>				
1	Rio Grande			ICCM
<u>Costa Rica</u>				
1	Tarrazu	8-V-1936	Marin E.	<i>Coffea arabica</i> USNM
1	Tarrazu	8-VIII-1936	Marin E.	rotten trunk, <i>Inga</i> sp. USNM
<u>Guatemala: Baja Verapaz</u>				
1	Purulha, 6-9 km.E	15-25-IV-1990	Giesbert E.	1500' FSCA
<u>Guatemala: Escuintla</u>				
1	Pantaleon			1700', Paralectotype <i>I. septemsignatus</i> β NHML
<u>Guatemala: Sacatepéquez</u>				
1	Capetillo			Paralectotype <i>I. septemsignatus</i> α NHML
<u>Mexico: Chiapas</u>				
1	Ocosingo, 9.8 km.N.	20-VI-1990	Thomas M.C.	FSCA
1	Palenque, 100 km SE on Bonampak Rd.	9-VII-1983	Peck S.	fresh fungus, rainforest CNCI
<u>Mexico: Hidalgo</u>				
1	Chapulhuacan, 3 mi.N on Hwy 85	28-29-V-1984	Ratcliffe B.C.	DEUN
<u>Mexico: San Luis Potosi</u>				
1	Antiguo, Morelos, 31 mi.W. on Hwy.80	13-VII-1986	McCleve S.	2800' UV light
<u>Mexico: Veracruz</u>				
2	Cordoba			ZMHB
1	Cordoba	16-V-1905	Fenyas A.E.	USNM
1	Cordoba	20-VII-1936	SeEVERS C.H.	FMNH
1	Cordoba	4-VIII-1965	Lau A.B.	USNM
1	El Palmar, 16 km.W. Tetzonapa	9-15-VI-1948		600' UAIC
1	Est. Biol. Los Tuxtlas	4-14-XI-1988	Mcjorada E.	UNAM
1	Fortin de las Flores	1-21-VI-1966	Ball & Whitehead	2900' blacklight
1	Toxpam			B.C.A., Col. NHML
1	Toxpam			LECTOTYPE <i>I. septemsignatus</i> NHML
<u>Mexico: Yucatan</u>				
1	Uxmal	16-18-VI-1959	Vaurie P. & C.	AMNH

Ischyryus n. sp. 3

<u>Panama: Canal Zone</u>				
1	Barro Colorado Island	18-VII-1962	Botimer L.J.	CNCI
1	Barro Colorado Island	1-9-V-1964	Duckworth W.D. & S.S.	USNM
3	Barro Colorado Island	10-17-V-1964	Duckworth W.D. & S.S.	USNM
1	Barro Colorado Island	20-23-V-1964	Duckworth W.D. & S.S.	USNM
1	Coco Solo Hospital	1-VII-1974	O'Brien & Marshal	PESC
24	Gamboa, 5 mi.NW., 9°10'N, 79°45'W	12-VII-1976	Montgomery & Lubin	Canopy fogging in <i>Luechea seemanni</i> , pyrethrin fog USNM
4	Gamboa, 5 mi.NW., 9°10'N, 79°45'W	26-VII-1976	Montgomery & Lubin	Canopy fogging in <i>Luechea seemanni</i> , pyrethrin fog USNM
1	La Pita Signal Station, Rd. leading to Paraiso	2-V-1979	Riley E.G.	EGRC
1	Paraiso	26-IV-1911	Schwarz E.A.	USNM
<u>Panama: Colon</u>				
1	Escabol Rd.	8-VII-1983	Engleman D.	EGRC
<u>Panama: Panama</u>				
1	Trinidad River	2-V-1911	Busck A.	USNM

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Ischyrys n. sp. 4

No.	County	Locality	Date	Collr.	El. Data	Rep.
Cuba ?						
1		Cejanal P.del Rio	XII-1928			FMNH
Cuba						
1		Baragua	22-VII-1929	Scaramuzza L.C.	at light	MCZC
1		Camaguey Baragua	11-VI-1932	Christenson	at light	USNM
1		Camaguey Baragua	26-V-1932	Christenson	at light	USNM
1		Camaguey Baragua	31-V-1932	Christenson	at light	USNM
1		Soledad (Cienfuegos)	24-X-1925	Darlington P.J.		MCZC
1		Soledad (Cienfuegos)	31-X-1926	Darlington P.J.	swamp	MCZC
3		Soledad (Cienfuegos)	8-XI-1926	Darlington P.J.		MCZC
1		Soledad (Cienfuegos)	VI-1929	Darlington P.J.		MCZC
2		Soledad (Cienfuegos)	2-12-VIII-1934	Darlington P.J.		MCZC
1		Soledad (Cienfuegos)	VIII-1936	Darlington P.J.		MCZC

Ischyrys n. sp. 6

No.	County	Locality	Date	Collr.	El. Data	Rep.
Bolivia: Sara						
1				Steinbach J.	450m	ICCM
Brasil						
1		Chapada	VIII			ICCM
Brasil: Alagoas						
1		Sao Miguel dos Campos	IV-1984	Oliveira F.M.		ICCM
Brasil: Rio de Janeiro						
1		Rio de Janeiro	I-1947	Wygodzinsky		USNM
Costa Rica: Alajuela						
1		Penas Blancas	9-V-1987	Cruz E.		CMNC
Costa Rica: Cartago						
1		Turrialba, CATIE	19-V-1979	Howden H. & A.	600m at night	CNCI
Costa Rica: Heredia						
1		La Selva, 3.2 km.SE.Puerto Viejo	30-I-1992	Bell W.	100m	SEMC
Costa Rica: Puntarenas						
1		Monteverde	1-3-VI-1984	Riley E.G.		EGRC
El Salvador						
1		San Salvador	1-5-V-1958	Cartwright O.L.	at light	USNM
Guatemala						
1		Finca San Rafael, Olimpo, Cuyotenango Such.	10-IV-1965	Campbell J.M.	1700'	CNCI
Guatemala: Escuintla						
1			8-9-VIII	Knab F.		USNM
Honduras: Santa Barbara						
1		La Fee	10-X-1993	Turnbow R.		RHTC
Panama: Bocas del Toro						
1		Almirante	30-III-1959	Dybas H.S.		FMNH
Panama: Canal Zone						
1		Barro Colorado Island	28-VII-1938	Williamson E.C.Jr.		FMNH
1		Barro Colorado Island	III-IV-1949	Zetek		USNM
1		Barro Colorado Island	19-I-1959	Dybas H.S.		FMNH
1		Barro Colorado Island	26-I-1959	Dybas H.S.		FMNH
1		Barro Colorado Island	10-17-V-1964	Duckworth W.D. & S.S.		USNM
1		Barro Colorado Island, 9°10'N, 79°50'W	28-VI-1973	Erwin T.		USNM
1		Frijoles	28-IV-1981	Gill B.		CNCI
Panama: Panama						
1		Trinidad River	VII-1911	Busck A.		USNM

Ischyrys n. sp. 7

No.	County	Locality	Date	Collr.	El. Data	Rep.
Brasil: Rondônia						
1		Ariquemes, 62 km.SW	27-IV-1992	Schmitz U.	blacklight trap	PESC
2		Ariquemes, 62 km.SW	8-IX-1992	Schmitz U.	blacklight trap	PESC
1		Ariquemes, 62 km.SW	20-IX-1992	Schmitz U.	blacklight trap	PESC
3		Ariquemes, 62 km.SW	5-17-X-1993	Eger J.E.	blacklight trap	PESC
Brasil: Sao Paulo						
1		Faz.Campininas, Mogi Guacu.	23-31-VII-1969	Campbell J.M. & B.A.		CNCI
1		Piracicaba	11-VI-1965	Triplehorn C.A.	blacklight trap	OSUC
27		Piracicaba	14-VI-1965	Triplehorn C.A.	blacklight trap	OSUC
1		Ubatuba	22-X-1964	Mosea		USNM
Costa Rica						
1		Rio Viejo	2-VII-1967	Spangler P.J.		USNM
Panama: Canal Zone						
3		Cardenas Village	10-V-1980	Riley E.G.		EGRC
10		Cardenas Village	17-18-V-1980	Riley E.G.		EGRC
8		Cardenas Village	22-V-1980	Riley E.G.		EGRC
6		Cardenas Village	26-V-1980	Riley E.G.		EGRC
Panama: Colon						
1		Fort Espinar	14-V-1991	Turnbow R.H.	at light	RHTC
Venezuela: Aragua						
1		Cagua	28-VI-1961	Bordon		MAIC
1		Choroni, nr.	6-VIII-1984	Watts J.		PESC

Ischyrys n. sp. 9

No.	County	Locality	Date	Collr.	El. Data	Rep.
Brasil: Mato Grosso						
1		R.Tapirape & R.Araquaiá	20-30-XII-1960	Malkin B.	night sweeping along trail	FMNH
Panama: Canal Zone						
1		Barro Colorado Island	26-IV-1967	Akre R.D.	Malaise trap	WSUC
1		Barro Colorado Island, 9°10'N, 79°50'W	15-27-V-1972	Erwin T.L. & L.J.	light	USNM
1		Barro Colorado Island, 9°10'N, 79°50'W	6-VI-1972	Pine R.	light	USNM
1		Barro Colorado Island, 9°10'N, 79°50'W	27-VI-1973	Erwin T.		USNM
1		Barro Colorado Island, 9°10'N, 79°50'W	2-VII-1973	Erwin T.L. & L.J.		USNM
1		Barro Colorado Island, Gatun Lake	20-V-1981	Gill B.		CNCI
2		Coco Solo Hospital	1-2-VII-1974	O'Brien C.W. & L.O.		PESC
1		Fort Gulick	19-III-1979	Harlan H.J.	at light	OSUC

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Ischyryus n. sp. 9 (Cont.)

Panama: Colon					
1	Colon	16-V-1991	Turnbow R.H.	MV & blacklight	RHTC
1	Porto Bello	17-II-1911	Schwarz E.A.		USNM
<u>Panama: Darien</u>					
1	Santa Fe	IV-V-1967	Delong & Triplehorn		OSUC
<u>Panama: Panama</u>					
1	Altos de Maje (Isle), 9°8'N, 78°49'W	28-30-V-1982	Ratcliffe B.C.		DEUN
1	Cerro Campana	11-15-V-1980	Riley E.G.		EGRC
<u>Trinidad</u>					
1	Tunapuna	1-3-VIII-1969	Howden H. & A.		CMNC
1	St. Georges Curepe	28-30-XI-1977	Mason W.R.M.		CNCI
<u>Venezuela</u>					
1	Santa Lucio	V-1922	Reynolds L.R.		FMNH

Ischyryus n. sp. 15

<u>Brasil: Pará</u>					
1	Serra Norte, Est.do Faloca [?]	9-IX-1983	Ramon F.F.		MPEG
<u>Colombia: Meta</u>					
2	Villavicencio	14-VII-1938	Dybas H.S.		FMNH
<u>Costa Rica: Cartago</u>					
1	Turrialba	13-17-III-1965	Duckworth S.S. & W.D.	light	USNM
<u>Ecuador: Pichincha</u>					
1	St. Domingo, 16 km.E., d.l.Colorados	19-21-XII-1987	Valentine B.D.	685m	PESC
<u>Panama: Canal Zone</u>					
1	Barro Colorado Island	1-VII-1938	Williams E.C.Jr.		FMNH
1	Barro Colorado Island, 9°10'N, 79°50'W	15-27-V-1972	Erwin T., et al.		USNM
1	Cardenas Village	17-18-V-1980	Riley E.G.		EGRC
<u>Panama: Panama</u>					
1	Las Cumbres	7-V-1975	Wolda H.		OSUC
1	Las Cumbres	16-V-1975	Wolda H.	blacklight	OSUC
<u>Trinidad</u>					
1	Simla, Arima-Blanchisseuse Rd.	22-VII-1975	Price J.	blacklight trap	FSCA
<u>Venezuela: Carabobo</u>					
1	San Esteban, nr. Puerto Cabello	30-XI-1939	Anduze P.J.		FMNH

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BIOGRAPHICAL SKETCH

Paul Edward Skelley was born 15 June 1964 to Mr. and Mrs. Paul F. Skelley of Decatur, Illinois. He attended grades one through 12 at Warrensburg-Latham, a small rural school. He became interested in insects while working on a Boy Scout project in 1977. Throughout high school, Paul's interests in nature compelled him to take advanced science classes and sell insect collections to support his entomological interests. In May 1982, he graduated from Warrensburg-Latham High School, 3rd in a class of 86. That fall he attended Eastern Illinois University, enrolled in the engineering program. A year later, he changed his major to zoology. Dr. M. A. Goodrich, his advisor, saw his interest in insects and put him to work curating the Coleoptera in the Spooner-Riegel Insect Collection. Paul graduated summa cum laude in May 1986 from Eastern Illinois University. Paul applied to the University of Florida and received a Master of Science degree in August 1988 under the guidance of Dr. R. E. Woodruff, whom he assisted in curating Coleoptera in the Florida State Collection of Arthropods. In November 1992 Paul married Lucile Heyer. He currently works at the Florida State Collection of Arthropods as a technician assisting in the curation of several taxa.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



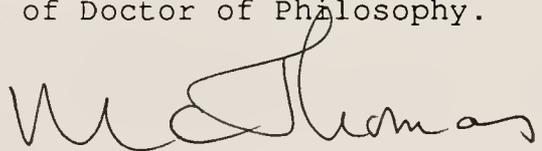
Robert E. Woodruff, Chair
Professor of Entomology and
Nematology

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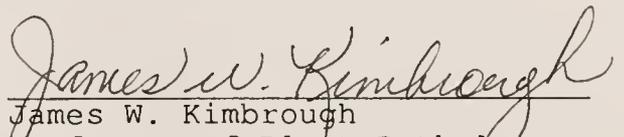
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