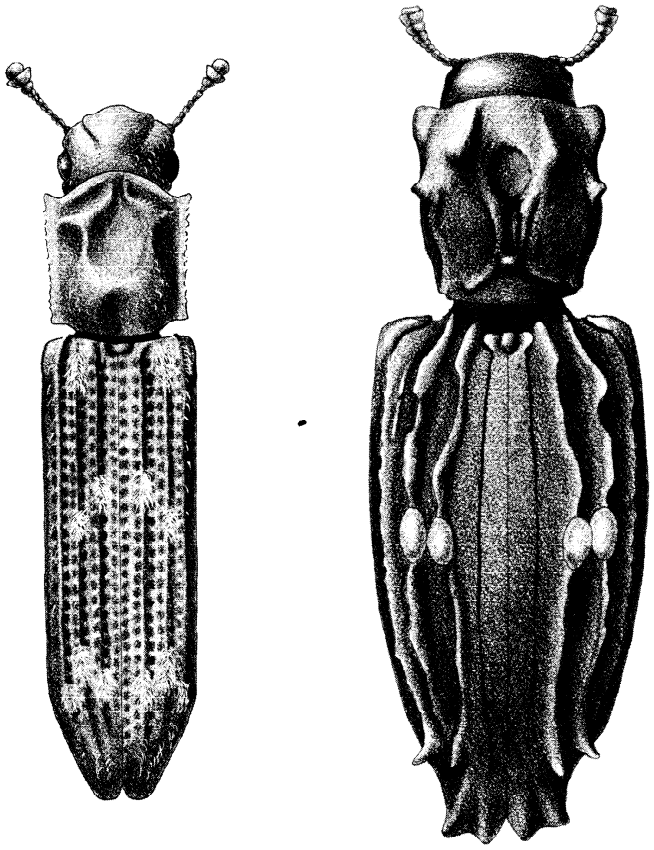
Occasional Papers
of the
Florida State Collection of Arthropods

Volume 6

The Bothrideridae and Colydiidae of America north of Mexico (Coleoptera: Clavicornia and Heteromera)

by

Karl H. Stephan



FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES
Doyle Conner, Commissioner

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The Bothrideridae and Colydiidae of America north of Mexico (Coleoptera: Clavicornia and Heteromera)[1]

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Foreword

There are few, if any, other fields of science in which nonprofessionals have made such great contributions as in plant and animal systematics. The author of this publication, Mr. Karl Heinz Stephan, is a good example. He has established himself as a recognized international authority on several families of Coleoptera, notably the Bothrideridae and Colydiidae. Karl is an energetic, multi-talented man of unceasing enthusiasm for his natural history interests. His keen interest in natural history became evident in his early childhood. The life history story of his development into a well-regarded beetle collector and systematist, his determination to find opportunity to continue these interests despite sometimes difficult times, is both interesting and revealing. Karl was born 15 May 1931, in Zella-Mehlis, now part of the East German Republic. Karl was the only son of Paul and Olga Stephan, and the second oldest of 4 children. Karl's father made a good living as an innovative, hard driving industrial engineer specializing in the manufacture of machinery and other steel products. He also had the gift to inspire others and was well versed in managerial skills. Therefore he was much sought after by big industrial firms, and the family moved frequently. During 12 years of Karl's schooling, his family lived in 7 different towns. Karl did not make friends easily, instead watched and captured many kinds of wildlife. By the time he was 10, his mother refused to clean his room for fear of the "critters" she might encounter. There were aquariums, terrariums, and bird cages full of animals. All this came to a sudden stop. At the end of World War II Karl's parents lost all of their possessions, and they were lucky to escape with their lives. For added safety the family fled to the Western Sector. Because of widespread destruction, housing was rationed, and the 6 of them had to live in a 2-room apartment. The war years were hard, but the post war years were even harder. In addition to crowded living quarters, the family endured extreme shortages of essentials. By then Karl was 17, 6 feet tall, and a virtual skeleton. Despite all, his keen interest in everything related to natural history persisted.

Because he no longer had room or equipment for larger animals, Karl's interest in insects, especially beetles, increased. It wasn't until 1948 that the Marshall Plan, designed to rehabilitate war torn Europe, took hold. The German mark was stabilized, and as if by magic, food, clothing, and work became available again. Karl's father accepted a management position in Karlsruhe, a city in the state of Baden near the Rhine River with a population of about 200,000 at that time. There Karl finished high school. Except for science and biology, his grades were not good enough for him to enter a university, crushing his dream of working in a natural history related field. Karl's father, being a practical man, enrolled Karl in a tool and die apprenticeship program. To Karl's surprise, he enjoyed the training and made top honors. Apprentices were not paid a regular salary, but they received a monthly allowance. Karl saved the small sum miserly. His first purchase was a bicycle. At that time Karlsruhe was surrounded by a green belt of pine-oak forest. Often, after work and on weekends, Karl pedaled there to collect beetles. One of his favorite places was an area full of old war time trenches and fox holes, which acted like big pitfall traps. Some of the larger beetles taken then are today in the Florida State Collection of Arthropods (FSCA). Soon Karl scoured bookstores for volumes on beetles. One place had a used copy of Reitter's 1911 *Fauna Germanica*. It had the most beautiful color plates that Karl had ever seen. He had to have it! Finally, after 5 months of saving, he had the 70 marks needed for the purchase. It was somewhat frazzled from use, but Karl still has and uses it.

While Karl was busy learning a trade, sparking a girl, and getting more involved in the study of beetles, the Cold War started heating up. Fearing another war, Karl's father decided to emigrate to Canada. New Year's Eve 1951-52 found Karl's father, younger sister, and Karl aboard a rickety old tub bound for North America. Their arrival in Windsor, Ontario coincided with the coldest time of the year. Here they were in a strange country with $15.00 between them. Karl's personal wealth consisted of an old suitcase full of clothing, his set of Reitter's *Fauna Germanica*, and 2 wooden ammunition boxes full of beetles. The latter he nearly lost to customs officials. His dad found a job right away, not as an engineer, but as a tool and die maker. His sister sold baked goods in a supermarket, while he walked the street for several weeks before his tool and die training paid off. He found employment with a company making aircraft body parts for the government in Tilbury, a small town 35 miles east of Windsor. Before long his dad joined him there, they pooled their money, and his dad made a down payment on an unfinished house. By fall his dad arranged passage for his mother and baby sister,

while his oldest sister, a dentist, opted to stay. The following spring Karl sent for his German sweetheart, Ulla, and they got married. Those were busy times. The next 8 years were spent establishing his own business, manufacturing press tools for the automotive industry, as well as raising a large family. Beetles had to "take a back seat". The business and 4 children took all of his time. By 1961 the pace slackened, and he got back to his hobby. With the aid of a homemade microscope, homemade insect boxes, household pins, and *Fauna Germanica*, Karl began to assemble a general beetle collection. Smaller specimens were glued onto homemade cards in typical European fashion. Soon species were found that had no European counterpart. He heard about the Canadian National Collection, and he sent specimens for identification. The reply was both enthusiastic and encouraging; he had found some rare things, some new to Canada. In 1963, on their way home to Ottawa form an entomological meeting in Lansing, Michigan, W. J. Brown, E. C. Becker, and H. F. Howden stopped to visit Karl and look at his collection. This was Karl's first contact with professional entomologists. He was impressed that they readily accepted him as a fellow entomologist, by their open compliments and suggestion, and most of all by their unreserved willingness to help in any way possible. This brief visit was without doubt an important milestone in his entomological endeavor. He quickly learned where to find literature and supplies, proper mounting techniques, and how to use identification keys. By fall of 1967 he had increased his holdings to about 1,500 species through intensive local collecting, 2 expeditions into the United States, and exchange with other collectors, both North American and abroad. However, operating out of a bedroom closet restricted him to keeping only a single specimen of each species.

A serious bout with arthritis prompted Karl to seek a warmer, drier climate. He chose Tucson, Arizona. He sold his business, and in February 1968 Ulla, Karl, and their 6 children moved into a large home. For the first time Karl enjoyed the luxury of his own "bug room". He found employment as a tool and die maker with a small firm making metal parts for the government. The company expanded rapidly, and within 6 months Karl was promoted to foreman. Those were good times. His arthritis vanished as if by magic, there was plenty of time and money to devote to his hobby, and his home became a stopover for many coleopterists, most of whom he still has contact with today. Then in January 1971, just when everything seemed to be going their way, Ulla became ill. The doctors diagnosed cancer. Karl immediately took Ulla to the cancer clinic in Houston, Texas. Despite all efforts, 2 months later he lost his mate of 18 years, and the children lost their mother. Holding down a full time job and being a single parent to 4 boys and 2 girls age 4 to 16 left little time for beetles. About a year later Karl met Nancy, a young divorcee with 2 small boys. Five weeks later she agreed to marry him despite such a larger family. Soon beetles got the attention they deserved!

During the next 4 years Karl steadily enlarged his collection until it contained about 10,000 species, most in moderate series. Specimens were from Germany, Canada, most of the United States, northern Mexico, India, Australia, and Japan. Karl also advanced in his profession by accepting a position as an executive with a Tucson division of Lear Siegler Corporation which employed about 800 people. He was appointed head of 3 departments, industrial engineering, tool and die, and plant maintenance. Trying to do well his job and his hobby, he spent 5 days a week in his office, while some nights and most weekends were devoted to beetle collecting all over Arizona, and occasionally in northern Mexico. Just as things were going along quite well, another crisis developed in May 1976. Lear Siegler decided to leave Tucson. Karl had the choice to relocate to some big city or lose his job. Nancy had long dreamed of simple country living, so after much serious thought, Karl resigned his job, and the family moved to the hill country of southeastern Oklahoma. This brought with it some major changes, some of which they had not anticipated. Karl's 3 oldest children already had left home; now the 4th elected to stay in Tucson to complete his senior year of high school. Suddenly the family was reduced to 4 children, Nancy's 2 boys and Karl's 2 youngest, a girl and a boy. They saw little point to country living unless they had their own land, so they bought a house with 80 acres, mostly forested. Raising a large family was expensive, and they were unable to save much. The equity of their Tucson home was a fair sum, but it fell far short of the amount needed to finance the move and the purchase of their country place. To raise much needed cash, in January 1977 Karl sold his entire collection of beetles to the State of Florida, except for the Histeridae and Staphylinidae which were purchased by the Field Museum of Natural History in Chicago. Florida purchased for the Florida State Collection of Arthropods more than 45,000 specimens, the identified specimens representing 111 families and 8,597 species. When Karl's collection, a part of him went with it, but he soon decided to build a new one. He became a Research

Associate of the Florida State Collection of Arthropods, and with the aid of the FSCA program he set out to assemble the best county collection possible.

The strain of many changes took its toll on their marriage, and in the spring of 1978 Nancy and Karl were divorced. Her boys stayed with her, and Karl's 2 youngest stayed with him. Karl determined that for him the key to a simple life is the proper frame of mind and that it is not how much money one makes but how much one spends. In the divorce settlement Karl was left with a 2-story, 3-car garage and 57 acres of land. He set about converting the building into a home. It had to be done after work hours and with very limited funds, but he got it done. It even included a "bug room". In the next several years he held several low paying jobs, including one in which he repaired several miles of barbed wire fence on a huge range north of Red Oak and spread tons of grass seed. He enjoyed working out-of-doors, and it allowed him to collect many fine beetles along the way. In 1980 he met and married Jana Faulk, a recently divorced young woman with 3 small children. This pretty Red Oak native "stole his heart by inches", and their family of 7 settled down to a normal routine. Karl made a poor living making home repairs. It wasn't that the pay was bad, it just wasn't steady. But Karl made good use of the extra time collecting, mounting specimens, identifying and putting together an ever growing number of species. In 1981 he was hired as operator for the Latimer County Rural Water District # 1, a job which involved responsibility for the repair and maintenance of all installations and providing all customers with adequate potable water. His district covered 170 miles of pipe, 4 active pump stations, 8 water towers, and 1,250 water meters, serving approximately 3,600 people. The job involved much travel within the district, but it also afforded Karl with good collecting opportunities. He seldom left home without a vial of alcohol in his pocket, and on summer days that vial usually was full by the time he returned home. By 1987 Karl's 2 youngest children had left home; daughter Nancy was married, and James was off to a university. Jan's girls had grown into fine young women; Melissa was off to college, Twila was a junior in high school. Jan's son, Greg, was living with his dad. There were also 13 grandchildren ages 1 to 14. It could be said that for much of his life, Karl has been a family man!

In the early years after Karl and his family moved to Red Oak, Oklahoma, they raised beef cattle, had milk cows, pigs, a chicken farm, an earthworm farm, timbered part of their land to sell the timber and provide firewood, grew assorted vegetables, canned vegetables and fruits, and made jellies, jams, and preserves. In recent years, as their financial situation improved, Karl discontinued most of these demanding activities in order to devote more of his time and energy to his entomological interests.

In recent years Karl has collected, neatly processed, and identified 10,000 to 20,000 insects a year in southeastern Oklahoma which he has donated to the Florida State Collection of Arthropods in addition to his untiring effort to expand his own personal collection. He is recognized as one of the premier insect collectors in North America, is one of the few remaining coleopterists who can provide accurate identification of most families of the North American fauna, and is the ultimate New World authority on Colydiidae and Bothrideridae. Karl has collected more than 50 holotypes of North American beetle species and has had 21 species named in his honor by 20 authors. In addition to his contributions to the study of Coleoptera, in recent years Karl has made extensive collections of Diptera, Hymenoptera, and miscellaneous other orders of insects which he continues to donate to the FSCA. He continues to build his reputation for excellence in his entomological pursuits.

Howard V. Weems, Jr.
Editor

Bureau of Entomology
Division of Plant Industry
Florida Department of Agriculture
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ABSTRACT

Ninety species, representing 7 genera of Bothrideridae and 23 genera of Colydiidae of America north of Mexico, are reviewed, reflecting recent changes. Keys to families, tribes, genera, and species are provided, as well as distributions, and biological information. Habitus drawings show a representative of each genus. New taxa in each family are:

BOTHRIDERIDAE: n. gen.: *Rustleria*; n. sp.: *Rustleria obscura, Bothrideres cryptus*; n. records: *Bothrideres depressus, Bothrideres subvittatus*. Placed in synonymy: *Redistes cylindricus*.

COLYDIIDAE: n. gen.: *Pseudotaphrus, Denophoelus*. n. sp.: *Rhagodera interrupta, Rhagodera texana, Megataphrus arizonicus, Megataphrus chandleri, Pseudotaphrus longus, Bitoma neglecta, Lasconotus knulli, Colydium robustum, Colydium glabriculum, Colydium thomasi, Pycnomerus arizonicus, Pycnomerus quercus*. Removed from synonymy: *Endeitoma, Colydium nigripenne, Aulonium aequicolle*. Placed in synonymy: *Synchita floridana, Eucicones latus, Bitoma sobrina, Bitoma trinotata, Bitoma suffusa, Bitoma prosopis, Bitoma paradisea, Lasconotus apicalis, Lasconotus schwarzi, Lasconotus krausi, Colydium bicoloratum*. New records: *Bitoma crenata, Bitoma exarata, Bitoma brevipes, Phloeonemus interruptus*.

INTRODUCTION

I have collected and studied beetles for more than 35 years, but have always had a special interest in the Colydiidae and their allies. In 1965, then a resident of southwestern Ontario, I intended to publish a list of the colydiids of that part of Canada. A friend, Dr. Edward C. Becker from the Systematic Entomology Unit in Ottawa, persuaded me against my better judgment to expand the area of coverage to include all of Canada. He generously provided not only encouragement, but also badly needed copies of papers, and made the Canadian National Collection available to me. But before this work was finalized, I moved to Tucson, Arizona.

For the next 8 years I collected many fine beetles throughout the southwest, including numerous colydiids, some of them undescribed. Several collecting trips into Mexico produced many interesting ones from there as well. During that time I made the decision to include all species from America north of Mexico in some form of revisional paper. It was also my good fortune to meet many professional coleopterists in Arizona, who encouraged and helped me unselfishly. Through their efforts I was able to borrow much material. Thus I had the opportunity to study most of our species and lay the groundwork for this review. A personal tragedy and ensuing turmoil, plus my relocation to eastern Oklahoma in 1976, delayed the project a few more years. Now that my life has returned to normal, I feel it is time to share my findings with the scientific community which supported me. No doubt this presentation has its shortcomings, but if it stimulates a few others to carry on where I left off, it accomplishes its purpose.

ACKNOWLEDGMENTS

Much of the material this study was based on, was kindly made available by the following institutions and individuals. I am grateful for their cooperation. Most of the abbreviations of the collections are from Arnett & Samuelson (1969).

CASC California Academy of Sciences, San Francisco; H.B. Leech.

CNCI Canadian National Collection of Insects, Ottawa: E.C. Becker.

CMNH Carnegie Museum of Natural History, Pittsburgh; R.L. Davidson.

CUIC Cornell University, Ithaca; L.L. Pechuman.

FMNH Field Museum of Natural History, Chicago; R.L. Wenzel.

FSCA Florida State Collection of Arthropods, Gainesville; R.E. Woodruff.

NMNH National Museum of Natural History, Washington; J.M. Kingsolver.

OSUC Ohio State University, Columbus; C.A. Triplehorn.

SEMC Snow Entomological Museum, Lawrence; J. Pakaluk.

CDAE State of California, Dept. Food & Agric., Sacramento; F.G. Andrews.

WVDA State of West Virginia, Dept. of Agric., Charleston; M.C. Thomas.

PASC The Polish Academy of Sciences, Warsaw; S.A. Slipinski.

UAIC University of Arizona, Tucson; F.G. Werner.

UCDC University of California, Davis; R.O. Schuster.

UDCC University of Delaware, Newark; W.A. Connel.

DENH University of New Hampshire, Durham; D.S. Chandler.

SMSH University of Oklahoma, Norman; H.P. Brown.

SDSU University of South Dakota, Brookings; E.U. Balsbough, Jr.

I thank the following individuals for making their private collections available:

ADA A.D. Allen collection, Twin Falls, Idaho.
DSC D.S. Chandler collection, Durham, New Hampshire.
NMDC N.M. Downie collection, Lafayette, Indiana.
HAHC H. and A. Howden collection, Ottawa, Ontario.
RLC The late R. Lenczy, Green Valley, Arizona. (Now at the NMNH, Washington, D.C.).
JPC J. Pakaluk collection, Lawrence, Kansas.
CPTC C.T. Parsons collection. (Now at the MCZC, Cambridge, Massachusetts.)
WRSC W.R. Suter collection, Kenosha, Wisconsin.
KSC K.H. Stephan collection, Red Oak, Oklahoma.
MCT M.C. Thomas collection, Gainesville, Florida.
RHT R.H. Turnbow collection, Ft. Rucker, Alabama.
WHTC W.H. Tyson collection, Fresno, California.

Special thanks are due E.C. Becker, who supplied all the initial literature and much needed encouragement; J.F. Lawrence, CSIRO, Canberra, Australia, and S.A. Slipinski for providing helpful comments and assistance on the higher taxa; R.D. Pope, British Museum of Natural History, J.M. Kingsolver, National Museum of Natural History, N.M. Downie, Purdue University, and J. Pakaluk, University of Kansas, for comparing specimens with types and many valuable comments; D.S. Chandler and A.D. Allen for testing the keys; R.E. Woodruff and M.C. Thomas for editing the manuscript. Sincere thanks are due my family, who endured years of neglect without complaint. I am especially grateful to M.C. Thomas for drawing the lifelike habitus drawings, which form an important part of this paper.

The publication of this study was made possible through the courtesy of the Bureau of Entomology, Division of Plant Industry, Florida Department of Agriculture and Consumer Services.

Checklist of the Bothrideridae of America north of Mexico

(Note: This tribal arrangement must be credited to S.A. Slipinski, who allowed me to use it prior to publication.)

TEREDINI
Oxylaemus Erichson
(*Redistes* Casey) **n. syn.**
americanus LeConte
(*cylindricus* Casey) **n. syn.**
californicus Crotch
Rustleria Stephan **gen. nov.**
obscura Stephan **sp. nov.**

DERETAPHRINI
Deretaphrus Newman
oregonensis Horn
Sosylus Erichson
costatus LeConte
dentiger Horn
extensus Casey

BOTHRIDERINI
Lithophorus Sharp
ornatus Arrow
Prolyctus Zimmermann
exaratus (Melsheimer)
Bothrideres Dejean
depressus Sharp
geminatus (Say)
cryptus Stephan **sp. nov.**
arizonicus Casey
montanus Horn
cactophagi Schwarz
subvittatus Sharp

Checklist of the Colydiidae of America north of Mexico

RHAGODERINI
Rhagodera Mannerheim
tuberculata Mannerheim
interrupta Stephan **sp. nov.**
costata LeConte
texana Stephan **sp. nov.**

SYNCHITINI
Coxelus Latreille
serratus Horn
Megataphrus Casey
tenuicornis Casey
arizonicus Stephan **sp. nov.**
chandleri Stephan **sp. nov.**
Pseudotaphrus Stephan **gen. nov.**
longus Stephan **sp. nov.**
Synchita Hellwig
fuliginosa Melsheimer
Microsicus Sharp
variegatus (LeConte) **n. comb.**
parvulus (Guérin-Méneville)
obscurus (Horn) **n. comb.**
Paha Dajoz
laticollis (LeConte) **n. comb.**
(*paradisea* Blatchley) **n. syn.**
Endeitoma Sharp
granulata (Say) **n. comb.**
(*floridana* Casey) **n. syn.**

Checklist (continued)

dentata (Horn) **n. comb.**
Eucicones Sharp
marginalis (Melsheimer)
(*latus* Casey) **n. syn.**
Bitoma Herbst
carinata (LeConte)
brevipes (Sharp)
sulcata (Leconte)
crenata (Fabricius)
exarata (Pascoe)
vittata Schaeffer
granulata(Blatchley)
quadricollis (Horn)
(*sobrina* Casey) **n. syn.**
discolor Schaeffer
quadriguttata (Say)
(*trinotata* Casey) **n. syn.**
pinicola Schaeffer
ornata (LeConte)
gracilis Sharp
(*prosopis* Schaeffer) **n. syn.**
(*suffusa* Casey) **n. syn.**
neglecta Stephan **sp. nov.**
Eudesmula Cockerell
undulata (Melsheimer)
Phloeonemus Erichson
catenulatus Horn
interruptus Reitter
Denophoelus Stephan **gen. nov.**
nosodermoides (Horn) **n. comb.**
Namunaria Reitter
guttulata (LeConte)
pacifica (Horn)
Lasconotus Erichson
flexuosus Kraus
complex LeConte
tuberculatus Kraus
nucleatus Casey
knulli Stephan **sp. nov.**
borealis Horn
intricatus Kraus
(*krausi* Hatch) **n. syn.**
pertenuis Casey
linearis Crotch
vegrandis Horn
(*apicalis* Casey) **n. syn.**
(*schwarzi* Kraus) **n. syn.**
referendarius Zimmermann
servus Horn
planipennis Kraus
simplex LeConte
fiskei Kraus
concavus Casey
subcostulatus Kraus
pusillus LeConte
laqueatus LeConte
bitomoides Kraus
Lobogestoria Reitter
gibbicollis Reitter
Chrysopogonius Hinton
1 undescribed species

COLYDIINI
Aulonium Erichson
longum LeConte
aequicolle LeConte
parallelopipedum (Say)
tuberculatum LeConte
ferrugineum Zimmermann
Colydium Fabricius
nigripenne LeConte
(*bicoloratum* Blatchley) **n. syn.**
lineola Say
robustum Stephan **sp. nov.**
glabriculum Stephan **sp. nov.**
thomasi Stephan **sp. nov.**

NEMATIDIINI
Nematidium Erichson
filiforme LeConte

PYCNOMERINI
Pycnomerus Erichson
sulcicollis LeConte
haematodes (Fabricius) **n. comb.**
reflexus (Say) **n. comb.**
arizonicus Stephan **sp. nov.**
quercus Stephan **sp. nov.**

ADIMERINI
Monoedus Horn
guttatus LeConte

HISTORICAL BACKGROUND

When Erichson (1845) erected the family Colydiidae he had before him a great number of small beetles from throughout the world having only a few morphological characters in common. He placed all those having globose procoxae, 4-segmented tarsi, and 5 abdominal segments in this new family. Then, using the relative position of the metacoxae, the relative length of the first ventrite, and the shape of the last segment of the maxillary palpi, he divided them into 5 groups: Synchitini, Colydiini, Bothrider-

ini, Pycnomerini, and Cerylini. It was not a good choice of characters. Using the relative length of the first ventrite caused much confusion in later years. He also miscounted the tarsi in the genera *Anommatus* and *Discoloma*. Both have 3, not 4-segmented tarsi. However much credit must be given to Erichson, because 3 of his 5 groups are still valid groups of the Colydiidae, while 2 represent separate families.

Horn (1878) was the first to revise the Colydiidae of America north of Mexico. He recognized some of Erichson's shortcomings and introduced more reliable key characters. He erected the family Discolomidae for the genus *Discoloma* and related forms, and the family Murmidiidae for the genera *Murmidius* and *Mychocerus*, but retained *Cerylon* and *Philothermus* within the Colydiidae. Adding 2 tribes, Rhagoderini and Deretaphrini, he increased the number of tribes represented in our fauna to 7 with 23 genera and 46 species.

Sharp (1894) erected the family Adimeridae for his genus *Adimerus*, a synonym of *Monoedus* Horn (1882), and described a number of genera and species later found in our fauna. Casey (1890) created the tribe Megataphrini to contain his genus *Megataphrus*. Craighead (1920) studied the larvae of several North American species and found those of the Colydiini to be of a different type than those of the Bothriderini. Based on his findings and the obvious differences in adult morphology, he gave the latter family rank. He was the first to use the term Bothrideridae. Unfortunately, subsequent workers either ignored or downplayed the importance of his findings. Hetschko (1930), in his world catalog, tried to simplify matters and divided the family into 4 subfamilies: Colydiinae, Ceryloninae, Murmidiinae, and Euxestinae. For unexplained reasons he placed the tribes Deretaphrini and Bothriderini in his subfamily Ceryloninae and kept *Monoedus* in a separate family. His classification undid much of the good work done previously.

Twenty-five years later, Crowson (1955) took the first positive step to resolve the chaotic arrangement of the Colydiidae. He transferred the genera *Cerylon, Philothermus, Murmidius, Mychocerus*, and allies to a separate clavicorn family Cerylonidae. The North American species of this family were revised by Lawrence and Stephan (1975). Crowson also recognized that the Bothriderinae form a distinct morphological line within the family but elected to retain them as part of the Colydiidae, to which he also assigned *Monoedus*.

Renewed interest in the Heteromera brought about some much needed changes in the composition of our Colydiidae, which in the past served as a depository for any small beetle with a 4-4-4 tarsal formula. Doyen and Lawrence (1979) transferred the genera *Anchomma* and *Myrmechixenis* to the Tenebrionidae, thus removing 2 foreign elements. When Lawrence (1980) moved *Aglenus* to the Othniidae, he also united the tribe Rhagoderini with the Orthocerini and the tribe Megataphrini with the Coxelini. At that time he also made a strong case for moving the Bothriderinae to a separate family but postponed a final decision on the matter.

Slipinski (1980-86) studied the former Colydiidae on a higher level. He treated them as 3 separate families, the clavicorn Cerylonidae and Bothrideridae and the heteromeran Colydiidae. He also united the tribe Coxelini with the Synchitini, stating that the traditional characters used to separate the 2 tribes break down when applied to the world fauna. He also (pers. com.) retains the tribe Rhagoderini because they possess several unique characters not found in the Orthocerini. To the Bothrideridae he added the tribe Teredini to which he assigned those former Deretaphrini with large trochanters. Reading this manuscript, he pointed out several name changes of which I was unaware.

Since this review is basically a regional identification manual, systematic changes above the generic level are mostly left to taxonomists studying the world fauna. Only those changes generally accepted and dictated by facts are introduced here. The classification of the former "Colydiidae" of America north of Mexico used here is as follows:

Cerylonidae	**Bothrideridae**	**Colydiidae**
Euxestinae	Teredini	Rhagoderini
Anommatinae	Deretaphrini	Synchitini
Murmidiinae	Bothriderini	Colydiini
Ceryloninae		Nematiini
		Pycnomerini
		Adimerini

List of genera formerly included in the Colydiidae and Bothrideridae of America north of Mexico, and their current placement:

Aglenus (Gyllenhal) .....(Othniidae)
Anchomma LeConte .....(Tenebrionidae)
Botrodus Casey .....(Cerylonidae)

Cerylon Latreille .....(Cerylonidae)
Eupsilobius Casey .....(Endomychidae)
Euxestus Wollaston .....(Cerylonidae)
Hypodacne LeConte .....(Cerylonidae)
Lapethus Casey .....(Cerylonidae)
Murmidius Leach .....(Cerylonidae)
Myrmechixenis Chevrolat .....(Tenebrionidae)
Philothermus Aube .....(Cerylonidae)

DISTRIBUTION

Two factors govern the distribution of Colydiidae and Bothrideridae: climate and the distribution of woody plants. Their boreal habit is the reason only a few have been seen from the prairie section of North America, where they are found only along tree-lined rivers. The southern tier of states harbors the greatest number of species, many of which extend into Mexico or the West Indies. In the east, their northern limit lays in the New England States, while on the warmer west coast 2 species extend as far north as the Northwest Territories of Canada.

With few exceptions, the eastern species do not cross the 100th meridian. Likewise, most western species do not cross this line to the east. Of the 90 species treated here, 36 are strictly eastern, 50 strictly western, and 4 are found on both sides of the 100th meridian. The following keys take advantage of that fact. On the generic level, the distribution is not nearly as sharply divided. Of the 30 genera recorded here, 11 are eastern, 7 western, and 12 have representatives on both sides of the 100th meridian.

Since the limited distributional records given by Arnett (1962), none has been published for the entire family. The present paper greatly extends the range of many species and lists every state where they have been recorded. This information is given in codens, which are in accordance with the "North American Beetle Fauna Project" by Arnett (1972) and listed in alphabetical order.

AL Alabama
AR Arkansas
AZ Arizona
BC southern British Columbia
BJ Baja California
CA California
CO Colorado
CT Connecticut
DC District of Columbia
DE Delaware
FL Florida
GA Georgia
IA Iowa
ID Idaho
IL Illinois
IN Indiana
KS Kansas
KY Kentucky
LA Louisiana
MA Massachusetts
MD Maryland
ME Maine
MI Michigan
MN Minnesota
MO Missouri
MS Mississippi
MT Montana
ND North Dakota
NC North Carolina
NH New Hampshire
NJ New Jersey
NK Nebraska
NM New Mexico
NV Nevada
NWT North West Territories
NY New York
OH Ohio
OK Oklahoma
ON Ontario
OR Oregon
PA Pennsylvania
QU southern Quebec
RI Rhode Island
SC South Carolina
SD South Dakota
SO Sonora
TN Tennessee
TX Texas
UT Utah
VA Virginia
VT Vermont
WA Washington
WI Wisconsin
WV West Virginia
WY Wyoming

GENERAL BIOLOGY

Little has been published on the early stages of the Bothrideridae and Colydiidae, or on larval or adult feeding habits. Craighead (1920) described the larvae of several North American species. He reared young larvae of *Aulonium tuberculatum* LeConte entirely on macerated inner bark of pines and found the larvae of *Synchita* species consistently associated with fungal growth. He also found the larvae of the Colydiinae to be of a different type than those of the Bothriderinae. Based on that discovery and differences in adult morphology, he placed the latter in the separate family Bothrideridae.

Lawrence (1980) noted that both the metendosternite and the aedeagus of the bothriderines are characteristic of Clavicornia, rather than Heteromera, and cited several larval characters indicating clavicorn affinities but left their position open to question.

De Leon (1934) conducted a study of the insects associated with the mountain pine beetle, *Dendroctonus monticola* Hopkins. He stated that Colydiidae of the genera *Aulonium* and *Lasconotus* found under bark, are probably predaceous, but not on the bark beetle.

Over the years, I have collected large numbers of "Colydiidae" in the old sense, including more than half of the 8300 specimens seen in the present study, In the process considerable knowledge of their habits was gained. However, with few exceptions my observations are of the adults only.

Almost all Bothrideridae and Colydiidae are found on dying or dead trees or their litter, but the 2 families show a preference for different habitats.

Bothrideridae are found most often under older dry bark, while Colydiidae prefer fresher moist habitats.

Some species are restricted to hardwoods, others to conifers, and a few are found on both. It is difficult to generalize, because many species show a distinct preference not shared even by members of the same genus. For instance, 3 of our 5 species of *Aulonium* are confined to pines, while the other 2 are restricted to hardwoods. None of the species known to me enters trees by chewing its own passages. All utilize holes bored by other insects, cracks caused by injury, and those caused by the process of drying. Most Bothrideridae and Colydiidae with a depressed body are found under bark, while those with a cylindrical body tend to follow certain scolytids and platypodids deep into the wood. Colydiidae of both types are most numerous when the cambium of the tree is in its early stages of decay (fermentation), or when mold and fungal growth is developing. Members of both families are surprisingly tolerant of heat, and are usually among the last beetles to be expelled when bark samples or forest litter are placed in a Berlese funnel. They also feign death but can move surprisingly fast in a somewhat jerky fashion.

In the deserts of the Southwest, where suitable habitats for Colydiidae are scarce, the same species of *Bitoma* is found in a number of seemingly unrelated situations: e.g., the leaf-axils of dying sotols and agaves, under bark of palo verde and mesquite, and in the nest piles of packrats. I believe the common denominators are moisture and fungal growth. *Phloeonemus catenulatus* adults and larvae live exclusively in the sappy wounds of mesquite caused by an undetermined cerambycid larva.

Some eastern Colydiidae are attracted to freshly cut wood. They can be trapped in large numbers as follows: In early spring, before the sap rises, cut down a tree, 1 foot in diameter or more. Make the cut 2 to 3 feet above ground. Then, making a nice clean cut, remove a 4 to 6 inch slab off the top of the stump. Clean the cut of all saw dust and replace the slab in its original position. The beetles will enter the saw cut and can be gathered by simply lifting the slab off and examining it. They sit in about equal numbers on the bottom and top. It is important to replace the slab carefully to prevent premature drying out. Such a stump-trap, operated in eastern Oklahoma during March, gave excellent results. The stump was that of a red oak about 2 feet diameter. Within its effective time of 3 weeks, it attracted nearly 300 *Microsicus parvulus*, many *Bitoma quadriguttata* and *Aulonium parallelopipedum*, as well as a few *Microsicus obscurus*, *Colydium lineola*, and *Bitoma quadricollis*. For a week the trap was checked in the morning and before sundown. It became obvious that most of the trapped species are predominantly diurnal in spring. Only a few were found in the morning, the majority in the evening. It should be noted that the nighttime temperatures were rather cool. As the slab and the face of the stump began to dry out, the attraction fell off sharply. After 3 weeks only occasional specimens were taken. Pouring water on the face of the stump did not renew the attraction. Stump-traps proved also very productive for other families. Various tree species have been tested. By far the best results were obtained with oak, followed by hickory, honey-locust, maple, sycamore, and elm. Yellow birch and pine did not attract Colydiidae. Blacklight trapping, throughout the season in the same area, produced only occasional specimens of those species stump trapped. It did, however, yield several species not found by the stump method. They were, in descending order: *Synchita fuliginosa*, *Aulonium tuberculatum*, *Lasconotus referendarius*, and *Bothrideres geminatus*.

In the eastern forests, during late spring and early summer, beating produces excellent results. Most species collected in this manner belong to the genera *Microsicus*, *Bitoma*, *Synchita*, *Namunaria*, and *Bothrideres*. This method captured many specimens of the rare *Microsicus obscurus*. Best results are obtained by beating large dead branches and dead young trees, especially if covered with fungus growth.

Pulling bark is the most universally used and if done carefully the easiest and the most productive collecting method. I like to do my "barking" during the cooler months but occasionally try it in summer. Since dead trees dry from the top down, and the beetles follow the moisture, care must be taken not to overlook the very base. This is where most platypodids attack and where the species of *Colydium*, *Oxylaemus*, and *Sosylus* are more frequent. During drought conditions, even the bark below ground level should be scrutinized. When stripping thick-barked trees, such as ponderosa pine, it is essential to examine the exit holes of bark beetles. Many fine specimens of *Colydium* hide in there, thus escaping detection. Pushing a pine needle, with its point broken off, through the hole will quickly expose them. If time is at a premium, large chunks of bark can be placed with the inside up on the hot coals of a camp fire and the beetles captured as they emerge.

Our species of *Megataphrus* and *Coxelus* are typical deep-litter inhabitants. They are flightless, and their eyes are greatly reduced. Their probable food is fungus mycelia. Sifting and using Berlese funnels are usually the only methods to collect these

seemingly rare species, but occasionally large numbers are encountered on top of the ground. Such was the case on 25-XII-1975, when I hand-picked 145 specimens of *Megataphrus arizonicus* in an area the size of an average house. It was a sunny winter afternoon, high (8500 ft.) in the Santa Catalina Mts., near Tucson, Arizona. The snow that had fallen a few days before was melting wherever the sun warmed the ground. A snow-free area, that had just a month before yielded a few specimens sifting, was examined. Bark chips, sticks, and similar larger pieces of debris scattered about the surface of a thick layer of pine needle litter were inspected. Most pieces had specimens clinging to the underside. Some pieces, no larger than a man's hand, revealed as many as 12 specimens, including mating pairs. As soon as the sun disappeared behind tall trees, and the temperature dropped to near freezing, the beetles vanished. The whole event lasted only about an hour. The following week, under similar conditions, no more specimens were found.

Some members of the Bothrideridae are known ectoparasites during their larval stages. Cerambycid and buprestid larvae and pupae are the preferred hosts. Our common *Bothrideres geminatus* seems to prefer the buprestids of the genus *Chrysobothris*. Hardwoods heavily infested by this buprestid, invariably yield *B. geminatus*. *Bothrideres cryptus* appears to seek out the larvae of cerambycids of the genus *Elaphidionoides*. Since both hosts attack the same species of oak, both species of *Bothrideres* can be found together often. One desert species, *Bothrideres cactophagi*, parasitizes the large weevil, *Cactophagus validus* LeC., which lives on cacti. Unlike the Colydiidae, the Bothrideridae do not require obvious moisture or fungus growth. They can be found under dry bark, which most other beetles, including the host, have left long ago. The same is true for *Deretaphrus* and *Prolyctus*. I have taken the former under dry bark of ponderosa pine and the latter on dry bark of oaks and hickories. Even though all known Bothrideridae are parasites, not all occur under dry bark. The species of *Sosylus* use platypodids as hosts and live in or about their bore-holes. The representatives of the genera *Oxylaemus* and *Rustleria* prefer the bases of dead trees. Several times they have been found in the company of ants; however, I suspect their true host is a weevil or bark beetle.

All known larvae of the Bothrideridae pupate in a shelter fashioned by themselves. Craighead (1920) gave a brief description of these structures for the genera *Deretaphrus, Lithophorus*, and *Bothrideres*. Unfortunately, his figures are of poor perspective and do not convey their true shape. He called them "cocoons". I have seen the "cocoons" of *Bothrideres geminatus, B. cryptus*, and *Prolyctus exaratus*, and found the term misleading. These structures bear no resemblance to the conventional concept of the cocoons of Lepidoptera or Hymenoptera. Instead they strongly resemble the oval armor of certain scale insects or the half shell of a mussel (Fig. 1). I therefore propose the use of the term pupal-shell. Once, while prying closely adhering, dry bark from a dead oak, I noticed an empty pupal chamber of a larger wood borer, probably a cerambycid. This chamber contained 7 pupal-shells. Several adult *Bothrideres cryptus* were resting near them; one was observed exiting. The structures were crowded together and partially overlapping. Their extremely thin walls appear to be made from finely mascerated bark, bonded with some exudate. The periphery is cemented directly to the bark, without the benefit of any inner floor. The color matches the surrounding bark. The construction material is quite brittle and free of threads. There was no sign of weaving as found in true cocoons. When emerging, the adults chew an exit hole near the bottom, which fits their flattened body.

Slipinski (pers. com.) observed similar pupal shells in the genus *Cerylon* of the family Cerylonidae. This further strengthens the opinion that the Bothrideridae are more closely related to the Cerylonidae than to the Colydiidae.

When available, more specific information is given in the text with each species.

ECONOMIC IMPORTANCE

In the past, the Colydiidae and Bothrideridae were regarded as rare and economically unimportant. True, some species are rarely found and probably of no consequence, but others are quite common and no doubt play an important part in the ecosystem. Biological studies should be made of these common species to determine their impact. To date only 1 species is known to be a serious agricultural pest, but others are suspect. On the other hand, some of our species probably are beneficial to forestry.

HARMFUL

In 1976, Dr. C.A. Triplehorn sent me a small series of Colydiidae he had received from Dr. Carlos Jorge Rossetto, a researcher with the Department of Agriculture, Brazil. The enclosed letter by Dr. Ros-

setto explained, "After 10 years of intensive study the Brazilian Department of Agriculture proved that this colydiid is the carrier of *Fusarium moniliforme* var. *subglutinans*. This organism is the cause of pineapple gum disease, which is the most important and limiting factor for pineapple production in Brazil. Crop losses are extremely heavy when the beetle is present. Fruits in the flowering stage, artificially infested with adults, rotted 100%." At that time I identified the beetle as *Bitoma* sp., but recently discovered it is *Phloeodalis reitteri* Grouvelle. I do not know if the above was ever published.

In Arizona, I have frequently collected the closely related *Bitoma gracilis* and *B. neglecta* on dead or dying sotol and agave. The cause of death of these plants was not determined, but it is possible the beetles played an important part in it.

I have noted that most of our species of the genera *Bitoma, Synchita, Microsicus*, and *Paha* are found on fungal growth of dead or dying trees. They are especially numerous on trees infested by the fungal genus *Hypoxylon*, which currently kills many valuable hardwood trees in southeastern Oklahoma. The connection between the beetles and the disease is not clear but should be investigated.

BENEFICIAL

All known larvae of the genus *Bothrideres* are ectoparasites of immature cerambycids and buprestids. Our common *Bothrideres geminatus* of eastern North America is especially detrimental to the larvae and pupae of *Chrysobothris* species. These flat

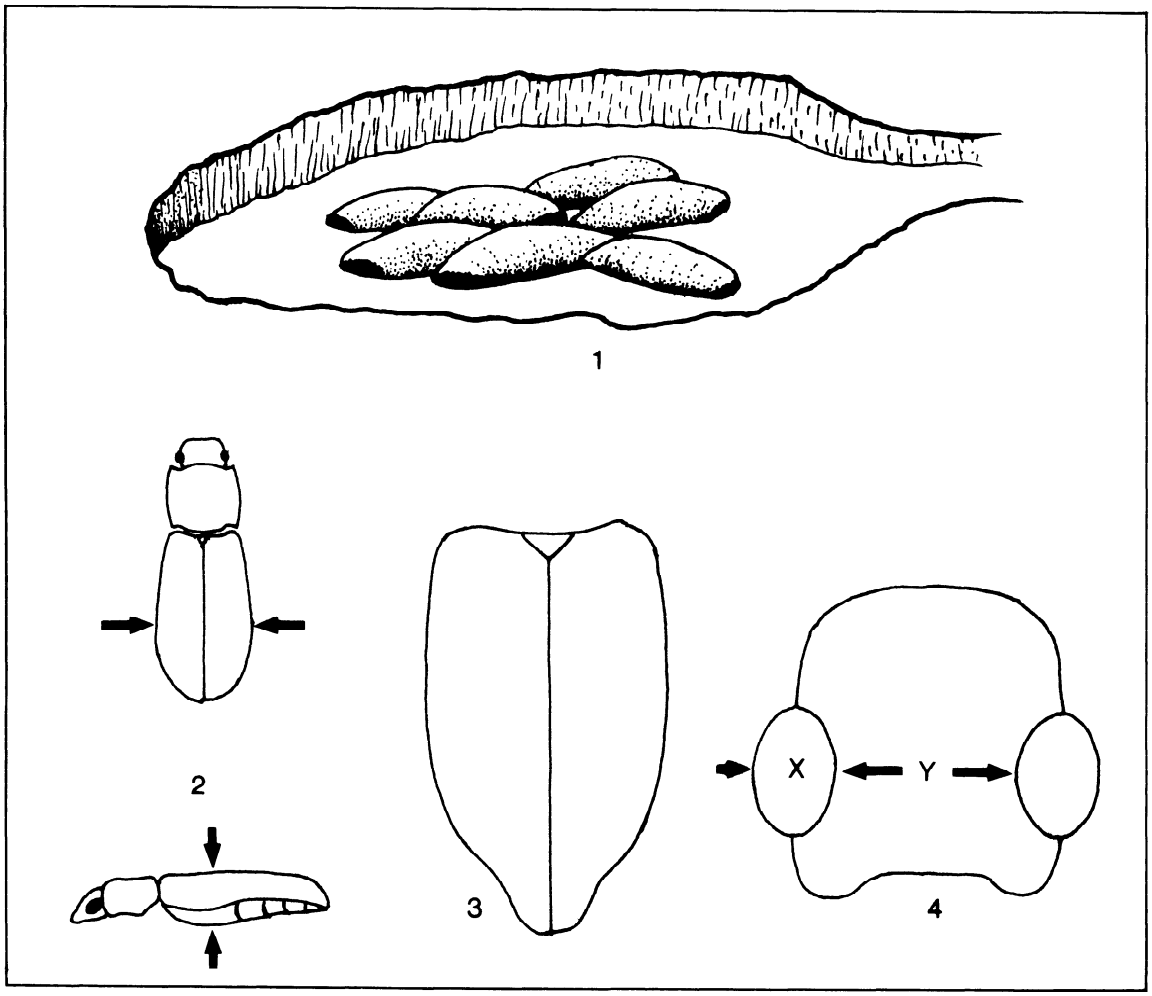

Figure 1-4. 1) Pupal-shells of *Bothrideres cryptus* Stephan; 2) Diagram showing use of T/W; 3) Diagram showing acutely rounded elytral apex; 4) Diagram showing use of X to Y.

headed borers are devastating pests of various fruit and forest trees I found *Bothrideres* much more numerous than the literature indicates and am convinced it is helpful as a control agent.

The greatly elongate and cylindrical colydiids of the genera *Colydium* and *Nematidium* frequent the bore holes of some ambrosia beetles and platypodids. Whether they are predators or scavengers is not clear. The similarly shaped bothriderids of the genus *Sosylus* are proven parasites of platypodids (Browne 1962), which bore deep into wood, thus greatly reducing the commercial value of timber.

METHODS AND TERMS

Specimens were examined with the aid of a binocular microscope of 30 power. Occasionally 60 power was used to view details of the antennae and tarsi. Measurements were taken with the aid of a scale in the eyepiece. Dissections were made only to establish the conditions of the procoxae and to see whether the elytra were connate. No attempt was made to examine the genitalia, except to distinguish 2 species of *Bothrideres*.

Most terms are standard, but a few need some explanation.

Length: The distance between the apex of the clypeus and the apex of the elytra.

T/W: The ratio of the greatest overall thickness (T), as seen in the side view, versus the greatest overall width (W), as seen from above. (Fig. 2). When the elytra are agape, allowances must be made.

Pronotum: The length of the pronotum is measured along the centerline, from base to apex. The width is the greatest distance between lateral margins at 90 degrees to the centerline. The sub-marginal carina or costa, if present, is located approximately midway between the center of the disk and the lateral margin. It must not be confused with the upper carina of the bicarinate lateral margin found in some species. In a bicarinate lateral margin the carinae are only narrowly separated. The carinae of the disk are called interlaced when they form an irregular lace-like pattern symmetrical about centerline.

Elytra: The terms costa and carina are interchangeable. Usually strong or rough elevations are called costae, while weak or smooth ones are called carinae. When counting costae or carinae on the elytra, the costae or carinae of the suture and lateral margin are not counted. The elytral apex is called acutely rounded when it is somewhat prolonged and tapered before the narrowly rounded tip (Fig. 3). The term network describes the condition of the ridges between the elytral punctures of some species. These ridges have the tendency to connect with each other, thus forming the pattern of a net.

Eyes and X/Y: Normally the eyes are located near the side of the head. In some species they are lower, thus exposing more of the eyes to ventral view. This reduces the distance between the eyes ventrally. This condition is specific and not influenced by the sex. Sometimes it is the only way to make positive identifications. The term X/Y expresses the ratio between the width of one eye (X), versus the distance between both eyes (Y), as seen from below on a straight line through the center of both eyes (Fig. 4). The eyes are called hemispherical when each eye is shaped like half a ball, thus strongly protruding.

Antennal grooves: This term is applied here only to those antennal receptacles which are margined and which are not shorter than an eye. The margin can be toward the outside, inside, or both. They are found mostly on the head but sometimes occur on the prothorax as well. Depressions which are likely used to retain the antennae in repose, but have no margin, are not called antennal grooves, nor are margined grooves which are shorter than the eye.

Antennal club: A club is 1-segmented when segments 10 and 11 are united to leave no other visible separation than a suture. Such a club has the base glabrous, the tip pubescent, and no longer shows a clear constriction at its suture, thus displaying an uninterrupted outline. While it is usually easy to decide whether a club is 2- or 3-segmented, there are a few cases which may be doubtful (Fig. 26). In those cases segment 9 is enlarged apically, but its base is subequal to the apex of segment 8. Unless the apex of segment 9 is 2.5 times wider than the apex of segment 8, it is not considered part of the club.

Pubescence: Pubescence is called sparse when it does not interfere with a clear view of the derma, moderately dense when the derma is somewhat obscured by it, and dense when the features of the derma are obscured. Unless otherwise stated, all references to the pubescence are for the dorsum only. Pubescence which can be seen only under higher than 30 power, or special lighting, is disregarded.

Mounting: During the course of this study, I have seen specimens mounted by many different methods and preparators. Some were a pleasure to work with, while others resembled something caught on "stick-um paper". In order to use the following keys to their fullest, the beetles should be clean and individually mounted in such a way as to expose at least half the top and bottom. Multiple points per pin,

or multiple specimens per card should be avoided. I have seen as many as 3 different species on a single pin.

Synonymy: Unless otherwise indicated, synonymies are taken from Hetschko (1930).

CLASSIFICATION

In order to make the identification of material from America north of Mexico as easy as possible, the following keys are tailored to our fauna and may not work for exotic species.

Key to the families

1. Antennal insertion exposed, visible from above ..... Bothrideridae
1'. Antennal insertion concealed under the frontal side margin ..... Colydiidae

Family BOTHRIDERIDAE

Key to the tribes of the Bothrideridae

1. Procoxae separated by at least 0.5 of 1 coxal diameter ..... Bothriderini
1'. Procoxae contiguous or nearly so 2

2(1'). Trochanters small, indistinct .. Deretaphrini
2'. Trochanters large, distinct ..... Teredini

Key to the genera of the Teredini

1. Elytral punctures in series, coarse ..... *Oxylaemus*
1'. Elytral punctures confused, very fine ... *Rustleria*

Genus *OXYLAEMUS* Erichson

Oxylaemus Erichson, 1845:275
(*Redistes* Casey, 1924:181) **n. syn.**

Type Species: *Lyctus cylindricus* Panzer, 1796:18

This new synonymy was discovered by J.M. Kingsolver of the NMNH, who kindly compared types for me.

Diagnosis: Body cylindrical, elongate, moderately shiny, punctation of dorsum sparse, but coarse, pubescence sparse. Head deflexed. Antennae 10-segmented, club 1-segmented, round, divided into a shiny and a densely pubescent part, antennal grooves indistinct, indicated only by a short polished area below the eyes. Pronotum longer than wide, lateral margins complete. Procoxae contiguous, their cavities narrowly closed behind. Elytra striate-punctate, apex evenly rounded.

Key to the species of *OXYLAEMUS*

1. Basal impressions of pronotum small, indistinct. East of the 100th meridian ..... *americanus*
1'. Basal impressions of pronotum large, extending forward to near middle. West of the 100th meridian ..... *californicus*

Oxylaemus americanus LeConte (Fig. 5)

Oxylaemus americanus LeConte, 1863:68
(*Redistes cylindricus* Casey, 1924:181) **n. syn.**

Diagnosis: Dark reddish brown. Body cylindrical, elongate, 3.2 times longer than wide. Pronotum longer than wide, widest slightly past middle, strongly convex, with a pair of small basal impressions, disk with large, somewhat elongate punctures, no other distinguishing sculpture, lateral margins barely visible from above. Elytral striae consisting of large, well separated, elongate punctures, striae not impressed, except at declivity. First ventrite with apical margin broadly impunctate. Dorsum shiny, pubescence short, sparse, and erect. Length 2.5 - 3 mm.

Distribution: This rare species is found throughout much of eastern North America, from New Jersey to Florida, west to eastern Oklahoma. Specimens examined, 15: 1(NJ, PA) 2(AL, FL, GA, NC) 3(OK).

Biology: Nothing has been published on the biology of *O. americanus*. Of those examined by me, 1 specimen from North Carolina carried a label, "ex fungus 253 large mushroom". I collected 2 specimens in eastern Oklahoma, on an old oak stump, and about the base of a large dead pine.

Months collected: III,IV,V,VIII.

Oxylaemus californicus Crotch

Oxylaemus californicus Crotch, 1874:75

Diagnosis: Reddish brown. Body cylindrical, elongate, about 3.2 times longer than wide. Pronotum longer than wide, subparallel, strongly convex, disk with large elongate punctures, center of disk with an impunctate area of variable extent, apical 2 thirds of lateral margin not visible from above, base at center with a pair of deep fovcae, the basal depressions near hind angles large and deep, extending forward to about middle, gradually becoming narrower and shallower. Elytral striae consisting of large, well separated, somewhat elongate punctures, striae not impressed, except sutural stria at declivity. First ventrite with apical margin narrowly impunctate. Dorsum shiny, pubescence short and erect. Length 3.2 - 4.4 mm.

Distribution: This fairly common species is restricted to the Pacific Northwest. Specimens examined, 69: 3(n.CA) 4(BC, ID, OR, WA).

Biology: Label data indicated that this species occurs under bark of various conifers. Nothing indicated whether the bark was moist or dry. Occasionally at light.

Months collected: V-VII.

Genus *RUSTLERIA* Stephan
new genus
Figure 6

Description: Body cylindrical, elongate, 3.2 times longer than wide. All punctation confused. Head strongly deflexed, vertex nearly vertical in repose, deeply withdrawn into pronotum, barely visible from above. Antennae 10-segmented, short, about as long as width of head, club abruptly 1-segmented, large, elongate oval, 5 times wider than segment 9, its shiny portion larger than pubescent one, antennal grooves absent. Eyes small, vertical relative to the head, nearly 3 times longer than wide, not protruding above contour of head. Pronotum obovate, 0.1 longer than wide, widest near apical third, sides rounded and convergent toward base, lateral margins distinct near basal angles only, elsewhere barely indicated, base near center with a pair of small indistinct depressions, basal depressions near basal angles shallow, subtriangular. Procoxae contiguous, their cavities narrowly open behind. Mesocoxae very narrowly separated. Metacoxae separated by an acute process of first ventrite. Center of metasternum with a deep longitudinal impressed line in apical half. Ventrite 1 about as long as next 2 combined, length of ventrite 2,3, and 4 subequal, 5 longer. Elytra without obvious sculpture, apex evenly rounded.

Type species: *Rustleria obscura* Stephan, **new species.**

Discussion: According to R.D. Pope of the BMNH (pers. com.), who kindly compared *Rustleria* with other New World genera, it is nearest *Teredomorphus* Heinze. The latter differs in the shape of the eyes and the lack of basal impressions on the pronotum.

Rustleria obscura Stephan
new species

Description: Holotype, light reddish brown throughout. Punctation of dorsum confused, extremely fine. Pubescence white, obvious but very fine, moderately dense, recumbent, forming vague, broad stripes on elytra. Length 3.1 mm. Sex unknown.

Distribution: Known only from the holotype: ARIZONA: Cochise County, Chiricahua Mts., Rustler's Park, 8500ft., 29-VI-1968, K.Stephan (FSCA).

Biology: Found inside a partially rotten ponderosa pine stump infested with ants (yellow *Lasius* sp.).

Key to the genera of the Deretaphrini

1. Length 9.5 mm or more. Procoxae slightly separated ..... *Deretaphrus*
1'. Length 5.5 mm or less. Procoxae contiguous ..... *Sosylus*

Genus *DERETAPHRUS* Newman
Figure 7

Deretaphrus Newman, 1842:403
(*Sigerpes* Germar, 1848:222)

Diagnosis: Body cylindrical, elongate, about 4 times longer than wide. Antennae 11-segmented, club 3-

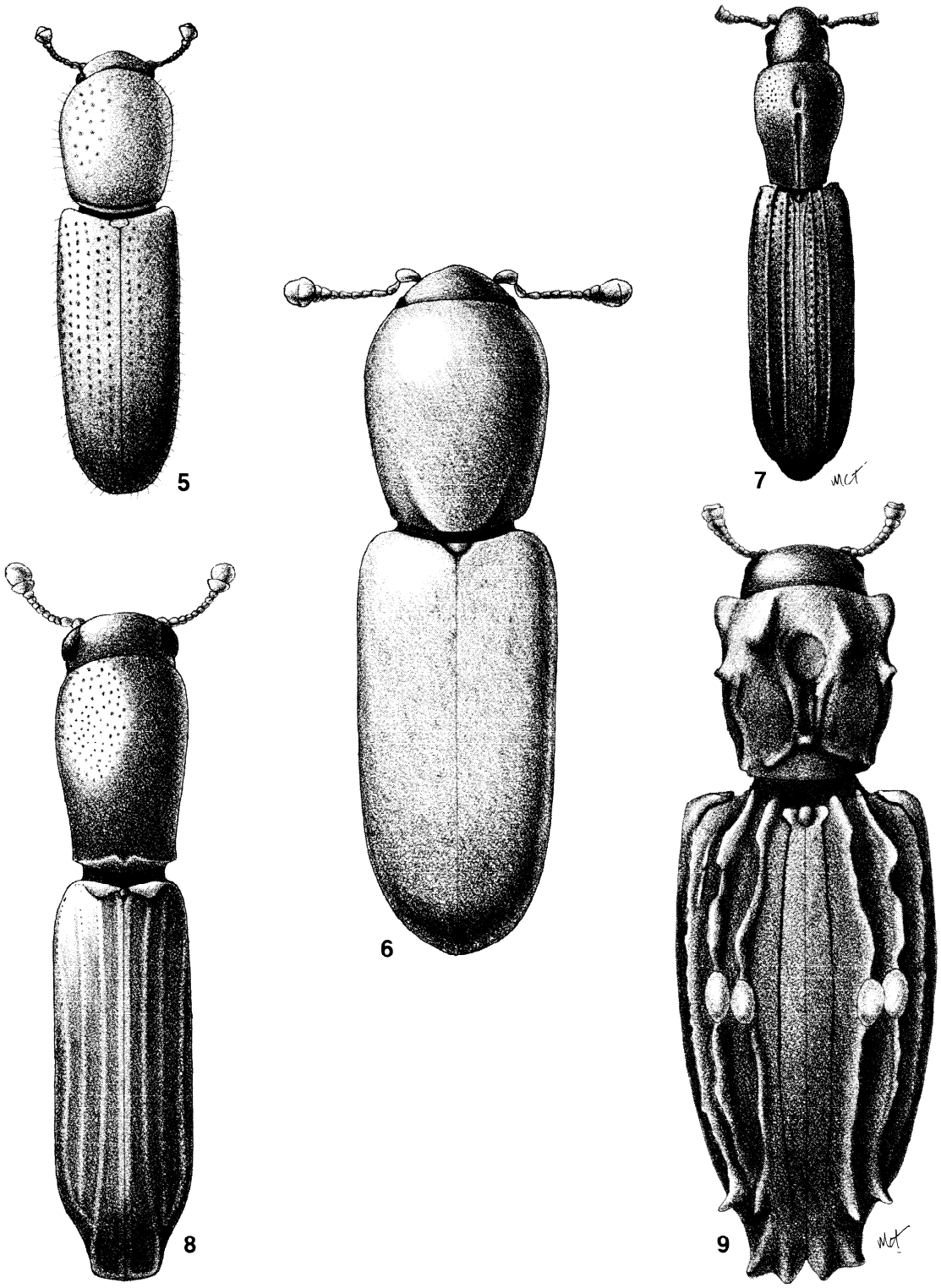

Figure 5-9. 5) Habitus of *Oxylaemus americanus* LeConte; 6) Habitus of *Rustleria obscura* Stephan; 7) Habitus of *Deretaphrus oregonensis* Horn; 8) Habitus of *Sosylus costatus* LeConte; 9) Habitus of *Lithophorus ornatus* Arrow.

segmented. Head with antennal grooves. Pronotum longer than wide. Procoxae slightly separated, closed behind. Elytra costate.

Deretaphrus oregonensis Horn

Deretaphrus oregonensis Horn, 1872:146

Diagnosis: Body piceous, opaque, glabrous, about 4 times as long as wide. Antennae thick and short, the club not abruptly differentiated from funicle, last segment truncate. Pronotum 1.25 times longer than wide, widest near apical third, sides sinuate and convergent toward base, lateral margin incomplete, ending near apical quarter, disk of pronotum with 2 deep longitudinal depressions, the apical one short, the basal one extending from base to about middle. Elytra between suture and lateral margin with 4 blunt costae, intervals with 2 rows of well separated large punctures. Length 9.7 - 11.5 mm.

Distribution: This is our largest species of the family. It is not rare, and restricted to northern California and the Pacific Northwest. Specimens examined, 41: 3(CA) 4(BC, ID, NV, OR, WA).

Biology: Found under loose, dry bark of dead pines. Craighead (1920) described the larva and pupa. He took the species on dead Jeffrey pine, in the pupal cell of the cerambycid, *Asemum atrum* Eschscholz. He also figured the pupal-shell. See General Biology.

Months collected: III, IV, VI, VII, VIII, XI, XII.

Genus *SOSYLUS* Erichson

Sosylus Erichson, 1845:28
(*Pleuridium* LeConte, 1861:91)
(*Pycnocephalus* Kraatz, 1895:160)
(*Cephalopycnus* Arrow, 1909:193)

Diagnosis: Body cylindrical, strongly elongate, glabrous. Antennae 11-segmented, club large, abruptly 2-segmented. Head with antennal grooves. Pronotum longer than wide. Elytra finely carinate, apex subtruncate. Procoxae contiguous, their cavities closed behind.

Discussion: Our species have in addition to a weak sutural and marginal carina, 4 stronger carinae. The one next to the suture is here called the first.

Biology: The species are predaceous on platypodids (Browne, 1962) and are not commonly collected, usually at light only.

Key to the species of *SOSYLUS*

1. Carina 1 reaches apical margin, carinae 2 and 3 do not ..... *.costatus*
1'. Carina 1 not reaching apical margin, carinae 2 and 3 join near apex, and continue to apical margin 2

2(1'). Interspaces finely punctate ..... *.dentiger*
2'. Interspaces impunctate, instead with 2 very fine, flat carinae ..... *.extensus*

Sosylus costatus LeConte
Figure 8

Sosylus costatus LeConte, 1863:64

Diagnosis: Dark brown to piceous, glabrous, subopaque. Body about 4.5 times longer than wide. Pronotum about 1.5 times longer than wide, widest near apical quarter, strongly convergent toward base, punctures of disk elongate, about 2 times longer than wide, lateral margin not quite reaching apex, its apical half not visible from above. Each elytron between suture and lateral margin with 4 carinae, carina 1 more pronounced and reaching apical margin, next 2 ending near declivity, fourth joining first, interspaces somewhat irregularly punctate, punctures well separated, shallow and nearly round. Length 3.8 - 4.1 mm.

Distribution: This, our most common species of the genus, is found in the southeastern USA. Specimens examined, 36: 2(AL, AR, FL, GA, MS, SC) 3(TX).

Biology: Only a few of the specimens examined carried habitat labels. One was taken under bark: (no host), all others came to light.

Months collected: III, V, VI, VII, VIII, XI.

Sosylus dentiger Horn

Sosylus dentiger Horn, 1878:582

Diagnosis: Dark brown to piceous, glabrous, subo-

paque. Body about 4.5 times longer than wide. Pronotum about 1.3 times longer than wide, widest near apical third, strongly convergent toward base, lateral margin visible from above, reaching apex, punctures of disk greatly elongate, about 3 times longer than wide. Each elytron between suture and lateral margin with 4 carinae, the first ending before apex, the second and third joining before apex, third and fourth join at apex. Interspaces irregularly punctate, punctures sparse, elongate and shallow, difficult to see. Length 4.5 - 5 mm.

Distribution: This rare species is found in Florida and the southwestern USA, as well as the Virgin Islands and Baja California. Specimens examined, 9: 2(FL) 3(AZ, BJ, CA).

Biology: Nothing specific is known about the biology of this species. The only label data were, at light.

Months collected: VII, VIII, IX.

Sosylus extensus Casey

Sosylus extensus Casey, 1897:633

Diagnosis: Dark brown to piceous, glabrous, subopaque. Body about 4.5 times longer than wide. Pronotum about 1.5 times longer than wide, widest near apical third, strongly convergent toward base, lateral margin visible from above and reaching apex, punctures of disk greatly elongate, about 3 times longer than wide. Each elytron between sutural and marginal carinae with 4 additional carinae, the first ending before apex, the second and third joining before apex, the third and fourth joining at apex. Interspaces impunctate, with 2 very fine, flat and polished carinae. Length 4.5 - 5 mm.

Distribution: This uncommonly collected species occurs from the southeastern USA to eastern Oklahoma. Specimens examined, 26: 2(AL, FL, GA, LA, MS) 3(OK, TX).

Biology: Of the 15 specimens carrying habitat labels, 13 were taken at light. I took 2 on a red oak stump-trap in July. Blacklight in the same area did not produce specimens. I assume they are not readily attracted to light.

Months collected: II, V, VII, VIII, IX.

Key to the genera of the Bothriderini

1. Elytral costae variously interrupted and each elytron with a pair of amber callosities ..... *Lithophorus*

1'. Elytral costae uninterrupted and each elytron without amber callosities 2

2(1'). Ventrite I with distinct coxal lines, which nearly reach the apical margin ... *Prolyctus*

2'. Ventrite I with coxal lines at most vaguely indicated ..... *Bothrideres*

Genus *LITHOPHORUS* Sharp

Lithophorus Sharp, 1894:487

Diagnosis: Body elongate, about 3 times longer than wide, convex. Antennae 10-segmented, club 1-segmented. Pronotum much narrower than elytra. Elytra with interrupted costae, and amber spots. Procoxal cavities closed behind. Ventrite 1 as long as next 3 combined, without coxal lines.

Lithophorus ornatus Arrow
Figure 9

Lithophorus ornatus Arrow, 1909:194
(*Lithophorus succineus* Sharp, 1894:488, not Pascoe, 1860:108)

Diagnosis: Piceous, glabrous, and opaque, convex, T/W = 4/5. Antennal club trapezoidal, 1.5 times wider than long, segment XI reduced to a densely pubescent remnant, retracted inside the 10th, which is barely visible from the side. Pronotum a little longer than wide, widest near apex, convergent toward base, sides only slightly rounded, disk roughly sculptured with tubercles and depressions, a rhomboidal depression on middle of disk. Elytral costae variously interrupted and raised into prominent tubercles, especially near apex, each elytron with 2 translucent amber spots near middle. Length 4 - 5 mm.

Distribution: This species is widely distributed south of the USA, from Mexico to Guatemala. In our area it is rare and found only in extreme southern Texas, near Brownsville. Specimens examined, 4.

Biology: According to Craighead (1920), *L. ornata* is predaceous on several species of cerambycids associated with *Acacia* spp.

Months collected: The 3 specimens showing dates were collected in June.

Genus *PROLYCTUS* Zimmermann

Prolyctus Zimmermann, 1869:254
(*Machlotes* Horn, 1878:585, not Pascoe, 1863a:36)

Diagnosis: Body elongate oval, about 2.7 times longer than wide, convex. Antennae 11-segmented, club 2-segmented. Pronotum about 1.2 times wider than long. Elytral costae uninterrupted. Ventrite 1 as long as the next 3.5 ventrites combined, coxal lines long and straight, nearly reaching the apical margin.

Prolyctus exaratus (Melsheimer) Figure 10

Prolyctus exaratus (Melsheimer), 1846:111
(*Erotylathris exaratus* (Melsheimer), Hetschko, 1930:86)
(*Machlotes exaratus* Melsheimer, Horn, 1878:586)

Diagnosis: Piceous, elytral intervals sometimes lighter, opaque, glabrous. Antennal club 2-segmented, penultimate segment large, trapezoidal, subglabrous and nearly twice as wide as last, which is ovate, wider than long and densely pubescent. Pronotum widest near middle, width of base and apex subequal, sculptured with costae and central depressions, central pronotal depression nearly half as wide as pronotum, sharply margined laterally, shallow, and gradually sloping upward toward apex, broadly open toward base, with a deep fovea at central basal limit, 2 prominent tubercles opposite scutellum; enclosed in central depression are 2 contiguous, ovate, and convex protuberances. Procoxal cavities closed behind. Each elytron between the sutural and marginal costae with 5 other costae, first closest to suture, ending just before apex, second, third, and fourth, more or less joined by short transverse costae, fourth continuing to near apical margin, fifth fading near apical third of elytra, third, fourth, and fifth starting at humerus. Elytral apex somewhat prolonged, subtruncate. Length 3.2 - 6 mm.

Distribution: While other members of this neotropical genus occur from Mexico to Argentina, our species has an isolated distribution. Specimens were seen from western Pennsylvania to northern Alabama, west to eastern Oklahoma and Texas. It seems to be missing in the southeastern coastal plain of the USA. Specimens examined, 95: 1(OH) 2(AL, AR, KY, LA, NC, PA) 3(OK, TX).

Biology: Nothing is known about the immature stages of this species. Adults are locally common and found under dry bark of dead or injured oaks and hickories, especially near the base. Old fire-scars often produce specimens. Occasionally on pines and at light.

Months collected: All year, except VIII.

Genus *BOTHRIDERES* Erichson

Bothrideres Erichson, 1845:287

Diagnosis: Body elongate oval, loosely articulated, depressed or convex, pubescent. Antennae 11-segmented, club 2-segmented, penultimate segment wider and larger than last. Pronotum widest near apical quarter, convergent toward base, disk with depressions or foveae, coarsely and densely punctate. Procoxal cavities narrowly closed behind. Elytral disk striate or carinate, or both, elytral base and apex more strongly so, punctation of elytra much finer than on pronotum. Ventrite 1 without coxal lines, a little less than 3 times longer than the next 3 combined. Members of this genus are subject to enormous size differences within each species.

Key to the species of *Bothrideres*

1. Body depressed, ratio of greatest thickness to greatest width 1 to 1.7 or more. Pronotal depressions usually vague, never deep or open at base. Elytral interval 3 not raised at base, subequal in height to intervals 2 or 4 2

1'. Body more convex, ratio of greatest thickness to greatest width 1 to 1.4 or less. Pronotal depressions distinct and large, often open at base. Elytral interval 3 strongly raised at base, much higher than intervals 2 or 4 . . . 5

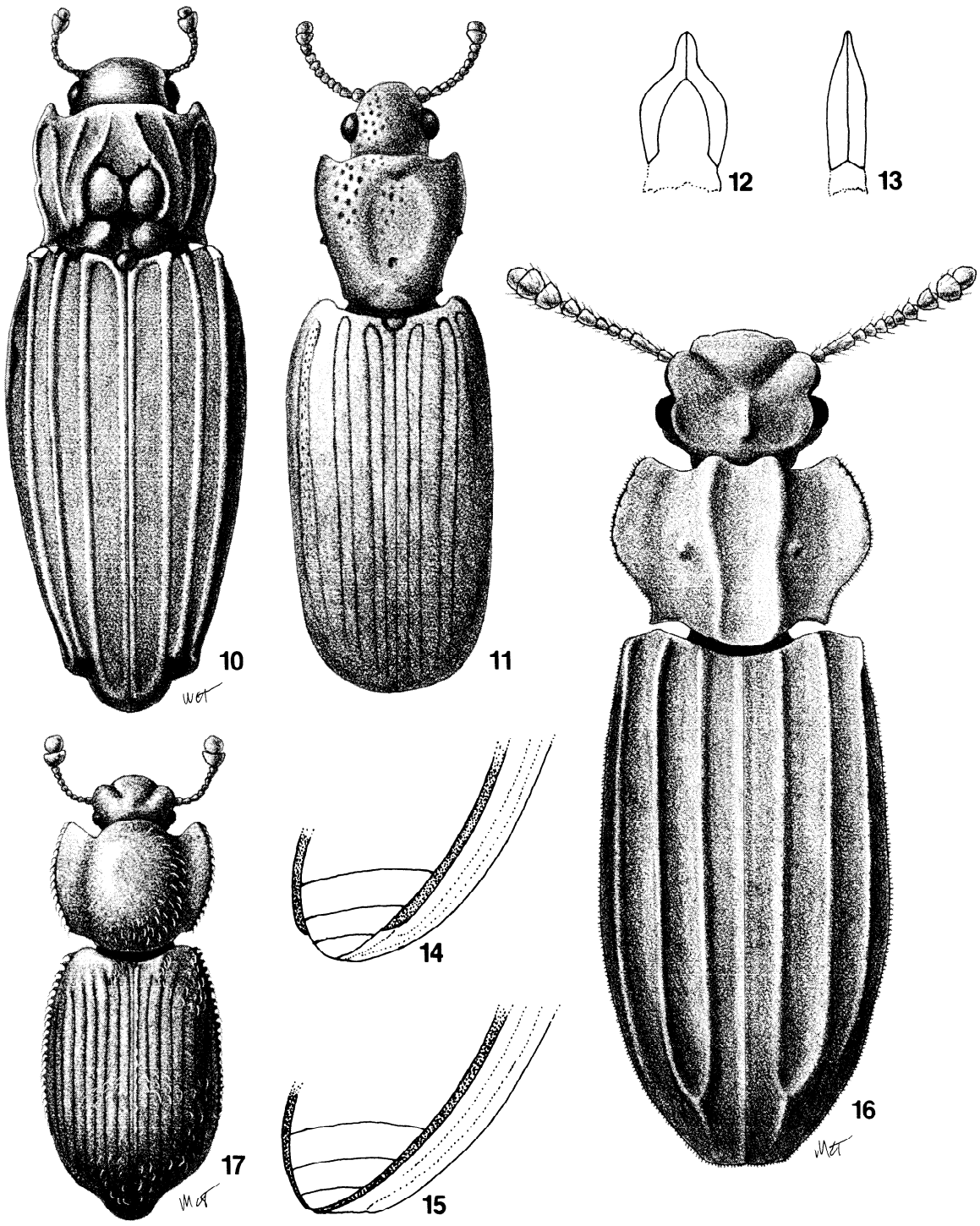

Figure 10-17. 10) Habitus of *Prolyctus exaratus* (Melsheimer); 11) Habitus of *Bothrideres geminatus* (Say), male; 12) Aedeagus of *Bothrideres geminatus* (Say); 13) Aedeagus of *Bothrideres cryptus* Stephan; 14) Epipleural fold near apex Tuberculata group; 15) Epipleural fold near apex Costata group; 16) Habitus of *Rhagodera costata* LeConte; 17) Habitus of *Coxelus serratus* Horn.

2(1). Area between suture and first stria with a double row of small punctures. West of the 100th meridian only ..... *depressus*

2'. Area between suture and first stria with a single row of larger punctures. East and west of the 100th meridian 3

3(2'). Punctures of the raised interval which originates at the humerus very fine, arranged in 2 somewhat confused rows. East of the 100th meridian only ..... *geminatus*

3'. Punctures of the raised interval which originates at the humerus coarser, arranged in a single row. East and west of the 100th meridian 4

4(3'). Eyes as seen from above like a half sphere, abruptly protruding. East of the 100th meridian only ..... *cryptus*

4'. Eyes as seen from above like a third of a sphere, flatter. West of the 100th meridian only ..... *arizonicus*

5(1). Pronotal depression nearest apex very large, twice as large as the one nearest base, the latter closed at base ..... *montanus*

5'. Pronotal depression nearest apex not twice as large as the one nearest base, the latter open at base 6

6(5'). Basal depression of pronotum broadly triangular, widely open at base. Lateral margin of pronotum angular, straight or slightly sinuate before the acute apical angle .... *cactophagi*

6'. Basal depression of pronotum deep and rounded, connected to base by a triangular, highly polished area, which is at a higher level than the bottom of the depression. Lateral margin of pronotum evenly rounded before the acute apical angle ... *subvittatus*

Bothrideres depressus Sharp

Bothrideres depressus Sharp, 1895:489

Diagnosis: Dark brown, strongly depressed, T/W = 1/2, moderately pubescent, denser on elytra. Eyes moderately protruding, facets fairly coarse. Pronotal length subequal to width, widest near apical quarter, apical margin nearly straight, apical angles rectangular, lateral margin subparallel from apex to tubercle, from there convergent toward base, basal angles small, obtuse, base about one fifth narrower than apex, disk flat to slightly convex, with 2 median depressions, the one nearest apex large, shallow and ill defined, the one nearest base foveiform, an area at central apical margin impunctate. Elytra striate, in the basal third, the raised sutural and second raised discal intervals each with a confused double row of small punctures, first raised discal interval with a single row of punctures, third raised discal interval bare. Length 2.8 - 4.1 mm.

Distribution: In our region, this species is restricted to the Sonoran Desert zone of southern Arizona, from where only 3 specimens were seen. It is more common from Sonora, Mexico to Guatemala.

Biology: It is found under dry bark of dead palo verde and mesquite infested with buprestids and cerambycids. In southern Sonora, I have taken several specimens beating dead branches of *Acacia* spp.

Months collected: III, V.

Discussion: *Bothrideres depressus* could be confused with *B. arizonicus*. In the latter each of the raised sutural and second raised elytral intervals has only a single row of punctures, whereas *depressus* has double rows there. In addition *depressus* averages smaller, is more pubescent, and confined to the lower desert.

Bothrideres geminatus (Say)
Figure 11

Bothrideres geminatus (Say), 1826:262
(*Lyctus geminatus* Say, 1826:262)

Diagnosis: Dark brown, depressed, T/W = 1/1.8, moderately pubescent, feebly shining. Eyes strongly protruding, hemispherical. Pronotal length subequal to width, widest near apex, apical margin nearly straight, apical angles rectangular, disk flat to slightly depressed, with 2 median, shallow depressions, an area at central apical margin impunctate. Elytra striate, their pubescence appressed, except along apical third of lateral margin, punctures of raised interval which originates at humerus very small and arranged in 2 somewhat confused rows. Elytral apex differs in the sexes. Male: elytral apex very blunt and upturned, low interval next to suture not reaching apex freely, stopped by a raised bead which margins entire apex. Female: elytral apex bluntly bullet-shaped

down turned, low interval next to suture freely reaching apex. Male genitalia wide as in figure 12. Length 2 - 5 mm.

Distribution: This common species is widespread throughout eastern North America, from northern New York to Florida, west to eastern Oklahoma. It has not been found south of the USA. Until recently I named all specimens from east of the 100th meridian *Bothrideres geminatus*, and so they stand in most collections. The recent discovery that 2 sympatric species are involved, left some of the records doubtful. However, I have no doubt that most, if not all state records for *B. geminatus* will be confirmed by reexamination of the material. Specimens examined, 500+: 1(DE, IL, IN, MD, NJ, NY, ON, PA) 2(AL, FL, GA, LA, MS, NC, TN, SC, WV) 3(OK, TX) 5(KS, MO).

Biology: This species occurs under dry bark of various hardwoods and occasionally pines, which are infested with buprestids of the genus *Chrysobothris*. It parasitizes their immatures. For information on the pupal-shells, read the section on General Biology. It rarely comes to light.

Months collected: All year.

Discussion: Until 1986, this species had been united with the sympatric *B. cryptus*. All specimens identified before that date are named *B. geminatus*. The 2 species can be separated as follows: *Bothrideres geminatus*: raised humeral interval with 2 rows of small punctures. Elytral pubescence appressed, except near apical lateral margin. Male genitalia wide. *Bothrideres cryptus*: raised humeral interval with 1 row of punctures. Elytral pubescence semierect. Male genitalia narrow.

Bothrideres cryptus Stephan new species

Description: Holotype, male. Dark brown, depressed, T/W = 1/1.8, moderately pubescent, feebly shining. Eyes strongly protruding, hemispherical. Pronotal length subequal to width, widest near apex, apical margin nearly straight, apical angles rectangular, disk flat to slightly depressed, with 2 median, shallow depressions, an area at central apical margin impunctate. Elytra striate, their pubescence semierect, especially nearer the sides, the punctures of the raised interval which starts at the humerus large and arranged in a single row. Elytral apex bluntly bullet-shaped (both sexes) and down turned, low interval next to suture freely reaching apex. Genitalia as in figure 13. Length 3.3 mm.

The female is indistinguishable by external characters. The 49 specimens examined varied in length, 2.5 - 5.0 mm.

Distribution: At present only a few of the 500+ specimens I originally identified as *Bothrideres geminatus* have been reexamined. Therefore, the distribution given here is sketchy at best. 1(IL, MD, NJ, OH, ON, PA) 2(DC, KY, NC) 3(OK).

Biology: Like *B. geminatus*, the present species is found under dry bark of oaks but seems to prefer the larvae of cerambycids of the genus *Elaphidionoides*.

Holotype male: OKLAHOMA, Latimer County, 5 mi. W. Red Oak, 16-X-77, K. Stephan. (FSCA) **Paratypes** (48): OKLAHOMA: (1) Co., 5 mi. W. Red Oak, 5-XII-76, K. Stephan (KSC). (3) Latimer Co., I-1986, III-1986m X-1983, K. Stephan (FSCA). MARYLAND: (2) Greenbelt Park, ex oak bark, April-1-1971, W. H. Tyson (FSCA). (1) Tacoma Park, Montgomery Co., 20-II-1970, W. H. Tyson (NMNH). (1) Bristol, 29-IX-1969, under bark, W. H. Tyson (CASC). ONTARIO: (1) Kent Co., Tilbury, 3-VI-1967, K. Stephan (CNCI). PENNSYLVANIA: (1) Pittsburgh, VIII. (MCT). Paratypes in the collection of the Carnegie Museum of Natural History (CMNH). PENNSYLVANIA: (3) St. Vincent. (12) Jeannette, V, VI, VII, VIII, IX. (4) Allegheny Co., (11) Pittsburgh, V, VI, IX, X. NEW JERSEY: (1) Riverton, IV, under bark maple. NORTH CAROLINA: (1) no data. KENTUCKY: (2) no data. DISTRICT OF COLUMBIA: (2) one without head, no data. ILLINOIS: (2) no data. OHIO: (1) no data.

Bothrideres arizonicus Casey

Bothrideres arizonicus Casey, 1924:181

Diagnosis: Dark brown, depressed, T/W = 1/1.8, moderately pubescent, feebly shiny. Eyes moderately protruding, like a third of a sphere. Pronotal length subequal to width, widest near apex, apical margin slightly sinuate, apical angles somewhat acute, lateral margin feebly sinuate near base, convergent toward base, base about 0.4 narrower than apex, basal angles very small and slightly obtuse, disk flat to slightly convex, with 2 median, shallow depres-

sions, an area at central apical margin impunctate. Elytra striate, the raised sutural and raised second discal intervals each with a single row of puncture in basal third, first and third raised discal intervals are impunctate, elytral pubescence more or less evenly distributed, appressed, and not dense. Length 3 - 4.5 mm.

Distribution: In our region it has been collected only in southern Arizona. I have also taken a few in adjacent northern Sonora, Mexico. Specimens examined, 38: ARIZONA, SONORA.

Biology: It occupies the oak-zone and follows some larger canyons upward where it is found under dry bark of oaks. It is taken rarely at light.

Months collected: All year, except November.

Discussion: *Bothrideres arizonicus* is most similar to the eastern *B. cryptus*. The 2 species are geographically isolated, a fact usually sufficient for identification. The most prominent morphological differences are: *B. cryptus*. Eyes abruptly protruding, like a half sphere, elytral pubescence semi-erect, vs. *B. arizonicus*. Eyes flatter, like a third of a sphere, elytral pubescence appressed. Also read discussion under *B. depressus*.

Bothrideres montanus Horn

Bothrideres montanus Horn, 1878:587

Diagnosis: Dark brown to piceous, venter and dorsum convex, T/W = 1/1.3, sparsely pubescent, elytra shiny. Eyes moderately protruding. Pronotal length subequal to width, widest near apical quarter, apical margin sinuate, apical angles protruding, rectangular, lateral margin strongly convergent toward apex, less strongly toward base, width of base and apex subequal, basal angles small, somewhat obtuse, disk generally convex, but large portion of center deeply depressed in 2 places, depression nearest apex twice as large as one nearest base, neither well defined, there is also a small polished depression at base near each basal angle. Even intervals of elytra polished and devoid of pubescence and on a slightly lower plane than odd intervals, which are finely punctate and pubescent. Length greatly variable, 3.3 - 6.5 mm.

Distribution: At present this rather common species is known only from the mountains of southeastern and east-central Arizona, western New Mexico, and southern Colorado. It also could occur in Sonora, Mexico. The majority of the 226 specimens examined was collected in Arizona.

Biology: It is found only under dry bark of dead ponderosa pines, especially near the base. Apparently it does not come to light.

Months collected: All year.

Discussion: *Bothrideres montanus* is separated easily from the other 2 highly convex species in our fauna by the structure of the basal depression of the pronotum. In the former it is closed at the base, while it is open in the latter. It also averages much larger and is confined to ponderosa pine at higher elevation, while the other 2 occupy the desert at lower elevation.

Bothrideres cactophagi Schwarz

Bothrideres cactophagi Schwarz, 1899:10

Diagnosis: Piceous, venter and dorsum convex, T/W = 1/1.35, sparsely pubescent, subopaque. Eyes slightly protruding. Pronotal length subequal to width, widest near apical fifth, apical margin strongly sinuate, apical angles protruding and acute, lateral margin sinuate before apex and strongly convergent toward it, less strongly convergent toward base, basal angles small and rounded, disk with large, very dense punctures, generally convex, but large portions of center deeply depressed in 2 places, one nearest apex smaller and punctate, one nearest base sharply outlined, broadly triangular, impunctate, widely open toward base, bottom of this depression nearly flat, in addition a small polished depression at base near each basal angle. Elytra with even intervals bare, except basal half of second interval which bears a row of fine setae, odd intervals slightly raised and with setae bearing punctures, third and seventh intervals strongly elevated at base, first and second depressed at declivity. Length greatly variable, 2.5 - 5.5 mm.

Distribution: It is apparently confined to the Sonoran Desert zone of southern Arizona but could occur in northern Sonora, Mexico. Specimens examined, 15: ARIZONA, Pima County near Tucson and Vail.

Biology: Schwarz (1899) reports it as parasitic on the

large cactus weevil, *Cactophagus validus* LeConte. I found it to be rare. In 8 years of collecting its habitat, I encountered it only twice, both times in pack rat nests containing much cactus.

Months collected: IV, V.

Discussion: *Bothrideres cactophagi* could only be confused with *B. subvittatus*. The characters given in the key should separate them readily.

Bothrideres subvittatus Sharp

Bothrideres subvittatus Sharp, 1895:490

Diagnosis: Dark brown, venter and dorsum convex, T/W = 1/1.3, sparsely pubescent, moderately shiny. Eyes slightly protruding. Pronotum about 0.1 longer than wide, widest near apical quarter, apical margin strongly sinuate, apical angles protruding and acute, sides strongly converging toward apex, less strongly toward base, basal angles obtuse, disk convex, with 2 small central depressions, one nearest base very deep, rounded, polished, and connected to base by a strongly divergent, polished area which lies on a higher plane than bottom of depression, small depressions near basal angles not polished. Elytra with even intervals subopaque, much less pubescent than odd intervals, all intervals on disk of equal height, third and fifth raised at base, second deeply depressed at declivity. Length 2.9 - 3.1 mm.

Distribution: In the U.S. this species is rare and restricted to extreme southern Arizona. It is more common in southern Sonora, Mexico. Of the 11 specimens examined, only 1 came from Arizona. ARIZONA, Santa Cruz Co., Nogales, July-27-1972, K. Stephan, under bark of palo verde. The southern Sonora specimens were beaten from buprestid and cerambycid infested palo verde, mesquite, and *Acacia* spp., along with specimens of *Bothrideres depressus*.

Discussion: *Bothrideres subvittatus* could only be confused with *B. cactophagi*. The characters given in the key should separate them readily.

Family COLYDIIDAE

Key to the tribes of the Colydiidae

1. First tarsal segment not dilated, normal or small 2
1'. First tarsal segment dilated, covering minute second and third, fourth larger (*Monoedus*) ..... Adimerini

2(1). Antennae glabrous or sparsely pubescent, club distinct 3
2'. Antennae densely covered with scale-like pubescence, club 3-segmented, loose, indistinct (*Rhagodera*) ..... Rhagoderini

3(2). Metacoxae usually closer together than the greatest length of a metacoxa; elytral pubescence obvious 4
3'. Metacoxae widely separated, the separation equal to at least greatest length of a metacoxa; elytral pubescence, if present, extremely fine and difficult to see .... Pycnomerini

4(3). Femora not obviously pubescent or punctate, usually very shiny, if pubescence or punctation present, it is extremely fine 5
4'. Femora obviously pubescent and opaque, or if glabrous and shiny, the punctation very obvious ..... Synchitini

5(4). More than half of mandibles hidden from dorsal view. Body not more than 5.5 times longer than wide ..... Colydiini
5'. Less than half of mandibles hidden from dorsal view. Body extremely elongate, 6.5 times longer than wide (*Nematidium*) ..... Nematidiini

Tribe Rhagoderini

Genus *RHAGODERA* Mannerheim

Rhagodera Mannerheim, 1843: 300

Type species: *Rhagodera tuberculata* Mannerheim, 1843

Diagnosis: Antennae 11-segmented, club indistinctly 3-segmented, all segments densely covered with scale like pubescence. Eyes small, hemispherical, coarsely faceted, scales between facets obscuring

their view. Pronotal disk with a pair of costae. Procoxal cavities narrowly open behind. Elytra, in addition to the sutural and marginal costae, with 3 costae per elytron. Epipleural fold more or less horizontal, reaching apex or distinctly abbreviated. Elytra connate. Body often encrusted, sparsely covered with elongate scales.

Discussion: This monotypic tribe contains only the North American genus *Rhagodera*. Lawrence (1980) united it with the tribe Orthocerini, but Slipinski (pers. com., 1986) retains its tribal status because of a number of characters not found in other Orthocerini. He mentioned the unusually wide metepisternum, the long intercoxal process of the first ventrite, the long ventral processes of the mouth cavity, and the unusual structure of the antennae. The most significant character is to be found in the male genitalia, which have the tegmen dorsal to the median lobe, a character he had not seen in any other Colydiidae. It is my opinion that the large size, non-clavate antennae, and its flightless, ground dwelling desert habit, set it apart from all other North American Colydiidae, and it perhaps should be placed elsewhere. The discovery of the larvae should resolve the problem.

Key to the species of *RHAGODERA*

(Our species have 3 elytral costae between the costae of the suture and margin. The one closest to the sutural costa is called the first.)

1. Epipleural fold ends near center of penultimate ventrite and is replaced there by a short carina which lies on a higher plane (Fig. 14) (*tuberculata* group) 2
1'. Epipleural fold reaches apex of elytra (Fig. 15) (*costata* group) 3

2(1). Second elytral costa uninterrupted near apex. Antennal segment 3 as long as diameter of eye ..... *tuberculata*
2'. Second elytral costa interrupted at least once near apex. Antennal segment 3 nearly twice as long as diameter of eye ..... *interrupta*

3(1'). Pronotum with lateral margin sinuate before the distinct hind angle and a small round prominence between discal costa and lateral margin (Fig. 16). Junction of elytral costae 1 and 2 near apex noticeably raised, higher than either costa. Arizona and California ..... *costata*
3'. Pronotum with lateral margin evenly rounded, hind angles indistinct, no prominence between discal costa and lateral margin. Junction of elytral costae 1 and 2 near apex not noticeably raised, even with them. Texas ..... *texana*

Rhagodera tuberculata Mannerheim

Rhagodera tuberculata Mannerheim, 1843:300

Diagnosis: Form elongate, about 3 times longer than wide, widest near middle of elytra, depressed, T/W = 1/1.8. Color piceous, opaque. Head, pronotum, costae, and margins sparsely closed with small scales. Head subquadrate, a little wider than long, frontal side margin strongly lobed laterally above antennal insertion, vertex with a blunt protuberance. Eyes posterior, far removed from antennal insertion. Length of antennal segment 3 subequal to diameter of eye. Antennal grooves wide and shallow, inner margin vague. Pronotum one third wider than long, sides evenly arcuate, not sinuate, apical and basal angles rectangular, disk bicostate, costae convergent toward base. Elytral costae 1 and 3 more prominent at base, only costa 1 reaches apical margin, no costae join near apex, intervals with 2 rows of large, round, well separated punctures, scutellar striae absent. Procoxal cavities narrowly open behind. Length 7 - 8 mm.

Distribution: Specimens examined, 20: 17 from Los Angeles County, 2 from San Diego County, California, and 1 from Greaterville, Pima County, Arizona. Horn (1878) records it from Alaska to San Diego and Arizona. The Alaskan record is in error.

Biology: Nothing is known about its biology. Horn (1878) stated that it is found under bark. The Arizona locality is in the oak zone.

Months collected: I, V, VIII.

Discussion: Despite its rarity, this is the most commonly collected species of the genus. It is easily

separated from *costata* and *texana* by the apically shortened epipleural fold, which it shares with *interrupta*. The shorter antennal segment 3 and the uninterrupted elytral costa 2 set it apart from the latter.

Rhagodera interrupta Stephan new species

Description: Holotype, form elongate, about 3 times longer than wide, widest across middle of elytra, depressed, T/W = 1/2. Color dark reddish brown, opaque. Head and pronotum very coarsely granulated, each granule bearing a tiny scale, top of elytral costae with extremely small scales. Head subquadrate, a little wider than long, frontal side margin strongly lobed laterally above antennal insertion, vertex without a protuberance. Eyes posterior, small, spherical, far removed from antennae. Antennal segment 3 twice as long as diameter of eye. Antennal grooves absent. Pronotum nearly one half wider than long, sides evenly arcuate, not sinuate, apical angle rectangular, distinct basal angle formed by jagged teeth, disk strongly bicostate, costae outwardly arcuate at apical half, subparallel at basal half. Elytral costae 1 and 3 each form a prominence at base, costa 2 fading toward base, no costae join near apex, costa 2 broadly interrupted at apical third, intervals with 2 rows of large, round, well separated punctures, scutellar striae absent. Epipleural fold ends near center of penultimate ventrite, replaced there by a short carina which lies on a higher plane (Fig. 12). Procoxal cavities open behind. Length 7 mm. Sex unknown.

The 4 paratypes are very similar to the holotype and vary only in the arrangement of the jagged teeth of the pronotum and the interruptions of the second elytral costa.

Distribution: Known only from California, state label only. Holotype: Cal. (small hand written label); Henry Ulke Beetle Col. CMNH, No. 1645. Deposited in the CMNH (Carnegie Museum of Natural History) Paratypes: (4) with same data as holotype, one without head and thorax (CMNH), 1 (KSC).

Biology: Nothing is known about the biology of this species.

Discussion: This species can be distinguished from all other known species of the genus by the more open procoxal cavities, lack of antennal grooves, and the greatly elongate antennal segment 3. Despite these aberrant characters, *interrupta* is without doubt a valid member of the genus. It is closest allied to *tuberculata*, with which it shares the structure of the epipleural fold and the elytral costae.

Rhagodera costata Horn Figure 16

Rhagodera costata Horn, 1867:295

Diagnosis: Form elongate, about 3 times longer than wide, widest near middle of elytra, depressed, T/W = 1/1.8. Color piceous, opaque. Head, costae, and margins sparsely clothed with small scales. Head subquadrate, a little wider than long, frontal side margin strongly lobed laterally above antennal insertion, vertex with a blunt protuberance. Eyes small, spherical, far removed from antennal insertion. Antennal grooves wide and shallow, but distinct. Pronotum cordate, sinuate before small, acute basal angles, apical angles rectangular to slightly obtuse, disk strongly bicostate, costae nearly straight, somewhat convergent toward base, their apex and base curved inward, a small round prominence between costae and lateral margin. Elytral costae 1 and 3 more prominent at base, costa 1 and 2 join near apex, where they form a raised prominence, intervals with 2 rows of large round, well separated punctures, scutellar striae absent. Epipleural fold reaching tip of elytra. Procoxal cavities narrowly open behind. Length 7 - 8 mm.

Distribution: The 4 specimens I have seen were all from southern Arizona. One, state label only; 1, Organ Pipe Cactus National Monument, Pima County; 1 , Arivaca, Pima County; 1, Pena Blanca Canyon, Santa Cruz County. The last 2 I found at medium elevation in the oak zone. One was collected sifting litter, the other under bark at the base of a dead oak.

Months collected: II, VIII, XI.

Discussion: *Rhagodera costata* is our only species which has the lateral margin of the pronotum sinuate, and elytral costae 1 and 2 joint near the apex. The last character is shared only by *texana*.

Rhagodera texana Stephan new species

Description: Holotype, form elongate, about 3 times longer than wide, widest just posterior to middle of elytra, depressed, T/W = 1/1. Color piceous, opaque. Head, costae, and margins clothed with small scales. Head subquadrate, a little wider than long, frontal side margin strongly lobed laterally above antennal insertion, vertex with a blunt protuberance. Eyes posterior, small, spherical, far removed from antennal insertion. Antennal grooves wide and shallow, but quite distinct. Pronotum one third wider than long, sides evenly arcuate, apical angles slightly obtuse, basal angles indistinct, disk strongly bicostate, costae nearly straight, slightly convergent toward base, curved inward at apex and base. Elytral costa 1 and 3 prominent at base, costae 1 and 2 join near apex, their junction not raised above level of the costae, intervals with 2 rows of large, round, well separated punctures, scutellar striae absent. Epipleural fold reaches apex. Procoxal cavities narrowly open behind. Length 6.2 mm.

Distribution: Known only from 2 specimens and a set of elytra. Holotype: TEXAS, The Basin, Chisos Mts., Big Bend National Park, H. V. Weems, Jr., 13-VIII-1962 (FSCA). Paratype: (1), same as holotype (FSCA). Wing covers only, Texas,Davis Mts., along hwy. 118, midway between Fort Davis and the McDonald Observatory, II-1971, K. Stephan (KSC).

Biology: Even though members of the genus *Rhagodera* are flightless. The type series was taken at blacklight. The wing cover was found in a spider web, under loose bark at the base of a dead oak.

Discussion: *Rhagodera texana* is the only *Rhagodera* known from Texas. It is closely allied to *costata*, with which it shares the entire epipleural fold and the joint elytral costae 1 and 2. The most outstanding difference is found in the lateral margin of the pronotum. In *texana* the sides are evenly rounded and the basal angles almost wanting, while in *costata* the sides are sinuate before the prominent basal angles.

Tribe SYNCHITINI

More than two-thirds of the North American Colydiidae belong to this large tribe. Included are those formerly assigned to the tribes Megataphrini and Coxelini. Five previously known generic names are here applied to North American species for the first time, 1 genus is reinstated, and 2 others are described as new.

Couplet 2 of the following key is very important, but due to the small size of most specimens, difficult to ascertain. If a series is at hand, it is best to dissect a specimen. Otherwise the following statement may help reaching the correct conclusion.

The procoxal cavities are closed only if the combination of characters is as follows: antennal club 2-segmented, head with antennal grooves, dorsum not carinate, elytra with tufts of white pubescence, length 3.5 - 5 mm. (see *Namunaria*); or antennal club distinctly 3-segmented, apex of 9th segment clearly 3 times wider than 8th, head without antennal grooves, length usually less than 4 mm (see *Lasconotus).*

Key to genera of the tribe Synchitini

1. Pronotum simple or variously carinate, but never with a projecting protuberance 2
1'. Pronotum with a projecting protuberance, which extends over head, partially concealing it from above 16

2(1). Procoxal cavities open behind 3
2'. Procoxal cavities closed behind 15

3(2). Antennae 10-segmented, club 1-segmented, club with a suture, indicating former segments 10 and 11, but no obvious constriction in outline 4
3'. Antennae 11-segmented, club distinctly 2-segmented, sometimes segment 9 widened apically, but never more than twice as wide as segment 8 (see fig. 26) 9

4(3). Head without distinctly margined antennal grooves 5
4'. Head with distinctly margined antennal grooves 8

5(4). Antennomere 3 unusually long, twice longer than 4 ..... *Endeitoma*
5'. Antennomere 3 normal, not twice longer than 4 6

6(5'). Scutellar striae and elytral pubescence absent. Lateral margin of pronotum not setose ..... *Paha*

6'. Scutellar striae, or elytral pubescence, or both, present. Lateral margin of pronotum setose 7

7(6'). Elytra unicolorous, with serially arranged, upright, straight setae ..... *Synchita*
7'. Elytra often variegated, pubescence various, but not as above . *Microsicus*

8(4'). Dorsum with clavate setae, variegated ..... *Eucicones*
8'. Dorsum with simple pubescence or glabrous, unicolorous ..... *Acolobicus*

9(3'). Eyes deeply emarginate anteriorly ..... *Phloeonemus*
9'. Eyes entire, normally rounded, or reduced, or reniform, or both 10

10(9'). Head without distinctly margined antennal grooves 11
10'. Head with distinctly margined antennal grooves 12

11(10) Pronotum with at least 2 pairs of full length carinae; elytra carinate; form elongate subparallel ..... *Bitoma*
11'. Pronotum and elytra non-carinate; form elongate ovate ..... *Coxelus*

12(10'). Both head and prothorax with margined antennal grooves; eyes much reduced, reniform, facets very coarse ..... *Megataphrus*
12'. Only the head with margined antennal grooves; prothorax may be concave, but depression not margined. eyes not as above 13

13(12'). East of 100th meridian; body strongly elongate; elytra variegated with whitish tufts of hair ..... *Eudesmula*
13'. West of 100th meridian; characters not as above 14

14(13'). Larger, 6 - 7 mm; elytra with irregular prominent carinae ..... *Denophoelus*
14'. Smaller, less than 4 mm; elytra serially granulate only ..... *Pseudotaphrus*

15(2'). Antennal club 2-segmented .... *Namunaria*
15'. Antennal club 3-segmented .... *Lasconotus*

16(11). Prothoracic protuberance covered with dense, shaggy hair; antennal club 3-segmented ..... *Chrysopogonius*
16'. Prothoracic protuberance bifid, shiny; antennal club 2-segmented ..... *Lobogestoria*

Genus *COXELUS* Latreille
Figure 17

Coxelus Latreille, 1829:31
(*Coxelus* Horn, 1878:568, in part)

Diagnosis: Antennae 11-segmented, club distinctly 2-segmented, antennal grooves absent. Eyes small, round, facets coarse. Pronotal disk strongly convex, lateral margin explanate. Procoxal cavities open behind. Elytra with serially arranged coarse punctures, connate. Pubescence recumbent, curved.

Coxelus serratus Horn

Coxelus serratus Horn, 1885:142
(*Namunaria serratus* (Horn), Hetschko, 1930)

Diagnosis: dark brown to piceous, opaque, moderately elongate ovate, about 2.5 times longer than wide, widest at middle of elytra. Head indistinctly granulate. pronotal granulation more pronounced, disk with a shallow median depression. Elytra with third interval raised at base, strial punctures deep, apex acutely rounded. Pubescence of head and pronotum moderate, whitish; pubescence of elytra of 2 colors, sparse whitish pubescence forming patches, especially on basal protuberances and on suture near apex; dark pubescence visible only in an oblique view. Length 2 - 2.9 mm.

Distribution: This rarely collected species occurs throughout the southern Coastal Range of California from San Diego County to the San Francisco area. Specimens examined, 29: CALIFORNIA.

Biology: I took a small series sifting deep redwood duff near Big Sur. It also has been found under bark of dead Douglas fir.

Months collected: IV, V, VI, XII.

Discussion: Horn (1878) listed 2 species of *Coxelus*, *guttulatus* LeConte and *pacificus* Horn. The last sentence of his generic description reads: "Our

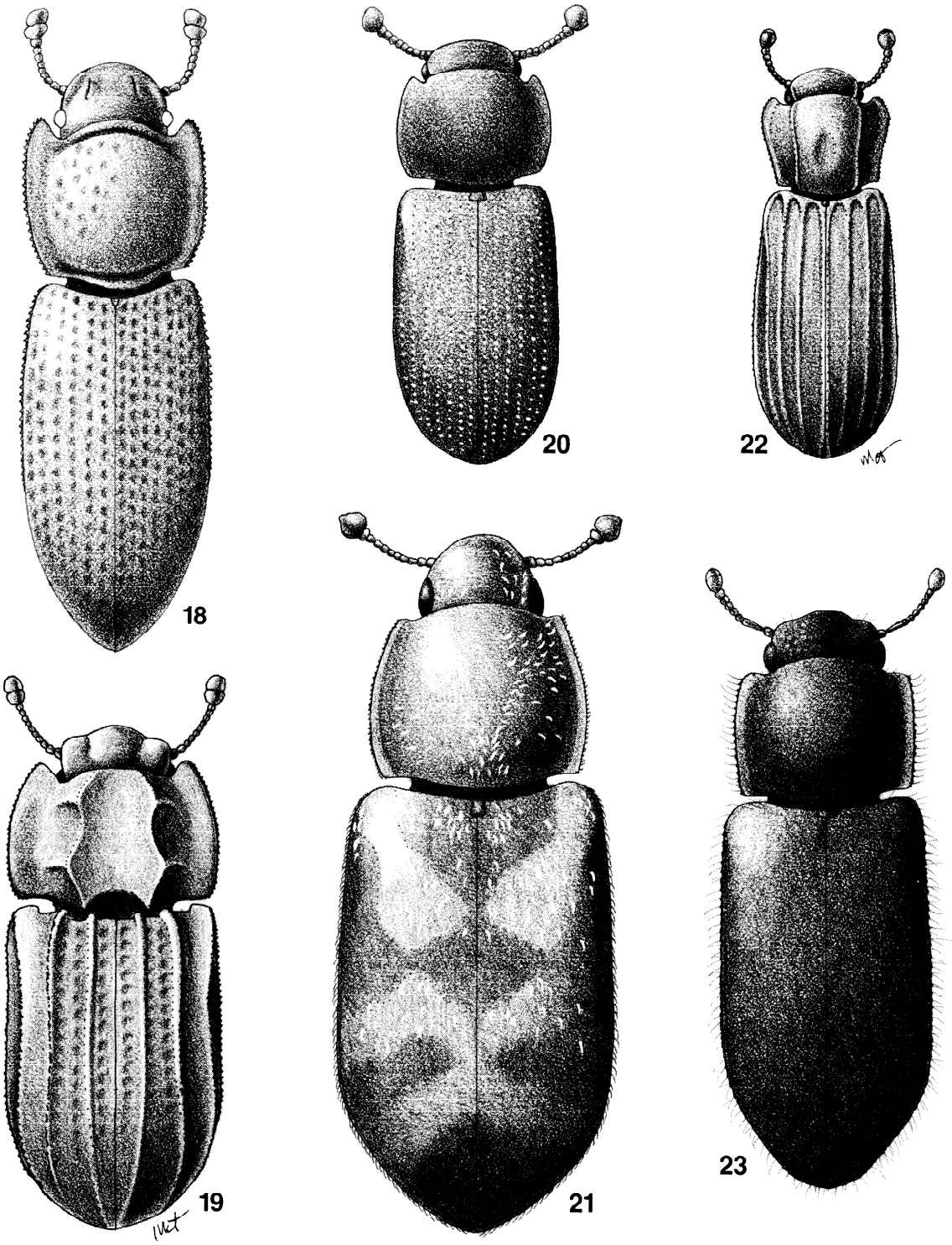

Figure 18-23. 18) Habitus of *Pseudotaphrus longus* Stephan; 19) Habitus of *Megataphrus tenuicornis* Casey ; 20) Habitus of *Synchita fuliginosa* Melsheimer; 21) Habitus of *Microsicus parvulus* (Guérin-Méneville); 22) Habitus of *Paha laticollis* (LeConte); 23) Habitus of *Endeitoma granulata* (Say).

species are winged". Later (1885), he described a third species, *serratus*, but failed to mention anything about the wings. He did not notice the absence of wings, the connate elytra, nor the open procoxal cavities, all characters not found in the first 2 species, but in the European *Coxelus* Latreille. Therefore Horn did not realize he was addressing 2 genera. Hetchko (1930) probably noted Horn's original remark about the wings and realized that *guttulatus* and *pacificus* belong to the genus *Namunaria* Reitter. He likely did not examine the rare *serratus* and transferred all 3 species to *Namunaria*, thus perpetuating Horn's mistake.

Genus *PSEUDOTAPHRUS* Stephan
new genus
Figure 18

Type species: *Pseudotaphrus longus* Stephan

Description: Antennae 11-segmented, club distinctly 2-segmented. Antennal grooves wide and shallow, outer margin distinct, inner margin vague or absent. Eyes small, round, consisting of about 26 - 32 coarse facets. Pronotal disk without special sculpture. Procoxal cavities open behind. Elytra with "serially arranged coarse granules, connate. Epipleural fold reaching apex of fourth ventrite. Body not encrusted, sparsely covered with thin hair.

Pseudotaphrus longus Stephan
new species

Description: Holotype, dark brown, elongate, 3.2 times longer than wide, subparallel, moderately convex, T/W = 1/1.6. Pronotum coarsely granulated, as wide as elytra, widest near apical quarter, apical angles produced, subacute, basal angles broadly rounded, lateral margins explanate, disk flat. Elytra serially granulate, granules elongate. Pubescence sparse, consisting of thin, curved hair, one atop each granule. Elytral apex acutely rounded. Sex unknown. Length 2.9 mm.

Variation: Color, light to dark brown. Pronotal disk flat to slightly concave. Length 2.4 - 3.2 mm.

Distribution: This species inhabits the mountains of southeastern Arizona at high elevation.

Holotype: Arizona, Pima Co., Santa Catalina Mts., elevation 8000ft., 27-VI-1968. K.Stephan (FSCA). **Paratypes**, 126: all Arizona, (27) Santa Catalina Mts., 8500ft., 29-VI-1968; (18) Santa Catalina Mts., 8000ft., 16-VI-1968; (15) Santa Catalina Mts., 8000ft., 27-VII-1968; (3) Santa Catalina Mts., 8000ft., 11-VIII-1968; (8) Santa Catalina Mts., 8ft., 7-IX-1968; (4) Santa Catalina Mts., 8000ft., 10-XI-1968; (5) Santa Catalina Mts., 9000ft., 25-IV-1970; (11) Santa Catalina Mts., Mt. Lemon, 13-VI-1970; (2) Santa Catalina Mts., 9200ft., 25-IV-1971; (10) Santa Catalina Mts., 8500ft., 4-X-1970; (4) Santa Catalina Mts., 9ft., 29-X-1974; (1) Santa Catalina Mts., 9000ft., 24-VI-1975; (3) Pinal Co., Mt. Graham, 18-V-1969; (14) Pinal Co., Wet Canyon, Mt. Graham, 21-IX-1974; (1) Cochise Co., Chiricahua Mts., 8500ft., 3-VIII-1969. Specimens in the collections of: FSCA, NMNH, CNCI, CASC, FMNH, KSC.

Biology: Specimens of this species were found clinging to bark of old pine stumps and bark about bases of dead ponderosa pines, especially those showing signs of fungal growth. They feign death, blend in with their surroundings, and are easily overlooked.

Discussion: *Pseudotaphrus* is not closely related to *Coxelus* nor *Megataphrus*. Its systematic position is not clear. It is placed here because it shares reduced eyes and wings with those 2 genera.

Genus *MEGATAPHRUS* Casey

Megataphrus Casey, 1890:309

Type species: *Megataphrus tenuicornis* Casey

Diagnosis: Antennae 11-segmented, club distinctly 2-segmented, antennal grooves of head distinct. Eyes very small, reniform, Subequal to length of last antennal segment, consisting of less than 12 coarse facets. Prosternum with antennal grooves which are margined on outside, or both outside and inside. Pronotal disk strongly convex. Procoxal cavities open behind. Elytra connate, costate, intervals striopunctate. Epipleural fold reaches only to apex of fourth ventrite. Body sparsely covered with hair and usually encrusted.

Key to the species of *Megataphrus*

1. Each elytron with 3 carinae between suture and margin 2
1'. Each elytron with 4 carinae between suture and margin. Antennal grooves of prothorax margined on the outside only, sometimes vaguely so. Arizona only ..... *arizonicus*
2(1). Antennal grooves or prothorax sharply defined inside and outside. California and Oregon ..... *tenuicornis*
2'. Antennal grooves of prothorax open to the inside, sharply margined to the outside. Oregon only ..... *chandleri*

Megataphrus tenuicornis Casey
Figure 19

Megataphrus tenuicornis Casey, 1890:310

Diagnosis: Dark brown to piceous, opaque, elongate-oblong, about 2.3 times longer than wide, convex, T/W = 1/1.3. Segments of antennal club subequal, or penultimate slightly wider. Antennal grooves of prothorax deep, sharply defined. Pronotum as wide as elytra, a quarter wider than long, elevated part of disk distinctly margined, granulation of disk varying from indistinct to coarse. Each elytron between suture and margin with 3 costae, each topped with a row of posteriorly curved setae, first carina ending near middle of declivity, second and third joined near apex, intervals with 2 rows of coarse punctures. Elytra connate, wings absent. Length 3.5 - 4.5 mm.

Distribution: This uncommon species has a rather wide distribution. It has been found from San Bernardino Co., California to southwestern Oregon. Specimens examined, 25: 3(CA) 4(OR).

Biology: This species is primarily a forest litter inhabitant. It has been found in duff of redwood, fir, eucalyptus, laurel, and by Berlesing; also under bark of stump.

Months collected: II, V, VI, VII, IX, X, XII.

Discussion: Of the 3 species known, this is the most distinct. The antennal grooves of the prothorax are very deep and sharply margined, both to the outside and the inside. Also, the sculpture of the pronotum is well developed.

Megataphrus arizonicus Stephan new species

Description: Holotype, dark brown, opaque, elongate-oblong,about 2.3 times longer than wide, convex, T/W = 1/1.3. Segments of antennal club subequal. Antennal grooves or prothorax open to the inside, weakly margined to outside. Pronotum as wide as elytra, a quarter wider than long, elevated part of disk barely margined, margin indicated only by ill-defined elevations, disk moderately granulate. Each elytron between suture and margin with 4 costae, each topped with a row of posteriorly curved setae, first carina ending near middle of declivity, second and fourth joined near apex, third ending like first, intervals with 2 rows of coarse, punctures. Elytra connate, wings absent. Sex unknown. Length 3 mm.

Variation: Penultimate segment of antennal club subequal to last, or slightly wider. Granulation of pronotal disk indistinct to coarse. Color dark brown to piceous. Length 2.2 - 3.5 mm.

Distribution: At present this species is known from the type locality only, which is in the upper reaches of Bear Canyon. At this point the canyon has a northerly position and is relatively moist. Snow persists here longer than most other places near by. A few firs grow alongside ponderosa pines, and litter is quite thick in places. I have collected in similar canyons throughout the mountains of southeastern Arizona, but no specimens were found.

Holotype: Arizona, Pima Co., Santa Catalina Mts., along road to Mt. Bigalow, between the Observatory and the radio tower, elevation 8500ft., 25-XII-1969, K.Stephan. (FSCA). **Paratypes**, 212: (with same data as holotype). (3) 16-VI-1968; (2) 7-IX-1968; (1) 31-V-1969; (3) 14-II-1970; (145) 25-XII-1969; (6) 4-X-1971; (51) 17-V-1975; (1) 23-XII-1975. Specimens in the collections of: FSCA, NMNH, CNCI, CASC, FMNH, KSC.

Biology: Specimens were extracted from deep conifer litter, and hand picked from the bottom of debris resting on it. Mating pair were observed under debris in December.

Months collected: II, V, VI, IX, X, XII.

Discussion: *Megataphrus arizonicus* and *M. tenuicornis* differ considerably in the structure of the

antennal grooves of the prothorax, the number of elytral carinae, and the development of the pronotal carinae. However, they share the same overall proportions and outline of the body, type and arrangement of pubescence, and characters of the head. The first elytral costa ends in the middle of the declivity in both species, and the second and fourth costae of *arizonicus* are joined in the same manner as the second and third of *tenuicornis*. The differences are certainly no greater than those found in the genera *Lasconotus* and *Bitoma*. At present I see no reason to erect a new genus for *M. arizonicus*.

Megataphrus chandleri Stephan new species

Description: Holotype, brown, opaque, elongate, about 2.7 times longer than wide, moderately convex, T/W = 1/1.4. Segment 10 of antennal club noticeably wider than segment 11. Antennal grooves of prothorax open to inside, distinctly margined to outside. Pronotum 0.1 narrower than elytra, a third wider than long, disk convex without any indication of costae, center flattened or slightly concave, granulation of disk coarse. Each elytron between suture and margin with 3 costae, each with a row of posteriorly curved setae, first costa ending near middle of declivity, second and third join near apex, intervals with 2 rows of coarse punctures. Elytra connate, wings absent. Length 3.5 mm. Sex unknown.

Variation: Color, dark brown to piceous. Length 3.2 - 4 mm.

Distribution: At present this species is known from 2 localities within the H.J. Andrews Experimental Forest, Lane County, Oregon.

Holotype: OREGON: Lane Co., H.J. Andrews Exp. For., Rd. 350, 3700', V-11-1984, D.S. Chandler (FSCA). **Paratypes**, 11: (10) with same data as holotype, (1) OREGON: Lane Co,, H.J. Andrews Exp. For., Rd. 130, 1650', V-12-1984. Specimens in collections of: (6) DENH, 1 each, FSCA, NMNH, CNCI, CASC, KSC.

Biology: Specimens were sifted from *Castanopsis* duff, at 1650 ft. elevation, and from *Ceanothus* and vine maple litter, at 3700 ft.

Discussion: *Megataphrus chandleri* falls between *tenuicornis* and *arizonicus*, displaying characters of both. With the first it shares 3 costae per elytron, but has the prothoracic antennal grooves similar to the latter. However it is more slender and less convex than either of them. The existence of this species came as a total surprise, because its collecting sites lie within the range of the widespread *tenuicornis*. It is my pleasure to name it in honor of Dr. D.S. Chandler, a long time friend, who collected the type series.

Genus *SYNCHITA* Hellwig

Synchita Hellwig, 1792:401
(*Ditoma* Reitter, 1881:124)

Diagnosis: Antennae 10-segmented, club 1-segmented, club round, with suture strongly outwardly curved, base glabrous, apex pubescent. Antennal grooves absent, reduced to a trace near eyes. Eyes large, prominent, diameter twice that of antennal club, facets fairly coarse. Pronotal disk without distinguishing sculpture, lateral margin with posteriorly and upwardly pointing, curved setae. Procoxal cavities open behind. Elytra striate, with serially arranged thick, upright, straight setae. Epipleural fold slightly restricted near metacoxae, reaching apex.

Discussion: The former genus *Synchita* was a composite and is here divided into 4 distinct genera. They all have 2 features in common: a 1-segmented club and absence of antennal grooves. The following are some of the major generic differences. *Paha* lacks both dorsal pubescence and scutellar striae. *Endeitoma* has an unusually elongated third antennal segment, and the dorsal pubescence consists of thin hair. *Microsicus* has squamose, curved, multicolored elytral pubescence of two types. *Synchita* has the dorsal pubescence bristly, straight, and unicolorous. The European *Synchita humeralis* Fab., which is the oldest described species of the genus, agrees well with our *S. fuliginosa* Melsheimer in most aspects except the epipleural fold is narrower past the metacoxae, the setae of the elytra are thinner and longer, and the beetle is larger.

Synchita fuliginosa Melsheimer Figure 20

Synchita fuliginosa Melsheimer, 1846:111
(*Synchita nigripennis* LeConte, 1863:67)

Diagnosis: Brown to dark brown, opaque, elongate, nearly parallel, about 2.5 times longer than wide. Body convex, T/W = 2/3. Elytra with rows of bristly setae. Ventral pubescence fine, recumbent. Length 1.8 - 3 mm.

Distribution: This species is widely distributed throughout eastern North America but is never common. Specimens examined, 191: 1(DC, IL, IN, NH, NJ, NY, ME, MD, OH, ON, PA) 2 (AR, FL, NC, SC,WV) 3(OK, TX) 5(MO).

Biology: It is most often taken at light, also under bark of dead maple, hickory, and oak. Other label data: emerged ex *Carya illinoinensis* (pecan), reared from elm, ex log of *Betula papyrifera*, beating dead oak branches.

Months collected: II, III, IV, V, VI, VII, IX, X, XI.

Discussion: The uniform color, 1-segmented club, absence of antennal grooves, and serially arranged straight elytral setae separate *S. fuliginosa* from all other North American species.

Genus *MICROSICUS* Sharp

Microsicus Sharp, 1894:456

Type species: *Microsicus setosus* Sharp, 1894. (Hinton, 1936:61 synonymized this with *M. parvula.*)

Diagnosis: Antennae 10-segmented, club 1-segmented, club round, with suture strongly outwardly curved, base glabrous, apex pubescent. Antennal grooves absent, reduced to trace near eyes. Eyes variable, facets never coarse. Pronotal disk without distinguishing sculpture, lateral margins arcuate, with posteriorly and upwardly pointing curved setae. Procoxal cavities open behind. Elytra striate or both striate and weakly carinate, densely covered with strongly curved, flattened setae of contrasting color. Epipleural fold gradually narrowing, reaching apex.

Discussion: Our 3 species were formerly part of the genus *Synchita*. The shape, arrangement, and color of the dorsal pubescence will separate them readily. (See discussion under *Synchita*). When Sharp (1894) described the genus *Microsicus* to accommodate his species *setosus*, he felt our *parvulus* may well be congeneric but did not make a decision on the matter for 2 reasons. He had no specimen of *parvulus* and erroneously compared his new genus to *Cicones* Curtis instead of *Synchita* Hellwig. Hinton (1936) examined the types of *Microsicus setosus* and *Synchita parvula* and found them both congeneric and conspecific.

Key to the species of *Microsicus*

1. Elytra weakly carinate, variegated; west of the 100th meridian ..... *variegatus*

1'. Elytra not carinate, variegated or not; east of the 100th meridian 2

2(1'). Eyes large, elongate, moderately convex, occupying nearly entire side of head; tempora absent ..... *parvulus*

2'. Eyes smaller, round and protruding; tempora present ..... *obscurus*

Microsicus variegatus (LeConte) new combination

(*Synchita variegata* LeConte, 1858:63)

Diagnosis: Dark brown, pubescence of head and pronotum coarse and pale, contrasting with dark derma, elytra with pale markings. Body elongate, 2.8 times longer than wide, widest near apical quarter of elytra, moderately convex, T/W = 4/7. Pronotum a little wider than long, slightly narrowed toward apex, lateral margin noticeably curved, disk somewhat depressed, 2 ovate areas medially near base glabrous. Elytra with 4 fine carinae, each bearing single row of anteriorly curved squamose setae, also 3 more or less continuous, irregular pale fasciae which are variously reduced or enlarged, elytral setae bicolored, of same color as derma. Length 2 - 2.3 mm.

Distribution: This species is restricted to the western U.S. and Baja California. Specimens examined, 45: 3(CA, AZ) 4(OR, ID).

Biology: Most specimens of this uncommon species were caught at light. In Arizona, I have taken it along water courses under bark of dead cottonwoods, together with *Bitoma ornata.*

Months collected: II, III, IV, VII, VIII, XII.

Discussion: This is the only western representative of the genus. The carinate elytra readily identify it.

Microsicus parvulus (Guérin-Méneville) Figure 21

Microsicus parvulus (Guérin-Méneville), (Hinton 1936:61)
(*Synchita parvula* Guérin-Méneville, 1829:189)
(*Microsicus setosus* Sharp, 1894:456. Synonymy by Hinton 1936:61))

Diagnosis: Light brown to piceous, pubescence of head and pronotum fine and pale, moderately dense, forming vague pattern on pronotum, elytra variegated with pale markings. Body elongate, 2.4 times longer than wide, slightly wedge-shaped, widest near apical quarter of elytra, moderately convex, T/W = 5/8. Eyes large oblong, moderately convex, nearly occupying entire side of head. Tempora absent. Pronotum 1.2 times wider than long, lateral margins rounded, narrowly explanate, widest near basal third, disk evenly convex. Elytra not carinate, with 3 more or less continuous, irregular pale fasciae which are variously reduced or enlarged, elytral setae bicolored, of same color as derma. Length 1.3 - 2.5 mm.

Distribution: This species occurs in the eastern U.S., from Delaware to Florida, west to eastern Oklahoma, also Mexico. Specimens examined, 374: 1(DE, IN, MD, PA) 2(AR, FL, GA, NC, WV, VA) 3(OK).

Biology: *Microsicus parvulus* is probably more common than collections indicate. Using a red oak stump trap in Oklahoma, I took nearly 300 in one season. It is most active on warm afternoons in early spring and is most often associated with oaks. This diurnal habit may account for the relatively few taken at light. I also have beaten many specimens from dead branches of oaks during spring. Two were taken on a hickory stump trap. Label data: window trap, under bark of legume tree, on palm (*Arecastrum romanzoffianum*).

Months collected: II, III, IV, V, VII, VIII, IX, XII.

Discussion: This is our most common and variable species. Northern specimens tend to be dark with only a few pale markings, while southern and Mexican specimens tend to be pale with dark markings. In the large Oklahoman population studied, dark ones are most common, but pale ones do occur frequently. The absence of elytral carinae and the large, oblong, moderately convex eyes are diagnostic.

Microsicus obscurus (Horn) new combination

(*Synchita obscura* Horn, 1885:140)

Diagnosis: Dark brown to piceous, elytra usually with pale markings. Body elongate, 2.4 times longer than wide, widest near apical quarter of elytra, quite convex, T/W = 2/3. Eyes small, round and moderately prominent. Tempora well developed. Pronotum 1.3 times wider than long, lateral margins slightly curved, widest near basal third, disk strongly convex, apical margin with collar-like fringe of dark setae. Elytra not carinate, dark or with pale markings. Pubescence dark, except on pale spots, where it is pale also. Length 1.2 - 2.2 mm.

Distribution: This is a rarely collected eastern species. Specimens examined, 51: (2) Washington, D.C., (1) Pennsylvania, and (48) eastern Oklahoma. Smith (1909) records it from New Jersey. It probably has a much wider distribution than collections indicate.

Biology: In Oklahoma, where most of the specimens were taken, it is associated with oaks and hickories. I took it in flight during the day, by beating dead hardwood branches, and on a hickory stump trap. Not yet recorded from light.

Months collected: III, IV, V, VI.

Discussion: When Horn (1885) described *Synchita obscura* from a single specimen, he stated that the elytra are costate. In a series before me, the elytra differ but little from those of *parvulus*, except that in some specimens the alternate intervals are slightly raised. The best character to separate the 2 species lies in the eyes. In *obscurus* they are moderately protruding, round, and small enough to leave obvious tempora, while in *parvulus* they are not protruding, elongate, and nearly cover the whole side of the head.

Genus *PAHA* Dajoz

Paha Dajoz, 1984:155

Diagnosis: Antennae 10-segmented, club 1-segmented, club longer than wide, oval with straight suture near apical third, tip pubescent, but not as dense as in 2 previous genera. Antennal grooves absent. Eyes not much greater in diameter than length of antennal club, somewhat ventrally located, barely visible from above, facets coarse. Pronotum widest near apical quarter, from there strongly convergent toward base and apex, lateral margins finely serrulate. Pronotal disk elevated, elevation margined by a carina each side, center of disk with shallow depression. Procoxal cavities open behind. Elytra striate and weakly carinate. Scutellar striae absent. Epipleural fold slightly narrower near hind coxae than near apex of ventrite 3, then evenly tapering to apex. Pubescence of dorsum absent, that of venter extremely fine. Disk of pronotum and elytra somewhat depressed.

Discussion: *Paha laticollis* was formerly assigned to *Synchita*, from the species of which it differs in several important aspects. The pronotal disk is elevated and carinate (similar to *Bitoma*), The dorsum has no pubescence, and the scutellar striae are absent. This is a unique combination of characters. I have seen 2 specimens of *Paha* from Cuba and am unable to distinguish them from North American material. Dajoz described the genus for a species from Guadeloupe. I suspect that *Paha guadeloupensis* Dajoz is the same as our *P. laticollis* (LeConte).

Paha laticollis (LeConte)
new combination
Figure 22

(*Synchita laticollis* LeConte, 1863:66)
(*Bitoma paradisea* Blatchley, 1930:32) **n. syn.**

Diagnosis: Dark brown to piceous, opaque, elytra often with a spot near humeri and another near elytral apex red, or red spots are enlarged to such a degree as to become the predominant color. In the latter case, only lateral margins, suture, and fascia across apical 2 thirds remain dark. Body elongate, 2.6 times longer than wide, convex with dorsum flattened. T/W = 2/3. Pronotum 1.2 times wider than long, granulate. Elytra with 3 weak carinae, scutellar striae absent, intervals with rows of elongate granules. Length 1.8 - 3 mm.

Distribution: This species has a typical eastern distribution from southern New York to the Florida Keys, west to eastern Oklahoma. Specimens examined, 63: 1(DC, IN, MD, NY, PA, TN) 2(AL, FL, MS, NC, VA) 3(OK).

Biology: In eastern Oklahoma this uncommon species is found about dead oaks, especially about their bases. Also on logs with white-rotten places. Other label data: under bark of oak, in fork-hole of living oak, beating rotten log. Blatchley (1930) took 3 specimens on Paradise Key, from beneath flakes of bark of a living wild tamarind tree (*Lysiloma bahamensis*). Not seen from light.

Months collected: II, III, IV, VI, VII, VIII, IX, X, XI.

Discussion: In specimens from extreme southern Florida, the red spots are greatly enlarged as described above. It is this color form Blatchley described as *Bitoma paradisea*. The similarity to *Bitoma* is great indeed.

Genus *ENDEITOMA* Sharp
new status

Endeitoma Sharp, 1894:450

Diagnosis: Antennae 10-segmented, segment 3 twice as long as 4; club 1-segmented, round, small for the tribe, its diameter subequal to combined lengths of segments 8 and 9; suture of club located near apical third, straight, tip densely pubescent. Antennal grooves absent. Eyes prominent, coarsely faceted. Pronotal disk without distinguishing sculpture, coarsely granulated, lateral margins dentate, each tooth with a long curved, forward and upward pointing thin seta. Procoxal cavities open behind. Elytra serially punctate, an elongate granule between punctures, each granule bearing a thin seta. Epipleura slightly narrower near metacoxae than near apex of ventrite 2, then evenly tapering to apex of elytra.

Discussion: *Endeitoma* is here reinstated to full generic rank. Hetchko (1930), without comment relegated *Endeitoma* to a subgenus of *Synchita*. Sharp (1894:450) in his generic description of *Endeitoma* pointed out: "The long third joint of the antennae distinguishes it from all the other Synchitini yet known from our region. It is probable that the North American *Synchita granulata* Say, may be allied to

E. mexicana." In the same paper Sharp also described *Asynchita,* with one species *A. granosa.* He stated: "...second and third [antennal segments] subequal in length... ". Hinton (1936) felt the need for a revision of the genus *Synchita,* and the removal of species to other genera. He then transferred *Synchita granulata* Say to *Asynchita.* This was a mistake. The species clearly displays the elongate third antennal segment typical of *Endeitoma.* The genus is widespread in the New World. I have seen specimens from North America, Central America, Cuba, and the Virgin Islands.

Key to the species of *Endeitoma*

1. Pronotal side margin narrowly explanate and moderately translucent, thus pronotum appearing bicolored. Length of antennal club shorter than diameter of eye ..... *granulata*

1'. Pronotal side margin not at all explanate or translucent, thus pronotum unicolorous. Length of antennal club equal to or longer than diameter of eye ..... *dentata*

Endeitoma granulata (Say) new combination Figure 23

Endeitoma granulata (Say), 1826:266
(*Synchita granulata* Say, 1826:266)
(*Asynchita granulata* Hinton, 1936:59) **n. syn.**
(*Endeitoma floridana* Casey, 1924:183) **n. syn.**

Diagnosis: Usually reddish brown, seldom darker, lateral margins, especially of pronotum, lighter. Fresh specimens are covered with a bluish-gray powder, which rubs off easily and dissolves in alcohol. Length 2.2 - 3.7 mm., mostly 3 mm. or more.

Distribution: This fairly common species occurs in the eastern U.S., from Delaware to Florida, west to eastern Oklahoma. Specimens examined, 98: 1(DE, IN, MD, PA) 2(AL, FL, GA, MS, NC, WV) 3(0K, TX) 5(MO).

Biology: It is found under loose bark of dead hardwoods and pines, especially near ground level and wherever mold is present. Label data: dead pine, dead oak, under bark of oak, under bark scales of white oak, dead *Pinus clausa, Magnolia grandiflora.*

Months collected: All year.

Discussion: If viewed against strong light, the explanate lateral pronotal margin is translucent, giving the appearance of a bicolored pronotum. The greatly elongate third antennal segment and the bluish-gray powder found on new specimens, are both characters typical of many Tenebrionidae.

Endeitoma dentata (Horn) new combination

Endeitoma dentata (Horn), 1885:139
(*Synchita dentata* Horn, 1885:139)

Diagnosis: Uniformly dark brown. Lateral pronotal margin not at all explanate. Length of antennal club equal to or longer than diameter of eye. Length 2.4 - 2.7 mm.

Distribution: This species is known from a few scattered localities in the southeast and eastern Oklahoma. Specimens examined, 8: (1) Leakesville, Mississippi, 4-III-1931, H. Dietrich. (1) Key Largo, Florida. (no other data). (1) Archbold Biol. Sta. Lk. Placid, Highlands Co. FLA., 12 FEB. 1987, M. Deyrup. (2) GA: Clarke Co., USA, Whitehall Forest, 14-24 August 1978, C.L. Smith. (3) Oklahoma, Latimer Co., IV-1982, III-1983, V-1983, K.Stephan.

Biology: The Highlands Co., Florida specimens were taken in rotten pine log near barrow pit, the Georgia specimen came from a pitfall trap, and the Oklahoma specimens were found under bark of dead oak near base. None have been taken at light.

Months collected: II, III, IV, V, VIII.

Discussion: The uniform dark color, nonexplanate pronotum, and shorter length should suffice to recognize this rare species.

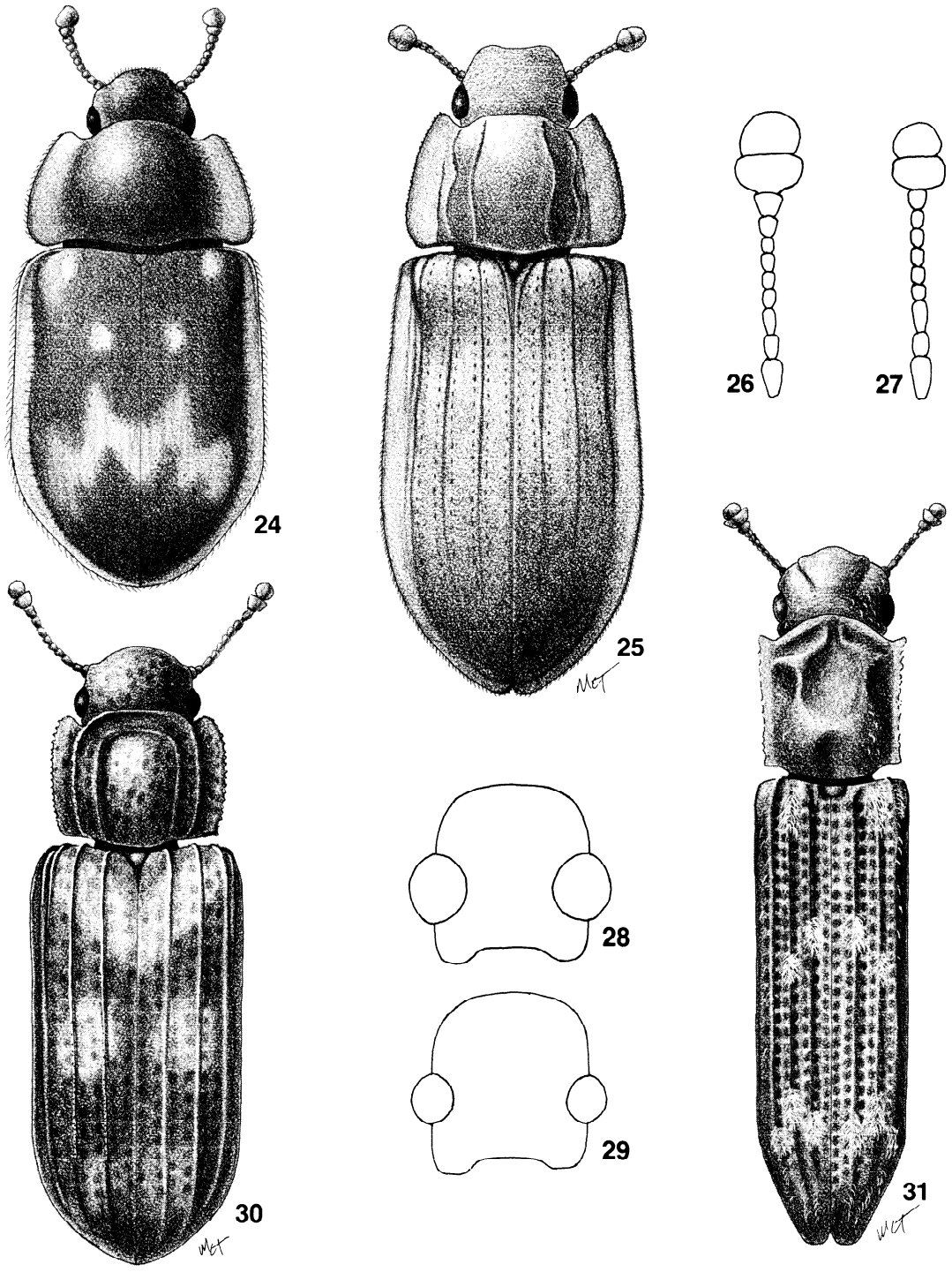

Figure 24-31. 24) Habitus of *Eucicones marginalis* (Melsheimer); 25) Habitus of *Acolobicus erichsoni* (Reitter); 26) Antennal club of *Bitoma sulcata* (LeConte); 27) Antennal club of *Bitoma quadriguttata* (Say); 28) Diagram showing Y=17 times X; 29) Diagram showing Y=25 times X; 30) Habitus of *Bitoma quadriguttata* (Say); 31) Habitus of *Eudesmula undulata* (Melsheimer).

Genus *EUCICONES* Sharp

Eucicones Sharp, 1894:452
(*Cicones* Horn, in part, 1878:563: not Curtis, 1827:149)

Diagnosis: Antennae 10-segmented, club 1-segmented, club round, diameter about equal to combined lengths of segments 7, 8, and 9. Its suture is near middle, and moderately curved outward, base glabrous, tip densely pubescent. Antennal grooves distinct, as long as eyes. Eyes large, about a third longer than wide, facets moderately coarse. Pronotum without distinguishing sculpture, lateral margins widely explanate, finely serrulate, basal half of lateral margin with short, anteriorly and upwardly, apical half with short posteriorly and upwardly pointing setae. Procoxal cavities open behind. Epipleural fold evenly tapering from base to apex, more or less horizontal, Elytra striate-punctate, intervals with a row of well separated, slightly reclined, straight, clavate setae.

Discussion: Horn (1878) did not distinguish *Eucicones* from *Acolobicus* and used the name *Cicones* for both.

Eucicones marginalis (Melsheimer) Figure 24

Eucicones marginalis (Melsheimer), 1846:112
(*Cicones marginalis* Melsheimer, 1846:112)
(*Eucicones latus* Casey, 1897:632) **n. syn.**

Diagnosis: Dark brown to piceous, margins much lighter, typically each elytron with a humeral spot, another near suture at basal third, an irregular fascia at apical third, and a spot closer to apex pale. The last 2 often confluent, sometimes pale markings vague or absent. Body elongate oval, about 2 times longer than wide, widest near middle of elytra, strongly convex, T/W = 5/8. Pronotum 1.6 times wider than long, widest near basal quarter, lateral margins evenly rounded, narrowing toward apex. Elytral setae bicolored, same as underlying derma. Length 3 - 3.5 mm.

Distribution: This species is widely distributed throughout eastern North America, but is never common. I have seen specimens from southwestern Ontario to Florida, west to Kansas and Texas. Specimens examined, 42: 1(DC, IL, IN, NJ, ON, PA) 2(AL, FL, TN) 3(OK, TX) 5(KS, MO).

Biology: Little is known about its habits. I found it under bark of oaks and elms, especially those dead for some time.

Months collected: I, II, III, IV, V, VI, VII, IX, X, XII.

Discussion: Having seen many specimens from widely separated localities, I am unable to make a positive and consistent distinction between *Eucicones marginalis* (Melsheimer) and *E. latus* Casey. The characters used by Casey to separate the 2 species are arbitrary and too variable. Therefore I reduce *E. latus* to a synonym of *E. marginalis*.

Genus *ACOLOBICUS* Sharp

Acolobicus Sharp, 1894:452
(*Cicones* Horn, 1878:563, in part; not Curtis, 1827:149)
(*Ditaphrus* Sharp, 1894:454. Synonym by Hinton 1936:62)

Type species: *Phloeodalis erichsoni* Reitter, 1877

Diagnosis: Antennae 10-segmented, club 1-segmented, club slightly longer than wide, oval, greatest diameter about equal to combined lengths of segments 6, 7, 8, and 9, suture straight, central, apical portion nearly glabrous except for a wide band of dense pubescence along outer edges. Antennal grooves distinct, as long as eyes. Eyes large, about a third longer than wide, facets moderately coarse. Pronotal disk margined by a pair of weak carinae each side, trace of a third closer to lateral margin, which is widely explanate and vaguely serrulate. Elytra weakly carinate, with 2 rows of fine, well separated punctures between carinae. Epipleural fold wide at base, evenly tapering to apex, strongly angled inward.

Discussion: Horn (1878) did not distinguish *Acolobicus* from *Eucicones* and used the name *Cicones* for both.

Acolobicus erichsoni (Reitter) new combination Figure 25

(*Phloeodalis erichsoni* Reitter, 1877:133)
(*Cicones lineaticollis* Horn, 1878:564) **n. syn.**
(*Acolobicus obscurus* Sharp, 1894:452) **n. syn.**

Diagnosis: Piceous, semi-opaque, pubescence inconspicuous, short. Body elongate-oval, 2.2 times longer than wide, widest slightly past middle of elytra, T/W = 1/2.2. Pronotum 1.2 times wider than long, widest near basal fifth, lateral margins moderately rounded, narrowing toward apex. Elytra between suture and margin with 3 weak carinae. Length 2.5 - 3 mm.

Distribution: Under the name *Cicones lineaticollis*, Horn described this rare species from 2 specimens, 1 from South Carolina, the other from Florida. It is known also from several localities in Mexico. Specimens examined, 24: all from Florida.

Biology: All U.S. specimens seen were taken at light. In Mexico it has been found under bark.

Months collected: III, VI.

Discussion: The above synonymy was discovered by S.A. Slipinski, (pers. com.). Reitter (1877) described *Phloeodalis erichsoni* from Vera Cruz, Mexico; Horn (1878) described *Cicones lineaticollis* from the USA; and Sharp (1894) described *Acolobicus obscurus* from Guatemala and Panama. All 3 described the same species. Since *Phloeodalis* and *Cicones* are names preoccupied by species of different genera, *Acolobicus* must be used in conjunction with the senior specific name *erichsoni*.

Genus *BITOMA* Herbst

Bitoma Herbst, 1793:25
(*Tritoma* Fabricius, 1775:69)
(*Ditoma* Illiger, 1807:320)
(*Eulachus* Erichson, 1845:275)
(*Euditomum* Gistel, 1857:524, 538)
(*Coniophaea* Pascoe, 1863b:80, 90)
(*Xuthia* Pascoe, 1863c:122, 128)
(*Synchytodes* Crotch, 1873:45)

Type species: *Tritoma crenata* Fabricius, 1775.

Diagnosis: Antennae 11-segmented, club abruptly 2-segmented or apex of segment 9 distinctly wider than apex of segment 8, but never more than twice as wide. Eyes round, always with some pubescence between facets. Antennal grooves absent, reduced to a small shiny area near the inside of each eye. Pronotal disk carinate. Procoxal cavities open behind. Elytra carinate, some pubescence always present.

Discussion: This difficult genus has a world-wide distribution, and it is doubtful that all 76 species assigned to it at present are congeneric. Of the 14 species found in America north of Mexico, only 3 are restricted to our region, 10 are found also south of the border, and one is a European import.

Slipinski (1985) redefined the genus based primarily on African species. When the characters used by him are applied to our species, many have to be excluded from the genus. His statement that the antennae are 10-segmented is obviously a typographical error, since his figure of *Bitoma siccana* (Pascoe) clearly shows 11 segments. Other characters, such as pronotum without double lateral margin, surface sparsely pubescent, lateral sides of pronotum not or very narrowly explanate, prothorax sub-quadrate to elongate and sub-parallel, do not apply to all American species. I have seen a Mexican *Bitoma* species near *sulcata* which has a distinct double lateral pronotal margin; *B. exarata* is so densely pubescent as to be tomentose; both *B. pinicola* and *B. vittata* have the pronotum broadly explanate; *B. vittata* also has the pronotum strongly converging toward the base. The above demonstrates that only a world revision of the genus will settle its classification.

Key to the species of *Bitoma*

1. Body nearly cylindrical; pronotum longer than wide .....
1'. Body depressed; pronotum wider than long 3

2(1). Pronotum with 2 pairs of full length carinae, disk between inner pair without an additional short pair ..... *carinata*
2'. Pronotum with 2 pairs of full length carinae, plus an additional short pair between inner pair at apical margin ..... *brevipes*

3(1'). Antennomere 9 distinctly wider than 8 (Fig. 26) 4
3'. Antennomere 9 subequal to 8 (Fig. 27) ... 5

4(3). Lateral pronotal margin evenly arcuate, widest at middle; elytral carinae acute and distinct throughout..... *sulcata*
4'. Pronotum somewhat cordate, widest at apical third; elytral carinae rounded and shallow, especially on disk..... *crenata*

5(3'). Larger, 3.4 - 4.2 mm; entire dorsum tomentose; restricted to southern Arizona.. *exarata*
5'. Smaller, rarely over 3.2 mm; dorsum not tomentose, pubescence permitting clear view of derma; generally distributed 6

6(5'). Pronotum strongly converging toward base, its margin widely explanate, widest near apex, there as wide as elytra at base; red elytral markings if present forming stripes ..... *vittata*
6'. Pronotum subquadrate, never strongly converging toward base; red elytral markings if present forming spots, bands or stripes ... 7

7(6'). Eyes greatly reduced, located at extreme outside of head, barely visible from above or below; body entirely dark, except antennae ..... *granulata*
7'. Eyes normal for the genus, clearly visible from above or below or both; color paler, or dark with red markings 8

8(7'). Species collected east of 100th meridian .. 9
8'. Species collected west of 100th meridian . 13

9(8). Y equals 1.7 times X or less, (Fig.28); eyes very coarsely faceted; lateral pronotal margin coarsely toothed..... 10
9'. Y equals not less than 2.5 times X, (Fig.29); eyes at most moderately coarsely faceted; lateral pronotal margin serrulate, not toothed 11

10(9). Elytra unicolorous, rarely reddish at humeri; widespread throughout eastern North America ..... *quadricollis*
10'. Elytra with a distinct red color pattern; restricted to southern Florida and Cuba .... *discolor*

11(9'). Ratio of greatest thickness to greatest width about 2 to 5, extremely depressed; in side view, metasternum not bulging downward, level with prothorax and abdomen; eyes very far apart ventrally, Y about 3.4 to 4 times X; elytra sometimes with faint red markings . ..... *pinicola*
11'. Ratio of greatest thickness to greatest width 1 to 2 or less; in side view, metasternum often bulging downward; Y never more than 3 times X; elytra usually with red markings 2

12(11'). Y equals 2.5 times X; body thicker, ratio of greatest thickness to greatest width about 2 to 3; in side view, metasternum bulging downward; color dark with 2 to 4 red spots on each elytron, spots sometimes enlarged and confluent; common throughout eastern North America ..... *quadriguttata*
12'. Y equals 3 times X; body thinner, ratio of greatest thickness to greatest width about 1 to 2; in side view, metasternum flat; color pale, elytra unicolorous or suture and lateral margins darker, with paler areas forming stripes not spots; extreme southeastern Texas to California ..... *gracilis* in part

13(8'). Each elytron with 1 or 2 well separated red spots, the apical one sometimes missing .... *ornata*
13'. Elytra unicolorous or red markings forming stripes, sometimes with vague fascia near middle 14

14(13'). Y equals 3 times X; pubescence of venter indistinct, finer and sparser than on head .. .. *gracilis* in part

14'. Y equals 4 times X; pubescence of venter similar to that of head ..... *neglecta*

Bitoma carinata (LeConte)

Bitoma carinata (LeConte), 1863:68
(*Eulachus carinatus* LeConte, 1863:68)

Diagnosis:; Piceous, sometimes reddish brown between elytral carinae, sub-opaque. Body nearly cylindrical, 4 times longer than wide, T/W = 9/10. Head and pronotum coarsely granulate. Pronotum elongate, 1.2 times longer than wide, widest near apex, with 2 pairs of strongly raised carinae, disk

without a trace of any other carinae or raised lines. Each elytron in addition to sutural and marginal carinae with 4 others, intervals with 2 rows of moderately sized, well separated punctures, surface appearing rather smooth. Pubescence very fine, not obvious. Length 2.8 - 4 mm.

Distribution: This uncommon species is confined to the southeastern U.S. east of the Mississippi River. Specimens examined, 21: 2(AL, FL, GA, MS, SC, VA).

Biology: Most of the specimens were taken at light, also under bark of dead oak.

Months collectcd: V, VI, VII, VIII, IX, XII.

Discussion: The dark, nearly cylindrical body, combined with the lack of a pair of short additional pronotal carinae, make this species easily recognized.

The cylindrical form and elongate pronotum prompted LeConte to place it in the genus *Eulachus*, which Erichson (1845) erected for a similar species, *costatus*, from the West Indies. Erichson treated *Eulachus* as part of the tribe Colydiini. Slipinski (1985) discussed the problem at length, and concludes that *Eulachus* is only a cylindrical form of *Bitoma*.

Bitoma brevipes (Sharp) new combination

(*Xuthia brevipes* Sharp, 1894:462)

Diagnosis: Light reddish brown, opaque. Body nearly cylindrical, 4 times longer than wide, T/W = 6/7. Pronotum elongate, 1.2 times longer than wide, lateral margin very little rounded, nearly parallel, widest near middle, with 2 pairs of moderately raised full length carinae, an additional short pair at central apical margin. Each elytron in addition to sutural and marginal carinae with 4 others, intervals with 2 rows of large, closely spaced punctures, punctures separated by moderately prominent ridges, giving the surface a rough appearance. Pubescence quite obvious, especially on head and pronotum. Length 2.6 - 2.7 mm.

Distribution: Sharp described it from 2 specimens, 1 from Cordova, Mexico, and 1 from Volcan de Chiriqui, Panama. Hinton (1936) recorded the species from Panama and Costa Rica. The 6 specimens I have seen were taken at Fort Myers, Florida, 6-V-1916, J.C. Bradley, (CUIC). None has been found since, and it is doubtful that *B. brevipes* is an established species in our fauna.

Discussion: When Sharp described *Xuthia* he mentioned it could be congeneric with *Eulachus* Erichson, but not having seen Erichson's type, could not be sure. He also compared it to *Bitoma*, but concluded that, though very similar, the 2 genera were distinct.

Bitoma sulcata (LeConte)

Bitoma sulcata (LeConte), 1858:63
(*Ditoma sulcata* LeConte, 1858:63)

Diagnosis: Light to dark brown, usually head and pronotum somewhat darker. Body elongate, a little less than 3 times longer than wide. Apex of ninth antennal segment about twice as wide as eighth, (Fig. 26). Eyes coarsely faceted, prominent, Y about 3 times X. Pronotum 0.1 wider than long, widest near middle, lateral margin evenly rounded, discal carinae vaguely connected along apical margin, an additional pair of short indistinct carinae near apical center. Body moderately depressed, T/W = 2.4/4. Pubescence indistinct. Length 2.3 - 3.1 mm.

Distribution: This common native species inhabits the desert southwest from Texas to California, as well as Mexico. Specimens examined, 437: 3(AZ, CA, SO, TX).

Biology: This species frequents the oak zone and lower canyons. There it is commonly found under loose bark of dead oaks and cottonwoods, also in the nest piles of packrats and at light.

Months collected: All year.

Discussion: The unicolorous elytra, coupled with the distribution, separate this easily recognizable species from the other *Bitoma* with an apically enlarged ninth antennal segment.

Bitoma crenata (Fabricius)

Bitoma crenata (Fabricius), 1775:69
(*Tritoma crenata* Fabricius, 1775:69)
(*Bitoma cremata*, Leng 1933:34) **lapsus**

Diagnosis: Piceous, elytra normally with 4 large red spots, basal pair reaching base and lateral margin, apical pair reaching lateral margin and apex, leaving only a narrow stripe along suture and a wider central fascia dark, some specimens are entirely pale red. Body a little more than 3 times longer than wide, moderately convex, T/W = 7/11. Eyes finely faceted, not prominent, Y about 3.5 times X. Apex of ninth antennal segment about 1.5 times wider than apex of eighth. Pronotum subquadrate, widest near apical quarter, lateral margin from there toward base nearly straight, slightly converging, discal carinae vaguely connected along apical margin. Elytral punctures shallow and well separated, giving elytra a rather smooth appearance. Dorsal pubescence sparse and indistinct. Length 2.6 - 3.5 mm.

Distribution: To the best of my knowledge, this is the first North American record of this European species, which was apparently introduced twice. The first introduction occurred around Lake Erie and connected water ways. From 1954 - 67, I found large numbers of *B. crenata* in Essex and Kent Counties, Ontario, Canada, and in northern Ohio. In both places it was the predominant species of *Bitoma*. I also have a specimen from the Five Finger Lake area of New York, collected in April 1950, and 3 from southeastern Vermont not far from Lake Champlain. All these localities are only a short distance from commercial waterways. The second introduction, in 1972 at Asotin County, Washington, cannot be attributed to boat traffic. Specimens examined, over 300: 1(IN, NY, OH, ON, VT) 4(WA).

Biology: This locally common species is found under bark of dead hardwoods and pines. Once I encountered more than a hundred specimens under the fungus infested bark of an ash log.

Months collected: All year.

Discussion: The typical form can be recognized easily by the large red spots and the enlarged ninth antennal segment. Since their range does not overlap, entirely pale individuals can be separated from *B. sulcata* by geography.

Bitoma exarata (Pascoe)

Bitoma exarata (Pascoe), 1863b:91
(*Coniophaea exarata* Pascoe, 1863b:91)

Diagnosis: All dorsal sculpture, such as granules, carinae, and margins are covered with tiny scales, giving this remarkable species the appearance of being covered with velvet. Ground color reddish brown, scales lighter. Body elongate, about 3 times longer than wide, depressed, T/W =3/5.5. Eyes coarsely faceted, Y about 2.7 times X. Antennal club abruptly 2-segmented, last segment slightly narrower than penultimate. Pronotum one sixth wider than long, lateral margins evenly rounded. Elytral carinae prominent. Length 3.5 - 4.2 mm.

Distribution: This, our largest *Bitoma*, is recorded here for the first time from North America, where it has been found only in extreme southern Arizona. Also occurring rarely from Brazil to Mexico. Specimens examined, 12: Santa Cruz and Pima Counties, Arizona.

Biology: All specimens were collected at light in the Sonoran desert zone.

Months collected: VI, VII, VIII.

Discussion: The large size, velvety appearance, and distribution should suffice to recognize this pretty beetle. There is an excellent figure of *B. exarata* in the Biol. Centr.- Amer., Vol. II., Pt. 1, Tab. 14, fig. 19.

Bitoma vittata Schaeffer

Bitoma vittata Schaeffer, 1907:136, 137

Diagnosis: Piceous to ferrugineous, mature specimens with a faint reddish stripe on middle of each elytron. Body elongate, a little less than 3 times longer than wide. Eyes prominent, coarsely faceted, Y about twice X. Antennal club abruptly 2-segmented, last segment slightly narrower than penultimate. Pronotum strongly converging toward base, widest near apex, there as wide as base of elytra, inner pair of discal carinae weak, outer pair distinct and strongly converging from apical margin to about middle, from there nearly parallel to base, lateral margins widely explanate. Elytral carinae moderately raised. Pubescence indistinct, confined to carinae and

margins. Body depressed, T/W = 5/8. Length 2.7 -3.1 mm.

Distribution: So far this uncommon species has been found only in extreme southern Texas, from Brownsville to the Davis Mountains.

Specimens examined: 47.

Biology: The only data available is, at light.

Months collected: VI, VII, IX.

Discussion: This is our only species with both a strongly converging pronotum and a widely explanate lateral pronotal margin, which gives it a distinct appearance.

Bitoma quadricollis (Horn)

Bitoma quadricollis (Horn), 1885:140
(*Ditoma quadricollis* Horn, 1885:140)
(*Bitoma sobrina* Casey, 1924:182) **n. syn.**

Diagnosis: Unicolorous, dark brown. Body elongate, a little less than 3 times longer than wide, depressed, T/W = 2/3.3. Antennal club abruptly 2-segmented, last segment very little narrower than penultimate, club large, as long as combined lengths of segments 6, 7, 8, and 9. Eyes very coarsely faceted, prominent and approximate on underside of head, Y equals 1.5 times X, (Fig. 28). Pronotum about 0.1 wider than long, lateral margins parallel to slightly rounded, with widely spaced irregular teeth, carinae of disk fine but distinct. Elytral carinae moderately raised, punctures between them deep, separated by ridges which form a coarse network. Prosternum in front of coxae granulated, granules finer than those on pronotal disk. Pubescence indistinct. Length 2.2 - 2.8 mm.

Distribution: *Bitoma quadricollis* is widely distributed throughout eastern North America, but is never common. Specimens examined, 144: 1(NJ, MD, OH) 2(FL, MS, NC, TN, WV, VA) 3(OK).

Biology: It is mostly found under bark of freshly killed oaks, also recorded from beech and maple. A few were taken in a window trap and at light.

Months collected: II, III, IV, V, VII, IX, X, XII.

Discussion: This species and *B. discolor* form a natural group. Both have very coarsely faceted, ventrally approximate eyes, a toothed lateral pronotal margin, and an unusually large antennal club. I have seen other species from Mexico and South America that belong here also. See discussion under *B. discolor*.

Bitoma discolor Schaeffer

Bitoma discolor Schaeffer, 1907:137, 138

Diagnosis: Light brown or reddish, a spot at scutellum, one slightly below middle at suture, one on each side near margin, and an extended area at apex distinctly darker; pronotal disk often darkened also. Body elongate, 3 times longer than wide, depressed, T/W = 2/3.6. Antennal club abruptly 2-segmented, last segment but little narrower than penultimate, club large, as long as the combined lengths of segments 6, 7, 8, and 9. Eyes very coarsely faceted, Y about 1.7 times X, Pronotum slightly wider than long, lateral margins barely rounded, finely toothed, discal carinae distinct. Elytral carinae moderately raised, , punctures between them not deep, separated by nearly obsolete ridges. Prosternum in front of coxae with extremely fine sculpture, opaque, not obviously granulate. Pubescence indistinct. Length 2.4 - 3 mm.

Distribution: This rare species is known only from southern Florida, Homestead, Key Largo, and Key West. Also Cayamas, Cuba. Specimens examined, 4: 2(FL).

Months collected: III, V.

Biology: Nothing is known about its habits. The specimens seen were probably taken at light.

Bitoma granulata (Blatchley)

Bitoma granulata (Blatchley), 1910:552
(*Ditoma granulata* Blatchley, 1910:552)

Diagnosis: Piceous, antennae and legs lighter, elytra with traces of red spots, their pattern similar to that of typical *B. quadriguttata*, (Fig. 30). Body elongate, but broader than most of our other species, about 2.7 times longer than wide, depressed, T/W = 1.1/2. Antennal club abruptly 2-segmented, segments of

equal width. Eyes greatly reduced, finely faceted, not at all prominent, about as large as antennal club, very far apart ventrally, Y about 6.5 times X. Pronotum about one fifth wider than long, discal carinae not prominent, lateral margins evenly arcuate, crenate. Prosternum opaque, finely sculptured, not granulate in front of coxae. Elytral carinae distinct, but not strongly raised, intervals not punctate, instead with 2 rows of elongate granules. Pubescence indistinct throughout. Length 2.8 - 3.1 mm.

Distribution: The only 2 specimens seen were in the Ulke collection at the Carnegie Museum of Natural History, one has been returned.

The only data were simply "Mo" and "Ioa", which I translate as Missouri and Iowa. Blatchley based his description on a single specimen taken at Marion County, Indiana. It is peculiar that the only 3 specimens known were captured in 3 different states.

Biology: It must live in a seldom collected habitat, even though Blatchley reported it from under bark. I have examined the wings of one specimen and found them normal. Our other colydiids with greatly reduced eyes are deep litter inhabitants with reduced wings. Therefore I postulate the species may be a tree hole or root hole occupant.

Discussion: This species can easily be distinguished from all others of *Bitoma* by its greatly reduced eyes, which are extremely far apart, and the much depressed body. It could be confused with its closest ally, *B. pinicola*, but that species has larger eyes, which are considerably closer together. Also the granules of the elytral intervals are not as obvious. Both are rare, rather restricted in range, and do not occur together

Bitoma quadriguttata (Say)
Figure 30

Bitoma quadriguttata (Say), 1826:266
(*Synchita 4-guttata* Say, 1826:266)
(*Ditoma quadriguttata* (Say), Horn, 1878:564, 565)
(*Bitoma trinotata* Casey, 1924:182) **n. syn.**

Diagnosis: Piceous, elytra normally with red markings as in fig. 30, or markings variously reduced, or enlarged and confluent, leaving but a few darker spots. Body elongate, a little less than 3 times longer than wide, depressed, T/W = 1/1.8. Antennal club abruptly 2-segmented, segments of subequal width. Eyes not very coarsely faceted, only moderately prominent, Y about 2.5 times X. Pronotum slightly wider than long, discal carinae prominent, inner pair curved outward. Prosternum granulated in front of coxae. Elytral carinae not prominent, punctures between them large and shallow, separated by ridges, which form a coarse network. Pubescence pale and obvious, especially on head and pronotum. Length 1.7 - 2.8 mm.

Distribution: This is by far our most common and widespread eastern species. It occurs from New Hampshire to southern Florida, west to eastern Oklahoma and Texas. Specimens examined, 1000+: 1(CT, DE, IN, MD, NJ, NH, NY, OH, ON) 2(AL, FL, GA, MS;NC, SC, TN, WV, VA) 3(OK, TX) and probably elsewhere in the east.

Biology: It is found under bark of dead or injured hardwoods of all kinds and occasionally on pines. Also on moldy lumber, in window traps, and at light.

Months collected: All year.

Discussion: The highly variable color pattern of this species makes it possible to confuse it with 4 others within its range. All dark specimens resemble *B. quadricollis* or *B. granulata*. In both cases the position and size of the eyes will separate them readily. All red specimens can be distinguished from the narrower *B. gracilis* as follows: *Bitoma quadriguttata* has the eyes closer together ventrally and the inner pair of pronotal carinae is distinctly curved outward. Specimens with greatly enlarged red markings, which leave only a few dark areas, resemble *B. discolor* to a high degree. Such individuals can be recognized by the ventrally more separated eyes, and the granulate prosternum.

Bitoma pinicola Schaeffer

Bitoma pinicola Schaeffer, 1907:137, 138

Diagnosis: Piceous to brown, elytra often with a trace of red spots, especially near apex. Body elongate, about 3 times longer than wide, much depressed, T/W = 1/2.1. Antennal club abruptly 2-segmented, last segment distinctly narrower than penultimate. Eyes coarsely faceted, fairly prominent, far apart ventrally, Y about 3.6 times X. Pronotum one third wider than long, lateral margins distinctly explanate, discal carinae somewhat shallow,

inner pair straight, subparallel. Prosternum granulated in front of coxae. Elytral sculpture appearing somewhat worn, carinae and ridges rounded, the latter forming vague rows of elongate granules in some specimens. Pubescence indistinct except on head. Length 2.8 - 3.2 mm.

Distribution: This rare species has a rather restricted range, from Massachusetts to North Carolina. Specimens examined, 5: 1(DE, MA, NJ) 2(NC).

Biology: Label data indicate it is restricted to pines.

Months collected: V, VI.

Discussion: This species can be separated from all others within its range by the greatly depressed body and the ventrally widely separated eyes. It also averages larger than any other eastern species. For distinction from the similar *B. granulata,* see remarks under that species.

Bitoma ornata (LeConte)

Bitoma ornata (LeConte), 1858:63
(*Ditoma ornata* LeConte, 1858:63)

Diagnosis: Piceous, each elytron with 2, well separated, but not sharply defined red spots: the larger basal one diagonally oblong, slanting from humerus to near suture; the smaller one, which is not as much elongate, located near apical third, parallel to suture, sometimes missing. Body elongate, a little less than 3 times longer than wide, depressed, T/W = 1/2. Antennal club abruptly 2-segmented, last segment slightly narrower than penultimate. Eyes finely faceted, moderately prominent, Y about 3 times X. Pronotum 0.1 wider than long, lateral margins evenly arcuate, widest near middle, discal carinae not strongly raised, inner pair straight or vaguely curved outward, subparallel. Prosternum not granulate in front of coxae, opaque. Elytral carinae moderately raised, but sharply outlined, punctures of intervals small but deep, separated by sharply defined ridges that do not join each other. Pubescence sparse, but distinct throughout. Length 2 - 3 mm.

Distribution: This is a widespread western species, which is found from southwestern Oregon to Mexico, east to Idaho and Arizona. Specimens examined, 109: 3(AZ, CA, SO) 4(ID, NV, OR) 5(CO).

Biology: This species is riparian, following rivers and streams. There it is found under bark of dead cottonwoods and maples, in flood debris, and at light.

Months collected: I, II, III, IV, X, XII.

Discussion: This is our only native western species with red spots. From the imported *B. crenata* it can be readily distinguished by, the small 9th antennal segment and the sharply outlined elytral sculpture. Teneral, all red specimens can be separated from *B. gracilis* by the wider body and the relatively narrower antennal club, and from *B. neglecta* by the more closely spaced eyes and less pubescent venter. See also under *B. gracilis* and *neglecta.*

Bitoma gracilis Sharp

Bitoma gracilis Sharp, 1894:460
(*Bitoma suffusa* Casey, 1897:631) **n. syn.**
(*Bitoma prosopis* Schaeffer, 1907:137, 139) **n. syn.**

Diagnosis: Light to dark reddish brown, quite variable, normally suture and lateral margins of elytra darker, but unicolorous specimens are not uncommon, some have apical half darker or a vague darker fascia near middle. Body elongate, more parallel sided than any of our other species, a little more than 3 times longer than wide, depressed, T/W = 1/2. Pronotum nearly a quarter narrower than elytra at middle, subquadrate, lateral margins slightly rounded, widest just past middle toward apex, discal carinae not strongly raised, inner pair less prominent than outer, vaguely hourglass shaped to subparallel. Antennal club very abruptly 2-segmented, large for the genus, 10th segment 3.5 times wider than 9th, a little wider than last. Eyes rather coarsely faceted, moderately prominent, Y about 3 times X. Pubescence of clypeus distinctly finer and sparser than on rest of head. Elytral carinae well defined, punctures between them large and deep, separated by narrow ridges which form a network. Prosternum wrinkled in front of coxae, opaque, almost glabrous. Dorsal pubescence sparse. Ventral pubescence very sparse. Length 2 - 2.7 mm.

Distribution: This rather common species occurs throughout Mexico and Central America. In the U.S. it ranges from Brownsville, Texas, west to southern California. Specimens examined, 267: 3(AZ, CA, NM, SO, TX).

Biology: *Bitoma gracilis* occupies the lower deserts within its range, where it inhabits a variety of different habitats. I have taken it under bark of dead palo verde and mesquite, on all sorts of injured or dying cacti, in the leaf-axils of dying sotol, agave, and yucca, in the nest piles of packrats, and commonly at light. It is a successful opportunist and shares these habitats with *B. neglecta.*

Months collected: All year.

Discussion: In the past *B. gracilis* and *B. neglecta* were treated as one species. The latter is known from southern Arizona only. For further discussion see under *neglecta.*

Bitoma neglecta Stephan new species

Description: Holotype. Dark reddish brown, suture and lateral margins darker. Body elongate, a little more than 3 times longer than wide, depressed, T/W = 3/7. Pronotum 0.2 narrower than elytra at middle, about 0.1 wider than long, lateral margins evenly rounded, widest near apical third, discal carinae not strongly raised, inner pair subparallel. Antennal club abruptly 2-segmented, large, longer than wide, tenth segment 3 times as wide as ninth, last segment distinctly narrower than penultimate. Eyes rather coarsely faceted, moderately protruding, Y about 4 times X. Pubescence of clypeus same as on head. Elytral carinae very distinct, punctures between them large and deep, separated by strong ridges, which form a network, giving the elytra a rough appearance. Prosternum with shallow granules before coxae. Dorsal pubescence quite distinct, especially on carinae, pronotum and head. Ventral pubescence not quite as distinct, but very obvious on head and prosternum. Length 3mm. Sex unknown.

Variations: Color, usually dark reddish brown, sometimes lighter, normally suture and side margin darker. Length 2.5 - 3.2 mm.

Distribution: At present this species is known only from southern Arizona and adjacent Sonora, Mexico.

Holotype: ARIZONA, Santa Cruz Co., Pajarito Mts., Pena Blanca Cyn., 11-VII-1970, K.Stephan. (FSCA).**Paratypes,** 108: ARIZONA; (32) same as holotype. loc. cit., 13-VII-1970; (1) 13-VII-1968; (15) Santa Cruz Co., Patagonia, 28-IX-1968; (3) Pima Co., Santa Catalina Mts., Foothills, 6-VII-1970; (1) loc. cit., 25-VII-1972; (3) Pima Co., Tucson, 14-IX-1968; (1) loc. cit.21-IX-1968; (1) 8-VIII-1968; (1) 27-VII-1968; (2) 11-VII-1970; (1) 29-VII-1969; (1) 28-VII-1970; (8) Pima Co., Corona de Tucson, VII-1972, F. Klozar; (1) Pima Co., Santa Catalina Mts., Molino Cyn., 10-VII-1968; (1) Pima Co., Santa Rita Exp. Range, 3-5-VIII-1973, W. Nutting; (3) Pima Co., Arivaca, 30-xI-1969: (9) Pima Co., Santa Catalina Mts., Redington Pass, 7-X-1969; (1) Pima Co., Collosal Cave Park, 25-VIII-1970; (1) Pima Co., Mammoth, 17-XI-1969; (1) Pima Co., Aravaipa Cyn., 8-III-1970; (1) Cochise Co., Chiricahua Mts. near Portal, 28-VII-7-VIII-1966; (1) Cochise Co., East Stronghold, 30-IV-1972. MEXICO: Sonora; (11) 13 miles southeast Alamos, 30-IX-1972; (1) Hermosillo, 15-20-VIII-1953, B. Malkin. (Unless otherwise stated, all specimens collected by K. Stephan.) Specimens in the collections of: FSCA, NMNH, CNCI, CASC, FMNH, KSC.

Biology: It is found under bark of dead mesquite and palo verde, between the leaves of dying sotol, but mostly at light.

Discussion: This species is very similar to *B. gracilis,* but because of the wider pronotum, appears less elongate. It is usually a little darker and averages larger (mostly 3 mm). The best way to differentiate between them is to use the ventral distance between eyes and the pubescence of the prosternum. In *B. neglecta* the eyes are set farther apart ventrally and the prosternum is obviously pubescent

Genus *EUDESMULA* Cockerell Figure 31

Eudesmula Cockerell, 1906:241
(*Eudesma* LeConte, 1863:66)

Diagnosis: Body cylindrical, strongly elongate, a little more than 4 times longer than wide. Antennae 11-segmented, club 2- segmented, penultimate segment one half wider than last. Eyes moderately prominent, facets fine. Head with oblique antennal grooves. Pronotum subquadrate, lateral margins subparallel, coarsely serrulate. Procoxal cavities open behind. Elytra weakly carinate, 2 rows of large, nearly confluent punctures between carinae, variegated with elongate patches of pale pubescence.

Eudesmula undulata (Melsheimer)

Eudesmula undulata (Melsheimer), 1846:110
(*Bitoma undulata* Melsheimer, 1846:110)

Diagnosis: Reddish brown, head, disk of pronotum, most of elytra, except humerus and suture, darker. Pronotum with a network of ridges enclosing depressions. Pubescence sparse, pale, contrasting with darker derma. Length 4 - 5 mm.

Distribution: I have seen only 3 specimens, 1 from Virginia and 2 from Illinois; other records are from the literature. This rare species occurs in 1(IL, IN, OH, PA) 2(VA).

Biology: The only clue to its habits comes from Blatchley (1910:553). He mentions that Dury found specimens running up and down and burrowing in the bark of a buckeye [*Aesculus glabra*] log. This tree is found mainly along the Ohio River and its tributaries, which may explain the distribution of the beetle.

Months collected: None of the specimens seen carried collecting data.

Genus *PHLOEONEMUS* Erichson

Phloeonemus Erichson, 1845:258

Diagnosis: Antennae 11-segmented, club 2-segmented, but segment 9 is one third wider than segment 8, making it appear 3-segmented. Antennal grooves distinct. Eyes deeply emarginate anteriorly by frontal side margin. Pronotum with a pattern of carinae, which are delimited by an undulating submarginal carina. Procoxal cavities open behind. Elytra carinate, with 2 rows of punctures between carinae. Epipleural fold nearly horizontal, evenly tapering toward apex, there as wide as apex of hind tibia. Dorsum shiny, without apparent pubescence.

Key to the species of *Phloeonemus*

1. Elytral carinae uninterrupted . . . *catenulatus*
1'. Elytral carinae interrupted several times . . . . . *interruptus*

Phloeonemus catenulatus Horn
Figure 32

Phloeonemus catenulatus Horn, 1878:568

Diagnosis: Reddish brown, pronotal disk and a broad band across center of elytra somewhat darker. Body elongate, about 2.5 times longer than wide, widest a little past center of elytra, moderately convex, T/W = 9/16. Vertex of head with elongate granules and a pair of small protuberances between eyes. Pronotum nearly one half wider than long, widest near middle, granulate. Elytra, besides the sutural and marginal carina, with 4 long carinae: first complete from base to apex; next 2 not reaching apex, submarginal one not reaching base and joining lateral margin ahead of apex, a short carina at humerus; intervals between carinae with 2 rows of small punctures which are connected by longitudinally elongate ridges. Dorsal pubescence indistinct, fine and sparse. Length 4 - 5.5 mm.

Distribution: I have taken it as far east as Texarkana, Texas, west to southern California, and south into Sonora, Mexico. Specimens examined, 124: 3(A2, CA, SO, TX).

Biology: This species frequently comes to light. It lives together with its larvae in the gummy wounds of mesquite. It is not rare in this habitat, and probably occurs wherever mesquite is common.

Months collected: I, III, IV, V, VI, VII, VIII, X, XI, XII.

Discussion: There has been some confusion as to the proper identity of this species, because Schaeffer (1906) placed *Phloeonemus adherens* Sharp in synonymy with it. Hinton (1936) discovered the error and reinstated *P. adherens* to specific rank. It does not occur in our fauna.

Phloeonemus interruptus Reitter

Phloeonemus interruptus Reitter, 1877:330

Diagnosis: Color, form and sculpture are much like in the preceding, except the elytral carinae are several times more or less broadly interrupted. The submarginal carina is complete. Length 4.5 - 5 mm.

Distribution: In the U.S. the species is known only

from the vicinity of Brownsville, Texas. Also known from Mexico, Honduras, and Guatemala. Specimens examined, 25.

Biology: Collected only at light.

Months collected: V, VI.

Discussion: The character of the interrupted elytral carinae is found in 2 of the 5 species of *Phloeonemus: interruptus* Reitter and *haroldi* Reitter. They can be separated by the condition of the marginal bead of the pronotal base, which is disrupted next to the submarginal carina in the former, complete in the latter, and the length, 6 - 7 mm. vs. 4 -5 mm. Our specimens agree well with the description of *P. interruptus* Reitter except for length. Length must be used with caution, because in the Colydiidae the size of specimens of many species often vary drastically. Sometimes the largest is twice as large as the smallest.

Genus *DENOPHOELUS* Stephan
new genus
Figure 33

(*Endophloeus* Horn, 1878:561, 567, not *Endophloeus* Erichson, 1845:256)

Type species: *Endophloeus nosodermoides* Horn, 1878.

Diagnosis: Piceous, opaque, most often somewhat encrusted. Body elongate, subparallel, about 3 times longer than wide, semicylindrical, T/W = 4/5. Antennae 11-segmented, short, segment 9 barely reaching apical margin of prosternum, segments 4 to 8 moniliform, 9 is a quarter wider than 8, club 2-segmented, penultimate wider, segments well separated. Eyes small, round, prominent, finely faceted. Antennal grooves wide, longer than eyes. Distance between antennal insertion and eye subequal to diameter of eye. Pronotum about 0.1 wider than long, widest near apical quarter, disk strongly elevated, margined by an undulating, blunt carina, lateral margin explanate, with a thick marginal bead, granulate. Procoxal cavities open behind. Elytral disk with irregular blunt carinae, and intermittent, coarsely punctate striae, lateral margin not explanate. Epipleural fold very wide near base of metasternum, strongly tapering toward apex of metasternum, from there tapering more gradually to about middle of last ventrite, where it ends. Pubescence sparse, consisting of very short, thin, curved setae.

Discussion: In the Colydiidae, the traditional, numerical approach to their classification does not work well. Merely counting antennal and club segments and using a rigid set of supporting characters, has in the past united species of different groups. A more flexible approach that takes into account the overall appearance, sculpture, as well as type and shape of pubescence in conjunction with traditional characters, will no doubt serve best. For example: our species of *Synchita* (old sense) all share the numerical requirements and other supporting characters set forth by earlier workers. Only when the features of form, sculpture, and pubescence were taken into account as well, did it become clear that 4 different genera were present. I have examined the type species *Endophloeus markovichianus* Piller = *Eledona spinulosa* Latreille and found many characters agreeing numerically with our species, but their arrangement is significantly different. There are also a number of important features which totally disagree, such as overall form, pubescence, and the epipleural fold. I am convinced that the 2 species are not congeneric. Therefore the new name *Denophoelus* is given to the genus, which includes only our species *nosodermoides* (Horn).

Denophoelus nosodermoides (Horn)
new combination

(*Endophloeus nosodermoides* Horn, 1878:567)

Diagnosis: The specific description matches the above generic one. Length 6 - 7 mm.

Distribution: This species is not rare locally and inhabits northern California and southern Oregon. Specimens examined, 32.

Biology: It is found under loose bark and about stumps of dead conifers.

Months collected: III, V, VI, VII, X.

Discussion: The distribution, relatively large size, cylindrical body, and opaque, dark color, should suffice to recognize this distinct species.

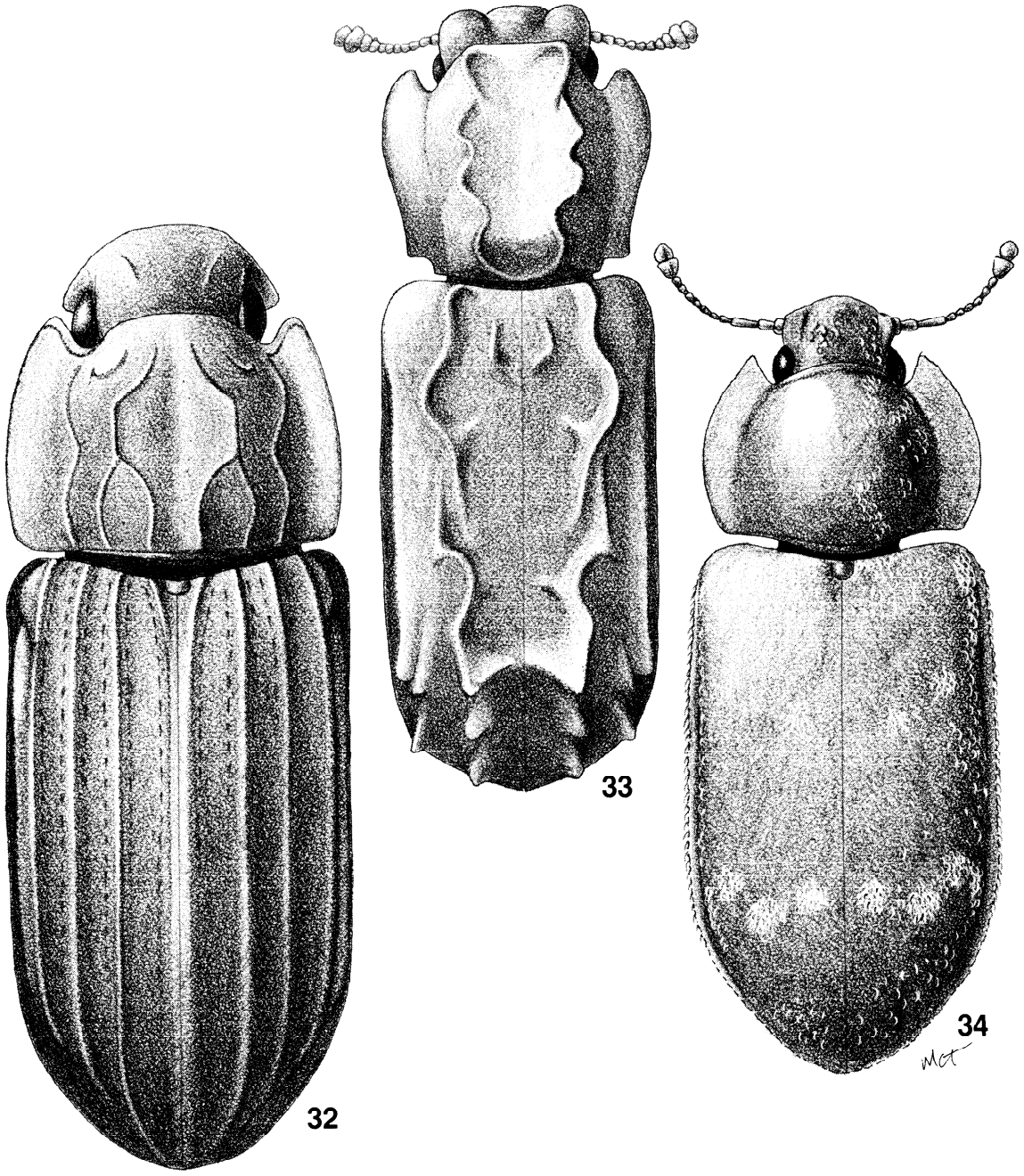

Figure 32-34. 32) Habitus of *Phloeonemus catenulatus* Horn; 33) Habitus of *Denophoelus nosodermoides* (Horn); 34) Habitus of *Namunaria guttulata* (LeConte).

Genus *NAMUNARIA* Reitter

Namunaria Reitter, 1882:114
(*Coxelus* Horn, 1878:561, 568, not Latreille 1829:31)

Diagnosis: Antennae 11-segmented, club 2-segmented. Antennal grooves short, only as long as eyes. Eyes round, prominent, finely faceted. Pronotal disk strongly convex, without distinguishing sculpture, lateral margins widely explanate, serrate. Procoxal cavities closed behind. Elytra striate-punctate, punctures well separated. Epipleural fold reaches apex, horizontal. Dorsum of elytra covered with intermixed dark and light, squamose, curved setae, and numerous tufts of white setae. Wings functional.

Key to the species of *Namunaria*

1. Antennal segment 3 one half longer than 4; east of the 100th meridian ..... *guttulata*
1'. Antennal segment 3 only slightly longer than 4; west of the 100th meridian ..... *pacifica*

Namunaria guttulata (LeConte)
Figure 34

Namunaria guttulata (LeConte), 1863:65
(*Coxelus guttulatus* LeConte, 1863:65)

Diagnosis: Piceous, margins lighter. Body elongate-oval, 2.3 times longer than wide, widest near middle of elytra, depressed, T/W = 3/5. Antennal segment 3 one half longer than 4. Segments of club of subequal width. Pronotum about 1.5 times wider than long, widest near middle, lateral margins strongly, evenly rounded, finely serrate. Length 3.5 - 5 mm.

Distribution: This common species is widely distributed throughout eastern North America, but is apparently absent from the extreme Southeast. Specimens examined, 315: 1(IN, NJ, NY, OH, ON, MD, PA) 2(NC, MS, TN, WV, VA) 3(OK, TX).

Biology: Though attracted to light, it is more commonly taken about fungal growth under bark of various dead hardwoods and pines.

Months collected: All year.

Discussion: The depressed form, tufted elytra, greatly elongated third antennal segment, and closed procoxal cavities, will distinguish it from all other eastern colydiids.

Namunaria pacifica (Horn)

Namunaria pacifica (Horn), 1878:569
(*Coxelus pacificus* Horn, 1878:569)

Diagnosis: Piceous, margins lighter. Body elongate, 2.7 times longer than wide, widest near apical third of elytra, depressed, T/W = 9/14. Antennal segment 3 only slightly longer than 4. Penultimate segment of club distinctly wider than last. Pronotum 1.3 times wider than long, lateral margins nearly parallel at middle, broadly rounded toward base and apex, finely serrate, apical angle acute. Length 4 - 5 mm.

Distribution: This species occurs from central California to southern British Columbia, and is not nearly as common as the eastern species. Specimens examined, 31: 3(CA) 4(BC, OR, WA).

Biology: It is found under bark of various dead hardwoods and conifers. There are no records from light.

Months collected: V, VI, VIII, IX, X, XII.

Discussion: This is the only western colydiid with a depressed body, tufted elytra, closed procoxal cavities, and functional wings. The similar, but smaller *Coxelus serratus* has a depressed body and tufted elytra, but its procoxal cavities are open behind and wings are absent. *Lasconotus nucleatus* has tufted elytra and closed procoxal cavities, but its body is subcylindrical and the antennal club is 3-segmented.

Genus *LASCONOTUS* Erichson
Figure 35, 36

Lasconotus Erichson, 1845:258
(*Illestus* Pascoe, 1863:33)
(*Lado* Wankowicz, 1867:249)
(*Othismopteryx* Sahlberg, 1871:44)

Type species: *Lasconotus complex* LeConte, 1859

Diagnosis: This large genus is hard to define. The body shape, sculpture and pubescence are all highly variable between species but rather constant within. It is our only genus of the tribe Synchitini with the

following combination of characters: antennal 1 club distinctly 3-segmented, antennal grooves absent, procoxal cavities closed behind. No diagnosis is given for the species of this genus. For more detailed information, the reader is referred to the revision of the genus by Kraus (1912) whose key I have modified here. One new species has been added, and 3 others are synonymized. In the following key, the sutural interspace is considered the first. The odd interspaces (1, 3, 5, 7) are always the more elevated ones, while the even interspaces (2, 4, 6) are frequently so flattened as to appear obsolete.

Key to the species of *Lasconotus*

1. Lateral margin of pronotum reflexed, forming a wide gutter between it and first pronotal carina; pronotum subquadrate (fig. 35) 2
1'. Lateral margin of pronotum beaded or simply rounded, never forming a wide gutter between it and first pronotal carina, which is sometimes missing; pronotal shape variable (fig. 36) 5

2(1). Elytral interspaces 1, 3, and 5 equally elevated from base to apex. Mexico only ..... *mexicanus*
2'. Elytral interspaces 3 and 5 more elevated than 1, 3 higher than 5 from middle to apex 3

3(2'). Lateral margin of pronotum, in side view, with a strong flexure ahead of middle ..... *flexuosus*
3'. Lateral margin of pronotum without a strong flexure 4

4(3'). Pronotum with 2 pairs of carinae, both pairs complete, not interrupted ..... *complex*
4'. Pronotum with 2 pairs of carinae, inner pair broken into acute tubercles .... *tuberculatus*

5(1'). Interspace 5 higher than 3; elytra concave between interspaces 5 on each elytron at apical half 16
5'. Interspace 5 only as high as 3, or all interspaces equal; elytra never concave, except at declivity 6

6(5'). All interspaces equally elevated 7
6'. Alternate interspaces either more strongly elevated, or crested with yellowish pubescence 8
7(6). All interspaces rounded; elytra with conspicuous tufts of pale setae ..... *nucleatus*
7'. All interspaces acute, each with a single row of pale setae ..... *knulli*

8(6'). Pronotum with a network of interlacing carinae, which are crested with obvious pubescence 9
8'. Pronotal carinae never both interlaced and crested with obvious pubescence 12

9(8). Alternate interspaces strongly elevated, each with a double or triple row of short setae . 10
9'. Alternate interspaces weakly elevated, each with a single row of recumbent, overlapping setae 11

10(9). Pronotum wider than long, ferrugineous .. .. *borealis*
10'. Pronotum longer than wide, piceous .... *intricatus*

11(9'). Ninth antennal segment much shorter and narrower than tenth; elytra unicolorous .. .. *pertenuis*
11'. Ninth antennal segment as long as tenth; elytra usually bicolored ..... *linearis*

12(8'). Longitudinal central pronotal impression not reaching base by a quarter of pronotal length ..... *vegrandis*
12'. Longitudinal central pronotal impression reaching base, or nearly so 13

13(12'). East of the 100th meridian ... *referendarius*
13'. West of the 100th meridian 14

14(13'). Length 3 mm. or more ..... *servus*
14'. Length 2.5 mm. or less 15

15(14'). Elevated interspaces obtuse, elytral disk markedly flattened ..... *planipennis*
15'. Elevated interspaces acute, elytral disk convex ..... *simplex*

16(5). Pronotum with a long carina between lateral margin and outer edge of median impression 17

16'. Pronotum without a long carina between lateral margin and outer edge of median impression 18

17(16). Elytra slightly concave; Texas only .. *fiskei*
17'. Elytra strongly concave; Texas to California ..... *bitomoides*

18(16). Anterior margin or pronotum without U-shaped carinae ..... *concavus*
18'. Anterior margin of pronotum with 2 U-shaped carinae 19

19(18'). In dorsal view, distance from rim to rim of pronotal impression about twice distance from rim to lateral margin; western only . ..... *subcostulatus*
19'. In dorsal view, distance from rim to rim of pronotal impression, about 3 times distance from rim to lateral margin 20

20(19'). East of the 100th meridian ..... *pusillus*
20'. West of the 100th meridian ..... *laqueatus*

The following list includes all known distributional data. A new length is given for most species, because many specimens examined were shorter or longer than indicated by Kraus.

Lasconotus mexicanus Kraus, 1912:27, 35
Mexico. Length 2.5 mm.

Lasconotus flexuosus Kraus, 1912:28, 35
Holotype only, Hoquiam, Washington. Length 3.8 mm.

Lasconotus complex LeConte, 1859b:282 **(Fig. 35)**
3(CA) 4(BC, ID, OR, UT, WA). Length 3.7 - 4.1 mm.

Lasconotus tuberculatus Kraus, 1912:28, 35
3(AZ, CA, NM, SO) 4(BC, OR, WA, UT) 5(SD, WY). Length 3.5 - 4 mm.

Lasconotus nucleatus Casey, 1890:314
3(CA) 4(OR, WA). Length 2.7 - 3.7 mm.

Lasconotus knulli Stephan new species

Description: Holotype: Ferruginous, subopaque. subparallel, not quite 4 times longer than wide, convex, T/W = 3/4. Antennal club distincly 3-segmented. Pronotum a quarter longer than wide, widest near apical third, apical angles round, basal angles obtuse, median impression long and narrow, nearly reaching both frontal and basal margins, a pair of equally narrow impressions each side of, and close to, median impression at base, their length equal to one third pronotal length, submarginal carina distinct but fine, lateral margins sharply pronounced, narrow. Elytra subparallel, all interspaces acutely raised, except at declivity, where second and fourth are somewhat flattened, each with a single row of reclining, overlapping, golden hair, giving the appearance of an uninterrupted fine line. Elytral punctures large, close set. Pubescence obvious, golden. Length 1.9 mm.

This is probably our smallest species of the genus. Known only from the holotype: ARIZONA, Santa Cruz County, Nogales, 2-VIII-1955. D.J. & J.N. Knull (FSCA).

This species is named in honor of the late Prof. J.N. Knull as an acknowledgement of his valuable contributions to the knowledge of North American beetles.

Lasconotus borealis Horn, 1878:570
1(MI, NH, NY, ON) N.W.T. Canada. Length 2.8 - 3.2 mm.

Lasconotus intricatus Kraus, 1912:30, 36
(*Lasconotus krausi* Hatch, 1962:243) **n. syn.**

I have examined part of the type series of *L. krausi* Hatch and found them to be typical *L. intricatus* Kraus. 4(BC, ID, OR, WA) N.W.T. Canada. Length 2.8 - 3.2 mm.

Lasconotus pertenuis Casey, 1890:313
3(CA). Length 2.3 - 2.6 mm.

Lasconotus linearis Crotch, 1874:75
3(CA). Length 2.5 - 3.2 mm.

Lasconotus vegrandis Horn, 1885:140
(*Lasconotus apicalis* Casey, 1890:315) **n. syn.**
(*Lasconotus schwarzi* Kraus, 1912:31, 37) **n. syn.**

Kraus used the pronotal shape, length vs. width, the elevated length of interspace 3, and the overall length, to separate the species. He reported some variation in the characters of the third interspace and overall length. As near as I can find out from his records, he saw less than 30 specimens. I have

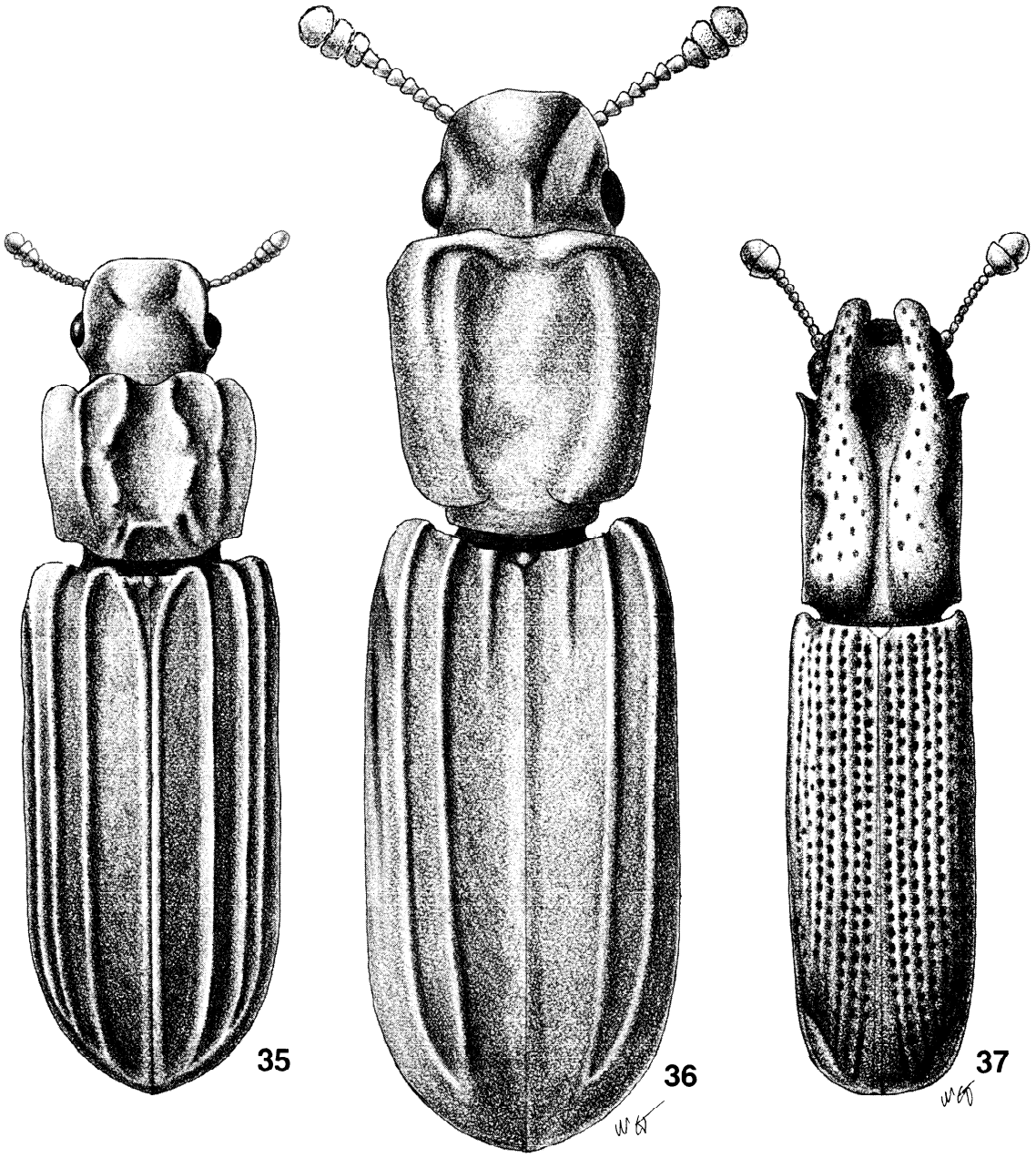

Figure 35-37. 35) Habitus of *Lasconotus complex* LeConte; 36) Habitus of *Lasconotus laqueatus* LeConte; 37) Habitus of *Lobogestoria gibbicollis* Reitter.

examined 128 specimens of *L. vegrandis, L. apicalis*, and *L. schwarzi*, and cannot separate them consistently. One series of 33 specimens from Trinity Co., California, keyed out to contain all three. I therefore suppress *L. apicalis* Casey, and *L. schwarzi* Kraus. 3(CA) 4(BC, ID, OR, WA). Length 3 - 4 mm.

Lasconotus referendarius Zimmermann, 1869:254
1(DC, IN, MD, NJ, PA) 2(AL, FL, GA, NC, SC, VA) 3(OK, TX). Length 1.8 - 2.5 mm.

Lasconotus servus Horn, 1885:141
3(AZ, CA, NM). Length 3 - 3.5 mm.

Lasconotus planipennis Kraus, 1912:32,39
3(AZ, CA, NM,) 4(BC, ID, WA) 5(SD, MT, WY). Length 2.2 - 2-5 mm.

Lasconotus simplex LeConte, 1866:378
3(AZ, CA, NM) Mexico. Length 2.3 - 2.5 mm.

Lasconotus fiskei Kraus, 1912:33, 39
Known only from Montell, Texas. Length 2 mm.

Lasconotus concavus Casey, 1890:315
3(AZ, NM, SO) 5(CO, MT). Length 2.8 - 3 mm.

Lasconotus subcostulatus Kraus, 1912:34, 40
3(CA) 4(ID, NV, OR, WA) 5(SD, MT, NK) Length 2.5 - 2.8 mm.

Lasconotus pusillus LeConte, 1863:67
1(OH) 2(AL, FL, GA, LA, MS, NC, SC) 3(OK, TX). Length 2.5 - 3.2 mm.

Lasconotus laqueatus LeConte, 1866:378
3(AZ, CA, NM, SO, TX) 4(NV) 5(SD, MT, WY). Length 2.7 - 3 mm.

Lasconotus bitomoides Kraus, 1912:33, 40
3(AZ, CA, NM, TX). Length 2.3 - 2.7 mm.

Genus *LOBOGESTORIA* Reitter
Figure 37

Lobogestoria Reitter, 1878:31
(*Aditoma* Casey, 1897:630)

Type species: *Lobogestoria gibbicollis* Reitter, 1897

Diagnosis: Body cylindrical. Antennae 11-segmented, short, club 2-segmented, penultimate wider. Pronotum longer than wide, with a large bifid process at apex, extending over head, center of disk with longitudinal depression, dilated and deepened at both ends. Procoxal cavities narrowly closed behind, all coxae approximate. Elytra striate-punctate, scutellar striae absent, intervals even, apical margin near apex with a flexure similar to *Pycnomerus*, somewhat truncately rounded. Process of first ventrite narrow and acute, ventrites 4 and 5 modified, excavated. Tibiae with outer apical angles somewhat expanded, but not toothed. Femora shiny, very coarsely and sparsely punctate, pubescence barely visible. Tarsi 4-segmented, first segment small.

Discussion: It is not the purpose of this paper to restructure the higher classification of the Colydiidae. However, this peculiar beetle raises some intriguing questions as to its proper placement. It is here included in the tribe Synchitini simply because no good alternative is available. It is the only North American species of that tribe with a combination of shiny, seemingly glabrous femora and without scutellar striae. All others have the femora opaque, or obviously pubescent, or both. Only *Paha* lacks scutellar striae, but is otherwise a typical synchitine. The only truly synchitine feature I can find in *Lobogestoria* is the small first tarsal segment. In contrast there are several characters common to the Pycnomerini and Gempylodini. The elytra resemble those of a typical *Pycnomerus*. They are shiny, seemingly glabrous, striate-punctate, without scutellar striae, and have a flexure of margin near the apex. The heavily sclerotized body, concave last visible ventrite, and structure of the antennae, are other pycnomine features. However, the cylindrical form and approximate coxae point toward Gempylodini; as do the upturned frons above the antennal insertions, which expose most of antennal segment 1. But the lack of a tooth on the outer apical angles of the tibiae, and the narrowly closed procoxal cavities, exclude it from the latter 2 tribes.

Lobogestoria gibbicollis Reitter

Lobogestoria gibbicollis Reitter, 1878:31
(*Aditoma bifida* Casey, 1897:630)

Diagnosis: Dark reddish brown, seemingly glabrous, the sparse pubescence is very short, shiny. Length 3 - 4 mm.

Distribution: This unique beetle is found in North America only in the southeastern U.S.; also known from Cuba and South America. The 3 specimens seen were from South Carolina, Florida and Cuba. Other localities are from the literature. 2(AL, FL, GA, LA, SC).

Biology: Nothing is known about its habits. The cylindrical form suggests a bore-hole habitat.

Months collected: One specimen was taken in July.

Genus *CHRYSOPOGONIUS* Hinton

Chrysopogonius Hinton, 1935:207, 208

Type species: *Chrysopogonius coronatus* Hinton, 1935.

Diagnosis: Body elongate, about 3.5 times longer than wide, moderately convex. Antennae 11-segmented, segment 3 strongly elongate, longer than segments 2 or 4, club 3-segmented. Pronotum longer than wide, apical margin with a hairy protuberance, which conceals part of head. Procoxal cavities narrowly open behind. Pubescence long and semierect.

Discussion: Dr. J.M. Kingsolver brought an undescribed species of this genus from Colorado to my attention. I am indebted to him for allowing me to record its existence here. He has a paper describing it in preparation.

Tribe COLYDIINI

Key to the genera of the Colydiini

1. Apical margin of last ventrite without a pair of long tactile, setae, elytral declivity not carinate ..... *Aulonium*
1'. Apical margin of last ventrite with a pair of long tactile setae, elytral declivity carinate ..... *Colydium*

Genus *AULONIUM* Erichson

Aulonium Erichson, 1845:275
(*Anoectochilus* Redtenbacher, 1845: 124)
(*Gloeania* Pascoe, 1860:99)
(Hetschko, 1930:7, placed *Colydium lineola* Say here by mistake)

Type species: *Colydium bidentatum* Fabricius, 1801

Diagnosis: Antennae 11-segmented, club 3-segmented. Head without antennal grooves. Eyes ovate, shorter than deep, incised by sides of frontal margin, fairly coarsely faceted. Pronotum subquadrate to elongate, more or less subparallel, lateral margins thick, bicarinate, carinae narrowly separated, each side with a submarginal carina, which is interconnected along apical margin, disk often with a pair of median sulci and callosities, shape and intensity of callosities variable, depending on species and sex. Procoxal cavities narrowly closed behind. Elytra striate-punctate, punctures small to moderate, not confluent. Epipleural fold nearly vertical, ending just before apex. Body elongate, semicylindrical, glabrous, moderately shiny.

Discussion: Much of the data cited here are taken from a recent review of the genus by Kingsolver and White (1967). Dr. Kingsolver was also most helpful in other areas throughout this study.

Key to the species of *Aulonium*

1. West of the 100th meridian 2
1'. East of the 100th meridian 3

2(1). Pronotum 0.15 longer than wide; submarginal carinae raised stronger near apex; usually reddish brown ..... *longum*
2'. Pronotum as long as wide; submarginal carinae raised only slightly more near apex; usually piceous ..... *aequicolle*

3(1'). Body 3 times longer than wide; usually piceous ..... *parallelopipedum*
3'. Body 3.6 times longer than wide; uniformly ferrugineus or ferrugineus with elytral apex darker 4

4(3'). Apical half of elytra usually darker, or uniformly reddish brown (teneral); pronotal disk vaguely sulcate; length 4mm or more ..... *tuberculatum*

4'. Elytra uniformly reddish brown; pronotal disk distinctly sulcate; length 4 mm or less ..... *ferrugineum*

Aulonium longum LeConte

Aulonium longum LeConte, 1866:378

Diagnosis: Reddish dark brown. Body strongly elongate, nearly 4 times longer than wide, subparallel, subcylindrical, T/W = 6/7. Pronotum 0.15 longer than wide, subparallel, pronotal disk near apical quarter with a pair of shallow callosities (female), or strongly raised knobs (male). Elytra finely, densely striate-punctate, intervals moderately dense, extremely finely, punctate. Length 4.2 - 5.5 mm.

Distribution: This species is widespread throughout the western third of North America, from southern California north to British Columbia, west to New Mexico and South Dakota. Specimens examined, 265: 3(AZ, CA, NM) 4(BC, ID, NV, OR, UT, WA) 5(CO, MT, SD).

Biology: It is found under bark of dying pines, especially ponderosa pine, at the stage when most bark beetles are still present.

Months collected: All year, except January.

Discussion: This is our only common western species. It differs from the rare *A. aequicolle* in the more elongate body and pronotum, reddish color, and strong sexual dimorphism.

Aulonium aequicolle LeConte

Aulonium aequicolle LeConte, 1859:81

Diagnosis: Dark brown to piceous. Body elongate, about 3 times longer than wide, widest near middle of elytra, convex, T/W = 3/4. Pronotum subquadrate, a little wider than long, lateral margins distinctly rounded, disk near apical fifth with a pair of very shallow callosities in both sexes. Elytra striate-punctate, punctures of moderate size, not crowded, intervals sparsely, finely punctate. Humeral stria, at humerus, with a fine but obvious fold, which diminishes gradually near basal third. Length 3.5 - 5 mm.

Distribution: LeConte described *aequicolle* from the Sacramento Valley, California. Specimens examined, 3: (1) Arizona, Santa Cruz Co., Santa Rita Mts., Madera Canyon, 19-VI-1965, D.N. Harrington; (1) Arizona, Pima Co., Santa Catalina Mts., Bear Canyon, 15-VI-1970, K. Stephan; (1) Arizona, Santa Cruz Co., Pena Blanca, 11- VI-1970, K. Stephan.

Biology: The Arizona specimens were all collected at light within the oak zone. The species is probably associated with oaks.

Discussion: I have not seen the type of *A. aequicolle*, but the description and distribution, leave little doubt that the 3 specimen before me belong to that species; however, LeConte did not mention the fold at the humerus. This character is not found in our other species, but is common in those from Mexico and southward. Dr. R.D. Pope, British Museum of Natural History (pers. com.), compared one of my specimens with all types of Sharp and Pascoe. He found it to be distinct. Crotch (1873:46) synonymized *A. aequicolle* LeConte with *A. parallelopipedum* (Say), which was in error, for the latter does not occur west of the 100th meridian.

Aulonium parallelopipedum (Say)
Figure 38

Aulonium parallelopipedum (Say), 1826:263
(*Colydium parallelopipedum* Say, 1826:263)

Diagnosis: Piceous to brown (teneral). Body elongate, about 3 times longer than wide, widest near middle of elytra, convex, T/W = 5/8. Pronotum 0.1 wider than long, sides subparallel, pronotal disk near apical fifth with a pair of narrowly elongate callosities in both sexes, those of male more pronounced. Elytra striate-punctate, punctures of moderate size, intervals densely, finely punctate. Length 3.5 - 5.5 mm.

Distribution: This common species is widespread throughout eastern North America, from northern New York to Florida, west to eastern Oklahoma and Texas. Specimens examined, 322: 1(DC, DE, IL, IN, MA, MD, MI, NJ, NY, OH, PA) 2(AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA) 3(OK, TX).

Biology: Occasionally at light, but much more frequent under bark of dying oaks and other hardwoods; also at sap.

Months collected: All year, except August.

Discussion: The dark color, broader and shorter form, and association with hardwoods, set this species apart from the other eastern ones.

Aulonium tuberculatum LeConte

Aulonium tuberculatum LeConte, 1863:67

Diagnosis: Dark reddish brown, elytra with apical third to two thirds darkened, rarely all reddish brown, subopaque. Body strongly elongate, 3.6 times longer than wide, subparallel, subcylindrical, T/W = 4/5. Pronotum 0.1 longer than wide, subparallel, disk with apical callosities absent (female), or shallow and with a pair of upright protuberances at apical margin (male), a pair of median sulci only vaguely indicated at basal half. Elytral striae distinct near base only, faded elsewhere, intervals with extremely fine punctures, surface opaque. Length 4 - 4.5 mm., rarely smaller.

Distribution: This species is not rare. It occurs throughout eastern North America wherever pines are present. Specimens examined, 133: 1(DC, IN, MD, NJ, NY, PA) 2(AL, DC, FL, GA, LA, MS, NC, SC, VA, WV) 3(OK, TX).

Biology: It is found under bark of dying pines, at a stage when most bark beetles are still present. It also comes to light.

Months collected: All year, except VIII.

Discussion: This species could be confused with *A. ferrugineum*. It can be distinguished by the darkened elytral apex, nearly quadrate pronotum, which has no discal sulci in the apical half, and the strong sexual dimorphism.

Aulonium ferrugineum Zimmermann

Aulonium ferrugineum Zimmermann, 1869:254

Diagnosis: Light reddish brown, moderately shiny. Body strongly elongate, nearly 4 times longer than wide, subparallel, subcylindrical, T/W = 4/5. Pronotum 1.3 times longer than wide, slightly wider apically, pronotal disk near apex without calosities in either sex, submarginal carinae increasing in height toward apex, extending over apical margin, median sulci strongly impressed, approximate and parallel in apical half, divergent toward base. Elytral striae vaguely indicated at base only, not visible past basal quarter, intervals with extremely fine punctures. Length 3.6 - 4 mm.

Distribution: This uncommon species is restricted to the southeastern U.S. Specimens examined, 45: 1(PA) 2(FL, GA) 5(OK, TX). Kingsolver and White (1967) record it also from (AL, NC, SC).

Months collected: I, II, IV, V, VI, VIII.

Discussion: The strongly elongate and uniformly reddish brown body, the elongate pronotum, with deeply impressed sulci, and the uniform sexes will separate it from *A. tuberculatum*.

Genus *COLYDIUM* Fabricius

Colydium Fabricius 1792:459

Diagnosis: Body strongly elongate, subcylindrical, glabrous and shiny. Antennae 11-segmented, club 3-segmented. Head without distinct antennal grooves, only a short shiny, groove-like area just below the eyes, which is at most half as long as the diameter of the eye. Eyes various, usually round, sometimes incised by frontal margin. Pronotum at least a little, but never more than 1.5 times longer than wide. Pronotal disk with a longitudinal sulcus, which is rarely missing, and at least a trace of a submarginal sulcus. Procoxal cavities closed behind. Elytra with several carinae, which are more elevated at base and declivity, intervals striate-punctate, punctures never confluent. Epipleural fold narrow, not reaching apex, nearly vertical. Apical margin of last ventrite with a pair of long tactile setae.

Discussion: Hinton (1936), in his description of *Colydium latum*, mentioned 2 long setae on the apical margin of the last ventrite. This is the only reference I was able to find in the literature, concerning these tactile setae. The 2 European, the 5 found in our fauna, and a few undetermined Mexican species, all have a pair of these setae. They are absent in the related genera *Anarmostes* Pascoe and *Aulonium* Erichson. I regard these setae as an important generic character, which is probably more reliable than the condition of the tibiae, previously used to separate *Colydium* from related forms.

Key to the species of *Colydium*

1. Apex of clypeus and labrum both hairy . . . 2
1'. Apex of clypeus glabrous, only labrum hairy 4

2(1). Body reddish; only elytra piceous; pronotal punctures round; Eastern North America . . . . . *nigripenne*
2'. Body piceous; elytra piceous or reddish near base; pronotal punctures elongate, if pronotal punctures are round, then species is western 3

3(2'). Apex of pronotum wider than base, body 5 times longer than wide; generally distributed . . . . . *lineola*
3'. Width of pronotum at base and apex subequal, body only 4 times longer than wide. Arizona only . . . . . *.robustum*

4(1'). Elytral carinae distinct only at base and apical half; Arizona and New Mexico . . . . . *glabriculum*
4'. Elytral carinae distinct throughout their entire length; Florida Keys . . . . . *.thomasi*

Colydium nigripenne LeConte

Colydium nigripenne LeConte, 1863:67
(*Colydium bicoloratum* Blatchley, 1925:165) **n. syn.**

Diagnosis: Entirely reddish, only elytra dark, shiny. Body strongly elongate, about 4.5 times longer than wide, subcylindrical, T/W = 5/6. Pronotum about 1.3 times longer than wide, widest at apex, lateral margins straight, slightly convergent toward base, medium sulcus distinct from base to apex, submarginal sulci distinct from apex to within one sixth of base, punctures of disk more or less round. Elytra carinate, carinae of interspaces 3, 5, and 9 reach apical margin, carina of interspace 7 ends abruptly before apex. Length 3.9 - 4.5 mm.

Distribution: This species is found from New Jersey to Florida, west to eastern Oklahoma. Specimens examined, 83: 1(DC, MD, IL, NJ) 2(AL, AR, FL, GA, MS, NC, SC, TN) 3(OK, TX).

Biology: It is found under bark and in the bore-holes of other beetles, especially scolytids and platypodids. It prefers pines, but is sometimes found on hardwoods; occasionally at light.

Months collected: All year.

Discussion: Blatchley (1925) suspected that his *C. bicoloratum* was the same as *C. nigripenne*, he was right. The combination of a red body with dark elytra, round pronotal punctures, and an eastern distribution is unique for this species.

Colydium lineola Say
Figure 39

Colydium lineola Say, 1826:264
(*Colydium longiusculum* Say, 1826:264)

Diagnosis: Usually piceous to black, sometimes elytral base broadly lighter or entirely reddish brown, shiny. Body strongly elongate, about 5 times longer than wide, subparallel, subcylindrical, T/W = 6/7. Pronotum 1.5 times longer than wide, widest at apical sixth, lateral margins slightly sinuate, convergent toward base, median sulcus variable, usually distinct from base to apex, rarely vague, submarginal sulci reach neither base nor apex by about one sixth pronotal length, punctures of disk distinctly elongate. Elytra carinate, carinae distinct throughout their length or outer ones vague near middle, more elevated near base and at declivity, carinae of interspaces 3, 5, and 9 reach apical margin, while carina of interspace 7 ends abruptly before apex. Length 3 - 7 mm.

Distribution: Among our Colydiidae, this common species is the most widespread. Specimens examined, 427: 1(DE, DC, IL, IN, MD, NJ, NY, ON, PA) 2(AL, AR, FL, GA, LA, MS, SC, TN) 3(AZ, CA, OK, TX) 4(BC, OR, WA) 5(MO).

Biology: The species is found under the bark of various hardwoods, less often on pine and spruce. It prefers the area about the base including large exposed roots, where it readily enters the bore holes of platypodids, anobiids, bostrichids, and scolytids of the genus *Gnathotrichus*.

Months collected: All year.

Discussion: There is considerable variation in *C. lineola*, especially in size, punctation, and color. Looking at single specimens from different localities, one gets the impression of dealing with several

species. I have examined more than 400 specimens, including sizable series from various localities, and found that the differences are neither local nor constant. Intermediate forms occur everywhere. However, there is a tendency for specimens from the southeast to be more reddish and smaller, while those from the middle states and the northeast are more typical in size and darker, while those from the northwest tend to be typical in coloration, but larger.

Colydium robustum Stephan new species

Description: Holotype: Piceous. Body elongate, about 4 times longer than wide, subparallel, but slightly wider near apical third of elytra, cylindrical, T/W = 1/1. Pronotum about 1.25 times longer than wide, widest just anterior to middle, lateral margins slightly rounded, basal and apical width subequal, median sulcus distinct from base to apex, submarginal sulcus not quite reaching base nor apex, punctures of disk more or less round. Elytra carinate, all carinae complete throughout their length, more raised near apex. Interspaces 3, 5, and 9 reach apical margin, interspace 7 does not. Length 5.8 mm.

Variation: Color: piceous, elytra often lighter; Length; 5 - 7 mm.

Distribution: This species is presently known only from the higher, forested mountain ranges of southeastern Arizona, where it is not rare.

Biology: It lives under bark of large, recently killed ponderosa pines. When a specimen is found on a section of bark, there are usually others hiding in the exit holes of bark beetles, especially when the bark is thick. They can easily be extracted from these holes by pushing them out with a pine needle or other slender object; not yet seen from light.

Months collected: II, IV, V, VI, VII, X, XI, XII.

Holotype: ARIZONA, Pima Co., Santa Catalina Mts., 7000 ft., 12-V-1968, K. Stephan (FSCA). **Paratypes**, 72, all ARIZONA: (15) same as holotype: (1) Santa Catalina Mts, , 8000 ft., 23-V-1968. (1) Santa Catalina Mts. 8000 ft., 10-XI- 1968. (10) Santa Catalina Mts., 7000 ft., 5-IV-1969. (18) Santa Catalina Mts., 7000 ft., 9-XI-1974. (4) Santa Rita Mts., 6000 ft., 8-XII-1968. (15) Santa Rita Mts., 7000 ft., 20-IV-1969. (8) Santa Rita Mts., 7000 ft., 28-II-1976. (7) Chiricahua Mts., 8500 ft., 4-V-1969. (2) Chiricahua Mts., 8000 ft., 6-X-1974. (1) Pinal Co., Mt. Graham, 18-V-1969. Greenly Co., Strayhorse Forest Camp, 5-V-1970. All collected by K. Stephan. Specimens in the collections of: FSCA, NMNH, CNCI, CASC, FMNH, KSC. Non-paratypes: all ARIZONA: (8) Santa Catalina Mts., IV-1965, M.L. Lindsey; (1) Flagstaff, VII-1943, F.H. Parker; (2) Santa Catalina Mts., 7000 ft., 5-IV-1969, C.T. Parsons; (1) Santa Catalina Mts., 1-VI-1938, VanDyke.

Discussion: Dr. R.D. Pope, British Museum of Natural History (pers. com.), compared both *C. robustum* and *C. glabriculum* with the American species of *Colydium* in his care: "*Colydium robustum* - *C. godmani* is a quite different species with strongly raised, arcuate carinae on the apical declivities of the elytra. *C. mexicanum* and *C. guatemalum* are very similar to *robustum*, but show slight differences in pronotal punctation and elytral sculpture. *C. chiriguense* is also very similar to *robustum*, but is a smaller species, with a less closely punctured pronotum and slightly more strongly raised elytral carinae. *Colydium glabriculum* does not correspond to any species in our collections. Although *C. puncticolle* lacks clypeal hairs, it is a very different species from *glabriculum*."

Colydium glabriculum Stephan new species

Description: Holotype: Dark brown, elytra somewhat lighter, shiny. Body strongly elongate, about 5 times longer than wide, subparallel, subcylindrical, T/W = 1/1. Clypeal hair lacking. Pronotum about 1.5 times longer than wide, widest near apical third, lateral margins vaguely sinuate, apex 0.1 wider than base, median sulcus distinct from base to apex, submarginal sulci absent or barely indicated near basal third, punctures of disk somewhat elongate. Elytra carinate, carinae distinct only at base and apical third, carinae of interspaces 3, 5, and 9 reach apical margin, carina of interspace 7 ends before apex. Length 4.6 mm.

Variation: Color; Dark brown to piceous; length 4 - 5 mm.

Distribution: This species is presently known only from the higher, forested mountain ranges of eastern Arizona, where it is quite rare. I have collected it in

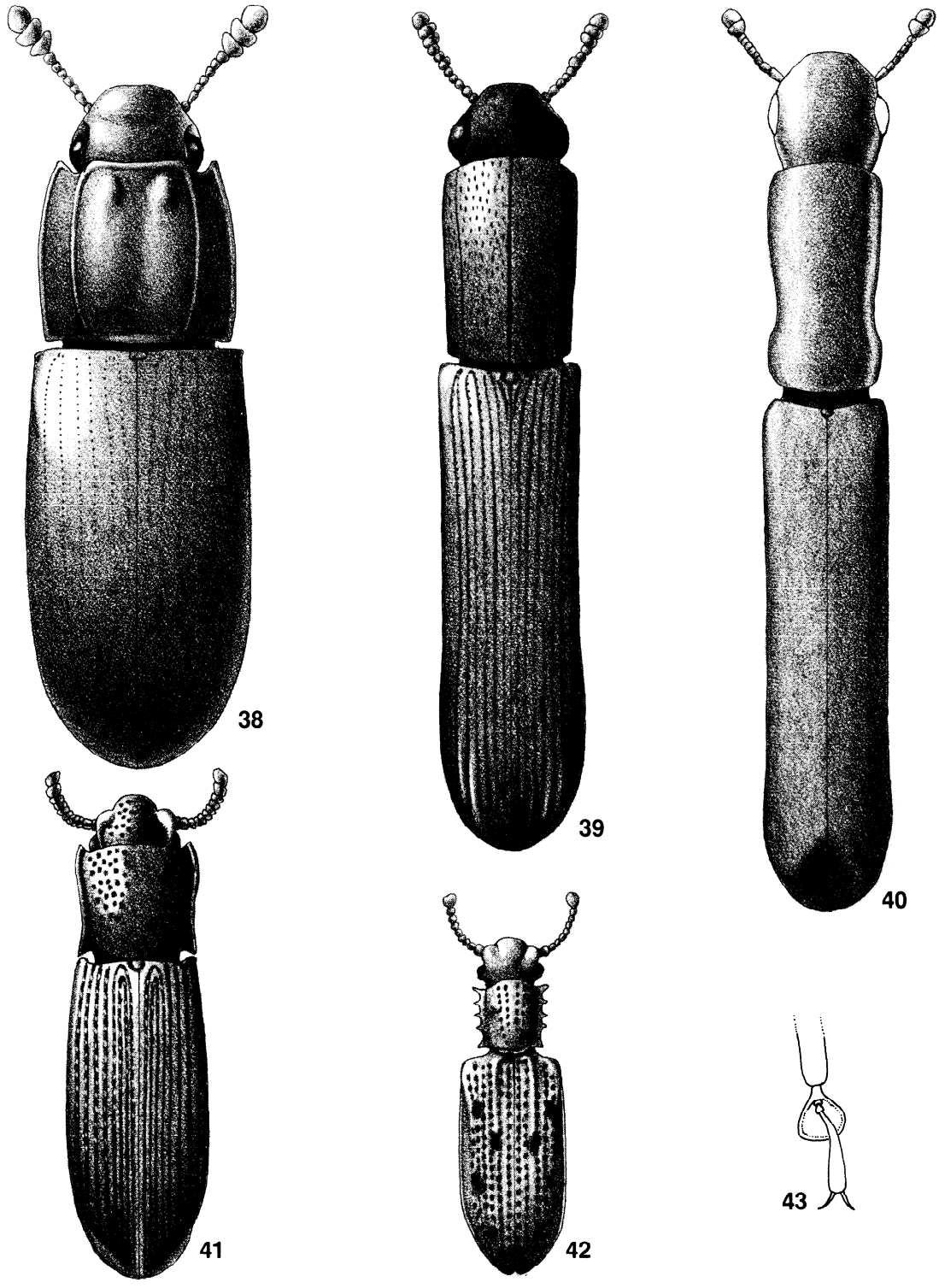

Figure 38-43. 38) Habitus of *Aulonium parallelopipedum* (Say), male; 39) Habitus of *Colydium lineola* Say; 40) Habitus of *Nematidium filiforme* LeConte; 41) Habitus of *Pycnomerus haematodes* (Fabricius); 42) Habitus of *Monoedus guttatus* LeConte; 43) Tarsus of *Monoedus guttatus* LeConte.

the Chuska Mts. of Arizona, and it should occur also in the New Mexican half of this range.

Biology: Like the preceding, it lives under the thick bark of recently killed ponderosa pines; not seen from light.

Months collected: II, V, VI, VIII, IX, X, XI.

Holotype: ARIZONA, Cochise. County, Chiricahua Mts., 8500 ft., 4-V-1968, K.Stephan (FSCA). **Paratypes**, 25, all ARIZONA: (9) same as holotype. (1) Chiricahua Mts., Barfoot Camp, 29-V-1976. (4) Pima Co., Santa Catalina Mts., 8000 ft., 7-IX-1968. (3) Santa Catalina Mts., 8000 ft., 20-X-1968 (1) Santa Catalina Mts., 8000 ft., 10-XI-1968. (1) Santa Catalina Mts., 8500 ft., 17-V-1975. (2) Santa Catalina Mts., 8000 ft., 8-II-1976. (4) Apache Co., Chuska Mts., Wagon-wheel Forest Camp, 31-VIII-1974. All collected by K. Stephan. Non-paratypes: All ARIZONA; (1) McNary: 16-VI-1937, R.P. Allen. (2) Santa Catalina Mts., 10-XI & 20-X-1968, C.T. Parsons. (1). Chiricahua Mts., Rustler's Park, 16-IX-1952, Malkin. (1) Chiricahua Mts., Rustler's Park, VI-1956. (4) Huachuca Mts., 8000 ft., VII. Specimens in the collections of: FSCA, NMNH, CNCI, CASC, FMNH, KSC.

Discussion: This species and *C. thomasi* are our only ones lacking hair on the clypeus. In the first the elytral carinae are obsolete on the central disk, while in the second they are rounded, but distinct. They are also geographically isolated. See also discussion under *C. robustum*.

Colydium thomasi Stephan
new species

Description: Holotype: Reddish brown, declivity darker, pronotum subopaque, elytra shiny. Eyes more than half length of head, coarsely faceted. Body very elongate, about 5.5 times longer than wide, subparallel, subcylindrical, T/W = 9.5/10. Pronotum about 1.5 times longer than wide, widest at apex, lateral margins vaguely sinuate, apex about one sixth wider than base, median sulcus distinct from base to apex, submarginal sulci indistinct, reaching neither base nor apex, punctures of disk small, somewhat elongate. Elytra carinate, carinae complete, but not prominent, except at declivity, first carina (third interspace) reaches apex, second not reaching apex by a tenth elytral length, submarginal carina joining third near apical margin, from which point third continues to apical margin. Length 5.5 mm.

Variation: There is little variation except for length, 5 - 5.5 mm.

Distribution: Known only from Florida, Upper Key Largo, and Cuba.

Months collected: IV, VI.

Holotype: FLORIDA; Monroe Co., Upper Key Largo, 3-VI-1976, M.C. Thomas (FSCA). **Paratypes**, 5: Same data as holotype except, 3-VI-1976, M.C. Thomas and J.H. Frank. Specimens in the collections of: NMNH, CNCI, MCT, KSC.

Discussion: The lack of hair on the clypeus, extremely elongate body, presence of carinae on the elytra] disk, and distribution characterize this species. Its occurrence in Cuba was brought to my attention by S.A. Slipinski, who intended to describe it as a new species from there. It gives me great pleasure to namethis species in honor of Dr. M.C. Thomas, who not only collected the type series but also devoted much of his time and talent toward the improvement of this paper.

Tribe NEMATIDIINI

Genus *NEMATIDIUM* Erichson
Figure 40

Nematidium Erichson, 1845:275
(*Filumis* Reitter, 1876:8, 16)

Type species: *Colydium cylindricum* Fabricius, 1801

Diagnosis: Bases of mandibles visible from above. Antennae 11-segmented, short, barely reaching apex of prosternum, club 2-segmented, last segment twice as long as, and a little wider than penultimate. Antennal grooves distinct. Eyes round, except for a flattened area along antennal grooves, large, diameter twice length of club, flush with contour of head. Pronotum without distinguishing sculpture, about twice as long as wide, lateral margins with large, shallow excavations to receive profemora. Procoxal cavities broadly closed behind. Elytra with finely impressed striae, which are densely punctate, intervals with a row of sparse punctures, alternate ones a little wider. Epipleural fold narrow, nearly vertical,

not quite reaching apex. Body cylindrical, extremely elongate. All tibiae spinose at outer apical angle, first segment of meso- and metatarsi longer than next 2 combined.

Nematidium filiforme LeConte

Nematidium filiforme LeConte, 1863:68

Diagnosis: Reddish brown, head and apex of elytra somewhat darker, glabrous, shiny. Body 6.5 times longer than wide. Length 5.5 - 7 mm.

Distribution: This rarely collected species is confined to the southeastern U.S. Specimens examined, 21: 2(AL, FL, GA, LA, NC, TN).

Biology: One specimen was taken at the base of a dead oak, others at light. I suspect its habits to be similar to *Colydium*.

Months collected: III, IV, V, VI, VII, IX, X.

Discussion: This is our most elongate colydiid, it is also the most modified for life in bore holes. It cannot be confused with any other beetle in our fauna.

Tribe PYCNOMERINI

Genus *PYCNOMERUS* Erichson

Pycnomerus Erichson, 1842:214
(*Penthelispa* Pascoe, 1860:111)
(*Endectus* LeConte, 1861:91)

Type species: *Ips terebrans* Olivier, 1790. Designated by Dajoz (1977).

Diagnosis: Body elongate ovate, more or less depressed, glabrous, shiny. Tibiae with outer apical angle expanded into a tooth. Antennal insertion not separated from base of mandibles by a carina. All coxae separated by at least 1 coxal diameter.

Discussion: Our 5 species all have the general habitus typical of the genus, but differ in many details of apparent generic importance. To divide them into 2 genera by characters of the antennae, as has been done in the past, is not satisfactory. The shape of the pronotal margin, the depth of the concavity of the last ventrite, and the degree of elytral explanation near the apex, all could be used for the same purpose. This would divide our species into several genera, which I feel is unwarranted. Therefore, I follow Sharp (1894) and unite them under the senior name *Pycnomerus*, until a more comprehensive study of the group proves otherwise.

Key to the species of *Pycnomerus*

1. East of the 100th meridian 2
1'. West of the 100th meridian 4

2(1). Antennal club 1-segmented ..... *sulcicollis*
2'. Antennal club distinctly 2-segmented 3

3(2'). Pronotum with 2 median, longitudinal depressions ..... *haematodes*
3'. Pronotum without depressions .... *reflexus*

4(1'). Antennal club 1-segmented ..... *arizonicus*
4'. Antennal club distinctly 2-segmented ..... *quercus*

The condition of the elytral intervals of these often strongly shining species cannot be accurately judged from above. They are best seen from behind, at an oblique angle.

Pycnomerus sulcicollis LeConte

Pycnomerus sulcicollis LeConte, 1863:69

Diagnosis: Dark reddish brown. Antennae 10-segmented, club 1-segmented. Pronotum slightly longer than wide, widest near apical fifth, convergent toward base, with a pair of deep, longitudinal, elongate depressions on disk, lateral margins narrowly reflexed. Elytra with intervals flat to slightly rounded, flexure at apical margin not prominent, apex acutely rounded. Last ventrite deeply excavated. Length 2.8 - 3 mm.

Distribution: This fairly common species occurs from New Jersey to Florida, west to eastern Oklahoma. Specimens examined, 127: 1(DE, IN, NJ) 2(AL, AR, FL, GA, MS, NC, SC, TN, VA) 3(OK).

Biology: This species lives under bark and in rotting, moist wood of oak, hickory, and other hardwoods;

rarely on pine. The majority of specimens seen were taken at light.

Months collected: IV - XII.

Discussion: This is our only eastern *Pycnomerus* with a 1-segmented club and a pair of distinct and long depressions on pronotum. In the similar western *P. arizonicus* the pronotal depressions are vague or obsolete.

Pycnomerus haematodes (Fabricius) new combination Figure 41

(*Penthelispa haematodes* Fabricius, 1801:562)

Diagnosis: Dark reddish brown, head and pronotum somewhat darker. Antennae 11-segmented, club distinctly 2-segmented, penultimate segment wider than last. Pronotum slightly wider than long, widest near apical fifth, lateral margins strongly convergent toward basal two thirds, from there slightly divergent to base, disk with a pair of shallow, longitudinal depressions, lateral margins moderately widely reflexed. Elytra with intervals strongly rounded, flexure at apical margin wide, prominent, apex truncately rounded. Last ventrite deeply excavated. Length 2.8 - 3 mm.

Distribution: This common species is widespread in the eastern U.S., from New York to Florida, west to eastern Oklahoma and Texas. Specimens examined, 245: 1(IN, MD, NJ, NY, OH, PA) 2(AL, FL, GA, MS, SC, VA) 3(OK, TX).

Biology: *Pycnomerus haematodes* seems to be confined to rotting, but standing pines, where it is found under moist bark and in moist rotting wood especially near the base. This slow moving beetle likes to feign death and is often overlooked.

Months collected: All year.

Discussion: Previous workers assigned this species to the genus *Penthelispa*, because of its 11-segmented antennae and 2-segmented club. See generic discussion.

Pycnomerus reflexus (Say) new combination

(*Penthelispa reflexa* Say, 1826:262)
(*Endectus nitidus* LeConte, 1861:91)

Diagnosis: Light to dark brown. Antennae 11-segmented, club 2-segmented, penultimate segment wider than last. Pronotum slightly longer than wide, widest near apical fifth, lateral margins convergent toward base, disk without depressions, lateral margins narrowly reflexed. Elytra with intervals flat to slightly rounded, flexure of apical margin not prominent apex acutely rounded. Last ventrite deeply excavated. Length 3 - 4 mm.

Distribution: This species is less common and widespread than the preceding. It occurs from Ontario to Georgia, west to Indiana and Mississippi. Only 2 specimens were seen from west of the Mississippi river, both from Louisiana. Specimens examined, 97: 1 (IL, IN, MD, NJ, OH, ON, PA) 2(GA, MS, NC, LA, SC, TN, VA).

Biology: All specimens with habitat labels were found under bark of rotting oak or at light.

Months collected: All but IX and XII.

Discussion: Though the characters of the antennae are much like those in *P. haematodes*, the characters of the pronotal disk, elytral intervals and apex differ sharply. It is also larger.

Pycnomerus arizonicus Stephan new species

Description: Holotype: Dark brown, head and pronotum somewhat darker, glabrous, shiny. Antennae 10-segmented, club 1-segmented. Pronotum slightly longer than wide, widest near apex, lateral margins consions, lateral margins narrowly reflexed. Elytra with intervals flat, flexure of apical margin indistinct, apex evenly rounded. Last ventrite deeply excavated. Length 3.8 mm. Sex unknown.

Variation: Pronotal depressions indistinct to absent. Length 3.2 - 3.8 mm.

Distribution: Known only from the mountains of southeastern Arizona.

Biology: Found under moist bark of rotting ponderosa pines; also at light.

Months collected: IV, V, VI, VII, VIII.

Holotype: ARIZONA, Cochise Co., Chiricahua Mts., 5500ft., 31-VII-1971, K. Stephan. (FSCA). 9 Paratypes: All ARIZONA: (4) Pima Co., Santa Catalina Mts., 7000ft., 5-V-1968. (1) Pima Co., Santa Catalina Mts., Mt. Lemon, 25-IV-1970. (3) Cochise Co., Chiricahua Mts., 5500ft., 31-VII-1971. (1) Pinal Co., Mt. Graham, 9200ft., 24-VI-1972. All K. Stephan. Specimens in the collections of: FSCA, NMNH, CNCI, CASC, FMNH, KSC. 5 Non-paratypes: All ARIZONA: (3) Cochise Co., Chiricahua Mts., 22-VII & 27-VII-1957, D.J. & J.N. Knull. (2) Cochise Co., Paradise, 10-VIII-1967, F. G. Andrews.

Discussion: Dr. R.D. Pope, British Museum of Natural History, (pers. com.) compared specimens of *Pycnomerus arizonicus* and *P. quercus* with all American species, except *P. longior* Grouvelle and *P. doelloi* Brethés. He found *P. arizonicus* different from all, and *P. quercus* closely allied to, but distinct from, *P. truquii* Pascoe.

Pycnomerus quercus Stephan new species

Description: Holotype: Reddish brown, head and pronotum somewhat darker, glabrous, shiny. Antennae 11-segmented, club distinctly 2-segmented, both segments of equal width. Pronotum slightly longer than wide, widest at apical third, lateral margins rounded and very narrowly reflexed, disk without depressions, width at apex one tenth greater than at base. Elytra with intervals flat to slightly rounded, flexure of apical margin not prominent, apex acutely rounded. Last ventrite flat to slightly concave. Length 3.8 mm.

Variation: The 5 specimens known are remarkably constant and vary only in length, 3.5 - 4 mm.

Distribution: This rare species is known only from 2 relatively wet canyons in southeastern Arizona, Madera Canyon, Santa Rita Mts., and Wet Canyon, Graham Mts.

Biology: All specimens were found only during the rainy season, under loose, moist bark of small, smooth barked, dead oaks, 3 - 7 inches in diameter.

Months collected: VI and VIII.

Holotype: ARIZONA, Santa Cruz Co. , Santa Rita Mts., Madera Canyon, 31- VIII-1968, K. Stephan. (FSCA). 4 Paratypes: (1) same as holotype. (2) ARIZONA, Santa Rita Mts., Madera Canyon, 3-VIII-1968. (1) ARIZONA; Graham Co., Graham Mt., upper Wet Canyon, 9200 ft. , 24-VI-1972. All K. Stephan. No others seen

Tribe ADIMERINI

Genus *MONOEDUS* Horn, 1882

Monoedus Horn, 1882
(*Adimerus* Sharp, 1894:441)

Diagnosis: Tarsi 4-4-4, first segment greatly dilated below, (Fig. 43) enclosing small second and third segments, fourth larger. Body with dorsum strongly convex, covered with squamose setae. Venter flat. Antennae 10-segmented, first 2 segments large, third to ninth gradually decreasing in size, club 1-segmented, small, tip densely pubescent. All segments, especially inner ones, covered with scale-like pubescence. Eyes small, round, quite remote from antennal insertion. Pronotum a little longer than wide, much narrower than elytra at base, lateral margin with a few blunt teeth. Elytra striate-punctate, punctures large and shallow, alternate intervals slightly raised. Procoxal cavities narrowly open behind. All coxae narrowly separated, trochanters visible. Ventrites not counting process of first, of subequal length. Wings functional.

Discussion: Sharp (1894) described the genus as *Adimerus*, a synonym of *Monoedus*, and placed it in his new family Adimeridae, because of the peculiar structure of the tarsi. However, Crowson (1955) stated: "The Neotropical *Monoedus* (=*Adimerus*) which has been given separate family status by many authors is on the other hand unequivocally Colydiid by my criteria". Both Lawrence and Slipinski (pers. com.) agree with Crowson. None of the above authorities mentions the biology of *Monoedus*. Arnett (1962) reports it as: "occurs on the milkweed *Metastelma* (=*Cynanchum*) *scoparium* Nuttall, which grows near wet hammocks along the south Florida coast". M.C. Thomas (pers. com.) reports collecting numbers of *M. guttatus* in Florida by beating tangles of *C. scoparium* and a series of another species of *Monoedus* in Haiti also by beating *Cynanchum*. No

larvae were ever collected in association with adults, though. I have never collected *Monoedus guttatus* and can neither confirm nor dispute the above. If correct, *Monoedus* is the only Colydiid known to me specifically associated with an herb.

Monoedus guttatus LeConte
Figure 42

Monoedus guttatus LeConte, 1882:116

Diagnosis: Light tan, most often encrusted with grayish exudate, scutellum and 10 to 16 small spots on elytra dark. Length 2.2 - 2.5 mm.

Distribution: This species is found in south Florida, the Keys, and the West Indies. The genus is known throughout Central and South America.

Biology: Recorded only from the milkweed, *Cynanchum scoparium* Nuttall. Locally not rare.

Months collected: II, III, IV, IX, X, XII.

Discussion: See generic discussion.

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