

# [Human organisms from the class mammalia all share](https://assignbuster.com/human-organisms-from-the-class-mammalia-all-share/)

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Human Impact on MammalsAll the living organisms on Earth are categorized into three domains oflife known as Archaea, Bacteria and Eukarya. These domains are further sortedinto kingdoms, phyla, classes and so on.

One major category of life is in thedomain Eukarya, kingdom Animalia, phylum Chordata, subphylum Vertebrata andlastly, class Mammalia. As humans this category is very important to us becausewe are a part of it. Organisms from the class Mammalia all share a set ofsimilar characteristics that distinguishes them from all other livingorganisms. Mammals are a unique group of animals with unique traits. In thispaper, I will discuss an overview on what it means to be a mammaland how mammals are affected by humans.

Characteristics of mammals            Similarto all other organisms from the kingdom Animalia, mammals are multicellularorganisms, they reproduce sexually and they are heterotrophic (Strauss 2017). Aheterotrophic animal is one that needs to consume other organisms in order toobtain energy, unlike autotrophs that can produce their own energy by the useof sunlight. However, unlike all other animals, the category of mammals alsohas other traits that help scientists to classify them. Mammals are anextremely diverse group of animals.

Mammals primarily live on land and are categorizedas terrestrial. However, they can live in a variety of different habitats, suchas deep seas, tropical rainforests and deserts. They also range in size fromtiny shrew organisms to giant whales in the ocean.             Oneunique trait of mammals is that they have hair covering their entire bodies atsome stage of their life.

The type of hair can also be diverse between mammals. Some mammals have thick fur, some have long whiskers, quills and some even havehorns. The main purpose of possessing hair is insulation for cold, protectionagainst infections and even camouflage to deceive predators, such as forgiraffes and zebras. One amazing function of hair is sensory feedback, anexample of this is observed in the whiskers of house cats (Strauss 2017).                      Unlikeother vertebrates, mammals are unique in the way that they nurse their youngwith milk from their mammary glands. The presence of mammary glands is seen inboth males and females, but only females are able to produce milk to feed theiroffspring.

One exception to this is the Dayak fruit bat, of whom the male hasthe responsibility to breast feed the young (Strauss 2017). Breastfeeding is anamazing process that delivers not only nutritious, fat, and protein rich milkfrom the mother to the baby but through that milk the mother is able totransfer vitamins, and antibodies to the baby as well.             Another, less prevalent, but important trait of mammals is how the lower jawbone, knownas the mandible in humans, is a single bone that connects directly to theskull. This bone is also called the dentary in other mammals because it is thebone that holds the teeth. The fact that the lower jaw attaches directly to theskull gives mammals the ability to have a powerful bite (Strauss 2017).

Theteeth and jaw also function for chewing, grinding, and cutting. Mammals arealso diphyodonts, which means they replace their set of teeth once in their life, unlike sharks who are polyphdonts and continuously replace their teeth (Strauss2017). The teeth of young mammals are weaker and the adult set are stronger andpermanent. However, only some but not all mammals are born with teeth, such as humans.            Anotherunique characteristic only seen in mammals is the presence of three inner earbones, the incus, malleus, and the stapes (Strauss 2017). Unlike other animals, these inner ear bones give mammals the ability to transmit sound vibrationsfrom the tympanic membrane (ear drum) to the inner ear and changes these vibrationsinto neural signals. These bones have evolved from the lower jaw bone ofancestral mammals which were a mammal-reptile organism, known as therapsids.

Therefore, it shows the link between mammals and reptiles. Even though beingwarm-blooded, endothermic, is not only exclusive for mammals, it is also seenin birds. Mammals however use their endothermic metabolisms efficiently in thestrenuous physical activities they perform (Strauss 2017). Being endothermicalso allows mammals to be active in a range of temperatures that otherexothermic groups such as, reptiles, cannot.             Similarto other vertebrates, mammals also possess diaphragms, which is the musclelocated within the thoracic cavity that expands and contracts in order to forceair to enter and leave the lungs during respiration.

In mammals, the diaphragmis highly advanced and this allows them to breathe in more oxygen and utilizeit more efficiently. This combined with their warm-blooded metabolisms allowsthem to perform a wide range of activities, as stated previously.             Once again, similar to all vertebrates, mammals havecardiac muscles that make up the walls of the heart and allows for pumping ofblood in order to deliver oxygen to the body tissues and remove carbon dioxide. The unique characteristic of mammalian hearts is that it consists of fourchambers.

The four chambers make the heart more efficient because it separatesthe oxygenated and deoxygenated blood. Overall, this gives mammals the abilityto deliver only oxygen rich blood to the tissues. This good quality of oxygendelivered to the tissues also gives them the ability to sustain longer periodsof physical activity.             Most mammals are polygynous or promiscuous. Polygynousmeans one male mates with multiple females, where as promiscuous means bothmales and females have multiple mates in their lifetime. Due to the fact thatfemales put more energy into the care of their young, they cannot mate morethan once in a mating season. Therefore, males have to compete with one andanother to mate and females are pickier in their choice of mates. Only a fewpercent of mammals, 3 percent, are actually monogamous, one being human beings (Strauss 2017).

Being monogamous means males only mate with one female and thus they also haveto put in care for the offspring. Lastly, mammals can be polyandrous whichmeans they display a cooperative breeding system, where groups of males andfemales care for each other’s offspring.             The behavior of mammals is as diverse as their type ofhabitat. Due to the fact that mammals can be terrestrial, aquatic or both, means that they are able to walk, run, swim, fly and climb (Wund 2012). Their lifestyles are alsodiverse. Some mammals choose to live in groups and some live alone. They can becarnivorous, herbivorous and even omnivorous, which means mammals can eat plants, animals and fungi. This shows that mammals as a group are generalists with a widerange of food choices, unlike a specialist that can only one type of diet orprey.

Mammalian diversity gradientin North America            The diversity of mammals allows them to live uniquelifestyles in all the corners of the Earth. Mammals can be found to range asfar north as the Arctic Circle, from east to west, and everything in between. Especially looking at the continent of North America we can see that mammalsare found everywhere. North America has a diverse range of ecosystems thatchanges drastically from one location to the next. This range of ecosystemsallows for a wide range of mammalian species to coexist.            A study was done to show that diversity of mammals foundin North America is dependent to their latitudinal position (Rodriguez et al. 2004).

The latitudinal diversity gradient (LDG) explainsthat the biodiversity of animals decreases as it goes from the equator tohigher altitudes. Jonathan Marcot, a University of Illinois animalbiology professor, states that “ theLDG says there are more species at the equator than at the poles” (Marcotet al. 2016). He also states in the journal that this pattern in ecology isseen in mammals, birds, insects, plants, in the oceans and on land.

Even thoughit might seem simple enough to think that more species can thrive in warmlatitudes, this does not mean it is always true. Marcot states that going backthousands of years it is evident to see that large mammals like horses, mammoths and rhinoceroses that were once present in North America lived inhigher latitudes. Therefore, things that we mostly find in southern latitudestoday may have lived in higher latitudes in the past.             Anotherstudy done by Marcot and colleagues in 2011 looked primarily at mammals fromlatitudes in western North America between 58 million and 63 million years ago. In this study Marcot states that “ it turns out the mammalian fossil recordof North America is the best- or one of the best-sampled terrestrial recordsfor this sort of analysis” (Marcot et al. 2016).

Overall, the study foundno evidence in latitudinal diversity gradient for North American mammals, Marcot states that “ there was no biodiversity gradient back then as thereis now” (Marcot et al. 2016). In order to answer this question, the teamwent back to the fossil records of all latitudes of North America from 63million years of mammalian life.

Theycompared the results of mammalian species diversity for every latitude in NorthAmerica for every time period. They also looked at and analyzed the diversityin comparison to the temperature changes during that time. Marcot states that” there were roughly as many animal species in the northern parts of NorthAmerica as there were in the southern regions” (Marcot et al. 2016).

Then, between 10 million to 4 million years ago they saw a stronger gradient forming. Finally, they found more species in the south than in the north, startingaround 4 million years ago. The team also analyzed the gradient in relation tothe record of temperature changes over the same time period and found “ astatistically significant correlation between temperature and the diversitygradient, meaning that the colder it gets, the stronger the diversity gradientgets for North American mammals” (Marcot et al.

2016). The study showsthat in order to study patterns of ecology for a group of animals, one muststudy not only the living organisms but also the fossil records of the speciespast. Examples of mammals found in North America            Whenwe think about a mammalian safari we automatically think about African mammalslike lions, elephants, leopards and rhinos. What we don’t stop to think aboutabout is the great diversity of mammals found right here in North America. North America, specifically the United States, offers the best large mammalsafaris. There are a diverse number of large mammals found in national parks inthe United States.

One historic national park located in the heart of Wyomingis Yellowstone National Park, which is home to a great number of amazingmammals.             Yellowstonehouses the Lamar Canyon wolf pack, which is a great place to see these graywolves in the wild. Another place that is great for seeing wolves roam in thewild are Alaska, which houses approximately 7, 000 to 11, 000 wolves (Nalewicki 2016). Yellowstone is also home to the grizzlybears of the country. Approximately 800 bears can be found in the park, seenprimarily during June to September, when they are not hibernating (Nalewicki 2016).             One of the largest mammals of North America are the NorthAmerican Bison, also known as buffalo.

These creatures can weigh up to 2000pounds. As of 2016, President Obama named them the official mammals of theUnited States (Nalewicki 2016). The best place to seethese great mammals is in Theodore Roosevelt National Park located in westernNorth Dakota, which is home to around 750 of these mammals (Nalewicki 2016).             Other mammals, such as polar bears live deep in theArctic Circle and some can be found in Alaska. The polar bear populations areconstantly threatened due to lack of prey and habitat destruction.

Moose can befound ranging from coast to coast, mostly found in northern Michigan in theIsle Royale National Park. They can also be found in herds roaming around inMaine. An example of aquatic marine mammals found in North America are humpbackwhales usually found off the coast of Hawaii, also in the Gulf of Maine andeven New Jersey. Similar to the great lions of Africa, mountain lions, pumas, panthers and cougars can be found in North America. Cougars are especiallyfound in places such as Arizona, Texas, and California.

These were just a fewexamples of the variety of different mammals that live in North America. Thelist can go on and on with a range of unique mammals all over North America (Nalewicki 2016). Evolution of mammals:            The evolution of mammals is studied to have begunprimarily after the extinction of dinosaurs. The first ancestor to the modernmammals we have today are creatures known as synapsid. Synapsid is believed tobe approximately 250 million years old and have reptile-mammal likecharacteristics. The first mammals colonized the joined land masses formerlyknown as Pangea (Carrasco et.

al. 2009). One group of mammals, themarsupials first evolved in North America and spread to South America, Australia, and the Artic. Another group of mammals evolved simultaneously inAsia and Europe.

Some mammals are believed to have colonizedNorth America through the Bering Land Bridge. The bridge allowed mammalianspecies to cross from Asia and Europe to North America and vice versa. Oneexample is the colonization of mammoths. Mammoths crossed the Bering landbridge and came to North America from Europe approximately 100, 000 years ago (Carrasco et. al. 2009). Another example is Bison reaching Alaska around 129, 000 years ago (Carrasco et. al.

2009). Other mammals that have evolved in North America are dogs and wolves. Whereas, mammals such as cats, bears, bison, buffalo and deer are from Eurasia. Horses are unique in their presence in North America.

Horses first originatedin North America but they left and went to Eurasia and Africa. Therefore, theydisappeared from North America. Other species such as camels also originated inNorth America but have now disappeared.             Therehas been a debate over the extinction of ancient mammalian species in NorthAmerica for many years.

New findings from TylerFaith, Ph. D, and Todd Surovell, associate professor of anthropologyat the University of Wyoming, states that the mass extinction occurred in ageological instant. Approximately 40, 000 to 10, 000 years ago is where there wasa loss of almost 50 percent of large mammal species in North America (Faith et al. 2009). This period is known as the Pleistocene erawhere species such as mammoths, mastodons, giant ground sloths and othersdisappeared. Some hypothesized causes for this sudden loss of species can bechange in climate, comet impact, human overkill and disease (Faith et al. 2009).             Theexact extinction time is unknown due to the fact that the fossil records areincomplete.

Therefore, it is hard to know whether the extinction was sudden orover a gradual period of time. According to Faith and Surovell the extinctionis said to be a more sudden event than a gradual process. They hypothesizedthat the extinction may have occurred between 13. 8 to 11. 4 thousands years ago (Faith et al. 2009). Therefore, Faith and Surovell conclude thatthe extinction was primarily due to human overkill, comet impact or other rapidevents instead of slow effects. Faith states that “ the massive extinctioncoincides precisely with human arrival on the continent, abrupt climate change, and a possible extraterrestrial impact event.

It remains possible that any oneof these or all, contributed to the sudden extinctions. We now have a betterunderstanding of when the extinctions took place and the next step is to figureout why” (Faith et al. 2009).

Human impact on mammals:            Humanimpact has continuously been prevalent on this group of animals. Humans havehad an impact on mammals in past, present, and will continue to affect them inthe future. Mammals are an important economic resource for humans. In the past, mammals have been domesticated by humans to provide us with goods such as milkand meat from mammals such as cows and goats (Doughty 2013). Other domesticated mammals by humans in the past are dogs and cats. Dogs were and are continuously used as service animals and companions forhumans. In some areas of the world these mammals, dogs and cats, are also usedfor their meat.

In general, mammals in zoos provide an important benefit to theecotourism industry.            Inpresent day, human populations are continuously growing which means more roomis needed to accommodate for the people. Making space for humans meansdestroying or fragmenting the habitats of mammals (Mariana et al. 2016).

Destruction of habitats has killed either prey or predator populations ofmammals. An example of this is seen through the increased populations of deerin New Jersey. The reason why deer have flourished so profoundly is due to the extinctionof their natural predators, wolves.

Due to loss of habitat by humans andhunting of these predators eventually caused their extinction and consequentlythe rise of their prey, the deer. These mammals have adapted well to novelurban environments and thus are able to reproduce effectively. Another group ofmammals that are well adapted are black bears also found in New Jersey. Due toless hunting by humans because of ethical reasons, the populations of blackbears has gone up over the years.             Fromthe start of the industrial revolution, human civilizations have had negativeimpact on mammals.

Humans have overfished, hunted, and destroyed the habitatsof mammals for agriculture. The use of chemicals, such as pesticides andherbicides, during farming has had a toll on mammalian species in North America(Hunter 2017). However, some mammals have adapted to these stresses put on byhumans. Mammals living in urban environments today have adapted to using thefood sources wisely and they now thrive in the presence and close proximity ofhumans. This shows that their adaptations are a source of study of naturalselection and it is valuable to see how these species will continuously affectmammals in the future. Those mammal species that are unable to adapt to novelurban societies will go extinct and those than can adapt will survive, which isa basic definition of natural selection.             Mammalsare an amazing group of animals. Their unique traits set them apart from otherclasses of Animalia.

Most importantly is their diversity in species andlifestyles. There is a diverse number of mammalian species found in NorthAmerican national parks. One of the great mammals to have existed in NorthAmerica are mammoths and now there are many other species of mammals such asbears, wolves, etc. Overall, humans have continuously impacted mammalianpopulations. Mammals and humans are always in close contact with each other andthus will impact one and another all the time.