A short sample list of 100+ gaps in the fossil record as of 2013 compiled by Piotr Gałecki

Global gaps in the fossil record (the collumn nr 6: "Gap") are presented in millions of years

Nr	The gap subject name	The gap subject description	Older fossils	Younger speciemens	Gap	Comments
1.	Albanerpeton	a genus of salamander-like lissamphibian (the subclass Lissamphibia in the class Amphibia)	Albanerpeton nexuosus, A. galaktion (Late Cretaceous, Lancian/upper Maastrichtian: 70.6 - 65.5 Ma)	Albanerpeton inexpectatum (Paleogene, Oligocene, MP 30 / Chattian: 28.4 - 23 Ma)	37	The Cretaceous fossils were reported in 1981 (Estes) and 2000 (Gardner), the Oligocene species was described in 2008 (Böhme)
2.	Alvarezsauroidea	a superfamily of dinosaurs in the clade Maniraptora	Haplocheirus sollers (Late Jurassic, Oxfordian: ~160 Ma)	Alnashetri cerropoliciensis (early Late Cretaceous, Cenomanian: ~97 Ma)	63	The Late Jurassic species was reported in 2010 (Choiniere, Xu, Clark, Forster, Guo, & Han), the Cenomanian specimen was described in 2012 (Makovicky, Apesteguía & Gianechini)
3.	Amiidae (bowfin)	a family of ray-finned fish (the class Actinopterygii) in the order Amiiformes	Guizhouamia bellula (Middle Triassic, Longobardian/Ladinian: 242 - 235 Ma)	Nipponamia satoi (Early Cretaceous, Neocomian: 145.5 - 130 Ma) or Amiidae indet. (Upper Jurassic, Kimmeridgian: 157.3 - 152.1 Ma)	77	The Triassic species was described in 2002 (Liu, Yin & Wang), the Early Cretaceous fossil was reported in 1994 (Yabumoto) and a possible Jurassic specimen of Amiidae was described in 2005 (Kriwet)
4.	Amphiuma	a genus of aquatic salamanders, the only extant genus within the family Amphiumidae	Amphiuma jepseni (Paleocene, Tiffanian: 61.7 - 56.8 Ma)	Amphiuma antica (Miocene, Barstovian: 16.0 - 13.6 Ma)	40	The Paleocene fossil was described in 1969 (Estes), the one from Miocene in 1977 (Holman)
5.	basal Anguilliformes (basal eels)	basal members of the order Anguilliformes (eels) in the superorder Elopomorpha of ray-finned fishes	Anguillavus mazeni, Luenchelys minimus (Late Cretaceous, Cenomanian: 100.5 – 93.9 Ma)	Protanguilla palau (Recent, 0 Ma)	100	The presented Cenomanian fossils were reported in 2003 (Belouze, Gayet & Atallah), the living basal eel was described in 2012 (Johnson, Ida, Sakaue, Sado, Asahida & Miya). The gap is assumed to be twice as large (200 Ma)
6.	Anomalocarididae	a family of marine animals in the order Radiodonta (the class Dinocarida of the phylum Arthropoda)	unnamed anomalocaridid (Early Ordovician, late Tremadocian - late Floian: 485 - 470 Ma)	Schinderhannes bartelsi (Lower Devonian, latest Pragian - early Emsian: 408 - 400 Ma)	62	The Ordovician specimen was reported in 2011 (Van Roy & Briggs), the Devonian species was described in 2009 (Kühl, Briggs & Rust)
7.	Archaeognatha, (Machilida, Monura, Microcoryphia, jumping bristletails)	an order of wingless insects	Dasyleptus brongniarti (Permian, Guadalupian, Roadian: 272.5 - 268 Ma)	Dasyleptus triassicus (Middle Triassic, Late Ladinian : ~236 Ma)	32	The Permian fossil was described in 1957 (Sharov), the one from Triassic in 2011 (Bechly & Stockar)

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8.	Ascidiacea (sea squirts)	a class of sac-like marine invertebrates in the subphylum Tunicata (Urochordata)	Ascidites dubius, Didemnum minutum, Didemnoides rosetta (Early Jurassic, Toarcian: 182.5 – 174 Ma; Late Jurassic, early Kimmeridgian: 157.5 – 154 Ma)	a number of species, e.g. Bonetia acuta, B. brevis, B. quasitruncata, B. truncata, Rigaudia multiradiata, R. praecisa, Micrascidites pauciradiatus, Monniotia acuformis, M. fasciculata (Paleogene, Eocene: 56 – 34 Ma)	98	The Early Jurassic species were described in 1971 (Bonet and Benveniste-Velasquez), their occurance in the Late Jurassic was reported in 2000 (Osman Varol, 8th International Nannoplankton Association Conference), the Eocene species have been reported a number of times since 1949 (Deflandre-Riguard), those mentioned here were described in 1996 (Varol & Houghton)
9.	Boavus affinis	a species of the true boas (the subfamily Boinae), snakes in the infraorder Alethinophidia (advanced snakes)	(Middle Eocene, Late Uintan – Duchesnian / Bartonian: 43 - 37.2 Ma)	(Middle Miocene, Early Barstovian / Langhian: 16 – 13.6 Ma)	21	The Eocene fossil was described in 1955 (Brattstrom), the one from Miocene was reported in 1996 (Holman)
10.	Bobbodus	a genus of fish in the family Eugeneodontidae of the order Eugeneodontida (Eugeneodontiformes) in the class Chondrichthyes	B. schaefferi (Permian, Cisuralian, Asselian: 299 – 295 Ma)	B. xerxesi (Permian, Lopingian, Wuchiapingian: 259 – 254 Ma)	36	The early Permian fossil was reported in 1996 (Schultze & West), the late Permian specimen was described in 2013 (Hampe, Hairapetian, Dorka, Witzmann, Akbari & Korn)
11.	Bowenia	a genus of cycads (the order Cycadales)	Bowenia eocenica, B. Bowenia papillosa (Middle Eocene: 48.6 - 37.2)	Bowenia spectabilis, Bowenia serrulata / the Byfield Fern (Recent: 0 Ma)	37	The Eocene species were reported in 1978 (Hill), the extant species were described in 1863 (Hooker) and in 1878 (Bull) respectively
12.	Brachionichthyidae (handfish)	a family of fish in the order Lophiiformes (Anglerfishes)	Histionotophorus bassani (Eocene, Lutetian: 47.8 - 41.3)	5 extant genera and a number of species, e.g. Brachionichthys hirsutus (Recent: 0 Ma)	41	The extant genus Brachionichthys (Lacépède, 1804) is now assumed to include the only fossil speciemen which was described in 1887 (De Zigno)
13.	Chigutisauridae	a family of large (8 to 16 ft) labyrinthodont amphibians in the order Temnospondyli	Siderops kehli (Early Jurassic, Upper Liassic / Pliensbachian - Toarcian: 189.6 - 175.6 Ma)	Koolasuchus cleelandi (Early Cretaceous, Aptian: 125.5 - 112 Ma)	50	The Jurassic species was reported in 1983 (Warren and Hutchinson), the Cretaceous one was described in 1997 (Warren, Rich & Vickers-Rich)
14.	Chlorogomphida	a clade of dragonflies in the suborder Anisoptera (true dragonflies)	Araripechlorogomphus muratai (Lower Cretaceous, Upper Aptian : 122.5 - 112 Ma)	a number of extant species, e.g. Chlorogomphus magnificus (Recent: 0 Ma)	112	The first fossil chlorogomphid was reported in 2002 (Bechly &Ueda), the type species for the extant genus Chlorogomphus was described in 1854 (Selys)

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15.	Cimbrophlebiidae (hangingfly)	a family of insects in the order Mecoptera (scorpionflies)	Telobittacus fragosus (Early Cretaceous, Late/Upper Hauterivian - Early/Lower Barremian: 136.4 - 125.4 Ma)	Cimbrophlebia bittaciformis, C. brooksi , C. flabelliformis, C. leahyi, C. westae (Eocene, Ypresian: 56.0 - 47.8 Ma)	69	The Cretaceous species was described in 1993 (Zhang) and the Eocene fossils were reported in 1977 (Willmann) and 2009 (Archibald)
16.	Coelacanthimorpha	a class of lobe-finned fish (Sarcopterygii) including an order Coelacanthiformes (coelacanth), its suborder Latimeroidei and an extant family Latimeriidae	Megalocoelacanthus dobiei, Mawsoniidae indet. (Late Cretaceous, Maastrichtian: 70.6 - 65.5 Ma)	Latimeria chalumnae, Latimeria menadoensis (Recent: 0 Ma)	65	Lazarus taxon, prior to 1938 it was known only from fossils ranging from Devonian to Cretaceous. Latimeria itself is considered to be a sister taxon of the Late Jurassic genus Swenzia and closely related to the Cretaceous genus Macropoma. The latest Cretaceous speciemens were described in 1994 (Schwimmer, Steward & Williams) and 2005 (Cavin, Forey, Buffetaut & Tong) respectively. The living representatives were reported in 1939 (Smith) and 1999 (Pouyaud, Wirjoatmodjo, Rachmatika, Tjakrawidjaja, Hadiaty & Hadie) respectively.
17.	Collembola (springtails)	an order of hexapods in the class Entognatha	Rhyniella praecursor (Early Devonian, Siegenian / Pragian: ~410 Ma)	Permobrya mirabilis (Permian, Cisuralian, Middle Ecca / Artinskian: 290 - 279.5 Ma)	120	The Devonian species was described in 1926 (Hirst & Maulik), the one from the Permian in 1976 (Riek)
18.	Collembola (springtails)	[see above]	Permobrya mirabilis (Permian, Cisuralian, Middle Ecca / Artinskian: 290 - 279.5 Ma)	Grinnellia ventis, Sminthuricinus deceptus, Mucrovirga incompleta, Sminthurconus grimaldi, Villusisotoma brevis, Villusisotoma longa, Proisotoma pettersonae, Burmisotoma lamellifera, Protoisotoma burma, Propachyotoma conica, Protodesoria granda, Protodontella minicornis, Praentomobrya avita, Cretacentomobrya burma (mid-Cretaceous, Early/Lower Cenomanian: 99.6 - 93.5 Ma)	179	The Permian species was reported in 1976 (Riek), the Middle Cretaceous fossils were described in 2006 (Christiansen & Nascimbene)

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19.	Cteniogenys	a genus in the family Cteniogenidae of the order Choristodera	C. antiquus (Late Jurassic, Early/Lower Tithonian: 150.8 - 145.5 Ma)	C. antiquus (Late Cretaceous, Judithian / middle Campanian: ~77.5 Ma)	68	A number of late Jurassic speciemens were reported, e.g. in 2000 (Foster & Trujillo), the late Cretaceous fossils were described in 1998 (Gao & Fox)
20.	Cyphophthalmi (mite harvestmen)	a suborder of arachnids in the order Opiliones (harvestmen)	Palaeosiro burmanicum (Upper Cretaceous, Early/Lower Cenomanian: 99.6 - 93.5 Ma)	Siro platypedibus, Siro balticus (Eocene, Lutetian: 48.6 - 40.4 Ma)	44	The Cenomanian fossil was reported in 2008 (Poinar), the Eocene species were described in 2003 (Dunlop & Giribet) and 2011 (Dunlop & Mitov)
21.	Dendrobranchiata (shrimp, prawns)	a suborder of the order Decapoda (decapod crustaceans)	Aciculopoda mapesi (Upper Devonian, Famennian: 372.2 - 358.9 Ma)	Ifasya madagascariensis , I. straeleni, Ambilobeia karojoi (Lower Triassic, Smithian/lower Olenekian: 251.3 - 247.2 Ma)	107	The Famennian (Devonian) species was reported in 2010 (Feldmann & Schweitzer), the Olenekian (Triassic) fossils were reported in 1933 (Van Straelen), 1995 (Garassino & Teruzzi) and 2002 (Garassino & Pasini) respectively
22.	Diatomyidae	a family of rodents in the suborder Hystricomorpha	Diatomys shantungensis, D. liensis (Miocene, Astaracian: 16 - 11.6 Ma)	Laonastes aenigmamus = Laotian rock rat (Recent: 0 Ma)	11	A Lazarus taxon: the Middle Miocene fossils were reported in 1983 (Yan, Qiu & Meng) and 1985 (Mein and Ginsburg) respectively; the living representatives were first described in 2005 (Jenkins, Kilpatrick, Robinson & Timmins)
23.	Diogenidae ("left-handed hermit crabs")	a family of hermit crabs (the superfamily Paguroidea)	Bachmayerus cavus (Late Jurassic – Early Cretaceous, Tithonian – early Berriasian: ~152 – 142 Ma)	Annuntidiogenes ruizdegaonai (mid-Cretaceous, Albian – Cenomanian: 105.3 - 93.5 Ma), Annuntidiogenes worfi (mid-Cretaceous, Late/Upper Albian – Early/Lower Cenomanian: ~100 Ma)	36	The Jurassic-Cretaceous species was described in 2013 (Fraaije, Van Bakel, Jagt, Skupien), the mid-Cretaceous fossils were described in 2008 (Fraaije, van Bakel, Jagt & Artal) and 2009 (Fraaije, Van Bakel, Jagt,. Klompmaker & Artal)
24.	Enteropneusta (acorn worms)	a class of invertebrates in the phylum Hemichordata	Spartobranchus tenuis (Cambrian, Series 3, Stage 5: 509 - 504.5 Ma)	Mazoglossus ramsdelli (Carboniferous, Pennsylvanian, Westphalian D / Moscovian: 311.5 - 307 Ma)	193	The Cambrian species was described in 2013 (Caron, Conway Morris & Cameron), the Carboniferous one was reported in 1997 (Bardack)
25.	Enteropneusta (acorn worms)	[see above]	Megaderaion sinemuriense (Lower Jurassic, Sinemurian: 196.5 - 189.6 Ma)	a number of extant species, e.g. Saccoglossus kowalevskii (Recent: 0 Ma)	189	The Sinemurian fossil was reported in 1981 (Arduini, Pinna & Teruzzi), the presented extant species was described in 1873 (Agassiz)

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26.	Eobaataridae	a family of rodent-like mammals in the order Multituberculata	Indobaatar zofiae (Early - Middle Jurassic, Toarcian - Aalenian: 183.0 - 171.6 Ma)	Dipriodon/Loxaulax valdensis (Lower Cretaceous, Early/Lower Valanginian: 140.2 - 136.4 Ma)	31	The Jurassic species was reported in 2013 (Parmar, Prasad & Kumar), the Cretaceous fossil was described in 1911 (Woodward)
27.	Ephemerellidae (Spiny Crawler Mayflies)	a family of the order Ephemeropterans (Mayflies)	Ephemeropsis/Turfanerella tingi (Late Jurassic, 161.2 - 145.5 Ma)	Philolimnias sinica (Eocene, Ypresian: 55.8 - 48.6 Ma)	89	The Jurassic fossil was described in 1935 (Ping), the one from Eocene in 1979 (Hong)
28.	Eupnoi	a suborder of harvestmen, arachnids in the order Opiliones	Eophalangium sheari (Early Devonian, Pragian: ~410 Ma)	Brigantibunum listoni (Carboniferous, Mississippian, Viséan / Brigantian: ~340 Ma)	70	The Devonian species was reported in 2004 (Dunlop, Anderson, Kerp & Hass), the one from the Carboniferous in 2005 (Dunlop & Anderson)
29.	Eupnoi	[see above]	Macrogyion cronus (Carboniferous, Pennsylvanian, Stephanian: ~305 Ma)	Mesobunus martensi, Daohugopilio sheari, Mesobunus dunlopi (Middle Jurassic, Callovian: ~165 Ma)	140	The latest Carboniferous species was reported in 2011 (Garwood, Dunlop, Giribet & Sutton); the first two Jurassic specimens were described in 2009 (Huang, Selden & Dunlop) and another one in 2012 (Giribet, Tourhino, Shih & Ren) respectively
30.	Eutheria	a clade of placental mammals (the infraclass Placentalia)	Juramaia sinensis (Upper Jurassic, Oxfordian: ~160 Ma)	Eomaia scansoria (Lower Cretaceous, Barremian: 130 – 125.5 Ma), Murtoilestes / Prokennalestes abramovi (Lower Cretaceous, Late/Upper Barremian – Aptian: 130 – 112 Ma)	30	The Jurassic specimen was described in 2011 (Luo, Yuan, Meng & Ji), the Early Cretaceous fossils were reported in 2002 (Ji, Luo, Yuan Wible, Zhang & Georgi) and 2000 (Averianov & Skutschas) respectively
31.	Geisonoceratidae	a family of nautiloid cephalopods in the order Orthocerida	Striacoceras typum (Middle Devonian, Givetian: 388.1 – 383.7 Ma)	cf. Geisonoceratidae indet. (Permian, Guadalupian, Capitanian: 265.0 - 259.0 Ma) or even Zhuravlevia insperata (Early Cretaceous, Clansenian / Upper Aptian: 118 – 112 Ma)	118	The Givetian species was first described in 1936 (Flower), the Permian fossil was reported in 2002 (Niko & Ehiro) and the Cretaceous speciemen was described in 1994 (Doguzhaeva)

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32.	Glypheoidea	a superfamily/group of lobster-like decapod crustaceans	Glyphea christeyi (Eocene, Bartonian: 43 - 37.2 Ma)	Neoglyphea inopinata, Laurentaeglyphea neocaledonica (Recent: 0 Ma)	37	Lazarus taxon, oldest fossils are Permo-Triassic in origin. First extant specimen was caught in 1908, but unidentified until 1975 (Forest & de Saint Laurent). Glyphea reticulata (Feldmann & Gazdzicki, 1997), from the lowermost part of the La Meseta Formation, is considered roughly the same age as Glyphea christeyi (Feldmann & Maxwell, 1999).
33.	Gobiconodontidae	a family of mammals (the class Mammalia)	Huasteconodon wiblei (Early Jurassic, Pliensbachian: 189.6 - 183 Ma)	Gobiconodon palaios (Lower Cretaceous, Berriasian: 145.5 - 140.2 Ma)	37	The Jurassic species was reported in 2008 (Montellano, Hopson & Clark), the Cretaceous fossils were described in 1990 (Sigogneau-Russell, Monbaron & Kaenel) and 2003 (Sigogneau-Russell)
34.	Gobipterygidae	a family of birds in the subclass Enantiornithes	Vescornis hebeiensis (Early Cretaceous, Aptian: ~122 Ma)	Gobipteryx minuta (Late Cretaceous, Campanian: ~75 Ma)	47	The Early Cretaceous specimen was reported in 2004 (Zhang, Ericson & Zhou), the Campanian species was described in 1974 (Elżanowski)
35.	Gymnophiona (caecilians)	an order of worm-like or snake-like amphibians in the subclass Lissamphibia	Apodops pricei (Late Paleocene, Thanetian: 58.7 - 55.8 Ma)	indeterminate Gymnophiona (Middle Miocene, Laventan / Serravallian: 13.8 - 11.8 Ma)	42	The Thanetian species was described in 1972 (Estes & Wake), the Laventan fossils were reported in 1997 (Hecht & LaDuke)
36.	Hilarimorphidae (hilarimorphid flies)	a family of the order Diptera (true flies)	Hilarimorphites longimedia, H. setosa, H. superba, H. yeatesi (Upper Cretaceous, Turonian: 93.9 - 89.8 Ma)	at least 27 extant species in Hilarimorpha genus, e.g. H. obscura (Recent: 0 Ma)	89	The Cretaceous species were reported in 1999 (Grimaldi & Cumming), the sample extant species was described in 1887 (Bigot)
37.	Huttoniidae	a family of eight-eyed spiders (the superfamily Palpimanoidea)	Huttoniidae speciemens in amber (Late Cretaceous, Campanian: 83.6 – 72.1 Ma)	Huttonia palpimanoides (Recent: 0 Ma)	72	Cretaceous fossil inclusions were reported in 2006 (Penney & Selden), the extant species was described in 1879 (Pickard-Cambridge)
38.	Ithonidae (moth lacewings)	a family of winged insects in the order Neuroptera	Principiala incerta (Lower Cretaceous, Upper Aptian: 122.5 - 112 Ma)	Allorapisma chuorum (Early Eocene, Ypresian: ~49.4 Ma)	62	The Cretaceous speciemens were reported in 2007 (Makarkin & Menon), the Eocene fossils were described in 2009 (Makarkin & Archibald)
39.	Ithonidae (moth lacewings)	[see above]	Allorapisma chuorum (Early Eocene, Ypresian: ~49.4 Ma)	35 extant species in 7 genera, e.g. Ithone fusca (Recent: 0 Ma)	49	The Eocene species was reported in 2009 (Makarkin & Archibald), the given extant species was first described in 1838 (Newman)
40.	Jurodidae	a family in the suborder Archostemata of the order Coleoptera (beetles)	Jurodes daohugouensis, J. pygmaeus, J. ignoramus (Middle-Upper Jurassic, Callovian-Oxfordian: 164.7 - 155.7 Ma)	Sikhotealinia zhiltzovae (Recent: 0 Ma)	155	Lazarus taxon, the Jurassic fossils were reported in 1985 (Ponomarenko) and 2013 (Yan, Wang, Ponomarenko & Zhang), the extant species was described in 1996 (Lafer)

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41.	Kneriidae (shellears)	a family of freshwater fish in the order Gonorhynchiformes	Mahengichthys singidaensis (Middle Eocene, Lutetian: 46 - 45 Ma)	4 extant genera comprising at least 30 species, e.g. Kneria angolensis (Recent: 0 Ma)	45	The Eocene species was reported in 2013 (Davis, Arratia & Kaiser), the presented extant species was described in 1866 (Steindachner)
42.	Leptophlebiidae (prong-gilled mayflies, leptophlebiids)	a family belonging to the Ephemeropterans (Mayflies)	Aureophlebia sinitshenkovae (Upper Cretaceous, Turonian: 93.5 - 89.3 Ma)	Paraleptophlebia prisca, Leptophlebia electra, Xenophlebia aenigmatica, etc. (Eocene, Lutetian: 48.6 - 40.4 Ma)	40	The Cretaceous fossil was reported in 2000 (Peters & Peters), those from Eocene were first described in 1856 (Pictet)
43.	Liaoxitriton	a genus of salamanders in the suborder Cryptobranchoidea	Liaoxitriton daohugouensis (Middle/Late Jurassic, Callovian - Oxfordian: 165 - 156 Ma)	Liaoxitriton zhongjiani (Early Cretaceous, early Aptian: 125 - 121 Ma)	31	The Late Jurassic species was described in 2004 (Wang), the Cretaceous one was reported in 1998 (Dong & Wang)
44.	Limulus	a genus of the horseshoe crab (the family Limulidae within Xiphosurida)	Limulus priscus (Middle Triassic, Ladinian: (242 – 235 Ma)	Limulus woodwardi (Middle Jurassic / Lower Oolite of England: 174 – 163 Ma)	61	The Triassic species was reported in 1839 (Münster), the Jurassic one was described in 1909 (Watson)
45.	Limulus	[see above]	Limulus woodwardi (Middle Jurassic / Lower Oolite of England: 174 – 163 Ma)	Limulus coffini (Late Cretaceous, upper Campanian: ~75 – 70 Ma)	88	The Jurassic species was reported in 1909 (Watson), the Cretaceous fossil was described in 1952 (Reeside & Harris)
46.	Listracanthus	a genus of fish with feather-like denticles in the class Chondrichthyes (cartilaginous fishes)	"Listracanthus" sp. (Permian, Cisuralian, Sakmarian: 295 - 290 Ma)	Listracanthus pectenatus (Early Triassic, Griesbachian? - lower Smithian: 252.5 - 249 Ma)	37	Fossil denticles from the early Permian were reported in 2005 (Ivanov); the Early Triassic species was described in 2006 (Mutter & Neuman)
47.	Litoleptis	a genus of the family Rhagionidae (snipe flies)	Litoleptis fossilis (Lower Cretaceous, early-middle Albian: 112 - 105.3 Ma)	a couple of species, e.g. Litoleptis alaskensis (Recent: 0 Ma)	105	The first fossil species was reported in 2009 (Arillo, Peñalver, & García-Gimeno), the type species (extant) was described in 1963 (Chillcott)
48.	Macropoma	a genus of coelacanth (closely related to Latimeria) in the class Sarcopterygii (lobe-finned fish)	Macropoma willemo(e)si (Upper Jurassic, Tithonian 152 - 145 Ma)	Macropoma lewesiensis / mantelli, Macropoma pr(a)ecursor (Lower - Upper Cretaceous, Albian - Cenomanian: 113 - 93 Ma)	32	Two earliest Macropoma species from the Cretaceous, first described in 1822 (Mantell) and 1909 (Woodward) respectively, are known from Albian (and younger) fossils. The Jurassic species was described in 1881 (Vetter) and 1996 (Lambers).

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49.	Mantophasmatidae (gladiators, rock crawlers, heelwalkers, mantophasmids, mantos)	a family of mantis-like insects	Raptophasma kerneggeri, Adicophasma spinosa, Adicophasma grylloblattoides (Eocene, Lutetian: ~45 Ma)	genus Chrisphasmanae, Mantophasma zephyrum, Mantophasma subsolanum, Tyrannophasma gladiator (Recent: 0 Ma)	45	Might be viewed as a Lazarus taxon, as both living (Zompro, Klass, Adis, 2001; Zompro, Klass, Kristensen, Adis, 2002; Zompro, 2003) and extinct (Zompro, 2001; Engel & Grimaldi, 2004; Arillo & Engel, 2006) speciemen were first described about the same time
50.	Mantophasmatidae	[see above]	Juramantophasma sinica (Middle-Upper Jurassic, Callovian-Oxfordian: 166-157 Ma)	Adicophasma grylloblattoides, etc [see above] (Eocene, Lutetian: ~45 Ma)	112	The gap fomed with the discovery of the Jurrassic species in 2008 (Huang et al.)
51.	Mastotermes	a genus of termites (the infraorder Isoptera)	Mastotermes sarthensis (Early Cretaceous, uppermost Albian: ~100 Ma)	Mastotermes bournemouthensis, M. krishnorum (Eocene, Lutetian / MP 13: 48.6 – 40.4 Ma)	51	The Cretaceous species was described in 1989 (Schlüter), the Eocene fossils were reported in 1913 (von Rosen) and 2006 (Wappler & Engel) respectively
52.	Mecysmaucheniidae	a family of eight-eyed spiders (the superfamily Palpimanoidea)	Archaemecys arcantiensis (Lower Cretaceous, uppermost Albian: ~100 Ma)	a number of living species, e.g. Mecysmauchenius segmentatus (Recent: 0 Ma)	100	The Cretaceous species was reported in 2009 (Saupe & Selden) and the presented extant species was described in 1884 (Simon)
53.	Megachasmidae (megamouth sharks)	a family of sharks (the superorder Selachimorpha)	cf. Megachasma sp. (Late Cretaceous, middle Cenomanian: ~97 Ma)	Megachasma sp. (early Miocene: 23 - 13 Ma or even middle Eocene: ~42 Ma)	55	The Cretaceous speciemens were reported in 2007 (Shimada). The Miocene fossils were described in 2001 (Purdy, Schneider, Applegate, McLellan, Meyer & Slaughter) and the possible ones from Eocene were reported in 1997 (Naylor, Martin, Mattison & Brown)
54.	Meridiolestida	an order of non-therian mammals in the superoder Dryolestoidea	Peligrotherium tropicalis (Early/Lower Paleocene, Tiupampan: 65.5 - 62.5 Ma)	Necrolestes patagonensis, N. mirabilis (early Miocene, Colhuehuapian, 21 - 17.5 Ma)	41	The Paleocene species was reported in 1993 (Bonaparte, Van Valen & Kramartz), the Miocene fossils were described in 1891 (Ameghino) and 2007 (Goin, Abello, Eduardo Bellosi, Kay, Madden & Carlini)
55.	Mesothelae	a suborder of spiders in the order Araneae	genus Arthrolycosa (Permian, Guadalupian, Roadian: 272.5 - 268 Ma) or even older species Palaeothele montceauensis (Selden, 1996)	extant family Liphistiidae comprising 3 genera and 89 species, e.g. Liphistius desultor (Recent: 0 Ma)	268	The Permian speciemens were reported in 2005 (Eskov & Selden), the type species (extant) was described in 1849 (Schiødte)

Nr	The gap subject name	The gap subject description	Older fossils	Younger speciemens	Gap	Comments
56.	Microbiotheriidae (monito del monte)	a family of diminutive marsupials in the order Microbiotheria	Microbiotherium patagonicum, M. tehuelchum, Stilotherium dissimile, etc. (Miocene, Santacrucian: 17.5 - 16.3 Ma)	Dromiciops gliroides / D. australis (Recent: 0 Ma)	16	Lazarus taxon, the extant species was described in 1893 (Philippi) and 1894 (Thomas) and the presented Miocene species were reported in 1887 (Ameghino)
57.	Microraptoria / Microraptorinae	a group of small theropod dinosaurs in the family Dromaeosauridae	Microraptor zhaoianus, M. gui, M. hanqingi (Early Cretaceous, Aptian: ~120 Ma)	Hesperonychus elizabethae (Late Cretaceous, upper Campanian: 76.5 - 74.8 Ma)	43	The Aptian fossils were described in 2000 (Xu, Zhou & Wang), 2003 (Xu, Zhou, Wang, Kuang, Zhang & Du) and 2012 (Gong, Martin, Burnham, Falk & Hou) respectively, the Campanian species was described in 2009 (Longrich & Currie)
58.	Myxinidae (hagfish, slime eels, Hyperotreti)	a family (in the class Myxini, the order Myxiniformes) of eel-shaped marine animals having a tongue with horny teeth in a round mouth surrounded by tentacles	Myxinikela siroka (Pennsylvanian, Westphalian: 313 – 304 Ma)	Myxine and other extant genera (Recent: 0 Ma)	304	Until the discovery of the first fossil speciemen that formed the gap (Bardack, 1991) they were considered to have been secondarily reduced (degenerate descendants of more complex forms)
59.	Neoephemera	a genus of the family Neoephemeridae belonging to the Ephemeropterans (Mayflies)	Neoephemera antiqua (Eocene, Ypresian: 55.8 - 48.6)	several extant species, e.g. Neoephemera maxima (Recent: 0 Ma)	48	The Eocene fossil was described in 1999 (Sinitchenkova) and the presented extant species in 1871 (Joly)
60.	Neornithes (modern birds)	a subclass of birds (the clade Aves)	Gallornis straeleni (Early Cretaceous, Berriasian - Hauterivian: 145 - 129.4 Ma)	Austinornis (Ichthyornis/Graculavus) lentus (Late Cretaceous, early Santonian: ~85 Ma)	44	The Early Cretaceous fossil was described in 1931 (Lambrecht), the Late Cretaceous specimen was reported in 1877 (Marsh)

Nr	The gap subject name	The gap subject description	Older fossils	Younger speciemens	Gap	Comments
61.	Nephila (golden silk orb-weavers, giant wood spiders, banana spiders)	a genus of araneomorph spiders	Nephila jurassica (Middle-Upper Jurassic, Callovian-Oxfordian: ~160 Ma)	Nephila pennatipes (Eocene, Chadronian: 37.2 - 33.9 Ma)	122	The Jurassic fossil was described in 2011 (Selden et al.), the one from Eocene in 1885 (Scudder). There are also a few Eocene or Miocene species (Nephila dommeli, N. breviembolus, N. tenuis, N. furca, N. longembolus) described in 1982 and 1986 (Wunderlich) whose dating is unclear: 20 - 15 Ma based on foraminifera, but 45 - 30 Ma based on coccoliths. In the second case the presented gap would be shortened to 116 Ma, but another 30 million year gap would lead to several extant species, e.g. Nephila clavipes described in 1767 (Linnaeus)
62.	Nucha	a genus of sponges in the grade Heteractinida	Nucha naucum? (Late Ordovician, Ashgillian: 449.5 – 443.7 Ma)	Nucha? vancouverensis (Late Triassic, Rhaetian: 208.5 - 201.3 Ma)	235	The Ordovician species (also found in Middle Cambrian rocks) was reported in 2008 (Rigby, Blodgett & Britt); the Triassic species (question marked due to a huge fossil record gap) was described in 1998 (Stanley)
63.	Obdurodon	a sister genus of the modern platypus (a monotreme mammal in the family Ornithorhynchidae)	Monotrematum sudamericanum (Paleogene, Paleocene, Danian / Tiupampan: 65.5 - 62.5 Ma)	Obdurodon insignis (late Oligocene - early Miocene: 28.4 - 16 Ma)	34	The Paleocene species was reported in 1992 (Pascual, Archer, Jaureguizar, Prado, Godthelp & Hand), the Miocene species was described in 1975 (Woodburne & Tedford)
64.	Octopodidae	a family in the order Octopoda (octopuses)	Styletoctopus annae (Upper Cretaceous, Upper Cenomanian: ~95 Ma)	a number of extant genera, esp. Octopus (Recent: 0 Ma)	95	The Cretaceous species was reported in 2009 (Fuchs, Bracchi & Weis) and the presented extant genus was described in 1797 (Cuvier)
65.	Octopoda (octopus)	an order of cephalopod molluscs	Proteroctopus ribeti (Middle Jurassic, Lower Callovian: ~164 Ma)	Keuppia levante, K. hyperbolaris, Styletoctopus annae (Upper Cretaceous, Upper Cenomanian: ~95 Ma)	69	The Jurassic species was reported in 1982 (Fischer and Riou) and the Cretaceous speciemens were described in 2009 (Fuchs, Bracchi & Weis)
66.	Octopoda	[see above]	Pohlsepia mazonensis (Upper Carboniferous, Pennsylvannian: ~296 Ma)	Proteroctopus ribeti (Middle Jurassic, Early Callovian: ~164 Ma)	132	The Carboniferous speciemen was reported in 2000 (Kluessendorf & Doyle) and the Jurassic fossil was described in 1982 (Fischer and Riou)
67.	Omma	a genus of beetles in the family Ommatidae	Omma antennatum (Lower Cretaceous, Lower Aptian: ~120 Ma)	4 extant species, e.g. Omma stanleyi (Recent: 0 Ma)	120	The Lower Aptian species was reported in 1997 (Ponomarenko), the type species (extant) was described in 1839 (Newman)

Nr	The gap subject name	The gap subject description	Older fossils	Younger speciemens	Gap	Comments
68.	Oribatida (oribatid mites, moss mites, beetle mites)	an order of arachnids in the superorder Acariformes	Archaeoplophora bella, Carbochthonius antrimensis, Gehypochthonimimus hibernicus, Monoaphelacarus carboniferus, Palaeohypochthonius jerami, Palaeoctenacarus simmsoi (Carboniferous, Mississippian, Brigantian / late Visean: 336 – 326 Ma)	Hydrozetes sp. [this genus is extant] (Lower Jurassic, Sinemurian: 199.3 - 190.8 Ma)	126	The six Carboniferous genera have been described in 2002 (Subías & Arillo), an extant genus species from the Jurassic was reported in 1978 (Sivhed & Wallwork)
69.	Orthocerida (Michelinocerda)	an order of cephalopod molluscs in the subclass Nautiloidea	Trematoceras cf. triadicum (Upper Triassic, Rhaetian: 208.5 - 201.3 Ma)	Zhuravlevia insperata (Early Cretaceous, Clansenian / Upper Aptian: 118 – 112 Ma)	83	The latest Jurassic specimen was reported in 1967 (Jeletzky & Zapfe), the Cretaceous species was described in 1994 (Doguzhaeva)
70.	giant Pachycormidae	giant suspension-feeding fish, members of the family Pachycormidae of the class Actinopterygii (ray-finned fishes)	Leedsichthys problematicus (Middle - Late Jurassic, Callovian – Kimmeridgian: 166.1 - 152.1 Ma)	Rhinconichthys taylori (Late Cretaceous, Cenomanian: 100.5 – 93.9 Ma)	51	The Jurassic species was first described in 1889 (Woodward), the Cenomanian fossils were reported in 2010 (Friedman, Shimada, Martin, Everhart, Liston, Maltese & Triebold)
71.	Pamphiliidae (leaf-rolling sawflies, web-spinning sawflies)	a family of insects in the superfamily Pamphilioidea (sawflies)	Juralyda udensis (Upper Jurassic, Oxfordian – Kimmeridgian: 161.2 – 150.8 Ma)	Atocus defessus, A. (Neurotoma) cockerelli (Eocene, Chadronian: 37.2 – 33.9 Ma)	113	The Jurassic species was reported in 1977 (Rasnitsyn), earliest Eocene species were described in 1892 (Scudder) and 1908 (Rohwer)
72.	Parapylochelidae	a family of hermit crabs (the superfamily Paguroidea)	Mesoparapylocheles michaeljacksoni (mid-Cretaceous, Late/Upper Albian – Early/Lower Cenomanian: ~100 Ma)	Parapylocheles scorpio (Recent: 0 Ma)	100	The Cretaceous fossil was reported in 2012 (Fraaije, Klompmaker & Artal), the extant species was described in 1894 (Alcock)
73.	Parapylochelidae	[see above]	Housacheles timidus (Late Jurassic – Early Cretaceous, Tithonian – early Berriasian: ~152 – 142 Ma) and Diogenicheles theodorae, Pilgrimcheles karolinae, Masticacheles longirostris (Upper Jurassic, middle Oxfordian, ~160 Ma)	Mesoparapylocheles michaeljacksoni (mid-Cretaceous, Late/Upper Albian – Early/Lower Cenomanian: ~100 Ma)	42	The Jurassic-Cretaceous species was described in 2013 (Fraaije, Van Bakel, Jagt, Skupien), the Cretaceous fossil was described in 2012 (Fraaije, Klompmaker & Artal), the oldest Jurassic species were presented in 2012 (Fraaije, Krzemiński, Van Bakel, Krzemińska & Jagt)

Nr	The gap subject name	The gap subject description	Older fossils	Younger speciemens	Gap	Comments
74.	Parastacoidea	a superfamily of freshwater crayfish (decapod crustaceans in the infraorder Astacidea)	Palaeoechinastacus australianus (Early Creataceous, Albian: 113 – 100.5 Ma)	Aenigmastacus crandalli (Eocene, Ypresian: ~53 Ma)	47	The early Cretaceous species was reported in 2008 (Martin, Rich, Poore, Schultz,Austin, Kool, Vickers-Rich), the one from Eocene was described in 2011 (Feldmann, Schweitzer & Leahy); Euastacus-like species from Eocene was also reported in 1987 (Sokol)
75.	Petromyzontiformes (lampreys, lamprey eels)	an order of jawless fish with a toothed sucking mouth in the class Hyperoartia (Petromyzontida)	Mesomyzon mengae (Early Cretaceous, Berriasian – Barremian: ~125 Ma)	three extant families comprising several species, e.g. Petromyzon marinus (Recent: 0 Ma)	125	The Cretaceous fossil was reported in 2006 (Chang, Zhang & Miao), the type species (extant) was described in 1758(Linnaeus)
76.	Petromyzontiformes (lampreys, lamprey eels)	[see above]	Mayomyzon pieckoensis, Pipiscius zangerli (Carboniferous, Pennsylvanian, Westphalian: 318 - 307 Ma)	Mesomyzon mengae (Early Cretaceous, Berriasian – Barremian: ~125 Ma)	182	The Middle Pennsylvanian speciemens were reported in 1962 (Bardack & Zangerl) and in 1977 (Bardack & Richardson), the Cretaceous species was described in 2006 (Chang, Zhang & Miao)
77.	Phylliidae (true leaf insects, walking leaves)	a family of insects in the order Phasmatodea (Phasmida / Phasmatoptera)	Eophyllium messelensis (Eocene, MP 11: 47 Ma)	a number of extant genera and species, e.g. Phyllium siccifolium (Recent: 0 Ma)	47	The Eocene fossil was reported in 2007 (Wedmann, Bradler & Rust), the presented extant species was described in 1758 (Linnaeus)
78.	Platypoda	a suborder of monotreme mammals (the order Monotremata)	Kollikodon ritchiei, Steropodon galmani (Lower Cretaceous, middle Albian: 110 - 100 Ma)	Monotrematum sudamericanum (Paleogene, Paleocene, Danian/Tiupampan: 65.5 - 62.5 Ma)	34	The Cretaceous fossils were described in (Flannery, Archer, Rich & Jones) 1995 and (Archer, Flannery, Ritchie, & Molnar) 1985 respectively, the Paleocene specimen was reported in 1992 (Pascual, Archer, Jaureguizar, Prado, Godthelp & Hand)
79.	Plectreuridae	a family (in the order Araneae) of haplogyne spiders	Palaeoplectreurys baltica (Eocene, Lutetian: 48.6 - 40.4 Ma)	Plectreurys pittfieldi (Miocene, Burdigalian – Langhian: 20.4 – 13.5 Ma)	20	Fossil species described in 2004 (Wunderlich) and 2009 (Penney) respectively. There is also another 13 million year gap between the Miocene Plectreurys pittfieldi and living species whose earliest description (Plectreurys castanea, Plectreurys tristis) was published in 1893 (Simon)
80.	Plectreuridae	[see above]	Eoplectreurys gertschi (Middle-Upper Jurassic, Callovian-Oxfordian: 166-157 Ma)	Palaeoplectreurys baltica (Eocene, Lutetian: 48.6 - 40.4 Ma)	108	Fossil species described in 2010 (Selden & Huang) and 2004 (Wunderlich) respectively.

Nr	The gap subject name	The gap subject description	Older fossils	Younger speciemens	Gap	Comments
81.	Pleocoma	a genus of beetles in the family Pleocomidae (rain beetles)	Pleocoma dolichophylla (Lower Cretaceous, Late/Upper Barremian: 130 - 125.5 Ma)	over 30 recent species, e.g. Pleocoma fimbriata (Recent: 0 Ma)	125	The Cretaceous fossil was reported in 2012 (Nikolajev & Ren), the type species (extant) was described in 1856 (LeConte)
82.	Porellaceae	a family of plants in the order Jungermanniales of the division Marchantiophyta (liverworts, hepatics)	Porella subgrandiloba (Eocene, Lutetian: 48.6 - 40.4 Ma)	Porella pinnata (Recent: 0 Ma)	40	The Eocene species was reported in 2004 (Grolle & So), the given extant species was first described in 1753 (Linnaeus)
83.	Proceratosauridae	a family of theropod dinosaurs in the superfamily Tyrannosauroidea	Guanlong wucaii (Late Jurassic, Oxfordian: ~160 Ma)	Sinotyrannus kazuoensis (Early Cretaceous, Aptian: ~120 Ma)	40	The Late Jurassic specimen was reported in 2006 (Xu, Clark, Forster, Norell, Erickson, Eberth, Jia & Zhao), the Aptian species was described in 2009 (Ji, Ji & Zhang)
84.	Psammosteiformes	an order of jawless fish in the subclass Heterostraci of the class Pteraspidomorphi	Psammosteus sp. (Late Devonian, Upper Frasnian: 379.5 - 376 Ma)	Psammosteus granulatus, P. vermicularis (Carboniferous, Pennsylvanian: 323 - 299 Ma)	53	The Upper Frasnian occurance was reported in 2002 (Blieck, Karatajute-Talimaa & Mark-Kurik), the Pennsylvanian species were described in 1848 (M'Coy)
85.	Pycnogonida (sea spiders)	a class of marine arthropods	Colossopantopodus boissinensis, Palaeoendeis elmii, Palaeopycnogonides gracilis (Middle Jurassic, Lower Callovian: ~165 Ma)	over 1300 extant species, e.g. Nymphon grossipes (Recent: 0 Ma)	165	The Jurassic speciemens were reported in 2007 (Charbonnier, Vannier & Riou), the presented extant species was described in 1780 (Fabricius)
86.	Pycnogonida (sea spiders)	[see above]	Pentapantopus vogteli, Flagellopantopus blocki, Palaeothea devonica, Palaeoisopus problematicus, Palaeopantopus maucheri (Early Devonian, Latest Pragian - Lower Emsian: 408 - 400 Ma)	Colossopantopodus boissinensis, Palaeoendeis elmii, Palaeopycnogonides gracilis (Middle Jurassic, Lower Callovian: ~165 Ma)	235	The Devonian species were reported in 2013 (Kühl, Poschmann & Rust), 2006 (Poschmann & Dunlop), 1980 (Bergström, Stürmer & Winter) and two in 1928 (Broili). The Jurassic fossils were described in 2007 (Charbonnier, Vannier & Riou)
87.	Rhabdopleura	the only genus of the family Rhabdopleuridae in the class Pterobranchia (worm-shaped animals, said to be living members of the graptolite clade)	Rhabdopleura eocenica (Eocene, Ypresian: 56 – 47.8 Ma)	R. normani (Recent: 0 Ma)	47	The Eocene species was reported in 1949 (Thomas & Davis), the type species (extant) was described in 1869 (Allmann)

Nr	The gap subject name	The gap subject description	Older fossils	Younger speciemens	Gap	Comments
88.	Rhabdopleura	[see above]	Rhabdopleura kozlowskii (Middle Jurassic, Bathonian - Callovian: 167.7 - 161.2 Ma)	Rhabdopleura vistulae (Late Cretaceous, Maastrichtian – Paleogene, Paleocene, Danian / Montian: 72.1 - 61.6 Ma)	89	The Jurassic species was described in 1969 (Kulicki), the Cretaceous-Tertiary species was reported in 1949 (Kozłowski), named in 1956 (Kozłowski)
89.	Rhabdopleura	[see above]	Rhabdopleura delmeri (Carboniferous, Mississippian, late Visean: ~331 Ma), Rhabdopleura graysoni (Carboniferous, Mississippian, Asbian / middle Visean: 337.5 - 333 Ma)	Rhabdopleura kozlowskii (Middle Jurassic, Bathonian - Callovian: 167.7 - 161.2 Ma)	163	The youngest Carboniferous species were described in 1955 (Mortelmans) and 1995 (Chapman, Durman & Rickards) respectively; the Jurassic species was reported in 1969 (Kulicki)
90.	Rhynchocephalia	an order of lizard-like reptiles in the superorder Lepidosauria – the order includes a number of extant genera and only one living genus Sphenodon (the tuatara)	Kawasphenodon expectatus, Lamarquesaurus cabazai, Sphenodontidae indet. (Upper Cretaceous, Late Campanian – Early Maastrichtian: ~70 Ma)	Sphenodontidae indet. (Early Miocene, Altonian / Burdigalian: (19 - 16 Ma)	51	The latest Cretaceous fossils were reported in 2005 (Apesteguía), 2007 (Apesteguia & Rougier) and 2012 (Apesteguia & Jones) respectively; the Miocene specimen was described in 2009 (Jones, Tennyson, Worthy, Evans & Worthy)
91.	Salamandroidea (advanced salamanders)	a suborder of salamanders (the order Caudata)	Beiyanerpeton jianpingensis (Late Jurassic, Early/Lower Oxfordian: 157 Ma)	Valdotriton gracilis (Lower Cretaceous, Late/Upper Barremian: ~127 Ma)	30	The Jurassic genus was described in 2012 (Gao & Shubin) and the Cretaceous one in 1996 (Evans & Milner)
92.	Schizodactylidae (dune crickets, splay-footed crickets)	a family of orthopteran insects (the order Orthoptera)	Brauckmannia / Schizodactylus groeningae (Lower Cretaceous, Upper Aptian: 122.5 - 112 Ma)	2 extant subfamilies comprising at least 16 extant species, e.g. Schizodactylus monstrosus (Recent: 0 Ma)	112	The Cretaceous species was reported in 2007 (Martins-Neto), the presented extant species was described in 1773 (Drury)
93.	Schizopteridae (jumping soil bugs)	a family in the infraorder Dipsocoromorpha belonging to Hemiptera (true bugs)	Buzinia couillardi, Tanaia burmitica (mid-Cretaceous, Early/Lower Cenomanian: ~100 Ma)	at least 4 extant genera: Hypselosoma, Glyptocombus, Ommatides, Williamsocoris (Recent: 0 Ma)	100	The mid-Cretaceous genera were reported in 2007 (Perrichot, Nel & Neraudeau) and the Hypselosoma genus was first described in 1891 (Reuter)
94.	Schizopteridae	[see above]	Libanohypselosoma popovi (Lower Cretaceous, Early Aptian: 125.5 – 122.5 Ma)	Buzinia couillardi, Tanaia burmitica (mid-Cretaceous, Early/Lower Cenomanian: ~100 Ma)	22	The Lower Cretaceous species was described in 2010 (Azar and Nel) and the mid-Cretaceous genera were reported in 2007 (Perrichot, Nel & Neraudeau)

Nr	The gap subject name	The gap subject description	Older fossils	Younger speciemens	Gap	Comments
95.	Scorpiones (scorpions)	an order of arachnids (the class Arachnida)	a number of Carboniferous fossils, the latest of which is Eoscorpius / Lichnophthalmus sp. (Permian, Cisuralian, lower Autunian / Asselian: ~298 Ma)	Protobuthus elegans, Gallioscorpio voltzi (Middle Triassic, Aegean / early Anisian: ~247.2 - 242 Ma), also fossil scorpions of intederminate family (Permian, Lopingian, Severodvinian / Wuchiapingian: ~258 Ma)	40	The Autunian speciemen was reported in 1963 (Laurentiaux-Vieira and Laurentiaux), the Aegean fossils were described in 2004 (Lourenço & Gall), the ones from the Severodvinian in 2011 (Fet, Shcherbakov & Soleglad)
96.	Scorpiones	[see above]	Liassoscorpionides schmidti (Lower Jurassic, Early/Lower Toarcian: 183.0 - 182.0 Ma)	Archaeobuthus estephani (Early Cretaceous, Hauterivian - early Aptian: 135-120 Ma)	47	The Jurassic species was reported in 1951 (Bode), the Cretaceous one was described in 2001 (Lourenço)
97.	Siro	a genus of arachnids in the family Sironidae of the suborder Cyphophthalmi (mite harvestmen)	Siro platypedibus, Siro balticus (Eocene, Lutetian: 48.6 - 40.4 Ma)	at least 12 extant species, e.g. Siro rubens (Recent: 0 Ma)	40	The Eocene species were reported in 2003 (Dunlop & Giribet) and 2011 (Dunlop & Mitov), the type species (extant) was described in 1804 (Latreille)
98.	Solifugae (camel spiders, sun spiders, wind scorpions, solifuges)	an order of arachnids (the class Arachnida)	Protosolpuga carbonaria (Carboniferous, Pennsylvanian, Westphalian D/Moscovian: 311.45 - 306.95 Ma)	Cratosolpuga wunderlichi (Early Cretaceous, Late/Upper Aptian: ~115 Ma)	191	The Pennsylvanian speciemen was described in 1913 (Petrunkevitch), Aptian fossils were reported in 1996 (Selden; Selden & Shear) and 2004 (Dunlop & Martill)
99.	Solifugae	[see above]	Cratosolpuga wunderlichi (Early Cretaceous, Late/Upper Aptian: ~115 Ma)	Palaeoblossia groehni (Eocene, Lutetian: 48.6 - 40.4 Ma)	66	Aptian fossils were reported in 1996 (Selden; Selden & Shear) and 2004 (Dunlop & Martill), the Eocene species was described in 2004 (Dunlop, Wunderlich & Poinar)
100.	Sphenodontinae	a subfamily of Sphenodontidae in the order Rhynchocephalia, lizard-like reptiles with only one extant genus Sphenodon (the tuatara)	Oenosaurus muehlheimensis (Late Jurassic, Early Tithonian: 152 – 148 Ma)	Sphenodontidae indet. (Upper Cretaceous, Late Campanian – Early Maastrichtian: ~70 Ma)	78	The Late Jurassic species was described in 2012 (Rauhut, Heyng, López-Arbarello & Hecker), the Late Cretaceous sphenodontine was reported also in 2012 (Apesteguia & Jones)
101.	Sphenodontinae	[see above]	Cynosphenodon huizachalensis, Zapatadon ejidoensis (Early Jurassic, Pliensbachian: 190.8 – 182.7 Ma)	Oenosaurus muehlheimensis (Late Jurassic, Early Tithonian: 152 – 148 Ma)	30	The Early Jurassic fossils were described in 1996 (Reynoso) and 1998 (Reynoso and Clark) respectively; the Late Jurassic species was reported in 2012 (Rauhut, Heyng, López-Arbarello & Hecker)

Nr	The gap subject name	The gap subject description	Older fossils	Younger speciemens	Gap	Comments
102.	Sphinctozoa (Sphinctozoans, the order Sphinctozoida)	families of moniliform sponges with syconoid canal-system, mainly the family Verticillitidae (phylum Porifera: class Demospongea: order Vaceletida)	Barroisia/Wienbergia faxensis (Paleocene, middle Danian: ~63 Ma)	Vaceletia progenitor (late Eocene, Priabonian: 38 - 33.9 Ma)	25	The Paleocene species was described in 1899 (Ravn) and renamed in 1982 (Clausen), the Eocene species was reported in 1982 (Pickett)
103.	Staphylinidae (rove beetle)	a family of beetles in the suborder Polyphaga	Leehermania prorova (Late Triassic, Norian: 221.5 - 205.6 Ma)	Morsum abdominale (Middle Jurassic: Bajocian -Bathonian: 171.6 – 164.7 Ma)	34	The Late Triassic fossils were described in 2012 (Chatzimanolis, Grimaldi, Engel & Fraser), the Middle Jurassic species was reported in 1985 (Ryvkin)
104.	Stephanidae (crown wasps)	a family of parasitoid wasps in the superfamily Stephanoidea	Archaeostephanus corae (Upper Cretaceous, Turonian: 93.5 – 89.3 Ma)	Electrostephanus brevicornis, E. petiolatus, E. tridentatus (Lutetian: 48.6 – 40.4 Ma)	40	The Cretaceous species was reported in 2004 (Engel & Grimaldi), oldest Eocene fossils were first described by Brues (1933)
105.	Stichopites mortenseni	a species of sea cucumbers, marine animals in the class Holothuroidea of the phylum Echinodermata	S. mortenseni (Middle Triassic, Anisian: 247 – 242 Ma)	S. mortenseni (Early Jurassic, middle Toarcian: 182 – 175.5 Ma)	60	The Triassic occurance was reported in 1971 (Zawidzka), the Middle Toarcian fossils were reported in 1961 (Rioult)
106.	Tetraphalerus	a genus of beetles in the family Ommatidae	Tetraphalerites / Tetraphalerus oligocenicus (Eocene, Priabonian: 38 – 33.9 Ma)	2 extant species, e.g. T. wagneri (Recent: 0 Ma)	33	The Eocene fossil was reported in 1962 (Crowson), the type species (extant) was described in 1901 (Waterhouse)
107.	Tetraphalerus	[see above]	Tetraphalerus okhotensis (Lower Cretaceous, Middle Albian: 109 - 105.3 Ma)	Tetraphalerites/Tetraphalerus oligocenicus (Eocene, Priabonian: 38 – 33.9 Ma)	67	The Albian specimen was reported in 1993 (Ponomarenko), the Eocene fossil was described in 1962 (Crowson)
108.	Tetrapoda	a superclass of four-limbed vertebrates	Zachełmie Quarry tracks left by various animals, some of which were capable of a quadrupedal gait and could fully support their body weight on their four limbs featuring distinct digits (Middle Devonian, Eifelian: ~395 Ma)	first body fossils of tetrapods classified as Ichthyostegalia, e.g. Elginerpeton pancheni (Late Devonian, late Frasnian: ~375 Ma)	18+	Zachełmie tracks were described in 2010 (Niedźwiedzki, Szrek, Narkiewicz, Narkiewicz, Ahlberg), the oldest ichthyostegalian fossil was reported in 1995 (Ahlberg). Niedźwiedzki and co-authors assumed that some of the trackways were made by tetrapods similar to Ichthyostega. However, an analysis performed in 2012 (Pierce, Clack & Hutchinson) showed that that animal was incapable of a quadrupedal gait. Thus, the gap leading to first true tetrapods is now much larger than initially estimated.

Nr	The gap subject name	The gap subject description	Older fossils	Younger speciemens	Gap	Comments
109.	Theriosuchus	a genus of crocodylomorph in the family Atoposauridae	T. grandinaris (Early Cretaceous, Berriasian-Barremian: 145.5 – 125.5 Ma)	T. sympiestodon (Late Cretaceous, Maastrichtian: 70.6 – 65.5 Ma)	54	The Early Cretaceous fossil was described in 2011 (Lauprasert, Laojumpon, Saenphala, Cuny, Thirakhupt, Suteethorn), the Late Cretaceous species was reported in 2010 (Martin, Rabi & Csiki)
110.	Therizinosauria (segnosaurs)	a clade of theropod dinosaurs	Eshanosaurus deguchiianus (Lower Jurassic, Hettangian: 201.6 - 196.5 Ma)	Falcarius utahensis (Early Cretaceous, Barremian: 130 - 125.5 Ma), Beipiaosaurus inexpectus (Early Cretaceous, late Barremian – early Aptian: ~124.6 Ma)	66	The Jurassic specimen was described in 2001 (Xu, Zhou & Clark), the Early Cretaceous fossils were reported in 2005 (Kirkland, Zanno, Sampson, Clark & DeBlieux) and 1999 (Xu, Tang & Wang) respectively
111.	Thuja	a genus of coniferous trees in the family Cupressaceae (cypress)	T. ehrenswaerdi, T. polaris (Paleocene: 66 - 56 Ma)	T. nipponica (Miocene: 23 - 5.3 Ma)	33	The Paleocene fossils were described in 1974 (Schweitzer) and 1989 (McIver & Basinger), the Miocene species was reported in 1973 (Akhmetiev)
112.	Thunnosauria (excluding Baracromia and, consequently, Ophthalmosauridae)	a group of non-baracromian and non-ophthalmosaurid thunnosaurians in the order Ichthyosauria (ichthyosaurs)	Ichthyosaurus communis (Early Jurassic: early Pliensbachian: ~186 Ma)	Malawania anachronus (Early Cretaceous, late Hauterivian - Barremian: 132.9 – 125 Ma)	53	The latest occurance (Jurassic) of Ichtyosaurus communis reported in 2012 (Bennett, Barrett, Collinson, Moore-Fay, Davis & Palmer), the Cretaceous fossil of Malawania described in 2013 (Fischer, Appleby, Naish, Liston, Riding, Brindley & Godefroit)
113.	Triops cancriformis (tadpole shrimp, horseshoe shrimp)	a species of small crustaceans in the order Notostraca	T. cancriformis (Late Triassic, Norian – Rhaetian: 228 – 201 Ma)	T. cancriformis (Recent: 0 Ma)	201	The species was first described on the basis of living specimens in 1801 (Bosc). The Late Triassic fossils were reported in 1938 (Trusheim), 1986 (Gore), 1998 (Kelber) and 1999 (Kelber). However, there have recently been attempts to undermine the taxonomy of the fossil specimens (Hegna & Dong, 2010; Mathers, Hammond, Jenner, Hänfling, Gómez, 2013), but there is no consensus on the subject.
114.	Tshekardocoleoidea	a superfamily of beetles (the order Coleoptera) in the superorder Protocoleoptera	Uralocoleus ultimus (Permian, Guadalupian, Roadian: 272.5 – 268 Ma)	Labradorocoleus carpenteri (Late Cretaceous, Cenomanian: 100.5 – 93.9 Ma)	167	The Roadian specimen was described in 2000 (Ponomarenko), the Cretaceous fossil was reported in 1969 (Ponomarenko)

Nr	The gap subject name	The gap subject description	Older fossils	Younger speciemens	Gap	Comments
115.	Tryblidiida / Tryblidioidea (Tryblidia, Monoplacophora sensu stricto)	a group / order of monoplacophoran mollusks	Early Cambrian - Middle Devonian (~542 - 375 Ma)	Micropilina minuta (Pleistocene, Sicilian: 0.78 - 0.26 Ma), Tectura / Veleropilina reticulata (Upper Pliocene / Lower Pleistocene: ~2.6 Ma)	372	Lazarus taxon, until 1952 (Lemche, 1957) they were thought to have been extinct since the mid-Devonian. Living species, like Neopilina galatheae or Vema ewingi (Clarke & Menzies 1959), bear striking resemblance to the fossil genus Pilina (esp. to the Silurian Pilina unguis, Lindström 1880). The middle Pleistocene shells were described in 1990 (Taviani, Sabelli & Candini) while the lower Pleistocene species was reported in 1876 (Seguenza) and later rediscribed in 1996 (Waren & Gofas)
116.	Urochordata (Tunicata)	a subphylum of sac-like marine invertebrates in the phylum Chordata	Shankouclava shankouense (Cambrian, Series 2, Stage 3 / Atdabanian: ~520 Ma)	Catellocaula vallata (Late Ordovician, Cincinnatian: 452.5 - 443.7 Ma)	67	2003 (Chen, Huang Peng Chi, Wang & Feng) the late Ordovician ichnogenus was reported in 1988 (Palmer and Wilson)
117.	Urochordata (Tunicata)	[see above]	Catellocaula vallata (Late Ordovician, Cincinnatian: 452.5 - 443.7 Ma)	Ascidites dubius, Didemnum minutum, Didemnoides rosetta, Lissoclinum branchiatus (Early Jurassic, Toarcian: 182.5 – 174 Ma)	261	The late Ordovician ichnogenus was reported in 1988 (Palmer and Wilson), the Early Jurassic species were described in 1971 (Bonet and Benveniste-Velasquez) and 1972 (Buge & Monniot)
118.	Vaceletia	a genus of sphinctozoid sponges ("sphinctozoans") in the family Verticillitidae (phylum Porifera, class Demospongea, order Vaceletida)	Vaceletia progenitor (late Eocene, Priabonian: 38 – 33.9 Ma)	Neocoelia/Vaceletia crypta (Recent: 0 Ma)	33	Lazarus taxon, first known only from fossils described since the 19th century; the Eocene species was described in 1982 (Pickett), the extant species was reported in 1977 (Vacelet)
119.	Xiphosurida	a (sub)order of marine chelicerates representing more advanced (modern, limuloid) members of Xiphosura (including horseshoe crabs)	Lunataspis aurora (Upper Ordovician, late Richmondian / latest Katian: ~445 Ma)	Rolfeia fouldenensis (Carboniferous, Dinantian / Mississippian, Tournaisian: 361 - 345 Ma)	84	The earliest Carboniferous species was reported in 1985 (Waterston), the Ordovician fossil was described in 2008 (Rudkin, Young & Nowlan)
120.	Xiphosurida	[see above]	Limulus / Tachypleus decheni (upper Eocene, 41 – 33 Ma)	Limulus polyphemus, Tachypleus gigas, T. tridentatus, Carcinoscorpius rotundicauda (Recent: 0 Ma)	33	The extant representatives of the group were first described in 1758 (Linnaeus), the Eocene fossil was reported in 1862 (Zinken)