

6. Evolution and Domestication of Wolves

Wolf Evolution

Scientists are not absolutely certain how and where the wolf evolved. By examining fossil bones, especially skulls, of animals that lived millions of years ago, however, they have hypothesized that wolves and other predators probably evolved from a small meat-eating mammal that lived in the Cenozoic era, 65 million years ago.

Specialized teeth for eating meat appeared about 55 million years ago in an animal called *Miacis*. It is likely that dogs, cats, weasels, raccoons and other carnivores all branched off from this line of primitive carnivore. A distinctly dog-like mammal, a little smaller than a fox, called *Cynodictus*, arose about 30 million years ago.

Over the next 10 million years, this branch of the carnivore lineage developed a larger brain, longer legs and the “dewclaw,” or reduced fifth toe, visible in dogs. Wolves began to take on their distinctly large size about 15 million years ago and to look much as they do now by about one million years ago. Today there are representatives of the Canidae family on all continents except Antarctica.

Domestication of Wolves

Every breed of domestic dog that we have today, from the poodle to the husky, is descended from the wolf. When and how this domestication process began is, however, a subject of controversy. Most scientists believe that dogs are derived from a small subspecies of wolf that was domesticated in China about 12,000 to 15,000 years ago. Some researchers have suggested the domestication process actually occurred much earlier.

There is evidence that early humans living in China (*Homo erectus pekinesis*) were associated with small wolves (*Canis lupus chanco*) during the mid-Pleistocene era about 200,000 to 500,000 years ago. It is believed, however, that these animals were not necessarily domesticated.

The fossil record does not tell us exactly when the dog lineage split off from the existing wolf branch. It does, however, give limited insight into how exactly humans and wolves came to live together. Some believe that ancient humans and wolves had similar social dynamics. For example, wolves live in family groups, as did the humans of that time. Because of this social dynamic, and because both relied on game species for survival, they most likely had similar hunting styles.

It may be that humans noticed that wolves hunted in a similar fashion and tried some form of interspecific cooperation, such as using the wolves to help in the hunt or letting the wolves eat the parts of the kill that they did not eat. It has also been suggested that perhaps human clans or tribes rescued orphan pups and raised them, thus beginning the domestication process through which dogs became both work animals and companions to humans.

Wolves and Dogs: Similarities and Differences

For years, wolves and dogs were classified under different species names - *Canis lupus* for the gray wolf (see Table 1. Taxonomy of the Gray Wolf, opposite) and *Canis familiaris* for the domestic dog. Recently, however, some scientists decided that wolves and dogs are similar enough to belong to the same species and they reclassified domestic dogs as wolf subspecies with the new nomenclature of *Canis lupus familiaris*. Some large carnivore researchers disagree with this reclassification, arguing that while dogs and wolves may be genetically identical, they have evolved into two distinct animals.

The link between the wolf and the dog via common or direct ancestry suggests that the wolf and the dog share similarities in morphology and behavior. For example, both species have the same gestation period, the pups of both are born blind and deaf, the milk teeth appear in the same order and the shedding phenomenon of both is equivalent. Although uncommon in nature, wolves and dogs can mate and produce fertile offspring.

Many behaviors such as vocalization, scent rolling and grooming are evident in both wolves and dogs. Wolves use complex communication skills (vocalizations, tail and body postures, facial expressions) to convey information and intention to other member of the pack. Domestic dogs often view their owners the same way subordinate wolves view the dominant members of the pack and use these same communication cues.

Selective breeding of dogs has created notable differences between the wolf and the dog. For instance, the muzzle of the wolf is longer than that of the dog. The wolf's tail hangs straight down when the animal is at rest; the tail of a dog tends to be held high and may even curl over its back. The wolf has a scent organ (precaudal tail gland) that is absent or nonfunctional in most dogs. When walking, the wolf's hind legs swing in the same line as its front legs, giving the wolf's gait an effortless flowing appearance. The dog's hind legs tend to track between the trail of the forelegs. In addition, wolves are not sexually mature until they are nearly two years old. Dogs are sexually mature at a younger age. Wolves breed once a year (late January to April), while dogs breed twice a year at random times.

While wolves and dogs display many of the same behavioral characteristics, they are not, in reality, the same animal. Wolves are wild animals. They can be tamed and socialized, but they cannot be domesticated. Even if they are raised by humans from birth, they retain their wildness. For instance, wolves cannot be housebroken or trained to respect the family furniture. They are relentlessly curious, a trait that enables them to survive in the wild but wreaks havoc in a home. Wolves have an urge to roam that makes them difficult to confine and predatory instincts that do not make them welcome additions to suburban neighborhoods. Punishment for what humans consider unacceptable behavior from a pet is counter-productive with wolves. Captive wolves do not respond to human commands and demands, and people who have raised them attest to the fact that they do not generally respond to any names given to them. If they do, it's merely an acknowledgment and never acquiescence.

Nevertheless, there are people who, for whatever misguided reasons, attempt to own wolves as pets. The tragedy is that wolves are nearly always the losers. If they escape, they are often destroyed. If the owner manages to confine them, they become destructive and are often placed in a shelter if one can be found that will take them. Usually euthanasia is the only solution. Wolf/dog hybrids create problems as well. There is no guarantee when one breeds a dog with a wolf that the offspring will look like a wolf and act like a dog. An animal with a dog's aggressive nature and a wolf's desire to remain aloof from humans can be a dangerous combination.

Someone once put it succinctly: "If you want a wolf, get a dog." In many states it is illegal to own wolves or wolf hybrids. As with most nature appreciation programs, a major goal of wolf education programs is to discourage people from wanting to own and confine an animal meant to be wild.

Table 1. Taxonomy of the Gray Wolf

The gray wolf is in:		Which includes:	And excludes:
Kingdom	Animalia	All multicellular organisms that lack cell walls and cannot perform photosynthesis	Plants, fungi, protists, bacteria
Phylum	Chordata	All animals that have a backbone or similar internal support	Invertebrates (insects, snails, starfish, etc.)
Class	Mammalia	All chordates that have fur and produce milk	Fish, amphibians, reptiles and birds
Order	Carnivora	All mammals that mostly eat meat	Rodents, deer, primates, etc.
Family	Canidae	All carnivores that are dog-like, with 42 teeth, walk on their toes and have long bushy tails	Lions, tigers, bears, raccoons, weasels, etc.
Genus	<i>Canis</i> *	Wolves and coyotes	Foxes, bush dogs
Species	<i>Lupus</i> *	Gray wolf	<i>Canis latrans</i> , the coyote <i>Canis rufus</i> , the red wolf
Subspecies	<i>*baileyi</i> <i>*lycaon</i>	Mexican gray wolf Eastern timber wolf	Gray wolves of other species

*A Word on Names

The genus and species names form the “scientific name” of the species and are *italicized*. The genus name is capitalized; the species name is not. The subspecies name, when used, is lowercase and *italicized* and follows the species name (e.g. *Canis lupus lycaon*). The names we are familiar with – gray wolf and red wolf – are the animals’ “common names.” The various subspecies of gray wolf are known by several other common names. For example, in the Southwest, the gray wolf is called the Mexican wolf, and in the Northeast, it is called the timber wolf. Yet, these wolves, as well as the Arctic wolf and the Alexander Archipelago wolf in Alaska, are all GRAY WOLVES!

Check Out Your Reading Skills
Evolution and Domestication of Wolves

Answer the following questions in complete sentences.

1. When did the *Miacis* live? How was it specialized?
2. Write the correct scientific name for the eastern timber wolf.
3. What class do wolves belong to? What order? What family?
4. List some of the similarities and differences between dogs and wolves.
5. Do wolves and wolf hybrids make good pets? Why or why not?