



ZOOTAXA

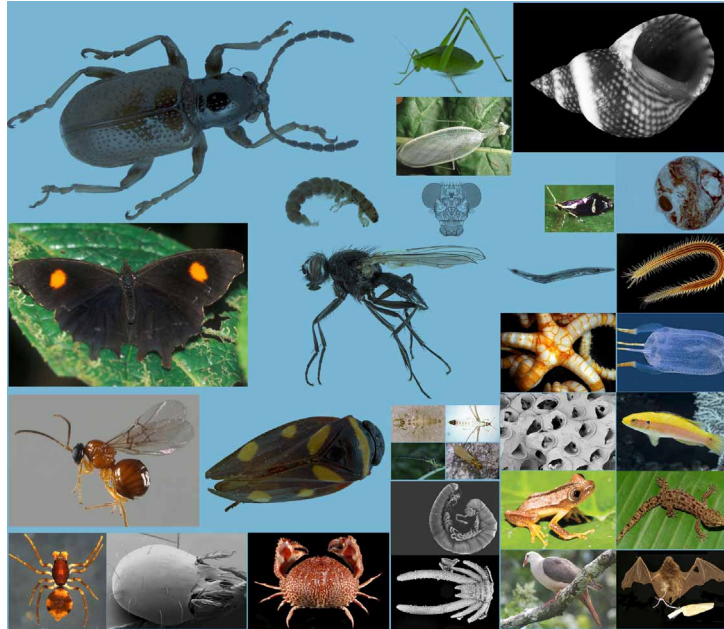
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Animal biodiversity:

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

ZHI-QIANG ZHANG (ED.)

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SCOTT MONKS AND DENNIS J. RICHARDSON

Order **Coleoptera** Linnaeus, 1758 (4 suborders)^{1,2}

†Suborder **Protocoleoptera** Tillyard, 1934 (3 superfamilies)

†Superfamily **Tshekardocoleoidea** Rohdendorf, 1944 (3 families)

†Family **Tshekardocoleidae** Rohdendorf, 1944 (13 genera, 18 species)

†Family **Labradorocoleidae** Ponomarenko, 1969 (1 genus, 1 species)

†Family **Oborocoleidae** Kukalová, 1969 (2 genera, 2 species)

†Superfamily **Permocupedoidea** Martynov, 1933 (2 families)

†Family **Permocupedidae** Martynov, 1933 (11 genera, 30 species)

†Family **Taldycupedidae** Rohdendorf, 1961 (6 genera, 18 species)

†Superfamily **Permosynoidea** Tillyard, 1924 (2 families)

†Family **Ademosynidae** Ponomarenko, 1968 (12 genera, 29 species)

†Family **Permosynidae** Tillyard, 1924 (3 genera, 14 species)

Suborder **Archostemata** Kolbe, 1908 (8 families)

Family **Crowsoniellidae** Iablokoff-Khnzorian, 1983 (1 genus, 1 species)

Family **Cupedidae** Laporte, 1836 (53(†44) genera, 120(†89) species)

Family **Micromalthidae** Barber, 1913 (2(†1) genera, 2(†1) species)

Family **Ommatidae** Sharp and Muir, 1912 (10(†8) genera, 120(†114) species)

Family **Jurodidae** Ponomarenko, 1985 (2(†1) genera, 3(†2) species)

†Family **Triadocupedidae** Ponomarenko, 1966 (8 genera, 16 species)

†Family **Magnocoleidae** Hong, 1998 (1 genus, 1 species)

†Family **Obrieniidae** Zherikhin and Gratshev, 1994 (5 genera, 7 species)

Suborder **Myxophaga** Crowson, 1955 (5 superfamilies)

†Superfamily **Asiocoloidea** Rohdendorf, 1961 (2 families)

†Family **Asiocolidae** Rohdendorf, 1961 (1 genus, 1 species)

†Family **Tricoleidae** Ponomarenko, 1969 (3 genera, 6 species)

†Superfamily **Rhombocoleoidea** Rohdendorf, 1961 (1 family)

†Family **Rhombocoleidae** Rohdendorf, 1961 (5 genera, 10 species)

Superfamily **Schizophoroidea** Ponomarenko, 1968 (3 families)

†Family **Schizophoridae** Ponomarenko, 1968 (20 genera, 36 species)

†Family **Catiniidae** Ponomarenko, 1968 (5 genera, 6 species)

†Family **Schizocoleidae** Rohdendorf, 1961 (4 genera, 30 species)

Superfamily **Lepiceroidea** Hinton, 1936 (1882) (2 families)

Family **Lepiceridae** Hinton, 1936 (1882) (1(†1) genus, 2(†1) species)³

Superfamily **Sphaeriuoidea** Erichson, 1845 (3 families)

Family **Torridincolidae** Steffan, 1964 (7 genera, 60 species)

Family **Hydroscaphidae** LeConte, 1874 (3 genera, 22 species)⁴

Family **Sphaeriusidae** Erichson, 1845 (2 (†1) genera, 20 (†1) species)

Suborder **Adephaga** Schellenberg, 1806 (17 families)

†Family **Tritarsusidae** Hong, 2002 (1 genus, 1 species)

Family **Gyrinidae** Latreille, 1810 (25 (†13) genera, 1000 (†118) species)

Family **Trachypachidae** C. G. Thomson, 1857 (22 (†21) genera, 57 (†51) species)

Family **Meruidae** Spangler and Steiner, 2005 (1 genus, 1 species)

Family **Rhysodidae** Laporte, 1840 (40 genera, 350 species)

Family **Carabidae** Latreille, 1802 (1500 genera, 40000 species)

1. **BY** S. A. Slipinski, R. A. B. Leschen, and J. F. Lawrence (for full contact details, see the list after **References**). The title of this contribution should be cited as "Order Coleoptera Linnaeus, 1758. In: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness".
2. Recent Coleoptera currently includes 176 families, 29500 genera and 386500 species, fossil taxa includes 31 families, 230 genera and 600 species. The classification is based on Lawrence and Newton (1995) and Bouchard *et al.* (2011). Numbers for fossil taxa were derived from Kirejtshuk *et al.* (2010) and only numbers of fossils for extinct Protocoleoptera and Coleoptera families are provided, apart from extant primitive Polyphaga. Numbers for extant taxa were taken from the *Handbook of Zoology* chapters in Beutel & Leschen (2005) and Leschen *et al.* (2010) except where noted. Because up-to-date catalogues do not exist, numbers in the *Handbook* had included estimates and here we cross-referenced these estimates with recent catalogues (e.g., Löbl & Smetana 2007) and web-based information (e.g., Hallan 2010). Cut off date for the information contained here was 10 February 2011.
3. See Ge *et al.* (2010).
4. See Fikáček and Šípková (2009).

- Family **Haliplidae** Aubé, 1836 (5 (†1) genera, 220 (†2) species)
†Family **Triaplidae** Ponomarenko, 1977 (1 genus, 2 species)
†Family **Colymbotethidae** Ponomarenko, 1994 (2 genera, 2 species)
†Family **Parahygrobiidae** Ponomarenko, 1977 (1 genus, 1 species)
†Family **Coptoclavidae** Ponomarenko, 1961 (14 genera, 32 species)
†Family **Liadytidae** Ponomarenko, 1977 (2 genera, 6 species)
Family **Noteridae** C. G. Thomson, 1859 (14 genera, 250 species)
Family **Amphizoidae** LeConte, 1853 (1 genus, 5 species)
Family **Aspidytidae** Ribera et al., 2002 (1 genus, 2 species)
Family **Hygrobiidae** Régimbart, 1879 (1837) (1 genus, 5 species)
Family **Dytiscidae** Leach, 1815 (190 (†6) genera, 4100 (†85) species)
- Suborder **Polyphaga** Emery, 1886 (7 series)
- Series **Staphyliniformia** Latreille, 1802 (2 superfamilies)
- Superfamily **Hydrophiloidea** Latreille, 1802 (4 families)
Family **Hydrophilidae** Latreille, 1802 (200 genera, 3400 species)
Family **Sphaeritidae** Shuckard, 1839 (1 genus, 5 species)
Family **Synteliidae** Lewis, 1882 (1 genus, 7 species)
Family **Histeridae** Gyllenhal, 1808 (350 genera, 4300 species)
- Superfamily **Staphylinoidea** Latreille, 1802 (6 families)
Family **Hydraenidae** Mulsant, 1844 (42 genera, 1600 species)
Family **Ptiliidae** Erichson, 1845 (80 genera, 650 species)
Family **Agyrtidae** C. G. Thomson, 1859 (8 genera, 70 species)
Family **Leiodidae** Fleming, 1821 (342 genera, 3700 species)
Family **Silphidae** Latreille, 1807 (15 genera, 200 species)
Family **Staphylinidae** Latreille, 1802 (3500 genera, 56000 species)
- Series **Scarabaeiformia** Crowson 1960 (1 superfamily)
- Superfamily **Scarabaeoidea** Latreille, 1802 (14 families)
Family **Pleocomidae** LeConte, 1861 (2 genera, 50 species)
Family **Geotrupidae** Latreille, 1802 (70 genera, 920 species)
Family **Belohinidae** Paulian, 1959 (1 genus, 1 species)
Family **Passalidae** Leach, 1815 (64 genera, 800 species)
Family **Trogidae** W. S. MacLeay, 1819 (5 genera, 300 species)
Family **Glaresidae** Kolbe, 1905 (3(†2) genera, 60 (†3) species)
Family **Diphyllostomatidae** Holloway, 1972 (1 genus, 3 species)
Family **Lucanidae** Latreille, 1804 (120(†6) genera, 1500 (†11) species)
Family **Ochodaecidae** Mulsant and Rey, 1871 (15 genera, 110 species, †2/3)
Family **Hybosoridae** Erichson, 1847 (77(†3) genera, 580 (†7) species)
Family **Glaphyridae** W. S. MacLeay, 1819 (11(†1) genera, 210(†6) species)
Family **Scarabaeidae** Latreille, 1802 (1900 genera, 27000 species)
†Family **Coprinisphaeridae** Genise, 2004 (4 genera, 9 species, ichnotaxon)
†Family **Pallichnidae** Genise, 2004 (2 genera, 3 species, ichnotaxon)
- Series **Scirtiformia** Fleming, 1821 (1 superfamily)
- Superfamily **Scirtoidea** Fleming, 1821 (6 families)
Family **Scirtidae** Fleming, 1821 (35 genera, 800 species)
Family **Decliniidae** Nikitsky et al., 1994 (1 genus, 2 species)
Family **Eucinetidae** Lacordaire, 1857 (11 genera, 53 species)
Family **Clambidae** Fischer von Waldheim, 1821 (6 genera, 170 species)
†Family **Elodophthalmidae** Kirejtshuk and Azar, 2008 (1 genus, 2 species)
†Family **Mesocinetidae** Kirejtshuk and Ponomarenko, 2010 (4 genera, 7 species)
- Series **Elateriformia** Crowson 1960 (4 superfamilies)
- Superfamily **Dascilloidea** Guérin-Méneville, 1843 (1834) (2 families)
Family **Dascillidae** Guérin-Méneville, 1843 (1834) (15 genera, 80 species)
Family **Rhipiceridae** Latreille, 1834 (7 genera, 70 species)
- Superfamily **Buprestoidea** Leach, 1815 (1 family)

- Family **Buprestidae** Leach, 1815 (470 genera, 14700 species)
- Superfamily **Byrrhoidea** Latreille, 1804 (12 families)
- Family **Byrrhidae** Latreille, 1804 (38 genera, 430 species)
- Family **Elmidae** Curtis, 1830 (149 genera, 1500 species)
- Family **Dryopidae** Billberg, 1820 (1817) (33 genera, 300 species)
- Family **Lutrochidae** Kasap and Crowson, 1975 (1 genus, 11 species)
- Family **Limnichidae** Erichson, 1846 (37 genera, 390 species)
- Family **Heteroceridae** W. S. MacLeay, 1825 (15 genera, 300 species)
- Family **Psephenidae** Lacordaire, 1854 (35 genera, 290 species)
- Family **Cneoglossidae** Champion, 1897 (1 genus, 10 species)
- Family **Ptilodactylidae** Laporte, 1836 (34 genera, 500 species)
- Family **Chelonariidae** Blanchard, 1845 (3 genera, 250 species)
- Family **Eulichadidae** Crowson, 1973 (2 genera, 30 species)
- Family **Callirhipidae** Emden, 1924 (9 genera, 150 species)
- Superfamily **Elateroidea** Leach, 1815 (20 families)
- Family **Rhinorhipidae** Lawrence, 1988 (1 genus, 1 species)
- Family **Artematopodidae** Lacordaire, 1857 (8 genera, 45 species)
- Family **Brachypsectridae** LeConte and G. H. Horn, 1883 (1 genus, 5 species)
- Family **Cerophytidae** Latreille, 1834 (3 genera, 21 species)
- Family **Eucnemidae** Eschscholtz, 1829 (200 genera, 1500 species)
- Family **Throscidae** Laporte, 1840 (5 genera, 150 species)
- Family **Elateridae** Leach, 1815 (400 genera, 10000 species)
- Family **Plastoceridae** Crowson, 1972 (1 genus, 2 species)
- Family **Drilidae** Blanchard, 1845 (6 genera, 120 species)
- Family **Omalisidae** Lacordaire, 1857 (3 genera, 8 species)
- Family **Lycidae** Laporte, 1836 (160 genera, 4600 species)
- Family **Telegeusidae** Leng, 1920 (3 genera, 10 species)
- Family **Phengodidae** LeConte, 1861 (31 genera, 250 species)
- Family **Rhagophthalmidae** E. Olivier, 1907 (6 genera, 30 species)⁵
- Family **Lampyridae** Rafinesque, 1815 (110 genera, 2200 species)
- Family **Omethidae** LeConte, 1861 (8 genera, 33 species)
- Family **Cantharidae** Imhoff, 1856 (1815) (160 genera, 5100 species)
- Family **Podabrocephalidae** Pic, 1930 (1 genus, 1 species)
- †Family **Berentimiridae** Winkler, 1987 (1 genus, 1 species)
- †Family **Lasiosynidae** Kirejtshuk, Chang, Ren & Kun, 2010 (4 genera, 7 species)
- Series **Derodontiformia** LeConte, 1861 (1 superfamily)
- Superfamily **Derontoidea** LeConte, 1861 (3 families)
- Family **Derodontidae** LeConte, 1861 (4 genera, 30 species)
- Family **Nosodendridae** Erichson, 1846 (1 genus, 50 species)
- Family **Jacobsoniidae** Heller, 1926 (3 genera, 20 species)
- Series **Bostrichiformia** Forbes, 1926 (1 superfamily)
- Superfamily **Bostrichoidea** Latreille, 1802 (4 families)
- Family **Dermestidae** Latreille, 1804 (50 genera, 1200 species)
- Family **Endecatomidae** LeConte, 1861 (1 genus, 4 species)
- Family **Bostrichidae** Latreille, 1802 (90 genera, 570 species)
- Family **Ptinidae** Latreille, 1802 (230 genera, 2200 species)
- Series **Cucujiformia** Lameere, 1938 (4 superfamilies)
- Superfamily **Lymexyloidea** Fleming, 1821 (1 family)
- Family **Lymexylidae** Fleming, 1821 (10 genera, 70 species)
- Superfamily **Cleroidea** Latreille, 1802 (12 families)
- Family **Phloiophilidae** Kiesenwetter, 1863 (1 genus, 1 species)
- Family **Trogossitidae** Latreille, 1802 (50 genera, 600 species)

5. See Löbl & Smetana (2007).

- Family **Chaetosomatidae** Crowson, 1952 (4 genera, 12 species)
 Family **Metaxinidae** Kolibáč, 2004 (1 genus, 1 species)
 Family **Thanerocleridae** Chapin, 1924 (7 genera, 30 species)
 Family **Cleridae** Latreille, 1802 (200 genera, 3400 species)
 Family **Acanthocnemidae** Crowson, 1964 (1 genus, 1 species)
 Family **Phycosecidae** Crowson, 1952 (1 genus, 4 species)
 Family **Prionoceridae** Lacordaire, 1857 (3 genera, 160 species)
 Family **Mauroniscidae** Majer, 1995 (5 genera, 26 species)
 Family **Melyridae** Leach, 1815 (300 genera, 6000 species)
 †Family **Parandrexidae** Kirejtshuk, 1994 (3 genera, 5 species)
- Superfamily **Cucujoidea** Latreille, 1802 (37 families)
- Family **Boganiidae** Sen Gupta and Crowson, 1966 (5 genera, 11 species)
 Family **Byturidae** Gistel, 1848 (7 genera, 24 species)
 Family **Helotidae** Chapuis, 1876 (5 genera, 107 species)
 Family **Protocucujidae** Crowson, 1954 (1 genus, 7 species)
 Family **Sphindidae** Jacquelin du Val, 1860 (9 genera, 59 species)
 Family **Biphyllidae** LeConte, 1861 (7 genera, 200 species)
 Family **Erotylidae** Latreille, 1802 (260 genera, 3500 species)
 Family **Monotomidae** Laporte, 1840 (33 genera, 250 species)
 Family **Hobartiidae** Sen Gupta and Crowson, 1966 (2 genera, 6 species)
 Family **Cryptophagidae** Kirby, 1826 (60 genera, 600 species)
 Family **Agapythidae** Sen Gupta and Crowson, 1969 (1 genus, 1 species)
 Family **Priasilphidae** Crowson, 1973 (3 genera, 11 species)
 Family **Phloeostichidae** Reitter, 1911 (5 genera, 14 species)
 Family **Silvanidae** Kirby, 1837 (58 genera, 500 species)
 Family **Cucujidae** Latreille, 1802 (4 genera, 44 species)
 Family **Myraboliidae** Lawrence and Britton, 1991 (1 genus, 13 species)
 Family **Cavognathidae** Sen Gupta and Crowson, 1966 (1 genus, 9 species)
 Family **Lamingtoniidae** Sen Gupta and Crowson, 1969 (1 genus, 3 species)
 Family **Passandridae** Blanchard, 1845 (9 genera, 109 species)
 Family **Phalacridae** Leach, 1815 (51 genera, 640 species)
 Family **Propalticidae** Crowson, 1952 (2 genera, 30 species)
 Family **Laemophloeidae** Ganglbauer, 1899 (37 genera, 430 species)
 Family **Tasmosalpingidae** Lawrence and Britton, 1991 (1 genus, 2 species)
 Family **Cyclaxyridae** Gimmel et al., 2009 (1 genus, 2 species)
 Family **Kateretidae** Kirby, 1837 (14 genera, 95 species)
 Family **Nitidulidae** Latreille, 1802 (350 genera, 4500 species)
 Family **Smicripidae** G. H. Horn, 1880 (1 genus, 6 species)
 Family **Bothrideridae** Erichson, 1845 (38 genera, 400 species)
 Family **Cerylonidae** Billberg, 1820 (52 genera, 450 species)
 Family **Alexiidae** Imhoff, 1856 (1 genus, 50 species)
 Family **Discolomatidae** G. H. Horn, 1878 (16 genera, 400 species)
 Family **Endomychidae** Leach, 1815 (130 genera, 1800 species)
 Family **Coccinellidae** Latreille, 1807 (360 genera, 6000 species)
 Family **Corylophidae** LeConte, 1852 (30 genera, 200 species)
 Family **Latridiidae** Erichson, 1842 (28 genera, 1000 species)
 Family **Akalypsoischiidae** Lord et. al, 2010 (1 genus, 24 species)⁶
 †Family **Sinisilvanidae** Hong, 2002 (1 genus, 1 species)
- Superfamily **Tenebrionoidea** Latreille, 1802 (28 families)
- Family **Mycetophagidae** Leach, 1815 (18 genera, 130 species)
 Family **Archeocrypticidae** Kaszab, 1964 (10 genera, 60 species)
 Family **Pterogeniidae** Crowson, 1953 (7 genera, 26 species)

6. See Lord et al. (2010).

- Family **Ciidae** Leach, 1819 (42 genera, 650 species)
 Family **Tetratomidae** Billberg, 1820 (13 genera, 150 species)
 Family **Melandryidae** Leach, 1815 (60 genera, 420 species)
 Family **Mordellidae** Latreille, 1802 (100 genera, 1500 species)
 Family **Rhiphoridae** Gemminger, 1870 (1853) (38 genera, 400 species)
 Family **Zopheridae** Solier, 1834 (190 genera, 1700 species)
 Family **Ulodidae** Pascoe, 1869 (14 genera, 30 species)
 Family **Promecheilidae** Lacordaire, 1859 (7 genera, 20 species)
 Family **Chalcodryidae** Watt, 1974 (3 genera, 15 species)
 Family **Trachelostenidae** Lacordaire, 1859 (1 genus, 2 species)
 Family **Tenebrionidae** Latreille, 1802 (2300 genera, 20000 species)
 Family **Prostomidae** C. G. Thomson, 1859 (2 genera, 30 species)
 Family **Synchroidae** Lacordaire, 1859 (3 genera, 8 species)
 Family **Stenotrachelidae** C. G. Thomson, 1859 (7 genera, 19 species)
 Family **Oedemeridae** Latreille, 1810 (100 genera, 500 species)
 Family **Meloidae** Gyllenhal, 1810 (120 genera, 3000 species)
 Family **Mycteridae** Oken, 1843 (29 genera, 160 species)
 Family **Boridae** C. G. Thomson, 1859 (3 genera, 4 species)
 Family **Trictenotomidae** Blanchard, 1845 (2 genera, 13 species)
 Family **Pythidae** Solier, 1834 (7 genera, 23 species)
 Family **Pyrochroidae** Latreille, 1807 (30 genera, 167 species)
 Family **Salpingidae** Leach, 1815 (45 genera, 300 species)
 Family **Anthricidae** Latreille, 1819 (100 genera, 3000 species)
 Family **Aderidae** Winkler, 1927 (50 genera, 900 species)
 Family **Scraptiidae** Gistel, 1848 (35 genera, 500 species)
 Superfamily **Chrysomeloidea** Latreille, 1802 (7 families)
 Family **Vesperidae** Mulsant, 1839 (17 genera, 75 species)
 Family **Oxypeltidae** Lacordaire, 1868 (2 genera, 3 species)⁷
 Family **Disteniidae** J. Thomson, 1861 (32 genera, 336 species)
 Family **Cerambycidae** Latreille, 1802 (5232 genera, 30079 species)⁸
 Family **Megalopodidae** Latreille, 1802 (30 genera, 350 species)⁹
 Family **Orsodacnidae** C. G. Thomson, 1859 (3 genera, 40 species)⁹
 Family **Chrysomelidae** Latreille, 1802 (2114 genera, 32500 species)
 Superfamily **Curculionoidea** Latreille, 1802 (8 families)¹⁰
 Family **Nemonychidae** Bedel, 1882 (20 genera, 70 species)
 Family **Anthribidae** Billberg, 1820 (372 genera, 3900 species)
 Family **Belidae** Schoenherr, 1826 (38 genera, 375 species)
 Family **Attelabidae** (150 genera, 2500 species)
 Family **Caridae** Thompson, 1992 (4 genera, 6 species)
 Family **Brentidae** Billberg, 1820 (400 genera, 4000 species)
 Family **Curculionidae** Latreille, 1802 (4600 genera, 51000 species)
 †Family **Ulyanidae** Zherikhin, 1993 (2 genera, 3 species)

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7. See Kuschel (1955).

8. Number of genera was obtained by tripling the number of neotropical genera (1744) supplied by M. Monne (pers. com). Species number was obtained from Anonymous (2010).

9. See Hallan (2010).

10. See Oberprieler et al. (2007).

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