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## Dog: Domestication

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### Basic Species Information

Dog domestication research is often controversial, but one point that is universally agreed upon by all parties is the identity of the direct ancestor of all domestic dogs: the gray wolf (*Canis lupus*). Since 1993, the domestic dog has been taxonomically classified as *Canis lupus familiaris*, though *Canis familiaris* is still commonly used. This genetic similarity to the gray wolf is equivalent for all dog breeds from Chihuahua to Great Dane (Vila et al. 1997). Within the taxonomic subfamily of *Caninae*, domestic dogs are grouped with the “wolf-life canids” (Fig. 1) also including gray wolf (*Canis lupus*), coyote (*Canis latrans*), golden jackal (*Canis aureus*), black-backed jackal (*Canis mesomelas*), and cape hunting dog (*Lycan pictus*) (Wayne & Ostrander 2007). While evidence for prehistoric dog remains becomes ambiguous beyond about 15,000 years ago, fossil wolf remains have been found in association with human contexts from at least 100,000 years ago.

Although genetic material makes it clear that the gray wolf is the ancestor of the dog, it is not

clear which or how many subspecies of *Canis lupus* were involved in the domestication process, though both the medium-sized Eurasian wolf (*Canis lupus lupus*) and the smaller Arabian wolf (*Canis lupus arabs*) are often mentioned. Although the details of dog domestication are debated (wolf subspecies involved, geographic location, intentional taming of wolf pups vs. “self-domestication”), it is agreed that humans played an important role in the path of the domestic dog. While some genetic researchers suggest the divergence between wolves and dogs may have taken place up to 135,000 years ago (Vila et al. 1997), the archaeological evidence suggests that dog domestication did not begin before 15,000 years ago, though there may have incomplete domestication processes around 33,000 years ago. Due to the genetic similarity between wolves and dogs, the determination between dog and wolf in early archaeological specimens often relies on examining the skeletal remains for a set of morphological traits that generally distinguish the two canids from one another.

Two of the primary questions in dog domestication research focus on whether dog domestication took place in a single or multiple locations and whether significant domestication happened once or multiple times. Conclusions from archaeological and genetic information are thus far unclear for both of these questions. Some researchers suggest the initial domestication of dogs may have happened in East Asia, specifically the Yangtze River area of China. They have suggested that a large founding population of wolves (probably several hundred) were intentionally domesticated here as part of a sustained cultural practice (Pang et al. 2009). Other researchers argue that genetic evidence points to the Middle East as the location of the most genetic diversity and thus the likely origin of dog domestication (vonHoldt et al. 2010). A high level of genetic diversity in native dog population has also been found in Africa, suggesting the model of Eurasian dog domestication may need to be reconsidered (Boyko et al. 2009). Genetic testing shows that the oldest groups of dogs with the most genetic diversity

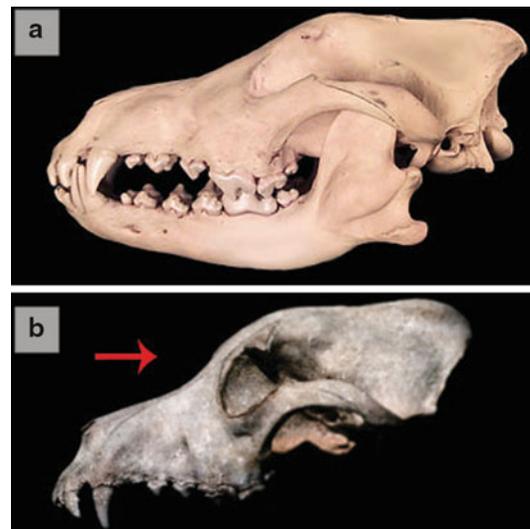


**Dog: Domestication, Fig. 1** Wild members of the *Caninae* subfamily: (a) Eurasian wolf (*Canis lupus lupus*), (b) black-backed jackal (*Canis mesomelas*), (c)

cape hunting dog (*Lycaon pictus*), (d) Arabian wolf (*Canis lupus arabs*), (e) golden jackal (*Canis aureus*), (f) coyote (*Canis latrans*)

(and which are most genetically similar to wolves) are primarily Asian and African in origin, including the Akita and Basenji. Many dogs which were thought to be ancient in origin, like the Irish Wolfhound and American Eskimo, are actually recently created breeds (Larson et al. 2012).

Like the genetic evidence, the archaeological data has also been interpreted in many different ways. The morphological traits which point to domestic dog in archaeological evidence earlier than about 15,000 are obscure and highly debated. Like all domesticated animals, the domestication of the gray wolf created distinct physical changes over time. These changes assist archaeologists and biologists in distinguishing between the two in fossil specimens. These changes include a general reduction in overall body size, a reduced muzzle length with crowding of the teeth, and the development of a distinctly stepped forehead or “stop” as opposed to the more sloped angle of the wolf face (Fig. 2). Due to the morphological similarities between wolves and early dogs, for many fossil specimens it is unclear whether they represent small wolves, large dogs, dog-wolf hybrids, or some sort of “in-between” species



**Dog: Domestication, Fig. 2** The sloped snout of a wild grey wolf (a) as compared to the distinctive ‘stop gap’ of a domesticated dog (b)

of wolves in transition to morphologically becoming domesticated dogs. The oldest uncontested archaeological dog remains from each geographic area are those from Bonn-Oberkassel (Germany; 14,708–13,874 cal. BP (before present)),



**Dog: Domestication, Fig. 3** Modern dog (*Canis lupus familiaris*) breeds: (a) Komondor, (b) Chinese Crested, (c) Pug, (d) Akita, (e) West Highland White Terrier, (f) Australian Dingo

Palegawra Cave (Iraq; 13,000 cal. BP), Ushki I (Russia; 12,900–12,600 cal. BP), Nanguanli (Taiwan; 4,800 cal. BP), Merimde Beni-Salame (Egypt; 6,800–6,520 cal. BP), Danger Cave (United States, 10,000–9,000 cal. BP), and Rosamachay (Peru, 5,620–5,150 cal. BP) (Larson et al. 2012).

In addition to these remains, there are also many for which a final determination between wolf and dog is more controversial. A fossil canid skull from Goyet Cave in Belgium, which had been excavated in the mid-nineteenth century, was reexamined and radiocarbon dated to 31,700 cal. BP. Some argue that the morphological traits of the skull are more suggestive of dog than wolf, which would make the Goyet specimen one of the oldest dog remains even found. Others question the determination of the skull as a domestic dog. Similar potential early domesticated dog finds have been cited in Chauvet Cave (France; ~ 26,000 BP), Predmostí Cave (Czech Republic; 27,000–24,000 BP), and Razboinichya Cave (Russia; 33,500–33,000 BP), but all have had the identification of their remains as dog challenged.

While the exact timing and location of dog domestication is still debated, the modern dog has spread throughout the world and now inhabits every continent aside from Antarctica. Through discerning breeding by humans, dogs now exist in an array of size, shapes, colors, and demeanors (Fig. 3). Their vast breadth of behavioral and morphological traits makes them the most adaptable land mammal on the planet.

## Cross-References

- ▶ [Animal Domestication and Pastoralism: Socio-Environmental Contexts](#)
- ▶ [Domestication: Definition and Overview](#)
- ▶ [Genetics of Animal Domestication: Recent Advances](#)

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## Domestic Archaeology: Textiles of Northern Mediterranean

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### Introduction

Throughout classical antiquity, textile manufacture was practiced on all levels of society and was one of the most labor-intensive of all occupations. As such, it was an industry of great cultural and social importance, playing an integral part in local and regional economies as well as local, regional, and long-distance exchange. The social significance of textile production in the northern Mediterranean was expressed in funerary ritual through the inclusion of textile implements among the burial goods, as well as in religious activities, through the deposition of textile tools in votive deposits and special ritual cloth production in sanctuaries.

Textiles were used for a variety of purposes, the most obvious of which was clothing. Like today, clothing in ancient times had multipurpose aspects, not least of which was expressing the identity of an individual or a group of peoples by symbolizing gender, age, family, social class, occupation, religion, or ethnic affiliation. Clothing and thereby textiles had an important communicative function since they combine both technological achievements and aesthetic values of any society. In addition to clothing, however, textiles were used for a variety of utilitarian purposes. Colorful bed covers, cushions, curtains, and other textiles are frequently represented by the Greek, Etruscan, and Roman iconographic sources. Another important use of textiles was for sails and ship rigging. The extravagant awnings for theaters and fora were made of textiles. Textiles were also used for military tents, cart covers, *vela* hung between temples' columns and *centones*, special fabrics used for extinguishing fires. A rather unique use of textiles known in the Etruscan sphere was for books. Called *libri lintei* by the Romans, they were made of linen and used for recording religious rituals.

Among the various sources that provide evidence for the study of textile production in the ancient northern Mediterranean, archaeological material is the most direct as it documents the productive activities through tools, installations, raw materials, and finished products. With the help of other, secondary sources of information, namely, the iconographic and written evidence, it is then possible to reconstruct the sequence of production processes involved in textile manufacture.

Although textiles surviving in their original form are relatively rare finds in northern Mediterranean archaeological sites, almost all conditions of preservation can be found in this vast and geologically and climatically diverse region. The largest corpus consists of linen textile fragments found in various Neolithic and Bronze Age sites in the north of the Apennine peninsula (Bazzanella et al. 2003), where they have been preserved by the basic conditions of the Alpine lakes. Wool textile fragments, on the other hand,