

Zoology

SELF-RELIANT MONGRELS

We talk to **Prof. Wiesław Bogdanowicz** from the PAS Institute of Zoology about the origins, abilities and intelligence of feral dogs.

ACADEMIA: Western Eurasia is no longer home to the animals from which the first domesticated dogs originated. Is it possible to determine when they died out?

WIESŁAW BOGDANOWICZ: Although we know that the original populations of dogs that directly descended from wolves are now extinct, we cannot be sure when they actually disappeared. The dogs we see around us today are descendants of a second migratory wave from Eastern Asia. They accompanied

human migrations around ten thousand years ago. Dogs did not roam on their own – they were already domesticated and their numbers were directly proportional to the numbers of human travelers. When inhabitants from Asia first arrived in Europe, their canine companions displaced the much less numerous indigenous population; in genetic terms, these “original” dogs went extinct.

Studies of DNA in present-day populations indicate that all dogs alive today originate from Asia.



Prof. Wiesław Bogdanowicz

is head of the Laboratory of Molecular and Biometric Techniques at the PAS Museum and Institute of Zoology, where he focuses on 3D geometric morphometrics and population genetics. His team of 15 researchers has published the results of genetic studies into feral dog populations from around the globe.

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One of the breeds closely related to the original population is the shar pei, although they don't have a classically canine silhouette – they do not have pointed ears, long muzzles or tails...

There are no animals today which are genuinely similar to the first domesticated dogs, but there are some breeds regarded as ancient. They include the chow, akita and shar pei. We can think of them as canine equivalents of the modern-day successors to ancient Egyptian or Greek populations. They are closely related to feral dogs from Asia, while European breeds originate from early European dogs. I once had a shar pei named China. She was incredible: very conservative and rather introverted. We always walked the same route, because whenever I tried changing it, China would stop and look at me questioningly, as though asking “Where are we going?” Once I explained we needed to go to the shop or to the bank, she would agree and we went on our way. She also very rarely barked.

fossil DNA and archaeological samples. The origin of domestic dogs has long remained a mystery, with different theories pointing to Asia, Europe and the Middle East. This is because the two original waves of migration led to the mixing of populations with roots in different periods and locations. Recent studies indicate that wolves were most likely domesticated in Asia and Europe independently. We are also seeing ongoing cross-breeding between wolves and dogs. Claims that contemporary dogs originate in the Middle East are incorrect, since they ignore the significant (up to 20%) inflow of wolf DNA into the local dog population. This blurs the real image and understanding of the region being the original home to domesticated dogs. Our research also shows that the second wave of migration (the forefathers of today's feral dogs) became dispersed along the route from East Asia to Europe and the Middle East.

Why do you refer to feral dogs as a “superbreed”?

The term was picked up by a New York Times journalist who was the first to interview us about our research. We showed that present-day ferals – also known as village dogs, street dogs and free-breeding dogs – are not simply a mixed-breed subpopulation of stray domestic dogs, since they have a separate genetic pool. In any case, it was important that our research analyzed a genetic pool of dogs which can freely interbreed. We assumed that breeds exhibiting similar characteristics have been developed in parallel. In any case it is widely known that the majority of dog breeds – a total of around 400 – arose over the last few hundred years, while our team is interested in genetics predating this period. Dogs were able to breed freely as they accompanied people along their vagaries, and they also needed to survive in a harsh environment; this meant they relied on a keen sense of smell and hearing, and they had powerful jaws and teeth. These differences are seen in the genetic pools of feral and pure-breed dogs. The majority of today's domestic dogs would not survive the kind of lives led by feral dogs, hence the term “superbreed.” In any case, both populations could be jokingly referred to as “semi-parasites” whose aim is to get as much from their human “hosts” as possible.

It is the purest form of making the most of opportunities.

Without a doubt! Feral dogs have many traits predisposing them to survival, and they know how to best use them to their advantage. Dr. Andrei Poyarkov from the Institute of Ecology and Evolution of the Russian Academy of Sciences in Moscow studied feral dogs in the city, and his research led him to define a “begging class.” These dogs tend to be idle until they spot people likely to fall for their charms, especially little old ladies; the mutts act friendly and

” Feral dogs have a keen sense of smell, ears raised to hear better, and relatively long snouts to easily bite bones. This is a „superbreed.”

That is rather like wolves, or other Asian breeds such as the akita and shiba inu... And Australian dingoes.

There are several different hypotheses as to the origins of dingoes. According to one they are a subspecies of wolf, although Australian researchers suggest that they are actually a separate canine species. When we look at ancient dog breeds, such as distinctive Asian dogs and Arctic breeds such as the husky or malamute (I should note that Arctic breeds originate from Asian dogs), it is obvious how diverse they are. But we should remember that all dog breeds are the result of careful breeding to select traits desirable to humans. Our research focused on the entire genome; we analyzed around 150,000 individual mutations and their variability. We learned that Asian and Arctic breeds, as well as feral dogs from those regions, appear close to wolves on the phylogenetic tree. I should stress again, however, that this original dog population is now extinct. This could go some way towards explaining discrepancies between research into contemporary DNA,

CANINE SUPERBREED

wag their tails, and this highly calculated behavior usually pays off. Poyarkov also identified a population of around 500 dogs living in the Moscow metro, and discovered that about twenty of them have learned to travel by it.

Given that the Moscow metro is so vast as to be seen as a whole underground city, this is an incredible achievement.

That is right! Films have even been made about it – the dogs not only board the trains at specific stations, but they also know where to get off. On their way back, they retrace the same route.

So in fact they manage better than foreign tourists who cannot read the Cyrillic alphabet!

They mainly rely on their sense of smell, but they also recognize names of stations announced onboard trains. And people are happy to share their journey with dogs.

Even though the dogs are riding without a ticket.

They are a real superbreed! They have a very keen sense of smell, which is not necessary in all domestic dog breeds. Their ears are pointy to make them hear better, and they have relatively long muzzles to make munching on bones easier. Pure-breed dogs with floppy ears and short muzzles would not be able to survive in the environments inhabited by feral dogs. Since ferals do not get taken to vets, natural selection means their resistance to infection is also high. Our team searched for traits related to domestication which decide whether dogs are likely to abandon their feral lives in favor of being cared for by people. This is a conglomerate of many traits present both among pure-breed dogs and feral dogs. Domesticated dogs are more likely to have shorter muzzles and smaller teeth, as well as being less aggressive than ferals.

How many wild traits are preserved in feral dogs? Surely they need some to help them survive in extreme conditions...

That is right. The survival instinct also means that ferals are generally more intelligent than pet dogs.

What about working dog breeds?

As far as I am aware, the most intelligent breed is the poodle.

That seems surprising! Unless they are so smart that they simply pretend to be dumb to manipulate people, or their elaborate haircuts make them look plain daft.

I have had a few pure-breed dogs: Szafir my current weimaraner, China the shar pei, and a basset hound. I think he was the least intelligent dog I have ever known.

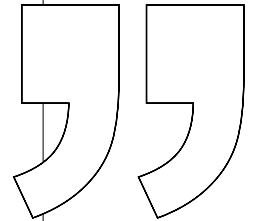
I guess that means he was the most highly domesticated.

By the way, it is also possible to domesticate foxes, as shown by the work of Prof. Dmitry Belyayev in the Soviet Union. He selected foxes which exhibited the lowest aggression towards humans. After a few dozen generations, the animals developed floppy ears, became friendly and happily wagged their tails when encountering people. As they became increasingly tame, they also started exhibiting a variety of coat colors.

There are around a billion dogs around the world – is that a lot?

It is the equivalent of every seventh person alive today having a dog, so I would say it is a lot. In some countries (including Poland) dogs outnumber cats, while in others the situation is reversed. But the overall trend is that as the world is becoming more industrialized and we are leading increasingly busy lives, fewer people decide to have dogs. We have less time for ourselves and for others.

Pure-breed dogs with floppy ears and short muzzles would not be able to survive in the environments inhabited by feral dogs.



How did you collect samples for your study?

I tried to make the most of all opportunities: for example, whenever I travelled to conferences abroad, I contacted local vets asking them to take blood samples and supplied them with test tubes. I also asked them to provide photos to accompany the samples when the dogs in question were mongrels.

How long did the study last?

A few years, and we took a couple of years to collect the samples. We did not always need blood samples – frequently a swab of epithelial cells from the dog's mouth was sufficient. Such samples were most difficult to collect from dogs from the Caucasian region; working dogs and guard dogs are not always terribly cooperative! The swabs are taken the same way as from people by rubbing a cotton bud on the inside of the cheek. This way we collected genetic material from hundreds of dogs.

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