

Case study

Performagene™ DNA collection kits used in genetic study of the Mongolian bankhar dog

Study overview

The bankhar is an ancient breed of dog native to Mongolia, and for centuries herders have used them to protect their herds of livestock from local predators. During the Soviet occupation, the bankhar population dwindled to the point of endangerment, leading to nomadic herders resorting to shooting or poisoning any threats toward their herds. As a result, there has been a significant regional decrease in the populations of gray wolves and snow leopards.

Formed in 2004, the Nomadic Guardian's Foundation (NGF) was created with the goal of reintroducing the practice of herd defense using the bankhar, which would protect both the livestock and their predators. The bankhar have a storied history in Mongolia, whose people share a tremendous pride in the animal. This non-profit organization aims to increase their numbers while helping nomadic livestock owners maintain their herds in a safe and ecologically friendly manner.

The NGF is working in conjunction with UC Berkley's Institute of Canine Biology with the goal of using molecular genetic analysis to learn the history of the animal as well as to establish breeding pairs to raise new pups that can be trained and freely distributed to livestock owners.



“This is a Mongolian solution to a Mongolian problem based on ancient Mongolian tradition.”

NGF Founder Bruce Elfstrom, on restoring the bankhar population to peacefully protect livestock

Collection methods considered

There has never been a DNA study of bankhar, who are often characterized by a brown or yellow spot above each of their eyes. It is believed that they may be related to the Tibetan mastiff, although this has never been conclusively determined.

When the project was first designed, DNA samples were to be collected from the bankhar using blood extraction. This proved to be impractical due to the aggressive nature of some of the dogs as well as the inability for blood samples to remain stable for lengthy periods of time. Collections would be executed out of the laboratory in remote areas, with the research team having to travel upwards of thirteen hours at a time to procure samples. Having blood drawn from the bankhar would not be a realistic or cost-effective strategy.

"Performagene kits have greatly benefited our project. To be able to get high quality and quantity bankhar DNA through such a quick and easy process, even while wearing thick gloves in the Mongolian winter, is truly remarkable."

NGF Scientific Field
Coordinator Doug Lally

Why Performagene™?

DNA samples were collected using Performagene PG-100 collection kits, which have proven to be easy and effective in the study. Performagene/saliva samples are immediately stabilized at the point of collection and remain stable at room temperature for one year, allowing ample time to store and ship the samples without any worry of sample loss or contamination.

Performagene kits are also less invasive to the animal than having blood drawn, and can be administered quickly and easily by the dog's owner if the bankhar is particularly aggressive. Without the need for a trained expert to conduct the collection, the bankhar's owners can be instructed via translator how to use the collection kits, which would not be an option with a blood-based procedure. This has allowed the collection process to experience extremely high compliance.

Results

Collections have been carried out throughout Mongolia, including such remote areas as South Gobi and Khovd (where bankhar are rumoured to be truly pure), with analysis to be performed by Dr. Carol Beuchat at UC Berkley using the Illumina® CanineHD BeadChip. Performagene kits provide DNA that is of suitable quality and quantity for analysis on the BeadChip, and the durable nature of the kit itself ensures that there will be no risk of lost samples due to breakage or leakage between collection and analysis. Each Performagene tube contains a barcode correlating to the canine donor, giving confidence that every sample analysed can be linked back to its correct provider.

The NGF has already secured land to breed, raise and train bankhar pups once the genetic analysis has been completed. Currently 26 bankhar saliva DNA samples have been collected, with preliminary analysis performed on 14 of them. Early analysis has revealed no traces of European breeds in the bankhar DNA, and no two bankhar studied have been found to be related. This is encouraging news for the NGF's goal of finding breeding pairs.

With the help of Performagene DNA collection kits, the Nomadic Guardian's Foundation is poised to repopulate the Mongolian bankhar, allowing herds to be protected without the need to destroy their predators. This is a unique opportunity to use modern scientific discovery to reinstate an ancient practice.

To learn more about the Nomadic Guardian's Foundation, please visit its Facebook page at <https://www.facebook.com/bankhardogproject>.

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