A CATALOG OF THE COLEOPTERA OF AMERICA NORTH OF MEXICO

FAMILY: DRYOPIDAE

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURE HANDBOOK NUMBER 529-49

PREPARED BY AGRICULTURAL RESEARCH SERVICE

FAMILIES OF COLEOPTERA IN AMERICA NORTH OF MEXICO

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[1] Missing numbers are those assigned in the computer program to families not found in the United States and Canada.

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A CATALOG OF THE COLEOPTERA OF AMERICA NORTH OF MEXICO

FAMILY: DRYOPIDAE

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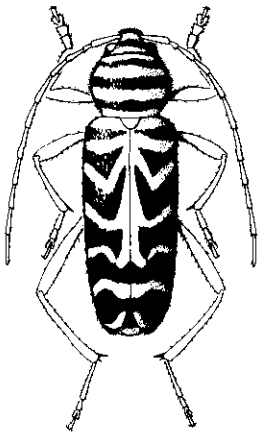

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURE HANDBOOK NUMBER 529-49

PREPARED BY AGRICULTURAL RESEARCH SERVICE

April 1983

FOREWORD

Many species of beetles are important pests of agricultural crops, stored food products, forests, wood products and structures, and fabrics. Many other species, in contrast, are beneficial in the biological suppression of pest arthropods and weeds, as well as in the decomposition of plant detritus, animal carcasses, and dung. Part of our national responsibility to American agriculture is to provide correct identification of species of American beetles so that appropriate controls can be applied.

Most information about animal species, whether agricultural, biological, or experimental, is filed under the species' scientific names. These names are therefore the keys to retrieval of such information. Because some species have been known by several names, a complete listing of these names for each species is necessary.

For the user of scientific names, an up-to-date taxonomic catalog providing currently accepted names and pertinent bibliographic and distributional data is an indispensable tool. Although taxonomic literature is constantly changing to reflect current work, the traditional published taxonomic catalog remains static with updating left to the individual user until it is revised. Production of catalogs in the past has been laborious with long printing delays resulting in data that are obsolete before being published. However, the computer now provides the capability of storing, updating, and retrieving taxonomic data; rapid publication through computer-driven typesetting machinery; and a greater degree of currentness and flexibility.

All 124 fascicles in this catalog of the beetles of America north of Mexico are produced by an original group of computer programs, designed and written during a pilot project by personnel of the Systematic Entomology Laboratory, Agricultural Research Service, and the Communications and Data Services Division, Science and Education Management Staff.

The published information is stored on computer tape, is updated periodically to reflect taxonomic progress in the family, and is available in a data base for computer searching.

T. B. Kinney, Jr.
Administrator
Agricultural Research Service

PREFACE

The Coleoptera, or beetles, are represented in the world by about 220,000 described species, of which about 24,000 occur in the United States and Canada. A comprehensive taxonomic catalog of beetles for this area has not been available except the series of world-based "Coleopterorum Catalogus" volumes (1909–present, Junk, Berlin). The Leng "Catalogue of the Coleoptera of America North of Mexico" (J. D. Sherman, Jr., Mt. Vernon, NY), which was published in 1920 with supplements to the end of 1947, is a checklist. However, it has served professional and amateur alike for nearly 60 years as the principal source of scientific names of beetles. Since 1947, many new taxa have been described and many changes in status and nomenclature have appeared in numerous scattered publications, but little effort has been made to summarize these changes.

This catalog will supplant the Leng catalog and supply additional essential information. It is produced by an original suite of storage, retrieval, and printing programs written especially for automated taxonomic catalogs.

The catalog for each family is published as a separate fascicle with its introductory text, bibliography, and index. Each family is numbered as listed, but the order of issuance of fascicles is not necessarily in numerical sequence. The publishing of separate fascicles makes data available shortly after they are assembled. Computer tapes for each fascicle are maintained for updating and necessary reprinting.

The information on each family is the responsibility of the respective author or authors. The editors modify it only to correct obvious errors and to make it conform to the requirements of the computer programs.

No original proposal for a new name, taxon, status, or classification is given, such data having been previously published, but new host and distributional data are often listed. The rules of "The International Code of Zoological Nomenclature" are followed.

The geographic scope of this catalog includes the continental United States, Canada, Alaska, Greenland, and the associated continental islands. Names of taxa found only in other regions are excluded. If the range of a species extends outside these geographic limits, this fact is indicated. Inside the back cover is a map of the 12 faunal regions based on historical and faunal criteria to simplify distribution recordings. Two-letter Postal Service style abbreviations are used for States and Provinces, and faunal regions are indicated in each distribution record by a diagonal line between groups of abbreviations.

It is not the purpose of this catalog to present a complete scheme of higher classification within the order. The familial makeup is somewhat intermediate between that of R. H. Arnett in "The Beetles of the United States" (1960–62, Catholic University Press, Washington, DC) and that of R. A. Crowson in "The Natural Classification of the Families of Coleoptera" (1967, Biddles Ltd., Guildford, England). Modifications of these two systems are largely those advocated by J. F. Lawrence based in part on suggestions by taxonomic specialists for certain families.

Generic groups and higher categories within the family are arranged phylogenetically as indicated by the author of the particular fascicle, and species group names with their respective synonyms are arranged alphabetically.

Names referable to incertae sedis and nomen dubium are listed separately at the end of the nearest applicable taxon with notations as to their status.

Each available name is followed by its author, date proposed, and page number referring to the complete bibliographic citation containing the original description. Following each generic name are

the type-species and method of its designation, necessary explanatory notes, and pertinent references on immature stages, taxonomy, redescription, ecology, and keys. After the specific name entry are the original genus (if different from the present placement), type-locality, geographical distribution by State, Province, and broad extralimital units, explanatory notes, pertinent references to immature stages, taxonomy, redescription, and ecology, depository of type-specimen and its sex, and hosts.

In addition to the list under the map of faunal regions (inside back cover), the following abbreviations are used in this catalog:

Abbreviations, General

Amer. Bor.—America Borealis
Amer. Sept.—America Septentrionalis
Autom.—Automatic
C. Amer.—Central America
Co.—County
Cosmop.—Cosmopolitan
Design.—Designated
F.—Female
Holarc.—Holarctic
Isl.—Island
M.—Male
Mex.—Mexico
Monot.—Monotypy
Mus.—Museum
N. Amer.—North America
Orig. des.—Original designation
Preocc.—Preoccupied
S. Amer.—South America
Sp.—Species
Subseq. monot.—Subsequent monotypy
Subsp.—Subspecies
Taut.—Tautonymy
Univ.—University
USA—United States of America
Var.—Variety
W. Ind.—West Indies

Museums in the Continental United States and Canada [1]

AMNH—American Museum of Natural History, New York
ANSP—Academy of Natural Sciences, Philadelphia, PA
BYUC—Brigham Young University, Provo, UT
CASC—California Academy of Sciences, San Francisco
CISC—University of California, Berkeley
CNCI—Canadian National Collections, Ottawa
CUIC—Cornell University, Ithaca, NY
CWOB—C. W. O'Brien Collection, Tallahassee, FL
DHKC—D. H. Kistner Collection, Chico State College, CA
ELSC—E. L. Sleeper Collection, Long Beach, CA
FMNH—Field Museum of Natural History, Chicago, IL
FSCA—Florida State Collection, Gainesville
HAHC—H. & A. Howden Collection, Ottawa, Canada
ICCM—Carnegie Museum, Pittsburgh, PA
INHS—Illinois Natural History Survey, Urbana
JGEC—J. G. Edwards Collection, San Jose, CA
KMFC—K. M. Fender Collection, McMinnville, OR
KSUC—Kansas State University, Manhattan
LACM—Los Angeles County Museum, CA
LSUC—Louisiana State University, Baton Rouge
MCZC—Museum of Comparative Zoology, Harvard University, Cambridge, MA
MSUC—Michigan State University, East Lansing
NCSM—North Carolina State University, Raleigh
NYSM—New York State Museum, Albany
OSEC—Oklahoma State University, Stillwater
OSUC—Ohio State University, Columbus
OSUO—Oregon State University, Corvallis

[1] Abbreviations for U.S. and Canadian museums abridged from Arnett, R. H., Jr., and Samuelson, G. A., 1969, "Directory of Coleoptera Collections of North America (Canada Through Panama)," Cushing-Malloy, Ann Arbor, MI, 123 pp.

PMNH—Peabody Museum, Yale University, New Haven, CT
PSUC—Pennsylvania State Museum, University Park
PURC—Purdue University, West Lafayette, IN
RUIC—Rutgers University, New Brunswick, NJ
SEMC—Snow Museum, University of Kansas, Lawrence
SJSC—San Jose State College, CA
SLWC—S. L. Wood Collection, Provo, UT
SMSH—Stovall Collection, University of Oklahoma, Norman
TAMU—Texas A. & M. University, College Station
UCDC—University of California, Davis
UMMZ—University of Michigan, Ann Arbor
UMRM—University of Missouri, Columbia
USNM—U.S. National Museum of Natural History, Washington, DC
WSUC—Washington State University, Pullman

Museums in Foreign Countries

BMNH—British Museum (Natural History), London
BPBM—Bernice P. Bishop Museum, Honolulu
GUHC—Glasgow University, Hunterian College, Scotland
HMOX—Hope Museum, Oxford, England
HNHM—Hungarian Natural History Museum, Budapest
IPZE—Institut Pflanzenschutzforschung Zweigstelle, Eberswalde, East Germany
IRSB—Institut Royal Sciences Belgique, Brussels
MFNB—Museum für Naturkunde (Humboldt), Berlin
MGFT—Museum G. Frey, Tutzing, Munich, West Germany
MHNL—Museum d'Histoire Naturelle, Lyon, France
MNHP—Museum National d'Histoire Naturelle, Paris
MNSL—Museum of Natural Sciences, Leipzig, East Germany
MZBS—Museum Zoologia, Barcelona, Spain
NHRS—Naturhistoriske Riksmuseet, Stockholm
NMPC—Narodni Museum, Prague, Czechoslovakia
SCUT—Spinola College, University of Turin, Italy
SMTD—Staatliches Museum für Tierkunde, Dresden, East Germany
UNAM—Universidad Nacional Autonoma, Mexico City
UZMC—University Zoological Museum, Copenhagen, Denmark
UZMH—University Zoological Museum, Helsinki, Finland
ZMAS—Zoological Museum, Academy of Sciences, Leningrad
ZMPA—Zoological Museum, Polish Academy of Sciences, Warsaw
ZMUL—Zoological Museum, University of Lund, Sweden
ZMUM—Zoological Museum, University of Moscow
ZSBS—Zoologische Sammlung Bayerischen Staates, Munich, West Germany

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We thank the following members of the Communications and Data Services Division, SEMS: Sandra Strauss and Marianne Kingston for designing and writing the computer programs, and Margaret Seldin for developing the editing system.

J. M. Kingsolver, editor in chief
Systematic Entomology Laboratory, Agricultural Research Service
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CONTENTS

Family DRYOPIDAE Grouvelle, 1896

By Harley P. Brown

Parnidea Leach, 1817: 88; Parnidae MacLeay, 1825: 34; Dryopini Erichson, 1847: 509; Parnides Redtenbacher, 1858: 410; Parnites Jacquelin du Val, 1859: 273; Diversicornes-Parniens Mulsant and Rey, 1872: 39; Parninae LeConte and Horn, 1883: 164; Parnini Kuwert, 1890: 16; Dryopides Grouvelle, 1896: 27; Dryopidae Grouvelle, 1900: 268; Dryopinae Zaitzev, 1910: 5.

There is no satisfactory common name for dryopids, but members of the genus *Helichus*, which is widespread and common in much of North America, may appropriately be called either long-toed water beetles or riffle beetles (a name shared with the elmids). Of the world's 17 genera and over 230 species, only 3 genera and 13 species have been reported from North America.

The history of the family is intertwined with that of the Elmidae, since the two groups were placed for so long within a single family. In 1791, Olivier created the genus *Dryops* for *Dermestes auriculatus* Geoffroy 1785 and a new species from Guadeloupe (now *Pelonomus picipes*). In 1792, Fabricius described *Parnus prolifericornis* as a new genus and species. Unfortunately, it was not until many years later that *Parnus prolifericornis* was recognized as a junior synonym for *Dryops auriculatus*. For the next century the names of higher taxa were based on the invalid *Parnus*. To compound the confusion, Leach in 1817 assigned the European species of *Helichus* (though this name was not created until 30 years later) to Olivier's *Dryops*. Thus most species of *Dryops* were described as *Parnus*, whereas most species of *Helichus* were described as *Dryops*.

Leach (1817) also created the family Parnidea, emended by MacLeay in 1825 to Parnidae, to encompass *Parnus*, *Dryops*, and *Potamophilus*. During the following century the family was expanded to include not only the Potamophilini (Larinae) but also the rest of the Elmidae and the Psephenidae at either subfamily or tribal level. The name was shifted from Parnidae to Dryopidae by Grouvelle (1896, 1900), but its composition remained relatively constant until Hinton (1939) excluded the Psephenidae (sen. lat.), Elmidae (both Larinae and Elminae), and such limnichid genera as *Lutrochus*. Although here we treat the family Dryopidae in this restricted sense, as do most taxonomists today, Bertrand (1972) retained the Elminae and Larinae within the family.

From the foregoing it is obvious that elmids are very closely related to the dryopids and less so to the limnichids and psephenids. Heterocerids are not very distant relatives. Crowson (1967) included them plus ptilodactylids, eulichids, eurypogonids, and chelonariids within the superfamily Dryopoidea, which, together with the Dascilloidea, Byrrhoidea, Buprestoidea, Rhipiceroidea, Elateroidea, and Cantharoidea, comprise the series Dascilliformia of the suborder Polyphaga.

LeConte (1852) described most of the North American species of *Helichus*, as summarized by Musgrave (1935). Harry Nelson is working on the genus. Most of the Neotropical dryopids were described by Sharp, Grouvelle, and Hinton, as were many from other tropical and subtropical regions. Deleve added numerous species from Africa and Southeast Asia. Sato has become the authority on Oriental dryopids. Bollow (1938-40) monographed the Palaearctic dryopids. Steffan and Olmi are current authorities on European dryopids.

So far as known, most dryopid larvae occur in moist soil or decaying wood and are essentially phytophagous. Few people have knowingly collected them. In contrast, the adults are relatively abundant and conspicuous and often are collected at lights. Although the adults of the large genus *Sostea* (mostly in the Malay region) display no affinity for water, those of most dryopids do. Members of the largest genus, *Dryops*, are typically riparian, often occurring in great numbers along Neotropical stream margins or in trash just above the water level. When disturbed, they drop onto the water surface, from which they readily take flight and fly rapidly; they are similar to larine elmids. Other species of *Dryops* and *Pelonomus* occur in or near the quiet waters of marshes or swamps and may creep beneath the water surface on the submerged parts of plants. Adults of *Helichus*, the only dryopids collected by most North American entomologists, resemble elmids in behavior and habitat, employing a hydrofuge plastron for truly aquatic respiration. Recently emerged adults fly, but once they have entered the water, most will probably never return to the air. They appear to be detritivores of stream substrates.

This manuscript was received May 1976.

Musgrave, 1935: 137; Hinton, 1939: 133 and 1955: 565; Leech and Chandler, 1956: 293; Steffan, 1961: 255; Brown, 1972.

Genus DRYOPS Olivier

Dryops Olivier, 1791: 297. Type-species: *Dermestes auricule* Geoffroy (monot.).

Parnus Fabricius, 1792: 245. Type-species: *Parnus prolifericornis* Fabricius (design. by Hope, 1838: 151) *auriculatus* (Geoffroy). Des Gozis (1886: 9) and Latreille (1804: 225) noted that *Parnus prolifericornis* Fabricius, 1792, was the same as *Dryops auriculatus* (Geoffroy, 1785). *P. acuminatus*, the only other species listed in the genus by Fabricius, is now in the genus *Potamophilus*.

IMMATURE STAGES: Bertrand, 1940: 360; figs. 100-111 (larva and pupa).

Subgenus DRYOPS Olivier

arizonensis (Schaeffer), 1905: 126 *(Parnus)*. AZ: Phoenix; AZ.

TYPE DEPOSITORY: Brkl. Inst. Arts Sci.

Subgenus YRDOPS Steffan

Yrdops Steffan, 1961: 286, figs. 24-33. Type-species: *Parnus striatopunctatus* Heer (orig. des.).Olmi (1972, p. 73, 74) questions the validity of such subdivisions of the genus as this pointing out the inadequacy of Steffan's material.

viennensis (Heer), 1841: 466 *(Parnus)*. Austria? and Switzerland: Zurich; PQ/ Old World.

TAXONOMY: Steffan, 1961.
REDESCRIPTION: Steffan, 1961: 289.

Genus HELICHUS Erichson

Helichus Erichson, 1847: 510. Type-species: *Elmis lithophilus* Germar (monot.).

Dryops Leach, 1817: 88. Type-species: *Dryops dumerilii* Latreille (monot.) *substriatus* (Mueller).

IMMATURE STAGES: Bertrand, 1940: 365, figs. 112-115 (larva).
TAXONOMY: Musgrave, 1935.
ECOLOGY: Brown, 1972: 21.
KEYS: Brown, 1972: 46.

basalis LeConte, 1852: 43. PA; KS IN OH KY/ PA DE MD WV VA/ MA/ OK/ LA MS AL GA.

TYPE DEPOSITORY: MCZC.
REDESCRIPTION: Musgrave, 1935: 140.

confluentus Hinton, 1935: 71, fig. E. AZ: Cochise Co., Cave Creek, Chiricahua Mts.; AZ NM TX/ Mex.

TYPE DEPOSITORY: CASC.
SEX OF TYPE: M.
TAXONOMY: Musgrave, 1935.

fastigiatus (Say), 1824: 275 *(Parnus)*. PA; KS IL IN OH/ PA NJ DE MD DC WV VA/ ME MA CT/ OK/ LA MS AL TN GA SC FL. The Say type-specimen was lost and a neotype was designated from WV: Ridge, Breakneck Run.

TYPE DEPOSITORY: USNM (neotype).
SEX OF TYPE: M.
REDESCRIPTION: Musgrave, 1935: 141.

immsi Hinton, 1937: 318, figs. 1-3, 6, 10. CA: Glendale; CA/ UT/ AZ NM TX/ Mex.

TYPE DEPOSITORY: BMNH.
SEX OF TYPE: M.

lithophilus (Germar), 1824: 88 *(Elmis)*. PA; WI ON PQ/ IA MO IL IN OH KY/ PA DE MD/ MA/ TX OK/ AR MS AL TN GA SC FL.

productus LeConte, 1852: 43. CA: San Diego; CA/ Mex.

TYPE DEPOSITORY: MCZC.
SEX OF TYPE: M.

striatus foveatus LeConte, 1852: 43 (synonymized by Horn, 1870: 33 but restored to variety by Musgrave, 1935: 142). NM: Santa Fe; BC WA OR/ CA NV/ AZ NM.

TYPE DEPOSITORY: MCZC.

columbianus Brown, 1931: 118 (synonymized by Musgrave, 1935: 142). BC: Copper Mountain.

TYPE DEPOSITORY: CNCI.

striatus striatus LeConte, 1852: 43. VT; BC WA OR/ AB MB MT ND SD/ MN WI MI ON PQ/ CA NV/ WY UT CO/ NE KS IA IL IN/ NH VT/ AZ NM.

TYPE DEPOSITORY: MCZC.
TAXONOMY: Musgrave, 1935: 142.

suturalis LeConte, 1852: 43. CA: San Diego; SD/ CA/ CO/ NE KS/ AZ NM TX OK/ Mex., C. Amer.

TYPE DEPOSITORY: MCZC.

gilensis LeConte, 1852: 43 (synonymized by Horn, 1870: 33). AZ: Gila River (near Pima villages).

TYPE DEPOSITORY: MCZC.

aequalis LeConte, 1854: 81 (synonymized by Horn, 1870: 33). TX: Frontera, Rio Grande(?).

TYPE DEPOSITORY: MCZC.

triangularis Musgrave, 1935: 143, pl. 17. AZ: Cochise Co., Chiricahua Mts., Pimery Canyon; AZ NM TX/ Mex.

TYPE DEPOSITORY: USNM.
SEX OF TYPE: M.

Genus PELONOMUS Erichson

Pelonomus Erichson, 1847: 510. Type-species: *Dryops picipes* Olivier (design. by Young, 1954: 207).

Oberonus Casey, 1893: 581 (synonymized by Sanderson, 1938: 660 (footnote)). Type-species: *Oberonus obesus* Casey (monot.) *obscurus* (LeConte).

Parnoides Kuwert, 1900: 17 (synonymized by Grouvelle, 1895: cclviii). Type-species: *Parnoides pectinicornis* Kuwert (monot.) *brasilianus* (Klug).

IMMATURE STAGES: Leech and Sanderson, 1959: fig. 38.67 (ventral aspect of larva).

obscurus gracilipes Chevrolat, 1864: 406. Cuba; FL/ W. Ind.

TAXONOMY: Darlington, 1936: 77.
ECOLOGY: Young, 1954: 208 (note).

obscurus obscurus LeConte, 1852: 42. 'Southern and western states' United States; KS IL IN KY/ TX/ AL TN SC FL/ Mex., C. Amer., W. Ind.

TYPE DEPOSITORY: MCZC.
SEX OF TYPE: F.

obesus Casey, 1893: 581 *(Oberonus)*(synonymized by Sanderson, 1938: 660 (footnote)). TN: Memphis.

TYPE DEPOSITORY: USNM.
SEX OF TYPE: M.

rufescens Casey, 1893: 581 (synonymized by Darlington, 1936: 77). FL.

TYPE DEPOSITORY: USNM.
SEX OF TYPE: F.

IMMATURE STAGES: Leech and Sanderson, 1959: fig. 38.67 (larva).
TAXONOMY: Darlington, 1936.

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INDEX

Names are indexed as follows:

CAPITALS: All names for taxa above the generic level;

Boldface: Valid generic and subgeneric names;

Roman: Valid specific and subspecific names;

Italic: All invalid names such as synonyms, nomina nuda, and extra-limital taxa even though valid.

Parentheses around an author's name indicate that the specific name has been transferred from its original genus. The generic name following the author's name indicates the present placement of the species. Synonyms of species-group names are listed with the original spelling.

AB Alberta
AK Alaska
AL Alabama
AR Arkansas
AZ Arizona
BC British Columbia
CA California
CO Colorado
CT Connecticut
DC District of Columbia
DE Delaware
FL Florida
GA Georgia
GL Greenland
IA Iowa
ID Idaho
IL Illinois
IN Indiana
KS Kansas
KY Kentucky
LA Louisiana
MA Massachusetts
MB Manitoba
MD Maryland
ME Maine
MI Michigan
MN Minnesota
MO Missouri
MS Mississippi
MT Montana
NB New Brunswick
NC North Carolina
ND North Dakota
NE Nebraska
NF Newfoundland
NH New Hampshire
NJ New Jersey
NM New Mexico
NS Nova Scotia
NT Northwest Territories
NV Nevada
NY New York
OH Ohio
OK Oklahoma
ON Ontario
OR Oregon
PA Pennsylvania
PE Prince Edward Island
PM St. Pierre-Miquelon
PQ Quebec
RI Rhode Island
SC South Carolina
SD South Dakota
SK Saskatchewan
TN Tennessee
TX Texas
UT Utah
VA Virginia
VT Vermont
WA Washington
WI Wisconsin
WV West Virginia
WY Wyoming
YT Yukon Territory