

HIGHLIGHTS

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Good dog

To many of us, dogs are the most familiar and best-loved of all animals. Agricultural worker, companion, pet and even surrogate child are all roles that have helped earn domestic dogs the tag “man’s best friend”. Now, Peter Savolainen and his colleagues’ phylogenetic analyses have shown that East Asia was probably where dogs were first domesticated and therefore where dogs and humans have been living together longest. These new data also provide the first evidence that the incredible diversity of dogs we see today — think of the Chihuahua and the Great Dane — might have originated from a single wolf population.

Mitochondrial variants of the 654 dogs sampled from all over the world fell into five evolutionary groups (clades), suggesting that dogs originated from at least five female wolf lines. Knowing the geographical sources of the wolf haplotypes related to these clades isn’t much use in determining where they originated — wolves are too mobile — which is why a worldwide survey of dogs was required.

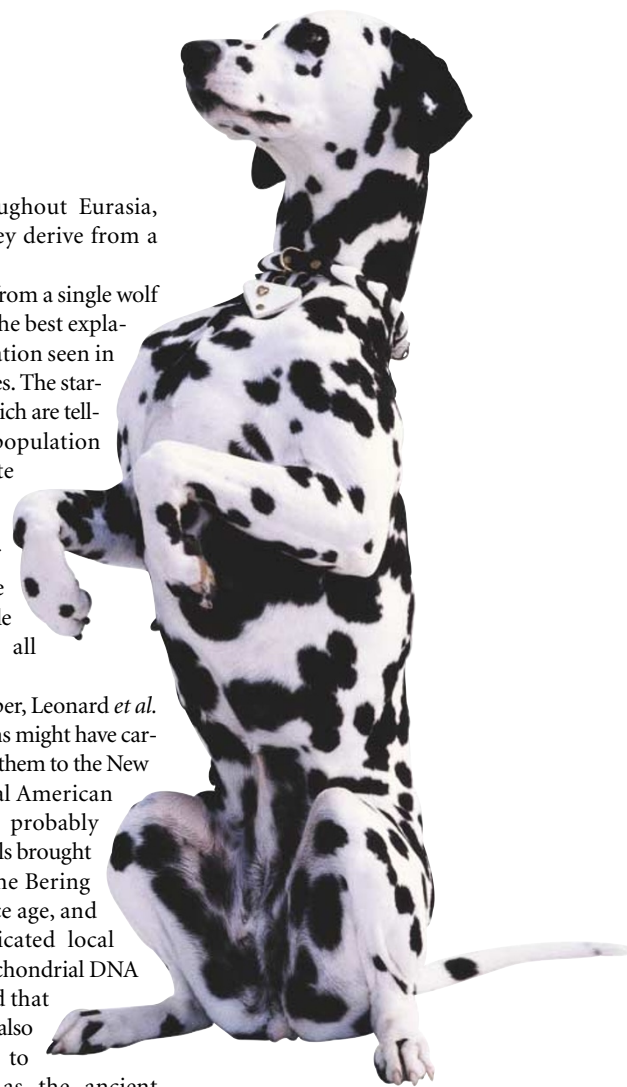
The authors found that East Asian dogs had higher mitochondrial nucleotide diversity and a greater number of haplotypes than their Southwest Asian and European counterparts. East Asia also tended to have more unique haplotypes and more haplotypes with greater than a single unique mutation. These results suggest that dogs originated in East Asia. In addition, the three largest dog clades were spread in roughly equal

frequencies throughout Eurasia, suggesting that they derive from a single population.

Domestication from a single wolf population is also the best explanation for the variation seen in the three main clades. The star-like phylogenies, which are tell-tale signatures of population expansion, indicate that the largest clade originated from several wolf haplotypes, the other two from single haplotypes — all ~15,000 years ago.

In a separate paper, Leonard *et al.* show that East Asians might have carried their dogs with them to the New World: pre-colonial American dog remains were probably derived from animals brought from Asia across the Bering Strait during the ice age, and not from domesticated local wolves. These mitochondrial DNA studies also showed that European colonists also preferred to stick to their own dogs, as the ancient American mitochondrial haplotypes are absent from modern American dog breeds.

So it seems when humans get a good dog they tend to stick to it. Although perhaps that should be “good bitch”, as it will need studies on nuclear DNA to confirm these patterns hold up for the male of the species.



Nick Campbell,
Nature Publishing Group

References and links

ORIGINAL RESEARCH PAPERS Savolainen, P. *et al.* Genetic evidence for an East Asian origin of domestic dogs. *Science* **298**, 1610–1613 (2002) | Leonard, J. *et al.* Ancient DNA evidence for Old World origin of New World dogs. *Science* **298**, 1613–1616 (2002)

WEB SITE

Peter Savolainen’s lab: <http://www.biotech.kth.se/molbio/researchers/savolainen.html>