CSI: St.Lawrence
Laboratory Activity
Comparison of Mammalian Hair
March 18, 2008

Objectives:
to observe and categorize types of mammalian hair

Background:
Refer to the sections in Chapter 17 of your textbook that deal with fiber and hair (pages 269-275)

Assignment – Due March 25, 2008
One report per team of three students
1. Complete Table 1. Specify the types of animal hair you examined. Specify the number of the unknown sample you examined.
2. Based on the data you collected on scale patterns and medullary index, identify the probable source of one unknown hair sample. Use the figures and charts provided to help justify your decision. Choices for unknown: llama, cow, horse, cat, rabbit, dog, or pig.

Scale cast preparations
© Procedure adapted from Forensics in the Classroom, by Topics Education Group and Court TV
Materials:

marker or wax pencil	4 microscope slides
a sample of hair from one student (untreated)	4 coverslips
samples of 2 types of animal hair	clear nail polish
1 unknown hair sample	forceps

Procedure. Prepare scale casts

1. Place 1 drop of clear nail polish at one end of a microscope slide.

2. Hold a coverslip at a 45-degree angle beside the drop of fingernail polish and allow the drop to run along the edge of the coverslip.

3. Gently drag the coverslip across the slide so the polish covers the surface of the slide.

4. Quickly place three or four pieces of human hair onto the polish so that the majority of the hair is laying on the slide (in the polish) and a small piece is hanging off of the edge.

5. Place the slide in an area where it will not be disturbed.

6. Repeat steps 1-5 for the two types of animal hair as well as for the unknown hair sample you have been assigned.

7. Allow slides to dry for about 20 minutes.

8. When the nail polish has dried, use forceps to pull the hair out of the polish and off of the slide by quickly tugging the hair at the exposed ends.

Procedure. Examine scale casts

9. View the samples first under low power, then with the 10X lens, then using the 40X lens.

10. To prevent scratching the lenses, return the smallest slide into the viewing position before removing your slide from the microscope stage.

11. DRAW THE SCALE PATTERNS IN TABLE 1.

While the scale cast preparations are drying, prepare and examine hair shafts using the following procedure.

Wet mount preparations

© Procedure adapted from Forensics in the Classroom, by Topics Education Group and Court TV

Materials:

marker or wax pencil   3 microscope slides
samples of 2 types of animal hair   3 coverslips
1 unknown   water in dropper bottles

Procedure:

1. Place a few strands of hair on a microscope slide and add one drop of water on the hair.

2. Carefully place the coverslip on top of the water drop and gently tap to remove excess water and air.

3. Place the slide on the microscope stage and examine with the smallest lens.

4. View the sample first under low power, then with the 10X lens, then using the 40X lens.

5. MAKE A SKETCH OF THE HAIR SHAFT IN TABLE 1. AND ESTIMATE THE MEDULLARY INDEX (see page 270 of your text for a description and uses of medullary index)

6. To prevent scratching the lenses, return the smallest lens into the viewing position before removing your slide from the microscope stage.

7. Repeat the procedure for two samples of animal hair as well as for the unknown.

To estimate the medullary index $= \dfrac{\text{width of medulla}}{\text{width of hair}}$

Table 1. Sketches of hair samples from different mammals

	color of hair	sketch of hair shaft at 400X	drawing of hair scales	estimation of medullary index
human hair		compare to drawings from previous lab		
animal hair				
animal hair				
unknown				