TIBET ANTELOPE

Research Area: Wildlife Forensics / Conservation Genetics

Background: The Tibet Antelope, also known as the "chiru", is a large grazing mammal endemic to Tibet and western China. The species is considered **highly endangered** by the United Nations and international trade of chiru products has been illegal since 1979. None-the-less trade in chiru products remains a lucrative industry. The antelope's undercoat, especially from around the neck (called *shahtoosh*), is highly prized as a fine wool. In fact, shahtoosh is known as the "king of wool". Shahtoosh shawls and wraps, woven in the Indian state of Kashmir and costing up to $15,000 each, are considered a status symbol by the world's fashion elite. Traders of shahtoosh garments perpetuate the myth that the wool is gathered from trees and bushes that the chiru has rubbed against during the annual spring molt. In fact, the antelope must be killed for the wool and each shawl requires three to five antelope pelts. Chiru are on the verge of extinction because of the continuing shahtoosh trade. Biologists estimate that 75,000 to 100,000 Tibet antelopes remain in the wild. Unfortunately, as many as 20,000 a year are killed by gangs in China who shoot the animals 500 at a time from vehicles and smuggle the wool to India.

By George B. Schaller / courtesy Wildlife Conservation Society

By Bill Bleisch / courtesy CERS

On 17 April 2000, British authorities raided the north London warehouse of the AsiaWorld trading company and confiscated 138 shahtoosh shawls, worth an estimated $560,000. Authorities estimated that 1,000 antelope pelts were used to make the 138 wraps. The president of AsiaWorld, Mr. Duojie Xil, at first denied that the shawls were shahtoosh. He claimed that the fur used was a mix of sheep and goat hairs, a well known combination in the shady, fake shahtoosh market which is supplied by products from Pakistan and Kyrgystan. In an odd twist, in the beginning of his trial, Mr. Xil changed his story and insisted that the shawls were indeed made from shahtoosh. Apparently, Mr. Xil had been advised by his lawyers that the rather trivial fines normally imposed in the U.K. for wildlife smuggling ($2,500) were to be preferred over the potential retributions of some of his underworld clients, if his furs were fake. The prosecutors and Scotland Yard now have a problem. If they charge Mr. Xil with the wrong crime, a mistrial will be declared. If the shawls are shahtoosh then a charge of wildlife smuggling is appropriate. If the shawls are fake, then charges of mail fraud and other British consumer laws would apply. If Mr. Xil can be convicted, then Scotland Yard can proceed to investigate AsiaWorld which they have reason to suspect is the base of several major world-wide smuggling operations.

Information and Data:

You have been contacted by Scotland Yard to help determine what species of animal provided hairs for the shawls. Based on previous arrests, it is known that 95% of fake shahtoosh is made from the fur of four animals, two varieties of goats and to types of sheep. You are being asked to use DNA genotypes as markers to help distinguish among the possible furs. In this type of genotype analysis, you will have to rely on shared similarities within species. Hair from the same species should have very similar sized DNA markers. Your best hope is that you can identify DNA markers that are unique to a species.

- You are provided with 2 DNA samples from two of the confiscated shawls
- DNAs from hair samples of 4 most likely "fake" fur sources are also available. These samples include Alai Sheep (Kyrgystan), Cholistani Sheep (Pakistan), Huaipi Goat (China), Loashan Goat (China).
- Two certified DNA samples from Chiru are also provided.
- Your laboratory has the capability to determine genotypes at six microsatellite loci. All of the loci exhibit co-dominant modes of inheritance. Some of the locus will be informative, some may not. You may use as many or as few loci as you feel are necessary.

Assigment:

1. Use the *ELS* program to collect genotype data from each of the 8 individuals. Be sure to carefully record the sample identification information on the **Electrophoresis Loading Sheets** and the genotypes on the **Genotyping Data Sheet.** Your data set is called *Antelope Data.*

2. Before examining the data, propose a hypothesis for one possible outcome of your investigation. Based on this hypothesis, state a prediction and an alternative that will allow you to answer the investigator's question.

Hypothesis:

Prediction 1:

Alternative:

4. Examine the genotype data. Based on the genotypes of the two known Chiru, what size range of DNA markers would you expect for each locus.

5. Examine the full data set. Are any markers unique for the Chiru? Which species (if any) do the hairs found in the shawls most closely resemble? Can you refute either your prediction or the alternative? Carefully consider the logic that you use. Remember that alleles that can exclude samples are more "powerful" than those that are shared.

6. What can you tell Scotland Yard? Which criminal charge do your data suggest would be the most appropriate?

7. Using the word processor on your computer, write a report (see Report Format instructions) outlining your investigation, describing the results and providing your conclusions. Be sure to include careful statements about the logic that led you to your decision.

8. Submit your report and your worksheets to your TA.