



Zootaxa 3148: 1–237 (2011)

www.mapress.com/zootaxa/

Copyright © 2011 · Magnolia Press

Monograph

ISSN 1175-5326 (print edition)

ZOOTAXA

ISSN 1175-5334 (online edition)

ZOOTAXA

3148

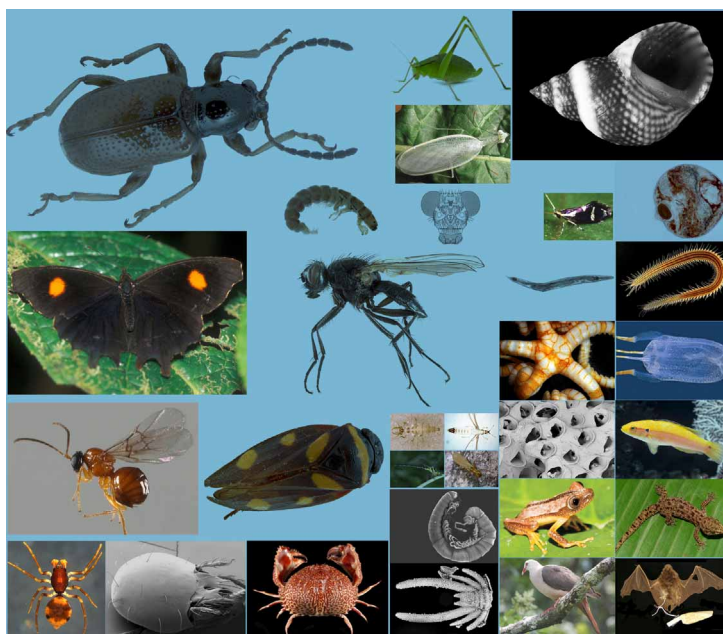
Animal biodiversity:

An outline of higher-level classification and survey of taxonomic richness

ZHI-QIANG ZHANG (ED.)

New Zealand Arthropod Collection, Landcare Research, Private Bag 92170, Auckland, New Zealand;

zhangz@landcareresearch.co.nz



Magnolia Press
Auckland, New Zealand

Accepted: published: 23 Dec. 2011

ZHI-QIANG ZHANG (ED.)

Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness
(*Zootaxa* 3148)

237 pp.; 30 cm.

23 Dec. 2011

ISBN 978-1-86977-849-1 (paperback)

ISBN 978-1-86977-850-7 (Online edition)

FIRST PUBLISHED IN 2011 BY

Magnolia Press

P.O. Box 41-383

Auckland 1346

New Zealand

e-mail: zootaxa@mapress.com

<http://www.mapress.com/zootaxa/>

© 2011 Magnolia Press

All rights reserved.

No part of this publication may be reproduced, stored, transmitted or disseminated, in any form, or by any means, without prior written permission from the publisher, to whom all requests to reproduce copyright material should be directed in writing.

This authorization does not extend to any other kind of copying, by any means, in any form, and for any purpose other than private research use.

ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)

Animal biodiversity:

An outline of higher-level classification and survey of taxonomic richness

ZHI-QIANG ZHANG (ED.)

Table of contents

- 7 **Animal biodiversity: An introduction to higher-level classification and taxonomic richness**
ZHI-QIANG ZHANG
- 13 **Phylum Porifera Grant, 1826. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
JOHN N.A. HOOPER, ROB W.M. VAN SOEST & ANDRZEJ PISERA
- 19 **Class Anthozoa Ehrenberg, 1834. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
ANDREA L. CROWTHER
- 24 **Phylum Xenacoelomorpha Philippe, *et al.*, 2011. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
SETH TYLER AND STEPHEN SCHILLING
- 26 **Pisces. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
WILLIAM N. ESCHMEYER & JON D. FONG
- 39 **Class Amphibia Gray, 182. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
DAVID C. BLACKBURN & DAVID B. WAKE
- 56 **Class Mammalia Linnaeus, 1758. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
D.E. WILSON & D.M. REEDER
- 61 **Order Testudines Batsch, 1788. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
UWE FRITZ
- 63 **“Phylum Nematoda Cobb 1932. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
MIKE HODDA
- 96 **Phylum Tardigrada Doyère, 1840. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
ROBERTO GUIDETTI & ROBERTO BERTOLANI
- 98 **Phylum Onychophora Grube, 1853. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
GEORG MAYER & IVO DE SENA OLIVEIRA
- 99 **Phylum Arthropoda von Siebold, 1848 In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
ZHI-QIANG ZHANG

- 104 **Class Trilobita Walch, 1771. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
JONATHAN M. ADRAIN
- 110 **Class Pycnogonida Latreille, 1810. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
ROGER BAMBER
- 112 **Order Opiliones Sundevall, 1833. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
ADRIANO B. KURY
- 115 **Order Scorpiones C.L. Koch, 1850. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
LORENZO PRENDINI
- 118 **Order Solifugae Sundevall, 1833. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
LORENZO PRENDINI
- 119 **Order Pseudoscorpiones de Geer, 1778. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
MARK HARVEY
- 121 **Order Palpigradi Thorell, 1888. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
LORENZO PRENDINI
- 122 **Order Ricinulei Thorell, 1876. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
LORENZO PRENDINI
- 123 **Superorder Parasitiformes Reuter, 1909. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
FRÉDÉRIC BEAULIEU
- 129 **Order Trombidiformes Reuter, 1909. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
ZHI-QIANG ZHANG, QING-HAI FAN, VLADIMIR PESIC, HARRY SMIT, ANDRE V. BOCHKOV, A. A. KHAUSTOV, ANNE BAKER, ANDREAS WOHLTMANN, TINGHUAN WEN, JAMES W. AMRINE, P. BERON, JIANZHEN LIN, GRZEGORZ GABRYS & ROBERT HUSBAND
- 139 **Suborder Endeostigmata Reuter, 1909. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
DAVID EVANS WALTER, SAMUEL BOLTON, MATTI UUSITALO & ZHI-QIANG ZHANG
- 141 **Suborder Oribatida van der Hammen, 1968. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
HEINRICH SCHATZ
- 149 **Order Araneae Clerck, 1757. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
JASON A. DUNLOP AND DAVID PENNEY

- 154 **Order Amblypygi Thorell, 1883. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
LORENZO PRENDINI
- 155 **Order Thelyphonida Latreille, 1804. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
LORENZO PRENDINI
- 156 **Order Schizomida Petrunkevitch, 1945. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
LORENZO PRENDINI
- 157 **Class Chilopoda, Class Symphyla and Class Pauropoda. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
ALESSANDRO MINELLI
- 159 **Class Diplopoda de Blainville in Gervais, 1844. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
WILLIAM SHEAR
- 165 **Subphylum Crustacea Brünnich, 1772. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
SHANE T. AHYONG, JAMES K. LOWRY, MIGUEL ALONSO, ROGER N. BAMBER, GEOFFREY A. BOXSHALL, PETER CASTRO, SARAH GERKEN, GORDAN S. KARAMAN, JOSEPH W. GOY, DIANA S. JONES, KENNETH MELAND, D. CHRISTOPHER ROGERS & JÖRUNDUR SVAVARSSON
- 192 **Class Collembola Lubbock, 1870. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
FRANS JANSSENS AND KENNETH A. CHRISTIANSEN
- 195 **Order Orthoptera Oliver, 1789. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
SIGFRID INGRISCH
- 198 **Order Phasmida Leach. 1815. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
PAUL D. BROCK & JUDITH MARSHALL
- 199 **Order Blattodea Brunner von Wattenwyl, 1882. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
GEORGE W. BECCALONI & PAUL EGGLETON
- 201 **Order Thysanoptera Haliday, 1836. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
LAURENCE A. MOUND
- 203 **Order Coleoptera Linnaeus, 1758. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
S. A. SLIPINSKI, R. A. B. LESCHEN, AND J. F. LAWRENCE
- 209 **Order Trichoptera Kirby, 1813. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
RALPH W. HOLZENTHAL, JOHN C. MORSE & KARL M. KJER

- 212 **Order Lepidoptera Linnaeus, 1758. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
ERIK J. VAN NIEUKERKEN, LAURI KAILA, IAN J. KITCHING, NIELS P. KRISTENSEN, DAVID C. LEES, JOËL MINET, CHARLES MITTER, MARKO MUTANEN, JEROME C. REGIER, THOMAS J. SIMONSEN, NIKLAS WAHLBERG, SHEN-HORN YEN, REZA ZAHIRI, DAVID ADAMSKI, JOAQUIN BAIXERAS, DANIEL BARTSCH, BENGT Å. BENGTSSON, JOHN W. BROWN, SIBYL RAE BUCHELI, DONALD R. DAVIS, JURATE DE PRINS, WILLY DE PRINS, MARC E. EPSTEIN, PATRICIA GENTILI-POOLE, CEES GIELIS, PETER HÄTTENSCHWILER, AXEL HAUSMANN, JEREMY D. HOLLOWAY, AXEL KALLIES, OLE KARSHOLT, AKITO Y. KAWAHARA, SJAAC (J.C.) KOSTER, MIKHAIL V. KOZLOV, J. DONALD LAFONTAINE, GERARDO LAMAS, JEAN-FRANÇOIS LANDRY, SANGMI LEE, MATTHIAS NUSS, KYU-TEK PARK, CARLA PENZ, JADRANKA ROTA, ALEXANDER SCHINTLMEISTER, B. CHRISTIAN SCHMIDT, JAE-CHEON SOHN, M. ALMA SOLIS, GERHARD M. TARMANN, ANDREW D. WARREN, SUSAN WELLER, ROMAN V. YAKOVLEV, VADIM V. ZOLOTUHIN, ANDREAS ZWICK
- 222 **Order Diptera Linnaeus, 1758. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
THOMAS PAPE, VLADIMIR BLAGODEROV & MIKHAIL B. MOSTOVSKI
- 230 **Phylum Phoronida Hatschek, 1888. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
CHRISTIAN C. EMIG
- 231 **Phylum Rotifera Cuvier, 1817. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
H. SEGERS
- 234 **Phylum Acanthocephala Kohlreuther, 1771 In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness**
SCOTT MONKS AND DENNIS J. RICHARDSON

Order **Scorpiones** C.L. Koch, 1850 (2 suborders)^{1,2,3}

- †Suborder **Branchioscorpionina** Kjellesvig-Waering, 1986 (4 infraorders)
 - †Infraorder **Bilobosternina** Kjellesvig-Waering, 1986 (1 superfamily)
 - †Superfamily **Branchioscorpionoidea** Kjellesvig-Waering, 1986 (2 families)
 - †Family **Branchioscorpionidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 - †Family **Dolichophonidae** Petrunkevitch, 1953 (1 genus, 1 species)
 - †Infraorder **Holosternina** Kjellesvig-Waering, 1986 (10 superfamilies)
 - †Superfamily **Acanthoscorpionoidea** Kjellesvig-Waering, 1986 (2 families)
 - †Family **Acanthoscorpionidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 - †Family **Stenoscorpionidae** Kjellesvig-Waering, 1986 (1 genus, 2 species)
 - †Superfamily **Allopalaeophonoidea** Kjellesvig-Waering, 1986 (1 family)
 - †Family **Allopalaeophonidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 - †Superfamily **Archaeoctonoidea** Petrunkevitch, 1949 (1 family)
 - †Family **Archaeoctonidae** Petrunkevitch, 1949 (2 genera, 2 species)
 - †Superfamily **Eoctonoidea** Kjellesvig-Waering, 1986 (5 families)
 - †Family **Allobuthiscorpiidae** Kjellesvig-Waering, 1986 (2 genera, 2 species)
 - †Family **Anthracoscorpionidae** Fritsch, 1904 (4 genera, 6 species)
 - †Family **Buthiscorpiidae** Kjellesvig-Waering, 1986 (1 genus, 2 species)
 - †Family **Eoctonidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 - †Family **Garnettiidae** Dubinin, 1962 (1 genus, 1 species)
 - †Superfamily **Gigantoscornoidea** Kjellesvig-Waering, 1986 (1 family)
 - †Family **Gigantoscorpionidae** Kjellesvig-Waering, 1986 (2 genera, 2 species)
 - †Superfamily **Mesophonoidea** Wills, 1910 (6 families)
 - †Family **Centromachidae** Petrunkevitch, 1953 (5 genera, 5 species)
 - †Family **Heloscorpionidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 - †Family **Liassoscorpionidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 - †Family **Mazoniidae** Petrunkevitch, 1913 (1 genus, 2 species)
 - †Family **Mesophonidae** Wills, 1910 (1 genus, 2 species)
 - †Family **Willsiscorpionidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 - †Superfamily **Palaeoscorpionoidea** Lehmann, 1944 (2 families)
 - †Family **Hydroscorpiidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 - †Family **Palaeoscorpiidae** Lehmann, 1944 (1 genus, 1 species)
 - †Superfamily **Proscorpioidea** Scudder, 1885 (3 families)
 - †Family **Proscorpiidae** Scudder, 1885 (2 genera, 2 species)
 - †Family **Labriscorpionidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 - †Family **Waeringoscorpionidae** Størmer, 1970 (1 genus, 1 species)
 - †Superfamily **Spongiophonoidea** Kjellesvig-Waering, 1986 (2 families)
 - †Family **Praearcturidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 - †Family **Spongiophonidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 - †Superfamily **Stoermeroscorpionoidea** Kjellesvig-Waering, 1986 (1 family)
 - †Family **Stoermeroscorpionidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 - †*Incertae sedis* (1 genus, 1 species)
 - †Infraorder **Lobosternina** Pocock, 1911 (5 superfamilies)
 - †Superfamily **Isobuthoidea** Petrunkevitch, 1913 (5 families)
 - †Family **Eobuthidae** Kjellesvig-Waering, 1986 (1 genus, 3 species)
 - †Family **Eoscorpiidae** Scudder, 1884 (3 genera, 8 species)
 - †Family **Isobuthidae** Petrunkevitch, 1913 (4 genera, 5 species)

1. **BY** Lorenzo Prendini (for full contact details, see **Author's address** after **References**). The title of this contribution should be cited as “Order Scorpiones C.L. Koch, 1850. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness”. Recent Scorpiones currently includes 18 families, 151 genera and 1947 species, fossil taxa include 47 families, 87 genera and 121 species.
2. Higher classification follows Fet et al. (2000) for fossil taxa (1758–1998) and Prendini & Wheeler (2005) for Recent taxa. Generic composition of families is identical in each case, except where noted (post-1998 for fossil taxa and post-2005 for Recent taxa).
3. The initial list of species was obtained from Fet et al. (2000) and updated using Hallan (2005) and Rein (2011). Only valid species are included in the cited totals; *species inquirenda* and infraspecific taxa are excluded. Counts of fossil genera and species are preceded by †.

†Family **Kronoscorpionidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 †Family **Pareobuthidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 †Superfamily **Loboarchaeoctonoidea** Kjellesvig-Waering, 1986 (1 family)
 †Family **Loboarchaeoctonidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 †Superfamily **Palaeophonoidea** Thorell & Lindström, 1885 (1 family)
 †Family **Palaeophonidae** Thorell & Lindström, 1885 (1 genus, 2 species)
 †Superfamily **Paraisobuthoidea** Kjellesvig-Waering, 1986 (3 families)
 †Family **Paraisobuthidae** Kjellesvig-Waering, 1986 (2 genera, 5 species)
 †Family **Scoloposcorpionidae** Kjellesvig-Waering, 1986 (2 genera, 2 species)
 †Family **Telmatoscorpionidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 †Superfamily **Pseudobuthiscorpioidea** Kjellesvig-Waering, 1986 (2 families)
 †Family **Pseudobuthiscorpiidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 †Family **Waterstoniidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 †Infraorder **Meristosternina** Kjellesvig-Waering, 1986 (3 superfamilies)
 †Superfamily **Cyclophthalmoidea** Thorell & Lindström, 1885 (2 families)
 †Family **Cyclophthalmidae** Thorell & Lindström, 1885 (1 genus, 3 species)
 †Family **Microlabidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 †Superfamily **Palaeobuthoidea** Kjellesvig-Waering, 1986 (1 family)
 †Family **Palaeobuthidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 †Superfamily **Tiphoscorpionoidea** Kjellesvig-Waering, 1986 (1 family)⁴
 †Family **Tiphoscorpionidae** Kjellesvig-Waering, 1986 (1 genus, 1 species)
 †*Incertae sedis* (6 genera, 6 species)
 Suborder **Neoscorpionina** Thorell & Lindström, 1885 (1 infraorder)
 Infraorder **Orthosternina** Pocock, 1911 (23 families)
 †Family **Akravidae** Levy, 2007 (1 genus, 1 species)⁵
 †Family **Archaeobuthidae** Lourenço, 2001 (1 genus, 1 species)⁶
 Family **Bothriuridae** Simon, 1880 (15 genera, 138 species)
 Family **Buthidae** C.L. Koch, 1837 (56/†6 genera, 938/†17 species)⁷
 Family **Chactidae** Pocock, 1893 (11/†1 genera, 178/†2 species)⁸
 Family **Chaerilidae** Pocock, 1893 (1/†1 genera, 36/†1 species)⁹
 †Family **Chaerilobuthidae** Lourenço, 2011 (1 genus, 1 species)¹⁰
 Family **Diplocentridae** Karsch, 1880 (8 genera, 113 species)
 Family **Euscorpiidae** Laurie, 1896 (4 genera, 25 species)
 Family **Hemiscorpiidae** Pocock, 1893 (1 genus, 13 species)¹¹
 Family **Heteroscorpionidae** Kraepelin, 1905 (1 genus, 6 species)
 Family **Hormuridae** Laurie, 1896 (9/†1 genera, 69/†1 species)¹²
 Family **Iuridae** Thorell, 1876 (6 genera, 36 species)
 †Family **Palaeoeuscorpiidae** Lourenço, 2003 (1 genus, 1 species)¹³
 †Family **Palaeopisthacanthidae** Kjellesvig-Waering, 1986 (3 genera, 4 species)

4. Tiphoscorpionoidea and its component taxa were omitted by Fet et al. (2000).

5. This monotypic family was added after 2005.

6. This monotypic family was added after 1998.

7. Microcharmidae Lourenço, 1996 was synonymized with Buthidae and its component genera transferred to the latter (Volschenk et al., 2008). Ten genera were added to Buthidae after 2005: *Afghanobuthus* Lourenço, 2005; *Ananteroides* Borelli, 1911 (reinstated from synonymy); *Cicileurus* Teruel, 2007; *Femtobuthus* Lowe, 2010; *Mauritanobuthus* Qi & Lourenço, 2007; *Pantobuthus* Lourenço & Duhem, 2009; *Physoctonus* Mello-Leitão, 1934 (reinstated from synonymy); *Picobuthus* Lowe, 2010; *Riftobuthus* Lourenço et al., 2010; *Saharobuthus* Lourenço & Duhem, 2009. Four buthid genera were synonymized after 2005: *Ankaranocharmus* Lourenço, 2004; *Microananteris* Lourenço, 2003; *Paraorthochirus* Lourenço & Vachon, 1997; *Simonoides* Vachon & Farzanpay, 1987.

8. A monotypic genus, *Araripescorpis* Bouret Campos, 1986 was transferred to Chactidae (Menon, 2007). The validity and taxonomic composition of several genera in this family continues to be disputed.

9. A monotypic genus, *Electochaerilus* Santiago-Blay et al., 2000, was added to Chaerilidae after 1998.

10. This monotypic family was added after 2005.

11. One hemiscorpiid genus, *Habibiella* Vachon, 1974, was synonymized after 2005 (Monod & Lourenço, 2005).

12. The older name, Hormuridae, is used instead of Liochelidae Fet & Bechly, 2001 (1879). Protoischnuridae Carvalho & Lourenço, 2001 was synonymized with Hormuridae (as Hemiscorpiidae), and *Protoischnurus* Carvalho & Lourenço, 2001 transferred to it (Menon, 2007). Another monotypic genus, *Tibetiomachus* Lourenço & Qi, 2006, was added to Hormuridae after 2005.

13. This monotypic family was added after 1998.

Family **Pseudochactidae** Gromov, 1998 (3 genera, 3 species)¹⁴
 Family **Scorpionidae** Latreille, 1802 (5 genera, 128 species)¹⁵
 Family **Scorpiopidae** Kraepelin, 1905 (5 genera, 48 species)
 Family **Superstitioniidae** Stahnke, 1940 (1 genus, 1 species)¹⁶
 Family **Troglotayosicidae** Lourenço, 1998 (2 genera, 3 species)
 Family **Typhlochactidae** Mitchell, 1971 (4 genera, 10 species)
 Family **Urodacidae** Pocock, 1893 (2 genera, 21 species)¹⁷
 Family **Vaejovidae** Thorell, 1876 (17 genera, 181 species)¹⁸
 †*Incertae sedis* (4 genera, 5 species)

Cited references

- Fet, V., Sissom, W.D., Lowe, G. & Braunwalder, M.E. (2000) *Catalog of the Scorpions of the World (1758–1998)*. The New York Entomological Society, New York.
- Hallan, J. (2005) Synopsis of the Described Scorpiones of the World. In: Hallan, J. (ed.) *Biology Catalog*. Digital resource at: <http://insects.tamu.edu/research/collection/hallan/Acari/Family/Scorpiones1.htm> (accessed on 16.x.2011).
- Menon, F. (2007) Higher systematics of scorpions from the Crato Formation, Lower Cretaceous of Brazil. *Palaeontology*, 50, 185–195.
- Monod, L. & Lourenço, W.R. (2005) Hemiscorpiidae (Scorpiones) from Iran, with descriptions of two new species and notes on biogeography and phylogenetic relationships. *Revue suisse de Zoologie*, 112, 869–941.
- Prendini, L. & Wheeler, W.C. (2005) Scorpion higher phylogeny and classification, taxonomic anarchy, and standards for peer review in online publishing. *Cladistics*, 21, 446–494.
- Rein, J.O. (2011) Species List. In: Rein, J.O. *The Scorpion Files*. Digital resource at <http://www.ntnu.no/ub/scorpion-files/> (accessed on 16.x.2011).
- Vignoli, V. & Prendini, L. (2009) Systematic revision of the troglomorphic scorpion family Typhlochactidae (Scorpiones: Chactoidea). *Bulletin of the American Museum of Natural History*, 326, 1–94.
- Volschenk, E.S., Mattoni, C.I. & Prendini, L. (2008) Comparative anatomy of the mesosomal organs of scorpions (Chelicerata, Scorpiones), with implications for the phylogeny of the order. *Zoological Journal of the Linnean Society*, 154, 651–675.

Author's address

Lorenzo Prendini, Division of Invertebrate Zoology, American Museum of Natural History, Central Park West at 79th Street, New York, NY 10024-5192, U.S.A.; lorenzo@amnh.org

-
14. Two monotypic genera were added to Pseudochactidae after 2005: *Troglokhammouanus* Lourenço, 2007; *Vietbocap* Lourenço & Pham, 2010.
 15. A monotypic genus, *Rugodentus* Bastawade et al., 2005, was added to Scorpionidae after 2005.
 16. Vignoli & Prendini (2009) elevated Typhlochactinae Mitchell, 1971 to family, removing its component genera from Superstitioniidae.
 17. A monotypic genus, *Aops* Volschenk & Prendini, 2008, was added to Urodacidae after 2005.
 18. Six genera, some of dubious validity, were added to Vaejovidae after 2005: *Gertschius* Graham & Söleglad, 2007; *Hoffmannius* Söleglad & Fet, 2008; *Kochius* Söleglad & Fet, 2008; *Kuarapu* Francke & Ponce-Saavedra, 2010; *Stahnkeus* Söleglad & Fet, 2006; *Wernerius* Söleglad & Fet, 2008.

Order **Solifugae** Sundevall, 1833 (13 families)^{1,2}

- Family **Ammotrechidae** Roewer, 1934 (21/†1 genera, 88/†1 species)
- Family **Ceromidae** Roewer, 1933 (3/†1 genera, 20/†1 species)
- Family **Daesiidae** Kraepelin, 1899 (29 genera, 191 species)
- Family **Eremobatidae** Kraepelin, 1901 (8 genera, 192 species)
- Family **Galeodidae** Sundevall, 1833 (9 genera, 201 species)
- Family **Gylippidae** Roewer, 1933 (5 genera, 27 species)
- Family **Hexisopodidae** Pocock, 1897 (2 genera, 23 species)
- Family **Karschiidae** Kraepelin, 1899 (4 genera, 40 species)
- Family **Melanoblossiidae** Roewer, 1933 (6 genera, 16 species)
- Family **Mummuciidae** Roewer, 1934 (10 genera, 20 species)
- †Family **Protosolpugidae** Petrunkevitch, 1953 (1 genus, 1 species)
- Family **Rhagodidae** Pocock, 1897 (27 genera, 99 species)
- Family **Solpugidae** Leach, 1815 (17 genera, 196 species)

Cited references

- Hallan, J. (2005) Synopsis of the Described Solifugae of the World. In: Hallan, J. (ed.) *Biology Catalog*. Digital resource at: <http://insects.tamu.edu/research/collection/hallan/Acari/Family/Solifugae1.htm> (accessed on 16.x.2011).
- Harvey, M.S. (2003) *Catalogue of the Smaller Arachnid Orders of the World: Amblypygi, Uropygi, Schizomida, Palpigradi, Ricinulei and Solifugae*. CSIRO Publishing, Collingwood.
- Harvey, M.S. (2011) Smaller Arachnid Orders Catalogue (SAOCat) database. In: Bisby F.A., Roskov Y.R., Orrell T.M., Nicolson D., Paglinawan L.E., Bailly N., Kirk P.M., Bourgoin T., Baillargeon G. & Ouvrard D. (eds.). *Species 2000 & ITIS Catalogue of Life: 2011 Annual Checklist*. Digital resource at <http://www.catalogueoflife.org/annual-checklist/2011/> (accessed on 16.x.2011). Species 2000, Reading, UK.

Author's address

Lorenzo Prendini, Division of Invertebrate Zoology, American Museum of Natural History, Central Park West at 79th Street, New York, NY 10024-5192, U.S.A.; lorenzo@amnh.org

-
1. **BY** Lorenzo Prendini (for full contact details, see **Author's address** after **References**). The title of this contribution should be cited as "Order Solifugae Sundevall, 1833. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness". Recent Solifugae currently includes 12 families, 141 genera and 1113 species, fossil taxa include 1 family, 3 genera and 3 species.
 2. The initial list of species was obtained from Harvey (2003) and updated using Hallan (2005) and Harvey (2011). Only valid species are included in the cited totals; *species inquirenda* and infraspecific taxa are excluded. Counts of fossil genera and species are preceded by †.

Order **Palpigradi** Thorell, 1888 (1 superfamily)^{1,2,3}
Superfamily **Eukoenerioidea** Petrunkevitch, 1955 (2 families)
Family **Eukoeneriidae** Petrunkevitch, 1955 (4 genera, 75 species)
Family **Prokoeneriidae** Condé, 1996 (2 genera, 7 species)
†*Incertae sedis* (1 genus, 1 species)

Cited references

- Carpenter, F.M. (1992) Superclass Hexapoda *In*: Moore, R.C. & Kaesler, R.L. (eds.). *Treatise on Invertebrate Paleontology. Part R, Arthropoda* 4, vol. 3. The Geological Society of America and University of Kansas Press, Boulder and Lawrence.
- GBIF (Global Biodiversity Information Facility), Version 1.3.2. (2011). Digital resource at: <http://data.gbif.org/> (accessed on 18.x.2011).
- Hallan, J. (2005) Synopsis of the Described Palpigradi of the World. *In*: Hallan, J. (ed.) *Biology Catalog*. Digital resource at: <http://insects.tamu.edu/research/collection/hallan/Acari/Family/Palpigradi1.htm> (accessed on 18.x.2011).
- Handlirsch, A. (1906) *Die Fossilen Insekten und die Phylogenie der Rezenten Formen*. Wilhelm Engelmann, Leipzig.
- Harvey, M.S. (2003) *Catalogue of the Smaller Arachnid Orders of the World: Amblypygi, Uropygi, Schizomida, Palpigradi, Ricinulei and Solifugae*. CSIRO Publishing, Collingwood.
- Harvey, M.S. (2011) Smaller Arachnid Orders Catalogue (SAOCat) database. *In*: Bisby F.A., Roskov Y.R., Orrell T.M., Nicolson D., Paglinawan L.E., Bailly N., Kirk P.M., Bourgoin T., Baillargeon G. & Ouvrard D. (eds.). *Species 2000 & ITIS Catalogue of Life: 2011 Annual Checklist*. Digital resource at <http://www.catalogueoflife.org/annual-checklist/2011/> (accessed on 18.x.2011). Species 2000, Reading, UK.
- Savory, T. (1974) On the arachnid order Palpigradi. *Journal of Arachnology*, 2, 43–45.

Author's address

Lorenzo Prendini, Division of Invertebrate Zoology, American Museum of Natural History, Central Park West at 79th Street, New York, NY 10024-5192, U.S.A.; lorenzo@amnh.org

-
1. **BY** Lorenzo Prendini (for full contact details, see **Author's address** after **References**). The title of this contribution should be cited as “Order Palpigradi Thorell, 1888. *In*: Zhang, Z.-Q. (Ed.) *Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness*”. Recent Palpigradi currently includes 2 families, 6 genera and 82 species, fossil taxa include 1 genus and 1 species.
 2. The initial list of species was obtained from Harvey (2003) and updated using Hallan (2005) and Harvey (2011). Only valid species are included in the cited totals; *species inquirenda* and infraspecific taxa are excluded. Counts of fossil genera and species are preceded by †.
 3. Family Sternarthronidae Haase, 1890, based on *Sternarthron zitteli* Haase, 1890, from the Jurassic of Germany, was excluded, following Harvey (2003). Although often assigned to Palpigradi (e.g. Savory, 1974; Hallan, 2005; GBIF, 2011), this taxon has also been placed in the insect order Phasmatodea Jacobson & Bianchi, 1902 (e.g. Handlirsch, 1906; Carpenter, 1992).

Order **Ricinulei** Thorell, 1876 (2 suborders)^{1,2}
 Suborder **Neoricinulei** Selden, 1992 (1 superfamily)
 Superfamily **Ricinoidoidea** Ewing, 1929 (1 family)
 Family **Ricinoididae** Ewing, 1929 (3 genera, 58 species)
 †Suborder **Palaeoricinulei** Selden, 1992 (1 superfamily)
 Superfamily **Curculioidea** Cockerell, 1916 (2 families)
 Family **Curculionidae** Cockerell, 1916 (2 genera, 11 species)
 Family **Poliocheridae** Scudder, 1884 (2 genera, 4 species)³

Cited references

- Hallan, J. (2005) Synopsis of the Described Ricinulei of the World. In: Hallan, J. (ed.) *Biology Catalog*. Digital resource at: <http://insects.tamu.edu/research/collection/hallan/Acari/Family/Ricinulei1.htm> (accessed on 16.x.2011).
- Harvey, M.S. (2003) *Catalogue of the Smaller Arachnid Orders of the World: Amblypygi, Uropygi, Schizomida, Palpigradi, Ricinulei and Solifugae*. CSIRO Publishing, Collingwood.
- Harvey, M.S. (2011) Smaller Arachnid Orders Catalogue (SAOCat) database. In: Bisby F.A., Roskov Y.R., Orrell T.M., Nicolson D., Paglinawan L.E., Bailly N., Kirk P.M., Bourgoin T., Baillargeon G. & Ouvrard D. (eds.). *Species 2000 & ITIS Catalogue of Life: 2011 Annual Checklist*. Digital resource at <http://www.catalogueoflife.org/annual-checklist/2011/> (accessed on 16.x.2011). Species 2000, Reading, UK.
- Selden, P.A. (1992) Revision of the fossil ricinuleids. *Transactions of the Royal Society of Edinburgh, Earth Sciences*, 83, 595–634.

Author's address

Lorenzo Prendini, Division of Invertebrate Zoology, American Museum of Natural History, Central Park West at 79th Street, New York, NY 10024-5192, U.S.A.; lorenzo@amnh.org

-
1. **BY** Lorenzo Prendini (for full contact details, see **Author's address** after **References**). The title of this contribution should be cited as "Order Ricinulei Thorell, 1876. In: Zhang, Z.-Q. (Ed.) *Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness*". Recent Ricinulei currently includes 1 family, 3 genera and 58 species, fossil taxa include 2 families, 4 genera and 15 species.
 2. The initial list of species was obtained from Harvey (2003) and updated using Hallan (2005) and Harvey (2011). Only valid species are included in the cited totals; *species inquirenda* and infraspecific taxa are excluded. Counts of fossil genera and species are preceded by †.
 3. *Poliochera pustulatus* Laurentiaux-Vieira & Laurentiaux, 1963 was excluded, as it may not be a ricinuleid (Selden, 1992).

Order **Amblypygi** Thorell, 1883 (2 suborders)^{1,2,3}
 Suborder **Euamblypygi** Weygoldt, 1996 (2 infraorders)
 Infraorder **Charinina** Weygoldt, 1996 (1 superfamily)
 Superfamily **Charinoidea** Weygoldt, 1996 (1 family)
 Family **Charinidae** Quintero, 1896 (3 genera, 55 species)
 Infraorder **Neoamblypygi** Weygoldt, 1996 (2 superfamilies)
 Superfamily **Charontoidea** Simon, 1892 (1 family)
 Family **Charontidae** Simon, 1892 (2 genera, 12 species)
 Superfamily **Phrynoidea** Blanchard, 1852 (2 families)
 Family **Phrynichidae** Simon, 1892 (7 genera, 34 species)
 Family **Phrynidae** Blanchard, 1852 (4/†1 genera, 58/†2 species)
 Suborder **Paleoamblypygi** Weygoldt, 1996 (1 superfamily)
 Superfamily **Paracharontoidea** Weygoldt, 1996 (1 family)
 Family **Paracharontidae** Weygoldt, 1996 (1/†1 genera, 2/†2 species)
Incertae sedis (†4 genera, †5 species)

Cited references

- Hallan, J. (2005) Synopsis of the Described Amblypygi of the World. In: Hallan, J. (ed.) *Biology Catalog*. Digital resource at: <http://insects.tamu.edu/research/collection/hallan/Acari/Family/Amblypygi1.htm> (accessed on 16.x.2011).
- Harvey, M.S. (2003) *Catalogue of the Smaller Arachnid Orders of the World: Amblypygi, Uropygi, Schizomida, Palpigradi, Ricinulei and Solifugae*. CSIRO Publishing, Collingwood.
- Harvey, M.S. (2011) Smaller Arachnid Orders Catalogue (SAOCat) database. In: Bisby F.A., Roskov Y.R., Orrell T.M., Nicolson D., Paglinawan L.E., Bailly N., Kirk P.M., Bourgoin T., Baillargeon G. & Ouvrard D. (eds.). *Species 2000 & ITIS Catalogue of Life: 2011 Annual Checklist*. Digital resource at <http://www.catalogueoflife.org/annual-checklist/2011/> (accessed on 16.x.2011). Species 2000, Reading, UK.
- Weygoldt, P. (1996) Evolutionary morphology of whip spiders: Towards a phylogenetic system (Chelicerata: Arachnida: Amblypygi). *Journal of Zoological Systematics and Evolution Research*, 34, 185–202.

Author's address

Lorenzo Prendini, Division of Invertebrate Zoology, American Museum of Natural History, Central Park West at 79th Street, New York, NY 10024-5192, U.S.A.; lorenzo@amnh.org

-
1. **BY** Lorenzo Prendini (for full contact details, see **Author's address** after **References**). The title of this contribution should be cited as "Order Amblypygi Thorell, 1883. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness". Recent Amblypygi currently includes 5 families, 17 genera and 161 species, fossil taxa include 6 genera and 9 species.
 2. Higher classification follows Weygoldt (1996).
 3. The initial list of species was obtained from Harvey (2003) and updated using Hallan (2005) and Harvey (2011). Only valid species are included in the cited totals; *species inquirenda* and infraspecific taxa are excluded. Counts of fossil genera and species are preceded by †.

Order **Thelyphonida** Latreille, 1804 (1 family)^{1,2,3}
Family **Thelyphonidae** Lucas, 1835 (18/†3 genera, 110/†9 species)

Cited references

- Hallan, J. (2005) Synopsis of the Described Uropygi of the World. In: Hallan, J. (ed.) *Biology Catalog*. Digital resource at: <http://insects.tamu.edu/research/collection/hallan/Acari/Family/Uropygi1.htm> (accessed on 16.x.2011).
- Harvey, M.S. (2003) *Catalogue of the Smaller Arachnid Orders of the World: Amblypygi, Uropygi, Schizomida, Palpigradi, Ricinulei and Solifugae*. CSIRO Publishing, Collingwood.
- Harvey, M.S. (2011) Smaller Arachnid Orders Catalogue (SAOCat) database. In: Bisby F.A., Roskov Y.R., Orrell T.M., Nicolson D., Paglinawan L.E., Bailly N., Kirk P.M., Bourgoin T., Baillargeon G. & Ouvrard D. (eds.). *Species 2000 & ITIS Catalogue of Life: 2011 Annual Checklist*. Digital resource at <http://www.catalogueoflife.org/annual-checklist/2011/> (accessed on 16.x.2011). Species 2000, Reading, UK.
- Shultz, J.H. (2007) A phylogenetic analysis of the arachnid orders based on morphological characters. *Zoological Journal of the Linnean Society*, 150, 221–265.
- Weygoldt, P. & Paulus, H.F. (1979) Untersuchungen zur Morphologie, Taxonomie und Phylogenie der Chelicerata. II. Cladogramme und die Entfaltung der Chelicerata. *Zeitschrift für die Zoologische Systematik und Evolutionforschung*, 17, 177–200.

Author's address

Lorenzo Prendini, Division of Invertebrate Zoology, American Museum of Natural History, Central Park West at 79th Street, New York, NY 10024-5192, U.S.A.; lorenzo@amnh.org

-
1. **BY** Lorenzo Prendini (for full contact details, see **Author's address** after **References**). The title of this contribution should be cited as “Order Thelyphonida Latreille, 1804. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness”. Recent Thelyphonida currently includes 1 family, 18 genera and 110 species, fossil taxa include 3 genera and 9 species.
 2. The earlier name, Thelyphonida, is applied to this order, rather than Uropygi Thorell, 1883, which more precisely refers to the monophyletic group comprising Thelyphonida and Schizomida Petrunkevitch, 1945 (Weygoldt & Paulus, 1979; Shultz, 2007).
 3. The initial list of species was obtained from Harvey (2003) and updated using Hallan (2005) and Harvey (2011). Only valid species are included in the cited totals; *species inquirenda* and infraspecific taxa are excluded. Counts of fossil genera and species are preceded by †.

Order **Schizomida** Petrunkevitch, 1945 (1 suborder)^{1,2}
Suborder **Schizomina** Petrunkevitch, 1945 (1 superfamily)
Superfamily **Hubbardioidea** Cook, 1899 (3 families)
†Family **Calcitronidae** Petrunkevitch, 1945 (1 genus, 2 species)
Family **Hubbardiidae** Cook, 1899 (44/†2 genera, 249/†2 species)
Family **Protoschizomidae** Rowland, 1975 (2 genera, 11 species)

Cited references

- Hallan, J. (2005) Synopsis of the Described Schizomida of the World. In: Hallan, J. (ed.) *Biology Catalog*. Digital resource at: <http://insects.tamu.edu/research/collection/hallan/Acari/Family/Schizomida1.htm> (accessed on 16.x.2011).
- Harvey, M.S. (2003) *Catalogue of the Smaller Arachnid Orders of the World: Amblypygi, Uropygi, Schizomida, Palpigradi, Ricinulei and Solifugae*. CSIRO Publishing, Collingwood.
- Harvey, M.S. (2011) Smaller Arachnid Orders Catalogue (SAOCat) database. In: Bisby F.A., Roskov Y.R., Orrell T.M., Nicolson D., Paglinawan L.E., Bailly N., Kirk P.M., Bourgoin T., Baillargeon G. & Ouvrard D. (eds.). *Species 2000 & ITIS Catalogue of Life: 2011 Annual Checklist*. Digital resource at <http://www.catalogueoflife.org/annual-checklist/2011/> (accessed on 16.x.2011). Species 2000, Reading, UK.

Author's address

Lorenzo Prendini, Division of Invertebrate Zoology, American Museum of Natural History, Central Park West at 79th Street, New York, NY 10024-5192, U.S.A.; lorenzo@amnh.org

-
1. **BY** Lorenzo Prendini (for full contact details, see **Author's address** after **References**). The title of this contribution should be cited as "Order Schizomida Petrunkevitch, 1945. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness". Recent Schizomida currently includes 2 families, 46 genera and 260 species, fossil taxa include 1 family, 3 genera and 4 species.
 2. The initial list of species was obtained from Harvey (2003) and updated using Hallan (2005) and Harvey (2011). Only valid species are included in the cited totals; *species inquirenda* and infraspecific taxa are excluded. Counts of fossil genera and species are preceded by †.