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A Rapid Technique for Preparing Hair Cuticular Scale Casts

One of the morphological features used for the examination and comparison of hair is the cuticular scale pattern. The shape and arrangement of the scales on the cuticle vary considerably in different species and to a lesser extent within species.

A number of techniques have been developed to prepare hair casts in order to visualize the cuticular scales, owing to the difficulty encountered in perceiving the scale patterns in whole mounts. Hardy and Plitt [*1*] described a casting method wherein the hairs were partially embedded in thermoplastic sheets to produce cuticular scale impressions. Wildman [*2*] described a technique which involved creating impressions on microscope slides previously coated with polyvinyl acetate, and other techniques which employed gelatin as the impression material.

The authors have used these methods and found them somewhat cumbersome in practice. They have developed a method which is more suited to routine casework involving hair examination, especially in those cases which involve the examination of a large number of hairs. The technique is rapid and simple and produces a cast with good definition of the cuticular scale pattern. Some difficulties are encountered in dealing with hair which is coarse and curly, and earlier methods may have to be employed to obtain adequate impressions of this type of hair.

Method

The hair to be cast is first examined microscopically to ascertain the presence of foreign materials which may aid in the comparison process. Next the hair is washed in an organic solvent such as chloroform or acetone to remove surface impurities.

The hair is then placed on a clean microscope slide and anchored at one end with a fingertip or pressure sensitive tape. A thin film is spread over the hair and microscope slide with several strokes from a Polaroid[2] black-and-white land film coater, which is ordinarily used to spread a protective coating on black-and-white Polaroid prints. The coating is allowed to dry thoroughly, and the hair is removed with a pair of needlepoint forceps. Removal of the hair leaves a stable, well defined impression of the cuticular scale pattern in the coating. The hair can be used subsequently for preparation of a whole mount, as the coating material does not appear to interfere with subsequent microscopic examination. This technique is not recommended when the hair is to be subjected to neutron activation analysis.

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[2] Polaroid Corporation, Cambridge, Massachusetts

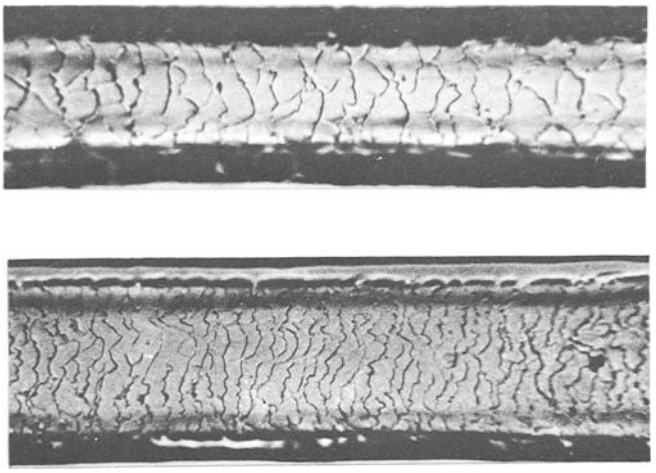

FIG. 1—*Scale casts of dog hair (top) and human hair (bottom).*

Figure 1 illustrates a scale cast of a dog hair (top) and a human hair (bottom) prepared with the authors' method.

The advantage of this method is the rapidity and ease with which a large number of scale casts can be made, factors which are of importance in those laboratories which have a sizable caseload involving hair examinations.

Summary

A rapid technique for preparing cuticular scale casts of hair is described. The method is simple and provides an excellent reproduction of the scale pattern.

References

[1] Hardy, J. I. and Plitt, T. M., *An Improved Method for Revealing the Surface Structure of Fur Fibres*, U.S. Department of Interior, Wildlife Circular No. 7, 1940.

[2] Wildman, A. B., "The Microscopy of Animal Textile Fibres," *Wool Industries Research Association, Annual Report*, 1954.

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