Caveman's best friends? Preserved Ice Age puppies awe scientists

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A scientist performs an autopsy of the remains of a puppy, which died 12,460 years ago and was discovered in Russia's northern Yakutia, at the North-Eastern Federal University in Yakutsk

The hunters searching for mammoth tusks were drawn to the steep riverbank by a deposit of ancient bones. To their astonishment, they discovered an Ice Age puppy's snout peeking out from the permafrost.

Five years later, a pair of puppies perfectly preserved in Russia's far

northeast region of Yakutia and dating back 12,460 years has mobilised scientists across the world.

"To find a carnivorous mammal intact with skin, fur and internal organs—this has never happened before in history," said Sergei Fyodorov, head of exhibitions at the Mammoth Museum of the North-Eastern Federal University in the regional capital of Yakutsk.

And the discovery could contribute to the lively scientific debate over the origin of domesticated dogs.

When the hunters stumbled on the first frozen pup in 2011, they alerted Fyodorov who immediately flew out to the remote Arctic tundra, about 4,700 kilometres (2,900 miles) from Moscow and only 130 kilometres from the Laptev Sea, which borders the Arctic Ocean.

Last year he returned for a more thorough look and found the second puppy close to the same spot, farther down the slope. Both had died when they were about three months old.

They most likely come from the same litter, said Fyodorov.

The discovery of 12,460-year-old puppies in Russia could contribute to the lively scientific debate over the origin of domesticated dogs

Last week he oversaw the removal of the second puppy's remarkably well-preserved brain—"the first in the world", he said.

"Puppies are very rare, because they have thin bones and delicate skulls," he said.

The duo have been named the Tumat Dog, after the nearest village to the site.

Fyodorov said a preliminary look at the mammoth remains also found at the dig suggested some had been butchered and burned, hinting at the presence of humans. It remains to be seen, however, whether the puppies were domesticated or wild.

The answer can only be determined by reconstructing their genomes, which would take at least a year.

Grass-eating dogs?

"Thus far, the lineages of wolves that likely gave rise to dogs have not yet been discovered and it's possible that these puppies could be on that lineage, which would be very exciting," said evolutionary biologist Greger Larson of University of Oxford, one of the scientists behind a collaborative project aimed at finding out when and where dogs became the first domesticated animals.

What makes the dog particularly intriguing is that it managed to become "man's best friend" even before humans became settled farmers.

Scientists from the Mammoth Museum of the North-Eastern Federal University extract the brain of a puppy, which died 12,460 years ago and was discovered in Russia's northern Yakutia

It is still unclear whether dogs were domesticated in one place or in several places independently, and whether the process started when humans took in cubs or whether wolves themselves gradually drifted to human sites in search of food.

Whatever their precise lineage, the Tumat pups will keep Fyodorov and other scientists busy for some time.

The second puppy's preserved brain will be compared with that of modern dogs and wolves. Parasites found on its body will be analysed, as will the contents of its stomach, which Fyodorov is particularly excited about.

"When we opened it, we were very surprised. The second puppy's stomach is mostly full of twigs and grass," he said, wondering if perhaps the animals were not exclusively carnivorous or whether they started eating grass after they were trapped by a mudslide and began to starve.

"This material is really exceptional and unique," said Mietje Germonpre, a palaeontologist from the Royal Belgian Institute who partnered up with Fyodorov on the project and came to Yakutsk to oversee the autopsy of the second puppy earlier this month.

"The fact that soft tissue is preserved will give much more information compared to information that can be obtained from 'normal' fossils," she said, meaning bones and teeth.

Permafrost secrets

Fyodorov lamented the long time it takes to get ancient biological material to suitable labs due to financial constraints, the rugged terrain and red tape which sometimes means that samples reach laboratories only six months later.

"Everyone understands that the tissue of mammoth fauna loses its structure with every passing second, even in the freezer," he said.

Yakutia's melting permafrost is likely to yield up even more treasures in the coming years, he added, saying the number of reported prehistoric finds has grown "severalfold" in the last decade.

Warm and wet weather and flash floods have been a big contributor to the thaw, he said.

"Right now it's 0 degrees (Celsius) here. That should not be the case in March."

As better transport and technology becomes affordable, he said, locals are embarking on expeditions to more and more remote corners of Siberia to look for the precious and lucrative mammoth tusks, which can sell for tens of thousands of dollars and are increasingly prized by Chinese carvers given trade bans on elephant ivory.

In Russia, indigenous tribes are allowed to hunt for ancient remains on their ancestral lands.

"Our land is locked in by permafrost, but little by little it is revealing its secrets," Fyodorov said.