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Order Diptera Linnaeus, 1758

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Order **Diptera** Linnaeus, 1758 (159,294 species, 3,817 fossil species, 5,969 dubious species)[1]

Suborder **NEMATOCERA** Dumeril, 1805 (9 subordinate groups) Paraphyletic, Sequential

Incertae Sedis (7 families)

Family †Asiochaoboridae Hong & Wang, 1990 (4 genera, 4 species)

Family †Eopolyneuridae Rohdendorf, 1962 (2 genera, 2 species)

Family †Hyperpolyneuridae Rohdendorf, 1962 (1 genus, 1 species)

Family †Luanpingitidae Zhang, 1986 (1 genus, 1 species)

Family †Palaeophoridae Rohdendorf, 1951 (1 genus, 1 species)

Family †Serendipidae Evenhuis, 1994 (2 genera, 3 species)

Family †Tethepomyiidae Grimaldi & Arillo, 2009 (1 genus, 1 species)

Infraorder **Deuterophlebiomorpha** Rohendorf, 1961 (1 family)

Family Deuterophlebiidae Edwards, 1922 (1 genus, 14 species)

Infraorder **Nymphomyiomorpha** Rohdendorf, 1964 (1 family)

Family Nymphomyiidae Tokunaga, 1932 (1 genus, 8 species, 0/1)

Infraorder **Tipulomorpha** Rohdendorf, 1961 (6 families)[2] Sequential

Family †Vladipteridae Shcherbakov, 1995 (4 genera, 5 species)[3]

Family Trichoceridae Rondani, 1841 (15 genera, 183 species, 9/24/3)[4]

Family Pediciidae Osten Sacken, 1859 (12 genera, 496 species, 2/9/1)[5]

Family Limoniidae Rondani, 1856 (188 genera, 10,777 species, 56/389/29) Para- or polyphyletic

Family Cylindrotomidae Schiner, 1863 (9 genera, 82 species, 0/14)

Family Tipulidae Latreille, 1802 (39 genera, 4,415 species, 2/94/25)

Infraorder [unnamed] (1 family)

Family †Tillyardipteridae Lukashevich & Shcherbakov, 1999 (2 genera, 2 species)[6]

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1. **BY** Thomas Pape, Vladimir Blagoderov & Mikhail B. Mostovski (for full contact details, see **Author names & addresses** after **Cited references**). The title of this contribution should be cited as "Order DIPTERA Linnaeus, 1758. *In*: Zhang, Z.-Q. (Ed.) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness".

   This listing of Diptera taxa follows the classification used by ***Systema Dipterorum*** (see www.diptera.org). Documentation for this classification as well as the ability to search for details on names and species is available there. ***Systema Dipterorum*** now documents more than a quarter of a million names (270,219) for some 160,000 (159,294) species. Unfortunately, due to the lack of support, the ***Systema Dipterorum*** is not up to date and many records remain incomplete. While some 2010-names are included, the last complete check against the ***Zoological Record*** was back in 2007 (volume 143, December 2007). The numbers presented here follow from a version prepared at the end of 2010 and passed along to the 2011 Catalogue of Life, Annual Checklist.

   The number for species includes dubious species, that is, species which are not well defined or known. These (5,969 names), however, represent about four per cent of the total names here tabulated and are not segregated as they may represent valid species and, clearly, they are much less than the number of unrecognized species. The number of dubious species is given for each family after that for fossil genera/fossil species. The standard estimate of undescribed species of arthropods is about 90%, that is, the described species are only 10% of the total.

   The classification largely follows from the **Diptera Tree of Life** analysis and cladogram (Wiegmann *et al.*, 2011) and departures from this classification are annotated as appropriate with footnotes. Basic information on family and higher-taxon names is largely based on Sabrosky (1999) and that for fossils on Evenhuis (1994). The fossils, however, are extensively annotated as there have been major changes in their family classification.

   Our list is hierarchical, arranged more or less in phylogenetic sequence from the primitive (oldest) to the most advanced (youngest) taxa. We have reluctantly assigned the traditional Linnaean ranks to the groups in our list, with the caveat that this implies an equivalence that does not exist. We have annotated our list to show the status of each group. The default is that the group is monophyletic and arrangement is alphabetic. If a taxon is sister to all the groups that follow, then the word "Sequential" is inserted after the name of the group to which these follow. Groups, which are either para- or polyphyletic are marked as such. Groups, which can not be accurately placed, are marked as *Incertae Sedis* at the level to which the placement is known. That is, if a lower-ranked group can not, for example, be placed within any of the subordinate groups of Nematocera, then that lower-ranked group is listed FIRST after Nematocera and is marked as *Incertae Sedis*. Then the fossil taxa are arranged alphabetically or sequentially, and extant taxa may be listed sequentially or included in the alphabetic list of fossil taxa. See Wiley (1979) for more details on annotated Linnaean hierarchies.

   Warning: While groups may have the same rank, they may not be equivalent and should not be used to make comparisons between similarly ranked taxa. For example, the family Limoniidae contains over 10,000 species and is over 235 million years old, whereas the family Braulidae contains only 7 species and is less than 30 million years old.

   This work is a joint effort and the order of authorship simply follows seniority, that is, oldest first to junior-most last. MM and VB were responsible for the fossils, TP oversaw the extant taxa and were in charge of bringing the manuscript into its final format. Special acknowledgments are due to F.C. Thompson, who assembled most of the data for this chapter and was a driving force on all stages of work on the manuscript, as well as to the Schlinger Foundation for its support of ***Systema Dipterorum*** over the years, without which this review would not have been possible.
2. The arrangement of the families of Tipulomorpha follows from Petersen *et al*. (2010).
3. Including *Triassochorista jinsuoguanensis* Hong and Guo, 2003 (Blagoderov *et al.*, 2007).
4. Including Musidoromimidae Rohdendorf, 1962 (Blagoderov *et al.*, 1994).
5. Including Diplopolyneuridae Rohdendorf, 1962 (Krzemiñski, 1992), Gracilitipulidae Hong & Wang, 1990, Zhangobiidae Evenhuis, 1994 (Blagoderov *et al.*, 2002), Archilimoniidae Krzeminski & Krzeminska, 2003 (Blagoderov *et al.*, 2007).

Infraorder **Ptychopteromorpha** Wood & Borkent, 1986 (3 families)
Family †Hennigmatidae Shcherbakov, 1995 (3 genera, 4 species)
Family †Nadipteridae Lukashevich, 1995 (1 genus, 3 species)
Family Ptychopteridae Osten Sacken, 1862 (27 genera, 156 species, 23/148/2)[7]
Infraorder **Psychodomorpha** Hennig, 1968 (5 families)
Family †Ansorgiidae Krzemiński & Lukashevich, 1993 (1 genus, 1 species)
Family Blephariceridae Loew, 1861 (39 genera, 331 species, 6/8/2)[8]
Family †Grauvogeliidae Krzemiński, 1999 (2 genera, 2 species)
Family Psychodidae Newman, 1834 (144 genera, 3,026 species, 22/68/44)
Family Tanyderidae Osten Sacken, 1880 (12 genera, 55 species, 3/17)
Infraorder **Culicomorpha** Hennig, 1948 (9 families)
Incertae Sedis (1 family)
Family †Protendipedidae Rohdendorf, 1951 (2 genera, 3 species)
---------- Extant taxa, Sequential
Family Dixidae Schiner, 1868 (9 genera, 197 species, 0/11/1)
Family Corethrellidae Edwards, 1932 (1 genera, 111 species, 0/7)
Family Chaoboridae Newman, 1834 (33 genera, 89 species, 15/35)[9]
Family Culicidae Meigen, 1818 (46 genera, 3,725 species, 3/20/41)
Family Thaumaleidae Bezzi, 1913 (10 genera, 183 species, 1/1)
Family Simuliidae Newman, 1834 (35 genera, 2,121 species, 6/14)
Family Ceratopogonidae Newman, 1834 (130 genera, 5,902 species, 12/258/152)
Family Chironomidae Newman, 1834 (541 genera, 7,290 species, 75/237/1,700)[10]
Clade **NEODIPTERA** Michelsen, 1994 (3 subordinate groups) Sequential
Infraorder **Perissommatomorpha** Rohdendorf, 1977 (2 families)
Family †Boholdoyidae Kovalev, 1985 (2 genera, 3 species)
Family Perissommatidae Colless, 1962 (5 genera, 9 species, 4/5)[11]
Infraorder **Bibionomorpha** Hennig, 1954 (33 families)
Incertae Sedis (4 families)
Family †Siberhyphidae Kovalev, 1985 (1 genus, 1 species)
Family †Tanyderophrynidae Rohdendorf, 1962 (1 genus, 1 species)
Family †Tipulodictyidae Rohdendorf, 1962 (1 genus, 1 species)
Family †Tipulopleciidae Rohdendorf, 1962 (1 genus, 1 species)
----------Fossil taxa
Family †Antefungivoridae Rohdendorf, 1938 (9 genera, 44 species)
Family †Archizelmiridae Rohdendorf, 1962 (4 genera, 5 species)
Family †Crosaphididae Kovalev, 1983 (1 genus, 2 species)
Family †Elliidae Krzeminska, Blagoderov & Krezmiński, 1993 (2 genera, 4 species)
Family †Eoditomyiidae Ansorge, 1996 (1 genus, 1 species)
Family †Heterorhyphidae Ansorge & Krzemiński, 1995 (1 genus, 1 species)
Family †Mesosciophilidae Rohdendorf, 1946 (8 genera, 14 species)
Family †Paraxymyiidae Rohdendorf, 1946 (7 genera, 12 species)[12]
Family †Pleciofungivoridae Rohdendorf, 1946 (17 genera, 63 species)
Family †Procramptonomyiidae Kovalev, 1983 (4 genera, 7 species)
Family †Protopleciidae Rohdendorf, 1946 (9 genera, 21 species)[13]
Family †Protorhyphidae Handlirsch, 1906 (7 genera, 19 species)

6. Including Rhaetaniidae Krzemiński and Krzemińska, 2002.
7. Architendipedidae Rohdendorf, 1962 and Eoptychopteridae Handlirsch, 1906 are included in Ptychopteridae after Lukashevich (2008).
8. Including Sinotendipedidae Hong & Wang, 1990 (Blagoderov *et al.*, 2002).
9. Including Dixamimidae Rohdendorf, 1959 and Rhaetomyiidae Rohdendorf, 1962 (Lukashevich, 1996).
10. Including Protobibionidae Rohdendorf, 1946 (Ashe, 1983).
11. Including Limnorhyphidae Hong, 1983.
12. Including Parapleciidae Hong, 1983 and genera considered by authors within Eopleciidae. *Eoplecia primitiva* Handlirsh, 1920 is a synonym of *Mesorhyphus nanus* Handlirsch, 1920, so Eopleciidae is a synonym of Anisopodidae (Ansorge & Krzemiński, 1995).
13. Including Pleciodictyidae Rohdendorf, 1962, Protoligoneuridae Rohdendorf, 1964, Palaeopleciidae Rohdendorf, 1962 (Blagoderov, 1995), Dyspolyneuridae Rohdendorf, 1961 (Krzemiński, 1992).

Family †Protoscatopsidae Rohdendorf, 1946 (2 genera, 2 species)
---------- Extant taxa, Sequential
Family Anisopodidae Knab, 1912 (24 genera, 196 species, 18/47)[14]
Family Canthyloscelididae Enderlein, 1912 (5 genera, 17 species, 0/1)
Family Scatopsidae Newman, 1834 (34 genera, 407 species, 2/17/19)
Family Valeseguyidae Amorim & Grimaldi, 2006 (3 genera, 3 species, 2/2)[15]
Family Axymyiidae Shannon, 1921 (6 genera, 8 species, 3/4)
Family Hesperinidae Schiner, 1864 (2 genera, 10 species, 1/2)
Family Bibionidae Fleming, 1821 (12 genera, 1,102 species, 5/342/11)[16]
Family Pachyneuridae Schiner, 1864 (7 genera, 8 species, 2/3)
Family Ditomyiidae Keilin, 1919 (8 genera, 98 species, 0/4)
Family Diadocidiidae Winnertz, 1863 (4 genera, 39 species, 2/5)
Family Mycetophilidae Newman, 1834 (233 genera, 4,525 species, 53/375/49)[17]
Family Bolitophilidae Winnertz, 1863 (2 genera, 61 species, 1/2)
Family Keroplatidae Rondani, 1856 (90 genera, 993 species, 12/40/26)
Family Lygistorrhinidae Edwards, 1925 (15 genera, 44 species, 7/12)
Family Rangomaramidae Jaschhof & Didham, 2002 (13 genera, 32 species, 1/5)[18]
Family Sciaridae Billberg, 1820 (92 genera, 2,455 species, 4/153/84)
Family Cecidomyiidae Newman, 1835 (761 genera, 6,296 species, 9/110/396)

Suborder **BRACHYCERA** Macquart, 1834 (2 subordinate groups) Sequential

Clade **Orthorrhapha** Brauer, 1863 (7 subordinate groups) Mono- or paraphyletic[19]

Incertae Sedis (4 families)
Family †Eomyiidae Rohdendorf, 1962 (1 genus, 1 species)
Family Nemestrinidae Griffith & Pidgeon, 1832 (26 genera, 300 species, 7/23/1)
Family †Prosechamyiidae Blagoderov & Grimaldi, 2007 (1 genus, 2 species)
Family †Rhagionemestriidae Ussatchov, 1968 (2 genera, 3 species)

Superfamily [unnamed] (2 families)
Family Acroceridae Leach, 1815 (55 genera, 400 species, 7/8/1)
Family Hilarimorphidae Williston, 1896 (2 genera, 36 species, 1/4)

Superfamily [unnamed] (1 family)
Family Vermileonidae Williston, 1886 (12 genera, 61 species, 2/2)

Superfamily **Asiloidea** Latreille, 1802 (11 families) Sequential
Family Bombyliidae Latreille, 1802 (275 genera, 5,382 species, 22/18/31)
Family Asilidae Latreille, 1802 (555 genera, 7,531 species, 8/52/186)
Family †Cratomyiidae Mazzarolo & Amorim, 2000 (2 genera, 2 species)
Family †Protapioceridae Ren, 1998 (1 genus, 3 species)
Family Mydidae Latreille, 1809 (66 genera, 498 species, 1/3/2)
Family Apioceridae Bigot, 1857 (1 genera, 143 species)
Family Evocoidae Yeates, Irwin & Wiegmann 2006 (1 genus, 1 species)
Family Apsilocephalidae Nagatomi, Saigusa, Nagatomi & Lyneborg, 1991 (4 genera, 7 species, 1/3)
Family Scenopinidae Burmeister, 1835 (25 genera, 420 species, 1/4)
Family †Protomphralidae Rohdendorf, 1957 (2 genera, 2 species)
Family Therevidae Newman, 1834 (128 genera, 1,143 species, 9/14/25)

Superfamily **Rhagionoidea** Latreille, 1802 (6 families) Sequential
Family Austroleptidae Nagatomi, 1982 (1 genus, 8 species)

14. Sinoditomyiidae Hong, 2002 are included in Anisopodidae: Mycetobiinae.
15. Valeseguyidae are placed as sister to the Scatopsidae and Canthyloscelididae following from Amorin & Grimaldi (2006).
16. Cascopleciidae Poinar, 2010 merely represent a typical bibionid with an abberant antenna and are here synonymized with Bibionidae (subfamily Pleciinae).
17. The genus *Manota* Williston, 1896 is retained in the Mycetophilidae as placed by Rindal *et al*. (2009), not as the sister to Ditomyiidae as in the **Diptera Tree of Life** analysis. Also, Huaxiasciaritidae Hong, 2002 are included here.
18. The circumscription and placement of the Rangomaramidae follow from Amorim and Rindal (2007).
19. The orthorrhaphan Dipteran have usually been considered a paraphyletic grade (e.g., Hennig 1973) but emerged as monophyletic in the **Diptera Tree of Life** analysis. Pending more firm evidence on orthorrhaphan relationships, we are here applying a classification with seven subordinate groups given rank as superfamilies.

Family Bolbomyiidae Stuckenberg, 2001 (1 genus, 4 species, 0/1)
Family †Palaeostratiomyiidae Rohdendorf, 1938 (1 genus, 1 species)
Family Rhagionidae Latreille, 1892 (47 genera, 756 species, 28/62/28)
Family †Rhagionempididae Rohdendorf, 1951 (5 genera, 5 species)
Family †Eostratiomyiidae Rohdendorf, 1951 (1 genus, 1 species)
Superfamily **Stratiomyoidea** Latreille, 1802 (4 families)
Family Panthophthalmidae Bigot, 1886 (2 genera, 20 species)
Family Stratiomyidae Latreille, 1802 (385 genera, 2,690 species, 9/22/24)
Family Xylomyidae Verrall, 1901 (4 genera, 138 species, 0/4)
Family †Zhangsolvidae Nagatomi & Yang, 1998 (1 genus, 1 species)
Superfamily **Tabanoidea** Latreille, 1802 (5 families)[20]
Family Athericidae Nowicki, 1873 (12 genera, 133 species, 2/9/7)
Family Oreoleptidae Zloty, Sinclair & Pritchard, 2005 (1 genus, 1 species)
Family Pelecorhynchidae Enderlein, 1922 (2 genera, 49 species)
Family Tabanidae Latreille, 1802 (156 genera, 4,434 species, 10/29/46)
Family †Uranorhagionidae Zhang, Yang & Ren, 2010 (2 genera, 5 species)
Superfamily **Xylophagoidea** Fallén, 1810 (5 families)
Family †Archisargidae Rohdendorf, 1951 (6 genera, 17 species)
Family †Eremochaetidae Ussatchov, 1968 (9 genera, 16 species)
Family †Kovalevisargidae Mostovski, 1997 (2 genera, 2 species)
Family †Protobrachyceridae Rohdendorf, 1964 (1 genus, 3 species)
Family Xylophagidae Fallén, 1810 (15 genera, 145 species, 6/9/2)
Clade **EREMONEURA** Lameere, 1906 (3 subordinate groups) Sequential
Incertae Sedis (1 family)
Family †Chimeromyiidae Grimaldi, Cumming & Arillo, 2009 (2 genera, 8 species)
Superfamily **Empidoidea** Latreille, 1804 (8 families)
Family Atelestidae Hennig, 1970 (11 genera, 22 species, 7/11)
Family Brachystomatidae Melander, 1908 (20 genera, 153 species, 0/6/6)
Family Dolichopodidae Latreille, 1809 (268 genera, 7,358 species, 29/123/90)
Family Empididae Latreille, 1804 (104 genera, 3,142 species, 32/93/104)
Family Homalocnemiidae Collin, 1928 (1 genus, 7 species)
Family Hybotidae Macquart, 1823 (75 genera, 2,005 species, 7/33/68)
Family "*Iteaphila*-group" (2 genera, 27 species)
Family Oreogetonidae Chvála, 1976 (1 genus, 36 species)
Superfamily **Apystomyioidea** Nagatomi & Liu, 1994 (1 family)
Family Apystomyiidae Nagatomi & Liu, 1994 (1 genus, 1 species)
Clade **CYCLORRHAPHA** Brauer, 1863 (2 subordinate groups) Sequential
Infraorder **ASCHIZA** Becher, 1882 (2 subordinate groups) Paraphyletic, Sequential
Superfamily **Phoroidea** Curtis, 1833 (5 families) Sequential
Family Lonchopteridae Macquart, 1823 (6 genera, 65 species, 2/2/1)
Family Opetiidae Rondani, 1856 (5 genera, 10 species, 4/6)
Family Platypezidae Latreille, 1829 (29 genera, 277 species, 10/25/1)
Family Ironomyiidae McAlpine & Martin, 1966 (5 genera, 17 species, 4/14)
Family Phoridae Curtis, 1833 (302 genera, 4,202 species, 23/97/5)
Superfamily **Syrphoidea** Latreille, 1802 (2 families) Sequential
Family Pipunculidae Walker, 1834 (22 genera, 1,428 species, 2/8/15)[21]
Family Syrphidae Latreille, 1802 (209 genera, 6,107 species, 10/92/24)
Infraorder **SCHIZOPHORA** Becher, 1882 (2 subordinate groups) Sequential
Clade **Archischiza** Enderlein, 1936 (1 family)
Family Conopidae Latreille, 1802 (52 genera, 831 species, 2/3/18)[22]
Clade **Muscaria** Enderlein, 1936 (2 subordinate groups)

20. The arrangement of the Tabanoidea (Tabanomorpha of authors) follows from Kerr (2010).
21. The Pipunculidae are retained as the sister to the Syrphidae, their traditional placement, whereas the **Diptera Tree of Life** analysis has them as sister to Schizophora.

Parvorder **ACALYPTRATAE** Macquart, 1835 (9 subordinate groups) Para- or polyphyletic[23]
- Superfamily **Carnoidea** Newman, 1834 (7 families) Paraphyletic?
  - Family Australimyzidae Griffiths, 1972 (1 genus, 9 species)
  - Family Canacidae Jones, 1906 (28 genera, 323 species, 0/1)
  - Family Carnidae Newman, 1834 (6 genera, 92 species, 1/2)
  - Family Chloropidae Rondani, 1856 (194 genera, 2,885 species, 2/5/35)
  - Family Inbiomyiidae Buck, 2006 (1 genus, 11 species)
  - Family Milichiidae Schiner, 1862 (20 genera, 288 species, 1/10)
  - Family Nannodastiidae Papp, 1980 (2 genera, 5 species)
- Superfamily **Ephydroidea** Zetterstedt, 1837 (7 families) Sequential
  - Family Ephydridae Zetterstedt, 1837 (128 genera, 1,994 species, 0/2/19)
  - Family Drosophilidae Rondani, 1856 (76 genera, 4,017 species, 3/14/6)
  - Family Braulidae Egger, 1853 (2 genera, 7 species)
  - Family Cryptochetidae Brues & Melander, 1932 (3 genera, 34 species, 1/1)
  - Family Camillidae Frey, 1921 (5 genera, 42 species, 1/2/1)
  - Family Curtonotidae Enderlein, 1914 (3 genera, 65 species, 0/1)[24]
  - Family Diastatidae Hendel, 1917 (4 genera, 50 species, 1/2)
- Superfamily **Lauxanioidea** Macquart, 1835 (3 families)
  - Family Celyphidae Bigot, 1852 (8 genera, 115 species, 0/0/7)
  - Family Chamaemyiidae Hendel, 1910 (24 genera, 351 species, 1/1/2)
  - Family Lauxaniidae Macquart, 1835 (168 genera, 1,900 species, 3/5/60)[25]
- Superfamily **Nerioidea** Westwood, 1840 (3 families)
  - Family Cypselosomatidae Hendel, 1931 (13 genera, 35 species, 2/2)
  - Family Micropezidae Blanchard, 1840 (52 genera, 583 species, 1/10/22)
  - Family Neriidae Westwood, 1840 (19 genera, 112 species, 0/0/1)
- Superfamily **Opomyzoidea** Fallén, 1820 (17 families) Paraphyletic?
  - Family Acartophthalmidae Czerny, 1928 (2 genera, 6 species, 1/1)
  - Family Agromyzidae Fallén, 1823 (41 genera, 3,017 species, 7/20/10)
  - Family Anthomyzidae Czerny, 1903 (22 genera, 95 species, 2/2)
  - Family Asteiidae Rondani, 1856 (10 genera, 138 species, 1/2)
  - Family Aulacigastridae Duda, 1924 (5 genera, 19 species, 1/1)
  - Family Clusiidae Handlirsch, 1884 (17 genera, 363 species, 2/3)
  - Family Fergusoninidae Tonnoir, 1937 (1 genus, 29 species)
  - Family Marginidae McAlpine, 1991 (1 genus, 3 species)
  - Family Megamerinidae Hendel, 1913 (4 genera, 16 species, 1/1)
  - Family Neminidae McAlpine, 1983 (3 genera, 14 species)
  - Family Neurochaetidae McAlpine, 1978 (3 genera, 22 species, 0/2)
  - Family Odiniidae Hendel, 1920 (14 genera, 65 species, 1/1)
  - Family Opomyzidae Fallén, 1820 (4 genera, 61 species, 0/2/6)
  - Family Pallopteridae Loew, 1862 (12 genera, 71 species, 2/1/1)
  - Family Periscelididae Oldenberg, 1914 (11 genera, 91 species, 1/8)
  - Family Teratomyzidae Hennig, 1969 (7 genera, 8 species)
  - Family Xenasteiidae Hardy, 1980 (1 genus, 13 species)
- Superfamily **Sciomyzoidea** Fallén, 1820 (11 families)
  - Family Coelopidae Hendel, 1910 (14 genera, 35 species, 0/0/3)
  - Family Dryomyzidae Schiner, 1862 (6 genera, 30 species, 2/5/2)
  - Family Helcomyzidae Hendel, 1924 (4 genera, 12 species)

22. The Conopidae are placed as basal to all other schizophoran groups following the original work of Enderlein (1936), the recent study by Gibson *et al.* (2010) and the **Diptera Tree of Life** analysis.
23. The Acalyptratae remain a para- or polyphyletic assemblage. The **Diptera Tree of Life** analysis did, however, retrieve some superfamily groups as monophyletic. These are Ephydroidea, Lauxanioidea, Nerioidea, Sciomyzoidea and Tephritoidea and we accept them as so defined. The other groups remain as previously defined.
24. Kirk-Spriggs (2007) contents that the fossil *Curtonotum gigas* Theobald. 1937 can not be placed in either of the families Drosophilidae or Curtonotidae. However we have left it as *incertae sedis* within the Curtonotidae.
25. The Eurychoromyiidae Hendel, 1910 are treated as a subfamily of Lauxaniidae following Gaimari & Silva (2010).

Family Huttoninidae Steyskal, 1965 (1 genera, 8 species)
Family Helosciomyzidae Steyskal, 1965 (10 genera, 23 species)
Family Heterocheilidae McAlpine, 1991 (1 genus, 2 species)
Family Natalimyzidae Barraclough & McAlpine, 2006 (1 genus, 1 species)[26]
Family Phaeomyiidae Verbeke, 1950 (2 genera, 4 species, 1/1)
Family Ropalomeridae Schiner, 1868 (8 genera, 33 species, 0/0/1)[27]
Family Sciomyzidae Fallén, 1820 (66 genera, 618 species, 3/13/37)
Family Sepsidae Walker, 1833 (38 genera, 345 species, 1/5/12)[28]
Superfamily **Sphaeroceroidea** Macquart, 1835 (5 families) Paraphyletic?
Family Chyromyidae Schiner, 1863 (4 genera, 139 species, 1/1/1)
Family Heleomyzidae Westwood, 1840 (76 genera, 738 species, 6/17/9)
Family Heteromyzidae Fallén, 1820 (1 genera, 7 species, 0/1)
Family Mormotomyiidae Austen, 1936 (1 genus, 1 species)[29]
Family Sphaeroceridae Macquart, 1835 (137 genera, 1,571 species, 9/3/17)
Superfamily **Tanypezoidea** Rondani, 1856 (7 families)
Family Diopsidae Bilberg, 1820 (14 genera, 194 species, 1/3/2)
Family Gobryidae McAlpine, 1997 (1 genus, 5 species)
Family Nothybidae Frey, 1927 (1 genus, 8 species)
Family Psilidae Macquart, 1835 (13 genera, 322 species, 2/2/12)
Family Somatiidae Hendel, 1935 (1 genus, 7 species)
Family Syringogastridae Prado, 1969 (1 genus, 10 species)
Family Tanypezidae Rondani, 1856 (5 genera, 68 species, 0/1/1)
Superfamily **Tephritoidea** Newman, 1834 (10 families) Sequential
Family †Proneottiphilidae Hennig, 1969 (1 genus, 1 species)
Family Richardiidae Loew, 1868 (34 genera, 178 species, 3/3)
Family Lonchaeidae Rondani, 1856 (10 genera, 504 species, 0/0/7)
Family Piophilidae Macquart, 1835 (14 genera, 83 species, 0/1/6)
Family Ulidiidae Macquart, 1835 (110 genera, 678 species, 1/3/31)
Family Platystomatidae Schiner, 1862 (128 genera, 1,164 species, 0/2/9)
Family Ctenostylidae Bigot, 1882 (6 genera, 10 species)
Family Tachiniscidae Kertész, 1903 (3 genera, 3 species)
Family Pyrgotidae Loew, 1868 (58 genera, 351 species, 0/1/1)
Family Tephritidae Newman, 1834 (492 genera, 4,716 species, 1/4/49)
Parvorder **CALYPTRATAE** Robineau-Desvoidy, 1830 (3 subordinate groups)[30]
Incertae Sedis (2 families)
Family †Eophlebomyiidae Cockerell, 1925 (1 genus, 1 species)
Family †Hoffeinsmyiidae Michelsen, 2009 (1 genus, 1 species)
Superfamily **Hippoboscoidea** Samouelle, 1819 (2 families) Sequential
Family Glossinidae Theobald, 1903 (1 genus, 25 species, 0/1)
Family Hippoboscidae Samouelle, 1819 (68 genera, 782 species, 0/1)[31]
Superfamily **Muscoidea** Latreille, 1802 (4 families) Paraphyletic, Sequential
Family Fanniidae Schnabl & Dziedzicki, 1911 (4 genera, 359 species)
Family Muscidae Latreille, 1802 (187 genera, 5,218 species, 2/8/58)
Family Anthomyiidae Robineau-Desvoidy, 1830 (53 genera, 1,941 species, 3/14/196)[32]
Family Scathophagidae Robineau-Desvoidy, 1830 (57 genera, 419 species, 0/0/55)

26. According to Barraclough & McAlpine (2006) at least 20 more new species remain to be described.
27. In the **Diptera Tree of Life** analysis the Ropalomeridae were sister to a clade consisting of Asteiidae, Fergusoninidae, Xenasteiidae and Australimyzidae. This family, however, is here retained in its traditional placement among the Sciomyzoidea.
28. In the **Diptera Tree of Life** analysis the Sepsidae were the sister to the Acartophthalmidae. This family, however, is here retained in its traditional placement among the Sciomyzoidea.
29. Mormotomyiidae are returned to their original placement next to the Sphaeroceridae.
30. The arrangement of the groups of Calyptratae follows from Kutty *et al.* (2010).
31. The Streblidae are retained as a subordinate (and possibly paraphyletic) unit of the Hippoboscidae which are viewed as sister to the Glossinidae as earlier workers and recently Kutty *et al.* (2010) have documented. The position of Streblidae as sister of Glossinidae and other hippoboscids in the **Diptera Tree of Life** analysis is probably due to the very restricted taxon sampling.

Superfamily **Oestroidea** Leach, 1815 (7 families)[33]
Family Calliphoridae Brauer & Bergenstamm, 1889 (97 genera, 1,525 species, 1/1/346)
Para- or polyphyletic
Family Mystacinobiidae Holloway, 1976 (1 genus, 1 species)
Family Oestridae Leach, 1815 (30 genera, 176 species, 4/6/16)
Family Rhiniidae Bauer & Bergenstamm, 1889 (30 genera, 376 species)
Family Rhinophoridae Robineau-Desvoidy, 1863 (27 genera, 174 species, 0/0/17)[34]
Family Sarcophagidae Macquart, 1834 (173 genera, 3,094 species, 0/0/203)
Family Tachinidae Robineau-Desvoidy, 1830 (1,597 genera, 9,626 species, 5/5/1,438)

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32. The Anthomyiidae are considered possibly paraphyletic by Kutty *et al.* (2010) based on a molecular analysis, but given the morphological support for monophyly (Michelsen, 1991), the family is here viewed as monophyletic.
33. Kutty *et al.* (2010) provided a molecular phylogeny for the Oestroidea, but branch support is very low for most clades.
34. The Rhinophoridae were found to be polyphyletic based on the molecular analysis by Kutty *et al.* (2010), but given the morphological evidence they are here treated as monophyletic (Pape & Arnaud, 2001).

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