

Paleolithic cave rock art, animal coloration, and specific animal habitats

Pruvost et al. (1) found a genetic relationship between Upper Paleolithic horse coat color phenotypes, as evident from Paleolithic cave rock art paintings in the Franco-Cantabrian region, and molecular data in fossil horse DNA. They have genotyped coat-color loci in predomestic ancient horses from Siberia, Eastern and Western Europe, and the Iberian Peninsula. Six horses from Western and Eastern Europe, but not from Siberia, shared an allele associated with dappled coat color. Eighteen were genotyped to be bay (reddish-brown), and seven were black. We propose that these genotyped colors, along with other animal colors documented in Paleolithic rock art, are related to specific animal habitats exploited by specific genetic types.

Mammal coat colors are not a random phenomenon but rather the outcome of selection by the need to avoid predation, to hide from prey, and for communication (2–4). Various mammal species show discontinuous variation in coloration, most notably melanism, with black individuals in darker habitats. A well-known mammalian example of ecological melanism is found in jaguars and leopards: black individuals are common in dense tropical forests (3).

Concerning Paleolithic European horses, of special importance are the dappled horses in Pech-Merle (≈ 25 kyBP) and brown and black horses at Lascaux (≈ 16 kyBP) and Chauvet (≈ 31 kyBP). These findings manifest ancient horse color diversity in those environments. They also highlight the sharp observation capability of Paleolithic people to document wild animals. This is also evident from dozens of mammal species depicted in these prehistoric “art galleries” (5). Interestingly, these paintings also include dark-spotted aurochs (Lascaux) and a spotted bison (Marsoulas) (≈ 14 kyBP). Others on display are black aurochs at Lascaux and Chauvet, black-reddish aurochs at Lascaux, and reddish and black-reddish bison at Altamira (≈ 14 kyBP). Large carnivores with spotted coats are represented by a spotted

hyena and possibly a leopard at Chauvet. Another frontal drawing of a big cat head from Trois-Frères (≈ 13 kyBP) is depicted with dark patches around its eyes and shaded ears (5).

Dark-spotted coats are common among many forest-dwelling mammals living in open forest habitats. Dark spots support background matching against typical dappled forest illumination (3). Similarly, dark eyes and ears as in the Trois-Frères feline are common among forest-dwelling carnivores (2). On the other hand, a plain, dark coat is associated with camouflage in dense forests (3).

We propose that plain light-colored, spotted, and black animals in Paleolithic rock art reflect the variability of their specific habitats. For some taxa (horses, aurochs, and bison) some populations specialized in exploiting nonforested habitats, whereas others exploited open forest habitats where trees and areas covered with herbaceous plants intermingled, and were camouflaged accordingly, and those with a black coat exploited dense forests. Thus, Paleolithic cave art, when tied to genetic results (1), not only reflects the general natural environment but also the range of preferred habitats and specific ecological landscapes exploited by both the wildlife and human hunters. As such it provides a valuable source of paleontological and anthropological information not considered previously.

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