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Biological Type Specimens of Texas Tech University, Lubbock, Texas, USA; with a History of these Collections at the Museum of Texas Tech University

Bill D. Mueller, James C. Cokendolpher, and Tamara Enríquez C.

Front cover: Representatives of some holotypes housed at Texas Tech University. Upper left, pseudoscorpion *Tyrannochthonius muchmoreorum* Cokendolpher, 2009 (TTU-Z029677) prior to being sputter-coated and mounted on a SEM stub. Upper right, dried skin of prepared bat *Carollia benkeithi* Solari and Baker, 2006 (TTU-M46187). Lower left, frozen tissue tube (heart/kidney) of the mouse *Peromyscus schmidlyi* Bradley et al., 2004 (TTU-TK72443, TTU-M81617). Lower right, Triassic fossil, archosaur *Shuvosaurus inexpectatus* Chatterjee, 1993 (TTU-P09280). All photographs by Cokendolpher, except the archosaur photo which is by Mueller.

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Abstract

The biological type collections at Texas Tech University currently contain 202 species and subspecies (of which 18 are fossil taxa), representing 104 genera (15 fossil taxa) in 67 families (12 fossils), 30 orders (five fossils), and in 10 classes of plants and animals. Of the 841 specimens that are types of some kind, 57 are holotypes, three are isotypes, 45 are syntypes (including a few that are frozen DNA, tissue, or blood samples only), and 736 are paratypes. There are four plant types (one of which is for a fossil taxon), 678 invertebrate types, two fossil fish types, one fossil amphibian type, nine fossil reptile types, two fossil bird types, one fossil synapsid type, and 126 mammal types (including one that is a fossil). The 20 recognized symbiotypes (hosts to parasitic mites and viruses) also are listed but are not included in the counts above. The recent plant types are held in the E. L. Reed Herbarium, Department of Biological Sciences, and the single fossil plant type and all animal types are housed in the Paleontology Division and the Natural Science Research Laboratory of the Museum of Texas Tech University. Names of all type specimens have been investigated to determine their currently accepted status, with discussions of changes detailed herein. The type locality for *Notoxus peccatus* Chandler and Nardin, 2004 (replacement name for *Notoxus orientalis* Chandler, 1978) is corrected to be in Nuevo León and not in Tamaulipas. The type localities of numerous *Geomydoecus* lice are herein restricted to more precise localities than the original authors (Price and Emerson 1971) listed. These restrictions are based upon hosts' locality data and museum labels for *Geomydoecus alcorni*, *Geomydoecus costaricensis*, *Geomydoecus fulvescens*, *Geomydoecus mexicanus*, *Geomydoecus jonesi*, *Geomydoecus mcgregori*, *Geomydoecus perotensis perotensis*, *Geomydoecus subgeomydis*, *Geomydoecus traubi*, *Geomydoecus umbrini*, and *Geomydoecus yucatanensis*. An overview of the history of the collections at Texas Tech University that hold type specimens is provided.

Key words: holotype, isotype, karyotype, paratype, symbiotype, frozen tissues, syntype, Texas Tech University

Introduction

The latest edition of the "International Code of Zoological Nomenclature" (ICZN 1999; https://www.iczn.org/the-code/the-international-code-of-zoological-nomenclature/the-code-online/) lists five recommendations for all institutions that house name-bearing types. In Article 72.10, Value of name-bearing types, "Recommendation 72F. Institutional responsibility" includes: (1) ensure that all are clearly marked so that they will be unmistakably recognized as name-bearing types; (2) take all necessary steps for their safe preservation; (3) make them accessible for study; (4) publish lists of name-bearing types in its possession or custody; and (5) to the extent possible, communicate information concerning name-bearing types when requested to do so. To help fulfill Texas Tech University's responsibility to the ICZN Recommendation and the systematics

community, a comprehensive list of the type specimens of Texas Tech University (TTU) is presented herein. The list is expanded to cover not only zoology, but all of biology, including paleobiology. Likewise, all secondary types, not just the name-bearing types, are included. Additionally, 20 symbiotypes (hosts of parasites and viruses) have been included. Symbiotypes have only relatively recently been recognized as specimens needing special protection and documentation. All of this information is published herein to make the data available to the scientific community and to promote and facilitate research on the taxa represented.

MATERIAL AND METHODS

This project was a long time coming, with several years devoted to data capture and assembly. Each section of the museum of TTU has had paper catalogs and field notes for many decades, but it is only in the past 40 years that this information has been typed into computer files and databases. Whenever possible the specimens were marked as type specimens in these computer files, and the collection manager for each section attempted to keep those records updated. In the case of Invertebrate Zoology, only the ant and parasite collections were recorded on paper and this information typed into databases. Many thousands of dry pinned insects and other invertebrates in containers of alcohol only have data recorded on small labels placed on the pins or in the containers and these have not been totally typed into a database. The actual type specimens have been gathered by three different hand searches of the entire collection by Cokendolpher (during 1997 and 2000), Enriquez (for her 2007 thesis), and then again with student workers cataloging further material for the SCAN Project (2012–2015): Digitization TCN: Collaborative Research: Southwest Collections of Arthropods Network (SCAN): A Model for Collections Digitization to Promote Taxonomic and Ecological Research (Cokendolpher, P.I. – NSF no. 1206951). Almost all of the type specimens found were listed in a preliminary, MS Excel spreadsheet placed online as part of the thesis by Enriquez (2007) and simply updated to the present.

Each taxon is listed by the name used in the original description. The name, where appropriate, is followed by the current taxonomic name (indicated by =) if it has changed due to replacement, synonymy, or emendation. In many cases the status is listed by the use of (basionym) or (current name).

For each account herein, names have been investigated to determine their currently accepted status; details are listed in the discussion under that taxon. It is hoped that by listing the current names and synonymy, future searches on the internet will point the researcher to the data listed in the digital copy of this publication regardless of the name searched. Additional information follows the name of the taxon, including when possible the sex, museum where it is held, and catalog number. The etymology is stated where it is known or easily deciphered from the name. Etymologies often are not listed in catalogs, but they often reveal historical snippets about collections or the names; in some cases revealing the reasons for emendations of the names when the gender is incorrect. Any parts of the etymology presented in quotation marks are taken directly from the original publications. This is followed by the details of the locality where the holotype/paratype(s) were obtained. The locality given is that of the specimens housed at TTU; if the holotype's collection locality (type locality) is different than the paratypes at TTU, the type locality is listed under the Holotype heading. Following the locality information is a listing of the stratigraphic occurrence of the type specimen and its age for the fossil taxa. That is followed by the name of the discoverer and/or collectors when known. The word "Collector" is used differently for different groups of taxa. For example, the individual who kills a bird and prepares it for storage in a museum drawer may not be aware that there are parasites on or in the specimen. In some cases, the person describing the parasite will list the "preparator" who recovers the parasite and mounts it on a microscope slide for study instead of the person who collected the host specimen. In the future it is hoped that names of both "collectors" will be recorded. Lastly, accounts include a discussion where needed or appropriate.

Format of dates, distances, and directions have been standardized. Dates are presented in sequence

from smallest to largest unit (e.g., 1 May 1965), except when both month and day were published as only numerals of 12 or below, in which case they are recorded in quotes. There does not appear to be consistency in the use of Roman numerals for days or months by all collectors, so it is of very limited use in deciphering dates. Changes in letter cases, spacing, and punctuation also have been made. Metric units are used throughout except when those differ from locations presented within quotes. Cardinal and ordinal directions are listed by letter only with no periods. All states and countries are spelled out (except for USA), even when abbreviated in the original publication. Collections are listed in the order of Country: State; County, specific locality. Where possible, names or initials of collectors or other information that is generally detailed in the discussion section also have been inserted [in brackets]. The ampersand symbol (&) has been replaced with the word "and" throughout the publication.

Abbreviations (Acronyms).—Brackets [ ] are used to enclose new or corrected data and the dagger symbol (†) indicates extinct fossil taxon. Acronyms are as follows: ASUCOB, Arizona State University Charles W. O'Brien Collection, searchable database at http://scan-bugs.org/portal/collections/harvestparams.php; AMNH, American Museum of Natural History, New York, New York, USA; AMB and AND, preface to number for living (at the time of description) lemurs—Henry Doorly Zoo Center for Conservation and Research, Omaha, Nebraska, USA; APG, Angiosperm Phylogeny Group, St. Louis, Missouri, USA; BEZ, prefix to number for living (at the time of description) lemurs—Henry Doorly Zoo Center for Conservation and Research, Omaha, Nebraska, USA; CAS, California Academy of Sciences, San Francisco, California, USA; CM, Carnegie Museum of Natural History, Pittsburg, Pennsylvania, USA; DAR, prefix to number for living (at the time of description) lemurs—Henry Doorly Zoo Center for Conservation and Research, Omaha, Nebraska, USA; EMEC, Essig Museum of Entomology Collections, Essig Museum of Entomology, University of California at Berkeley, California, USA; FAN, FIA, and HIH, prefix to number for living (at the time of description) lemurs—Henry Doorly Zoo Center for Conservation and Research, Omaha, Nebraska, USA; ICTV, International Committee on Taxonomy of Viruses; ICVCN, International Code of Virus Classification and Nomenclature; ICZN, International Commission of Zoological Nomenclature; IES, Instituto de Ecología y Sistemática, La Habana, Cuba; ITIS, Integrated Taxonomic Information System—www.itis.gov; JAR, prefix to number for living (at the time of description) lemurs—Henry Doorly Zoo Center for Conservation and Research, Omaha, Nebraska, USA; JCC one of the coauthors of this publication; KALA, prefix to number for living (at the time of description) lemurs—Henry Doorly Zoo Center for Conservation and Research, Omaha, Nebraska, USA; KIBO, prefix to number for living (at the time of description) lemurs—Henry Doorly Zoo Center for Conservation and Research, Omaha, Nebraska, USA; Km, kilometer (km) marker; KU, Natural History Museum, University of Kansas, Lawrence, Kansas, USA; KUM, Mammalogy Collection at KU; LACMNH, Los Angeles County Museum of Natural History, California, USA; LOKO, preface to number for living (at the time of description) lemurs—Henry Doorly Zoo Center for Conservation and Research, Omaha, Nebraska, USA; M, preface to number for living (at the time of description) lemurs—Henry Doorly Zoo Center for Conservation and Research, Omaha, Nebraska, USA; MAS, preface to number for living (at the time of description) lemurs—Henry Doorly Zoo Center for Conservation and Research, Omaha, Nebraska, USA; MO-MBG, Missouri Botanical Garden, University of Missouri, Columbia, Missouri, USA; MO-WREEM, Wilbur R. Enns Entomology Museum, University of Missouri, Columbia, Missouri, USA; MOTT VPL, Museum of Texas Tech Vertebrate Paleontology Locality; MoTTU, Museum of Texas Tech University, Lubbock, Texas, USA; NARA, preface to number for living (at the time of description) lemurs—Henry Doorly Zoo Center for Conservation and Research, Omaha, Nebraska, USA; NMNH and NMNHENT, National Museum of Natural History, Smithsonian Institution (= older acronym USNM, the current catalog acronym for the Invertebrate Collection is USNM and that of the Entomology Collection is NMNHENT with an 8-digit (if necessary with leading zeros) number following (searchable catalogs at: https://collections.nmnh.si.edu/search/), Washington, District of Columbia, USA; no., abbreviation for no.; NSRL, Natural Science Research Laboratory, Lubbock, Texas, USA; QCAZ, Museo de Zoología of the Pontificia Universidad Catôlica del Ecuador, Quito, Ecuador; RWH, acronym for cataloged preparations of mites

by Robert W. Husband, retired now, formerly Adrian College, Adrian, Michigan, USA; SCAN, computer database of invertebrate museum specimens (http://scan-bugs.org/portal/collections/index.php); SMU, Southern Methodist, University, Dallas, Texas, USA; TMM, Texas Memorial Museum, Austin, Texas, USA; TTC, Texas Tech College herbarium; TTCC, Texas Technological College Collection; TTU, Texas Tech University, Lubbock, Texas, USA; TTU-ATP, Museum of Texas Tech University Paleontology Division, Antarctic Plant Collection; TTU-M, Museum of Texas Tech University Mammalian Collection; TTU-O, Museum of Texas Tech University Ornithology Collection; TTU-P, Museum of Texas Tech University Paleontology Collection; TTU-MZ, Museum of Texas Tech University Medical Zoology Collection, pre-1997 catalog and acronym for collection—the catalog for Medical Zoology numbers assigned before 1997 are no longer valid, since that date previously cataloged records have been renamed as TTU-Z—the numbers are the same today with the addition of 100,000 records in front of the number, thus TTU-MZ1 = TTU-TK100001; TTU-TK, Texas Tech University Tissues and Karyotypes Collection; TTU-Z, Museum of Texas Tech University Invertebrate Zoology Collection; UMMZ, University of Michigan Museum of Zoology, Ann Arbor, Michigan, USA; USNM, National Museum Natural History (older acronym for currently valid NMNHENT), Washington, D.C., USA; VertNet, computer database where cataloged museum vertebrate specimens can be searched (http://portal.vertnet.org/search); WTMus. Pal. Col., West Texas Museum Paleontology Collection, Canyon, Texas, USA; Zara, Zara Environmental LLC, Manchaca, Texas, USA; and ZOMB, preface to number for living (at the time of description) lemurs—Henry Doorly Zoo Center for Conservation and Research, Omaha, Nebraska, USA.

COLLECTIONS OF BIOLOGICAL SPECIMENS AT TEXAS TECH UNIVERSITY

Responsibility for Data Dissemination

During the assemblage of data for this publication it became apparent that exchange of information could be improved in several ways. First, the author(s) describing the new taxa should record all catalog numbers of the type specimens, and in the case of symbiotypes, the host or associated specimen numbers and where the specimens are stored. It also is the responsibility of the journal editor and reviewers to make sure this data is included in the published manuscript. Further, those authors should send a copy of the publication to the curator that is in charge of that collection or loan, notifying them that the names are published and ideally marking the section(s) of the paper where the specimen name and data are noted (especially in larger works). Although this is part of almost all museum loan policies, it is over-looked by some. It also is a good practice to send similar notification to any loan or database official with which the author(s) have dealt. There seems to be a disconnect between getting the data published and then getting it correctly recorded and updated in the appropriate online database(s). It should not be the responsibility of data entry personnel or collection managers to scour the literature looking for taxonomic descriptions.

History and Status of the Collections

Texas Tech University is the repository for numerous biological type specimens (outlined in the abstract of this publication). The plant specimens are housed in the E. L. Reed Herbarium in the Biological Sciences Building and the animal specimens are housed in the Museum of Texas Tech University (MoTTU). The Museum's recent specimens are held in the Natural Science Research Laboratory (NSRL) and fossil specimens are housed in the Paleontology Division.

The two divisions of the Museum that archive holotype specimens house them in locked cabinets in locked, climate-controlled rooms separate from the main collections. Paratypes of invertebrates are generally very small (often just one insect on a pin, microscope slide, etc.) and delicate and take up very little storage space, so those too are housed separately from the main collection. However, certain parts of types such as frozen tissues and DNA extractions are housed with similar types of materials because of the necessity for ultracold (-80 °C or nitrogen vapor) storage. However, the type vials and boxes are labeled as such. Biological types stored in ethanol are housed in the cabinets with the other dried type specimens.

Because of the number of specimens and differences in drawers, the vertebrates are stored in a separate cabinet from the invertebrates. Containers with types stored in alcohol are sight monitored at least twice a year to ensure maintenance of sufficient fluid levels.

Although holotypes clearly are irreplaceable specimens, paratypes and other non-holotypes also are useful for settling many taxonomic and other research questions and as such they merit special efforts to maintain them for future generations.

The plant collection of Texas Tech University is part of the E. L. Reed Herbarium, which is administered by the Department of Biological Sciences. This Herbarium was established in 1925 and includes the three type specimens discussed herein. For details on the herbarium and their collections and database, see http://www.mossmatters.com/herbarium/ and http://sernecportal.org/portal/collections/misc/collprofiles.php?collid=387.

The Museum of Texas Tech University originally was established as the West Texas Museum in 1929. The Museum moved from Holden Hall into the current facilities in 1970. The Museum first received accreditation by the American Association of Museums in 1990 and has continued to maintain its accreditation. The Museum includes three divisions that house natural history specimens. Although the Anthropology Division's vertebrate collection contains no type specimens, both the Natural Science Research Laboratory and the Paleontology Division currently house types.

The NSRL originally housed collections of mammals, birds, reptiles, amphibians, fishes, and the vertebrate paleontology collection (Bradley et al. 2005). In 1996, the paleontology collection became a separate division and its collections were moved to the basement of the main building of the Museum of Texas Tech University. The mission of the NSRL is to collect, document, preserve, archive, interpret, and disseminate knowledge about the fauna of the Southwestern USA and other geographic regions related by natural history, geography, ecology, climate, human welfare, and needs of the state of Texas. The NSRL's collections and research augment the Museum of Texas Tech University and the diverse interests of Texas Tech University in its role in public and professional education in local, state, national, and international communities. Through classroom instruction, internship, practicums, and field work, the NSRL provides both theoretical and practical education in the biological sciences. It is dedicated to acting as a responsible component of the Museum of Texas Tech University and the community of museums.

The NSRL was established with the purpose of preserving samples of the Earth's biodiversity for research, education, and outreach. The mammal collection originated in the Department of Biological Sciences in 1962 by Robert L. Packard. The collection was later transferred to the Museum of Texas Tech. The concept of the NSRL was developed in the early 1970s and the NSRL wing of the Museum was completed in 1972 to house the vertebrate natural history collections with adequate space to allow for growth. The NSRL collections at that time included fishes, amphibians, reptiles, birds, mammals, and the paleontology collection.

In 2001, the NSRL transferred its fish, amphibian, and reptile collections to the Texas Memorial Museum (TMM—later becoming the Biodiversity Center, University of Texas at Austin) in exchange for their bird and mammal collections. As far as can be determined, the only type specimen in the outgoing collections was a paratype of a turtle. A more detailed history of the recent mammalian collections at MoTTU can be found in the publication by Bradley et al. (2005).

The Bird Collection of the NSRL consists of skins, skeletal material, alcohol-preserved bodies, nests, eggs, and taxidermy mounts. The Bird Collection includes members from every extant avian Order but focuses primarily on the birds of Texas. Other specimens are from most USA states and from 13 other countries and the Antarctica.

The NSRL collection also includes frozen tissues in the Genetic Resources Collection, which was named as such in 1998 and renamed the Robert J. Baker Genetic Resources Collection in 2019. Earlier (since the NSRL establishment in the 1970s), the assemblage of samples was simply called the Tissue Collection (officially) and informally called the "Tissue Room" by those working in that collection.

The Genetic Resources Collection is a biological archive currently containing greater than 425,000 genetic samples. These samples are from more than 100,000 individuals representing approximately 1,100 species of mammals (predominantly) and other taxa, including limited collections from birds, reptiles, amphibians, fish, and invertebrates. The majority of the samples are frozen tissues, but the collection also contains samples in ethanol, lysis buffer, and extracted DNA.

Since its establishment in the 1970s, the Tissue Collection/GRC had relied upon traditional -80 °C mechanical freezers for storage of frozen samples. However, these freezers have a short lifespan and are subject to frequent malfunction or complete failure, as well as to power outages, thus putting samples at risk for degradation or total loss. More importantly, current and developing scientific disciplines require that tissue samples be preserved at temperatures colder than -132 °C to preserve the entire spectrum of genomic data they contain (e.g., RNA, viruses, bacteria). Thus, from 2016 to 2019, the collection of frozen tissues of the GRC were transferred from mechanical -80 °C freezers to vapor-phase liquid nitrogen freezers to ensure the collection's long-term preservation.

History of the Invertebrate Zoology Collection

The current Invertebrate Zoology Collection was formed from the union of the former Entomology Collection, Medical Zoology Collection, and Invertebrate Zoology Collection. These early collections were housed at Texas Tech University [known as Texas Technological College until 1969] and the TTU University Health Sciences Center (TTUHSC), respectively. While most of the early Entomology and Medical Zoology collections remain at TTU, the early Invertebrate Zoology collections (free-living arachnids and non-arthropod collections) are gone (see below under "The former Invertebrate Collection"). Because the name of the latter is the most inclusive, it was selected as the current name for this collection.

The former Entomology Collection.—The Entomology Collection of Texas Tech University originated and was first administered by the former Agricultural Sciences Department. Later, this unit became the Department of Entomology in the College of Agricultural Sciences (renamed the College of Agricultural Sciences and Natural Resources in 1993). In 1987, the Department of Entomology was absorbed into the newly formed Department of Agronomy, Horticulture, and Entomology, which was renamed the Department of Plant and Soil Science in 1993. The Entomology Collection, which was housed in the Agricultural Sciences Building, was begun by one of the earlier faculty members but the date is uncertain. Judging from the number and age of the older specimens' labels in the collection now, it appears that the collection was begun in the late 1950s and early 1960s. Oscar F. Francke (pers. comm. to JCC 9 July 2019) believes that Donald Ashdown and Charles Ward probably established the collection sometime during the 1960s. It is clear from the introduction to the 1977 book *Annotated Checklist of New World Insects Associated with* Prosopis *(Mesquite)* (Ward et al. 1977) that Ward and his colleagues felt the collection was officially accepted by that time: "Abbreviated names of museum collections listed as sources of data are as follows: TAMU Texas A&M University, UAT University of Arizona at Tucson, TTU Texas Tech University, UCR University of California at Riverside."

Donald Ashdown (and T. Ashdown, his spouse?) collected many insects that are now cataloged in the collection from 1955 to 1976. He was a Professor of Entomology at Texas Tech working primarily with pest management in West Texas and the Texas Tech entomology teaching curriculum. One of his students, Ellis W. Huddleston, later of the Agricultural Sciences Department (worked at TTU 1959–1974), was one of the first faculty to work in entomology and collected about 350 specimens that currently are cataloged in the TTU-Z collection. There also are quite a few specimens collected by professors Ward, Tenorio, and Bennett in the 1960s–1970s. Unfortunately, no one recorded the full history of this collection. Charles R. Ward has about 4,500 insects in the collection now. Dwight Bennett and K. Bennett (spouse?) have about 620 insects in the collection, and J. A. Tenorio and J. M. Tenorio (spouse?) have about 1,400 insects pinned and cataloged in the collection.

There are a considerable number of insects that are cataloged in the collection from Hunt, Texas, from

as early as 1938. These, along with those from 1948 and later from Lubbock, were all collected by Russell W. Strandtmann. He was a Texas Tech biology professor from 1948 to 1976, working in the biological field of parasitology, and he was especially well known as an acarologist. It appears that his collections were not transferred from the Biological Sciences Department to the Invertebrate Zoology Collection until much later, when Marilyn A. Houck (also an acarologist and Curator of the Invertebrate Zoology Collection at the Museum from 1996 to 2003) was overseeing the collection.

From the names recorded as collectors of samples in the Texas Tech University collection, several can be recognized as university personnel. These indicate that the collection began back in the 1950s. From what can be gathered now, it appears that the older metal cabinets and glass-topped wooden drawers for the collection were not built until later in the 1970s. The earlier collections were in cigar boxes, Schmitt boxes, or simply stuck on cork and maybe only kept for reference or teaching.

Charles "Charlie" W. O'Brien was an Assistant Professor (1970–1972) and even later (in 1977) he was still listed in a publication as being at TTU (Ward et al. 1977). Hundreds of hand-made, glass-topped, CAS style wooden insect drawers (many still in service today), were made by Lois and Charlie O'Brien. There are numerous CAS and Cornell drawers now in the collection. Based on the age of the majority of cabinets, the Steel Fixture Cornell cabinets are the oldest and the newer cabinets are one of two different metal cabinet types from BioQuip with CAS and Cornell drawers and front doors that can be removed. In about 2000, Cokendolpher began switching to Cornell Style cabinets, drawers, and unit trays when possible. This style of storage wastes some room (drawers are taller), but CAS drawers will fit in a Cornell cabinet but not the other way around.

In an article by Charlie W. O'Brien (2006), he recorded "Lois [Charlie's wife] and I had left Purdue to take a two-month position in mosquito taxonomy for the State of Ohio in Columbus and then moved on to Texas Tech University for two and a half years before accepting a position at Florida A & M University (FAMU). We had kept in touch with Ross [Arnett] by mail and at annual Entomological Society of America meetings, so he knew that my grant-supported position at Texas Tech was ending." Presumably the grant supporting his efforts was that of the funded research projects on Noxious Brush and Weed Control (1970s). Much of his efforts at TTU were devoted to collecting and curating insects from the New World associated with mesquite (*Prosopis* sp.) (Ward et al. 1977). Charles R. Ward was an Assistant Professor (1967 up to the middle of the 1970s) in Entomology and closely tied to the collection. There were several people who worked as curators for the Entomology Collection when it was in the College of Agricultural Sciences. The exact dates of service as curators were not recorded in any document and there is overlap in the dates that they were at TTU.

Foster (1976) listed specimens in his study from lending institutions as "TTCC-Texas Tech University, Lubbock (C. W. O'Brien)." It is clear at that time that Foster recognized O'Brien as the curator. The original source material for that publication was not examined to see if the text was the same as in his dissertation (Foster 1973) or for any other details on dates. Clearly Charlie O'Brien was credited as the curator by at least 1976; although his official time working at the university was only 1970–1972. David E. Foster was at TTU 1969–1977 and based on Foster (1976) it is possible that he curated the collection only in 1977; or there was overlap with Foster continuing working on the Insects of The Guadalupe Mountains National Park (Genoways and Baker 1979). One of the coauthors (JCC) , when arriving at TTU in 1978, remembers a green metal cabinet of insects from the Guadalupe Mountains that no one except Dave Foster was supposed to open or examine. Officially recognized curators of the collection were Charlie O'Brien (1970–1972 or as late as 1976), Dave Foster (1977 and ?), Oscar F. Francke (1978–1986), Robert W. Sites (at TTU 1986–1991), Leland Chandler (at TTU 1986–1991), and Harlan Thorvilson (curator 1991–1996). The Entomology Collection was moved to the basement (unnumbered room, later named room D19) of MoTTU in the late 1970s. While Oscar F. Francke was the curator of the Entomology Collection in 1978–1979 at the museum and a faculty member in Entomology and Biology departments, the collection was moved out of the Museum back to the basement

of the northwestern corner of the Agricultural Sciences Building (leaving the oversight and support of the MoTTU). Thereafter, the collection was moved again in the basement to the southwestern corner of the same building. Francke, Sites, Nichols, Chandler, and Thorvilson were the caretakers of the collection while it resided in the Agricultural Sciences Building. Although not officially recognized as a curator, Becky J. Nichols (at TTU 1986–1989), was a Technician with some duties in curation (pers. comm. to JCC, 1 July 2019). There are official loan forms on file here that were signed by Nichols, a duty usually confined to curators at that time. In 1996, the Entomology Collection was brought back to the MoTTU for a second time and placed on the second floor of the NSRL at the eastern corner of the bird and mammal collections room (Monk 1996). Since that time the collection has been moved out of the large open space on the second floor to closed rooms (207, 211, 213) and a closed room for specimens in formaldehyde on the first floor.

The former Medical Zoology Collection.—The Medical Zoology Collection originated in 1973 and was curated by Danny B. Pence. The collection first was housed in the basement of the MoTTU, next to the Entomology Collection, and then was moved in 1974 to a single room in the extreme northwestern corner of the NSRL. It was subsequently moved in 1978 to a room in the southeastern corner of the NSRL where it remained until 1981. Following the MoTTU's 1979 financial crisis and the subsequent reorganization of research collections in the NSRL, the Medical Zoology Collection was moved to the Laboratory of Danny B. Pence in the Department of Pathology of the TTU Health Science Center. The Medical Zoology Collection includes about 75,000 slide-mounted and fluid-preserved parasite specimens. Although this collection was always part of the MoTTU, it was not officially accessioned until 2003 when it was returned from Pence's laboratory at TTUHSC to the NSRL under the purview of then Curator of Invertebrates, Marilyn A. Houck. The collection currently is housed in the NSRL in three areas: the slides are stored with other invertebrate slides; specimens in alcohol solutions are maintained with similarly preserved samples; and the formalin-preserved specimens are kept in a small, isolated room because of the human health hazard associated with formaldehyde.

The former Invertebrate Collection.—The Invertebrate Collection originated in and was first housed in the Department of Biological Sciences in the College of Arts and Sciences. Robert W. Mitchell was the first and only curator. In the early 1970s, the Invertebrate Collection was moved to the basement in the old classroom 5 of the MoTTU, later changed into the library. The Invertebrate Collection was accessioned in 1973 and consisted at that time of approximately 140 vials of miscellaneous arthropods, 800 containers of miscellaneous arachnids, and 39 slide-mounted paratypes. James R. Reddell, a student in Biological Sciences, was the first Curatorial Assistant for that collection. Reddell cataloged the entire Invertebrate Collection prior to his leaving the MoTTU in 1977. In 1978, Cokendolpher began to work as the Curatorial Assistant in the Invertebrate Collection. In 1979, the state of Texas suffered budget cuts and TTU and MoTTU were not exempt. The Governor of Texas, Mark W. White, vetoed the line-item budget of the MoTTU. Because funds and facilities were no longer available to maintain these collections in MoTTU, they were relocated: the Invertebrate Collection was moved to the 4th floor of the Department of Biological Sciences building in the College of Arts and Sciences, where Francke and Mitchell (both faculty members) had offices and laboratories, and the collection subsequently was disassembled. In 1979, some of the specimens were given to other museums (worldwide) and informally distributed between Cokendolpher and Francke. Cokendolpher retained some of the harvestmen and Francke kept some of the scorpions for their studies. Later these scorpions went to the American Museum of Natural History (AMNH) when Francke retired and moved to Mexico in 1986 to take a job in the private sector. Some of the Opiliones retained by Cokendolpher were returned to the Museum collection in 2007, but most went to the TMM and the AMNH. In an agreement between Francke and Mitchell, the remainder of the Invertebrate Collection was transferred as a gift to the TMM. Additionally, all invertebrate holotypes formerly at TTU were transferred to the AMNH and the TMM. A few specimens had dried out and were damaged (primarily some millipedes). Cokendolpher (1989) published a notice in the Insect Collections News reporting the transfer of the collection from TTU to TMM. Specimens transferred included type specimens of Opiliones, Schizomida, Scorpiones, Solifugae, decapod crustaceans, and planarians.

Invertebrate Zoology Collection since 1997.—In 1996, the Entomology Collection consisted of 465,000 specimens, including a large collection of approximately 300,000 ants from the southwestern USA, and 1,000 microscope slide preparations of insect and other arthropod chromosomes. Dick Auld and Harlan Thorvilson, from the Department of Plant and Soil Science, made the collection available to the NSRL. Later, in 1997, the Entomology Collection was moved to rooms 205 and 207 of the NSRL and accessioned. Part of the collection remained in the Entomology Department and was combined with the already existing Entomology Teaching Collection. In the fall of 1996, Robert J. Baker, director of the NSRL, appointed Marilyn A. Houck, a faculty member in the Department of Biological Sciences, as Curator of Invertebrates. She oversaw the relocation of the Entomology Collection to the MoTTU in September 1996. She was the curator until her retirement from TTU in August 2003. Although the position of Curator of Invertebrates has been vacant since 2003, during 2002–2003, Cokendolpher worked full-time as the acting invertebrate collection manager (titled Research Associate). He continued to oversee the Invertebrate Zoology Collection as a non-salaried member of the NSRL from 2003 until spring 2007, when he was hired as a part-time Research Scientist and Assistant Curator. During 2006–2007, Cokendolpher oversaw the expansion of the collection to NSRL rooms 209 and 211. In 2007, Cokendolpher's position as Research Scientist became full-time and his title was Assistant Curator until his retirement at the end of August 2016. The collection was closed for loans at the end of 2016 and was re-opened in November 2018 when Jennifer Girón was named Acting Collections Manager of the Invertebrate Zoology Collection.

The current Invertebrate Zoology Collection contains significant portions of the Entomology Collection, obtained from funded research projects such as the Noxious Brush and Weed Control Research at Texas Tech University (1970s) and the Ants of Western Texas Survey (1978–1981). Collections from some former curators also are held in the current Invertebrate Zoology Collection at the MoTTU. In addition, in 2001–2002 the U. S. Fish and Wildlife Service (USFWS) deposited a collection at the MoTTU to be held-in-trust. This collection is comprised of about 40,000 confiscated specimens (illegally collected and/or illegally imported into the USA in hopes of sales to insect collectors). In 2003, a collection of approximately 1,200 slide-mounted mite specimens from Mexico and Central America was transferred from the Department of Biological Sciences to the MoTTU. Additionally, the Invertebrate Zoology Collection was significantly augmented thanks to Marilyn A. Houck who donated much of her field collections to the MoTTU.

The collection currently consists of about 1 million pinned insects and about 75,000 individuals from Medical Zoology Collection. Miscellaneous groups of invertebrates (mostly arthropods) in alcohol make up the remainder of the samples. In all there are an estimated 4.5 million specimens, more than half of which are retained as bulk samples of aquatic samples (mostly from playa lakes of Texas and waterways near the TTU Junction Field Station), UV light trap samples, and ground/soil (Berlese funnel and pitfall trap) samples. The latter two groups are especially numerous from Texas sands.

History of the Paleontology Collection

The Paleontology Collection of the Museum was initiated sometime prior to 1937. The earliest documented donation of a fossil in the collection of the Museum, an Oligocene lagomorph mandible, was collected in 1927 by Ann Doughty and later donated to the Museum through the assistance of E. C. Case from the University of Michigan. The next earliest documented specimen is a partial skull of a phytosaur collected by John Clark in 1931.

Prior to the growth and development at the Museum in the 1970s, the Paleontology Collection was housed in the original Museum location in Holden Hall. It was primarily under the control of the Department of Geology (Geosciences), but was moved from Holden Hall to the new MoTTU in 1970. The Paleontology Collection was moved into the new NSRL wing in 1972. The Paleontology Division of the Museum of Texas Tech officially was established in 1996, separate from the NSRL, and was relocated to the basement of the main Museum building. The mission of the Paleontology Division is to collect, preserve, interpret, and disseminate information concerning the paleontology of the southwestern USA and other areas related by geology, stratigraphy, or natural history.

The Paleontology Division is an active research division of the Museum and is a source of posters, presentations, and publications relating the results of research performed on the Museum's collections by the staff, students, research associates, and visiting researchers. The primary focus of the Paleontology Division is the vertebrate paleontology of the Llano Estacado and Gypsum Plains physiographic regions (Raisz 1957) of West Texas. This area has vertebrate fossils from a variety of localities and stratigraphic horizons. The early holdings in the Museum's Paleontology Collection focused on vertebrate paleontology and were collected primarily by Grayson Meade, Wann Langston, Jr., John Clark, and Paul Montgomery during the late 1930s and early 1940s. The focus of the collection shifted from Neogene mammals to Triassic vertebrates in 1978 with the arrival of Sankar Chatterjee as the Paleontology Curator.

The Museum's Paleontology Collection includes specimens from throughout the Phanerozoic Eon. The Triassic vertebrate fossil collection is the most current. In 2008, the number of cataloged Triassic specimens in the collection more than doubled and the Triassic collection now contains more than 7,000 specimens. Several new taxa were collected during the first part of the 21st century and are in the process of being described. The Permian and Cretaceous type specimens in the collection are from Antarctica. Chatterjee and his field crews made the largest acquisition of Cretaceous vertebrates amd Permian and Triassic plants in the Museum's collection during expeditions to Antarctica in the early and mid-1980s. The Antarctic vertebrate fossil collection contains four holotypes.

There is a small collection of other Cretaceous vertebrate fossils, including dinosaur fossils from the Big Bend region of Texas and two enigmatic mosasaur vertebrae from the Llano Estacado (Mueller et al. 2008). The Cenozoic vertebrate collection is divided between two divisions of the Museum. The Anthropology Division has a collection of Pliocene–Holocene vertebrate specimens from the Llano Estacado and Gypsum Plains. The Paleontology Division's Cenozoic collection contains more than 2,500 specimens from the central portion of the United States, ranging from the Trans-Pecos of Texas northward to South Dakota and Wyoming. The largest and most significant portion of this collection consists of Blancan fossils from the Llano Estacado and Gypsum Plains. The Paleontology Division's Cenozoic collection contains one holotype.

RESULTS AND DISCUSSION

It is important to remember that catalog numbers are assigned to individuals, and individuals may include multiple samples or parts. For example, a standard mammal voucher specimen might be prepared as a dried skin, a skull, and/or a full skeleton, or as a complete specimen (whole body) in alcohol. Likewise, tissue samples are listed under a single tracking number (TK) unique to each individual, but typically there are multiple vials of tissues (e.g., blood, kidney, liver, muscle, etc.). Extracted DNA and dried samples such as blood (nobuto strips) or karyotypes also are stored under a single TK number. Listing all the parts that are stored for each individual is beyond the scope of this publication.

According to Heath Garner (Curator of Collections, pers. comm. to JCC, 5 December 2018), the TTU NSRL loan policy (dating back to at least 2000) is never to loan the last of a tissue sample, as that is reserved for TTU-only use. Garner stated that it has not come to that end since the policy was enacted (that is, TTU using the last of the sample). Pre-2000, some tissue samples were used in their entirety. In one case, the sample from a holotype (*Geomys personatus davisi* Williams and Genoways, 1981) was depleted. Extracted DNA and empty DNA/tissue tubes are saved by the museum. Remnants of many electrophoretic samples in the collection also are saved, and with proper care and a well-trained person sequencing them, they still yield good, basic DNA about 30% of the time.

Excluded and mislabeled type specimens.—There are two specimens labeled holotype (male) and paratype (female) of an *Apiomerus* new species (Insecta, Hemiptera, Reduviidae) with a manuscript name by S. L. Sizerlip 1976 (name not repeated here for no-

menclatural reasons). Both specimens are now treated in the literature as *Apiomerus flaviventris* Herrich-Schaetfer (Berniker et al. 2011). The collection data are: MEXICO: Michoacán; Hwy. 15 NW Morelia, 14 July 1969, [C. R.] Ward, [J.] Tenorio] and [D.] Bennett. Both specimens are in the TTU-Z collection.

Bergan et al. (1994) stated: "The unpublished doctoral dissertation of Mollhagen (1976) provided an extensive taxonomic revision of males of the genus *Tetrameres* [Nematoda] with redescriptions of subgenera, many species redescriptions and recombinations, and some new species descriptions. However, this does not constitute a valid taxonomic publication in accordance with Articles 8 and 9 of the rules of the International Code of Zoological Nomenclature (1985 [updated 1999]). Therefore, the names and information contained therein cannot be applied as published information. Fortunately, all the paratype material for the above redesciptions is in the collection of one of the present authors (DBP [= Danny B. Pence]) and remains available for further study."

There are two vials labeled as "*Capillaria forresteri* paratypes" in the TTU-Z collection. This species is now known as *Aonchotheca forresteri* (Kinsella and Pence, 1987) Pisanu and Bain 1999: Trichuridae, Nematoda. These are not type specimens because they were not designated as such in the original description. Both samples are clearly part of the original collections of this species and possible measured for the size ranges presented in the original description, but not herein considered types. The specimens were collected by J. M Kinsella on Paynes Prairie, Alachua County, Florida (type locality) on 12 April [6 specimens, Kinsella sample number 71-130, TTU-Z57380] and 15 April 1971 [15 specimens, Kinsella sample number 71-135, TTU-Z57384] from the stomachs of rice rats *Oryzormys palustris*. According to the database of the the U.S. National Parasite Collection (now housed at the NMNH), https://collections.nmnh.si.edu/search/iz/, male holotype 73422, female allotype 73423, and male and female paratypes 73424 were collected by J. M. Kinsella on 13 April 1971.

The specimen TTU-Z102336 is labeled as a paratype male of *Schoutedenocoptes americanus* Fain and Hyland, 1967 (Arachnida, Acarina [now = order Sarcoptiformes], Turbinoptidae). This is in error; it is not a paratype because the locality and host (USA: Louisiana; St. Tammany Parish, Mandeville in *Coccyzus americanus*) is described as a "New host record" by Pence (1972d) and the date of collection on the microscope slide is given as 6 June 1970 by D. B. Pence, which is three years after the mite species was described.

Symbiotypes.—The term symbiotype is a relatively new designation (Frey et al. 1992): "The accurate identification of a host organism is an important component in the taxonomic recognition of a new species of parasite. Current identification, curatorial management, and safekeeping of the host specimen from which a parasite type specimen was collected are also desirable. It is recommended that the host from which the type of a new parasite species is described should be designated as a symbiotype." It is also hoped that future curatorial staff at TTU will record and make public any host data for newly described parasites or symbiotes, whether they be plant, animal, or otherwise. Where regulations and morality allow, it also is suggested that hosts be preserved and labeled as such for newly named viruses and diseases.

SYMBIOTYPES IN THE VERTEBRATE AND INVERTEBRATE COLLECTIONS OF TEXAS TECH UNIVERSITY

KINGDOM ANIMALIA Linnaeus, 1758
CLASS INSECTA Linnaeus, 1758
ORDER COLEOPTERA Linnaeus, 1758
Family Carabidae Latreille, 1802
***Stenolophus* spp.**

Hosts and symbiotypes.—All parasitic specimens of *Eutarsopolipus brevichelus* Husband and Husband, 2003 were collected from under the elytra of *Stenolophus* spp. (see symbiotypes of *Stenolophus* species, below).

Localities.—[A] USA: Texas; Hemphill County, 12.9 km NE Canadian; C. W. O'Brien, 23 June [incorrectly reported as 13 June and 23 July] 1970. [B] USA: Texas; Garza County, Justiceburg [reported as Justiceberg; also misspelled on specimen label]; [C. R.] Ward and [E.W.] Huddleston, 13 October 1968. [C] U.S.A.: Texas; Lubbock County, Texas A&M University Experiment Station, 8 October 1968, D. Arnold. [D] U.S.A.: Texas; Hale County, Abernathy, 25 August 1968, Owens, White and Rogers.

***Stenolophus comma* (Fabricius, 1775)**

Symbiotype.—[A] TTU-Z012131. *Parasites*: TTU-Z012684, RWH03022003-2, 1 egg with larval female inside; not at TTU-Z (slide retained by RWH) RWH03022003-1, 1 larval female from egg; not at TTU-Z (microscope slide retained by RWH) RWH03022003-1, 1 male.

***Stenolophus lecontei* (Chaudoir, 1868)**

Symbiotypes.—[A] TTU-Z012669. *Parasites*: TTU-Z015903, RWH5032003-2, 1 female, 1 male; TTU-Z015904, RWH5032003-6, 1 larval female; TTU-Z015905, RWH5032003-7, many others in ethanol. [A] TTU-Z012670. *Parasite*: TTU-Z015900, RWH5032003-8, 1 larval female. [B] TTU-Z012627. *Parasites*: TTU-Z015898, RWH02802203-3, 1 larval female, vial with many larval females in ethanol; TTU-Z015899, RWH28022003-4, 1 larval female; TTU-Z015901, RWH28022003-6, 1 male; TTU-Z015902, RWH28022003-8, 1 male, 1 female, 1 larval female, 7 eggs. [C] TTU-Z012622. *Parasite*: 1 larval female, vial with many larval female paratypes in ethanol, not deposited at TTU-Z. [D] TTU-Z012660. *Parasite*: 1 larval female paratype, not deposited at TTU-Z.

Parasite.—CLASS ARACHNIDA Lamarck, 1801; ORDER TROMBIDIFORMES Reuter, 1909; Family Podapolipidae Ewing, 1922; Genus *Eutarsopolipus* Berlese, 1913; *Eutarsopolipus brevichelus* Husband and Husband, 2003. The Holotype at MOWREEM, female, (type locality, USA: Missouri; Boone County, Ashland). All TTU-Z specimens (listed in original description publication) are paratypes.

Discussion.—For further details on the parasitic mite species type specimens, see that species name in the "Catalog of Type Specimens."

CLASS AVES LINNAEUS, 1758
ORDER STRIGIFORMES Wagler, 1830
Family Strigidae Leach, 1820
***Athene cunicularia hypugaea* (Bonaparte, 1825)**

Host/Symbiotype.—*Athene cunicularia hypugaea* (= *Speotyto cunicularia hypugaea*); TTU-O41 (stuffed skin), female. USA: Texas; Lubbock County, prairie dog town southwest of Buffalo Lakes. Collected R. W. Strandtmann, 30 December 1950.

Parasite.—CLASS ARACHNIDA Lamarck, 1801; ORDER MESOSTIGMATA Canestrini, 1891; Family Rhinonyssidae Vitzthum, 1935, *Rhinoecius bisetosus* Strandtmann, 1952. The mite holotype female and several paratypes, including the male and nymph are in the NMNHENT (formerly USNM). The type host locality was in the nasal passages.

CLASS MAMMALIA Linnaeus, 1758
ORDER RODENTIA Bowdich, 1821
Family Cricetidae Fischer, 1817
***Neotoma albigula* Hartley, 1894**
Tonto Creek virus

Host/Symbiotype.—*Neotoma albigula*, TTU-M97148 (skeleton, skin, skull), TTU-TK93637 (tissue), male. USA: Arizona: Gila County, White Cow Mine. Trapped C. Fulhorst et al., prepped. A. L. Vestal, 7 November 2001. TTU-M88387 (skeleton, skin, skull), TTU-TK113981 (tissue), male. USA: Arizona: Gila County, Cherry Creek. Trapped by C. Fulhorst et al., prepped by S. Solari, 6 January 2002.

Virus.—Phylum Negarnaviricota, Class Ellioviricetes, Order Bunyavirales, Arenaviridae: Family Arenaviridae, Genus *Mammarenavirus*, accepted species *Whitewater Arroyo mammarenavirus* [proposed name Tonto Creek virus (TTCV), Milazzo, Cajimat, Haynie, Abbott, Bradley, and Fulhorst, 2008].

Discussion.—The collection from Cherry Creek was reported and mapped as being in Gila County by

Milazzo et al. (2008). The same collection is reported as Yavapai County online in the NSRL database and VertNet. The physical data sheet (Fulhorst field TK sheet stored at TTU) also listed Yavapai County. It is assumed that the collection county was corrected when mapping the localities and the digital data and TK sheets were not corrected.

The proposed species (Tonto Creek virus, TTCV) is not significantly different from *Whitewater Arroyo mammarenavirus* to be recognized as an accepted species by the ICVCN [species demarcation criterion is specified to be divergence between species of at least 12% in the nucleoprotein amino acid sequence (King et al. 2012)]. More recently, Radoshitzky et al. (2015) stated: "Due to the recognition of the widely expanding diversity of arenaviruses, we base arenavirus classification on objective criteria based on coding-complete genomic segment sequences … Based on consensus voting of ICTV [International Committee on Taxonomy of Viruses] Arenaviridae Study Group members, arenaviruses are now classifiable if: 1) coding-complete genomic sequences are available for both S and L segments even in the absence of a culturable isolate; or 2) a coding-complete genomic sequence is available for the S segment together with a culturable isolate. Based on these criteria, all currently classified arenaviruses … should remain classified" including "Middle Pease River virus … Tonto Creek virus, … Ocozocoautla de Espinosa virus … Real de Catorce virus, and the unnamed North American arenaviruses should be considered tentative members of the family until more data become available." The current classification follows Maes et al. (2018).

Big Brushy Tank virus

Host/Symbiotype.—*Neotoma albigula*, TTU-M99846 (skeleton, skin, skull), TTU-TK114533 (tissue), male. USA: Arizona: Graham County, Brushy Tank. Trapped C. Fulhorst et al., prepped S. Solari, 13 February 2002. TTU-M99895 (skeleton, skin, skull), TTU-TK114581 (tissue), female. USA: Arizona, Graham County, Hackberry Creek, Trapped C. Fulhorst et al., prepped S. Solari, 15 February 2002.

Virus.—Phylum Negarnaviricota, Class Ellioviricetes, Order Bunyavirales, Arenaviridae: Family Arenaviridae, Genus *Mammarenavirus*, accepted species *Whitewater Arroyo mammarenavirus* [proposed name Big Brushy Tank virus (BBTV), Milazzo, Cajimat, Haynie, Abbott, Bradley, and Fulhorst (2008)].

Discussion.—The collection sites for both localities were reported and mapped as being in Graham County by Milazzo et al. (2008). The same collection is reported as Gila County online at the NSRL database and VertNet. The physical data sheets (Fulhorst field TK sheet stored at TTU) also listed Gila. It is assumed that the collections county was corrected when mapping the localities and that the digital data and TK sheets were not corrected.

The proposed species (Big Brushy Tank virus, TTCV) is not significantly different from *Whitewater Arroyo mammarenavirus* to be recognized as an accepted species by the International Code of Classification and Nomenclature of Viruses [species demarcation criterion is specified to be divergence between species of at least 12% in the nucleoprotein amino acid sequence (King et al. 2012)]. The current classification follows Maes et al. (2018).

***Neotoma leucodon* Merriam, 1894**
Real de Catorce virus

Host/Symbiotype.—*Neotoma leucodon*, TTU-M109269 (skeleton, skin, skull), TTU-TK133448 (tissue), male. MEXICO, San Luis Potosí: 22.8 km N Real de Catorce. Trapped R. D. Bradley et al., prepped J. D. Hanson, 5 August 2005.

Virus.—Phylum Negarnaviricota, Class Ellioviricetes, Order Bunyavirales, Family Arenaviridae, Genus *Mammarenavirus*, species ? [proposed name Real de Catorce virus (RDCV), Inizan, Cajimat, Milazzo, Barragán-Gomez, Bradley, and Fulhorst, 2010].

Discussion.—This species was proposed by Inizan et al. (2010). Zapata and Salvato (2013) stated "With non-isolated viruses, it is impossible to study serological and morphological parameters to give an accurate characterization. Although, they cannot be classified as new Arenavirus species until infectious isolates become available … it is important to capture and record their characteristics because they shed

light on the evolution of the arenaviruses" "Real de Catorce [virus] (RDCV): … Unknown pathogenicity for humans, Mexico". See also under discussion of the Tonto Creek virus. The current classification follows Radoshitzky et al. (2015).

***Neotoma mexicana* Baird, 1855**
Skinner Tank virus

Host/Symbiotype.—*Neotoma mexicana*, TTU-M100791 (skin, skull, skeleton), TTU-TK119202 (tissue), female. USA: Arizona: Coconino County, Skinner Tank. Trapped C. Fulhorst et al., prepped B. D. Baxter, 9 August 2002.

Virus.—Phylum Negarnaviricota, Class Ellioviricetes, Order Bunyavirales, Arenaviridae: Family Arenaviridae, Genus *Mammarenavirus*, accepted species *Whitewater Arroyo mammarenavirus* [proposed name Skinner Tank virus (SKTV), Cajimat, Milazzo, Borchert, Abbott, Bradley, and Fulhorst, 2008].

Discussion.—The proposed species (Skinner Tank virus, SKTV) by Cajimat et al. (2008) is not significantly different from *Whitewater Arroyo mammarenavirus* to be recognized as an accepted species by the ICVCN [species demarcation criterion is specified to be divergence between species of at least 12% in the nucleoprotein amino acid sequence (King et al. 2012)]. The current classification follows Maes et al. (2018).

***Neotoma micropus* Baird, 1855**
Catarina virus

Host/Symbiotype.—*Neotoma micropus*, TTU-M80915 (skeleton, skin, skull), TTU-TK84703 (tissue), female. USA: Texas: Dimmitt County, Chaparral Wildlife Management Area (ChapWMA-18) [approximately 18.7 km east of the town of Catarina]. Trapped R. D. Bradley et al., prepped R. A. Van Den Bussche; 19 July 1999. TTU-M81029 (skeleton, skin, skull), TTU-TK84816 (tissue), male. USA: Texas: La Salle County, Chaparral Wildlife Management Area (ChapWMA-26) [approximately 18.7 km east of the town of Catarina]. Trapped by R. D. Bradley et al., prepped by L. A. Mitchell, 20 July 1999.

Virus.—Phylum Negarnaviricota, Class Ellioviricetes, Order Bunyavirales, Arenaviridae: Family Arenaviridae, Genus *Mammarenavirus*, accepted species *Whitewater Arroyo mammarenavirus* [proposed name Catarina virus (CTNV), Cajimat, Milazzo, and Fulhorst, 2007].

Discussion.—The proposed species (Catarina virus, CTNV) is not significantly different from *Whitewater Arroyo mammarenavirus* to be recognized as an accepted species by the ICVCN [species demarcation criterion is specified to be divergence between species of at least 12% in the nucleoprotein amino acid sequence (King et al. 2012)]. Preliminary studies with this virus were reported by Fulhorst et al. (2002) and formal description by Cajimat et al. (2007). The current classification follows Maes et al. (2018).

Middle Pease River virus

Host/Symbiotype.—*Neotoma micropus*, TTU-TK137081 (tissue), TTU-M119505 (skeleton, skin, skull), male. USA: Texas, Motley County, 1.6 km S Flomot. Trapped 7 October 2006, prepped 30 March 2007. TTU-TK147378 (tissue), TTU-M115424 (skeleton, skull, skin), sex undetermined. USA: Texas, Dickens County, R. J. Baker's Ranch, 1.6 km N Patton Springs. Trapped by J. D. Hanson et al., prepped by M. S. Corley, 28 September 2008.

Virus.—Phylum Negarnaviricota, Class Ellioviricetes, Order Bunyavirales, Family Arenaviridae, Genus *Mammarenavirus*, species ? [proposed name Middle Pease River virus (MPRV), Cajimat, Milazzoa, Mauldin, Bradley, and Fulhorst, 2013].

Discussion.—The proposed species is not significantly different from other *Mammarenavirus* to be recognized as an accepted species by the ICVCN [species demarcation criterion is specified to be divergence between species of at least 12% in the nucleoprotein amino acid sequence (King et al. 2012)]. Along with the description of the virus in the publication by Cajimat et al. (2013) it was noted: "The most recent report of the International Committee on Taxonomy of Viruses (Salvato et al. 2013) indicated that strains of different species in the Arenaviridae should exhibit at least a 12.0% difference in pairwise comparisons of complete N protein sequences … authors of this study suggest that a revision of the criteria for species demarcation within the Arenaviridae is required … should consider

differences in ecology, crossneutralization tests, N protein sequences, GPC sequences, and other phenetic characteristics in the context of phylogenetic relationships estimated from complete GPC gene sequences and complete N protein gene sequences." See also under discussion of the Tonto Creek virus.

***Oryzomys couesi* (Alston, 1877)**
Catacamas virus

Host/Symbiotype.—*Oryzomys couesi*, TTU-M84697 (skeleton, skin, skull), TTU-TK102040 (tissue), male. Honduras: Olancho: 4 km E Catacamas (Escuela de Sembrador). Trapped R. D. Bradley et al., prepped N. D. Durish, 20 July 2001.

Virus.—Phylum Negarnaviricota, Class Ellioviricetes, Order Bunyavirales, Family Hantaviridae, Genus *Orthohantavirus*, accepted species *Bayou orthohantavirus*, [proposed name Catacamas virus (CATV), Milazzo, Cajimat, Hanson, Bradley, Quintana, Sherman, Velásquez, and Fulhorst, 2006].

Discussion.—The proposed species (Catacamas virus) by Milazzo et al. (2006) is not significantly different from other *Orthohantavirus* to be recognized as an accepted species by the ICVCN [species demarcation criterion is specified to be divergence between species of at least 12% in the nucleoprotein amino acid sequence (King et al. 2012)]. The current classification follows Maes et al. (2018)

***Peromyscus californicus* (Gambel, 1848)**
Bear Canyon virus

Host/Symbiotype.—*Peromyscus californicus*, TTU-M83520 (skeleton, skull), TTU-TK90438 (tissue), male. USA, California, Riverside: Bear Canyon Trailhead. Trapped C. Fulhorst et al., prepped K. E. Halcomb, 13 November 1998.

Virus.—Phylum Negarnaviricota, Class Ellioviricetes, Order Bunyavirales, Family Arenaviridae, Genus *Mammarenavirus*, accepted species name *Bear Canyon mammarenavirus* [abbreviation: Bear Canyon virus (BCNV), Fulhorst, Bennett, Milazzo, Murray, Webb, Cajimat, and R. D. Bradley, 2002].

Discussion.—The species was named by Fulhorst et al. (2002). Although King et al. (2012) stated that this virus was not significantly different enough to be recognized as an accepted species by the ICVCN [species demarcation criterion is specified to be divergence between species of at least 12% in the nucleoprotein amino acid sequence], it has since been recognized as valid. The current classification follows Maes et al. (2018), and the species is listed in ICTV Master Species List 2018b.v1 (2019: https://talk.ictvonline.org/files/master-species-lists/m/msl/8266).

***Peromyscus mexicanus* (Saussure, 1860)**
Ocozococautla de Espinosa virus

Host/Symbiotype.—*Peromyscus mexicanus*, TTU-M82764 (skeleton, skin, skull), TTU-TK93325 (tissue), male. MEXICO, Chiapas: 14.5 km N Ocozocoaulta. Trapped R. D. Bradley et al., prepped S. R. Hoofer, 17 July 2000.

Virus.—Phylum Negarnaviricota, Class Ellioviricetes, Order Bunyavirales, Family Arenaviridae, Genus *Mammarenavirus*, species ? [proposed name Ocozococautla de Espinosa virus (OCEV), Cajimat, Milazzo, Bradley, and Fulhorst, 2012].

Discussion.—As noted by the original authors (Cajimat et al. 2012) "The failure to isolate arenavirus from Mexican deer mice in this study could be caused by small sample size or poor specimen quality. Alternatively, a cricetid rodent other than the Mexican deer mouse is the principal host of Ocozocoautla de Espinosa virus (OCEV)." Zapata and Salvato (2013) stated that it is for that reason of "non-isolated viruses, it is impossible to study serological and morphological parameters to give an accurate characterization. Although, they cannot be classified as new Arenavirus [*Mammarenavirus*] species until infectious isolates become available … it is important to capture and record their characteristics because they shed light on the evolution of the arenaviruses [*Mammarenavirus*]." See also under discussion of the Tonto Creek virus.

CATALOG OF TYPE SPECIMENS IN THE COLLECTIONS OF TEXAS TECH UNIVERSITY

KINGDOM ARCHAEPLASTIDA Adl, Simpson, Farmer, Andersen, Anderson, Barta, Bowser, et al., 2005
SUBKINGDOM PLANTAE Linnaeus, 1751 *sensu* Copeland, 1956
† ORDER GLOSSOPTERIDALES Plumstead, 1956
† Family Glossopteridaceae Plumstead, 1956
† Genus *Glossopteris* Brongniart, 1828
† *Glossopteris taylori* Tewari, Chatterjee, Agnihotri, and Pandita, 2015

Holotype.—TTU-ATP067.

Etymology.—Named for Thomas N. Taylor for his contributions to the study of Antarctic plant fossils.

Locality.—ANTARCTICA: South Victoria Land, Allen Hills, MTT VPL 3400.

Stratigraphy and Age.—Weller Formation, Late Permian.

Collector and date.—Sankar Chatterjee, 1983.

ORDER ASTERALES APG, 2009
Family Asteraceae Bercht and Presl, 2009
Genus *Leucosyris* Greene, 1897 (current name)
= Genus *Machaeranthera* Nees von Esenbeck, 1832 (in part)
***Leucosyris turneri* (Arnold and Jackson, 1978) (current name) = *Arida turneri* (Arnold and Jackson, 1978) = *Machaeranthera turneri* Arnold and Jackson, 1978 (basionym)**

Holotype.—TTC009913, field number 4005.

Etymology.—Species named for B. L. Turner of the University of Texas, Austin.

Locality.—MEXICO: Chihuahua; 5.3 km N Meoqui, Hwy 45.

Collector and date.—R. C. Jackson, 1 August 1964.

Discussion.—The species was described by Arnold and Jackson (1978) and placed in its current combination with *Leucosyris* by Pruski and Hartman (2012). Earlier Morgan and Hartman (2003) recognized the species combination with the genus *Arida* (Hartman) Morgan and Hartman (2003).

ORDER CARYOPHYLLALES APG, 2009
Family Nyctaginaceae Jussieu, 1789
Genus *Abronia* Jussieu, 1789
***Abronia macrocarpa* Galloway, 1972**

Holotype.—MO-MBG-35582 (Tropicos number 100268207).

Isotype.—TTC016930, TTC field number 07077.

Etymology.—There was no discussion of the etymology for the species name in the publication, but obviously it refers to large fruit (Latin: *macrocarpa* = large fruited).

Locality.—USA: Texas; Leon County, NW Normangee [Detailed locality information protected. Federally listed endangered species. Contact TTU Herbarium for further details].

Collector and date.—Leo A. Galloway, 10 June 1971.

Discussion.—At the time of publication, this species was known only from the type locality and was under threat of habitat destruction. The author suggested that the taxon could become extinct within a few years of its description. It currently is listed as an endangered species. See https://www.fws.gov/southwest/es/Documents/R2ES/Large-fruited_sand-verbena_5-year_Review.pdf.

CLASS MONOCOTYLEDONEAE E. Morren ex Mez, 1840–1906
ORDER POALES Small, 1903
Family Cyperaceae Juss, 1789
Genus *Cyperus* Linnaeus, 1753
***Cyperus onerosus* Johnston, 1964**

Holotype.—SMU, field number 60-072.

Isotype.—TTC.

Etymology.—There was no discussion of the etymology of the species name in the original publication. Latin: *onerosus* = burdensome, heavy, oppressive.

Locality.—USA: Texas; Winkler County, 16 km NE Kermit, Hwy 115.

Collector and date.—Chester M. Rowell, Jr., 13 November 1960.

KINGDOM ANIMALIA Linnaeus, 1758
CLASS INSECTA Linnaeus, 1758
ORDER COLEOPTERA Linnaeus, 1758
Family Anthicidae Latreille, 1819
Genus *Notoxus* Geoffroy, 1762
***Notoxus campus* Chandler, 1978**

Holotype.—NMNHENT (formerly USNM), male.

Paratypes.—TTU-Z030124–030129[A], TTU-Z030130[B], TTU-Z030131[B], TTU-Z030132[A].

Etymology.—Not given in original description. Possibly from Latin "campus" meaning "field."

Localities.—[A]MEXICO: San Luis Potosí; Highway 57 N San Luis Potosí, km 710 or km 210 (type locality); [B]MEXICO: Nuevo León; 16 km S Junction 57 and 60.

Collector and dates.—[A][C. R.] Ward, [J.] Tenorio, [D.] Bennett, [B] [G.] Brothers; [A]11 July 1969, [B]23 June 1971.

Discussion.—The published locality data for the holotype are presented in two sections: first, at start of male holotype description as "km 210, Hwy 57 N of San Luis Potosí, San Luis Potosí" and then again under specimens examined as "km 710, Hwy 52 N of San Luis Potosí, San Luis Potosí". The digital catalog of type specimens in the Entomology section at the Smithsonian, Natural History Museum, listed: "Precise Locality: Mexico: km. 710, hwy 57 N. of San Luis Potosi". Also, a research assistant at the SI-Entomology section (Coleoptera), Charyn Micheli, kindly sent me (JCC) photographs (taken 2 July 2019) of the holotype's labels and thus confirmed the data visually.

***Notoxus celatus* Chandler, 1978**

Holotype.—NMNHENT (formerly USNM), male, (type locality, MEXICO: Morelos; 3.2 km N Jojutla).

Paratypes.—TTU-Z030133[A], TTU-Z030134[B], TTU-Z030135–030144[C, D].

Etymology.—Not provided in original publication; however *celatus* (Latin) means hidden, covered, concealed.

Localities.—[A, B]MEXICO: Puebla; 6.4 km NW Tehuitzingo; [C, D]MEXICO: Oaxaca; Huajuapan de León.

Collectors and date.—[A][C. R.] Ward and [G.] Brothers, [B]C. W. O'Brien and [G. B.] Marshall, [C]L. O'Brien, C. W. O'Brien, and G. B. Marshall, [D]C. W. O'Brien, and G. B. Marshall, all on 28 June 1971.

***Notoxus nuperus haustrus* (Chandler, 1978) = *Notoxus haustrus* Chandler, 1978 (basionym)**

Holotype.—NMNHENT (formerly USNM), male, (type locality, USA: Arizona; Pima County, Colossal Cave County Park).

Paratypes.—TTU-Z030145–030147.

Etymology.—Not given in original publication. Latin *haustus* means, among other things, hollowed out. In the key to species, the author listed the pronotal "horn often centrally depressed before apex to form

scoop-like structure" and the next closest relative as horn only slightly depressed.

Locality.—MEXICO: Chihuahua; 8 km S Galeana.

Collector and date.—C. W. O'Brien and G. B. Marshall, 2 July 1971.

Discussion.—This species is currently recognized by Young (1984) as a subspecies of *Notoxus nuperus* Horn, 1884 = *Notoxus nuperus haustrus* (Chandler, 1978). See discussion under *Notoxus peccatus* for a note on the locality of the paratypes.

Notoxus peccatus Chandler and Nardin, 2004 = *Notoxus orientalis* Chandler, 1978 (basionym)

Holotype.—NMNHENT (formerly USNM), male, (type locality, MEXICO: Nuevo León [not Tamaulipas]; 6 km S Galeana).

Paratypes.—TTU-Z030148[A], TTU-Z030149[A], TTU-Z030150–030152[B].

Etymology.—Not given in publication, but *orientalis* from the Latin for easterly; probably referring to the distribution of the species in Mexico, maybe more specifically to "areas around the Sierra Madre Orientalis." The replacement "new name is Latin noun in apposition: *peccatus* = error, sin."

Localities.—[A] MEXICO: Nuevo León; 64 km NW Junction Highway 57 and 60; [B] MEXICO: San Luis Potosí, Highway 57 N San Luis Potosí, Km 710.

Collectors and dates.—[A] C. W. O'Brien and G. B. Marshall, 22 June 1971; [B] [C. R.] Ward, [J.] Tenorio, and [D.] Bennett, 11 July 1969.

Discussion.—The original name proposed by Chandler in 1978 (*Notoxus orientalis*) was a junior primary homonym of a name used by Heberday for another *Notoxus* species (subspecies) from Iran and Turkmenistan in 1936. Therefore, Chandler and Nardin (2004) proposed the replacement name *Notoxus peccatus*. The type locality data presented in the original publication was; "6 km S of Galeana" in Tamaulipas (collected 25/26 June 1969 by M. W. Sanderson and J. M. Mathieu). A very similar locality is listed for paratypes of *Notoxus haustrus* at "8 km S of Galeana" in Chihuahua (collected 2 July 1971 by C. W. O'Brien and G. B. Marshall). Neither of these localities is reported from Nuevo León, where the best known Galeana (largest city in state) is located in Mexico. The locality in Chihuahua is not as well-known but it exists. On the SCAN database search the holotype was listed at the USNM: Entomology collection of *Notoxus orientalis* as "Nuevo Leon, O km S. galeana" with the same collectors and dates as presented in the original publication. Two reasonable observations were made about this recording by Floyd Shockley (pers. comm. to JCC, 16 November 2018) who oversees that collection. He noted that the holotype specimen of *N. orientalis* bears the following label data (verbatim): "6 km.S.Galeana," "N.L., MEX. June25" "26,1969 MWSanderson, JMMathieu" "Black lt. trap" in a typical, small, 4-lined label for a pinned/pointed insect and further remarked that: "I find myself wondering if this also wasn't a transcription error with someone assuming that N.L. stood for Nuevo Leon since that's where Galeana is and confused it with Nuevo Laredo, which is in Tamaulipas. To make things even more confusing, there IS also a Galeana street in Nuevo Laredo, Tamaulipas. The discrepancy about the specific locality relative to Galeana is easily resolved with one quick look at the label. Whoever cut out the label cut too close to the text and sheared off the top of the 6, so someone not paying attention could easily have read it as a "0" even though 0 km south of Galeana makes no sense. That would literally be IN Galeana, by default. Anyway, the online record was incorrect, and we are in the process of having it fixed" (pers. comm. to JCC, Floyd Shockley 16 November 2018). It is accepted that the type locality for this species is in Nuevo León and not in Tamaulipas.

Notoxus postictus Chandler, 1978

Holotype.—NMNHENT (formerly USNM), male, (type locality, MEXICO: Tamaulipas; Santa Engracia).

Paratype.—TTU-Z030153, male.

Etymology.—No indication of etymology given in original publication.

Locality.—USA: Texas; Culberson County, Pine Springs.

Collector and date.—C. W. O'Brien, 18 August 1970.

***Notoxus pygidialis* Chandler, 1978**
= *Notoxus tlaxcalensis* Chandler and Nardin, 2004

Holotype.—NMNHENT (formerly USNM), male.

Paratypes.—TTU-Z030154, TTU-Z030155.

Etymology.—Not mentioned in original description, but likely refers to "The females are very distinctive in having the apically produced pygidium."

Locality.—MEXICO: Tlaxcala; Zacatelco (type locality).

Collectors and date.—R. L. Mangan and D. S. Chandler, 26 July 1974.

Discussion.—The original name proposed by Chandler in 1978 was a junior primary homonym of a name used by Pic for another *Notoxus* species from "Congo belge," Africa, in 1913. Therefore Chandler and Nardin (2004) provided a replacement name.

***Notoxus zapotecorum* Chandler, 1978**

Holotype.—CAS, male, (type locality, MEXICO: Nayarit; Jesús María).

Paratype.—TTU-Z030156, male.

Etymology.—None given in original publication.

Locality.—MEXICO: Oaxaca; Huajuapan de León.

Collectors and date.—C. W. O'Brien and G. B. Marshall, 28 June 1971.

Family Chrysomelidae Latreille, 1802
(= Bruchidae Latreille, 1802)
Genus *Acanthoscelides* Schilsky, 1905

***Acanthoscelides baboquivari* Johnson, 1974**

Holotype.—NMNHENT (formerly USNM, number 71401), male, (type locality, USA: Arizona; Pima County, Kitt Peak).

Paratypes.—TTU-Z030157-030160.

Etymology.—Although not mentioned in the original publication, it is possible that the species is named after the Baboquivari Mountains near the type locality at Kitt Peak.

Locality.—USA: Arizona; Cochise County, Huachuca Mountains, Miller Canyon.

Collector and date.—C. D. Johnson, 6 October 1972.

Discussion.—This species was originally described in the family Bruchidae, but that family is now considered a synonym (subfamily) by Lawrence and Newton (1982) for the Chrysomelidae.

***Acanthoscelides daleae* Johnson, 1970**

Holotype.—NMNHENT (formerly USNM, number 69686), male.

Paratypes.—TTU-Z030162–030165.

Etymology.—The specific name is based on the name of the host plants *Dalea* spp.

Locality and host.—USA: California; San Bernardino County, 13 km W Needles (type locality). Reared from type plant seeds of *Dalea spinosa*.

Collector and date.—C. D. Johnson, 17 July 1964.

***Acanthoscelides desmanthi* Johnson, 1977**

Holotype.—NMNHENT (formerly USNM, number 72782), male, (type locality, MEXICO: Chiapas; 4.8 – 8 km W Ocozocoautla).

Paratypes.—TTU-Z030166–030170.

Etymology.—Named for the host plant, genus *Desmanthus*.

Locality.—MEXICO: Sinaloa; 42 km S Culiacán.

Collector and date.—C. D. Johnson, 25 February 1973.

***Acanthoscelides guazumae* Johnson and Kingsolver, 1971**

Holotype.—NMNHENT (formerly USNM, number 69949), male.

Paratypes.—TTU-Z030180–030188.

Etymology.—Not discussed in text; however, the species was found on the food plant of the genus *Guazuma*.

Locality and host.—MEXICO: Sonora; 6.5 km NW Alamos (type locality). Specimens were reared from seeds of the type host plant *Guazuma tomentosa*.

Collector and date.—C. D. Johnson, 14 July 1968.

***Acanthoscelides jardin* Johnson, 1983**

Holotype.—NMNHENT (formerly USNM, number 72793), male, (type locality, MEXICO: Veracruz; Jardin Botanique, Jalapa [correctly Xalapa]).

"Labeled" Paratype.—TTU-Z030171.

Etymology.—Name based on the type locality Jardin Botanique at Xalapa.

Locality.—MEXICO: San Luis Potosí; 22.4 km E Ciudad del Maiz.

Collectors and date.—L. O'Brien, C. W. O'Brien, and G. B. Marshall, 16 August 1971.

Discussion.—Although the specimen is labeled "paratype" and has the same blue-colored printed label as other specimens of this generic revision, the data were not presented in the original publication and therefore it has no type standing.

***Acanthoscelides kingsolveri* Johnson, 1973**

Holotype.—NMNHENT (formerly USNM, number 71400), male, (type locality, MEXICO: Sinaloa; 46.4 km NW Mazatlán).

Paratypes.—TTU-Z030173–030177.

Etymology.—Named for John M. Kingsolver.

Locality and host.—MEXICO: Sonora; Alamos. The food host plant (seeds) is the legume genus *Indigofera*.

Collector and date.—C. D. Johnson, 14 July 1968.

***Acanthoscelides mankinsi* Johnson, 1983**

Holotype.—NMNHENT (formerly USNM, number 76829), male (type locality, MEXICO: Sinaloa; 6.4 km N Mazatlán).

Paratype.—TTU-Z030172.

Etymology.—"This species is named in honor of J. V. Mankins, my friend and collector of many bruchids from Honduras."

Locality.—MEXICO: Oaxaca; 13 km E Nochixtlán.

Collectors and date.—[C. R.] Ward and [G.] Brothers, 28 June 1971.

***Acanthoscelides margaretae* Johnson, 1970**

Holotype.—NMNHENT (formerly USNM, number 69687), male.

Paratypes.—TTU-Z030178, TTU-Z030179.

Etymology.—Named after the author's wife Margaret, "whose help and encouragement has enabled me to complete this monograph."

Locality and host.—USA: California; San Mateo County, 16 km S Half Moon Bay, Pomponio Beach. The type host food plant is *Astragalus pycnostachyus*.

Collector and date.—C. D. Johnson, 10 October 1965.

***Acanthoscelides napensis* Johnson, 1970**

Holotype.—NMNHENT (formerly USNM, number 69688), male (type locality, USA: California; Napa County, 14.4 km SE Pope Valley on Chiles and Pope Valley Road).

Paratype.—TTU-Z030189.

Etymology.—This species was first collected by the author in large numbers in Napa County, California, and therefore named after that location; and the Latin suffix -*ensis*, from or belonging to.

Locality.—USA: California; Lake County, 6.5 km S Middletown.

Collector and date.—C. D. Johnson, 10 May 1964.

Genus *Algarobius* Bridwell, 1946

***Algarobius atratus* Kingsolver, 1986**

Holotype.—NMNHENT (formerly USNM), male (type locality, MEXICO: Zacatecas; 3.2 km SE Fresnillo).

Paratype.—TTU-Z030190.

Etymology.—Not provided in original publication, but *atratus* Latin = darkened.

Locality and host.—MEXICO: San Luis Potosí; 19.2 km "NW" of San Luis Potosí. Most likely *Prosopis laevigata* and not *P. juliflora* as recorded on some collection labels (Kingsolver 1986) is the type host plant.

Collectors and date.—O'Brien and [G. B.] Marshall, 30 June 1971.

Discussion.—The original publication listed this collection as being from 19.2 km "N" of San Luis Potosí; the printed label on the paratype is "NW".

***Algarobius johnsoni* Kingsolver, 1986**

Holotype.—NMNHENT (formerly USNM), male (MEXICO: Aguascalientes; 3.2 km N Rincón de Romos).

Paratypes.—TTU-Z030191–030212[A], TTU-Z030213–030221[B], TTU-Z030222–030234[C], TTU-Z030235[A], TTU-Z030236–030261[C], TTU-Z030262–030282[C], TTU-Z030297[D], TTU-Z030299[E], TTU-Z030300[F], TTU-Z030301[F], TTU-Z030302[G], TTU-Z030303[G], TTU-Z030304[H], TTU-Z030305–030313[I], TTU-Z030314–030330[J], TTU-Z030331–030333[C].

Etymology.—"This species is named to honor C. D. Johnson, Northern Arizona University, Flagstaff, doughty peregrinator and student of Bruchidae, who collected the type-series and supplied many specimens for the study."

Locality and host.—[A] MEXICO: Zacatecas; 50 km SE Guadalupe; [B] MEXICO: Durango; 3 km N Cerro Gordo; [C] MEXICO: Nuevo León; Hwy 57, 127 km S Linares; [D] MEXICO: Hidalgo; 29 km NW Pachuca; [E] MEXICO: San Luis Potosí; 105 km NW San Luis Potosí; [F] MEXICO: San Luis Potosí; 29 km NE San Luis Potosí; [G] MEXICO: Hidalgo; 18 km S Zimapan; [H] MEXICO: Coahuila; 37 km W Saltillo; [I] MEXICO: Oaxaca; Huajuapan de León; [J] MEXICO: Querétaro; Tequisquiapan. Most likely *Prosopis laevigata* and not *P. juliflora* as recorded on some collection labels (Kingsolver 1986) is the type host plant.

Collectors and dates.—[A] O'Brien and [G. B.] Marshall, 30 June 1971; [B] L. B. O'Brien, 1 July 1971; [C] O'Brien and [G. B.] Marshall, 23 June 1971; [D] [C. R.] Ward and [G.] Brothers, 25 June 1971; [E] [C. R.] Ward and [G.] Brothers, 30 June 1971; [F] O'Brien and [G. B.] Marshall, 16 August 1971; [G] [C. R.] Ward and [G.] Brothers, 25 June 1971; [H] O'Brien and [G. B.] Marshall, 20 August 1971;[I] [C. W. or L.?] O'Brien and [G. B.] Marshall, 28 June 1971; [J] [C. R.] Ward and [G.] Brothers, 29 June 1971.

Discussion.—There is a specimen in the collection that is labeled as a paratype. The printed label is blue colored and looks identical to those on other specimens of this species. The specimen data (TTU-Z030298, MEXICO: Nuevo León; 40 km E San Roberto, collected L. O'Brien, C. W. O'Brien, and [G. B.] Marshall, 15 August 1971); are not listed in the original publication and therefore the specimen cannot be regarded as a paratype.

***Algarobius nicoya* Kingsolver, 1986**—not present at TTU

Holotype.—NMNHENT (formerly USNM), male (type locality, COSTA RICA; Puntarenas Province, Boca Barranca).

Paratypes.—According to the original publication, there should be up to six paratypes at TTU-Z, but these were not found by Enriquez (2007), nor in a search in the reference collection as well as the type cabinet on 30 December 2016, by James C. Cokendolpher. Most likely those missing specimens were collected [because of the collectors' names and their association with TTU]: MEXICO: Oaxaca; Huajuapan de León, [C. W. or L.?] O'Brien and [G. B.] Marshall, 28 June 1971. There is no available correspondence regarding these specimens and it is not certain if they were ever returned to TTU after the description.

Etymology.—"The specific name is a noun in apposition for the Bay of Nicoya into which the Rio Barranca flows. The type locality is at its mouth."

Locality and host.—MEXICO: Oaxaca; Huajuapan de León. The type host plant is *Prosopis juliflora*.

Collector and dates.—[C. W. or L.?] O'Brien and [G. B.] Marshall, 28 June 1971.

Genus *Amblycerus* Thunberg, 1815

***Amblycerus acapulcensis* Kingsolver, 1975**

Holotype.—NMNHENT (formerly USNM, number 72812), male, (type locality, MEXICO: Veracruz; Cerro Gordo, Rinconada).

Paratypes.—TTU-Z030334–030339[A], TTU-Z030340–030342[B], TTU-Z030343[A], TTU-Z030344[A], TTU-Z030345[C], TTU-Z030346[A], TTU-Z030347[A], TTU-Z030348[B], TTU-Z030349[B], TTU-Z030350[A], TTU-Z030351[C], TTU-Z030352[A], TTU-Z030353[C], TTU-Z030354[B], TTU-Z030355[B], TTU-Z030356[C], TTU-Z030357[C], TTU-Z030358[A], TTU-Z030359[B], TTU-Z030360[B], TTU-Z030361[B], TTU-Z030362[A], TTU-Z030363–030367[D].

Etymology.—Not discussed in the publication; however, the first collection of the species was in Acapulco. Latin suffix -*ensis*, belonging to.

Localities.—[A] MEXICO: Sinaloa; 10 km N Los Mochis; [B] MEXICO: Sinaloa; 16 km SE Guamúchil; [C] MEXICO: Sinaloa; 42 km S Culiacán; [D] MEXICO: Sinaloa; 6.5 km S Culiacán.

Collector and dates.—A C. D. Johnson, 12 March 1973; B C. D. Johnson, 12 March 1973; C C. D. Johnson, 25 February 1973; D C. D. Johnson, 25 February 1973.

Genus *Mimosestes* Bridwell, 1946

***Mimosestes acaciestes* Kingsolver and Johnson, 1978**

Holotype.—NMNHENT (formerly USNM, number 72778), male.

Paratypes.—TTU-Z030368[A], TTU-Z030369–030373[B], TTU-Z030374[A], TTU-Z030375[B], TTU-Z030376[A].

Etymology.—The food plants (host) are all members of the genus *Acacia*; *estes* = eater.

Localities.—[A] MEXICO: San Luis Potosí; 26 km S Santa María del Río; [B] USA: Arizona; Yavapai County, W Clear Creek Campgrounds, 12 km ESE Camp Verde (type locality).

Collectors and dates.—[A] [C. R.] Ward, C. O'Brien, and [G. B.] Marshall, 29 June 1971; [B] G. W. Forister, 11 September 1969.

Genus *Sennius* Bridwell, 1946
***Sennius durangensis* Johnson and Kingsolver, 1973**

Holotype.—NMNHENT (formerly USNM, number 71394), male, (type locality, MEXICO: Durango; 76.8 km N Rodeo).

Paratypes.—TTU-Z030383–030387.

Etymology.—Not discussed in the publication; however, it was collected in the state of Durango. Latin suffix *-ensis*, belonging to.

Locality and host.—MEXICO: Durango; 13 km NE Guadalupe Victoria. Specimens were swept from one of the host food plants *Cassia crotalarioides*.

Collector and date.—C. D. Johnson, 10 July 1964.

***Sennius ensiculus* Johnson and Kingsolver, 1973**

Holotype.—NMNHENT (formerly USNM, number 71395), male.

Paratypes.—TTU-Z030388–030390.

Etymology.—Although not discussed in the original publication, *ensiculus* means a little sword or rapier and might be in reference to the sharp spine on the hind femora.

Locality.—MEXICO: Durango; 87 km SW El Salto (type locality).

Collector and date.—C. D. Johnson, 25 August 1965.

Genus *Stator* Bridwell, 1946
***Stator beali* Johnson, 1963**

Holotype.—NMNHENT (formerly USNM, number 36981), male.

Paratypes.—TTU-Z030379–030382.

Etymology.—The species is named after Richard S. Beal, Jr., Flagstaff, Arizona, for helping the author study the biosystematics of the Bruchidae.

Locality.—USA: Texas; Cameron County, Brownsville (type locality).

Collector and date.—J. C. Bridwell, June 1921.

Family Carabidae Latreille, 1802
Genus *Rhadine* LeConte, 1846
***Rhadine bullis* Reddell and Cokendolpher, 2004**

Holotype.—AMNH, male (type locality, USA: Texas; Bexar County, Camp Bullis, Stahl Cave).

Paratype.—TTU-Z031080.

Etymology.—"The species is named for Camp Bullis and is a noun in apposition."

Locality.—USA: Texas; Bexar County, Camp Bullis, Hector Hole.

Collectors and date.—J. R. Reddell, M. Reyes, and G. Veni, 15 April 2002.

Family Cerambycidae Latreille, 1802
Genus *Typocerus* LeConte, 1850
Typocerus balteatus Horn, 1878
***Typocerus balteatus diana* Lewis, 2001**

Holotype.—EMEC69775, male.

Paratypes.—TTU-Z030780, TTU-Z030781.

Etymology.—"I am very happy to name this subspecies after my wife, Diana, who has worked beside

me for so many years collecting in the field and typing my manuscripts."

Locality.—USA: Texas; El Paso County, 30.5 km E El Paso.

Collector and date.—Arthur E. Lewis, 30 September 1999.

Discussion.—Collected from a localized sand dune area on the flowers of sunflowers *Helianthus* sp.

Family Cleridae Latreille, 1802
Genus *Aulicus* Spinola, 1841
***Aulicus apachei* Barr and Foster, 1979**

Holotype.—CAS, male, (type locality USA: Arizona; Cochise County, 3.2 km E Portal).

Paratypes.—TTU-Z030391[A], TTU-Z030392[B], TTU-Z030393[C], TTU-Z030394[C], TTU-Z030395[D], TTU-Z030396[C].

Etymology.—Presumably named after the regional tribe of Native Americans, no etymology given in the original publication.

Localities.—[A] USA: Arizona; Cochise County, Portal; [B] USA: Arizona; Santa Cruz County, Madera Canyon; [C] MEXICO: Sonora; 31 km S Estación Llano; [D] MEXICO: Nuevo León; 22.5 km N Ciénega de Flores.

Collectors and dates.—[A, E] I. Schlinger, 14 August 1967; [B] A. McDonald, 21 August 1921; [C] M. E. Irwin, 17 August 1964; [D] C. O'Brien, L. O'Brien, and [G. B.] Marshall, 14 August 1971.

Genus *Cymatodera* Gray, 1832
***Cymatodera sobara* Barr, 1960**

Holotype.—CAS, male, (type locality, USA: California; Imperial County, Palo Verde).

Paratype.—TTU-Z030397.

Etymology.—Unknown, not stated in the original publication. *Sobar* is Greek as well as Spanish, but how these words might be related to the species name is unknown.

Locality.—USA: Arizona; Maricopa County, Gillespie Dam.

Collectors and date.—F. Werner and W. Nutting, 9 August 1948.

Genus *Trichodes* Herbst, 1792
Trichodes ornatus Say, 1823
***Trichodes ornatus bonnevillensis* Foster, 1976**

Holotype.— Reported originally as being housed at TTCC. This was in error; it is currently listed in the catalog of the CAS Type number 12795 as being in that collection. Male, type data USA: Nevada; Lander County, 19.2 km E Austin. D. E. Foster and R. L. Penrose, 16 July 1969.

Paratypes.—TTU-Z030398[A], TTU-Z030399[A], TTU-Z030400[B], TTU-Z030401[B].

Etymology.—Named after "Bonneville lake system, the history of which has greatly influenced the current distribution and variability of this subspecies." Latin suffix *-ensis*, from or belonging to.

Localities.—USA: Utah; Box Elder County, [A] Kelton, [B] Kelton Pass.

Collectors and dates.—[A] G. F. Knowlton and W. J. Hanson, 29 June 1969. [B] G. F. Knowlton, 24 October 1972.

Family Curculionidae Latreille, 1802
Genus *Macroscytalus* Broun, 1881 (current name)
= Genus *Rhinanisus* Broun, 1883
***Macroscytalus chisosensis* (O'Brien, 1973) = *Rhinanisus chisosensis* O'Brien, 1973 (basionym)**

Holotype.—NMNHENT (formerly USNM), male.

Paratypes.—TTU-Z030402–030441.

Etymology.—Latin suffix *-ensis*, from or belonging to. Named in reference to the Chisos Mountains.

Locality.—USA: Texas; Brewster County, Big Bend National Park, Chisos Mountains, Green Gulch (type locality).

Collectors and date.—L. O'Brien and C. W. O'Brien, 3 June 1970.

Discussion.—Kuschel (1990) listed *Rhinanisus* as a new synonym of *Macroscytalus* and then by implication other species were automatically transferred to *Macroscytalus*. It was listed in this new combination first by Anderson (2002).

Genus *Minyomerus* Horn, 1876
***Minyomerus trisetosus* Jansen and Franz, 2015**

Holotype.—Originally deposited in Charles W. O'Brien Collection, transferred August 2018 to ASUCOB: Green Valley, Arizona; female (USA: Texas; Lamb County, 14.4 km W Littlefield, 21 April 1971 "IV-21-1971", C. W. O'Brien).

Paratypes.—TTU-Z207409–207424.

Etymology.—"Named in reference to the three distinct types of setae present on the body; *tri* = three; *setosus* = bristly, hence *trisetosus* = with three kinds of bristles; Latin adjective."

Locality.—USA: Texas; Hansford County, 12.8 km W Spearman.

Collectors and date.—C. W. O'Brien, 3 June 1971.

Genus *Rhinanisus* Broun, 1883 = see Genus *Macroscytalus* Broun, 1881 (current name)

Genus *Sibinia* Germar, 1817
***Sibinia stricticomula* Clark, 1978**

Holotype.—NMNHENT (formerly USNM, no.75405), male, (type locality MEXICO: Guerrero; 4 km NE Cacachuamilpa).

Paratypes.—TTU-Z030442–030457.

Etymology.—Not provided in original description.

Locality.—MEXICO: Puebla; 18 km SE Petlalcingo.

Collectors and date.—[C. R.] Ward and [G.] Brothers, 28 June 1971.

Genus *Trigonoscutoides* O'Brien, 1977
***Trigonoscutoides texanus* O'Brien, 1977**

Holotype.—Originally retained in Charles W. O'Brien Collection, transferred August 2018 to ASUCOB (number ASUCOB0002342), male, (type locality, USA: Texas; Winkler County, 7.2 km NE Kermit [Hwy 115]).

Paratypes.—TTU-Z030458–030461.

Etymology.—Referring to the state of Texas.

Locality.—USA: Texas; Ward County, 2 km E Monahans.

Collectors and date.—L. O'Brien and C. W. O'Brien, 28 March 1970.

Family Dytiscidae Leach, 1815
Genus *Anodocheilus* Babington, 1841
***Anodocheilus bellitae* Young, 1974**

Holotype.—UMMZ, male.

Paratypes.—TTU-Z030462, TTU-Z030463.

Etymology.—Not given in original publication, but likely based on female name Bellita. Several of the names in this publication were constructed in that fashion.

Locality.—BRASIL: Mato Grosso; Jacaré, Parque Nacional Xingú (type locality).

Collectors and date.—Moacir Alvarenga and Werner Bokermann, November 1965.

***Anodocheilus francescae* Young, 1974**

Holotype.—UMMZ, male, (type locality, MEXICO: Tamaulipas; Río Guayalejo near Magiscatzin).

Paratypes.—TTU-Z030002, TTU-Z030003.

Etymology.—Not given in original publication, but likely based on female name Francesca. Several of the names in this publication were constructed in that fashion.

Locality.—MEXICO: Tamaulipas; near San Antonio.

Collector and date.—Frank N. Young, 27 July 1969.

***Anodocheilus villae* Young, 1974**

Holotype.—UMMZ, male, (type locality, VENEZUELA; Bolívar Medio Orinoco, Isla Cuba or Playa de Medio).

Paratypes.—TTU-Z030004–030010.

Etymology.—Not given in original publication, but likely based on female name Villa. Several of the names in this publication were constructed in that fashion.

Locality.—VENEZUELA; Guarico; San Fernando.

Collectors and date.—Paul Spangler and Phyllis Spangler, 12 February 1969.

Genus *Copelatus* Erichson, 1832
Copelatus caelatipennis Schaeffer, 1908 (not Aubé, 1838; see Young 1963)
***Copelatus caelatipennis princeps* Young, 1963**

Holotype.—UMMZ, male.

Paratypes.—TTU-Z030011[A], TTU-Z030012, TTU-Z030014–030017[B].

Etymology.—"The name *princeps* is given to this subspecies in recognition of its pioneer role in invading newly formed aquatic stations."

Localities.—[A] USA: Florida; Dade County, Miami, South Prong Miami River (type locality); [B] USA: Florida; Hendry County, near Clewiston.

Collector and dates.—[A] F. N. Young, 9 September 1939; [B] F. N. Young, 1 July 1962.

Genus *Haideoporus* Young and Longley, 1976
***Haideoporus texanus* Young and Longley, 1976**

Holotype.—NMNHENT (formerly USNM, number 73502), male.

Paratypes.—TTU-Z030110, TTU-Z030783.

Etymology.—Named after the state of Texas.

Locality.—USA: Texas; Hays County, Artesian well at the Aquatic Station, Southwest Texas State University (type locality).

Collector and date.—Joe Klob, between 28 October 1973 and 9 January 1976.

Family Haliplidae Aubé, 1836
Genus *Peltodytes* Regimbart, 1878
***Peltodytes dunavani* Young, 1961**

Holotype.—UMMZ, male, (type locality, USA: North Carolina; Bertie County, Salmon Creek near Eden House).

Paratypes.—TTU-Z030022, TTU-Z030023.

Etymology.—Named to honor Professor David Dunavan, Clemson College, South Carolina, who studied Haliplidae for many years.

Locality.—USA: Georgia; Pulaski County, S Hawkinsville.

Collector and date.—Frank N. Young, 13 July 1960.

Family Hydrophilidae Latreille, 1802
Genus *Tropisternus* Solier, 1834
Tropisternus mexicanus LaPorte de Castelnau, 1840
***Tropisternus collaris viridis* (Young and Spangler, 1957) = *Tropisternus mexicanus viridis* Young and Spangler, 1957 (basionym)**

Holotype.—UMMZ, male (type locality, USA: Florida; Alachua County, San Felasco Hammock, W Gainesville).

Paratypes.—TTU-Z030024, TTU-Z030025.

Etymology.—From Latin *viridis* meaning green; apparently in reference to the metallic-looking coloration of the body.

Locality.—USA: Florida; Baker County, MacClenny Cattail Pond. In the original publication, the county name was only listed for these paratypes.

Collector and date.—F. N. Young, 30 December 1947.

Discussion.—*Tropisternus mexicanus viridis* Young and Spangler, 1957 is currently recognized by Hansen (1999) as a subspecies of *Tropisternus collaris* (Fabricius, 1775) resulting in the combination of *Tropisternus collaris viridis* (Young and Spangler, 1957).

Family Scarabaeidae Latreille, 1802
Genus *Anomala* Samouelle, 1819
***Anomala carlsoni* Hardy, 1976**

Holotype.—CAS, number 12427, male.

Paratypes.—TTU-Z030026[A], TTU-Z030027[A], TTU-Z030782[B].

Etymology.—The etymology was not stated in the publication; however, the first sentence states that careful observations by Dave Carlson (of Oregon State University) contributed to the recognition of a new taxon.

Localities.—[A]USA: California; Imperial County, 5 km NW Glamis, sand dunes; [B]USA: California, Imperial County, 3 km NW Glamis (type locality).

Collector and date.—A. R. Hardy, 1972.

Family Leiodidae Fleming, 1821
Genus *Ptomaphagus* Hellwig, 1795 (current name)
= Genus *Echinocoleus* López-Neyra, 1947 (now subgenus)
***Ptomaphagus chihuahuensis* (Peck, 1976) = *Echinocoleus chihuahuensis* Peck, 1976 (basionym)**

Holotype.—CAS, female.

Paratypes.—TTU-Z030028–030031.

Etymology.—Name refers to desert region of Texas, New Mexico, and Mexico; and Latin suffix *-ensis*, belonging to.

Locality.—USA: Texas; Culberson County, 9 km N Pine Springs (type locality).

Collector and date.—D. E. Foster, 9 June 1974.

Discussion.—The specimens were found in the nest of the ant *Pogonomyrmex maricopa*. This species was originally described in the genus *Echinocoleus* López-Neyra, 1947 as *Echinocoleus chihuahuensis* Peck, 1976. According to Peck and Gnaspini (1997) *Echinocoleus* is now recognized as a subgenus of *Ptomaphagus* Hellwig, 1795, resulting in the current name of *Ptomaphagus chihuahuensis* (Peck, 1976).

Family Tenebrionidae Latreille, 1802
Genus *Argoporis* Horn, 1870
Argoporis rufipes Champion, 1885
***Argoporis rufipes femorata* Berry, 1980**

Holotype.—NMNHENT (formerly USNM, number 76146), male.

Paratypes.—TTU-Z030032–030037[A], TTU-Z030038[B], TTU-Z030039 and 030040[C], TTU-Z030041[D].

Etymology.—Not discussed in original publication, but presumably named after the femora because of the diagnostic features: "… head, prothorax, venter, and femora usually of same shade of castaneous, usually slightly lighter than elytra." "… profemur strongly

swollen and somewhat lobate on the posteroventral side."

Localities.—[A] MEXICO: Zacatecas; 14.4 km SE Zacatecas; [B] MEXICO: Durango; 3.2 km NW La Zarca; [C] MEXICO: Durango; 16 km NW Las Nieves; [D] MEXICO: Durango; Km 1226, Hwy 45, S La Rosalana.

Collectors and dates.—[A] C. W. O'Brien and G. B. Marshall, 30 June 1971; [B] L. O'Brien, C. W. O'Brien, and G. B. Marshall, 1 July 1971; [C] C. W. O'Brien, 1 July 1971; [D] [C. R.] Ward, [J.] Tenorio, and [D.] Bennett, 16 August 1969.

ORDER DIPTERA Linnaeus, 1758
Family Apioceridae Bigot, 1857
Genus *Apiocera* Westwood, 1835
Apiocera ammophila Cazier, 1982

Apiocera ammophila ammophila Cazier, 1982

Holotype.—AMNH, male.

Paratype.—TTU-Z030065.

Etymology.—"From the Greek *ammo*, meaning sand, and *phila*, meaning loving which describes the habitat preference of the species."

Locality.—USA: Arizona; Yuma County, Ligurta (type locality).

Collectors and date.—J. H. Davidson and J. M. Davidson, 9 April 1966.

Discussion.—The holotype was originally described as the type for both the species and subspecies. A second subspecies was named in the same publication.

Apiocera arena Cazier, 1982

Holotype.—AMNH, male.

Paratypes.—TTU-Z030049[A], TTU-Z030050[B], TTU-Z030051[C].

Etymology.—From the Latin *arena*, for sand, its primary habitat.

Localities.—[A] USA: California; San Bernardino County, 11 km NE Newberry (type locality); [B, C] USA: California; San Bernardino County, 14.5 km S Baker, Zzyzx Springs.

Collectors and dates.—[A] N. Foster, J. Bigelow, and M. Cazier, 18 May 1968; [B] Kitayama and Cave, 25 April 1977; [C] Chemsak, 26 April 1977.

Apiocera auripilosa Cazier, 1982

Holotype.—AMNH, male.

Paratypes.—TTU-Z030073, TTU-Z030074.

Etymology.—"From the Latin *auri*, meaning gold or golden and *pilosa*, meaning hairy which amply characterizes the unique condition of abdominal segments, especially the sternites, one through four which are golden pilose in this species."

Locality.—USA: Arizona; Coconino County, 9.5 km S Page (type locality).

Collectors and date.—L. (Welch) Draper, O. Francke, and M. Cazier, 14 June 1970.

Apiocera barri Cazier, 1982

Holotype.—AMNH, male.

Paratypes.—TTU-Z030067, TTU-Z030068.

Etymology.—Species was named for William F. Barr of the University of Idaho, Moscow.

Locality.—USA: Idaho; Nez Perce County, 5 km S Lewiston (type locality).

Collectors and date.—W. F. Barr, J. Bigelow, M. Mortenson, and M. Cazier, 12 August 1969.

Apiocera bibula Cazier, 1982

Holotype.—AMNH, male.

Paratypes.—TTU-Z030075, TTU-Z030076.

Etymology.—From the Latin *bibula*, fond of drinking.

Locality.—MEXICO: Baja California Sur; San Juan.

Collectors and date.—N. Leppla, J. Davidson, J. Bigelow, M. Bentzien, W. Fox, S. Williams, and M. Cazier, 29 June 1968.

***Apiocera bigelowi* Cazier, 1982**

Holotype.—AMNH, male.

Paratype.—TTU-Z030066.

Etymology.—Named in honor of Joe Bigelow, then of Arizona Western College.

Locality.—MEXICO: Coahuila; Cuatro Cienegas Basin, 1.5 km SE Cuatro Cienegas.

Collectors and date.—M. Bentzien, S. Williams, J. Bigelow, and M. Cazier, 12 August 1968.

***Apiocera chiltonae* Cazier, 1982**

Holotype.—AMNH, male.

Paratypes.—TTU-Z030042, TTU-Z030043.

Etymology.—Named for Beverly Chilton for discovering the species.

Locality.—USA: Arizona; Maricopa County, E Phoenix (type locality).

Collectors and date.—Chilton family, 25 June 1969.

***Apiocera femoralis* Cazier, 1982**

Holotype.—AMNH, male.

Paratype.—TTU-Z030061.

Etymology.—"From the Latin *femoris*, meaning thigh to emphasize the black femora characteristic of this species."

Locality.—USA: Texas; Brewster County, Big Bend National Park, Rio Grande Village (type locality).

Collectors and date.—M. Cazier, O. Francke, and L. (Welch) Draper, 23 June 1970.

***Apiocera franckei* Cazier, 1982**

Holotype.—AMNH, male.

Paratypes.—TTU-Z030046[A], TTU-Z030047[B].

Etymology.—Named for Oscar F. Francke, then of Texas Tech University.

Locality.—USA: Texas; Brewster County, Big Bend National Park, Rio Grande Village (type locality).

Collectors and date.—[A]J. Bigelow and M. Cazier, 18 August 1968; [B]L. (Welch) Draper, O. Francke, and M. Cazier, 18 August 1968.

***Apiocera hamata* Cazier, 1982**

Holotype.—AMNH, male (USA: New Mexico; Sandoval County, San Ysidro).

Paratype.—TTU-Z030048.

Etymology.—From the Latin *hamata*, hooked.

Locality.—USA: Texas; El Paso County, 17 km NE Fabens.

Collectors and date.—O. F. Francke, J. V. Moody, and T. B. Hall, 19 May 1978.

***Apiocera linsleyi* Cazier, 1982**

Holotype.—AMNH, male.

Paratypes.—TTU-Z030052[A], TTU-Z030053[B], TTU-Z030054[C].

Etymology.—Named in honor of E. G. Linsley, University of California, Berkeley.

Locality.—MEXICO: Baja California; La Paz.

Collectors and dates.—[A] M. Bentzien, J. Bigelow, S. Williams, and M. Cazier, 28 July 1968. [B] J. Davidson, J. Bigelow, M. Bentzien, W. Fox, S. Williams, and M. Cazier, 24 July 1968. [C] M. Bentzien, J. J. Bigelow, S. Williams, and M. Cazier, 28 July 1968.

Discussion.—Described originally as a subspecies: *Apiocera linsleyi linsleyi* Cazier, 1982.

Apiocera linsleyi obliqua Cazier, 1982

Holotype.—AMNH, male.

Paratypes.—TTU-Z030055, TTU-Z030056.

Etymology.—From the Latin *obliqua*, oblique; for its markings.

Locality.—MEXICO: Baja California; Santa Rita (type locality).

Collectors and date.—J. Davidson, J. Bigelow, M. Bentzien, S. Williams, and M. Cazier, 27 July 1968.

Discussion.—Described originally as a subspecies.

Apiocera macswaini Cazier, 1982

Holotype.—AMNH, male (USA: California; Inyo County, Antelope Springs).

Paratypes.—TTU-Z030077[A], TTU-Z030078[B].

Etymology.—Named in honor of J. W. MacSwain.

Locality.—[A, B] USA: California; Inyo County, Deep Springs.

Collectors and dates.—[A] W. D. McLellan, 17 July 1953; [B] H. Nakakihara, 17 July 1953.

Apiocera minckleyi Cazier, 1982

Holotype.—AMNH, male.

Paratypes.—TTU-Z030059, TTU-Z030060.

Etymology.—"The species is named after W. L. Minckley, Arizona State University, Tempe in grateful acknowledgment of his being the first to discover *Apiocera* in the Cuatro Cienegas Basin."

Locality.—MEXICO: Coahuila; Cuatro Cienegas Basin, 1.5 km S Posos de la Becerra.

Collectors and dates.—J. Bigelow and M. Cazier, 11–12 August 1968.

Apiocera mortensoni Cazier, 1982

Holotype.—AMNH, male.

Paratypes.—TTU-Z030063, TTU-Z030064.

Etymology.—Named for Martin A. Mortenson, Tempe, Arizona.

Locality.—USA: Utah; Washington County, Dixie State Park, Snow Canyon (type locality).

Collectors and date.—J. Bigelow, M. Mortenson, and M. Cazier, 22 August 1969.

Apiocera painteri Cazier, 1963

Holotype.—R. H. Painter Collection, according to Cazier (1982) now at the NMNHENT (formerly USNM), USNMENT832050, male.

Paratypes.—TTU-Z030057[A], TTU-Z030058[B].

Etymology.—Named in honor of R. H. Painter who collected the first specimens of this species. Although E. M. and R. H. Painter were listed under records as collectors, Cazier clearly stated that the species was named after R. H. Painter who was also listed in the literature cited as the author of two significant papers on this family of flies from the 1930s.

Localities.—USA: Arizona; Cochise County, [A]3 km NE Portal (type locality); [B]13 km E Portal.

Collector and dates.—[A] M. A. Cazier, 28 May 1962; [B] M. Cazier, 30 May 1961.

Discussion.—The distance of the paratype from 13 km E Portal is either slightly too far or is located in Hidalgo County, New Mexico.

***Apiocera parahydra* Cazier, 1982**

Holotype.—AMNH, male.

Paratypes.—TTU-Z030069, TTU-Z030070.

Etymology.—"From the Greek *para*, meaning beside or near and *hydra*, meaning water which amply characterizes the microhabitat of the paratopotypic series and that of most of the other samples."

Locality.—USA: Arizona; Apache County, Lukachukai (type locality).

Collectors and date.—J. Bigelow, O. [F.] Francke, M. G. Cazier, and M. A. Cazier, 7 July 1972.

Discussion.—Neither of the specimen labels list J. Bigelow as a collector, but the collectors were listed in the original description publication as "June 24, 25, 30 and July 2–4, 7, 8, 12, 1972 by J. Bigelow, O. Francke, M. G. Cazier, M. A. Cazier." It is possible that Bigelow did not collect with the group on the 7th of July, but unless field notes or other information to the contrary is located it is accepted that Bigelow was one of the original collectors.

***Apiocera rockefelleri* Cazier, 1982**

Holotype.—AMNH, male (MEXICO: Chihuahua; Samalayuca).

Paratypes.—TTU-Z030044, TTU-Z030045.

Etymology.—"The species is named after David Rockefeller in grateful acknowledgment for his making possible this extensive 1947 [American Museum of Natural History] collecting expedition to Mexico."

Locality.—USA: Texas; Loving County, 44.8 km N Mentone.

Collectors and date.—O. F. Francke, J. V. Moody, and F. W. Merickel, 6 August 1979.

***Apiocera sonorae* Cazier, 1954**

Holotype.—AMNH, male.

Paratype.—TTU-Z030062.

Etymology.—None was stated; however, the holotype and paratypes were collected in the Mexican state of Sonora.

Locality.—MEXICO: Sonora; 32 km SW Sonoyta (type locality).

Collectors and date.—R. Schrammel, W. Gertsch, and M. Cazier, 13 June 1952.

***Apiocera spectabilis* Cazier, 1982**

Holotype.—AMNH, male.

Paratypes.—TTU-Z030071, TTU-Z030072.

Etymology.—"From the Latin *spectabilis*, meaning visible or remarkable in reference to its large size and contrasting black and white abdominal maculations."

Locality.—MEXICO: Baja California; Las Arrastras (type locality).

Collectors and date.—N. Leppla, J. Davidson, J. Bigelow, M. Bentzien, W. Fox, S. Williams, and M. Cazier, 5 June 1968.

Family Mydidae Latreille, 1809

Genus *Rhaphiomidas* Osten Sacken, 1877

***Rhaphiomidas hasbroucki* Cazier, 1985**

Holotype.—AMNH, male, (type locality USA: California; Riverside County, 4.8 km S Rice).

Paratypes.—TTU-Z030079, TTU-Z030080.

Etymology.—Named for F. F. Hasbrouck.

Locality.—USA: Arizona, Yuma County, 9.6 km SE Parker.

Collectors and date.—S. A. Gorodenski, J. M. Davidson, and M. Cazier, 7 May 1966.

Family Stratiomyidae Latreille, 1802
Genus *Labostigmina* Enderlein, 1930 = see Genus *Psellidotus* Rondani, 1864 (current name)

Genus *Manotes* Kertesz, 1916
***Manotes crassimanus* James, 1980**

Holotype.—NMNHENT (formerly USNM), female (MEXICO: Morelos; Cuernavaca).

Paratype.—TTU-Z030082.

Etymology.—Details not mentioned in original publication, but probably referring to the "front tarsus, especially basitarsus, much thicker than other pairs": *crassi* (Latin) = thick; *manus* (Latin) = hand.

Locality.—MEXICO: Oaxaca; 18 km S Petlalcingo.

Collector and date.—L. O'Brien, 28 June 1971.

Discussion.—The species was named by only one of the authors in James et al. (1980).

Genus *Psellidotus* Rondani, 1863 (current name) = Genus *Labostigmina* Enderlein, 1930
***Psellidotus dasyops* (James, 1979)**
= *Labostigmina dasyops* James, 1979 (basionym)

Holotype.—Stated in original publication to be at Washington State University, but CAS, number 14136, is listed in the type catalog of that institution [http://researcharchive.calacademy.org/research/entomology/typesDB/types.asp?page=2&family=Stratiomyidae], female.

Paratype.—TTU-Z030081, female.

Etymology.—Not stated in the original definition. *Dasy*- Greek, a combining form meaning hairy, shaggy, dense; *ops*, Greek: eyes or sight.

Locality.—MEXICO: Hidalgo; 38.4 km NE Jacala [1,524 m. elevation] (type locality).

Collectors and date.—C. O'Brien, L. O'Brien, and [G. B.] Marshall, 18 August 1971.

Discussion.—*Labostigmina dasyops* James, 1979 was described in the publication by James and McFadden (1979). Because *Labostigmina* Enderlein, 1930 was synonomized with *Psellidotus* Rondani, 1863 by Woodley (2001), the correct name for the species is now *Psellidotus dasyops* (James, 1979).

ORDER HEMIPTERA Latreille, 1807
Genus *Apiomerus* Hahn, 1831
***Apiomerus montanus* Berniker and Sizerlip, 2011**

Holotype.—University of California, Berkeley, UCB, number 00033405, male (USA: Utah; San Juan County, Navajo Mountains).

Paratypes.—TTU-Z052191[A], TTU-Z052207[A], TTU-Z052211[A], TTU-Z052278[B].

Etymology.—*Montanus* is a Latin word meaning mountain.

Localities.—[A]USA: Colorado; Fremont County; [B]USA: Arizona; Cochise County, 14.4–19.2 km E Portal.

Collectors and dates.—[A]Bill Jones, 11 June 1957; [B]D. E. Foster, J. V. Moody, 19 May 1974.

Discussion.—Only two of the authors named this species in the publication by Berniker et al. (2011). The distance of the paratype from near Portal is either incorrect or located in Hidalgo County, New Mexico.

Family Pentatomidae Leach, 1815
Genus *Chlorochroa* Stål, 1872
***Chlorochroa opuntiae* Esselbaugh, 1947**

Holotype.—NMNHENT (formerly USNM), male.

Paratypes.—TTU-Z030083, TTU-Z030084.

Etymology.—Named after the food plant, *Opuntia polyacantha*.

Locality.—USA: Washington; Whitman County, Clarkston (type locality).

Collector and date.—Charles O. Esselbaugh, 20 August 1947.

Genus *Oebalus* Stål, 1862 (current name) = Genus *Solubea* Bergroth, 1891
***Oebalus mexicanus* (Sailer, 1944) = *Solubea mexicana* Sailer, 1944 (basionym)**

Holotype.—NMNHENT (formerly USNM, number 56807), male, (type locality MEXICO: Colima; Vulcano).

Paratype.—TTU-Z030085.

Etymology.—The name is in reference to the country from where most localities are known.

Locality.—USA: Arizona; Pima County, Tucson Mountains.

Collector and date.—R. J. Beamer, 18 June 1933.

Discussion.—Tuscon [=Tucson] Mountains is misspelled in the originally publication. Sailer (1957) synonomized the genus *Solubea* Bergroth, 1891, under the genus *Oebalus* Stål, 1862 (current name) and therefore the species *Solubea mexicana* Sailer, 1944 (basionym) = *Oebalus mexicanus* (Sailer, 1944).

Genus *Solubea* Bergroth, 1891 = see Genus *Oebalus* Stål, 1862 (current name)

Family Cixiidae Spinola, 1839
Genus *Haplaxius* Fowler, 1904 (New World) = Genus *Myndus* Stål, 1862 (Old World) (in part)
***Haplaxius texensis* (Kramer, 1979)**
= *Myndus texensis* Kramer, 1979 (basionym)

Holotype.—NMNHENT (formerly USNM, number 75917), male.

Paratype.—TTU-Z030086.

Etymology.—No etymology was stated in the manuscript; however, the specimens were from Texas; Latin suffix *-ensis*, belonging to.

Locality and host.—USA: Texas; Culberson County, Pine Springs (type locality), type host food plant is *Yucca thompsoniana*.

Collectors and date.—C. W. O'Brien and G. B. Marshall, 3 July 1971.

Discussion.—Kramer (1979) synonymized the genera *Haplaxius* Fowler, 1904 and one other genus under *Myndus* Stål, 1862. In the same publication he also described the current species as *Myndus texensis* Kramer, 1979. Emeljanov (1989) then reinstated the genus *Haplaxius* for species found in the New World and by implication this included *H. texensis*. As now understood *Myndus* species are only known from the Old World.

ORDER HYMENOPTERA Linnaeus, 1758
Family Formicidae Latreille, 1809
Genus *Pogonomyrmex* Mayr, 1868
***Pogonomyrmex bigbendensis* Francke and Merickel, 1982**

Holotype.—CAS, worker ant.

Paratypes.—TTU-Z030087, TTU-Z030088, workers.

Etymology.—Name is based on Big Bend; and the Latin suffix *-ensis*, from or belonging to.

Locality.—USA: Texas; Brewster County, Big Bend National Park, Rio Grande Village (type locality).

Collectors and date.—O. F. Francke, J. V. Moody, and T. B. Hall, 30 July 1978.

Discussion.—Although the date listed on the top of the article was April 1981, the publication was not actually printed/available until 15 March 1982.

Pogonomyrmex texanus Francke and Merickel, 1982

Holotype.—CAS (USA: Texas; Lubbock County, Lubbock, Farm Road 2641 at Blackwater Draw).

Paratypes.—TTU-Z030089[A], TTU-Z030090[B], TTU-Z030091[C], TTU-Z030092[D], TTU-Z030093[E], TTU-Z030094[F], TTU-Z030095[G], TTU-Z030096[H], TTU-Z030097[I], TTU-Z030098[J], TTU-Z030099[K], TTU-Z030100[L], TTU-Z030101[M], TTU-Z030102[N], TTU-Z030103[O], TTU-Z030104[P], TTU-Z030105[Q], TTU-Z030106[R], TTU-Z030107[S], TTU-Z030108[T], TTU-Z030109[U].

Etymology.—The name is based on the state of Texas.

Localities.—[the number of ants reported here are the number and sex of specimens mounted for each catalog no.] [A]USA: Texas; Culberson County, McKittrick Canyon, Guadalupe Mountains National Park; [B]USA: Texas; Terrell County, 52.3 km N Dryden - 3 workers; [C] USA: Texas; Coke County, 22.4 km NW Robert Lee - 3 workers; [D]USA: Texas; Midland County, 48 km SW Midland - 3 workers; [E]USA: Texas; Brewster County, 28.8 km NE Marathon - 3 workers; [F]USA: Texas; Midland County, 48 km SW Midland - 3 workers; [G] USA: Texas; Brewster County, 6.4 km W Marathon - 3 workers; [H]USA: Texas; Crane County, 9.6 km W Crane - 3 workers; [I]USA: Texas; Pecos County, 10.4 km SE Sheffield - 2 workers; [J]USA: Texas; Dickens County, 21.6 km N Dickens - 3 workers; [K]USA: Texas; Reagan County, 20.8 km W Big Lake - 2 workers; [L] USA: Texas; Crosby County, 17.5 km N Crosbyton - 3 workers; [M]USA: Texas; Reagan County, 20.8 km W Big Lake - 2 workers; [N]USA: Texas; Midland County, 27.2 km S Midland - 3 workers; [O]USA: Texas; Upton County, 108.8 km N Rankin - 3 workers; [P]USA: Texas; Hall County, 23.2 km S Estelline - 3 workers; [Q]USA: Texas; Upton County, 108.8 km N Rankin - 3 workers; [R]USA: Texas; Presidio County, 34.2 km SW Marfa - 3 workers; [S]USA: Texas; Lubbock County, Lubbock - male alate; [T]USA: Texas; Lubbock County, Lubbock - 3 workers, male alate; [U]USA: Texas; Brewster County, 6.4 km W Marathon, - 3 workers.

Collectors and dates.—[A]O. F. Francke and J. V. Moody, 14 May 1978; [B]J. V. Moody and Meeks, 21 October 1978; [C]O. F. Francke, Moody, and Hall, 21 October 1978; [D]J. V. Moody and F. W. Merickel, 5 June 1979; [E]O. F. Francke, Moody, and T. B. Hall, 27 July 1979; [F]O. F. Francke, J. V. Moody, and F. W. Merickel, 5 June 1979; [G]O. F. Francke, J. V. Moody, and T. B. Hall, 27 July 1979; [H]O. F. Francke, J. V. Moody, and F. W. Merickel, 5 June 1979; [I]O. F. Francke, J. V. Moody, T. B. Hall, and W. D. Sissom, 10 August 1979; [J]W. D. Sissom, O. F. Francke, and J. V. Moody, 11 June 1979; [K]O. F. Francke, T. B. Hall, J. V. Moody, and W. D. Sissom, 10 August 1978; [L]R. D. Beckham, A. Cooper, G. C. Henderson, and K. C. Neece, 15 June 1978; [M]O. F. Francke, J. V. Moody, and W. D. Sissom, 10 August 1978; [N]O. F. Francke, J. V. Moody, F. W. Merickel, 12 August 1979; [O]. F. Francke, T. B. Hall, J. V. Moody, and W. D. Sissom, 11 August 1978; [P]D. P. Bartell, R. D. Beckham, A. Cooper, G. C. Henderson, and K. C. Neece, 8 June 1978; [Q]O. F. Francke, Hall, Moody, and Sissom, 11 August 1978; [R]O. F. Francke, J. V. Moody, and F. W. Merickel, 8 August 1978; [S]J. V. Moody, 2 August 1973; [T]J. V. Moody, 2 August 1973; [U]O. F. Francke, J. V. Moody, and T. B. Hall, 27 August 1979.

Discussion.—Although the date listed on the top of the article was April 1981, the publication was not actually printed/available until 15 March 1982.

ORDER LEPIDOPTERA Linnaeus, 1758
Family Saturniidae Boisduval, 1837
Genus *Hemileuca* Walker, 1855

Hemileuca slosseri Peigler and Stone, 1989

Holotype.—LACMNH, male, (type locality, USA: Texas; Kent County, Jayton).

Paratypes.—TTU-Z030111–030113, males.

Etymology.—Named in honor of Jeffrey E. Slosser, Texas Agricultural Experiment Station, Vernon, Texas.

Locality.—USA: Texas; Yoakum County, Taylor Ranch near Tokio.

Collector and date.—J. K. Wangberg, 4 November 1980.

Discussion.—Many types reared *ex-ovo* from *Quercus fusiformis*. Some taking three years to emerge.

Family Tortricidae Latreille, 1803
Genus *Synalocha* Powell, 1985
***Synalocha gutierreziae* Powell, 1985**

Holotype.—EMEC69054, male.

Paratypes.—TTU-Z030114[A], TTU-Z030115[B], TTU-Z030116[C], TTU-Z030117[B], TTU-Z030118-030121[A], TTU-Z030122[C], TTU-Z030123[C].

Etymology.—Not stated in the original publication; however, specimens were collected on plants of the genus *Gutierrezia* for which it seems likely that they were named after.

Localities.—[A] USA: Texas; Winkler County, 4 km E Wink; [B] USA: New Mexico; Lea County, Jal; [C] USA: Texas; Pecos County, 16 km E Fort Stockton.

Collectors and date.—[A] B. R. McPherson, May 1980; [B]. R. McPherson, 15 October 1979; [C] [James] Wangberg Collection, 15 September 1978.

ORDER PHTHIRAPTERA Haeckel, 1896
Family Trichodectidae Kellogg, 1896
Genus *Geomydoecus* Ewing, 1929
***Geomydoecus alcorni* Price and Emerson, 1971**

Holotype.—KU, male.

Paratypes.—TTU-Z030484, TTU-Z030485.

Etymology.—No reference to the etymology was mentioned in the original publication, but it is obviously the same specific name as the type host and as the collector of the host.

Locality and host.—MEXICO: Jalisco; [6 km W of] Mazamitla (type locality, 19.91556, -103.0776459 NAD27) on what was reported as *Pappogeomys alcorni* (type host specimen is the holotype of that species which is now recognized as *Pappogeomys bulleri alcorni* number KUM-39806, female).

Collector and date.—J. R. Alcorn, 18 October 1950.

Discussion.—In the original publication, the locality was recorded as only from Mazamitla without a specific location out of the city. A search of VertNet revealed the more specific locality and it is suggested that the type locality should thus be restricted to 6 km W Mazamitla and updated type host name of *Pappogeomys bulleri alcorni*.

***Geomydoecus costaricensis* Price and Emerson, 1971**

Holotype.—KU, male.

Paratypes.—TTU-Z030566–030574.

Etymology.—Named for the country of origin and the Latin suffix *-ensis*, belonging to.

Locality and host.—COSTA RICA; San José; [Volcan Irazu; Rancho Redondo] (type locality, 9.984181, -83.862255 NAD27), *Macrogeomys heterodus cartagoensis* (type host specimen number KUM-60663, male).

Collector and date.—L. Holdridge, 2 June 1954.

Discussion.—The current name used for the host is *Orthogeomys heterodus cartagoensis*. The name of the collector was provided by the KU mammal catalog on VertNet. The same database also listed the locality of the holotype's host as COSTA RICA: San José, Volcan Irazu; Rancho Redondo, not as San José, San José.

***Geomydoecus dariensis* Price and Emerson, 1971 (basionym) = see below under *Geomydoecus panamensis dariensis* Price and Emerson, 1971**

Geomydoecus duchesnensis Price and Emerson, 1971

Holotype.—NMNHENT (formerly USNM), male.

Paratype.—TTU-Z030491.

Etymology.—Named for the county of origin and the Latin suffix -*ensis*, belonging to.

Locality and host.—USA: Utah: Duchesne County; Strawberry River (type locality). Type host is *Thomomys talpoides*; probably *T. t. uinta*.

Collector and date.—D. M. Allred, 18 June 1957.

Geomydoecus fulvescens Price and Emerson, 1971

Holotype.—KU, male.

Paratypes.—TTU-Z030608–030611.

Etymology.—Probably based on the scientific name of the host.

Locality and host.—MEXICO: Veracruz; [3 km W] Limón (type locality, 19.5019444, 97.3777778 NAD27). *Pappogeomys merriami fulvescens* (type host specimen number KUM-19351, male)

Collector and date.—Walter W. Dalquest, 19 November 1946.

Discussion.—The name of the collector was provided by the KU mammal catalog on VertNet. It also listed the type locality (which is herein restricted) of this mite more precisely as 3 km W Limón.

Geomydoecus geomydis Osborn, 1891 = see *Geomydoecus subgeomydis* Price and Emerson, 1971

Geomydoecus jonesi Price and Emerson, 1971

Holotype.—KU, male.

Paratype.—TTU-Z030487.

Etymology.—Although not stated, the species is probably named after J Knox Jones, Jr. (at that time at the University of Kansas), who provided many of the specimens of gophers for the study by Price and Emerson (1971).

Locality and host.—MEXICO: Puebla; [1.6 km SSW of] Tilapa (type locality, 18.58038, 98.55975, NAD27). *Orthogeomys grandis felipensis* (type host specimen number KUM-62523, female).

Collector and date.—R. W. Dickerman, 13 August 1954.

Discussion.—The type locality was listed in the original publication as simply Tilapa, but on the label of the microscope slide for the paratype it is recorded as "1 mi (1.6 km) SSW Tilapa" and therefore the type locality should be restricted to that position. The name of the collector was provided by the KU mammal catalog on VertNet as well as confirmation of the data on the precise collecting locality listed above.

Geomydoecus mcgregori Price and Emerson, 1971

Holotype.—KU, male.

Paratypes.—TTU-Z030575–030586, TTU-Z030588, TTU-Z030612–030614.

Etymology.—Named after a Mr. McGregor, but which one is not certain. It is likely after E. Alexander McGregor who published several papers on taxonomy of Mallophaga during 1912-1918 while at the Bureau of Entomology, U. S. Department of Agriculture.

Locality and host.—MEXICO: Colima; [6.4 km SW] Colima (type locality, 19.2019022, -103.7717178 NAD27). Type host: *Cratogeomys fumosus* (type host specimen number KUM-39819, male).

Collector and date.—J. R. Alcorn, 25 November 1950.

Discussion.—Although this species is recorded from several species of pocket gopher, it is most often on the type host, which was reported as *Pappogeomys fumosus*. The host specific name is now considered

to belong in the genus *Cratogeomys*; as *Cratogeomys fumosus fumosus* (see Hafner et al. 2004). Although the type locality was listed in the original description of this parasite as just Colima, Colima; the KU mammal catalog on VertNet listed the precise collecting locality as ***6.4 km SW*** Colima and thus the type locality should be restricted to that point.

Geomydoecus merriami Price and Emerson, 1971

Holotype.—NMNHENT (formerly USNM), female (MEXICO: México; Nevado de Toluca, Raices).

Paratypes.—TTU-Z030564[A], TTU-Z030565[B].

Etymology.—Although the etymology of this name was not given in the original publication it was likely copied from the host's name *Pappogeomys merriami merriami*.

Locality and host.—[A] MEXICO: México; Nevado de Toluca; [B] MEXICO: México; 6.5 km S Raices, Nevado de Toluca. The type host is *Cratogeomys* (= *Pappogeomys*) *merriami merriami*.

Collector and date.—Collector uncertain, 22 March 1963.

Discussion.—The host's specific name is now considered to belong in the genus *Cratogeomys*; as *Cratogeomys merriami merriami* (see Hafner et al. 2004).

Geomydoecus mexicanus Price and Emerson, 1971

Holotype.—KU, male.

Paratypes.—TTU-Z030595–030605, TTU-Z030634.

Etymology.—Named for the country of origin.

Locality and host.—MEXICO: Puebla; 3.2 km S Atlixco (type locality). *Cratogeomys* (= *Pappogeomys*) *merriami saccharalis* (type host specimen at KUM.

Collector and date.—R. W. Dickerman, 9 August 1954.

Discussion.—In the original publication and on all the microscope slide labels at TTU, except for one slide (TTU-Z030595), the locality is simply listed as "Atlixco." On the single detailed label, it is listed as "2 mi. S. Atlixco." This is the only slide that is in a distinctively neat handwriting and includes the original collector's name and field catalog number R. W. Dickerman, number 4248, 5800 ft. Lot. 56-B149. Presumably it was the original label. A search of the records in the KU mammal catalog VertNet revealed six specimens of this species of gopher and they were all collected at the same locality "2 mi. S. Atlixco" and are numbered KUM 62513–62518. The collector and date were likewise all the same and like our samples: R.W. Dickerman, 9 August 1954. Therefore, the type locality is restricted to 3.2 km S. Atlixco. In the original publication the type host was reported as *Pappogeomys merriami saccharalis*; which is now considered to be a species of *Cratogeomys*.

Geomydoecus oklahomensis Price and Emerson, 1971

Holotype.—NMNHENT (formerly USNM), male.

Paratype.—TTU-Z030488.

Etymology.—Named for the state of origin and the Latin suffix *-ensis*, belonging to.

Locality and host.—USA: Oklahoma; Cleveland County (type locality). The type host is *Geomys bursarius*; probably the subspecies *dutcheri*.

Collector and date.—RW number 2096, December 1956.

Geomydoecus oregonus Price and Emerson, 1971
Geomydoecus oregonus oregonus Price and Emerson, 1971

Holotype.—KU, male.

Paratypes.—TTU-Z030464–030469[A], TTU-Z030470–030472[B], TTU-Z030473–030478[A], TTU-Z030479–030482[B], TTU-Z030483[A], TTU-Z030492–030494[A], TTU-Z030495[B].

Etymology.—No etymology was stated in the original publication; however, the species is known from Oregon.

Locality and host.—[A]USA: Oregon; Multnomah County, Portland (type locality, 45.5236, -122.675 NAD27; host specimen number KUM-10083); [B]USA: Oregon; Benton County, Granger (host specimen number KUM-94625). The type host is *Thomomys bulbivorus*.

Collectors and dates.—[A]S. G. Jewett, Jr., 10 April 1932; [B]G. L. Hickman, 15 February 1963.

Discussion.—The names of the collectors were provided by the KU mammal catalog on VertNet. The type specimens were described originally for this *Geomydoecus* species and subspecies. Since that time, Price and Hellenthal (1980) only recognized one species and no subspecies of *Geomydoecus oregonus*.

Geomydoecus panamensis Price and Emerson, 1971
= _Geomydoecus panamensis panamensis_ Price and Emerson, 1971 (current name)

Holotype.—NMNHENT (formerly USNM, number 5801), male.

Paratypes.—TTU-Z030562, TTU-Z030563.

Etymology.—No etymology was stated; however, they were collected in Panama and the Latin suffix *-ensis*, belonging to.

Locality and host.—PANAMA: Chiriquí; Cerro Punta (type locality), *Macrogeomys cavator* (type host).

Collector and date.—Collector uncertain, 28 January 1960

Discussion.— Price et al. (1985) recognized *Geomydoecus panamensis* as being composed of two subspecies which were given new status as *Geomydoecus panamensis panamensis* Price and Emerson, 1971 and *Geomydoecus panamensis dariensis* Price and Emerson, 1971. This arrangement of two subspecies was also accepted by Price et al. (2003) in their checklist to the lice of the world.

Geomydoecus panamensis dariensis Price and Emerson, 1971 (current name)
= _Geomydoecus dariensis_ Price and Emerson, 1971

Holotype.—NMNHENT (formerly USNM, number 000875), male (PANAMA: Darién Province; Jaqué).

Paratypes.—TTU-Z030559–030561.

Etymology.—Named for the location and the Latin suffix *-ensis*, belonging to.

Locality and host.—PANAMA: Darién Province; Darién. The type host is *Macrogeomys dariensis*, which is now recognized as *Orthogeomys dariensis*.

Collectors and date.—F. M Greenwell and T. H. Fleming, 1 March 1966.

Discussion.—*Geomydoecus dariensis* Price and Emerson, 1971 (basionym) was recognized as a subspecies of another species described in the same publication named *Geomydoecus panamensis* Price and Emerson, 1971. Price et al. (1985) recognized *Geomydoecus panamensis* as being composed of two subspecies which were given new status as the nominal subspecies and *Geomydoecus panamensis dariensis* Price and Emerson, 1971. This arrangement of two subspecies was also used by Price et al. (2003) in their catalog to the lice of the world.

Geomydoecus perotensis perotensis Price and Emerson, 1971

Holotype.—KU, male.

Paratypes.—TTU-Z030555[A], TTU-Z030556[A], TTU-Z030557[B], TTU-Z030558[B].

Etymology.—"This louse species is named *G*[*eomydoecus*]. *p*[*erotensis*]. *perotensis* on the basis of Hall and Kelson (1959) placing *P*[*appogeomys*]. *m*[*erriami*]. *estor* and *P*[*appogeomys*]. *m*[*erriami*]. *perotensis* together as subspecies of *Cratogeomys perotensis*, apart from *C*[*ratogeomys*]. *merriami*."

Locality and host.—[A] MEXICO: Veracruz; [3 km E] Las Vigas (type locality); [B] MEXICO: Veracruz; Altotonga. The type host is stated to be *Pappogeomys merriami estor* (type host specimen number KUM-19338, female) in the original description.

Collector and dates.— Walter W. Dalquest, [A] 4 November 1946, [B] 11 November 1946.

Discussion.—Like several other species described by Price and Emerson (1971), the type locality of the parasite (reported as Las Vigas) does not match that of the host (3 km E Las Vigas) according to data on VertNet. The correct current name of the host is unclear, but the name must be in combination with the generic name *Cratogeomys* and appears to be *C. perotensis* (see Hafner et al. 2005). The name of the collector was provided by the KUM catalog VertNet.

Geomydoecus polydentatus Price and Emerson, 1971

Holotype.—KU, male.

Paratypes.—TTU-Z030515–030517, TTU-Z030587, TTU-Z030589–030594.

Etymology.—Not discussed in the original description, but *poly* = many, *dentatus* = teeth, could refer to "The large number of prominent spines on the genital sac easily separates the ♂ of *G. polydentatus* from all other species."

Locality and host.—MEXICO: Jalisco; Lagos de Moreno (type locality, 21.35583, -101.93333 NAD27). The host species is *Cratogeomys zinseri* (type host specimen number KUM-103348).

Collector and date.—P. L. Clifton, 15 October 1965.

Discussion.—The name of the collector was provided by the KUM catalog on VertNet.

Geomydoecus quadridentatus Price and Emerson, 1971

Holotype.—KU, male.

Paratypes.—TTU-Z030496[A], TTU-Z030497[A], TTU-Z030498[B], TTU-Z030499[B].

Etymology.—Not discussed in original publication, but presumably has to do with the spines of the genital sac: "The ♂, with the scape as for *G. californicus* and *G. umbrini*, is separated from those species on the basis of the genital sac having only 4 large spines instead of 6."

Localities and host.—[A] USA: Texas; El Paso County, El Paso; [8 km S, 12.8 km E City Hall]; [B] USA: Texas; Hudspeth County, [Fort Hancock (type locality, 31.298333, -105.844722)]. The type host is *Geomys arenarius arenarius* (type host specimen number KUM-51998, female).

Collectors and dates.—[A] M. R. Lee, 26 July 1960; [B] G. H. Heinrich, 16 January 1953.

Discussion.—The name of the collector was provided by the KUM catalog on VertNet. The precise localities within the counties were from the same source.

Geomydoecus subcalifornicus Price and Emerson, 1971

Holotype.—NMNHENT (formerly USNM: H. S. Gentry, number 22407), male.

Paratype.—TTU-Z030501.

Etymology.—Original publication provides no details. The author possibly was thinking of the distribution with "sub" meaning below: "This species has an odd discontinuous distribution from southern California to 2 widely-spaced locations in Mexico."

Locality and host.—USA: California; Imperial County, Colorado Desert (type locality). The type host is *Thomomys bottae*.

Collector and date.—H. S. Gentry, 17 February 1934.

***Geomydoecus subgeomydis* Price and Emerson, 1971 (current name)**
= *Geomydoecus geomydis subgeomydis* Price and Emerson, 1971

Holotype.—NMNHENT (formerly USNM), male.

Paratype.—TTU-Z030534, female.

Etymology.—Not given in original publication. Literally the name *geo-mydas* means a king of or relating to the earth (ground), and *sub-* means beneath, presumably referring to the home of the host, a pocket gopher.

Locality and host.—USA: Texas; Walker County, [3.2 km NE Huntsville] on *Geomys bursarius* [*sagittalis*] (type host).

Collector and date.—R. D. Hodgins, 12 May 1957.

Discussion.—Although the original publication listed the collection locality as Huntsville, the paratype microscope slide is labeled "2 mi N. E." Hunstville. The point 3.2 km NE Hunstville should be considered the newly restricted type locality. Timm and Price (1980) also corrected the subspecies name of the type host. It was originally reported as *Geomys bursarius brazensis* and now the type host is *Geomys bursarius sagittalis*. The lice species was originally described as a subspecies *Geomydoecus geomydis subgeomydis* Price and Emerson, 1971. Later, Timm and Price (1980) recognized *Geomydoecus subgeomydis* Price and Emerson, 1971 to represent a full species.

***Geomydoecus traubi* Price and Emerson, 1971**

Holotype.—KU, male.

Paratypes.—TTU-Z030524–030532[A], TTU-Z030533[B].

Etymology.—No mention of or indication on the origin of the name is made in the original publication. Probably it is after Robert Traub, a well-known researcher on fleas/lice and other parasites of mammals.

Localities and host.—[A]MEXICO: México; [5 km W] Rio Frio (type locality, 19.3525, -98.72 NAD27); [B] MEXICO: México; La Piedra, Lagunas de Zempoala. The type host is *Pappogeomys merriami merriami* (type host specimen number KUM-19327).

Collectors and dates.—[A] Walter W. Dalquest; 23 September 1946; [B] Collector uncertain; 26 March 1963.

Discussion.—The precise locality information as well as name of collector and host are from VertNet. The type host is now named *Cratogeomys merriami*. The type locality of this species should be restricted to 5 km W Rio Frio.

***Geomydoecus trichopi* Price and Emerson, 1971**

Holotype.—KU, male.

Paratypes.—TTU-Z030625–030633.

Etymology.—Name is likely based on the specific and subspecific name *trichopus* of the host species.

Locality and host.—MEXICO: Michoacán; Sierra Patamba (type locality). Type host is *Zygogeomys trichopus trichopus* (type host specimen number KUM-62520).

Collector and date.—R. W. Dickerman, 29 June 1954.

***Geomydoecus umbrini* Price and Emerson, 1971**

Holotype.—KU, male.

Paratypes.—TTU-Z030502–030514[A], TTU-Z030535–030539[B].

Etymology.—The name is presumably based on the species name *umbrinus* of the former type host (see below in discussion). The name *umbrini* with the terminal *i* would suggest that it was named after a man, but no such connection has been discovered. The use of the terminal *i* was intentional because it was spelled that way consistently throughout the publication. The Latin *umbra* means shadow or a color of brown. The name is not emended here because it has been used in

this form in several publications and in doing so the understanding or recognition of the species will not be improved.

Locality and host.—[A] MEXICO: Sinaloa; [3.2 km NE Agua Caliente 24.23298, -106.61527, NAD27] Aguacaliente (KUM-97132, KUM-97133, both females); [B] MEXICO: Sinaloa; [5.6 km NE] San Lorenzo (type locality), *Thomomys umbrinus parviceps* (type host specimen number KUM-97136, male).

Collector and date.—[A, B] Listed by Price and Emerson (1971) incorrectly as "1.V.1965". VertNet listed all three collections as P. L. Clofton, [A] 21 February 1964, [B] 17 February 1964.

Discussion.—The type host listed by Price and Emerson is *Thomomys umbrinus parviceps*. That subspecies is now known (Hafner et al. 2011) in the combination of *Thomomys atrovarius parviceps*. This is a perfect example of why symbiotypes are important, especially when the name of the parasite matches an old name or incorrect modern identification. The type locality is given as San Lorenzo in the original publication, but the microscope slides of the paratypes are labeled as "3½ mi. NE" of San Lorenzo. This same distance NE the locality is also confirmed by data on VertNet and therefore that should be the new restricted type locality.

Geomydoecus wardi Price and Emerson, 1971

Holotype.—NMNHENT (formerly USNM), male.

Paratypes.—TTU-Z030849, TTU-Z030850.

Etymology.—Specific name is probably in honor of Ronald A. Ward, then of the Rocky Mountain Laboratory. He is thanked in the acknowledgments for collecting many of the specimens.

Locality and host.—USA: Colorado; Douglas County, D'Arcy Ranch, Cherry Creek (type locality); *Thomomys talpoides macrotis* (type host)

Collector and date.—R. L. Landberg, 10 April 1932.

Geomydoecus wernecki Price and Emerson, 1971

Holotype.—KU, male.

Paratypes.—TTU-Z030518–030523.

Etymology.—Although not stated in the publication, there are two references to publications in the Literature Cited by F. L. Werneck on trichodectid lice. It is likely that the species was dedicated to F. L. Werneck of Rio de Janeiro, an authority on lice.

Locality and host.—MEXICO: Jalisco; Lagos de Moreno (type locality, 21.35583, -101.93333 NAD27), *Pappogeomys zinseri* (type host specimen number KUM-103348, field number PLC 9661, female).

Collector and date.—P. L. Clifton, 15 October 1965.

Discussion.—The type host species has been transferred to *Cratogeomys* and is now known (Spradling et al. 2016) in the combination *Cratogeomys zinseri*.

Geomydoecus yucatanensis Price and Emerson, 1971

Holotype.—KU, male.

Paratype.—TTU-Z030486.

Etymology.—It is uncertain if the authors intended the name to be the same as for the host subspecies or a name based on the peninsula on which the species occurs.

Locality and host.—MEXICO: Campeche; [7 km N, 51 km E] Escárcega (type locality); *Orthogeomys hispidus yucatanensis* (type host, specimen number KUM-93630, host field number P. L. Clifton-3436).

Collector and date.—P. L. Clifton, 26 December 1962.

Discussion.—The type host has been transferred (Spradling et al. 2016) to *Heterogeomys* and is now known in the combination *Heterogeomys hispidus*

yucatanensis. The data on VertNet shows that the precise restricted type locality should be "7 km N, 51 km E Escarcega," not just "Escarcega." Price and Emerson did not give the KU catalog number for the male gopher from which the lice were recovered, but there is only one specimen in the KU collection that matches the date and collector and host for these lice. The microscope slide at TTU with the paratype is also inaccurately labeled "Escarcega."

Family Gyropidae Kellogg, 1896
Genus *Gyropus* Nitzsch, 1818
***Gyropus emersoni* Méndez, 1969**

Holotype.—NMNHENT (formerly USNM), male

Paratypes.—TTU-Z030540[A] (male and female), TTU-Z030541[B] (male and female), TTU-Z030542[C] (male and female), TTU-Z030543[A] (female), TTU-Z030544[D] (male).

Etymology.—Named in honor of Kary Emerson: "I am pleased to dedicate this species to Dr K. C. Emerson, a fine collaborator and an outstanding contributor to the knowledge of the bird and mammal Mallophagan fauna of the world."

Locality and host.—[A] PANAMA: Panamá; Madden Dam, Panama Canal Zone; [B] PANAMA: Panamá; 3.2 km W Gamboa, Panama Canal Zone (type locality); [C] PANAMA: Panamá; Fort Davis, Panama Canal Zone; [D] PANAMA: Panamá; Fort Clayton, Panama Canal Zone.

Type host is *Proechimys semispinosus panamensis*. According to the original publication all of the paratypes listed above were from this host. Labels on the microscope slides list nothing or only the generic name of the host.

Collectors and dates.—[A] Malaria Control Section personnel (slide label: PMS-MCS #1702), 5 October 1956; [B] H. W. Setzer, 27 January 1953; [C] F. S. Blanton, 9 October 1952 (slide label: RT-B-15443 Lot 54-9634); [D] F. S. Blanton, 20 November 1952 or H. W. Setzer, 14 January 1953 (no collector/date on slide label).

***Gyropus mesoamericanus* Méndez, 1969**

Holotype.—NMNHENT (formerly USNM), male.

Paratypes.—TTU-Z030616–030624.

Etymology.—In reference to Middle America.

Locality and host.—NICARAGUA: Zelaya [= Región Autónoma de la Costa Caribe Sur, former Departamento de Zelaya]; El Recreo, 25 m [= meters] S Río Mico, *Hoplomys gymnurus truei* (type locality and type host). The type host specimen is number KUM-110580, field number JDS-2989.

Collector and date.—JDS [J. D. Smith], 22 June 1967.

Genus *Gliricola* Mjöberg, 1910
***Gliricola arboricola* Méndez, 1969**

Holotype.—NMNHENT (formerly USNM), male.

Paratypes.—TTU-Z030551–030554, TTU-Z030615.

Etymology.—Name refers to the arboreal habits of the type host.

Locality and host.—PANAMA: Colón; Achiote, on *Diplomy labilis* (type locality and type host).

Collector and date.—V. E. Hatcher, 25 May 1956.

***Gliricola sylvatica* Méndez, 1969**

Holotype.—NMNHENT (formerly USNM), male. (PANAMA: Darién Province; Tacarcuna) (type locality).

Paratypes.—TTU-Z030547–030550.

Etymology.—*Sylvatica* meaning things pertaining to forests.

Locality and host.—PANAMA: Bocas del Toro; Bocas del Toro. All known specimens (including holotype) were collected on type host *Hoplomys gymnurus*.

Collector and date.—Collector uncertain, field number 5504, 29 January 1960.

Family Trimenoponidae Neumann, 1890
Genus *Cummingsia* Ferris, 1922
***Cummingsia inopinata* Méndez, 1971**

Holotype.—NMNHENT (formerly USNM, field number HTC-2425), male.

Paratypes.—TTU-Z030545, TTU-Z030546, 2 females.

Etymology.—No indication of the etymology is made in the original publication. However, the specific name is Latin, meaning unexpected, unforeseen, surprising and is presumably from the occurrence of this parasite on a rodent. The genus is otherwise known only as ectoparasites on South American marsupials.

Locality and host.—COLOMBIA: Departamento de Narino; Laguna de la Cocha (type locality), on *Thomasomys cinereiventer* (type host).

Collector and date.—H. Trapido, 16 May 1968.

ORDER SIPHONAPTERA Latreille, 1825
Family Rhopalopsyllidae Oudemans, 1909
Genus *Ectinorus* Jordan, 1942
***Ectinorus chilensis* Lewis, 1976**

Holotype.—NMNHENT (formerly USNM, number 73734), male.

Paratype.—TTU-Z100500.

Etymology.—Named after the country of origin, Chile; Latin suffix *-ensis*, belonging to.

Locality and host.—CHILE: Santiago; 10 km W Tiltil (type locality), on *Abrocoma bennetti* (type host).

Collector and date.—R. E. Martin, 4 November 1974

***Ectinorus martini* Lewis, 1976**

Holotype.—NMNHENT (formerly USNM, number 73735), male.

Paratype.—TTU-Z102469.

Etymology.—Named in honor of the collector, Robert E. Martin.

Locality and host.—CHILE: Malleco; Parque Nahuelbuta, 25 km W Angol (35°50′S, 72°57′W) (type locality), from *Aconaemys fuscus* (type host).

Collector and date.—R. E. Martin, 31 January 1975.

CLASS ARACHNIDA Lamarck, 1801
ORDER ARANEAE Clerck, 1757
Family Linyphiidae Blackwall, 1859
Genus *Ceratinella* Emerton, 1882
***Ceratinella playa* Cokendolpher, Torrence, Smith, and Dupérré, 2007**

Holotype.—TTU-Z029902, male[A].

Allotype.—TTU-Z029903, female[B].

Etymology.—Specific name refers to the shallow depressions on the Llano Estacado called playas, where the species was collected.

Localities.—[A]USA: Texas; Briscoe County, Playa number BR34 (34°32′12.336″N, 101°17′37.212″W); [B] Briscoe County, Playa number BR59 (34°24′40.896″N, 101°17′16.548″W).

Collectors and dates.—[A] S. M. Torrence and L. M. Smith, 15 June 2005; [B] S. M. Torrence and L. M. Smith, 22 June 2005.

Family Hahniidae Bertkau, 1878
Genus *Cicurina* Menge, 1871
***Cicurina troglobia* Cokendolpher, 2004**

Holotype.—AMNH, female.

Paratype.—TTU-Z031081 (TTU-TK126136), female.

Etymology.—From the Greek *trogl*, cave; and *bios*, life.

Locality.—USA: Texas; Bell County, Seven Mile Mountain Cave (type locality).

Collectors and date.—J. Reddell and M. Reyes, 28 June 2000.

Discussion.—Wheeler et al. (2017) transferred the genus *Cicurina* from the Dictynidae Pickard-Cambridge, 1871 (where this species was original placed) to the family Hahniidae.

Family Antrodiaetidae Gertsch, 1940
Genus *Antrodiaetus* Ausserer, 1871

***Antrodiaetus ashlandensis* Cokendolpher, Peck, and Niwa, 2005**

Holotype.—NMNHENT, male.

Paratype.—TTU-Z018833.

Etymology.—Based on the region of Oregon where the taxon was found. Latin suffix *-ensis*, belonging to.

Locality.—USA: Oregon; Jackson County, Ashland Ranger District, Rogue River National Forest (type locality).

Collectors and date.—[Christine G.] Niwa and [Robert W.] Peck, USFS, 11 October 1998.

***Antrodiaetus coylei* Cokendolpher, Peck, and Niwa, 2005**

Holotype.—NMNHENT, male.

Paratypes.—TTU-Z018830, TTU-Z018831.

Etymology.—Named for Fred Coyle.

Locality.—USA: Oregon; Jackson County, Ashland Ranger District, Rogue River National Forest (type locality).

Collectors and date.—[Christine G.] Niwa and [Robert W.] Peck, USFS, 11 October 1998.

***Antrodiaetus effeminatus* Cokendolpher, Peck, and Niwa, 2005**

Holotype.—NMNHENT, male.

Paratype.—TTU-Z018832.

Etymology.—Refers to the feminine likeness of the male tibia.

Locality.—USA: Oregon; Josephine County, Ashland Resource Area, Medford Ranger District, Bureau of Land Management (42°15′12″N, 123°27′41″W), (type locality).

Collectors and date.—[Christine G.] Niwa and [Robert W.] Peck, USFS, 9 October 2001.

ORDER MESOSTIGMATA Canestrini, 1891
Family Rhinonyssidae Trouessart, 1895
Genus *Mesonyssoides* Strandtmann and Clifford, 1962
= Genus *Tinaminyssus* Strandtmann and Wharton, 1958 (current name)

Genus *Ptilonyssus* Berlese and Trouessart, 1889

***Ptilonyssus perisorei* George, 1961**

Holotype.—NMNHENT (formerly USNM), female.

Paratype.—TTU-Z101338.

Etymology.—Not stated in original publication, but name is likely based on generic name of type host *Perisoreus*.

Locality and host.—USA: New Mexico; Santa Fe County, near Santa Fe, on *Perisoreus canadensis* (type locality and type host).

Collector and date.—R. W. Strandtmann, 27 November 1955.

***Ptilonyssus phainopeplae* George, 1961**

Holotype.—NMNHENT (formerly USNM), female.

Paratype.—TTU-Z101336, female.

Etymology.—Found on *Phainopepla*.

Locality and host.—USA: Texas; Val Verde County, [Juno], on *Phainopepla nitens* (type locality and type host).

Collectors and date.—R. W. Strandtmann and D. L. Brooks, 7 March 1958.

Discussion.—The locality Juno was not specified in the original publication, but it is listed on the microscope slide label.

Genus *Sternostoma* Berlese and Trouessart, 1889

***Sternostoma crotophagae* Pence and Casto, 1975b**

Holotype.—NMNHENT (formerly USNM, number 3648), female.

Paratype.—TTU-Z101106.

Etymology.—Not stated in original publication but obviously based on the genus of the type host *Crotophaga*.

Locality and host.—USA: Texas; La Salle County, Millett, from *Crotophaga sulcirostris*.

Collector and date.—S. D. Casto, 30 May 1974.

***Sternostoma dumetellae* Pence, 1972c**

Holotype.—NMNHENT (formerly USNM, number 3483), female.

Paratype.—TTU-Z102159.

Etymology.—Not stated in the original publication, but certainly based on genus of type host *Dumetella*.

Locality and host.—USA: Louisiana; St. John the Baptist Parish, Laplace, on *Dumetella carolinensis* (type locality and type host).

Collector and date.—D. B. Pence, 10 October 1970.

***Sternostoma sayornis* Pence and Casto, 1975b**

Holotype.—NMNHENT (formerly USNM, number 3649), female.

Paratype.—TTU-Z100080.

Etymology.—Not stated in the original publication, but obviously based on the genus of the host *Sayornis*.

Locality and host.—USA: Texas; Presidio County, Candelaria, on *Sayornis nigricans* (type locality and type host).

Collector and date.—S. D. Casto, 26 June 1974.

Genus *Tinaminyssus* Strandtmann and Wharton, 1958 (current name)
= Genus *Mesonyssoides* Strandtmann and Clifford, 1962

***Tinaminyssus ixoreus* (Strandtmann and Clifford, 1962)**
= *Mesonyssoides ixoreus* Strandtmann and Clifford, 1962 (basionym)

Holotype.—NMNHENT (formerly USNM), female.

Paratype.—TTU-Z101429, female.

Etymology.—Name based on the genus of the type host *Ixoreus*.

Locality and host.—USA: Montana; Ravalli County, Lost Horse Canyon, in the nasal turbinates of *Ixoreus naevius* (type locality and type host).

Collector and date.—C. Clifford, 14 September 1961.

Discussion.—The generic name *Mesonyssoides* Strandtmann and Clifford, 1962 (October) is a homonym of the slightly older name *Mesonyssoides* Fain and Nadchatram, 1962 (July) according to Domrow (1964). Thus, the type species *Mesonyssoides ixoreus* Strandtmann and Clifford, 1962 became *Tinaminyssus ixoreus* (Strandtmann and Clifford 1962) (current name)

***Tinaminyssus juxtamelloi* Pence and Canaris, 1976**

Holotype.—NMNHENT (formerly USNM, number 3705), female.

Paratypes.—TTU-Z101427 and 101428.

Etymology.—No indication of the etymology is made in the original publication. Presumably it was named "*juxta*" = from the French *juxta*position, Latin *iuxtā* ("near"), and *melloi* after the scientific name of the most closely related species = *Tinaminyssus melloi* (Castro, 1948).

Locality and host.—USA: New Mexico; Luna County, Membres, on what is now known in the combination *Patagioenas fasciata*. In the original description the host was listed as *Columbia fasciata* (type locality and type host).

Collector and date.—A. G. Canaris, 21 October 1974.

ORDER PSEUDOSCORPIONES Haeckel, 1866
Family Neobisiidae Chamberlin, 1930
Genus *Parobisium* Chamberlin, 1930
***Parobisium yosemite* Cokendolpher and Krejca, 2010**

Holotype [by locality code (collectors/dates code)].—TTU-Z051528 (Zara 3524), male[A (A)].

Paratypes [by locality code (collectors/dates code)].—TTU-Z051540 (Zara-940) [A (C)], male; TTU-Z051544 (Zara-920) [B (C)], tritonymph; TTU-Z051548 (Zara-3555) [A (C)], female; TTU-Z051552 (Zara 3549) [B (D),] deutonymph; TTU-Z051556 (Zara 3549) [B (D)], female; TTU-Z051564 (Zara 3563) [A (D)], deutonymph; TTU-Z051568 [C (E)], female; TTU-Z051572 [B (E)], male; TTU-Z051576 [C (E)], male; TTU-Z051580 (Zara 4175) [D (F)], female; TTU-Z051584 [A (A)], female; TTU-Z051588 [A (A)], female.

Etymology.—"The specific name Yosemite is used as a noun in apposition and is taken from the known localities which are in Yosemite (pronounced "yo-SEM-it-ee") Valley in Yosemite National Park of the U.S.A. The area was apparently named after the Yosemite Indian peoples (http://theautry.org/yosemite/ [accessed 1 Sept. 2010])."

Localities.—[A] USA: California; Mariposa County, Indian Cave, Journal Room; [B] USA: California; Mariposa County, Indian Cave, East Branch; [C] USA: California; Mariposa County, Indian Cave, West Branch; [D] USA: California; Mariposa County, Elf Village Cave.

Collectors and dates.—[(A)] J. Krejca and K. McDermid, 4 March 2009; [(B)] J. Krejca and G. Stock, 15 August 2006; [(C)] J. Krejca and G. Stock, 16 August 2006; [(D)] G. Stock, J. Krejca, K. McDermid, and R. Sas, 3 March 2009; [(E)] J. Krejca, 7 July 2009; [(F)] J. Krejca, 8 July 2009.

Discussion.—TTU-Z051548 is mounted on a SEM stub, whereas the other specimens are in ethanol.

Family Chthoniidae Daday, 1888
Genus *Tyrannochthonius* Chamberlin, 1929
***Tyrannochthonius muchmoreorum* Cokendolpher, 2009**

Holotype.—TTU-Z029677, male.

Etymology.—"The new species name is a patronym honoring Bill and Midge Muchmore."

Locality.—USA: Texas; Bell County, Fort Hood, Geocache Cave.

Collectors and date.—C. Pekins, J. Reddell, and M. Reyes, 27 June 2004.

Discussion.—Specimen is now mounted on SEM stub; right palp is in 75 % ethyl alcohol (same catalog no.).

ORDER SCHIZOMIDA Petrunkevitch, 1945
Family Hubbardiidae Cook, 1899
Genus *Rowlandius* Reddell and Cokendolpher, 1995
***Rowlandius engombe* Armas and Abud Antun, 2002**

Holotype.—IES, heteromorphic male. Type locality, DOMINICAN REPUBLIC, Santo Domingo, Engombe.

Paratypes.—TTU-Z031082 (heteromorphic male and 2 females).

Etymology.—Named for the type locality city "Nombre en aposición, referido a la localidad tipo."

Locality.—DOMINICAN REPUBLIC, Distrito Nacional, Engombe (type locality).

Collector and date.—A. J. Abud Antún, 28 September 1990.

Family Protoschizomidae Rowland, 1975
Genus *Agastoschizomus* Rowland, 1971
***Agastoschizomus texanus* Monjaraz-Ruedas, Francke, and Cokendolpher, 2016**

Holotype.—TTU-Z060311, adult female.

Paratype.—TTU-Z060312, a sub-adult male with same information as holotype.

Etymology.—Specific name refers to the state of Texas where the species was collected.

Locality.—USA: Texas; Val Verde County, Seminole Canyon State Park, Seminole Sink (type locality).

Collectors and date.—P. Paquin, M. Sanders, and K. O'Connor, 20 February 2009.

ORDER SARCOPTIFORMES Reuter, 1909
Family Hypoderidae Murry, 1877
Pelecanectes Fain, 1966 (basionym, now considered a subgenus)
= Genus *Neottialges* Fain, 1966 (current name)
***Neottialges apunctatus* (Pence and Courtney, 1973) = *Pelecanectes apunctatus* Pence and Courtney, 1973 (basionym)**

Holotype.—USNM.

Paratypes.—TTU-Z101044–101079, TTU-Z102224–102229.

Etymology.—Apunctatus literally meaning without punctures; possibly referring to the punctuations being "absent from the entire idiosomal surface."

Locality and host.—USA: Florida; Lee County, Bird Island from the Brown Pelican on *Pelecanus occidentalis carolinensis* (type locality, type host).

Collector and date.—C. H. Courtney, June 1972.

Discussion.— The current correct name combination is: *Neottialges apunctatus* (Pence and Courtney, 1973) according to Fain and Laurence (1979). These mites (hypopi only) were in subcutaneous tissues of trachea and neck.

Family Knemidokoptidae Dubinin, 1953
Genus *Picicnemidocoptes* Pence, 1972b
***Picicnemidocoptes dryocopea* Pence, 1972b**

Holotype.—NMNHENT (formerly USNM, number 3481), female.

Paratypes.—TTU-Z103877–103882.

Etymology.—Not defined in original publication, but it is probably in reference to the genus of the type host species, *Drycopus pileatus*.

Locality and host.—USA: Louisiana; St. Tammany Parish, Mandeville (type locality), *Drycopus pileatus* (type host).

Collector and date.—D. B. Pence, 14 August 1971.

Discussion.—In the description of the species it is stated that it is based on a holotype female, 11 paratype females, and 2 nymphs. Then under "Types: Holotype female, 3 paratype females, and one nymph USNM Coll. 3481, remaining specimens in collection of author." The series at TTU from Pence's collection now consists of 5 females and 1 nymph. The whereabouts of the other 2 female paratypes is uncertain.

Family Oppiidae Grandjean, 1954
Genus *Ramusella* Hammer, 1962
= now considered a subgenus, *Insculptoppia* Subias, 1980
***Ramusella cavernalis* (Ohkubo and Cokendolpher, 2002)**
= *Insculptoppia cavernalis* Ohkubo and Cokendolpher, 2002 (basionym)

Holotype.—USNM, Cokendolpher Cave Catalog #496.

Paratype.—TTU-Z-030778.

Etymology.—Latin meaning pertaining to cave.

Locality.—USA: New Mexico; Eddy County, Guadalupe Mountains, Lincoln National Forest, Hidden Cave (type locality).

Collectors and date.—J. C. Cokendolpher, V. J. Polyak, C. Belski, B. Eaton, and C. and J. Lee, 16 August 1992.

Discussion.—*Ramusella cavernalis* (Ohkubo and Cokendolpher, 2002) is the correct combination according to Subías et al. (2012).

ORDER TROMBIDIFORMES Reuter, 1909
Family Cloacaridae Camin, Moss, Oliver, Jr, and Singer, 1967
Genus *Caminacarus* Fain, 1968
***Caminacarus chrysemys* Pence and Casto, 1975a**

Holotype.—NMNHENT (formerly USNM, number 3642), female (USA: Louisiana; St. John the Baptist Parish, Laplace).

Paratype.—TTU-Z103883.

Etymology.—Named after the genus of the type host *Chrysemys scripta elegans*. The turtle's specific name has now been transferred to the genus *Trachemys*.

Locality.—USA: Louisiana; St. Charles Parish, Norco, Bonnet Carre Floodway.

Collector and date.—D. B. Pence, 19 February 1971.

Family Cytoditidae Oudemans, 1908
Genus *Cytonyssus* Fain, 1960
***Cytonyssus troglodyti* Pence, 1972a**

Holotype.—NMNHENT (formerly USNM, number 3437), female.

Paratype.—TTU-Z102233.

Etymology.—Not defined in original publication, but it is probably in reference to the mite living in a nasal cavity of a bird (family Troglodytidae).

Locality and host.—USA: Louisiana; St. Tammany Parish, Mandeville (type locality), *Thryothorus ludovicianus* (type host).

Collector and date.—Danny B. Pence, pre-1972.

Family Epidermoptidae Trouessart, 1892
Genus *Congocoptes* Fain, 1956
***Congocoptes dryocopi* Pence, 1972d**

Holotype.—NMNHENT (formerly USNM, number 3497), female.

Paratype.—TTU-Z102311.

Etymology.—Named for the genus *Dryocopus*, the host.

Locality and host.—USA: Louisiana; St. John the Baptist Parish, Laplace, in nasal cavity of the type host, *Dryocopus pileatus*.

Collector and date.—Danny B. Pence, 10 February 1970.

***Congocoptes sphyrapicicola* Pence, 1972d**

Holotype.—NMNHENT (formerly USNM, number 3498), female, (type locality, USA: Louisiana; St. Tammany Parish, Covington).

Paratype.—TTU-Z102310.

Etymology.—Refers to living on *Sphyrapicus*; *-cola* (Latin) inhabitant.

Locality and host.—USA: Louisiana; St. Tammany Parish, Mandeville, (type host, *Sphyrapicus varius*).

Collector and date.—Danny B. Pence, 4 December 1970.

Family Ereynetidae Oudemans, 1931
Genus *Astrida* Fain, 1955
= Genus *Ralliboydaia* Fain, 1962 (in part)
***Ralliboydaia coccyzae* (Pence, 1973)**
= *Astrida coccyzae* Pence, 1973 (basionym)

Holotype.—NMNHENT (formerly USNM, number 3510), female.

Paratype.—TTU-Z102288.

Etymology.—Name based on the genus of the host *Coccyzus americanus*.

Locality and host.—USA: Louisiana; St. Tammany Parish, Mandeville on *Coccyzus americanus* (type locality and type host).

Collector and date.—Danny B. Pence, 12 May 1970.

Discussion.—Both of the genera *Astrida* Fain, 1955 and *Ralliboydaia* Fain 1962 are in use today. *Astrida coccyzae* Pence, 1973 was recognized as *Ralliboydaia coccyzae* (Pence, 1973), new combination, by Fain (1985).

Genus *Boydaia* Womersley, 1953
***Boydaia pheucticola* Pence and Casto, 1976**

Holotype.—NMNHENT (formerly USNM, number 3706), female.

Paratypes.—TTU-Z101393–101396.

Etymology.—Refers to living on the bird *Pheucticus*; *-cola* (Latin) inhabitant.

Locality and host.—USA: Texas; Jeff Davis County, near Fort Davis on *Pheucticus melanocephalus* (type locality and type host).

Collector and date.—Danny B. Pence, 1 August 1974.

Family Podapolipidae Ewing, 1922
Genus *Eutarsopolipus* Berlese, 1913
***Eutarsopolipus brevichelus* Husband and Husband, 2003**

Holotype.—MO-WREEM, Number RWH210503-1, female, (type locality and type host, USA: Missouri; Boone County, Ashland, under elytra of *Stenolophus lecontei*).

Paratypes.—TTU-Z012684, TTU-Z015898–015905.

Etymology.—The species name is in reference to the short cheliceral stylets in adult females.

Locality and host.—[A] USA: Texas; Hemphill County, 12.9 km NE Canadian; [B] USA: Texas; Garza County, Justiceburg [reported as Justiceberg, misspelled on specimen label too], all on *Stenolophus lecontei*.

Collector and date.— [A] C. W. O'Brien, 23 June [incorrectly reported as 13 June and 23 July] 1970; [B] [C. R.] Ward and [E.W.] Huddleston, 13 October 1968.

Host: TTU-Z012131 [A]: parasites: TTU-Z012684, RWH03022003-2, 1 egg with larval female inside.

Host: TTU-Z012669[A]: parasites TTU-Z015903, RWH5032003-2, 1 female, 1 male; TTU-Z015904, RWH5032003-6, 1 larval female; TTU-Z015905, RWH5032003-7, many others in ethanol.

Host: TTU-Z012670[A]: parasite TTU-Z015900, RWH5032003-8, 1 larval female:

Host: TTU-Z012627[B]: parasites TTU-Z015898, RWH02802203-3, 1 larval female, vial with many larval females in ethanol; TTU-Z015899, RWH28022003-4, 1 larval female; TTU-Z015901, RWH28022003-6, 1 male; TTU-Z015902, RWH28022003-8, 1 male, 1 female, 1 larval female, 7 eggs.

Genus *Ovacarus* Stannard and Vaishampayan, 1971
***Ovacarus peellei* Husband, 1974**

Holotype.—University of Georgia, Acarology Collection, male

Paratypes.—TTU-Z030777, TTU-Z030779.

Etymology.—Named after Miles L. Peelle, Professor Emeritus of Adrian College.

Locality and host.—USA: North Dakota; Barnes County, Valley City (type locality), found in sacs associated with the oviducts of the type host *Pasimachus elongates*.

Collector and date.—P. W. Fattig, 28 August 1917.

CLASS NEMATODA Diesing, 1861
ORDER SPIRURIDA Chitwood, 1933
Family Tetrameridae Travassos, 1914
Genus *Tetrameres* Creplin, 1846
***Tetrameres americana* Cram, 1927**

Holotype.—NMNH Invertebrate Zoology (USNM 1328686), formerly US National Parasite Collection (USNPC number 026382), http://n2t.net/ark:/65665/38d7d16ed-021e-46a2-83f1-41130c5e4568), type + paratype, sex of type not published but description based on both sexes.

Paratype.—TTU-Z101561.

Etymology.—Name based on continent of origin, North America.

Locality and host.—USA: District of Columbia: Washington, proventriculus of *Gallus gallus*, type host.

Collector and date.—Not reported in the original publication, but data from NMNH catalog is listed as: M. C. Hall and E. B. Cram, 4 March 1922.

Discussion.—The microscope slide with the two slide covers is more recent than those from Cram's time. It was presumably deposited here and remounted during studies by Mollhagen (1976) as the handwriting on the slide label matches other parasite labels of that time period in the collection. Mollhagen (1976) synonymized this species with another of an earlier described species, but as noted by Bergan et al. (1994) [see also introductory material under discussion of this paper] this doctoral dissertation is unpublished and has no standing in nomenclature or taxonomy.

CLASS CHONDRICHTHYES Huxley, 1880
ORDER CHIMAERIFORMES Obruchev, 1953
Family Chimaeridae Bonaparte, 1831
Genus *Chimaera* Linnaeus, 1758
† *Chimaera zangerli* Stahl and Chatterjee, 1999

Holotype.—TTU-P09413; a left palatine toothplate, a right palatine toothplate, two toothplate fragments, and a chondrocranial fragment.

Etymology.—The species is named for Rainer Zangerl of the Field Museum of Natural History, Chicago.

Locality.—ANTARCTICA: Seymour Island; MOTT VPL 3397 (64°15.767′S, 56°44.600′W).

Stratigraphy and Age.—Lopez de Bertodano Formation. Maastrichtian, Late Cretaceous.

Collectors and date.—S. Chatterjee and B. J. Small, 1 January 1984.

Discussion.—The elements of the holotype specimen were all found together in a small nodule.

CLASS OSTEICHTHYES Huxley, 1880
ORDER BERYCIFORMES Regan, 1909 *sensu* Zehren, 1979
Family Trachichthyidae Patterson, 1964 *sensu* Gayet, 1982
† Genus *Antarctiberyx* Grande and Chatterjee, 1987
† *Antarctiberyx seymouri* Grande and Chatterjee, 1987

Holotype.—TTU-P09210; the anterior portion of a skull, with part of the dentary attached.

Etymology.—The generic name is composed of *Antarcti* for the locality, Antarctica, and *beryx* - a fish (Latin). The species name *seymouri* is for the type locality of Seymour Island.

Locality.—ANTARCTICA: Seymour Island; MOTT VPL 3398 (64°16.967′S, 56°44.750′W).

Stratigraphy and Age.—Lopez de Bertodano Formation. Maastrichtian, Late Cretaceous.

Collectors and date.—S. Chatterjee and B. J. Small, 1985.

CLASS AMPHIBIA Grey, 1825
† ORDER TEMNOSPONDYLI Zittel, 1888 *sensu* Yates and Warren, 2000
† Suborder Stereospondyli E. Frass, 1889 *sensu* Yates and Warren, 2000
Family not resolved
† Genus *Rileymillerus* Bolt and Chatterjee, 2000
† *Rileymillerus cosgriffi* Bolt and Chatterjee, 2000

Holotype.—TTU-P09168, skull.

Etymology.—"The generic name refers to Riley C. Miller, who generously permitted the junior author to collect at the Post Quarry. The species is named for the late John Cosgriff, a lifelong student of Triassic temnospondyls."

Locality.—USA: Texas; Garza County, 15 km SE Post, R. C. Miller Ranch, Post Quarry, MOTT VPL 3624 (33°03.321′N, 101°19.010′W).

Stratigraphy and Age.—Tecovas Formation, Dockum Group. Norian, Triassic.

Collectors and date.—S. Chatterjee and MoTTU field crew, 1 June 1982.

Discussion.—Additional material including postcranial material was also collected (TTU-P09170); two badly preserved partial mandibles, 15 vertebrae, ribs, and unidentified bone fragments. However, it was not associated with the holotype and appears to belong to a much smaller specimen, if it belongs to the same taxon.

CLASS REPTILIA Laurenti, 1768
† ORDER PLESIOSAURIA de Blainville, 1835
† Family Cryptoclididae Williston, 1925
† Genus *Turneria* Chatterjee and Small 1989 (preoccupied)
= † Genus *Morturneria* Chatterjee and Creisler, 1994 (current name)
† *Morturneria seymourensis* (Chatterjee and Small, 1989)
= † *Turneria seymourensis* Chatterjee and Small, 1989 (basionym)

Holotype.—TTU-P09219, skull and associated cervical vertebrae.

Etymology.—The generic names, *Turneria* and the replacement name, *Morturneria*, were both proposed in "honor of Dr. Mort D. Turner for his keen interest in the Seymour Island project." The species name *seymourensis* is for the type locality on Seymour Island, and the Latin suffix *-ensis*, from or belonging to.

Locality.—ANTARCTICA: Seymour Island; MOTT VPL 3399 (64°16.417′S, 56°44.417′W).

Stratigraphy and Age.—Lopez de Bertodano Formation. Maastrichtian, Late Cretaceous.

Collectors and date.—S. Chatterjee and B. J. Small, 1985.

Discussion.—The generic name *Morturneria* Chatterjee and Creisler 1994 was proposed and accepted because the name it was replacing (*Turneria* Chatterjee and Small 1989) was preoccupied by the name of an ant genus *Turneria* Forel 1895. Thus resulting in the new combination (current name) for the species *Morturneria seymourensis* (Chatterjee and Small 1989).

† CLADE ARCHOSAURIFORMES Gauthier, 1986
† ORDER PHYTOSAURIA Jaeger, 1828 *sensu* Nesbitt, 2011
† Family Parasuchidae Lydekker, 1885 (current name)
= † Family Phytosauridae Jaeger, 1828 *sensu* Doyle and Sues, 1995

Discussion.—When the first phytosaur fossils were described, it was not clear what kind of animal they represented. The first genus and species named was *Phytosaurus cylindricodon* Jaeger, 1828 because that author mistakenly thought that ossified mud fillings in the jaw were representive of herbivore teeth (= *Phytosaurus*). The specimen is in too poor of condition to be diagnostic, regarded genus as indeterminable by Gregory and Westphal (1969), and thus this specific/generic names are no longer valid. The name of the group (Order) Phytosauria was "coined" by Hermann von Meyer in 1861, on the basis of this first named species. Parasuchidae as described by Jaeger was formalized by Lydekker, 1888 or as "Jaeger, 1828 *sensu* Nesbitt, 2011." Regardless of which position is taken (1888 or 1828 sensu 2011) they are more recent dates than that held by the senior synonym and currently used name Parasuchidae Lydekker, 1885. Unfortunately, the use of the ordinal name is well established despite being a totally inappropriate name for carnivores. Given the designation by the ICZN of a neotype for *Parasuchus* (Chatterjee 2001; ICZN 2003), this genus takes priority over '*Paleorhinus*' as the senior synonym. As a result, all species in the *Paleorhinus* were reassigned to the genus *Parasuchus* by Kammerer et al. (2015). They also suggested to use Parasuchidae to include taxa traditionally included in the Phytosauridae as well as *Parasuchus*.

Genus *Wannia* Stocker, 2013 (current name) = † Genus *Paleorhinus* Williston, 1904 (in part)
† *Wannia scurriensis* (Langston, 1949)
= † *Paleorhinus scurriensis* Langston, 1949 (basionym)

Holotype.—TTU-P00539 (WTMus. Pal. Col. number 539); partial skull lacking premaxilla.

Etymology.—The new generic name was in honor of Wann Langston, TMM, who originally described and named the taxon while he was at TTU. The species name is in reference to Scurry County where the specimen was discovered.

Locality.—USA: Texas; Scurry County, 4 km NE Camp Springs, H. G. Bryan farm, MOTT VPL 0694 (approximately 32°47.924′N, 100°40.388′W).

Stratigraphy and Age.—Santa Rosa Formation (Camp Springs Formation), Dockum Group. Late Carnian, Triassic.

Collector and date.—John Clark, 18 March 1937.

Discussion.—This species was originally described by Langston (1949) in the genus *Paleorhinus* Williston, 1904. Later it was incorrectly synonymized with the type species of the genus, *Paleorhinus bransoni* Williston, 1904 by Hunt and Lucas (1991). Upon redescription it was revealed that *scurriensis* was instead the basal most known member of the family, justifying the erection of a new monotypic genus *Wannia* Stocker, 2013.

† Genus *Machaeroprosopus* Mehl, 1916
† *Machaeroprosopus lottorum* Hungerbühler, Mueller, Chatterjee, and Cunningham, 2013

Holotype.—TTU-P10076, a complete skull.

Paratype.—TTU-P10077, a complete skull.

Etymology.—The species name is in honor of John Lott and Patricia Lott Kirkpatrick for their support.

Locality.—USA: Texas; Garza County, Patricia Quarry, MOTT VPL 3870. Specific locality withheld: Paleontology Division policy prohibits publication of geographic coordinates where active research is taking place.

Stratigraphy and Age.—Bull Canyon Formation, Dockum Group. Norian, Triassic.

Collector and date.—Doug Cunningham, 2001.

CLADE ARCHOSAURIA Cope, 1869 *sensu* Nesbitt, 2011
CLADE SUCHIA Krebs, 1974
† CLADE AETOSAURIA Marsh, 1884 *sensu* Parker, 2007
† Family Stagonolepididae Lydekker, 1887 *sensu* Heckert and Lucas, 2000
† Genus *Tecovasuchus* Martz and Small, 2006
† *Tecovasuchus chatterjeei* Martz and Small, 2006

Holotype.—TTU-P00545, five paramedian osteoderms, three fragmental paramedian osteoderms, a lateral osteoderm, a fragmental lateral osteoderm, a partial vertebra, and a partial braincase.

Etymology.—"The generic name is for the Tecovas Formation, from which all currently known material is derived; the specific epithet honors Dr. Sankar Chatterjee for his guidance as our mentor and his contributions to Triassic vertebrate paleontology."

Locality.—USA: Texas; Oldham County, NW Amarillo, near Rotten Hill, along breaks of Sierrita de la Cruz Creek, MOTT VPL 3621.

Stratigraphy and Age.—Tecovas Formation, Dockum Group. Norian, Triassic.

Collector and date.—Wann Langston, Jr., 1945.

† Genus *Desmatosuchus* Case, 1920
† *Desmatosuchus smalli* Parker, 2005

Holotype.—TTU-P09024, a nearly complete skull and right mandible, partial pelvis, femora, nearly complete series of cervical osteoderms, numerous other associated osteoderms.

Paratypes.—TTU-P09023, a well-preserved skull and mandibles, a scapulocoracoid, a humerus, a dorsal vertebra, cervical lateral spine, associated dorsal osteoderms; TTU-P09025, partial skull with teeth; TTU-P09027, pelvis; TTU-P09170, right humerus and ulna.

Etymology.—"Nommé en l'honneur de Bryan Small, pour son travail détaillé sur les aétosaures." The species name honors Bryan Small for his work with aetosaurs.

Locality.—USA: Texas; Garza County, 15 km SE Post, R. C. Miller Ranch, Post Quarry, MOTT VPL 3624 (33°03.321′N, 101°19.010′W).

Stratigraphy and Age.—Tecovas Formation, Dockum Group. Norian, Triassic.

Collectors and date.—S. Chatterjee and MoTTU field crews, 1984.

CLADE PARACROCODYLOMORPHA Parrish, 1993
† Family Shuvosauridae Chatterjee, 1993
† Genus *Shuvosaurus* Chatterjee, 1993
† *Shuvosaurus inexpectatus* Chatterjee, 1993

Holotype.—TTU-P09280, a nearly complete skull, left mandible, and a dorsal vertebra.

Paratypes.—TTU-P09281, anterior portion of 2 dentaries, left atlantal neural arch, and a right scapula; TTU-P09282, partial skull comprised of premaxillae, frontal, squamosal, palatoquadrate, braincase, and atlas vertebra. These were listed as hypodigms, not paratypes.

Etymology.—"The generic name is given in recognition of my son, Shuvo, who discovered the material during preparation. Specific name implies the unexpected find of an ornithomimosaur in the Late Triassic."

Locality.—USA: Texas; Garza County, 15 km SE Post, R. C. Miller Ranch, Post Quarry, MOTT VPL 3624 (33°03.321′N, 101°19.010′W).

Stratigraphy and Age.—Tecovas Formation, Dockum Group. Norian, Triassic.

Collectors and date.—S. Chatterjee and MoTTU field crews, 1984.

Discussion.—Misassociated fossils found together or misinterpreted age classes have occasion-

ally created taxonomic problems. TTU-P09001 and TTU-P09003–09011 were originally misidentified and designated as paratypes of *Postosuchus kirkpatricki* Chatterjee, 1985. Long and Murry (1995) pointed out that the post-cranial skeletons, paratypes of *P. kirkpatricki* that were reported as juveniles in the original description, belonged to their *Chatterjeea elegans* with TTU-P09001 becoming the holotype. Nesbitt (2007) synonymized *Chatterjeea* as a junior synonym of *Shuvosaurus*. *Shuvosaurus inexpectatus* was named based on a skull, whereas the postcrania of the same species were named *Chatterjeea elegans* Long and Murry, 1995. *Effigia okeeffeae* Nesbitt and Norell, 2006 (type species of the genus) was recognized by both associated skull and postcranium. Recognizing the complete skeleton of *Effigia*, Lucas et al. (2007) synonymized that genus as a junior synonym of *Shuvosaurus* and then only recognized two species: *Shuvosaurus inexpectatus* (= *Chatterjeea elegans*) and *Shuvosaurus okeeffeae* (= *Effigia okeeffeae* Nesbitt and Norell, 2006, basionym).

† Genus *Chatterjeea* Long and Murry, 1995 (junior synonym)
= † Genus *Shuvosaurus* Chatterjee, 1993 (correct name)

† *Chatterjeea elegans* Long and Murry, 1995 (junior synonym)
= † *Shuvosaurus inexpectatus* Chatterjee, 1993

Holotype.—TTU-P09001, a complete post-cranial skeleton.

Etymology.—The genus is named "After Professor Sankar Chatterjee, discoverer of the holotypic material." "The species epithet is from the Latin *elegans*, meaning very fine or beautiful."

Locality.—USA: Texas; Garza County, 15 km SE Post, R. C. Miller Ranch, Post Quarry, MOTT VPL 3624 (33°03.321′N, 101°19.010′W).

Stratigraphy and Age.—Tecovas Formation, Dockum Group. Norian, Triassic.

Collectors and dates.—Sankar Chatterjee and MoTTU field crews, 1980–1985.

Discussion.—TTU-P09001 and TTU-P09003–09011 were originally misidentified and designated as paratypes of *Postosuchus kirkpatricki* Chatterjee, 1985. Long and Murry (1995) pointed out that many of the juvenile skeletons (TTUP 9003–9011) which Chatterjee assigned to *P. kirkpatricki*, belonged to a distinct new genus and species, which they named as *Chatterjeea elegans*. In the same publication (Long and Murry 1995) remarked that they only had postcranial material of *Chatterjeea elegans* and "If our speculations are confirmed that the skull of *Shuvosaurus inexpectatus* belongs with the postcranium of *Chatterjeea elegans*, the former shall be the senior synonym. Until that time, we regard these animals as distinct taxa." The species was then synonymized with *Shuvosaurus inexpectatus* by Nesbitt (2007). See also discussion under *Shuvosaurus inexpectatus*.

† Family Rauisuchidae Huene, 1936

† *Postosuchus kirkpatricki* Chatterjee, 1985

Holotype.—TTU-P09000, a well-preserved skull and partial postcranial skeleton.

Paratypes.—TTU-P09002, nearly complete skeleton. Misassociated (misidentified) designated paratypes: TTU-P09001, TTU-P09003–09011.

Etymology.—"The generic name refers to the town of Post, near which the type material was discovered; the specific name is given in honour of Mr. and Mrs. Kirkpatrick for their help and hospitality during my field work."

Locality.—USA: Texas; Garza County, 15 km SE Post, R. C. Miller Ranch, Post Quarry, MOTT VPL 3624; (33°03.321′N, 101°19.010′W).

Stratigraphy and Age.—Tecovas Formation, Dockum Group. Norian, Triassic.

Collectors and date.—Sankar Chatterjee and MoTTU field crews, 1983.

Discussion.—TTU-P09001 and TTU-P09003–09011 were originally misidentified and designated as paratypes of *P. kirkpatricki* by Chatterjee (1985). Later these fossils were designated as the holotype and referred specimens for *Chatterjeea elegans* Long and Murry, 1995 and then that species was synonymized with *Shuvosaurus inexpectatus* by

Nesbitt (2007). Thus, leaving only the holotype (TTU-P09000) and paratype (TTU-P9002) of the type series as representative of *P. kirkpatricki*. Also, see discussion under *Shuvosaurus inexpectatus* Chatterjee, 1993.

† CLADE DINOSAUROMORPHA Benton, 1984
† CLADE DINOSAURIFORMES Novas, 1992
† Clade Silesauridae Langer, Ezcurra, Bittencourt, and Novas, 2010
† *Technosaurus smalli* Chatterjee, 1984

Holotype.—TTU-P09021, a dentary, premaxilla, and an astragalus.

Etymology.—"The generic name is given in honor of Texas Tech University, the specific name in recognition of the generous help afforded by Bryan J. Small in the field and laboratory."

Locality.—USA: Texas; Garza County, 15 km SE Post, R. C. Miller Ranch, Post Quarry, MOTT VPL 3624 (33°03.321′N, 101°19.010′W).

Stratigraphy and Age.—Tecovas Formation, Dockum Group. Norian, Triassic.

Collectors and date.—Sankar Chatterjee and MoTTU field crews, 1983.

Discussion.—Chatterjee originally described *Technosaurus* as an ornithischian dinosaur; however, because of more recent discoveries it is considered to be a dinosauriforme, not an ornithischian (Nesbitt et al. 2007).

CLASS AVES Linnaeus, 1758
† ORDER PROTOAVIFORMES Chatterjee, 1991
† Family Protoavidae Chatterjee, 1991
† Genus *Protoavis* Chatterjee, 1991
† *Protoavis texensis* Chatterjee, 1991

Holotype.—TTU-P09200, partial skull.

Paratype.—TTU-P09201, partial skull and partial postcranial skeleton.

Etymology.—The generic name refers to Latin for "first bird." The specific name was given in honor of the State of Texas where the specimen was discovered; and the Latin suffix *-ensis*, from or belonging to.

Locality.—USA: Texas; Garza County, 15 km SE Post, R. C. Miller Ranch, Post Quarry, MOTT VPL 3624 (33°03.321′N, 101°19.010′W).

Stratigraphy and Age.—Tecovas Formation, Dockum Group. Norian, Triassic.

Collector and date.—B. J. Small, August 1983.

Discussion.—The order, family, and the monotypic genus are all based on this species and it's placement in the class Aves. Ostrom (1996) was one of the most vocal critics. He questioned the interpretation of the bones and the association of the bones. Chatterjee (1998) published a paper in response to his doubters. Chatterjee (1999) restated the characters and reasons why he believes that *Protoavis texensis* is avian. Witmer (2001) discussed the contentious history of the taxon and the potential that the species is a chimera (misassociated fossils) of more than one taxon and detailed various aspects as to whether *Protoavis* was or was not avian.

ORDER GAVIIFORMES Wetmore and Miller, 1926
† Family Vegaviidae Agnolín, Brissón Egli, Chatterjee, Garcia Marsà, and Novas, 2017
† Genus *Polarornis* Chatterjee, 2002
† *Polarornis gregorii* Chatterjee, 2002

Holotype.—TTU-P09265, skull, four cervical vertebrae, left femur, proximal left tibiotarsus, proximal right femur, and sternal fragment.

Etymology.—"*Polar*, referring to Antarctica where it was found; *ornis* (Latin): bird; *gregorii*: in honor of Joseph T. Gregory for his contributions to vertebrate paleontology."

Locality.—ANTARCTICA: Seymour Island; MOTT VPL 3399 (64°16.417′S, 56°43.417′W).

Stratigraphy and Age.—Sandwich Bluff Member, Lopez de Bertodano Formation. Maastrichtian, Cretaceous.

Collector and date.—B. J. Small, August 1983.

Discussion.—The specimen is currently considered to be that of an early loon-like bird.

† CLASS SYNAPSIDA Osborn, 1903
† ORDER THERAPSIDA Broom, 1905
† Family Tritheledontidae Broom, 1912
† Genus *Pachygenelus* Watson, 1913
† *Pachygenelus milleri* Chatterjee, 1983

Holotype.—TTU-P09020, right dentary, juvenile.

Etymology.—"The specific name is given in recognition of R. C. Miller and his wife for their help and hospitality during my fieldwork."

Locality.—USA: Texas; Garza County, 15 km SE Post, R. C. Miller Ranch, Post Quarry, MOTT VPL 3624 (33°03.321′N, 101°19.010′W).

Stratigraphy and Age.—Tecovas Formation, Dockum Group. Norian, Triassic.

Collectors and date.—Sankar Chatterjee and MoTTU field crew, 1982.

Discussion.—*Pachygenelus milleri* has recently been considered a member of the Eucynodontia, not belonging to tritheledontid clade Pachygenelinae (Martz et al. 2013).

CLASS MAMMALIA Linnaeus, 1758
ORDER ARTIODACTYLA Owen, 1848
Family Antilocapridae Gray, 1866
† Genus *Capromeryx* Matthew, 1902
† *Capromeryx minor* Taylor, 1911 (current name)
= † *Capromeryx minimus* Meade, 1942

Holotype.—TTU-P00018 (originally described using the catalog number West Texas Museum number 18), a partial left mandible with P/3 to M/3.

Etymology.—There was no reference to the etymology for the species name; however, Meade (1942) described the anterior beam of the horn core as much more reduced than in *Capromeryx mexicana*, *C. minor*, and C. *furcifer*. Also, all this group's members are sometimes known as dwarf pronghorn, and are very small, extinct species.

Locality.—USA: Texas; Lubbock County, 8 km N Slaton, Smart Ranch, Slaton Quarry, MOTT VPL 1400.

Stratigraphy and Age.—Late Yarmouthian Interglacial Stage (Womochel 1977, p. 134–137), Irvingtonian NALMA (North American Land Mammal Age) (Bell et al. 2004).

Collectors and date.—West Texas Museum and Texas Tech Geology field crews, pre-1942.

Discussion.—The fossil species, *Capromeryx minor* Taylor, 1911 was considered by Prothero and Foss (2007) to be the senior synonym of *Capromeryx minimus* Meade, 1942.

ORDER CHIROPTERA Blumenbach, 1779
Family Molossidae Gervais, 1856
Genus *Eumops* Miller, 1906
***Eumops wilsoni* Baker, McDonough, Swier, Larsen, Carrera, and Ammerman, 2009**

Holotype.—QCAZ-10600, formerly TTU-M103281 (TTU-TK134825), original number of Juan Sebastián Tello Vasques (JSTV) 438, adult male.

Etymology.—Named in honor of Don E. Wilson.

Locality.—ECUADOR; Guayas; Bosque Protector Cerro Blanco, Centro de Visitantes (2°10′47.6″S, 80°01′17.7″W).

Collectors and date.—TTU and QCAZ field crews on Sowell Expedition, 4 July 2004.

Discussion.—Specimen deposited in Museo de Zoología of the Pontificia Universidad Católica del Ecuador, tissues and karyotype slide retained at TTU (Baker et al. 2009).

Family Phyllostomidae Gray, 1825
Genus *Carollia* Gray, 1838
***Carollia benkeithi* Solari and Baker, 2006**

Holotype.—TTU-M46187 (TTU-TK22892), adult male (incorrectly stated as female in the 2006 description by Solari and Baker; an erratum to the pubication has been posted at http://www.depts.ttu.edu/nsrl/publications/downloads/ErratumOP254.pdf).

Etymology.—"The specific epithet *benkeithi* is a modified Latin genitive after Mr. Ben E. Keith, a long-time benefactor of the Natural Science Research Laboratory (NSRL) of the Museum of Texas Tech University. Species such as *Carollia* are not only hard to tell apart, but often deemed too common to merit specific focus of systematic studies. Funding of research institutions has a direct impact on our work and allows for significant effort on many poorly understood taxa. A recent grant by Mr. Keith and his family has resulted in a new wing that more than doubled the size of the NSRL and greatly improved the available facilities. We acknowledge his commitment to the study of natural science collections by naming this new species after him. Date of publication of this new name was chosen to coincide with the day the first catalogued mammal specimens were transferred to the museum wing constructed through Mr. Ben Keith's generosity."

Locality.—PERU: Huánuco; Leoncio Prado, 2 km S Tingo María (9°18′S, 75°59′W).

Collectors and date.—Robert J. Baker, Jane A. Groen, Robert D. Owen, Michael J. Smolen, and Priscilla K. Tucker, 13 October 1983.

***Carollia sowelli* Baker, Solari, and Hoffmann, 2002**

Holotype.—TTU-M82495 (TTU-TK101341), adult male.

Etymology.—"It is our pleasure to name this species in honor of Mr. James E. Sowell, who has been a major benefactor to Texas Tech University. Mr. Sowell has funded the Sowell Expeditions, which have tremendously benefited the Natural Sciences Research Laboratory's research collections and provided an opportunity for many Tech students to experience the natural history and ecology of the tropics."

Locality.—HONDURAS: Comayagua; Cueva de Taulabe (14°41′42″N, 87°57′07″W).

Collectors and date.—R. D. Bradley and the Texas Tech Sowell Expedition field party, 11 July 2001.

Genus *Chiroderma* Peters, 1860
***Chiroderma improvisum* Baker and Genoways, 1976**

Holotype.—TTU-M19900 (TTU-TK8285), field number John C. Patton 552, adult male.

Etymology.—"The specific name *improvisum* is from Latin, meaning unforeseen or unexpected. We did not expect to find *Chiroderma* on Guadeloupe because the nearest known representative from the Caribbean occurs on Trinidad and Tobago, 550 kilometers to the south."

Locality.—FRANCE: Guadeloupe: Basse-Terre, 2 km S, 2 km E Baie-Mahault.

Collectors and date.—R. J. Baker and H. H. Genoways, 29 July 1974.

Genus *Glossophaga* Geoffroy, 1818
Glossophaga commissarisi Gardener, 1962
***Glossophaga commissarisi bakeri* Webster and Jones, 1987**

Holotype.—TTU-M9093 (TTU-TK901777), original number 1453, adult male.

Etymology.—"It is a pleasure to name this race of bat after its collector, Robert J. Baker, in recognition of his contributions to our understanding of the systematics of New World leaf-nosed bats."

Locality.—COLOMBIA: Amazonas; Isla Santa Sofía, 30 km NW Leticia.

Collector and date.—R. J. Baker, 28 June 1969.

***Glossophaga commissarisi hespera* Webster and Jones, 1982**

Holotype.—TTU-M36223 (TTU-TK909696), formerly University of Arizona number 4956, original number A. L. Gardner 6864, adult female.

Etymology.—The derivation of the name is not given in the original publication, but presumably it is named to denote the western occurrence of this bat (*hesperus* = Greek for Evening Star, of the western sky).

Locality.—MEXICO: Jalisco; Tepehuajes Mine, *ca*. 20 km N Soyatlán del Oro.

Collector and date.—A. L. Gardner, 16 January 1964.

Glossophaga soricina (Pallas, 1766)
***Glossophaga soricina handleyi* Webster and Jones, 1980**

Holotype.—TTU-M25893 (TTU-TK912970), adult male.

Etymology.—"Patronymic recognition is accorded Charles O. Handley, Jr., for his helpful comments relative to the preceding discussion and in testimony to his long-time interest in American Chiroptera."

Locality.—MEXICO: Yucatán; Mérida, from the grounds of Colegio Peninsular.

Collector and date.—J. B. Bowles, 1 April 1975.

Genus *Lophostoma* d'Orbigny, 1836
***Lophostoma aequatorialis* Baker, Fonseca, Parish, Phillips, and Hoffmann, 2004**

Holotype.—QCAZ-6500, formerly TTU-M85292 (TTU-TK104520), original number René M. Fonseca-40, adult male.

Paratype.—TTU-M85277, adult female.

Etymology.—"We have named *L. aequatorialis* after Ecuador and the position of the type locality near the Equator."

Locality.—ECUADOR; Esmeraldas; Estación Experimental La Chiquita, near San Lorenzo (1°16′60″N, 78°49′60″W).

Collectors and date.—TTU and QCAZ Sowell Expedition field crews, 2 August 2001.

Discussion.—Holotype body returned to Ecuador (Bradley et al. 2005). Deposited in the Museo de Zoología of the Pontificia Universidad Católica del Ecuador. Recognized as a junior synonym of *Lophostoma occidentalis* (Davis and Carter, 1978) by Velazco and Cadenillas (2011).

***Lophostoma schulzi* (Genoways and Williams, 1980)**
= *Tonatia schulzi* Genoways and Williams, 1980 (basionym)

Holotype.—CM 63687 (TTU-TK11270), Stephen L. Williams original number 4951.

Etymology.—"It is our pleasure to name this species in honor of Dr. Joop P. Schulz, Director of STINASU (Foundation for Nature Preservation in Suriname) in recognition of the work that he has done in establishing an extensive system of Nature Reserves in Suriname. We are particularly grateful to Dr. Schulz for the assistance that he has given us during our work in Suriname."

Locality.—SURINAME: Brokopondo; Tafelberg Nature Reserve, 3 km SW Rudi Kappelvliegveld (3°46′N, 56°10′W) (type locality).

Collector and date.—Stephen L. Williams, 1 October 1979.

Discussion.—The TTU-TK sample consists of frozen tissue as well as karyotype. Lee et al. (2002) transferred the species to its current taxonomic combination.

Genus *Micronycteris* Gray, 1866

***Micronycteris giovanniae* Baker and Fonseca, 2007**

Holotype.—QCAZ-7200, formerly TTU-M85445 (TTU-TK104673), adult male.

Etymology.—"The species is named to honor Nikki Giovanni in recognition of her poetry and writings."

Locality.—ECUADOR; Esmeraldas; E. San Lorenzo (toward Lita), Finca San José 101°3′32.1″N, 78°37′20.7″W.

Collectors and date.—TTU and QCAZ field party on the Sowell Expedition, 6 August 2001.

Discussion.— Baker and Fonseca described the species in a publication by Fonseca et al. (2007).

***Micronycteris buriri* Larsen, Stiles, Pedersen, and Kwiecinski, 2011**

Holotype.—TTU-M105773 (TTU-TK144656), original number Peter A. Larsen 365, adult female.

Paratypes.—TTU-M105774, adult male[A]; TTU-M105640–105643, 4 adult males[B]; TTU-M105352–105355, 4 adult males[C]; TTU-M105507, TTU-M105508, 2 adult males[D]; TTU-M105971, TTU-M105972, 2 adult males[E]; TTU-M105548, adult male[F]; TTU-M105473, adult male[G]; TTU-M105535, adult male[H]; TTU-M105981, TTU-M105982, 2 juvenile females[I].

Etymology.—The specific epithet *buriri* is a noun in apposition, originating from the Garifuna word, Búriri, for bat. Búriri is derived from the words "Buriga-" and "Luburiga" meaning dark and darkness."

Localities.—SAINT VINCENT AND THE GRENADINES: Saint Vincent; [A] Saint Andrew Parish, Parrot Lookout Vermont Nature Trail, 2.3 km N, 1.75 km E Vermont (type locality); [B] Colonarie River 1 km S, 2.4 km W South Rivers, Charlotte Parish (13°14′10.4″N, 61°09′52.7″W); [C] La Soufrière Trail, 0.7 km N, 5.1 km W Orange Hill, Charlotte Parish (13°19′22.8″N, 61°10′1.2″W; 646 m); [D] 0.75 km S, 2.3 km E Rose Hall, St. David Parish on 3 June 2006 (13°15′51.2″N, 61°13′25.7″W); [E] Convent 0.4 km N, 3 km E Grove, St. Patrick Parish (13°14′53.5″N, 61°12′32.1″W); [F] Mount St. Andrew, 1.75 km N, 0.3 km E Green Hill, St. George Parish (13°11′17.9″N, 61°12′56.8″W); [G] 1.25 km N, 1.6 km E Vermont, St. Andrew Parish (13°12′55.6″N, 61°12′52″W); [H] Morgan Woods, 0.4 km N, 2.4 km E Richmond, St. David Parish (13°18′28.9″N, 61°12′27.9″W); [I] Mount Wynne Caves, Mount Wynne Bay, St. Patrick Parish (13°13′3.6″N, 61°16′30.4″W).

Collectors and dates.—Peter A. Larsen et al.; [A] 1 August 2005; [B] 28 July 2005; [C] 1 June 2006; [D] 3 June 2006; [E] 3 August 2005; [F] 4 June 2006; [G] 28 May 2006; [H] 27 May 2006; [I] 6 August 2005.

Genus *Sturnira* Gray, 1842

***Sturnira bakeri* Velazco and Patterson, 2014**

Holotype.—QCAZ-14635 (TTU-TK135127), adult female (original field number of J. Sebastián Tello is JST 487).

Paratypes.—QCAZ-9737 (TTU-TK135040), adult female; QCAZ 9739 (TTU-TK135051), adult male.

Etymology.—"The name *bakeri* honors our friend Dr. Robert J. Baker, who has made enormous contributions to our understanding of bats, particularly to the evolution of Neotropical phyllostomids. Robert's numerous contributions, both to the literature and to scientific discourse, and his productive and generous mentoring of students make him a professional paragon for each of us."

Localities.—ECUADOR; El Oro; Reserva Militar Arenillas: holotype at Palmales (approximately 3°40′27.4″S, 80°06′20″W) (type locality); paratypes at Quebrada Seca (approximately 3°39′24.1″S, 80°10′56.2″W).

Collectors and dates.—Holotype, J. Sebastián Tello, 16 July 2004; paratypes, Peter A. Larsen, 16 July 2004.

Discussion.—Only the frozen tissues are housed at TTU, but they include that of the holotype.

Genus *Tonatia* Gray, 1827
Tonatia saurophila Koopman and Williams, 1951
***Tonatia saurophila bakeri* Williams, Willig, and Reid, 1995**

Holotype.—TTU-M39120 (TTU-TK22573), field number 1195, adult male.

Etymology.—Named in honor of Robert J. Baker in "recognition of contributions of … to genetics and systematics of New World leaf-nosed bats, family Phyllostomidae."

Locality.—PANAMA: Darién Province; 6 km SW Cana.

Collector and date.—R. J. Baker, 31 January 1983.

***Tonatia saurophila maresi* Williams, Willig, and Reid, 1995**

Holotype.—TTU-M9774 (TTU-TK914643), adult female, original number 318.

Etymology.—"The name *T. s. maresi* is given in recognition of the contributions of Michael A. Mares to the systematics, ecology, and zoogeography of South American mammals."

Locality.—TRINIDAD AND TOBAGO: Trinidad; Blanchisseuse.

Collector and date.—R. J. Baker, 12 July 1969.

***Tonatia schulzi* Genoways and Williams, 1980 (basionym)**
= see *Lophostoma schulzi* (Genoways and Williams, 1980) (current name)

Genus *Uroderma* Peters, 1866
***Uroderma bakeri* Mantilla-Meluk, 2014**

Holotype.—TTU-M33358 (TTU-TK15288), adult male.

Etymology.—"*Uroderma bakeri* is named for Dr. Robert J. Baker, who has dedicated his life to the study of a wide variety of aspects of the natural history and evolution of the Neotropical mammalian fauna, in particular to the study of phyllostomid bats."

Locality.—VENEZUELA; Miranda; Santa Crucita, Parque nacional Guatopo (10°5′N, 66°33′W).

Collectors and date.—M. O'Connell and R. J. Baker; 25 April 1978.

Uroderma bilobatum Peters, 1866
***Uroderma davisi* Baker and McDaniel, 1972 (current name)**
= *Uroderma bilobatum davisi* Baker and McDaniel, 1972

Holotype.—TTU-M12664 (TTU-TK902884), original number 455 of William J. Bleier, adult female.

Etymology.—"This subspecies, *Uroderma bilobatum davisi*, is named in honor of Professor William B. Davis in recognition of his contributions to the systematics of Neotropical bats."

Locality.—EL SALVADOR: La Paz, 4.8 km NW La Herradura.

Collectors and date.—R. J. Baker and party, 11 July 1971.

Discussion.—Mantilla-Meluk (2014) elevated the subspecies name *Uroderma bilobatum davisi* Baker and McDaniel, 1972 to full species *Uroderma davisi* Baker and McDaniel, 1972 (current name).

Family Vespertilionidae Gray, 1821
† Genus *Ancenycteris* Sutton and Genoways, 1974
† *Ancenycteris rasmusseni* Sutton and Genoways, 1974

Holotype.—TTU-P04093, well preserved left mandible with i1-m2.

Etymology.—*Anceney*, for the Anceney Local Fauna; and *nycteris* from the Greek *nykteris* for bat.

Locality.—USA: Montana; Galatin County, 21.7 km W Bozeman (N ½, Sec. 13, T2S, R3E).

Collectors and date.—John F. Sutton and Leonard Krishtalka, 1972.

Stratigraphy and Age: Anceney Local Fauna, Madison Valley Formation, Barstovian, Upper Miocene.

Discussion.—This specimen was presumed lost, not seen since the late 1970s or early 1980s. It was reported as lost by Czaplewski and Morgan (2000); however, the mold and a number of casts of the specimen are still in the collections of the Paleontology Division of the Museum of Texas Tech University as well as other museums. It has since been determined that the holotype was de-accessioned and transferred to the Carnegie Museum of Natural History by Craig Black in the 1970s. The catalog number for the holotype of *Ancenycteris rasmusseni* is listed in the Carnegie Museum of Natural History's collection as CM 54093, but it is also missing from there (Amy C. Henrici, pers. comm. to JCC 10 June 2019; Collection Manager of Vertebrate Paleontology, Carnegie Museum of Natural History). In an e-mail to Henrici from Nicholas J Czaplewski (pers. comm. to JCC, 13 June 2019; Curator of Vertebrate Paleontology, Oklahoma Museum of Natural History) to Henrici, he stated that "I have an old letter to me from Beth Henry at TTU from 8 March 1989 as well as associated loan forms. The handwriting is mine at the right margin of the letter, and indicates that, after loaning me the cast she looked twice for the original specimen [the holotype] but was unable to find it in the TTU collection. They gave me permission to remold the cast. We did so here and have a few copies in the OMNH cast collection."

Genus *Eptesicus* Rafinesque, 1820
***Eptesicus guadeloupensis* Genoways and Baker, 1975**

Holotype.—TTU-M19902 (TTU-TK8286), original J. W. Bickham number 74M338, adult male.

Etymology.—Named for the island of Guadeloupe; and the Latin suffix *-ensis*, from or belonging to.

Locality.—FRANCE: Guadeloupe: Basse-Terre, 2 km S, 2 km E Baie-Mahault.

Collectors and date.—R. J. Baker and H. H. Genoways, 29 July 1974.

Genus *Myotis* Kaup, 1829
Myotis evotis (H. Allen, 1864)
***Myotis evotis jonesorum* Manning, 1993**

Holotype.—TTU-M60269 (TTU-TK923721), A. H. Harris original number 1185, formerly Museum of Southwestern Biology number 5101, adult female.

Etymology.—"The specific epithet, *jonesorum*, is a patronym for Clyde Jones and J. Knox Jones, Jr., my mentors."

Locality.—USA: New Mexico; Socorro County, San Mateo Mountains, Bear Trap Canyon, 32 km S and 30.4 km W Magdalena.

Collector and date.—A. H. Harris, 29 July 1958.

Genus *Rhogeessa* H. Allen, 1866
***Rhogeessa bickhami* Baird, Marchán-Rivadeneira, Pérez, and Baker, 2012**

Holotype.—TTU-M36161 (TTU-TK20594), adult female[A].

Paratypes.—TTU-M36164 (collector's number 1224) adult female[A]; TTU-M60985, collector's number 586, adult female[B]; TTU-M60986 and 60987, 2 adult females[C]; TTU-M83681, adult female; TTU-M83682, collector's number 799, adult male; TTU-M83705, adult female; TTU-M83713, adult female; TTU-

M83927 adult female[D]; TTU-M84027, adult male; TTU-M84030, adult female[E].

Etymology.—Named for John W. Bickham.

Localities.—[A] MEXICO: Chiapas; 38 km N Huixtla (type locality); [B] EL SALVADOR: La Paz; Zacatecoluca, Hacienda Escuintla; [C] EL SALVADOR: San Salvador; El Guaje; [D] HONDURAS: Valle; 3 km N, 12.5 km SW San Lorenzo; [E] HONDURAS: Comayagua; Comayagua.

Collectors and dates.—[A] L. W. Robbins, 20 May 1981 (holotype); 21 May 1981 (paratype); [B] J. G. Owen, 30 October 1990; [C] J. G. Owen, 20 July 1990; [D] R. D. Bradley et al., 7 July 2001; [E] R. D. Bradley et al., 10–11 July 2001.

Rhogeessa genowaysi Baker, 1984

Holotype.—TTU-M36169 (TTU-TK20584), field number Lynn W. Robbins 10592, (karyotype TTU-TK20584), adult female.

Etymology.—"The specific name *genowaysi* is a patronym for my close friend, Hugh H. Genoways, in recognition of his outstanding contributions to systematic mammalogy."

Locality.—MEXICO: Chiapas; 38 km by road NW Huixtla.

Collectors and date.—David Webster, Laurie Robbins, and Lynn W. Robbins, 20 May 1981.

Rhogeessa hussoni Genoways and Baker, 1996

Holotype.—CM 63934 (TTU-TK10150), field number Jane A. Groen 1058, adult female.

Etymology.—"It is our pleasure to name this species in honor of the late Dr. A. M. Husson, the former Curator of Mammals of the Rijksmuseum van Natuurlijke Historie in Leiden, The Netherlands, in recognition of his major contributions to the study of South American mammals through his monographs on the bats of Suriname (1962) and the mammals of Suriname (1978)."

Locality.—SURINAME: Nickerie District; Sipaliwini Airstrip (type locality).

Collectors and date.—Jane A. Groen and Stephen Williams, 18 August 1979.

Discussion.—Only the frozen tissue sample is housed at TTU.

Rhogeessa menchuae Baird, Marchán-Rivadeneira, Pérez, and Baker, 2012

Holotype.—TTU-M61230 (TTU-TK40360), collector's number 612, adult male[A].

Paratype.—TTU-M61229, adult female[B].

Etymology.—"This species is named to honor Rigoberta Menchú (along with the rest of the Menchú family) for her decades of work establishing a better understanding of the Mayan culture in Guatemala."

Locality.—[A, B] HONDURAS: Atlantida; Lancetilla (type locality).

Collector and dates.—R. D. Bradley, [A] 6 August 1991, [B] 5 August 1991.

Genus *Scotophilus* Leach, 1821

Scotophilus andrewreborii Brooks and Bickham, 2014

Holotype.—CM 98049, muscle tissue sample TTU-TK33143, Kimberly Nelson, field number 217, adult male [A].

Paratypes.—CM 98048, tissue sample TTU-TK33140, Kimberly Nelson field number 214, adult female [A]; CM 98050, tissue sample TTU-TK33149, Kimberly Nelson field number 219, adult male [B].

Etymology.—"It is our honor to name this species for Andrew N. Rebori (1948–2011). Rebori unknowingly touched the lives and inspired many individuals, including many museum professionals. He always maintained a keen interest in animals, especially bats, which exemplified his spirit and attitude toward life, 'Take flight every new day!'."

Locality.—[A] KENYA: Rift Valley Province, Nakuru District, 12 km S, 4 km E Nakuru (0°24′S, 36°07′E) (type locality); [B] KENYA: Rift Valley Province, Nakuru District, Kenya Njoro River, 3 km S, 3 km W Nakuru (0°19′S, 36°03′E).

Collector and dates.—Kimberly Nelson, [A] 7 October 1985, [B] 8 October 1985.

Discussion.—Only the frozen tissue samples are housed at TTU.

***Scotophilus livingstonii* Brooks and Bickham, 2014—**not present at TTU

Holotype.—CM 98051, tissue sample TTU-TK33536 [tissue sample not at TTU]. Duane Schlitter field number 7396, adult male.

Paratype.—CM 98053, Duane Schlitter field number 7394, muscle tissue sample TTU-TK33534 [tissue sample not at TTU], adult female.

Etymology.—"It is our honor to name this species for the late David Livingstone (1813–1873). At a time when most of Africa was barely known compared to today, Livingstone, a young Scot of humble means, explored central Africa. Between 1841 and his death in 1873, Livingstone made several expeditions into the interior of the continent, mapping uncharted lands and searching for navigable waterways."

Locality.—KENYA: Western Province, Kakamega District, Ikuywa River Bridge, 6.5 km S, 19 km E Kakamega (0°13′N, 34°55′E) (type locality).

Collector and dates.—Duane Schlitter, 8 November 1985.

Discussion.—None of the tissue samples from the type specimens are now at TTU. It is uncertain if they were "used up" in analysis or if they were just never returned to the collection.

***Scotophilus trujilloi* Brooks and Bickham, 2014**

Holotype.—CM 98038, muscle tissue sample TTU-TK33263, Duane Schlitter field number 7086, adult male.

Paratypes.—CM 98040, tissue sample TTU-TK33266, Duane Schlitter field number 7089, adult female; CM 98041, tissue sample TTU-TK33267, Duane Schlitter field number 7090, adult female.

Etymology.—"It is our honor to name this species for Dr. Robert Trujillo (b. 1975), who's ground-breaking doctoral dissertation on the molecular systematics of *Scotophilus* paved the way for the description of the four cryptic species described in this paper (Trujillo 2005; Trujillo et al. 2009). Dr. Trujillo's dedication to science and environmental stewardship are reflected in his outstanding career in the US Forest Service."

Locality.—KENYA: Coastal Province, Kwale District, Moana Marine Station, 1 km S, 2 km E Ukunda (4°18′S, 39°35′E) (type locality).

Collector and date.—Duane Schlitter, 18 October 1985.

Discussion.—Only the frozen tissue sample is housed at TTU.

ORDER PRIMATES Linnaeus, 1758
Family Cheirogaleidae Gray, 1873
Genus *Cheirogaleus* Geoffroy, 1812
***Cheirogaleus andysabini* Lei, McLain, Frasier, Taylor, Bailey, Engberg, Ginter, et al., 2015**

Holotype.—AMB5.27 (Henry Doorly Zoo); adult female; 4×2.0 mm biopsies from ear pinna and 0.3 cc of whole blood TTU-M118801 (TTU-TK129239). The holotype was described, microchipped, and released back into the wild.

Etymology.—"This new species is named after Andy Sabin, a well-known New York philanthropist committed to species conservation, especially turtles, amphibians and primates. In particular, he has supported many projects in Madagascar: including research on lemurs, tortoises and frogs. His long-term interest, his enthusiasm, and his generosity have helped to encourage many researchers and conservationists, young and old alike."

Locality.—MADAGASCAR: Antsiranana Province; Diana Region, District Antsiranana II, Montagne

d'Ambre National Park (S12.52720, E49.17950) at 1073 m above sea level (type locality).

Collector and date.—Jean Freddy Ranaivoarisoa, Ravaka Ramanamahefa, Nirina Jean de Dieu Andriamadison, Joseph Désiré Rabekinaja, Gérard Nalanirina, and François Randrianasolo, 22 November 2005.

Discussion.—The only portion of the holotype stored at TTU is the tissue and blood sample. The holotype was described, microchipped, and released back into the wild.

***Cheirogaleus shethi* Frasier, Lei, McLain, Taylor, Bailey, Ginter, Nash, et al., 2016**

Holotype.—FIA5.19; adult female, 4 × 2.0 mm biopsies from ear pinna and 0.02 cc of whole blood at TTU-M122795 (TTU-TK128750).

Etymology.—"This new species is named after Brian Sheth, the Chair of the Board of the NGO Global Wildlife Conservation. Brian is deeply committed to biodiversity conservation worldwide, and is a leading philanthropist for species and ecosystem conservation. He has supported many projects in Madagascar including research and the establishment and management of nature reserves. His passion and drive to help save the diversity of life on our planet has been an inspiration to all around him."

Locality.—MADAGASCAR: Antsiranana Province; Diana Region, District Antsiranana II, Andrafiamena (Anjakely) (12°54′55″S, 49°19′10″E; S12.91539, E49.31956) at 316 m above sea level (type locality).

Collector and date.—Nirina Jean de Dieu Andriamadison, Jean Aimé Andriamihaja, Jean Claude Randriamanana, Joseph Désiré Rabekinaja, François Randrianasolo, Philibert Randrianarinjaka, and Rambinintsoa Andriantompohavana, 3 December 2005.

Discussion.—The only portion of the holotype stored at TTU is the tissue/blood sample. The holotype was microchipped subcutaneously between the scapulae and returned to the wild.

Genus *Microcebus* Geoffroy, 1834

***Microcebus mamiratra* Andriantompohavana, Zaonarivelo, Engberg, Randriamampionona, McGuire, Shore, Rakotonomenjanahary, et al., 2006**

Holotype.—Not designated.

Syntypes.—Not specifically designated syntypes, but "type series" = whole total genomic DNA samples: LOKO4.26 (TTU-TK125580), adult female, LOKO4.37 (TTU-TK125581), adult female, LOKO4.38 (TTU-TK125582), adult female.

Etymology.—"The name *mamiratra* is derived from the Malagasy language and means "clear and bright" and is proposed for Claire Hubbard and the Theodore F. and Claire M. Hubbard Family Foundation. The Hubbard Foundation has provided generous support over the past five years, providing the Malagasy graduate students the opportunity to conduct conservation genetics projects in the field and in the laboratory."

Locality.—MADAGASCAR: Province de Antsiranana; Nosy Be, Lokobe Special Reserve (approximately 13°24′16.9″S, 48°18′11.2″E).

Collectors and dates.—Richard Randriamampionona, Jean C. Randriamanana, Gerard Nalanirina, Rambinintsoa Andriantompohavana, and John Zaonarivelo; LOKO4.26, 8 July 2004; LOKO4.37, 9 July 2003; LOKO4.38, 9 July 2004.

Discussion.—This species is based on nontraditional type specimens that are stored as whole total genomic DNA (50 ng/µl).

Family Induriidae Burnett, 1828

Genus *Avahi* Jourdan, 1834

***Avahi betsileo* Andriantompohavana, Lei, Zaonarivelo, Engberg, Nalanirina, McGuire, Shore, et al., 2007**

Holotype.—Not designated.

Syntypes.—Not specifically designated syntypes, but "type series" = whole blood from FAN2.14 (TTU-

TK125757), adult male; FAN2.15 (TTU-TK125758), adult female; and FAN2.20 (TTU-TK125759), adult male.

Etymology.—"The name *betsileo* is proposed for this species and is derived from the Malagasy tribe from the Fandriana region."

Locality.—MADAGASCAR: Province de Fianarantsoa; Region Amoron'i Mania, District of Fandriana, Bemosary Classified Forest; (20°20′60.1″S, 47°33′36.1″E) and south of Mangoro River.

Collectors and dates.—Richard Randriamampionona, Jean C. Randriamanana, Gerard Nalanirina, Razafindraibe Jean, Rambinintsoa Andriantompohavana, and John R. Zaonarivelo; FAN2.14, 13 July 2002; FAN2.15, 13 July 2002; FAN2.20, 15 July 2002.

Discussion.—This species is based on non-traditional type specimens that are stored at TTU-TK as whole blood samples.

***Avahi mooreorum* Lei, Engberg, Andriantompohavana, McGuire, Mittermeier, Zaonarivelo, Brenneman, et al., 2008**

Holotype.—Not designated.

Syntypes.—Not specifically designated syntypes, but "type series" = whole blood from MAS6.1, TTU-M104519 (TTU-TK145356), adult female; MAS6.2, TTU-M104520 (TTU-TK145357), adult male; and MAS6.3, TTU-M104521 (TTU-TK145358), adult male.

Etymology.—"The name *mooreorum* is proposed in honor of the Moore Family - Gordon and Betty Moore, Ken and Kris Moore and Steve and Kathleen Moore - in recognition of their long-term commitment to biodiversity and conservation. The major support that they have provided through the Gordon and Betty Moore Family Foundation and other channels has been critical to advancing conservation in some of the world's most important and most endangered biodiversity hotspots, including Madagascar and continues to have enormous impact."

Locality.—MADAGASCAR: Province de Antsiranana; Masoala National Park (approximately 15°40′008″S, 49°57′476″E).

Collectors and dates.—Edward Louis, Richard Rakotonomenjanahary, Jean C. Randriamanana, Justin Andrianasolo, Philibert Randriamaronjaka, and Jean Claude Rakotoniaina, 20–21 November 2006.

Discussion.—This species is based on non-traditional type specimens that are stored as whole blood samples. The blood samples were taken from free-ranging lemurs which were released back into the wide after data collection.

Family Lepilemuridae Gray, 1870
Genus *Lepilemur* Geoffroy, 1851

***Lepilemur ahmansonorum* Louis, Jr., et al., 2006 (current name)**
= *Lepilemur ahmansoni* Louis, Jr., Engberg, Lei, Geng, Sommer, Randriamampionona, Randriamanana, et al., 2006

Holotype.—Not designated.

Syntypes.—Not specifically designated syntypes, but type series = whole blood from KIBO22, TTU-M104462 (TTU-TK125529), adult male; KIBO58, TTU-M104463 (TTU-TK125530), adult female; and KIBO65, TTU-M104464 (TTU-TK125531), adult female.

Etymology.—"The name ahmansoni is proposed in honor of Robert Ahmanson and the Ahmanson Foundation who have given extensive support to the graduate programs of the Malagasy students in Madagascar and at the Henry Doorly Zoo's Center for Conservation and Research."

Locality.—MADAGASCAR: Province de Mahajanga; Tsiombikibo Classified Forest (16°02′24.7″S, 45°48′10.6″E) and northwest of the Mahavavy River (type locality).

Collectors and dates.—Richard Randriamampionona, Jean C. Randriamanana, Gerard Nalanirina, Rambinintsoa Andriantompohavana, and John R.

Zaonarivelo; KIBO22, 23 October 2003; KIBO58, 27 October 2003; KIBO65, 29 October 2003.

Discussion.—This species is based on non-traditional type specimens that are stored as whole blood samples that were taken from free-ranging wild lemurs. The ending of the originally proposed scientific name did not match the etymology. Following ICZN code: "A species-group name, if a noun in the genitive case formed directly from a modern personal name, is to be formed by adding to the stem of that name *-i* if the personal name is that of a man, *-orum* if of men or of man (men) and woman (women) together…" The emended lemur name was by Hoffman et al. (2009).

Lepilemur betsileo Louis, Jr., Engberg, Lei, Geng, Sommer, Randriamampionona, Randriamanana, et al., 2006

Holotype.—Not designated.

Syntypes.—Not specifically designated syntypes, but type series = whole blood from FAN11, TTU-M104446 (TTU-TK125513), adult female; FAN4.24, TTU-M104447 (TTU-TK125514), adult male.

Etymology.—"The name *betsileo* is proposed for this species and is derived from the Malagasy tribe from the Fianarantsoa region."

Locality.—MADAGASCAR: Province de Fianarantsoa; Fandriana Classified Forest (approximately 20°23′40.5″S, 47°38′06.6″E) and on the Mananjary River.

Collectors and dates.—Richard Randriamampionona, Jean C. Randriamanana, Gerard Nalanirina, Rambinintsoa Andriantompohavana, and John R. Zaonarivelo; FAN11, 28 October 2000; FAN4.24, 2 April 2004.

Discussion.—This species is based on non-traditional type specimens that are stored as whole blood samples that were taken from free-ranging wild lemurs.

Lepilemur fleuretae Louis, Jr., Engberg, Lei, Geng, Sommer, Randriamampionona, Randriamanana, et al., 2006

Holotype.—Designated as "type series" in publication, but it is a holotype by monotypy = whole blood sample from AND20, TTU-M104492 (TTU-TK125559), adult male.

Etymology.—"The name *fieuretae* is proposed in honor of Madame Fleurete Andriantsilavo, former Secrétarire Général du MINENVEF. Madame Fleurete worked tirelessly and constantly strove for the long term conservation of Madagascar's protected and unprotected areas."

Locality.—MADAGASCAR: Province de Toliary; Manangotry, Andohahela National Park (approximately 24°45′46.0″S, 46°51′47.0″E).

Collectors and date.—Richard Randriamampionona, Jean C. Randriamanana, Gerard Nalanirina, and Edward Louis; 12 May 2004.

Discussion.—This species is based on non-traditional type specimens that are stored as whole blood samples that were taken from free-ranging wild lemurs.

Lepilemur grewcockorum Louis et al., 2006 (emended name) = _Lepilemur grewcocki_ Louis, Jr., Engberg, Lei, Geng, Sommer, Randriamampionona, Louis, et al., 2006

Holotype.—Not designated.

Syntypes.—Not specifically designated syntypes, but type series = whole blood from HIH21, TTU-M104452 (TTU-TK125519), adult male; HIH22, TTU-M104453 (TTU-TK125520), adult female; HIH23, TTU-M104454 (TTU-TK125521), adult female.

Etymology.—"The name *grewcocki* is proposed in honor of Bill and Berniece Grewcock who have generously supported our fieldwork in Madagascar and

provided the laboratories and housing for all of the Malagasy graduate students in Omaha. The Grewcock's support is instrumental, transferring conservation related technology to the future Malagasy scientists."

Locality.—MADAGASCAR: Province de Mahajanga; Anjiamangirana Classified Forest (approximately 15°09′14.9″S, 47°43′41.0″E).

Collectors and date.—Richard Randriamampionona, Jean C. Randriamanana, Gerard Nalanirina, Rambinintsoa Andriantompohavana, and John R. Zaonarivelo, 13 November 2004.

Discussion.—This species is based on non-traditional type specimens that are stored as whole blood samples that were taken from free-ranging wild lemurs. Following ICZN code: "A species-group name, if a noun in the genitive case formed directly from a modern personal name, is to be formed by adding to the stem of that name -i if the personal name is that of a man, -*orum* if of men or of man (men) and woman (women) together…" The emended lemur name was by Hoffman et al. (2009).

***Lepilemur hollandorum* Ramaromilanto, Lei, Engberg, Johnson, Sitzmann, and Louis, Jr., 2009**

Holotype.—Not designated.

Syntypes.—Not specifically designated syntypes, but type series = whole blood NARA4.20, TTU-M109031 (TTU-TK125726), adult female; NARA8.5, TTU-M109032 (TTU-TK125727), adult male; NARA8.7, TTU-M109033 (TTU-TK125728), adult female.

Etymology.—"The name *hollandorum* is proposed in honor of Dick and Mary Holland for their philanthropic support for art, science, education, and research, including providing opportunities for young Malagasy scientists."

Locality.—MADAGASCAR: Toamasina Province; Mananara-Nord Biosphere Reserve (approximately 16°18′22.6″S, 49°47′03.9″E).

Collectors and date.—Edward E. Louis, Jr., Brandon D. Sitzmann, Richard Randriamampionona, Richard Rakotonomenjanahary, Jean C. Randriamanana, Justin Andrianasolo, Jean Claude Rakotoniaina, Jean Freddy Ranaivoarisoa, Boromé Ramaromilanto, Fidelis Razafimanjato, and Jean Aimé Andriamihaja; NARA4.20, 8 August 2004; NARA8.5 and NARA8.7, 21 February 2008.

Discussion.—This species is based on non-traditional type specimens that are stored as whole blood samples that were taken from free-ranging wild lemurs.

***Lepilemur hubbardorum* Louis et al., 2006 (emended name) = *Lepilemur hubbardi* Louis, Jr., Engberg, Lei, Geng, Sommer, Randriamampionona, Randriamanana, et al., 2006**

Holotype.—Not designated.

Syntypes.—Not specifically designated syntypes, but type series = whole blood from ZOMB9, TTU-M104491 (TTU-TK125558), adult female; ZOMB12, TTU-M104489 (TTU-TK125556), adult male; ZOMB15, TTU-M104490 (TTU-TK125557), adult male.

Etymology.—"The name *hubbardi* is proposed in honor of Theodore F. and Claire M. Hubbard Family Foundation for their generous support of Malagasy graduate students in the field and in the laboratory at Henry Doorly Zoo's Center for Conservation and Research (CCR). By providing the new laboratory and housing for the CCR's Genetics Department, the Hubbard Family Foundation's support will continue to be instrumental in transferring conservation related technology to the future Malagasy scientists."

Locality.—MADAGASCAR: Province de Toliary; Zombitse National Park; (approximately 22°53′18.7″S, 44°41′43.3″E).

Collectors and dates.—Richard Randriamampionona, Jean C. Randriamanana, Gerard Nalanirina, and Rambinintsoa Andriantompohavana; ZOMB9, 15 March 2004; ZOMB12, 15 March 2003; ZOMB15, 16 March 2003.

Discussion.—This species is based on non-traditional type specimens that are stored as whole

blood samples that were taken from free-ranging wild lemurs. Following ICZN code: "A species-group name, if a noun in the genitive case formed directly from a modern personal name, is to be formed by adding to the stem of that name -i if the personal name is that of a man, -*orum* if of men or of man (men) and woman (women) together…" The emended lemur name was by Hoffman et al. (2009).

***Lepilemur jamesorum* Louis et al., 2006 (emended name)**
= *Lepilemur jamesi* Louis, Jr., Engberg, Lei, Geng, Sommer, Randriamampionona, Randriamanana, et al., 2006

Holotype.—Not designated.

Syntypes.—Not specifically designated syntypes, but type series = whole blood from M140, TTU-M104471 (TTU-TK125538), adult male; M141, TTU-M104472 (TTU-TK125539), adult male; M142, TTU-M104473 (TTU-TK125540), adult male.

Etymology.—"The name *jamesi* is proposed in honor of the Larry, Jeannette, and Barry James' Family for their generous and long term support of Malagasy graduate students in the field and in the laboratory at Henry Doorly Zoo's Center for Conservation and Research."

Locality.—MADAGASCAR: Province de Fianarantsoa; Manombo Special Reserve; (approximately 23°01′69.5″S, 47°43′84.1″E).

Collectors and date.—Richard Randriamampionona, Jean C. Randriamanana, Gerard Nalanirina, John R. Zaonarivelo, and Edward Louis, 13 November 2000.

Discussion.—This species is based on non-traditional type specimens that are stored as whole blood samples that were taken from free-ranging wild lemurs. Following ICZN code: "A species-group name, if a noun in the genitive case formed directly from a modern personal name, is to be formed by adding to the stem of that name -i if the personal name is that of a man, -*orum* if of men or of man (men) and woman (women) together…" The emended lemur name was by Hoffman et al. (2009).

***Lepilemur milanoii* Louis, Jr., Engberg, Lei, Geng, Sommer, Randriamampionona, Randriamanana, et al., 2006**

Holotype.—Not designated.

Syntypes.—Not specifically designated syntypes, but type series = whole blood from DAR4.7, TTU-M104449 (TTU-TK125516), adult female; DAR4.17, TTU-M104450 (TTU-TK125517), adult male; and DAR4.18, TTU-M104497 (TTU-TK125564), adult female.

Etymology.—"The name *milanoii* is proposed for the Daraina region and is derived from the Malagasy language and means, "to swim". The Malagasy people refer to the Daraina region as "Daraina milanoa" which means "Daraina swimming" in reference to their swimming in the Andranotsimaty River looking for gold."

Locality.—MADAGASCAR: Province de Antsiranana; Daraina, Andranotsimaty (approximately 13°08′52.5″S, 49°41′11″E).

Collectors and dates.—Richard Randriamampionona, Jean C. Randriamanana, Gerard Nalanirina, and Edward Louis; DAR4.7, 25 November 2004; DAR4.17 and DAR4.18, 26 November 2004.

Discussion.—This species is based on non-traditional type specimens that are stored as whole blood samples that were taken from free-ranging wild lemurs.

***Lepilemur petteri* Louis, Jr., Engberg, Lei, Geng, Sommer, Randriamampionona, Randriamanana, et al., 2006**

Holotype.—Not designated.

Syntypes.—Not specifically designated syntypes, but type series = whole blood from BEZ15, TTU-M104444 (TTU-TK125511), adult female; BEZ18, TTU-M104496 (TTU-TK125563), adult male; BEZ21, TTU-M104445 (TTU-TK125512), adult female.

Etymology.—"The name *petteri* is proposed in honor of Jean-Jacques Petter for his immense body of work on lemurs, including the sportive lemurs.

Considered a leader in French primatology, Dr. Petter was a winner of the WWF Gold Medal in 1981 for his conservation work in Madagascar."

Locality.—MADAGASCAR: Province de Toliary; Beza-Mahafaly (approximately 23°39′11.4″S, 44°37′90.6″E).

Collectors and dates.—Richard Randriamampionona and Edward Louis; BEZ15 and BEZ18, 5 March 2001; BEZ21, 6 March 2001.

Discussion.—This species is based on non-traditional type specimens that are stored as whole blood samples that were taken from free-ranging wild lemurs.

Lepilemur scottorum Lei, Engberg, Andriantompohavana, McGuire, Mittermeier, Zaonarivelo, Brenneman, et al., 2008

Holotype.—Not designated.

Syntypes.—Not specifically designated syntypes, but "type series" = whole blood from MAS6.12, TTU-M104516 (TTU-TK145333), adult female; MAS6.13, TTU-M104517 (TTU-TK145334), adult female; and MAS6.14, TTU-M104518 (TTU-TK145335), adult male.

Etymology.—"The name *scottorum* is proposed in honor of the Suzanne and Walter Scott Jr. Family Foundation. Suzanne and Walter Scott Jr. are definitive leaders, mentors, and motivators of *in situ* and *ex situ* conservation throughout the world and have volunteered extensively in Henry Doorly Zoo's conservation programs for decades. Walter Scott, Jr. is a 32-year member of the Board of Directors of the Omaha Zoological Society. Formerly president of the board, he has been chairman of the board since 1984. He is a philanthropist, business leader, and community activist on the board of many charitable organizations and businesses. Suzanne M. Scott, a long-time zoo supporter, in 1984 became the founding executive director of the Omaha Zoo Foundation responsible for establishing the zoo's endowment funds and raising money for special projects."

Locality.—MADAGASCAR: Province de Antsiranana; Masoala National Park (approximately S15°40′246″, E49°57′537″).

Collectors and date.—Edward Louis, Richard Rakotonomenjanahary, Jean C. Randriamanana, Justin Andrianasolo, Philibert Randriamaronjaka, and Jean Claude Rakotoniaina, 20 November 2006.

Discussion.—This species is based on non-traditional type specimens that are stored as whole blood samples that were taken from free-ranging wild lemurs.

Lepilemur seali Louis, Jr., Engberg, Lei, Geng, Sommer, Randriamampionona, Randriamanana, et al., 2006

Holotype.—Not designated.

Syntypes.—Not specifically designated syntypes, but type series = whole blood from JAR2, TTU-M104456 (TTU-TK125523), adult male; JAR3, TTU-M104457 (TTU-TK125524), adult female; JAR8, TTU-M104458 (TTU-TK125525), adult female.

Etymology.—"The name *seali* is proposed in honor of Dr. Ulysses Seal, an architect of the Conservation Breeding Specialist Group SSC/IUCN, and a definitive leader, teacher, and motivator of in situ conservation throughout the world."

Locality.—MADAGASCAR: Province de Antsiranana; Anjanaharibe-Sud Special Reserve (approximately 14°47′45.l″S, 49°27′88.5″E).

Collectors and dates.—Richard Randriamampionona, Jean C. Randriamanana, Gerard Nalanirina, and Edward Louis; JAR2 and JAR3, 19 July 2001 and JAR8, 21 July 2001.

Discussion.—This species is based on non-traditional type specimens that are stored as whole blood samples that were taken from free-ranging wild lemurs.

Lepilemur tymerlachsonorum Louis et al., 2006 (emended name)
= _Lepilemur tymerlachsoni_ Louis, Jr., Engberg, Lei, Geng, Sommer, Randriamampionona, Randriamanana, et al., 2006

Holotype.—Not designated.

Syntypes.—Not specifically designated syntypes, but type series = whole blood from LOKO4.2, TTU-M104468 (TTU-TK125535), adult male; LOKO4.5, TTU-M104470 (TTU-TK125537), adult female; LOKO4.33, TTU-M104469 (TTU-TK125536), adult female.

Etymology.—"The name *tymerlachsoni* is proposed in honor of the Howard and Rhonda Hawk Family who have made generous contributions to the Madagascar Project, providing infra-structure and field support to the many Malagasy graduate students." The specific name is not based on a person's name, but rather a nonsensical name created by the Hawk family.

Locality.—MADAGASCAR: Province de Antsiranana; Nosy Be, Lokobe National Park (approximately 13°23′27.6″S, 48°18′15.2″E).

Collectors and dates.—Richard Randriamampionona, Jean C. Randriamanana, Gerard Nalanirina, Rambinintsoa Andriantompohavana, and John R. Zaonarivelo; LOKO4.2 and LOKO4.5, 6 July 2004; LOKO4.33, 9 July 2004.

Discussion.—This species is based on non-traditional type specimens that are stored as whole blood samples that were taken from free-ranging wild lemurs. Sample LOKO4.5 was reported in the original publication as being collected on 6 July 2003, it should have stated 2004. Following ICZN code: "A species-group name, if a noun in the genitive case formed directly from a modern personal name, is to be formed by adding to the stem of that name -i if the personal name is that of a man, -*orum* if of men or of man (men) and woman (women) together…" The emended lemur name was by Hoffman et al. (2009).

Lepilemur wrightae Louis et al., 2006 (emended name)
= _Lepilemur wrighti_ Louis, Engberg, Lei, Geng, Sommer, Randriamampionona, Randriamanana, et al., 2006

Holotype.—Not designated.

Syntypes.—Not specifically designated syntypes, but type series = whole blood from KALA4.9, TTU-M104460 (TTU-TK125527), adult female; KALA4.16, TTU-M104498 (TTU-TK125565), adult male; KALA4.18, TTU-M104459 (TTU-TK125526), adult female.

Etymology.—"The name *wrighti* is proposed in honor of Dr. Patricia Wright for her long term dedication and contributions to conservation in Madagascar and tropical environments throughout the world."

Locality.—MADAGASCAR: Province de Toliary; Kalambatritra Special Reserve, Befarara (approximately 23°25′05.4″S, 46°26′55.4″E).

Collectors and dates.—Richard Randriamampionona, Jean C. Randriamanana, Gerard Nalanirina, Rambinintsoa Andriantompohavana, and Edward Louis; KALA4.9 and KALA4.16, 12 June 2004; KALA4.18, 14 June 2004.

Discussion.—This species is based on non-traditional type specimens that are stored as whole blood samples that were taken from free-ranging wild lemurs. Sample KALA4.16 was reported in the original publication as being collected on 12 June 2003, it should have stated 2004. Following ICZN code: "A species-group name, if a noun in the genitive case formed directly from a modern personal name, is to be formed by adding to the stem of that name -i if the personal name is that of a man, -*orum* if of men or of man (men) and woman (women) together …" The emended lemur name was by Hoffman et al. (2009).

ORDER RODENTIA Bowdich, 1821
Family Cricetidae Fischer, 1817
Genus *Sigmodon* Say and Ord, 1825
Sigmodon fulviventer L. A. Allen, 1889
***Sigmodon fulviventer dalquesti* Stangl, 1992**

Holotype.—TTU-M59413 (TTU-TK938327), adult male. Previous catalogs Midwestern State University Collection of Recent Mammals no.17906, original field number 3085.

Etymology.—Named in honor of the late Walter W. Dalquest, formerly of Midwestern State University.

Locality.—USA: Texas; Jeff Davis County, 2.4 km W Point-of-Rocks Park.

Collector and date.—F. B. Stangl, Jr., 27 March 1991.

Genus *Peromyscus* Gloger, 1841
***Peromyscus kilpatricki* Bradley, Ordóñez-Garza, Ceballos, Rogers, and Schmidly, 2017**

Holotype.—TTU-M104808 (TTU-TK150644); adult male; skin, skull, and skeleton. Original field number Steve R. Hoofer 1179.

Paratype.—One female TTU-M104799 (TTU-TK150627).

Etymology.—"This species is named in honor of Dr. C. William Kilpatrick (Zadock Thompson Museum of Natural History, University of Vermont) for his many contributions to the systematic studies of the *P. boylii* species group and overall passion for rodent systematics and taxonomy."

Locality.—MEXICO: Michoácan; 13.5 km SW Zitácuaro (UTM 14Q-352122–2140934).

Collector and date.—Steve R. Hoofer, 25 July 2006.

***Peromyscus schmidlyi* Bradley, Carroll, Haynie, Martinez, Hamilton, and Kirkpatrick, 2004a**

Holotype.—TTU-M81617 (TTU-TK72443), original field number Robert W. Bradley 828, adult female.

Etymology.—"This species is named in honor of Professor David J. Schmidly for his many contributions to the systematics of the genus *Peromyscus* and devotion to mammalian taxonomy."

Locality.—MEXICO: Durango; 6.1 km W Coyotes (Hacienda Coyotes) (UTM 2634281-13–465908).

Collector and date.—R. D. Bradley, 4 July 1997.

***Peromyscus carletoni* Bradley, Ordóñez-Garza, Sotero-Caio, Huynh, Kilpatrick, Iñiguez-Dávalos, and Schmidly, 2014**

Holotype.—TTU-M110122 (TTU-TK148443), adult male.

Etymology.—"This species is named in honor of Dr. Michael D. Carleton (National Museum of Natural History, Smithsonian Institution) for his eloquent contributions to the studies of the genus *Peromyscus* and devotion to rodent systematics and taxonomy."

Locality.—MEXICO: Nayarit; 70 km N Santa María del Oro (UTM 13Q-559922–2395306).

Collectors and date.—Bradley et al., 19 July 2008

Genus *Reithrodontomys* Giglioli, 1873
***Reithrodontomys bakeri* Bradley, Mendez-Harclerode, Hamilton, and Ceballos, 2004b**

Holotype.—TTU-M82790 (TTU-TK93372), adult male.

Paratypes.—TTU-M82791 (TTU-TK93373), male; TTU-M82192 (TTU-TK93374), female.

Etymology.—"It is our pleasure to name this species after Dr. Robert J. Baker. Dr. Baker has played a major role in investigating chromosomal evolution, systematics, and molecular evolution of *Reithrodontomys*. Through his tutelage, many of his former graduate students gained valuable research experiences by examining systematic and evolutionary questions affiliated with members of this genus. Through his efforts, our knowledge of *Reithrodontomys* has been increased and it seems appropriate to name this taxon accordingly."

Locality.—MEXICO: Guerrero; 6.4 km SSW Filo de Caballo.

Collector and date.—R. D. Bradley et al., 20 July 2000.

Family Geomyidae Bonaparte, 1845
Genus *Geomys* Rafinesque, 1817
***Geomys knoxjonesi* Baker and Genoways, 1975 (current name)**
= *Geomys bursarius knoxjonesi* Baker and Genoways, 1975

Holotype.—TTU-M19872 (TTU-TK947860, karyotype number TTU-TK5074), collector's field number 1303, adult female.

Etymology.—"The subspecific name is a patronym honoring Dr. J. Knox Jones, Jr., in recognition of his contributions to the study of Recent mammals and his leadership in the American Society of Mammalogists."

Locality.—USA: Texas; Winkler County, 6.6 km N, 8.2 km E Kermit.

Collector and date.—Stephan L. Williams, 27 January 1974.

Discussion.—Considered a subspecies of *bursarius* by the original authors (Baker and Genoways, 1975) and cataloged like that by Patton (1993), it later was recognized as a distinct species by Baker et al. (2003b) and elevated. Patton (2005) now list it as a full species. Baker et al. (1989) described a hybrid zone with partial reproductive isolation between *knoxjonesi* and *bursarius major*. Its phylogenetic position within *Geomys* was established by Jolley et al. (2000).

Geomys personatus True, 1889
***Geomys personatus davisi* Williams and Genoways, 1981**

Holotype.—CM 48689, Stephan L. Williams original number 2081; (TTU-TK6857).

Etymology.—"The subspecific name honors Dr. William B. Davis for his contributions to the knowledge of *Geomys personatus* as well as other species of pocket gophers."

Locality.—USA: Texas; Zapata County, 4.8 km N, 4.5 km W Zapata (type locality).

Collector and date.—Stephan L. Williams, 16 November 1976.

Discussion.—The frozen tissue sample TTU-TK6857 has been depleted. The karyotype slides may still be at TTU under this TTU-TK number, but no attempt was made to locate them for this project.

Genus *Cratogeomys* Merriam, 1895
Cratogeomys castanops (Baird, 1852)
***Cratogeomys castanops dalquesti* Hollander, 1990**

Holotype.—TTU-M44458 (TTU-TK945834), original number of R. R. Hollander 1506, adult female.

Etymology.—"It gives me great pleasure to name this subspecies in honor of Walter W. Dalquest of Midwestern State University. Dr. Dalquest has made numerous contributions to our knowledge of mammalian faunas of Texas, especially Pleistocene faunas. Through his efforts and those of his students, the largest series of this taxon available for study is housed in the mammal collection of Midwestern State University."

Locality.—USA: Texas; Sterling County, 1.6 km N and 6.4 km W Sterling City.

Collector and date.—Robert R. Hollander, 10 June 1986.

ORDER SORICOMORPHA Gregory, 1910
Family Soricidae Fischer, 1814
Genus *Cryptotis* Pomel, 1848
***Cryptotis eckerlini* Woodman, 2019**

Holotype.—TTU-M136186 (TTU-TK186803), original field number 1699 of Nicté Ordóñez Garza, adult female, see under discussion below.

Paratypes.—TTU-M136183 (TTU-TK186800), TTU-M136185 (TTU-TK186802), TTU-M136188 (TTU-TK186805), TTU-M136192 (TTU-TK186807), adult females; TTU-M136184 (TTU-TK186801), TTU-M136187 (TTU-TK186804), TTU-M136189 (TTU-TK186806), adult males.

Etymology.—"The species name is in honor of Ralph P. Eckerlin, a wellspring of natural history information whose contributions to mammalogy as a collector, parasitologist, and tireless field companion are insufficiently acknowledged."

Locality.—GUATEMALA: Sacatepéquez Department: Cerro Cucurucho; 11 km by road SE of Antigua Guatemala; Finca El Pilar (14º31.112′N, 90º41.472′W) [2,640 m. elevation] (type locality).

Collectors and date.—Nicté Ordóñez Garza et al., 9 January 2015.

Discussion.—Both the stuffed specimens and frozen tissue samples of the type series are currently deposited at Texas Tech University as stated in the original publication. Under provisions of the collecting permit the holotype (dried specimen) must be returned to the country of origin (Nicté Ordóñez Garza, pers. comm. to JCC, 2 February 2020), but the frozen tissues of the holotype will remain at TTU. Both skins and frozen tissues of the paratypes will remain at TTU. The holotype skin will be transferred to the Museo de Historia Natural de la Universidad de San Carlos de Guatemala, Guatemala City (USAC).

Genus *Notiosorex* Coues, 1877
***Notiosorex cockrumi* Baker, O'Neill, and McAliley, 2003a**

Holotype.—TTU-M100000 (TTU-TK49918), original field number M10 of L. Rex McAliley, adult female.

Etymology.—"The specific epithet *cockrumi* was chosen to recognize and to honor Dr. E. Lendell Cockrum for his lifetime of research on mammals and for his commitment to the education of students in Mammalogy and General Biology. Examples of Dr. Cockrum's research on the distribution and biodiversity of mammals include *Mammals of Kansas* (1952), and *The Recent Mammals of Arizona* (1960). Examples of university textbooks include *Introduction to Mammalogy* (1962) and *Zoology* (Cockrum and McCauley 1965). Additionally, he has written a number of books for the general public on a variety of subjects including mammals as well as health issues (Cockrum, 1998)."

Locality.—USA: Arizona; Cochise County, Leslie Canyon National Wildlife Refuge (T21S, R28E, NE 1/4 Section 20).

Collector and date.—Bill Radke, September or October 2000.

REMARKS

The above catalog of type specimens was created to provide researchers with information on the holdings of Texas Tech University. This catalog illustrates the diversity of the collections at Texas Tech University, as well as the advancement in technology with the frozen tissue samples of type material that are housed in the NSRL.

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