Rec. zool. Surv. India, **93** (1-2) : 31-34, 1993

STUDY OF SURFACE STRUCTURE OF HAIR OF SOME PRIMATES OF INDIAN SUB-CONTINENT

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Introduction

Hairs of some species of *Macaca* were investigated with the help of a Scanning Electron Microscope (SEM) to obtain fine structural details on hair surface. Attempt to identify the specific characters of hair structures of these species have been made.

Hairs have certain distinct advantages from the point of taxonomy and systematics (Cole, 1924 ; Mathiak, 1938), forensic sciences (Seta *et al.*, 1975), criminology (Curry, 1972) etc. The aim of the present study was to find out basic characters of the surface ultra-structures of hairs of *Macaca* spp, Initially hairs of *Macaca assamensis assamensis* (M'Clelland), *Macaca fascicularis aurea* Geoffroy and *Macaca mulatta* (Zimmermann) were studied with the help of the Scanning Electron Microscope (SEM).

Information regarding surface ultra-structure of hairs in Indian wild mammalian forms is meagre. Some works on the surface of hair have been done by Kopikar and Sabnis (1976, 1977). During early twentieth centuries animals hair studies were extensively made by a number of workers such as Friedenthal (1911), Hausman (1924), Williams (1938) etc. Their studies were, however, mainly confined to the light microscopic observation only.

Materials and Methods

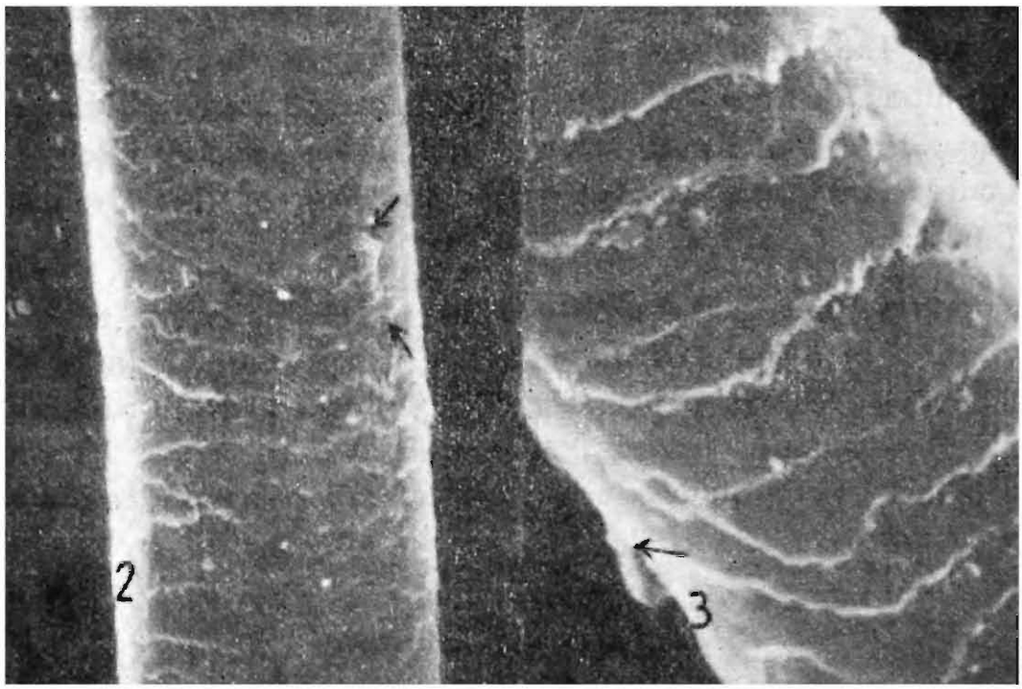
Hair samples were collected from the rump region of three species of the genus *Macaca* collected during 1878 to 1880 and preserved in the National Zoological Collections, Zoological Survey of India, Calcutta.

Twenty to 25 hair strands of each species were taken for investigation. Hair strands were thoroughly washed in petroleum ether to dissolve external contamination as well as fatty substances. Subsequently the samples were studied under SEM following the technique of Pal and De (1978).

Results

Results of three-dimensional structure of hairs of three species of *Macaca* are detailed below :—

Macaca fascicularis aurea (Fig. 1) :



Figs. 1-3. 1. Scanning electron micrograph of a part of hair of *Macaca fascicularis aurea* showing highly crenated scales (dark arrows) and exogenous particles (White arrows). X 1344.

2. 3D structure of a part of hair of *Macaca assamensis assamensis* depicting puncture and depression (arrows) on the surface. X 672.

3. Scanning electron micrograph of a part of hair of *Macaca mulatta* showing extension of cortical scale (arrow). X 2688.

Diameter of hair varies from 37.30 to 62.50 μ. Surface consists of cuticular scales with crenate margins. Amplitude of bare portion of scales varies from 4.45 to 6.50 μ. Occasionally surface shows extensive breakages of cortical scales.

Macaca assemensis assamensis (Fig. 2) :

The surface of hairs consists of regularly arranged cuticular scales of crenate type. Diameter varies from 35.25 to 52.25 μ and interscaler portion varies from 5.90 to 11.95 μ. Occationally the surface is punctured by ridges and furrows.

Macaca mulatta (Fig. 3) :

Diameter remains within the range of 29.00 to 42.50 μ and amplitude of bare portion of scales remains within 3.35 to 5.35 μ. Cortical scales are of crenate type. But crenation is ill developed. Extensions of cortical scales are found occasionally. Sometimes crystal like exogenous substances are found on the surface.

Discussion

The hairs for the present study possess highly crenated type of scales with veriable inter-scalar portion. The breadth of the bare portion of scales within these species of *Macaca* varies from 3.35 to 11.95 μ. Hair strands for the present study consist of crenate type of scales. This observation is quite different from the findings of Kopikar and Sabnis (1976) who have noted that the hair in *Macaca mulatta* is devoid of scales. This scaleless feature observed by the above authors may be due to the association of microbes on the hair shaft. The unusual changes in the cortical scales are due to attack of dermatophytes such as mycelial form of saprophytic yeasts which are responsible for surface erosion and subsequent obliteration of scales (Carteaud, 1973 ; De 1982 ; Pal *et al.*, 1981).

Hairs of the species studied above have number of overlapping characters. Further extensive studies are, therefore, required to formulate a suitable key at specific level.

Oglae and Mitsinka (1973) concluded that the shape and arrangement of the scales on the cuticle vary considerably in different species and to a lesser extent within the same species. Thus, cuticular scale pattern and their disposition on the hair surface may serve as useful diagnostic feature for the identification of different mammalian species. Further, according to Sudo and Seta (1975) and Kind (1965), medullary index may be helpful for the identification of animal species. However, this may not be true for the hairs of Rhinocerotidae. It would, thus appear that further studies on the surface ultra-structure along with medullary index may be helpful in identifying deffe-rent mammalian species.

ACKNOWLEDGEMENTS

I am very much thankful to the Director, Zoological Survey of India for providing facilities for this work. I am also grateful to the officers and staff of the Mammal and Osteology Section and Higher Chordata Division, Zoological Survey of India, for their suggestions and help in various ways.

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