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Kingdom of living thingsFor other uses, see Animal (disambiguation). "Animalia" redirects here. For other uses, see Animalia (disambiguation).AnimalsTemporal range: Cryogenian present, 6650Ma Pha.ProterozoicArcheanHad.Scientific classification
Domain:EukaryotaClade:AmorpheaClade:ObazoaClade:OpisthokontaClade:HolozoaClade:FilozoaClade:ChoanozoaKingdom:AnimaliaLinnaeus, 1758Major groupsBilateria (~30 phyla)CnidariaCtenophoraPlacozoaPoriferaSynonymsMetazoa Haeckel 1874[1]Choanoblastaea Nielsen 2008[2]Gastrobionta Rothm. 1948[3]Zooaea Barkley 1939[3]Euanimalia Barkley 1939[3]Animals are multicellular, eukaryotic organisms in the biological kingdom Animalia (/nmeli/[4]). With few exceptions, animals consume organic material, breathe oxygen, have myocytes and are able to move, can reproduce sexually, and grow from a hollow sphere of cells, the blastula, during embryonic development. Animals form a clade, meaning that they arose from a single common ancestor. Over 1.5 million living animal species have been described, of which around 1.05 million are insects, over 85,000 are molluscs, and around 65,000 are vertebrates. It has been estimated there are as many as 7.77million animal species on Earth. Animal body lengths range from 8.5m (0.00033in) to 33.6m (110ft). They have complex ecologies and interactions with each other and their environments, forming intricate food webs. The scientific study of animals is known as zoology, and the study of animal behaviour is known as ethology.The animal kingdom is divided into five major clades, namely Porifera, Ctenophora, Placozoa, Cnidaria and Bilateria. Most living animal species belong to the clade Bilateria, a highly proliferative clade whose members have a bilaterally symmetric and significantly cephalised body plan, and the vast majority of bilaterians belong to two large clades: the protostomes, which includes organisms such as arthropods, molluscs, flatworms, annelids and nematodes; and the deuterostomes, which include echinoderms, hemichordates and chordates, the latter of which contains the vertebrates. The much smaller basal phylum Xenacoelomorpha have an uncertain position within Bilateria.Animals first appeared in the fossil record in the late Cryogenian period and diversified in the subsequent Ediacaran period in what is known as the Avalon explosion. Earlier evidence of animals is still controversial; the sponge-like organism Otavia has been dated back to the Tonian period at the start of the Neoproterozoic, but its identity as an animal is heavily contested.[5] Nearly all modern animal phyla first appeared in the fossil record as marine species during the Cambrian explosion, which began around 539million years ago (Mya), and most classes during the Ordovician radiation 485.4Mya. Common to all living animals, 6,331 groups of genes have been identified that may have arisen from a single common ancestor that lived about 650Mya during the Cryogenian period.Historically, Aristotle divided animals into those with blood and those without. Carl Linnaeus created the first hierarchical biological classification for animals in 1758 with his Systema Naturae, which Jean-Baptiste Lamarck expanded into 14 phyla by 1809. In 1874, Ernst Haeckel divided the animal kingdom into the multicellular Metazoa (now synonymous with Animalia) and the Protozoa, single-celled organisms no longer considered animals. In modern times, the biological classification of animals relies on advanced techniques, such as molecular phylogenetics, which are effective at demonstrating the evolutionary relationships between taxa.Humans make use of many other animal species for food (including meat, eggs, and dairy products), for materials (such as leather, fur, and wool), as pets and as working animals for transportation, and services. Dogs, the first domesticated animal, have been used in hunting, in security and in warfare, as have horses, pigeons and birds of prey; while other terrestrial and aquatic animals are hunted for sports, trophies or profits. Non-human animals are also an important cultural element of human evolution, having appeared in cave arts and totems since the earliest times, and are frequently featured in mythology, religion, arts, literature, heraldry, politics, and sports.The word animal comes from the Latin noun animal of the same meaning, which is itself derived from Latin animalis 'having breath or soul'.[6] The biological definition includes all members of the kingdom Animalia.[7] In colloquial usage, the term animal is often used to refer only to nonhuman animals.[8][9][10][11] The term metazoa is derived from Ancient Greek meta 'after' (in biology, the prefix meta- stands for 'later') and zia 'animals', plural of zion 'animal'.[12][13]Animals are unique in having the ball of cells of the early embryo (1) develop into a hollow ball or blastula (2).Animals have several characteristics that they share with other living things. Animals are eukaryotic, multicellular, and aerobic, as are plants and fungi.[14] Unlike plants and algae, which produce their own food,[15] animals cannot produce their own food[16][17] a feature they share with fungi. Animals ingest organic material and digest it internally.[18] Animals have structural characteristics that set them apart from all other living things: cells surrounded by an extracellular matrix[19] composed ofcollagen[20] andelastic glycoproteins[19][21]motility[22] i.e. able to spontaneously move their bodies during at least part of their life cycle.a blastula stage during embryonic development[23]Typically, there is an internal digestive chamber with either one opening (in Ctenophora, Cnidaria, and flatworms) or two openings (in most bilaterians).[24]Animal development is controlled by Hox genes, which signal the times and places to develop structures such as body segments and limbs.[25][26]During development, the animal extracellular matrix forms a relatively flexible framework upon which cells can move about and be reorganised into specialised tissues and organs, making the formation of complex structures possible, and allowing cells to be differentiated.[27] The extracellular matrix may be calcified, forming structures such as shells, bones, and spicules.[28] In contrast, the cells of other multicellular organisms (primarily algae, plants, and fungi) are held in place by cell walls, and so develop by progressive growth.[29]See also: Sexual reproduction Animals, and Asexual reproduction Examples in animalsSexual reproduction is nearly universal in animals, such as these dragonflies.Nearly all animals make use of some form of sexual reproduction.[30] They produce haploid gametes by meiosis; the smaller, motile gametes are spermatozoa and the larger, non-motile gametes are ova.[31] These fuse to form zygotes,[32] which develop via mitosis into a hollow sphere, called a blastula. In sponges, blastula larvae swim to a new location, attach to the seabed, and develop into a new sponge.[33] In most other groups, the blastula undergoes more complicated rearrangement.[34] It first invaginates to form a gastrula with a digestive chamber and two separate germ layers, an external ectoderm and an internal endoderm.[35] In most cases, a third germ layer, the mesoderm, also develops between them.[36] These germ layers then differentiate to form tissues and organs.[37]Repeated instances of mating with a close relative during sexual reproduction generally leads to inbreeding depression within a population due to the increased prevalence of harmful recessive traits.[38][39] Animals have evolved numerous mechanisms for avoiding close inbreeding.[40]Some animals are capable of asexual reproduction, which often results in a genetic clone of the parent. This may take place through fragmentation; budding, such as in Hydra and other cnidarians; or parthenogenesis, where fertile eggs are produced without mating, such as in aphids.[41][42]Predators, such as this ultramarine flycatcher (Ficedula superciliaris), feed on other animals.Animals are categorised into ecological groups depending on their trophic levels and how they consume organic material. Such groupings include carnivores (further divided into subcategories such as piscivores, insectivores, ovivores, etc.), herbivores (subcategorised into folivores, graminivores, frugivores, granivores, nectarivores, algivores, etc.), omnivores, fungivores, scavengers/detritivores,[43] and parasites.[44] Interactions between animals of each biome form complex food webs within that ecosystem. In carnivorous or omnivorous species, predation is a consumerresource interaction where the predator feeds on another organism, its prey,[45] who often evolves anti-predator adaptations to avoid being fed upon. Selective pressures imposed on one another lead to an evolutionary arms race between predator and prey, resulting in various antagonistic/competitive coevolutions.[46][47] Almost all multicellular predators are animals.[48] Some consumers use multiple methods; for example, in parasitoid wasps, the larvae feed on the hosts' living tissues, killing them in the process,[49] but the adults primarily consume nectar from flowers.[50] Other animals may have very specific feeding behaviours, such as hawksbill sea turtles which mainly eat sponges.[51]Hydrothermal vent mussels and shrimpsMost animals rely on biomass and bioenergy produced by plants and phytoplanktons (collectively called producers) through photosynthesis. Herbivores, as primary consumers, eat the plant material directly to digest and absorb the nutrients, while carnivores and other animals on higher trophic levels indirectly acquire the nutrients by eating the herbivores or other animals that have eaten the herbivores. Animals oxidise carbohydrates, lipids, proteins and other biomolecules, which allows the animal to grow and to sustain basal metabolism and fuel other biological processes such as locomotion.[52][53] Some benthic animals living close to hydrothermal vents and cold seeps on the dark sea floor consume organic matter produced through chemosynthesis (via oxidising inorganic compounds such as hydrogen sulfide) by archaea and bacteria.[54]Animals evolved in the sea. Lineages of arthropods colonised land around the same time as land plants, probably between 510 and 471 million years ago during the Late Cambrian or Early Ordovician.[55] Vertebrates such as the lobe-finned fish Tiktaalik started to move on to land in the late Devonian, about 375 million years ago.[56][57] Animals occupy virtually all of earth's habitats and microhabitats, with faunas adapted to salt water, hydrothermal vents, fresh water, hot springs, swamps, forests, pastures, deserts, air, and the interiors of other organisms.[58] Animals are however not particularly heat tolerant; very few of them can survive at constant temperatures above 50C (122F)[59] or in the most extreme cold deserts of continental Antarctica.[60]The collective global geomorphic influence of animals on the processes shaping the Earth's surface remains largely understudied, with most studies limited to individual species and well-known exemplars.[61]Further information: Largest organisms and Smallest organismsThe blue whale (Balaenoptera musculus) is the largest animal that has ever lived, weighing up to 190 tonnes and measuring up to 33.6 metres (110ft) long.[62][63] The largest extant terrestrial animal is the African bush elephant (Loxodonta africana), weighing up to 12.25 tonnes[62] and measuring up to 10.67 metres (35.0ft) long.[62] The largest terrestrial animals that ever lived were titanosaur sauropod dinosaurs such as Argentinosaurus, which may have weighed as much as 73 tonnes, and Supersaurus which may have reached 39 metres.[64][65] Several animals are microscopic; some Myxozoa (obligate parasites within the Cnidaria) never grow larger than 20 m,[66] and one of the smallest species (Myxobolus shekel) is no more than 8.5m when fully grown.[67]The blue whale is the largest animal that has ever lived; it can be up to 33.6 metres (110ft) long.Myxozoans such as Myxobolus cerebralis are single-celled parasites, never more than 20 m across.The following table lists estimated numbers of described extant species for the major animal phyla,[68] along with their principal habitats (terrestrial, fresh water,[69] and marine),[70] and free-living or parasitic ways of life.[71] Species estimates shown here are based on numbers described scientifically; much larger estimates have been calculated based on various means of prediction, and these can vary wildly. For instance, around 25,00027,000 species of nematodes have been described, while published estimates of the total number of nematode species include 10,00020,000; 500,000; 10 million; and 100 million.[72] Using patterns within the taxonomic hierarchy, the total number of animal speciesincluding those not yet describedwas calculated to be about 7.77 million in 2011.[73][74][a]PhylumExampleSpeciesLandSeaFreshwaterFree-livingParasiticArthropoda1,257,000[68]Yes 1,000,000(insects)[76]Yes >40,000(Malac-ostraca)[77]Yes 94,000[69]Yes[70]Yes >45,000[b][71]Mollusca85,000[68]107,000[78]35,000[78]60,000[78]5,000[69]12,000[78]Yes[70]>5,600[71]Chordata>70,000[68][79]23,000[80]13,000[80]18,000[69]9,000[80]Yes40(catfish)[81][71]Platyhelminthes29,500[68]Yes[82]Yes[70]1,300[69]Yes[70]3,0006,500[83]>40,000[71]4,00025,000[83]Nematoda25,000[68]Yes (soil)[70]4,000[72]2,000[69]11,000[72]14,000[72]Annelida17,000[68]Yes (soil)[70]Yes[70]1,750[69]Yes400[71]Cnidaria16,000[68]Yes[70]Few[70]Yes[70]>1,350(Myxozoa)[71]Porifera10,800[68]Yes[70]200300[69]YesYes[84]Echinodermata7,500[68]7,500[68]Yes[70]Bryozoa6,000[68]Yes[70]6080[69]YesRotifera2,000[68]>400[85]2,000[69]YesYes[86]Nemertea1,350[87][88]YesYesYesTardigrada1,335[68]Yes[89](moist plants)YesYesYesFurther information: UrmetazoanEvidence of animals is found as long ago as the Cryogenian period. 24-Isopropylcholestane (24-ipc) has been found in rocks from roughly 650 million years ago; it is only produced by sponges and pelagophyte algae. Its likely origin is from sponges based on molecular clock estimates for the origin of 24-ipc production in both groups. Analyses of pelagophyte algae consistently recover a Phanerozoic origin, while analyses of sponges recover a Neoproterozoic origin, consistent with the appearance of 24-ipc in the fossil record.[90][91]The first body fossils of animals appear in the Ediacaran, represented by forms such as Charnia and Spriggina. It had long been doubted whether these fossils truly represented animals,[92][93][94] but the discovery of the animal lipid cholesterol in fossils of Dickinsonia establishes their nature.[95] Animals are thought to have originated under low-oxygen conditions, suggesting that they were capable of living entirely by anaerobic respiration, but as they became specialised for aerobic metabolism they became fully dependent on oxygen in their environments.[96]Many animal phyla first appear in the fossil record during the Cambrian explosion, starting about 539 million years ago, in beds such as the Burgess shale.[97] Extant phyla in these rocks include molluscs, brachiopods, onychophorans, tardigrades, arthropods, echinoderms and hemichordates, along with numerous now-extinct forms such as the predatory Anomalocaris. The apparent suddenness of the event may however be an artefact of the fossil record, rather than showing that all these animals appeared simultaneously.[98][99][100][101][102] That view is supported by the discovery of Auroralumina attenboroughii, the earliest known Ediacaran crown-group cnidarian (557562 mya, some 20 million years before the Cambrian explosion) from Charnwood Forest, England. It is thought to be one of the earliest predators, catching small prey with its nematocysts as modern cnidarians do.[103]Some palaeontologists have suggested that animals appeared much earlier than the Cambrian explosion, possibly as early as 1 billion years ago.[104] Early fossils that might represent animals appear for example in the 665-million-year-old rocks of the Trezona Formation of South Australia. These fossils are interpreted as most probably being early sponges.[105] Trace fossils such as tracks and burrows found in the Tonian period (from 1 gya) may indicate the presence of triploblastic worm-like animals, roughly as large (about 5mm wide) and complex as earthworms.[106] However, similar tracks are produced by the giant single-celled protist Gromia sphaerica, so the Tonian trace fossils may not indicate early animal evolution.[107][108] Around the same time, the layered mats of microorganisms called stromatolites decreased in diversity, perhaps due to grazing by newly evolved animals.[109] Objects such as sediment-filled tubes that resemble trace fossils of the burrows of wormlike animals have been found in 1.2 gya rocks in North America, in 1.5 gya rocks in Australia and North America, and in 1.7 gya rocks in Australia. Their interpretation as having an animal origin is disputed, as they might be water-escape or other structures.[110][111]Dickinsonia costata from the Ediacaran biota (c. 635542 mya) is one of the earliest animal species known.[95]Auroralumina attenboroughii, an Ediacaran predator (c.560 mya)[103]Anomalocaris canadensis is one of the many animal species that emerged in the Cambrian explosion, starting some 539 mya, and found in the fossil beds of the Burgess shale.Further information: Lists of animalsAnimals are monophyletic, meaning they are derived from a common ancestor. Animals are the sister group to the choanoflagellates, with which they form the Choanozoa.[112] Ros-Rocher and colleagues (2021) trace the origins of animals to unicellular ancestors, providing the external phylogeny shown in the cladogram. Uncertainty of relationships is indicated with dashed lines. The animal clade had certainly originated by 650 mya, and may have come into being as much as 800 mya, based on molecular clock evidence for different phyla.[113]OpisthokontaHolomycota (inc. fungi) HolozoaIchthyosporea Pluriformea FilozoaFilasterea ChoanozoaChoanoflagellateaAnimaliaover650myaThe relationships at the base of the animal tree have been debated.[114][115] Other than Ctenophora, the Bilateria and Cnidaria are the only groups with symmetry, and other evidence shows they are closely related.[116] In addition to sponges, Placozoa has no symmetry and was often considered a "missing link" between protists and multicellular animals. The presence of hox genes in Placozoa shows that they were once more complex.[117] The Porifera (sponges) have long been assumed to be sister to the rest of the animals, but there is evidence that the Ctenophora may be in that position. Molecular phylogenetics has supported both the sponge-sister and ctenophore-sister hypotheses. In 2017, Roberto Feuda and colleagues, using amino acid differences, presented both, with the following cladogram for the sponge-sister view that they supported (their ctenophore-sister tree simply interchanging the places of ctenophores and sponges):[118] AnimaliaPorifera EumetazoaCtenophora ParaHoxozoaPlacozoa Cnidaria Bilateria symmetryhoxgenesmulticellularConversely, a 2023 study by Darrin Schultz and colleagues uses ancient gene linkages to construct the following ctenophore-sister phylogeny:[119]AnimaliaCtenophora MyriazoaPorifera ParaHoxozoaPlacozoa Cnidaria Bilateria symmetryhoxgenesmulticellularNon-bilaterians include sponges (centre) and corals (background).Sponges are physically very distinct from other animals, and were long thought to have diverged first, representing the oldest animal phylum and forming a sister clade to all other animals.[120] Despite their morphological dissimilarity with all other animals, genetic evidence suggests sponges may be more closely related to other animals than the comb jellies are.[121][122] Sponges lack the complex organisation found in most other animal phyla;[123] their cells are differentiated, but in most cases not organised into distinct tissues, unlike all other animals.[124] They typically feed by drawing in water through pores, filtering out small particles of food.[125]The Ctenophora and Cnidaria are radially symmetric and have digestive chambers with a single opening, which serves as both mouth and anus.[126] Animals in both phyla have distinct tissues, but these are not organised into discrete organs.[127] They are diploblastic, having only two main germ layers, ectoderm and endoderm.[128]The tiny placozoans have no permanent digestive chamber and no symmetry; they superficially resemble amoebae.[129][130] Their phylogeny is poorly defined, and under active research.[121][131]Main articles: Bilateria and Symmetry (biology) Bilateral symmetryThe remaining animals, the great majoritycomprising some 29 phyla and over a million speciesform the Bilateria clade, which have a bilaterally symmetric body plan. The Bilateria are triploblastic, with three well-developed germ layers, and their tissues form distinct organs. The digestive chamber has two openings, a mouth and an anus, and in the Nephrozoa there is an internal body cavity, a coelom or pseudocoelom. These animals have a head end (anterior) and a tail end (posterior), a back (dorsal) surface and a belly (ventral) surface, and a left and a right side.[132][133] A modern consensus phylogenetic tree for the Bilateria is shown below.[134]BilateriaXenacoelomorpha NephrozoaDeuterostomiaAmbulacraria Chordata ProtostomiaEcdysozoa Spiralia 610mya650MyaIdealised nephrozoan body plan.[c] With an elongated body and a direction of movement the animal has head and tail ends. Sense organs and mouth form the basis of the head. Opposed circular and longitudinal muscles enable peristaltic motion.Having a front end means that this part of the body encounters stimuli, such as food, favouring cephalisation, the development of a head with sense organs and a mouth. Many bilaterians have a combination of circular muscles that constrict the body, making it longer, and an opposing set of longitudinal muscles, that shorten the body;[133] these enable soft-bodied animals with a hydrostatic skeleton to move by peristalsis.[135] They also have a gut that extends through the basically cylindrical body from mouth to anus. Many bilaterian phyla have primary larvae which swim with cilia and have an apical organ containing sensory cells. However, over evolutionary time, descendant spaces have evolved which have lost one or more of each of these characteristics. For example, adult echinoderms are radially symmetric (unlike their larvae), while some parasitic worms have extremely simplified body structures.[132][133]Genetic studies have considerably changed zoologists' understanding of the relationships within the Bilateria. Most appear to belong to two major lineages, the protostomes and the deuterostomes.[136] It is often suggested that the basalmost bilaterians are the Xenacoelomorpha, with all other bilaterians belonging to the subclade Nephrozoa.[137][138][139] However, this suggestion has been contested, with other studies finding that xenacoelomorphs are more closely related to Ambulacraria than to other bilaterians.[140]Further information: Embryological origins of the mouth and anusMain articles: Protostome and DeuterostomeThe bilaterian gut develops in two ways. In many protostomes, the blastopore develops into the mouth, while in deuterostomes it becomes the anus.Protostomes and deuterostomes differ in several ways. Early in development, deuterostome embryos undergo radial cleavage during cell division, while many protostomes (the Spiralia) undergo spiral cleavage.[141]Animals from both groups possess a complete digestive tract, but in protostomes the first opening of the embryonic gut develops into the mouth, and the anus forms secondarily. In deuterostomes, the anus forms first while the mouth develops secondarily.[142][143] Most protostomes have schizocoelous development, where cells simply fill in the interior of the gastrula to form the mesoderm. In deuterostomes, the mesoderm forms by enterocoelic pouching, through invagination of the endoderm.[144]The main deuterostome phyla are the Ambulacraria and the Chordata.[145] Ambulacraria are exclusively marine and include acorn worms, starfish, sea urchins, and sea cucumbers.[146] The chordates are dominated by the vertebrates (animals with backbones),[147] which consist of fishes, amphibians, reptiles, birds, and mammals.[148][149][150]The Spiralia develop with spiral cleavage in the embryo, as here in a sea snail.The protostomes include the Ecdysozoa, named after their shared trait of ecdysis, growth by moulting,[151] Among the largest ecdysozoan phyla are the arthropods and the nematodes.[152] The rest of the protostomes are in the Spiralia, named for their pattern of developing by spiral cleavage in the early embryo. Major spiralian phyla include the annelids and molluscs.[153]Further information: Taxonomy (biology), History of zoology through 1859, and History of zoology since 1859Jean-Baptiste de Lamarck led the creation of a modern classification of invertebrates, breaking up Linnaeus's "Vermes" into 9 phyla by 1809.[154]In the classical era, Aristotle divided animals,[d] based on his own observations, into those with blood (roughly, the vertebrates) and those without. The animals were then arranged on a scale from man (with blood, two legs, rational soul) down through the live-bearing tetrapods (with blood, four legs, sensitive soul) and other groups such as crustaceans (no blood, many legs, sensitive soul) down to spontaneously generating creatures like sponges (no blood, no legs, vegetable soul). Aristotle was uncertain whether sponges were animals, which in his system ought to have sensation, appetite, and locomotion, or plants, which did not: he knew that sponges could sense touch and would contract if about to be pulled off their rocks, but that they were rooted like plants and never moved about.[155]In 1758, Carl Linnaeus created the first hierarchical classification in his Systema Naturae.[156] In his original scheme, the animals were one of three kingdoms, divided into the classes of Vermes, Insecta, Pisces, Amphibia, Aves, and Mammalia. Since then, the last four have all been subsumed into a single phylum, the Chordata, while his Insecta (which included the crustaceans and arachnids) and Vermes have been renamed or broken up. The process was begun in 1793 by Jean-Baptiste de Lamarck, who called the Vermes une espce de chaos ('a chaotic mess')[e] and split the group into three new phyla: worms, echinoderms, and polyps (which contained corals and jellyfish). By 1809, in his Philosophie Zoologique, Lamarck had created nine phyla apart from vertebrates (where he still had four phyla: mammals, birds, reptiles, and fish) and molluscs, namely cirripedes, annelids, crustaceans, arachnids, insects, worms, radiates, polyps, and infusorians.[154]In his 1817 Le Rgne Animal, Georges Cuvier used comparative anatomy to group the animals into four embranchements ('branches' with different body plans, roughly corresponding to phyla), namely vertebrates, molluscs, articulated animals (arthropods and annelids), and zoophytes (radiata) (echinoderms, cnidaria and other forms).[158] This division into four was followed by the embryologist Karl Ernst von Baer in 1828, the zoologist Louis Agassiz in 1857, and the comparative anatomist Richard Owen in 1860.[159]In 1874, Ernst Haeckel divided the animal kingdom into two subkingdoms: Metazoa (multicellular animals, with five phyla: coelenterates, echinoderms, articulates, molluscs, and vertebrates) and Protozoa (single-celled animals), including a sixth animal phylum, sponges.[160][159] The protozoa were later moved to the former kingdom Protista, leaving only the Metazoa as a synonym of Animalia.[161]Main article: Human uses of animalsSides of beef in a slaughterhouseThe human population exploits a large number of other animal species for food, both of domesticated livestock species in animal husbandry and, mainly at sea, by hunting wild species.[162][163] Marine fish of many species are caught commercially for food. A smaller number of species are farmed commercially.[162][164][165] Humans and their livestock make up more than 90% of the biomass of all terrestrial vertebrates, and almost as much as all insects combined.[166]Invertebrates including cephalopods, crustaceans, insectsprincipally bees and silkwormsand bivalve or gastropod molluscs are hunted or farmed for food, fibres.[167][168] Chickens, cattle, sheep, pigs, and other animals are raised as livestock for meat across the world.[163][169][170] Animal fibres such as wool and silk are used to make textiles, while animal sinews have been used as lashings and bindings, and leather is widely used to make shoes and other items. Animals have been hunted and farmed for their fur to make items such as coats and hats.[171] Dyestuffs including carmine (cochineal),[172][173] shellac,[174][175] and kermes[176][177] have been made from the bodies of insects. Working animals including cattle and horses have been used for work and transport from the first days of agriculture.[178]Animals such as the fruit fly Drosophila melanogaster serve a major role in science as experimental models.[179][180][181][182] Animals have been used to create vaccines since their discovery in the 18th century.[183] Some medicines such as the cancer drug trabectedin are based on toxins or other molecules of animal origin.[184]A gun dog retrieving a duck during a huntPeople have used hunting dogs to help chase down and retrieve animals,[185] and birds of prey to catch birds and mammals,[186] while tethered cormorants have been used to catch fish.[187] Poison dart frogs have been used to poison the tips of blowpipe darts.[188][189]A wide variety of animals are kept as pets, from invertebrates such as tarantulas, octopuses, and praying mantises,[190] reptiles such as snakes and chameleons,[191] and birds including canaries, parakeets, and parrots[192] all finding a place. However, the most kept pet species are mammals, namely dogs, cats, and rabbits.[193][194][195] There is a tension between the role of animals as companions to humans, and their existence as individuals with rights of their own.[196]A wide variety of terrestrial and aquatic animals are hunted for sport.[197]The signs of the Western and Chinese zodiacs are based on animals.[198][199] In China and Japan, the butterfly has been seen as the personification of a person's soul,[200] and in classical representation the butterfly is also the symbol of the soul.[201][202]Artistic vision: Still Life with Lobster and Oysters by Alexander Coosemans, c.1660Animals have been the subjects of art from the earliest times, both historical, as in ancient Egypt, and prehistoric, as in the cave paintings at Lascaux. Major animal paintings include Albrecht Drer's 1515 The Rhinoceros, and George Stubbs's c.1762 horse portrait Whistlejacket.[203] Insects, birds and mammals play roles in literature and film,[204] such as in giant bug movies.[205][206][207]Animals including insects[200] and mammals[208] feature in mythology and religion. The scarab beetle was sacred in ancient Egypt,[209] and the cow is sacred in Hinduism.[210] Among other mammals, deer,[208] horses,[211] lions,[212] bats,[213] bears,[214] and wolves[215] are the subjects of myths and worship.Animal colorationEthologyLists of organisms by populationWorld Animal Day, observed on 4 October^ The application of DNA barcoding to taxonomy further complicates this; a 2016 barcoding analysis estimated a total count of nearly 100,000 insect species for Canada alone, and extrapolated that the global insect fauna must be in excess of 10 million species, of which nearly 2 million are in a single fly family known as gall midges (Cecidomyiidae).[75]^ Not including parasitoids.[71]^ Compare File:Annelid redone w white background.svg for a more specific and detailed model of a particular phylum with this general body plan.^ In his History of Animals and Parts of Animals.^ The French prefix une espce de is pejorative.[157]^ de Queiroz, Kevin; Cantino, Philip; Gauthier, Jacques, eds. 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Archived 12 June 2011 at the Wayback MachineAnimal Diversity Web University of Michigan's database of animalsWildscreen Arkive multimedia database of endangered/protected speciesRetrieved from " study nature, a series of taxonomic categories are used that divide the living beings in groups. Each of these categories groups beings that have some characteristics in common.A traditional series of taxonomic categories is the following (from the most general to the most particular):Domain Kingdom Phylum or division Class Order Family Genus SpeciesThat is to say that the kingdoms are very extensive subdivisions.What are the Kingdoms? Animalia. Beings with the ability to move, without chloroplast or cell wall, with embryonic development. They are eukaryotic organisms. Plantae. Photosynthetic living beings, without the ability to move, with cell walls largely composed of cellulose. They are eukaryotic organisms. Fungi. Beings with cell walls made up largely of chitin. They are eukaryotic organisms. Protista. All eukaryotic organisms that do not meet the characteristics that would allow them to be classified within the three previous kingdoms. Eukaryotic cells are those that have the nucleus differentiated from the rest of the cell. Monera. Prokaryotic beings, that is, those whose cells do not have a differentiated nucleus.Characteristics of the Animal KingdomThe animal kingdom (Animalia) groups together a wide variety of organisms that meet various characteristics: Eukaryotic cells. The nucleus of these cells is separated from the cytoplasm by a cell membrane. In other words, the genetic information is separated from the cytoplasm. Heterotrophs. They feed on organic matter that comes from other living things. Multicellular. They are those that are made up of two or more cells. All animals are made up of millions of cells. Movement ability. Unlike other living beings (such as plants or fungi), animals have anatomical structures in their bodies that allow them to move around. Tissue. In animals, cells form organized structures called tissues. In them, the cells are all equal and regularly distributed. Their physiological behavior is coordinated. The cells of a tissue share the same embryonic origin. Cell walls without chloroplast. It is the substance that allows plants to carry out photosynthesis. Since animals do not have chloroplast, they must feed on other living things (heterotrophs) Embryonic development. From a single zygote (cell resulting from the union of a male gamete and a female gamete), embryonic development begins cell multiplication to form the entire organism, with its multiplicity of differentiated cells, tissues, organs and systems.Examples of Animal KingdomHuman being (Homo Sapiens). Edge: cordate. Subphylum. Vertebrate. Class: mammal. Order: Primate.Ant (Formicidae). Phylum: arthropod. Subphylum: Hexapod. Class: insect. Order: hymenopteran.Eoperipatus totoro. Phylum: velvety worm. Class: udeonychopohora. Order: Euonychophora. Peripatidae family.Bee (anthophila). Phylum: arthropod. Class: insect. Order: hymenopteran.Domestic cat (felis silvestris catus). Edge: cordate. Subphylum: vertebrate. Class: mammal. Order: carnivore. Family. Feline.Elephant (elephantidae). Edge: cordate. Subphylum: vertebrate. Class: Mammal. Order: proboscidean.Crocodile (crocodylidae). Edge: cordate. Class: Sauropsido. Order: Crocodilia.Butterfly (lepidoptera). Phylum: arthropod. Class: insect. Order: Lepidoptera.Yellow clam (mactroid yellow desma). Phylum: mollusk. Class: bivalve. Order: veneroid.Salmon (psalm). Edge: cordate. Subphylum: verbrate. Order: salmoniformes.Oceanic dolphin (delphinidae). Edge: cordate. Class. Mammal. Order: cetacean.Ostrich (struthio camelus). Edge: cordate. Class: ave. Order: struthioniforme.Penguin. Edge: cordate. Class: Ave. Order: sphenisciforme.Boa. Edge: Cordado. Class: sauropsid. Order: squamata.Bat (chiropter). Edge: cordate. Class: mammal. Order: chiroptera.Earthworm (lumbrcido). Phylum: annelid. Class: clitellata. Order: haplotaxida.Subdivision of the Animal KingdomThe animal kingdom in turn is divided into large groups called phyla: Acanthocephala (Acanthocephalus). Parasitic worms (they get food from other live animals). They have a head with thorns. Acoelomorpha (Acelomorphs). Cellophane worms (solid, without cavities) that do not have a digestive tract. Annelida (Annelids). Coelominated worms (with cavities) that have the body segmented into rings. Arthropoda (arthropods). They have a chitin exoskeleton (carapace or similar structure) and jointed legs Brachiopoda (Brachiopods). They have a loptophore, which is a rounded organ with tentacles that surrounds the mouth. They also have a shell with two valves. Bryozoa (Bryozoans). They have a loptophore and anus outside the tentacular crown. Chordata (Chordate). They have a dorsal chord or spine, also called the notochord. They can lose it after the embryonic stage. Cnidaria (Cnidarians). Diblastic animals (complete embryonic development without mesoderm) that have cnidoblasts (cells that secrete defense substances) Ctenophora (Ctenophores). Diblastic animals with coloblasts (cells to trap food) Cycliophora (Cyclophores). Pseudocoelomed animals (animals with a general cavity of non-mesodermal origin) with a circular mouth surrounded by cilia (thin, hair-like appendages) Echinodermata (Echinoderms). Animals with skin with thorns. They have pentarradiate symmetry (central symmetry) and an external skeleton made up of calcareous pieces. Echiura (Equiuroideos). Marine worms with proboscis and thorn tail. Entoprocta (entoproctos). Loptophores with anus included in the tentacular crown (inner anus) Gastrotrichia (gastrotricks). Pseudocoelomed animals, with spikes and two adhesive caudal tubes. Gnathostomulida (gnatostomlidos). Animals with characteristic jaws that distinguish them from other animals. Hemchordata (hemichordates). Deuterostomous animals (animals that in their embryonic state develop the anus before the mouth), with pharyngeal fissures and stomocord (a kind of spinal column where the weight of the body is supported). Kinorhyncha (quinorhincs). Pseudocoelomed animals with retractable head and segmented body. Loricifera (Lorociferous). Pseudocoelomed animals covered with a protective coating. Micrognathozoa (micrognatozoa). Pseudocoelomates with complex jaws and an extendable thorax. Mollusca (mollusks). Soft-bodied animals, mouths with radula and covered by a shell. Myxozoa (myxozoa). Microscopic parasites. They have polar capsules that secrete defense substances. Nematoda (nematodes). Pseudocoelomed worms that have a chitin cuticle. Nematomorpha (nematomorphs). Parasitic worms similar to nematodes. Nemerte (Nemertinos). Cellophane worms (no cavity, solid body) with extendable proboscis. Onychophora (velvety worms). Worms with legs that end in chitin nails. Orthonectide (orthonrectids). Parasites with cilia (hair-like appendages) Phoronida (phoronids). Tube-shaped worms and U-shaped intestine. Placozoa (placozoans): Crawling animals. Platyhelminthes (flatworms). Worms with cilia, without anus. Many of them are parasites. Pogonophora (pogonophos). Tube-shaped animals with retractable heads. Porifera (sponges), Parazoans (animals without muscles, nerves or internal organs), with inhalant pores in the body, without defined symmetry. Priapulida (priapulids). Pseudocoelomed worms with an extendable proboscis surrounded by papillae. Rhombozoa (rhombozoa). Parasites made up of few cells. Rotifera (rotifers). Pseudocoelomates with a crown of cilia. Sipuncula (sipunclidos). Coelominated worms with mouths surrounded by tentacles. Tardigrada (water bears). Segmented trunk, with eight clawed legs or suction cups. Xenacoelomorpha (xenoturbelids). Deuterostomous worms with cilia.

Example of a animalia. What are 3 examples of animalia. What are 5 characteristics of animalia. 10 examples of animalia. 5 examples of animalia kingdom. 5 examples of organisms in the animalia kingdom. List 5 examples of organisms in kingdom animalia.