

FAMILY GROUP NAMES AND CLASSIFICATION

and taxa excluded from Sphecidae sensu lato

as of 20 November 2020

compiled by

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The family and tribe level classification used below follows the findings of Brothers (1999), Melo (1999), and Prentice (1998, unpublished Ph.D. thesis, validated by Hanson and Menke, 2006). Their systems differ at the tribal level, and that of Prentice is accepted here as it is based on a much larger data set, but his one new tribe and one new subtribe are not included since they were not published. The classification of Ampulicidae is as proposed by Ohl and Spahn, 2009, the classification of Bembicinae follows Nemkov and Lelej, 2013, and the authorship of Palarini and Xenosphecini is as corrected by Menke and Pulawski (2002). Because Astatinae and Dinetinae each have a single tribe I am not using them in this catalog. The names, authorship, dates, stems, and other pertinent information, are from Menke (1997), who was advised by Don Cameron, a Latin and Greek scholar at the University of Michigan, about the proper formation of names. All genera described subsequent to Bohart and Menke (1976) have been added (both extant and fossil), and recently established synonymies are also indicated.

The recent cladistic analyses of Hymenoptera by Branstetter et al (2017) and by Peters and al. (2017) are not considered here, as they took into account only a limited representation of Sphecidae s.l., and they have not changed the established classification. On the other hand, Sann, Niehuis, Peters, Mayer, Kozlov, Podsiadlowski, Bank, Meusemann, Misof, Bleidorn, and Ohl (2018) proposed a radically new classification of the traditional Sphecidae s.l. They recognized the following 10 families: Ammoplanidae, Ampulicidae, Astatidae, Bembicidae, Crabronidae, Mellinidae, Pemphredonidae, Philanthidae, Psenidae, and Sphecidae (with Heterogynaidae included into Bembicidae, and Entomosericini and Eremiasphecini omitted from the analysis). This classification is not accepted here because: 1. it was based on molecular characters only, to the exclusion of morphological characters, 2. it is likely to change with the next cladistic analysis, 3. Recognition of so many families is unnecessary, and 4. stability of nomenclature is a necessity.

Menke (1997) commented that “Ammophilomorpha, Sphecinomorpha, and Palmodomorpha could be construed as valid [correctly: available] since they are based on generic names with -morpha endings”. Article 11.7.1.3 of the Code (Fourth Edition) leaves no doubt that these names are available, with their original authorship and date, but with a correct suffix (as specified in Article 29.2).

All the family group names of Apoidea (including Sphecidae sensu lato treated here) were reviewed by Engel, 2005 (Family-group names for bees (Hymenoptera: Apoidea). American Museum Novitates 3476:33 pp.).

Families are listed in the presumed phylogenetic order, whereas subfamilies and tribes are listed alphabetically within each family, as are the subtribes within each tribe. The dagger symbol (†) indicates fossil taxa.

I sincerely thank Helen K. Court, Jean Leclercq, Arnold S. Menke, and Alexander P. Rasnitsyn, who reviewed earlier versions of this document, as well as Vassili Belov, Helen K. Court, Alexander V.

Antropov, John S. Ascher, Andrew Debevec, Jere S. Schweikert, and Sara Alexander, who helped correct a number of mistakes.

Superfamily: Apoidea

Apoidea Latreille, 1802a:425 (April). Based on *Apis* Linnaeus, 1758 (stem: *Ap-*).

Sphecoidea Latreille, 1802b:331 (November). Based on *Sphex* Linnaeus, 1758 (stem: *Sphec-*).

Family: Heterogynaidae

Ohl's and Bleidorn's (2006) molecular cladistic analysis suggests that Heterogynaidae are members of Crabronidae. This opinion is confirmed by Sann et al., 2018 in their molecular cladistic analysis.

Heterogynaidae Nagy, 1969:7. Based on *Heterogyna* Nagy, 1969 (stem: *Heterogyna-*). Originally spelled Heterogynidae (stem: *Heterogyn-*), a junior homonym of Heterogynidae Rambur, 1866, based on *Heterogynis* Rambur, 1837. Both family name and stem emended by International Commission on Zoological Nomenclature, 1987:150, in Opinion 1445, as proposed by Day, 1985b:385.

Included genus: *Heterogyna* Nagy, 1969 (= *Daycatinca* Argaman, 1985, = *Daya* Antropov and Gorbatovskiy, 1992).

Family: Ampulicidae

Ampulicidae Shuckard, 1840:178, 180. Based on *Ampulex* Jurine, 1807 (stem: *Ampulic-*).

Subfamily: Ampulicinae Shuckard, 1840:178, 180. Based on *Ampulex* Jurine, 1807 (stem: *Ampulic-*).

Tribe: Ampulicini Shuckard, 1840:178, 180. Based on *Ampulex* Jurine, 1807 (stem: *Ampulic-*).

Included genera: *Ampulex* Jurine, 1807, *Trirogma* Westwood, 1841

Tribe: †Cretampulicini Antropov, 2000. Based on *Cretampulex* Antropov, 2000 (stem: *Cretampulic-*).

Included genus: †*Cretampulex* Antropov, 2000.

Tribe: †Mendampulicini Antropov, 2000. Based on *Mendampulex* Antropov, 2000 (stem: *Mendampulic-*).

Included genus: †*Mendampulex* Antropov, 2000.

Subfamily: Dolichurinae Dahlbom, 1842:3. Based on *Dolichurus* Latreille, 1809 (stem: *Dolichur-*). Originally spelled Dolichuridae. Menke (1997:250) incorrectly attributed authorship to Lepeletier de Saint Fargeau, 1845.

Tribe: Aphelotomini Ohl and Spahn, 2009. Based on *Aphelotoma* Westwood, 1841 (stem: *Aphelotom-*).

Included genera: *Aphelotoma* Westwood, 1841, *Riekefella* Özdikmen, 2005 (= *Austrotoma* Riek, 1955).

Tribe: †**Apodolichurini** Antropov, 2000. Based on *Apodolichurus* Antropov, 2000 (stem: *Apodolichur-*).

Included genus: †*Apodolichurus* Antropov, 2000.

Tribe: **Dolichurini** Dahlbom, 1842:3. Based on *Dolichurus* Latreille, 1809 (stem: *Dolichur-*). Originally spelled Dolichuridae. Menke (1997:250) incorrectly attributed authorship to Lepeletier de Saint Fargeau, 1845.

Included genera: *Dolichurus* Latreille, 1809, *Paradolichurus* F. Williams, 1960, †*Protodolichurus* Nemkov, 1988.

Tribe unknown within Ampulicidae

†*Cariridris* Brandão and Martins-Neto, 1990:201, †*Longivenula* Zhang, 1989.

Family: Sphecidae (sensu stricto)

Sphecidae Latreille, 1802b:331 (November). Based on *Sphex* Linnaeus, 1758 (stem: *Sphex-*). Originally spelled Sphegimes, latinized to Sphegineae by Fallén, 1812:129, to Sphecida and Sphecides by Leach, 1812 (Edinb. Encycl.), and to Sphegidae by Westwood, 1840 (Introd. Class. Ins.). Tillyard (1926:300) first demonstrated the proper stem.

The molecular cladistic analysis by Sann et al., 2018 suggests that Sphecidae are members of Crabronidae.

Subfamily: Ammophilinae André, 1886:50 (originally spelled Ammophilidae). Based on *Ammophila* Kirby, 1798 (stem: *Ammophil-*).

= Acutoclypeata Ohl, 1996:32. Not available: not based on any of the included genera (Article 11.7.1). Genera of Acutoclypeata: *Eremnophila*, *Hoplammophila*.

= Ammophilomorpha Ohl, 1996:35 (correct spelling: Ammophilinae). Based on *Ammophila* Kirby, 1798 (stem: *Ammophil-*). Synonym and junior homonym of Ammophilinae André, 1886. Genera of Amophilomorpha: *Ammophila*, *Eremochares*, *Parapsammophila*, *Podalonia*.

Included genera: *Ammophila* W. Kirby, 1798, *Eremnophila* Menke, 1964, *Eremochares* Gribodo, 1883, *Hoplammophila* de Beaumont, 1960, *Parapsammophila* Taschenberg, 1869, *Podalonia* Fernald, 1927.

Subfamily: Chloriontinae Fernald, 1905:16. Based on *Chlorion* Latreille, 1802 (stem: *Chloriont-*). Originally spelled Chlorioninae.

Included genus: *Chlorion* Latreille, 1802.

Subfamily: Sceliphrinae Ashmead, 1899:349 (1815). Based on *Sceliphron* Klug, 1801 (stem: *Sceliph-*). Originally spelled Sceliphroninae. The name, a junior synonym of Pelopeini Leach, 1815, was retained by Menke (1997) as valid because of its nearly universal use (Article 40.2.1 of the Code).

= Pelopoeinae Leach, 1815:150. Based on *Pelopoeus* Latreille, 1802. Originally spelled Pelopaeida.

= Lutifera Ohl, 1996:19. Not available: not based on any of the included genera (Article 11.7.1). Include Podiini + Sceliphriini.

Tribe: Podiini de Saussure, 1892. Based on *Podium* Fabricius, 1804 (stem: *Podi-*). Originally spelled *Podiites*, latinized to Podiinae by Ashmead, 1899:348.

Included genera: *Dynatus* Lepeletier de Saint Fargeau, 1845, *Penepodium* Menke in R. Bohart and Menke, 1976, *Podium* Fabricius, 1804, *Trigonopsis* Perty, 1833.

Tribe: †Protosceliphriini Antropov, 2014. Based on *Protosceliphron* Antropov, 2014 (stem: Protosceliphri-).

Included genus: †*Protosceliphron* Antropov, 2014

Tribe: Sceliphriini Ashmead, 1899 (1815).

Included genera: *Chalybion* Dahlbom, 1843, †*Hoplisidia* Cockerell, 1906, *Sceliphron* Klug, 1801.

Subfamily: Sphecinae Latreille, 1802b:331. Based on *Sphex* Linnaeus, 1758.

= *Sphecinomorpha* Ohl, 1996:24 (correct spelling: *Sphecini*). Based on *Sphex* (stem: *Sphec-*). Synonym and junior homonym of *Sphecini* Latreille, 1802. Include *Stangeella* + *Eusphecinomorpha* Ohl, 1996:26 (not available: not based on any of the included genera; Article 11.7.1; include *Sphecini* + *Ammophilini* except *Stangeella*).

Tribe: Prionychini Bohart and Menke, 1963:94, 141. Based on *Prionyx* Vander Linden, 1827 (stem: *Prionych-*). Originally spelled *Prionyxina*.

= *Palmodomorpha* Ohl, 1996:29 (correct spelling: *Palmodini*). Based on *Palmodes* Kohl, 1890 (stem: *Palmod-*). Genera of *Palmodomorpha*: *Chilosphex*, *Palmodes*.

Included genera: *Chilosphex* Menke in R. Bohart and Menke, 1976, *Palmodes* Kohl, 1890, *Prionyx* Vander Linden, 1827.

Tribe: Sphecini Latreille, 1802b: 331. Based on *Sphex* Linnaeus, 1758.

= *Ammobiini* Krombein in Krombein and Burks, 1967. Based on *Ammobia* Billberg, 1820, a junior synonym of *Sphex* (stem: *Ammobi-*). A junior homonym of *Ammobiini* Desbrochers des Loges, 1903 (which is a synonym of *Opatrini* Brullé, 1832), a tribe in *Tenebrionidae*.

= *Eusphecinomorpha* Ohl, 1996:26. Not available: not based on any of the included genera (Article 11.7.1). Include Ohl's *Sphecini* + *Ammophilini*.

Included genera: *Isodontia* Patton, 1880, *Sphex* Linnaeus, 1758.

Tribe: Stangeellini Bohart and Menke, 1976:87. Based on *Stangeella* Menke, 1962 (stem: *Stangeell-*).

Included genus: *Stangeella* Menke, 1962.

Family: Crabronidae

Crabronidae Latreille, 1802b:340. Based on *Crabro* Fabricius, 1775 (stem: *Crabron-*). Originally spelled *Crabronites*, latinized to *Crabronida* by Leach, 1812 (*Edinb. Encycl.*). Four other names of Latreille (1802b) were available for this family, but Acloque (1897:80) used *Crabronidi* acting as first reviser.

= *Thyreopidae* J.Ch. Bradley, 1919a:69. Based on *Thyreopus* Lepeletier de Saint Fargeau and Brullé, 1835 (stem : *Thyreop-*). Omitted from Menke, 1997.

Subfamily: Astatinae Lepeletier de Saint Fargeau, 1845:231. Based on *Astata* Latreille, 1796 (stem: *Astat -*). Originally spelled *Astatites*, latinized to *Astati* by de Saussure, 1867:65.

= *Diploplectriini* W. Fox, 1894:302. Based on *Diploplectron* W. Fox, 1893 (stem: *Diploplectr-*).

= Dimorphini Brues and Melander, 1932:503. Based on *Dimorpha* Panzer, 1806 (stem: *Dimorph-*).

Included genera: *Astata* Latreille, 1796 (= *Dimorpha* Panzer, 1806), *Diploplectron* W. Fox, 1893, *Dryudella* Spinola, 1843, *Uniplectron* F. Parker, 1966.

Subfamily: Bembicinae Latreille, 1802b:365. Based on *Bembex* Fabricius, 1777 [correctly *Bembix* Fabricius, 1775] (stem: *Bembi-*). Originally spelled Bembiciles, latinized to Bembecinae by Fallén, 1813.

Tribe: Alyssontini Dalla Torre, 1897:562. Based on *Alysson* Panzer, 1806 (stem: *Alyssont-*). Originally spelled Alyssoninae, based on *Alyson* Jurine, 1807.

Included genera: *Alysson* Panzer, 1806, *Analysson* Krombein, 1985, *Didineis* Wesmael, 1852.

Tribe: Bembicini Latreille, 1802 b:365. Based on *Bembex* Fabricius, 1777 [correctly *Bembix* Fabricius, 1775] (stem: *Bembi-*).

Subtribe: Bembicina Latreille, 1802b:365. Based on *Bembex* Fabricius, 1777 [correctly *Bembix* Fabricius, 1775] (stem: *Bembi-*).

Included genera: *Bembix* Fabricius, 1775, *Bicyrtes* Lepeletier de Saint Fargeau, 1845, *Carlobembix* Willink, 1958, *Editha* J. Parker, 1929, *Hemidula* Burmeister, 1874, *Microbembex* Patton, 1979c, *Rubrica* J. Parker, 1929, *Selman* J. Parker, 1929, *Stictia* Illiger, 1807, *Trichostictia* J. Parker, 1929, *Zyzyx* Pate, 1937.

Subtribe: Exeirina de Dalla Torre, 1897:534. Based on *Exeirius* Shuckard, 1838 (stem: *Exeir-*).

Prentice (1998) recognized the subtribe Clitemnestrina, which is a junior synonym of *Exeirina*, with the following genera included: *Clitemnestra*, *Olgia*, and *Exeirius*. I regard this as synonymizing *Exeirina* with *Clitemnestrina* and *Olgiina*.

= *Exirina* W. Schulz, 1906:199. Based on *Exirus* W. Schulz, 1906 (stem: *Exir-*). Unjustified emendation of *Exeirina* de Dalla Torre.

= *Clitemnestrina* Nemkov and Lelej, 1996:11. Based on *Clitemnestra* Spinola, 1851 (stem: *Clitemnestr-*). Synonymy resulting from Prentice's classification of 1998.

= *Olgiina* Nemkov and Lelej, 1996:11. Based on *Olgia* Radoszkowski, 1877 (stem: *Olgi-*). Synonymy resulting from Prentice's classification of 1998.

= *Argogorytina* Nemkov and Lelej, 1996:11. Based on *Argogorytes* Ashmead, 1899 (stem: *Argogoryt-*). Synonymized with *Exeirina* by Nemkov and Ohl, 2011:39.

Included genera: *Argogorytes* Ashmead, 1899 (= *Malaygorytes* Nemkov, 1999), *Clitemnestra* Spinola, 1851 (= *Ochleroptera* Holmberg, 1903), *Exeirius* Shuckard, 1838, *Neogorytes* R. Bohart in R. Bohart and Menke, 1976, *Olgia* Radoszkowski, 1877, *Paraphilanthus* Vardy, 1995.

Subtribe: Gorytina Lepeletier de Saint Fargeau, 1845. Based on *Gorytes* Latreille, 1805 (stem: *Goryt-*). Originally spelled Gorytites, latinized to Gorytinae by Dalla Torre, 1897:535. Spelled Goritini by A. Costa, 1859:3, 26, 53 (Italian vernacular), and Gorytesii by Acloque, 1897:80.

= *Arpactini* R. Turner, 1915:67. Based on *Arpactus* Panzer, 1805 (stem: *Arpact-*).

= *Hoplisini* Rohwer, 1916:654,656. Based on *Hoplisus* Lepeletier de Saint Fargeau, 1832 (stem: *Hoplis-*).

= *Trichogorytina* Nemkov and Pulawski, 2009. Based on *Trichogorytes* Rohwer, 1912 (stem: *Trichogoryt-*). Synonymized with *Gorytina* by Nemkov and Ohl, 2011:39.

Included genera: *Afrogorytes* Menke, 1967, *Allogorytes* R. Bohart, 2000, *Arigorytes* Rohwer, 1912, *Aroliagorytes* R. Bohart, 2000, *Austrogorytes* R. Bohart, 1967, †*Biamogorytes* Nemkov, 1990, *Eogorytes* R. Bohart in Bohart and Menke, 1976, *Epigorytes* R. Bohart, 2000, *Gorytes* Latreille, 1805 (= *Pseudoplisus* Ashmead, 1899, = *Leiogorytes* R. Bohart, 2000), *Hapalomellinus* Ashmead, 1899, *Harpactostigma* Ashmead, 1899, *Harpactus* Shuckard, 1837, *Hoplisoides* Gribodo, 1884, *Lestiphorus* Lepeletier de Saint Fargeau, 1832, *Leurogorytes* R. Bohart, 2000, *Liogorytes* R. Bohart, 1967, *Megistommum* W. Schulz, 1906, *Oryttus* Spinola, 1836, *Psammaecius* Lepeletier de Saint Fargeau, 1832, *Psammaletes* Pate, 1936, *Sagenista* R. Bohart, 1967, *Saygorytes* Nemkov, 2007, *Stenogorytes* Schrottky, 1911 (= *Neoplisus* R. Bohart, 1967), *Stethogorytes* R. Bohart, 2000, *Tretogorytes* R. Bohart, 2000, *Trichogorytes* Rohwer, 1912, *Xerogorytes* R. Bohart in Bohart and Menke, 1976.

Subtribe: Handlirschiina Nemkov and Lelej, 1996:12. Based on *Handlirschia* Kohl, 1897 (stem: *Handlirschi*-).

Included genera: *Handlirschia* Kohl, 1897, *Pterygorytes* R. Bohart, 1967.

Subtribe: Spheciina Nemkov and Ohl, 2011:39. Based on *Sphecius* Dahlbom, 1843 (stem: *Spheci*-).

Included genera: *Ammatomus* A. Costa, 1859, *Kohlia* Handlirsch, 1895, *Sphecius* Dahlbom, 1843, *Tanyoprymnus* Cameron, 1905.

Subtribe Stictiellina R. Bohart and Horning, 1971. Based on *Stictiella* Parker, 1917 (stem: *Stictiell*-). Synonymized with Bembicini by R. Bohart and Menke, 1976:534, resurrected as valid tribe by Nemkov and Ohl, 2011:40.

Included genera: *Chilostictia* Gillaspay, 1983, *Glenostictia* Gillaspay in Gillaspay, Evans, and Lin, 1962, *Microstictia* Gillaspay, 1963, *Steniolia* Say, 1837, *Stictiella* J. Parker, 1917, *Xerostictia* Gillaspay, 1963.

Subtribe: Stizina A. Costa, 1859:2, 4, 55. Based on *Stizus* Latreille, 1802 (stem: *Stiz*-).

Included genera: *Bembecinus* A. Costa, 1859, *Stizoides* Guérin-Méneville, 1844, *Stizus* Latreille, 1802.

Tribe: Heliocausini Handlirsch, 1925:807. Based on *Heliocausus* Kohl, 1892 (stem: *Heliocaus*-).

Included genera: *Acanthocausus* Fritz and Toro, 1977, *Heliocausus* Kohl, 1892, *Tiguipa* Fritz and Toro, 1976.

Tribe: Nyssonini Latreille, 1804:180. Based on *Nysson* Latreille, 1802 (stem: *Nyssont*-, ruled to be *Nysson*- by International Commission on Zoological Nomenclature, 1979, Opinion 1115). Originally spelled *Nyssonii*, corrected to *Nyssoninae* by Dalla Torre, 1897:566.

Subtribe: Nurseina Nemkov and Lelej, 2013. Based on *Nursea* Cameron, 1902 (stem: *Nurse*-).

Included genera: *Nippononysson* Yasumatsu and Maidl, 1936, *Nursea* Cameron, 1902,

Subtribe: Nyssonina Latreille, 1804:180. Based on *Nysson* Latreille, 1802 (stem: *Nyssont*-, ruled to be *Nysson*- by International Commission on Zoological Nomenclature, 1979, Opinion 1115). Originally spelled *Nyssonii*, corrected to *Nyssoninae* by Dalla Torre, 1897:566.

Included genera: *Acanthostethus* Smith, 1869, *Antomartinezius* Fritz, 1955, *Brachystegus* A. Costa, 1859, *Cresson* Pate, 1938, *Epinysson* Pate, 1935, *Foxia* Ashmead, 1898, *Hovanysson* Arnold, 1945, *Hyponysson* Cresson, 1882, *Idionysson* Pate, 1940, *Losada* Pate, 1940, *Metanysson* Ashmead, 1899, *Neonysson* R. Bohart, 1968, *Nysson* Latreille, [1802] (= *Synnevrus* A. Costa, 1859), *Perisson* Pate, 1938, *Zanysson* Rohwer, 1921.

Subfamily: Crabroninae Latreille, 1802. Based on *Crabro* Fabricius, 1775 (stem: *Crabron-*). Originally spelled Crabronites.

Tribe: Bothynostethini W. Fox, 1894:302. Based on *Bothynostethus* Kohl, 1884 (stem: *Bothynosteth-*).

Subtribe: Bothynostethina W. Fox, 1894. Based on *Bothynostethus* Kohl, 1894 (stem: *Bothynosteth-*).

Included genera: *Bothynostethus* Kohl, 1894, *Sanaviron* Vardy, 1987, *Willinkiella* Menke, 1968.

Subtribe: Scapheutina Menke, 1968:91. Based on *Scapheutes* Handlirsch, 1887 (stem: *Scapheut-*).

Included genera: *Bohartella* Menke, 1968, *Scapheutes* Handlirsch, 1887.

Tribe: Crabronini Latreille, 1802. Based on *Crabro* Fabricius, 1775 (stem: *Crabron-*). Originally spelled Crabronites.

Subtribe: Anacrabronina Ashmead, 1899:163. Based on *Anacrabro* Packard, 1866 (stem: *Anacrabron-*).

= *Karossiina* Pate, 1936:151. Based on *Karossia* Arnold, 1929 (stem: *Karossi-*).

Included genera: *Anacrabro* Packard, 1866, *Encopognathus* Kohl, 1897, *Entomocrabro* Kohl, 1905, *Entomognathus* Dahlbom, 1844.

Subtribe: Crabronina Latreille, 1802.

= *Lindeniina* Ashmead, 1899:163. Based on *Lindenius* Lepeletier de Saint Fargeau and Brullé, 1834 (stem: *Lindeni-*).

= *Thyreopodina* Ashmead, 1899:164. Based on *Thyreopus* Lepeletier de Saint Fargeau and Brullé, 1845 (stem: *Thyreopod-*). Originally spelled Thyreopinae. Thyreocopidae of Strickland, 1947:127 is probably a misspelling.

= *Rhopalina* Ashmead, 1899:164. Based on *Rhopalum* Stephens, 1829 (stem: *Rhopal-*). Junior homonym of Rhopalidae Amyot and Serville, 1843, based on *Rhopalus* Schilling, 1827 (Heteroptera).

= *Soleniina* Bradley, 1926:1029. Based on *Solenius* Lepeletier de Saint Fargeau and Brullé, 1835 (stem: *Soleni-*).

= *Pemphilidina* Pate, 1935:246. Based on *Pemphilis* Risso, 1826 (stem: *Pemphilid-*). Originally spelled Pemphilidae.

Included genera: *Alinia* Antropov, 1993, *Arnoldita* Pate, 1948, *Chimila* Pate, 1944, *Chimiloides* Leclercq, 1951, *Crabro* Fabricius, 1775, *Crorhopalum* Tsuneki, 1984, *Crossocerus* Lepeletier de Saint Fargeau and Brullé, 1835 (= *Towada* Tsuneki, 1970), *Dasyproctus* Lepeletier de Saint Fargeau and Brullé, 1835, *Echucoides* Leclercq, 1957, *Ectemnius* Dahlbom, 1845 (= *Spadicocrabro* Tsuneki, 1990), *Enoplolindenius* Rohwer, 1911, *Eupliloides* Pate, 1946, *Foxita* Pate, 1942 (= *Taruma* Pate, 1944), *Hingstoniola* Turner and Waterston, 1926, *Holcorhopalum* Cameron, 1904, *Huacrabro* Leclercq, 2000, *Huavea* Pate, 1948, *Isorhopalum* Leclercq, 1963, *Krombeinictus* Leclercq, 1996, *Leclercqia* Tsuneki, 1968, *Lecrenierus* Leclercq, 1977, *Lestica* Billberg, 1820, *Lindenius* Lepeletier de Saint Fargeau and Brullé, 1835, *Minicrabro* Leclercq, 2003, *Moniaecera* Ashmead, 1899, *Neodasyproctus* Arnold, 1926, *Notocrabro* Leclercq, 1951, *Odontocrabro* Tsuneki, 1971, *Pae* Pate, 1944 (= *Lamocrabro* Leclercq, 1951), *Papurus* Tsuneki, 1983, *Parataruma* Kimsey, 1982, *Pericrabro* Leclercq, 1954, *Piyuma* Pate, 1944b, *Piyumoides* Leclercq, 1963, *Podagritoides* Leclercq, 1957, *Podagritus* Spinola, 1851, *Pseudoturneria* Leclercq, 1954, *Quexua* Pate, 1942, *Rhopalum*

Stephens, 1829, *Tracheliodes* A. Morawitz, 1866, *Tsunekiola* Antropov, 1986, *Vechtia* Pate, 1944, *Williamsita* Pate, 1947, *Zutrhopalum* Leclercq, 1998.

Tribe: Larrini Latreille, 1810:289, 438. Based on *Larra* Fabricius, 1793 (stem: *Larr-*). = Larradini de Saussure, 1892:471. Based on *Larrada* F. Smith, 1856 (stem: *Larrad-*).

Subtribe: Gastrosericina André, 1886:51. Based on *Gastrosericus* Spinola, 1838 (stem: *Gastroseric-*). Originally spelled Gasteroseriidae, corrected to Gastroseriidae by André, 1888:211.

= Tachytina G. Bohart, 1951:945. Based on *Tachytes* Panzer, 1806 (stem: *Tachyt-*).

Included genera: *Gastrosericus* Spinola, 1839, *Holotachysphex* de Beaumont, 1940, *Kohliella* Brauns, 1910, *Larropsis* Patton, 1892, *Parapiagetia* Kohl, 1897, *Prosopigastra* A. Costa, 1867, *Tachysphex* Kohl, 1883, *Tachytella* Brauns, 1906, *Tachytes* Panzer, 1806.

Subtribe: Larrina Latreille, 1810. Based on *Larra* Fabricius, 1793 (stem: *Larr-*).

Included genera: *Dalara* Ritsema, 1884, *Dicranorhina* Shuckard, 1840, *Larra* Fabricius, 1793, *Liris* Fabricius, 1804, *Megalara* Kimsey and Ohl, 2012, *Paraliris* Kohl, 1884.

Tribe: Miscophini W. Fox, 1894:302. Based on *Miscophus* Jurine, 1807 (stem: *Miscoph-*).

= Lyrodini W. Fox, 1895:302. Based on *Lyroda* Say, 1837 (stem: *Lyrod-*).

= Sericophorini Dalla Torre, 1897:577. Based on *Sericophorus* F. Smith, 1851 (stem: *Sericophor-*).

= Nitelini Dalla Torre, 1897:697. Based on *Nitela* Latreille, 1809 (stem: *Nitel-*).

= Paranyssontini R. Turner, 1914:337. Based on *Paranysson* Guérin-Méneville, 1844 (stem: *Paranyssont-*). Originally spelled Paranyssoninae.

Included genera: *Aha* Menke, 1977, *Auchenophorus* R. Turner, 1907, *Larrissa* Pulawski, 2012, *Larrisson* Menke, 1967, *Lyroda* Say, 1837, *Miscophoidellus* Menke in Bohart and Menke, 1976, *Miscophoides* Brauns in Kohl, 1897, *Miscophus* Jurine, 1807, *Namiscophus* Lomholdt, 1985, *Nitela* Latreille, 1809, *Paranysson* Guérin-Méneville, 1844, *Plenoculus* W. Fox, 1893, *Saliostethoides* Arnold, 1924, *Saliostethus* Brauns in Kohl, 1897, *Sericophorus* F. Smith, 1851, *Solierella* Spinola, 1851, *Sphodrotes* Kohl, 1889.

Tribe: Oxybelini Leach, 1815:152. Based on *Oxybelus* Latreille, 1796 (stem: *Oxybel-*). Originally spelled Oxybellida.

Included genera: *Belarnoldus* Antropov, 2007, *Belokohlus* Antropov, 2007, *Belomicrinus* Antropov, 2000, *Belomicroides* Kohl, 1899, *Belomicrus* A. Costa, 1871, *Brimocelus* Arnold, 1927, *Enchemicrum* Pate, 1929, *Gessus* Antropov, 2001, *Guichardus* Antropov, 2007, *Minimicroides* Antropov, 2000, *Nototis* Arnold, 1927, *Oxybelomorpha* Brauns, 1897, *Oxybelus* Latreille, 1797, *Pseudomicroides* Antropov, 2001, *Wojus* Antropov, 1999.

Tribe: Palarini Schrottky, 1909:249. Based on *Palarus* Latreille, 1802 (stem: *Palar-*). Originally spelled Palaridae. Also used by Ruiz Pereira, 1924:102.

= Palarini Börner, 1919:185. Based on *Palarus* Latreille, 1802 (stem: *Palar-*).

= Mesopalarini Lomholdt, 1985:22. Based on *Mesopalarus* Brauns, 1899 (stem: *Mesopalar-*). Synonymized with Palarini by Pulawski and Prentice (2008:311).

Included genera: *Mesopalarus* Brauns, 1899, *Palarus* Latreille, 1802.

Tribe: †Protomicroidini Antropov, 2010b:66. Based on *Protomicroides* Antropov, 2010 (stem: *Protomicroid-*).

Included genus: †*Protomicroides* Antropov, 2010b and 2010c.

Tribe: Trypoxylini Lepeletier de Saint Fargeau, 1845:224. Based on *Trypoxylon* Latreille, 1796 (stem: *Trypoxyl-*). Originally spelled Trypoxylites, latinized to Trypoxylidae by Thomson, 1870:207, and incorrectly to Trypoxylonidae in subsequent publications.

= Pisini Ashmead, 1899:241 (originally spelled Pisoninae). Based on *Pison* Jurine, 1808, Greek for pea, and also one of the rivers in the Garden of Eden (stem: *Pis-*). May have been based on the Roman family name *Pison*, in which case the stem would be *Pison-*.

Included genera: *Aulacophilinus* Lomholdt, 1980, *Aulacophilus* F. Smith, 1869, †*Eopison* Nel, 2005, †*Megapison* Zhang, 1989, *Pison* Jurine in Spinola, 1808, *Pisonopsis* W. Fox, 1893, *Pisoxylon* Menke, 1968, *Trypoxylon* Latreille, 1796.

Subfamily: Dinetinae W. Fox, 1895:305. Based on *Dinetus* Panzer, 1806 (stem: *Dinet-*).

Included genus: *Dinetus* Panzer, 1806.

Subfamily: Eremiasphecinae Menke, 1967:148. Based on *Eremiasphecium* Kohl, 1897 (stem: *Eremiaspheci-*). Originally treated as tribe *Eremiasphecini*.

Tribe: Eremiasphecini Menke, 1967. Based on *Eremiasphecium* Kohl, 1897 (stem: *Eremiaspheci-*).

Included genus: *Eremiasphecium* Kohl, 1897 (= *Taukumia* Kazenas, 1991, = *Xanthosphecium* Simon Thomas, 1994).

Tribe: Laphyragogini R. Bohart and Menke, 1976:217. Based on *Laphyragogus* Kohl, 1889 (stem: *Laphyragog-*).

Included genus: *Laphyragogus* Kohl, 1889.

Subfamily: Mellininae Latreille, 1802b:337. Based on *Mellinus* Fabricius, 1790 (stem: *Mellin-*). Originally spelled Melliniores, latinized to Mellinii by Fallén, 1812:130.

Tribe: Mellinini Latreille, 1802. Based on *Mellinus* Fabricius, 1790 (stem: *Mellin-*).

Included genus: *Mellinus* Fabricius, 1790 (= *Trachogorytes* R. Bohart, 2000).

Tribe: Xenosphecini F. Parker, 1966:195. Based on *Xenosphech* F. Williams, 1954 (stem: *Xenosphec-*).

= Xenosphecini R. Bohart and Menke, 1976:437. Based on *Xenosphech* F. Williams, 1954 (stem: *Xenosphec-*).

Included genus: *Xenosphech* F. Williams, 1954.

Subfamily: Pemphredoninae Dahlbom, 1835:2, 6, 8. Based on *Pemphredon* Latreille, 1796 (stem: *Pemphredon-*). Nomen protectum (Article 23.9). Originally spelled Pemphredonides, corrected to Pemphredonides in Isis von Oken, 1836, Heft 4:col. 288, and spelled Pemphredonidae by Dahlbom, 1842:1.

= Cemoninae Fallén, 1812:131. Based on *Cemonus* Panzer, 1806 (stem: *Cemon-*), a junior synonym of *Pemphredon*. Nomen oblitum (Article 23.9). Originally spelled Cemonii. Not listed by Menke, 1997.

Tribe: Entomosericiini Dalla Torre, 1897:557. Based on *Entomosericus* Dahlbom, 1845 (stem: *Entomoseric-*).

Included genus: *Entomosericus* Dahlbom, 1845.

Tribe: Odontosphecini Menke, 1967:144. Based on *Odontosphex* Arnold, 1951 (stem: *Odontosphec-*).

Included genus: *Odontosphex* Arnold, 1951.

Tribe: †Palangini Antropov, 2011b:235. Based on *Palanga* Budrys, 1993 (stem: Palang-).

Included genus: †*Palanga* Budrys, 1993.

Tribe: Pemphredonini Dahlbom, 1835:2, 6, 8. Based on *Pemphredon* Latreille, 1796 (stem: *Pemphredon-*).

Subtribe: Ammoplanina Evans, 1959:182, 189. Based on *Ammoplanus* Giraud, 1869 (stem: *Ammoplan-*).

Included genera: *Ammoplanellus* Gussakovskij, 1931, *Ammoplanops* Gussakovskij, 1931, *Ammoplanus* Giraud, 1869, *Ammostigmus* Antropov, 2010, *Mohavena* Pate, 1939, *Parammoplanus* Pate, 1939, *Protostigmus* Turner, 1918 (= *Anomiopteryx* Gussakovskij, 1935), *Pulverro* Pate, 1937, *Riparena* Pate, 1939, *Timberlakena* Pate, 1939.

Subtribe: Pemphredonina Dahlbom, 1835. Based on *Pemphredon* Latreille, 1796 (stem: *Pemphredon-*).

Included genera: †*Cretoecus* Budrys, 1993, *Diodontus* Curtis, 1834, †*Eopinoecus* Budrys, 1993, †*Eoxyloecus* Budrys, 1993, †*Iwestia* Rasnitsyn and Jarzembowski in Rasnitsyn, Jarzembowski, and Ross, 1998, †*Palarpactophilus* Ohl and Bennett, 2009, *Passaloecus* Shuckard, 1837, *Pemphredon* (= †*Sinostigma* Hong, 1984), †*Pittoecus* Evans, 1973, *Polemistus* de Saussure, 1892, †*Prolemistus* Antropov, 2000, †*Rovnoecus* Antropov, 2009, †*Succinoecus* Budrys, 1883.

Subtribe: Spilomenina Menke, 1989:740. Based on *Spilomena* Shuckard, 1838 (stem: *Spilomen-*).

Included genera: *Arpactophilus* F. Smith, 1863, †*Cretospilomena* Antropov, 2000, †*Lisponema* Evans, †*Menopsila* Bennett, Perrichot, and Engel, 2014 (tribal assignment according to A.V. Antropov, pers. comm. of 29 Dec 2014), *Microstigmus* Ducke, 1907, †*Plisomena* Antropov, 2014, †*Psolimena* Antropov, 2000, *Spilomena* Shuckard, 1838, *Xysma* Pate, 1937.

Subtribe: Stigmina R. Bohart and Menke, 1976:175, 185. Based on *Stigmus* Panzer, 1804 (stem: *Stigm-*).

Included genera: *Allostigmus* Melo and Naumann, 1999, *Araucastigmus* Finnamore, 1995, *Aykhustigmus* Finnamore, 1995, *Ceratostigmus* Melo and Naumann, 1999, *Carinostigmus* Tsuneki, 1954, *Incastigmus* Finnamore, 1995, *Llaqhastigmus* Finnamore, 1995, *Paracrabro* Turner, 1907, *Parastigmus* Antropov, 1992, *Stigmus* Panzer, 1804, *Tzustigmus* Finnamore, 1995.

Genus that cannot be confidently placed in Spilomenina or Stigmina: *Colmepsiterona* Cockx and Mc Keller, 2018.

Tribe: Psenini A. Costa, 1858:4, 21. Based on *Psen* Latreille, 1796 (stem: *Psen-*).

= Mimesini E. Saunders, 1880:261. Based on *Mimesa* Shuckard, 1837 (stem: *Mimes-*). Originally spelled Mimesidae.

= Psenulini Gittins, 1969:50. Based on *Psenulus* Kohl, 1897 (stem: *Psenul-*). Originally spelled Psenuli.

Included genera: *Ammopsen* Krombein, 1959, *Deinomimesa* Perkins, 1899, †*Eomimesa* Budrys, 1993, *Lithium* Fynnmore, 1987, *Mimesa* Shuckard, 1937, *Mimumesa* Malloch, 1933, *Nesomimesa* R. Perkins, 1899, *Odontopsen* Tsuneki, 1964, *Pluto* Pate, 1937, *Psen* Latreille, 1796, *Pseneo* Malloch, 1933, *Psenulus* Kohl, 1897, †*Tythopsen* Antropov, 2014.

Tribe: †Rasnitsynapini Antropov, 2011b:230. Based on *Rasnitsynapus* Antropov, 2011 (stem: *Rasnitsynap-*).

Included genus: †*Rasnitsynapus* Antropov, 2011:232.

Subfamily: Philanthinae Latreille, 1802b:365. Based on *Philanthus* Fabricius, 1790 (stem: *Philanth-*). Originally spelled Philanthores, spelled *Philanthoidae* by Agassiz, 1847:284.

Tribe: Aphilanthopini R. Bohart, 1966. Based on *Aphilanthops* Patton, 1881 (stem: *Aphilanthop-*). Originally spelled Aphilanthopsina.

Included genera: *Aphilanthops* Patton, 1881, *Clypeadon* Patton, 1897 (= *Listropygia* R. Bohart, 1959).

Tribe: Cercerini Lepeletier de Saint Fargeau, 1845:1. Based on *Cerceris* Latreille, 1802 (stem: *Cercer-*). Originally spelled Cercérites, latinized to Cerceridae by A. Costa, 1860:6.

Included genera: *Cerceris* Latreille, 1802, *Eucercheris* Cresson, 1865.

Tribe: Philanthini Latreille, 1802b:365. Based on *Philanthus* Fabricius, 1790 (stem: *Philanth-*). Originally spelled Philanthores, spelled *Philanthoidae* by Agassiz, 1847:284.

Subtribe: Philanthina Latreille, 1802 b:365. Based on *Philanthus* Fabricius, 1790 (stem: *Philanth-*). Originally spelled Philanthores, spelled *Philanthoidae* by Agassiz, 1847:284.

Included genera: *Philanthus* Fabricius, 1790, †*Prophilanthus*, Cockerell, 1906 (placed here tentatively), *Trachypus* Klug, 1810.

Subtribe: Philanthinina Menke, 1967:148. Based on *Philanthinus* de Beaumont, 1949 (stem: *Philanthin-*).

Included genus: *Philanthinus*, de Beaumont, 1949.

Tribe: Pseudoscoliini Menke, 1967:148. Based on *Pseudoscolia* Radoszkowski, 1876 (stem: *Pseudoscoli-*).

Included genus: *Pseudoscolia* Radoszkowski, 1876.

Family: Apidae (sensu lato) =

= Apoidea of bee workers

See: C.D. Michener. 2000. The bees of the world. The John Hopkins University Press, Baltimore and London. 913 pp. Second edition: 2007, 953 pp.

Fossil Family and Subfamilies of Uncertain Position Within Apoidea

Family: Angarosphecidae Rasnitsyn, 1975:109 Based on *Angarosphex* Rasnitsyn, 1975 (stem: *Angarosphex*-).

= Baissodidae Rasnitsyn, 1975:122 Based on *Baissodes* Rasnitsyn, 1975 (stem: *Baissod*-).

Included genera: †*Angarosphex* Rasnitsyn, 1975, †*Archisphex* Evans, 1969 (= *Cretosphex* Rasnitsyn, 1975, = *Paleapis* Hong, 1984, = *Mateosphex* Zhang, 1985), †*Baissodes* Rasnitsyn, 1975, †*Cretobestiola* Pulawski and Rasnitsyn, 2000 (= *Bestiola* Pulawski and Rasnitsyn, 1999, junior homonym of *Bestiola* Nikol'skaya, 1963, and of *Bestiola* Andronov, 1972), †*Burmasphex* Melo and Rosa, 2018, †*Calobaissodes* Zhang, 1992, †*Cretosphexium* Pulawski and Rasnitsyn, 2000, †*Eosphexium* Pulawski and Rasnitsyn, 2000, †*Eubaissodes* Zhang, 1992, †*Ilerdosphex* Rasnitsyn, 2000, †*Montecosphex* Rasnitsyn and Martínez-Delclòs, 2000, †*Oryctobaissodes* Rasnitsyn, 1975, †*Pompilopterus* Rasnitsyn, 1975, †*Trichobaissodes* Rasnitsyn, 1975. Excluded from Angarosphecinae and Aculeata are *Jibaissodes giganteus* Ren, 1995 and *Shandongodes necrodes* J.F. Zhang.

Subfamily: Burmastatinae Antropov, 2000:60. Based on *Burmastatus* Antropov, 2000 (stem: *Burmastat*-).

Included genus: †*Burmastatus* Antropov, 2000:60.

Subfamily: Cirrosphecinae Antropov, 2000:61. Based on *Cirrosphex* Antropov, 2000 (stem: *Cirrosphex*-).

Included genus: †*Cirrosphex* Antropov, 2000:62.

Genera incertae sedis.

†*Gallosphex* Schlüter, 1978:83, †*Trigampulex* Antropov, 2000:70.

Genus and species unknown.

Rasnitsyn, Jarzembowski, and Ross, 1998:379 (England, body without head or wings); Rasnitsyn and Martínez-Delclòs, 2000:85, 86 (Spain: Lérida Province: Montsec Range).

FOSSIL TAXA DESCRIBED IN SPHECIDAE (sensu lato) AND TRANSFERRED TO OTHER FAMILIES

Didineis solidescens Scudder, 1890:620. Holotype: USA: Wyoming: Green River (MCZ). Age: Eocene. – Dalla Torre, 1897:566 (in catalog of world Sphecidae); Ashmead, 1899d:329 (in checklist of North American Crabronidae); Evans, 1966d:393 (study of holotype, transferred to Eumeninae near *Alastor*); R. Bohart and Menke, 1976:31 (in checklist of world Sphecidae, reference to Evans, 1966d).

Jibaissodes Ren *in* Ren, Lu, Guo, and Ji, 1995:120 (Chinese) and 196 (English). Type species: *Jibaissodes giganteus* Ren *in* Ren, Lu, Guo, and Ji, 1995, by original designation and monotypy. Described in Baissodidae (now Angarosphecidae), transferred to Megalomontesidae by Rasnitsyn. Testing cladograms by fossil record: the ghost range test. Contributions to Zoology 2000:252 (caption for Fig. 1, line 8).

Nysson rottensis Meunier, 1915:... Transferred to Eumenine by Evans, 1966d:396.

Philoponites Cockerell, 1915b:482. Type species: *Philoponites clarus* Cockerell, 1915, by monotypy. Transferred to Tiphiidae by Antropov in Antropov, Belokobylskij, Compton, Dlussky, Khalaim, Kolyada, Kozlov, Perfilieva, and Rasnitsyn, 2014:64.

Shandongodes necrodes J.F. Zhang, 1985:35. Holotype: ♀, China: Shandong Province: Laiyang District: Tuanwang (Shandong Provincial Museum, Shandong, China). Age: Lower Cretaceous (as Upper Jurassic), Laiyang Formation. – Rasnitsyn, Jarzembowski, and Ross, 1998:370 (excluded from Aculeata because of external ovipositor; ovipositor

invisible on the original illustration, but detected by Rasnitsyn on the photograph received from J.F. Zhang; personal communication of A.P. Rasnitsyn of 6 August 2020).

Taimyrisphex Evans, 1973d. Type species: *Taimyrisphex pristinus* Evans, 1973, by original designation and monotypy. Included species: *Taimyrisphex pristinus* Evans, 1973d:168, ♂. Holotype: Russia, Taimyr Peninsula: Yantardagh Hill 3 km south from mouth of Maimetcha River (PIN). Age: Upper Cretaceous amber. Transferred to Falsiformicidae (Scolioidea) by Rasnitsyn, 1980:28.