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# A CATALOG OF THE COLEOPTERA OF AMERICA NORTH OF MEXICO

FAMILY: BYTURIDAE

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## FAMILIES OF COLEOPTERA IN AMERICA NORTH OF MEXICO

<i>Fascicle<sup>1</sup> Family</i>	<i>Year issued</i>	<i>Fascicle<sup>1</sup> Family</i>	<i>Year issued</i>	<i>Fascicle<sup>1</sup> Family</i>	<i>Year issued</i>	
1 .....	Cupedidae .....	1979	46 .....	Callirhipidae .....		
2 .....	Micromalthidae .....	1982	47 .....	Heteroceridae .....	1978	
3 .....	Carabidae .....		48 .....	Linnichidae .....	1986	
4 .....	Rhysodidae .....	1985	49 .....	Dryopidae .....	1983	
5 .....	Amphizoidae .....	1984	50 .....	Elmidae .....	1983	
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8 .....	Noteridae .....		52 .....	Cebrionidae .....		
9 .....	Dytiscidae .....		53 .....	Elatерidae .....		
10 .....	Gyrinidae .....		54 .....	Throscidae .....		
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				146 .....	Ithyoceridae .....	

<sup>1</sup>Missing numbers are those assigned in the computer program to families not found in the United States and Canada.

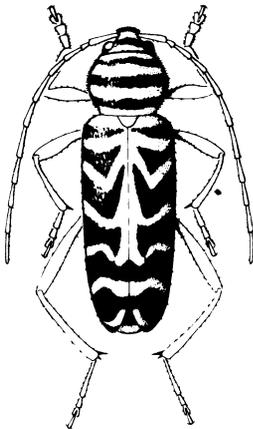
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# A CATALOG OF THE COLEOPTERA OF AMERICA NORTH OF MEXICO

FAMILY: BYTURIDAE

By  
CHARLES A. SPRINGER  
DEPARTMENT OF BIOLOGY  
HASTINGS COLLEGE  
HASTINGS, NE 68901

MICHAEL A. GOODRICH  
DEPARTMENT OF ZOOLOGY  
EASTERN ILLINOIS UNIVERSITY  
CHARLESTON, IL 61920



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## 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 the 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 and the Communication and Data Services Division, Agricultural Research Service.



R. D. Plowman  
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 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, 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. On (or inside of) 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 (on or inside of the back cover) of faunal regions, the following abbreviations are used in this catalog:

#### ABBREVIATIONS, GENERAL

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

#### MUSEUMS IN THE UNITED STATES AND CANADA

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

<sup>1</sup>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  
UICM—University of Idaho, Moscow  
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  
GUHC—Glasgow University, Hunterian College, Scotland  
HMOX—Hope Museum, Oxford, England  
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 Autónoma, Mexico City  
UZMC—University Zoological Museum, Copenhagen, Denmark  
UZMH—University Zoological Museum, Helsinki, Finland  
ZMAS—Zoological Museum, Academy of Sciences, Leningrad  
ZMPA—Zoological Museum, Academy of Sciences, Warsaw  
ZMUL—Zoological Museum, University of Lund, Sweden  
ZMUM—Zoological Museum, University of Moscow  
ZSBS—Zoologische Staatliche Museum Bayerischen Staates, Munich, West Germany

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Systematic Entomology Laboratory, Agricultural Research Service  
Washington, DC

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# Family BYTURIDAE

1

By Charles A. Springer and Michael A. Goodrich

The Byturidae have been variously placed within the Coleoptera. Most early workers (De Geer, 1774; Fabricius, 1775; Scriba, 1790; Latreille, 1796, 1807) placed them in the Dermestidae, although Westwood (1840) listed them with the Nitidulidae. The first New World species, *Byturus unicolor*, was described by Say in 1823 and was also placed in the Dermestidae. The family Byturidae was established by Thomson in 1859 as a monotypic family based on *Byturus* Latreille, 1796. LeConte's (1861) treatment of the Byturidae placed them as a subfamily of Dermestidae as did Jayne (1882), the describer of a new species from California, *Byturus grisescens*. As late as 1910, Blatchley was treating *Byturus* as a genus of Dermestidae. Casey (1916) described three new species of *Byturus* for North America, placing the family among the Clavicornia.

In the first revision of the family, Barber (1942) listed five genera and 19 species with Holarctic distribution. He described a new monotypic genus, *Byturellus*, with *Byturus grisescens* Jayne as type species, described three new species for North America (*Byturus bakeri*, *B. rubi*, and *B. sordidus*), and reduced the species described by Casey to synonymy. Springer and Goodrich (1983), in revising the family for North America, reduced Barber's three species to synonymy with *B. unicolor* Say.

In 1986, as a part of their revision of the European species of Byturidae, Springer and Goodrich placed *Byturellus* Barber, 1942 (and *Satorystia* Reitter, 1905) in synonymy with *Xerasia* Lewis, 1895. This change created the new combination, *Xerasia grisescens* (Jayne), for that North American species.

The affinity of the Byturidae with the Cucujoidea was recognized as early as 1912 by Sharp and Muir in a comparative study of the male genitalia, and in 1931 by Boeving and Craighead, as a result of their comparative studies of larvae. More recently, Crowson (1967) and Abdullah (1973, 1977) also have placed the family within the Cucujoidea, although these authors differ with regard to which group of families within the Cucujoidea the Byturidae are most closely allied. Based on our study of a diversity of morphological structures, we agree in general with Crowson in placing the Byturidae with the Clavicornia, rather than with the primitive section of the Heteromera, as does Abdullah.

Adult byturids are small, oblong beetles, 2.24-4.70 mm long, with a gently convex dorsum. Their color ranges from yellow to black and the body is covered with a fine, pale vestiture. The head is deflexed and inserted into the prothorax to the base of the eyes. The antennae are 11-segmented and terminate in a 3-segmented club. The labrum is transverse, mandibles apically bidentate, maxillary palpi 4-segmented and labial palpi 3-segmented. All tarsi have five tarsomeres; the second and third segments are distinctly lobed beneath. The male genitalia are of the trilobate type; the tegmen has apically bifid parameres and is supported by two basal struts.

Larvae of *Byturus unicolor* are eruciform, but without prolegs, and are 5-8 mm long. The head is exserted, prognathous and sclerotized. The mandibles are bidentate, without prostheca, and possess a setiferous clublike structure below the mola. The 10-segmented abdomen has two sclerotized urogomphi on the dorsum of segment nine. Larvae feed on the fruit of raspberries and other species of *Rubus*. The larvae and life history of *Xerasia grisescens* are undescribed.

This manuscript was received October 1983, modified November 1984 and July 1987.

## Subfamily BYTURINAE

### Tribe BYTURINI

#### Genus BYTURUS Latreille 1796

*Byturus* Latreille, 1796: 69. Type-species: *Dermestes tomentosus* DeGeer (monot).

IMMATURE STAGES: Peterson, 1960: 90, illus. (larvae).

TAXONOMY: Springer and Goodrich, 1983: 185, 1986: 337; Barber, 1942: 21.

REDESCRIPTION: Springer and Goodrich, 1983: 186, illus. (adult), 1986: 337, illus.

ECOLOGY: Springer and Goodrich, 1983: 188, 1986: 337, illus.; Baker, et al., 1947: 9; Walden, 1923: 92; Goodwin, 1909: 174.

KEYS: Springer and Goodrich, 1983: 185 (adult), 1986: 337 (adult); Peterson, 1960: 15 (larvae).

- unicolor** Say, 1823: 197 (Summers (1874) transferred *unicolor* Say (1823) to *Trixagus*). OK: Arkansas River; AK YT NT/ BC WA OR ID/ AB SK MB MT SD/ MN WI MI ON PQ/ NB NS NF/ CO/ NE KS IA MO IL IN OH KY/ NY PA NJ DE MD DC WV VA/ ME NH VT MA RI CT/ AZ TX OK/ AR AL TN GA SC NC; Mex. *B. unicolor* is the common raspberry fruitworm collected throughout its range on *Rubus* spp. The life history is well known from studies of damage to cultivated raspberries. Adults emerge from underground pupae in the spring, feed on leaves and flowers, and mate. Single eggs are oviposited on or near buds, flowers, or developing fruit. Larvae drop to the ground and overwinter as pupae in the soil.
- americanus* Gemminger and Harold, 1868: 912. America borealis.
- brevicollis* Casey, 1916: 179. not given.  
TYPE DEPOSITORY: USNM.
- punctatus* Casey, 1916: 178. DC.  
TYPE DEPOSITORY: USNM.
- bakeri* Barber, 1942: 20. WA: Vashon Is., Burton.  
TYPE DEPOSITORY: USNM.
- rubi* Barber, 1942: 18. NY: Marion.  
TYPE DEPOSITORY: USNM.
- sordidus* Barber, 1942: 18. DC.  
TYPE DEPOSITORY: USNM.  
IMMATURE STAGES: Peterson, 1960: 90, illus. (larvae).  
TAXONOMY: Springer and Goodrich, 1983: 185; Barber, 1942: 21.  
REDESCRIPTION: Springer and Goodrich, 1983: 186, illus. (adult).  
ECOLOGY: Springer and Goodrich, 1983: 188; Baker, et al., 1947: 9; Walden, 1923: 92; Goodwin, 1909: 174.  
HOST: *Rubus idaeus*, *R. spectabilis*, *R. occidentalis*, *R. ursinus*, *R. parviflorus*, *R. allegheniensis*, *R. canadensis*, *R. hispidus*, *Geranium maculatum*; *Geum* spp.

### Genus XERASIA Lewis 1895

- Xerasia** Lewis, 1895: 120. Type-species: *Xerasia variegata* Lewis (orig. des).
- Byturellus* Barber, 1942: 14. Type-species: *Byturellus grisescens* Jayne (orig. des).  
TAXONOMY: Lewis, 1895: 120; Barber, 1942: 14; Springer and Goodrich, 1983: 189 and 1986: 347; Goodrich and Springer, 1988: 346.  
REDESCRIPTION: Springer and Goodrich, 1983: 189, illus. (adult) and 1986: 347, illus.  
ECOLOGY: Springer and Goodrich, 1983: 191, illus. and 1986: 349, illus.  
KEYS: Springer and Goodrich, 1983: 185 and 1986: 337; Goodrich and Springer, 1988: 345.
- grisescens** Jayne, 1882: 346, figs. 5-6 (*Byturellus*). CA; WA OR/ CA/ AZ. Little is known about the life history and ecology of *grisescens*. Adults are collected throughout their range in association with *Quercus* spp. and *Pinus* spp.
- inflatus* Casey, 1916: 177 (*Byturellus*). CA: Calaveras Co., Mokelumne Hill, 1500 ft.  
TYPE DEPOSITORY: USNM.  
SEX OF TYPE: M.
- grisescens dubius* Barber, 1942: 15 (*Byturellus*). OR: Willamette Valley.  
TYPE DEPOSITORY: USNM.  
SEX OF TYPE: M.  
TAXONOMY: Springer and Goodrich, 1983: 189; Barber, 1942: 14.  
REDESCRIPTION: Springer and Goodrich, 1983: 189, illus. (adult).  
ECOLOGY: Springer and Goodrich, 1983: 191, illus.  
HOST: *Quercus agrifolia*, *Q. kelloggii*, *Q. dumosa*, *Q. wislizenii*, *Q. tomentella*; *Pinus sabiniana*, *P. ponderosa*, *P. jeffreyi*; *Cupressus macrocarpa*.

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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;

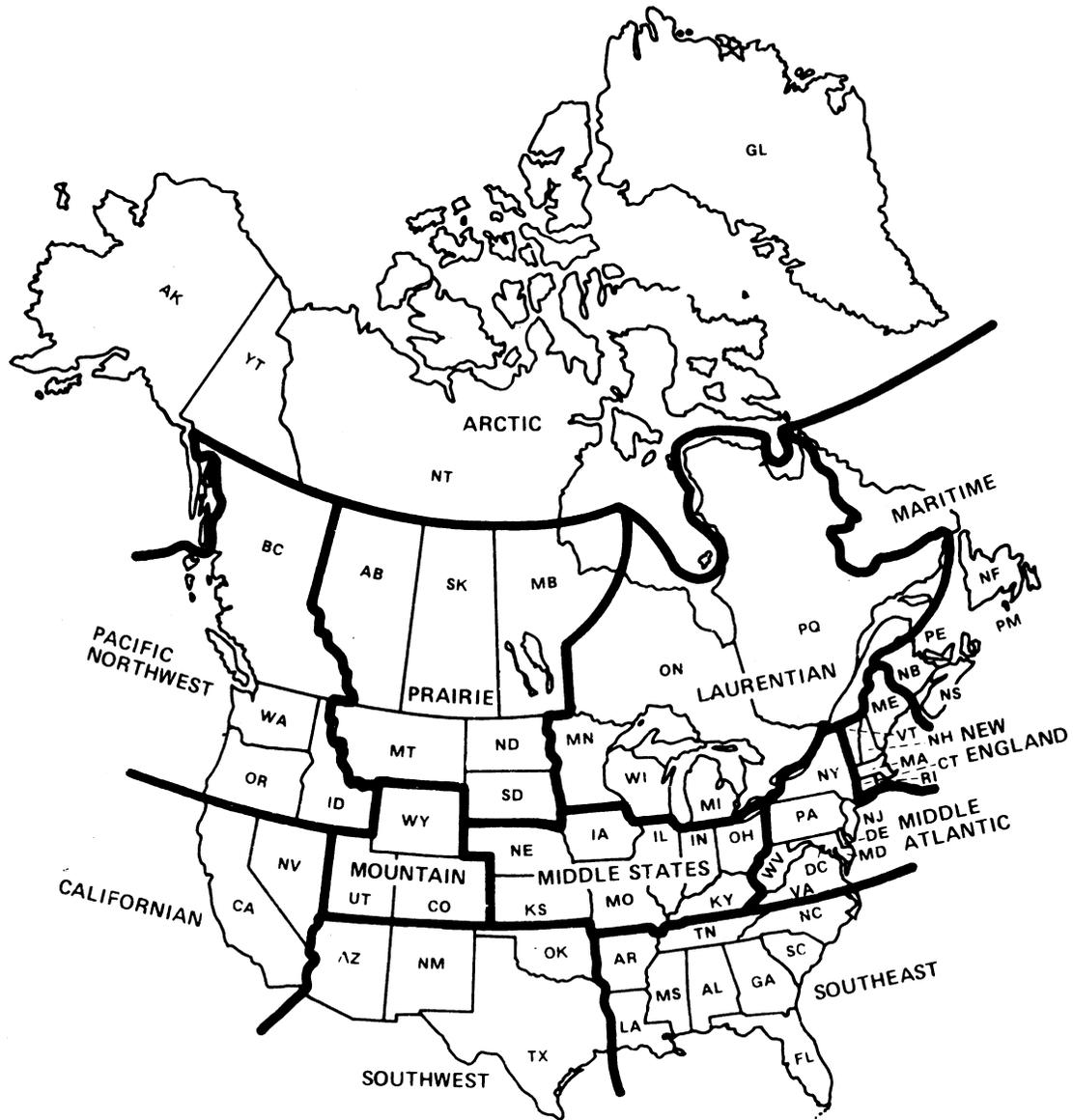
**Roman:** Valid specific and subspecific names;

**Italics:** 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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<b>BYTURINAE</b> .....	1
<b>BYTURINI</b> .....	1
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- |                                |                                 |                                |
|--------------------------------|---------------------------------|--------------------------------|
| <b>AB</b> Alberta              | <b>MB</b> Manitoba              | <b>ON</b> Ontario              |
| <b>AK</b> Alaska               | <b>MD</b> Maryland              | <b>OR</b> Oregon               |
| <b>AL</b> Alabama              | <b>ME</b> Maine                 | <b>PA</b> Pennsylvania         |
| <b>AR</b> Arkansas             | <b>MI</b> Michigan              | <b>PE</b> Prince Edward Island |
| <b>AZ</b> Arizona              | <b>MN</b> Minnesota             | <b>PM</b> St. Pierre-Miquelon  |
| <b>BC</b> British Columbia     | <b>MO</b> Missouri              | <b>PQ</b> Quebec               |
| <b>CA</b> California           | <b>MS</b> Mississippi           | <b>RI</b> Rhode Island         |
| <b>CO</b> Colorado             | <b>MT</b> Montana               | <b>SC</b> South Carolina       |
| <b>CT</b> Connecticut          | <b>NB</b> New Brunswick         | <b>SD</b> South Dakota         |
| <b>DC</b> District of Columbia | <b>NC</b> North Carolina        | <b>SK</b> Saskatchewan         |
| <b>DE</b> Delaware             | <b>ND</b> North Dakota          | <b>TN</b> Tennessee            |
| <b>FL</b> Florida              | <b>NE</b> Nebraska              | <b>TX</b> Texas                |
| <b>GA</b> Georgia              | <b>NM</b> New Mexico            | <b>UT</b> Utah                 |
| <b>GL</b> Greenland            | <b>NH</b> New Hampshire         | <b>VA</b> Virginia             |
| <b>IA</b> Iowa                 | <b>NJ</b> New Jersey            | <b>VT</b> Vermont              |
| <b>ID</b> Idaho                | <b>NM</b> New Mexico            | <b>WA</b> Washington           |
| <b>IL</b> Illinois             | <b>NS</b> Nova Scotia           | <b>WI</b> Wisconsin            |
| <b>IN</b> Indiana              | <b>NT</b> Northwest Territories | <b>WV</b> West Virginia        |
| <b>KS</b> Kansas               | <b>NV</b> Nevada                | <b>WY</b> Wyoming              |
| <b>KY</b> Kentucky             | <b>NY</b> New York              | <b>YT</b> Yukon Territory      |
| <b>LA</b> Louisiana            | <b>OH</b> Ohio                  |                                |
| <b>MA</b> Massachusetts        | <b>OK</b> Oklahoma              |                                |