

Feline evolution: How house cats and humans domesticated each other



few years ago, I had the opportunity to go on safari in southern Africa. One of the greatest thrills was going out at night looking for predators on the prowl: lions, leopards, hyenas.

As we drove through the darkness, though, our spotlight occasionally lit up a smaller hunter – a slender, tawny feline, faintly spotted or striped. The glare would catch the small cat for a moment before it darted back into the shadows.

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An African wildcat doesn't look so different from a domestic cat. Credit: pum_eva/iStock via Getty Images Plus

Based on its size and appearance, I initially presumed it was someone's pet inexplicably out in the bush. But further scrutiny revealed distinctive features: legs slightly longer than those of most domestic cats, and a striking black-tipped tail. Still, if you saw one from your kitchen window, your first thought would be "Look at that beautiful cat in the backyard," not "How'd that African wildcat get to New Jersey?"

[As an evolutionary biologist](#), I've spent my career [studying how species adapt to their environment](#). My research has been reptile-focused, investigating the workings of [natural selection](#) on lizards.

Yet, I've always loved and been fascinated by felines, ever since we adopted a shelter cat when I was 5 years old. And the more I've thought about those African wildcats, the more I've marveled at their evolutionary success. The species' claim to fame is simple: The [African wildcat is the ancestor](#) of our beloved household pets. And despite changing very little, their descendants have become among the world's two most popular companion animals. (Numbers are fuzzy, but the global population of [cats](#) and [dogs](#) approaches a billion for each.)

Clearly, the few evolutionary changes the domestic cat has made have been the right ones to wangle their way into people's hearts and homes. How did they do it? I explored this question in my book "[The Cat's Meow: How Cats Evolved from the Savanna to Your Sofa](#)."

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Why the African wildcat?

Big cats – like lions, tigers and pumas – are the attention-grabbing celebrities of the feline world. But of the [41 species of wild felines](#), the vast majority are about the size of a housecat. Few people have heard of the black-footed cat or the Borneo bay cat, much less the kodkod, oncilla or marbled cat. Clearly, the little-cat side of the feline family needs a better PR agent.

In theory, any of these species could have been the progenitor of the domestic cat, but [recent DNA studies demonstrate unequivocally](#) that today's housecats arose from the African wildcat – specifically, the North African subspecies, *Felis silvestris lybica*.

Given the profusion of little pussies, why was the North African wildcat the one to give rise to our household companions?

In short, it was the right species in the right place at the right time. [Civilization began](#) in the [Fertile Crescent](#) about 10,000 years ago, when people first settled into villages and started growing food.

This area – spanning parts of modern-day Egypt, Turkey, Syria, Iran and more – is [home to numerous small cats](#), including the caracal, serval, jungle cat and sand cat. But of these, the African wildcat is the one that to this day enters villages and [can be found around humans](#).

African wildcats are among the friendliest of feline species; raised gently, they [can make affectionate companions](#). In contrast, despite the most tender attention, their close relative the European wildcat [grows up to be hellaciously mean](#).

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Egyptian mummified cat. Credit:
Universal History Archive/Universal
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Given these tendencies, it's easy to [envision what likely happened](#). People settled down and started raising crops, storing the excess for lean times. These granaries led to rodent population explosions. Some African wildcats – those with the least fear of humans – took advantage of this bounty and started hanging around. People saw the benefit of their presence and treated the cats kindly, perhaps giving them shelter or food. The boldest cats entered huts and perhaps allowed themselves to be petted – kittens are adorable! – and, voilà, the domestic cat was born.

Where exactly domestication occurred – if it was a single place and not simultaneously throughout the entire region – is unclear. But [tomb paintings and sculptures](#) show that by 3,500 years ago, domestic cats lived in Egypt. [Genetic analysis](#) – including [DNA from Egyptian cat mummies](#) – and archaeological data chart the feline diaspora. They moved northward through Europe (and ultimately to North America), south deeper into Africa and eastward to Asia. Ancient DNA even demonstrates that [Vikings played a role in spreading felines](#) far and wide.

What cat traits did domestication emphasize?

Domestic cats possess many colors, patterns and hair textures not seen in wildcats. Some [cat breeds](#) have distinctive physical features, like [munchkins' short legs](#), [Siameses' elongated faces](#) or [Persians' lack of muzzle](#).

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A fluffy, flat-faced Persian cat has changed a lot in looks from its wildcat ancestor. Credit: Shirlaine Forrest via Getty Images

Yet many domestics appear basically indistinguishable from wildcats. In fact, only [13 genes have been changed by natural selection](#) during the domestication process. By contrast, [almost three times as many genes changed](#) during the descent of dogs from wolves.

There are only two ways to indisputably identify a wildcat. You can measure the size of its brain – [housecats, like other domestic animals](#), have evolved reductions in the parts of the brain associated with aggression, fear and overall reactivity. Or you can measure the length of its intestines – [longer in domestic cats](#) to digest vegetable-based food provided by or scavenged from humans.

The most significant evolutionary changes during cat domestication involve their behavior. The common view that domestic cats are aloof loners couldn't be further from the truth. When lots of domestic cats live together – in places where humans provide copious amounts of food – [they form social groups very similar to lion prides](#). Composed of related females, these cats are very friendly – grooming, playing with and lying on top of each other, nursing each other's kittens, even serving as midwives during birth.

To signal friendly intentions, [an approaching cat raises its tail straight up](#), a trait shared with lions and no other feline species. As anyone who has lived with a cat knows, they use this “I want to be friends” message toward people as well, indicating that they include us in their social circle.

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Cats use plenty of tools and tricks to get you to hand over what they want. Credit:
Nail Galiev/iStock via Getty Images Plus

Evolution of a master manipulator

Household cats are quite vocal to their human companions, using [different meows to communicate different messages](#). Unlike the tail-up display, however, this is not an example of their treating us as part of their clan. Quite the contrary, [cats rarely meow to one another](#).

The sound of these meows has [evolved during domestication](#) to more effectively communicate with us. Listeners rate the wildcat's call as more urgent and demanding ("Mee?O?O?O?O?W!") compared with the domestic cat's more pleasing ("MEE?ow"). Scientists suggest that these shorter, higher-pitched sounds are [more pleasing to our auditory system](#), perhaps because young humans have high-pitched voices, and domestic cats have evolved accordingly to curry human favor.

Cats similarly [manipulate people with their purrs](#). When they want something – picture a cat rubbing against your legs in the kitchen while you open a can of wet food – they purr extra loudly. And this purr is not the agreeable thrumming of a content cat, but an insistent chainsaw br-rr-oom demanding attention.

Scientists digitally compared the spectral qualities of the [two types of purrs](#) and discovered that the major difference is that the insistent purr includes a component very similar to the sound of a human baby crying. People, of course, are [innately attuned to this sound](#), and cats have evolved to take advantage of this sensitivity to get our attention.

Of course, that won't surprise anyone who's lived with a cat. [Although cats are very trainable](#) – they're very food motivated – cats usually train us more than we train them. As the old saw goes, "Dogs have owners, cats have staff."

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