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A CATALOG OF THE COLEOPTERA OF AMERICA NORTH OF MEXICO

FAMILY: AMPHIZOIDAE



UNITED STATES
DEPARTMENT OF
AGRICULTURE

AGRICULTURE
HANDBOOK
NUMBER 529-5

PREPARED BY
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FAMILIES OF COLEOPTERA IN AMERICA NORTH OF MEXICO

<i>Fascicle</i> ¹	<i>Family</i>	<i>Year issued</i>	<i>Fascicle</i> ¹	<i>Family</i>	<i>Year issued</i>	<i>Fascicle</i> ¹	<i>Family</i>	<i>Year issued</i>
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2	Micromalthidae	1982	46	Callirhipidae		100	Lathridiidae	
3	Carabidae		47	Heteroceridae	1978	102	Biphyllidae	
4	Rhysodidae		48	Limnichidae		103	Byturidae	
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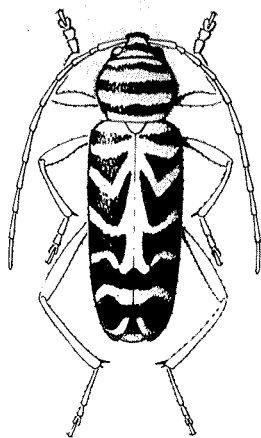
¹ Missing numbers are those assigned in the computer program to families not found in the United States and Canada.

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A CATALOG OF THE COLEOPTERA OF AMERICA NORTH OF MEXICO

FAMILY: AMPHIZOIDAE

BY
DAVID H. KAVANAUGH
DEPARTMENT OF ENTOMOLOGY
CALIFORNIA ACADEMY OF SCIENCES
SAN FRANCISCO, CA



UNITED STATES
DEPARTMENT OF
AGRICULTURE

AGRICULTURE
HANDBOOK
NUMBER 529-5

PREPARED BY
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May 1984

FOREWORD

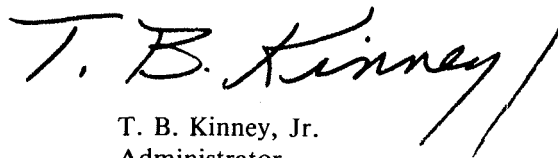
Many species of beetles are important pests of agricultural crops, stored food products, forests, wood products and structures, and fabrics. Many other species, in contrast, are beneficial in the biological suppression of pest arthropods and weeds, as well as in the decomposition of plant detritus, animal 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 (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, Phila-
 delphia, 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, Chi-
 cago, 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, Har-
 vard 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

ACKNOWLEDGMENTS

We are indebted to many individuals who contributed to the planning and development of this catalog. We are especially grateful to the following specialists who helped to make it as complete and accurate as possible: Richard H. Foote, Systematic Entomology Laboratory (SEL), Agricultural Research Service (ARS), for his suggestions, guidance, and encouragement; C. W. Sabrosky, SEL, for valuable counsel on nomenclatural problems; J. F. Lawrence, Division of Entomology, Commonwealth Scientific and Industrial Research Organization, Canberra, Australia, for his recommendations on higher categories; and more than 50 coleopterists in Canada, the United States, and Mexico for voluntarily contributing information about their specialty groups.

We thank the following members of the Communications and Data Services Division, ARS: 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
Washington, D.C.

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Family AMPHIZOIDAE LeConte, 1853

By David H. Kavanaugh

Arnett, 1960: 183; Edwards, 1951: 303 (monograph of family); Forsyth, 1970: 51 (structure); Horn, 1881: 91, and 1883: 275 (classification); Kavanaugh, 1980: 289 (type-specimens); Peterson, 1960; Tanner, 1927: 20, figs. 22 and 23 (structure).

In 1853, LeConte described *Amphizoa insolens* and erected for it the new family Amphizoidae, which he recognized as closely related to, but distinct from, other families of the Adephaga Carabidoidea. This view was shared by Horn (1883) and most later workers, although Mannerheim (1853) placed his genus *Dysmathes*, a junior synonym of *Amphizoa*, in the Tenebrionidae. Edwards (1951) considered Amphizoidae as intermediate between Carabidae and Dytiscidae and most closely related to Hygrobiidae. The most recent and comprehensive revision of the Amphizoidae is that of Edwards (1951).

At present, the family contains a single genus, *Amphizoa*, and five species--four in western North America and one in the Himalayas of Asia (Kavanaugh and Roughley, 1981).

Amphizoids are tenebrionoid in appearance, elongate-ovoid in silhouette, moderately convex dorsally, and piceous or dull black. Vestiture is much reduced, restricted to a fringe of long, fine setae in a groove on the posterodorsal surface of the middle tibia, traces of the same on the front and hind tibiae, and very short setae in punctures on all surfaces of all tibiae. The head is quadrate, with small, relatively flat eyes. Antennae are filiform, comprised of 11 short, slightly longer than wide antennomeres. Mandibles are stout, blunt, and concealed apically by the large, quadrate clypeus and labrum. The pronotum is flat, narrower than the elytra, with sides slightly to strongly crenulate and basally sinuate, and with anterior and posterior angles pointed and projected. Notopleural sutures are clearly evident. The legs are short and slender, and the tarsal formula in 5-5-5. The elytra are broad, subovoid, and tapered to a blunt point apically; the elytral surface is faintly punctulate and rugulose and striae are evident but poorly defined. The hindwing is fully developed, its venation pattern including both oblongum and wedge cells. The abdomen has six visible sterna, the first broadly and completely divided by the hindcoxae.

Both larvae and adults occur in cool or cold, swift-flowing mountain streams, where they are most often found clinging to driftwood and other debris floating in eddies or backwashes. They are also frequently found attached to the roots of undercut streamside vegetation or under partially submerged stones at the stream edge. Less frequently, and usually when disturbed, they can be seen floating sluggishly at or near the water surface. Larvae pupate out of water on adjacent streambanks; and in captivity, both adults and larvae can survive out of water indefinitely on cool, moist soil. Edwards (1954) reported eggs found on the underside of floating driftwood, and in the laboratory, adults will oviposit on moist peat moss. Both adults and larvae are strict predators (Edwards, 1954).

Larvae of *Amphizoa lecontei* Matthews were described by Hubbard (1892). Forsyth (1970) studied the structure of the pygidial glands for defensive secretions.

This manuscript was received October 1981.

Genus AMPHIZOA LeConte

Amphizoa LeConte, 1853: 227. Type-species: *Amphizoa insolens* LeConte (monot.) =

Dysmathes Mannerheim, 1853: 264. Type-species: *Dysmathes sahlbergii* Mannerheim (monot.) = *insolens* LeConte. Genus was placed by Mannerheim in Tenebrionidae.

IMMATURE STAGES: Boevig & Craighead, 1931: 17; Edwards, 1951: 308, and 1954: 19; Hubbard 1892a: 19, and 1892b: 341.

TAXONOMY: Edwards, 1951: 304; Horn, 1881: 91, and 1883: 275.

REDESCRIPTION: Edwards, 1951: 322.

ECOLOGY: Arnett, 1960: 184; Edwards, 1951: 306, 1953: 4, and 1954: 19; Darlington, 1930: 383.

KEYS: Edwards, 1951.

carinata Edwards, 1951: 326. CO: Conejos Co., Conejos River near Monkhaven; CO/ NM.

TYPE DEPOSITORY: CASC.

SEX OF TYPE: M.

insolens LeConte, 1853: 228. CA: Sacramento; AK YT/ BC WA OR ID/ AB/ CA NV.

TYPE DEPOSITORY: MCZC.

SEX OF TYPE: M.

sahlbergii Mannerheim, 1853: 265 (*Dysmathes*). AK: Sitka.

TYPE DEPOSITORY: Unknown.

josephi Matthews, 1872: 119. BC: Vancouver Isl.

TYPE DEPOSITORY: BMNH.

SEX OF TYPE: M.

REDESCRIPTION: Edwards, 1951: 323.

ECOLOGY: Darlington, 1930: 383.

lecontei Matthews, 1872: 121. BC: Vancouver Isl.; BC WA OR ID/ AB MT/ WY UT.

TYPE DEPOSITORY: BMNH.

SEX OF TYPE: M.

planata Van Dyke, 1927a: 98. AB: Beaver Creek.

TYPE DEPOSITORY: CASC.

SEX OF TYPE: F.

IMMATURE STAGES: Hubbard, 1892a: 19, and 1892b: 341.

REDESCRIPTION: Edwards, 1951: 327.

ECOLOGY: Darlington, 1930: 384.

striata Van Dyke, 1927b: 197. WA: King Co., Snoqualamie River (near Northbend); BC WA OR.

TYPE DEPOSITORY: CASC.

SEX OF TYPE: M.

REDESCRIPTION: Edwards, 1951: 324.

ECOLOGY: Darlington, 1930: 383; Bonnell and Bruzas, 1938: 112.

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Van Dyke, E. C.

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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.

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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
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RI Rhode Island
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TN Tennessee
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UT Utah
VA Virginia
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WA Washington
WI Wisconsin
WV West Virginia
WY Wyoming
YT Yukon Territory