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Characterisations of hair of Hoolock Gibbon *Hoolock hoolock* (Harlan, 1834) (Hylobatidae: Primates: Mammalia)

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Abstract

The present study was undertaken to know the characterisations of hair of Hoolock Gibbon, *Hoolock hoolock*. The laboratory study was conducted at the Mammal & Osteology section, Zoological Survey of India, Kolkata during January – July, 2016. Microscopic hair analysis of Hoolock Gibbon *Hoolock hoolock* was done using optical light microscope for its species identification. The hair of *H. hoolock* can easily be identified on basis of their unique medulla and transverse section of hair. The high-resolution photo-micrographs and key characteristics of hair presented here can be used as an appropriate reference for species identification.

Keywords: Hoolock Gibbon, *Hoolock hoolock*, food habit, carnivores, morpho-taxonomy

1. Introduction

Tricho-taxonomy *i.e.* study of mammal hairs is one of the methods for identification of mammals based on the hair characteristics, which is relatively significant in the study of food habit of carnivores and is supportive to control the illegal trade in wildlife and its derivatives [8]. While the morpho-taxonomy is unable to provide a fruitful result in the case of small part of the skin of a mammal, the tricho-taxonomy may be used for identification of species on the basis of a combination of microscopic characters [2]. There are many workers *viz.*, Mayer [5]; Stains [10]; Brunner and Coman [1]; Moore *et al.* [7]; Koppikar and Sabins [4]; Teerink [11]; Wallis [12]; Chakraborty and De [2] have well documented the different hair characters of mammals.

In India, the tricho-taxonomic studies have been carried out by many workers on different species of mammals *viz.*, Koppikar and Sabins (Artiodactyls) [4]; Chakraborty and De (Carnivores) [2]; Sarkar *et al.* (Primates) [9]. The hoolock gibbon is the only ape found in India, and the only primate in India have sexual dimorphism by colour, whereas the male is black and female is golden blonde; distributed wider range of all the states of the north-eastern India; as per the IUCN Red list, this animal is endangered and listed under Schedule I of the Indian Wildlife (Protection) Act, 1972 [6]. However, tricho-taxonomic studies on species of the Hoolock Gibbon *Hoolock hoolock* is unknown. Therefore, the microscopic analysis of hairs of *H. hoolock* was studied and present in this paper.

2. Materials and Methods

The hairs of male and female of *H. hoolock* were collected from the dry flat skins housed in the National Zoological Collections, Mammal and Osteology Section, Zoological Survey of India, Kolkata, India. The laboratory study was conducted at the Mammal & Osteology section, Zoological Survey of India, Kolkata during January – July, 2016. The samples were washed thoroughly with acetone ((CH₃)₂CO = 58.08) and carbon tetrachloride (CCl₄ = 153.82) to remove the dirt of exogenous materials. The cuticular characters of hair such as scale position, scale patterns, structure of scale margins and distance between scale margins and medullary characters such as width composition, structure and form of margins of the medulla, and shape of cross-section of hair were examined under 400 X magnification with help of the digital camera fitted on optical microscope (Olympus BX41) and the observed microscopic characters of hair were photographed.

The methodology and nomenclature of cuticular, medullary and cross-sectional characteristics of dorsal guard hairs were followed according to the descriptions provided by Brunner and Comman [1], Moore *et al.* [7] and Teerink [11].

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3. Results and Discussion

The hair of *H. hoolock* (Table 1; Fig. 1 and 2) was sexually dimorphic, the male coat colour was blackish and the female was golden blonde. The cuticular characteristics were similar between the male and female of *H. hoolock* such as the scale position was 'transversal', scale patterns was 'regular wave', the structure of scale margins was 'smooth' and the distance between scale margins- 'distant'. Similarly, the medullary

characteristics hair of male and female *H. hoolock* were as: composition of medulla- 'unicellular', the structure of medulla- 'interrupted', and form of the medulla margins- 'scalloped'. However, the cross-section of hair was varied between the genders and observed as 'oval' and 'circular' shape in the male and female of hair of *H. hoolock*, respectively.

Table 1: Microscopic hair characteristics of male and female of *Hoolock hoolock*

Microscopic hair characteristics	Male	Female
Cuticular scale position	Transversal	Transversal
Cuticular scale patterns	Regular wave	Regular wave
Cuticular Structure of scale margins	Smooth	Smooth
Distance between cuticular scale margins	Distant	Distant
Composition of medulla	Unicellular	Unicellular
Structure of medulla	Interrupted	Interrupted
Margins of medulla	Scalloped	Scalloped
Shape of cross-section	Oval	Circular

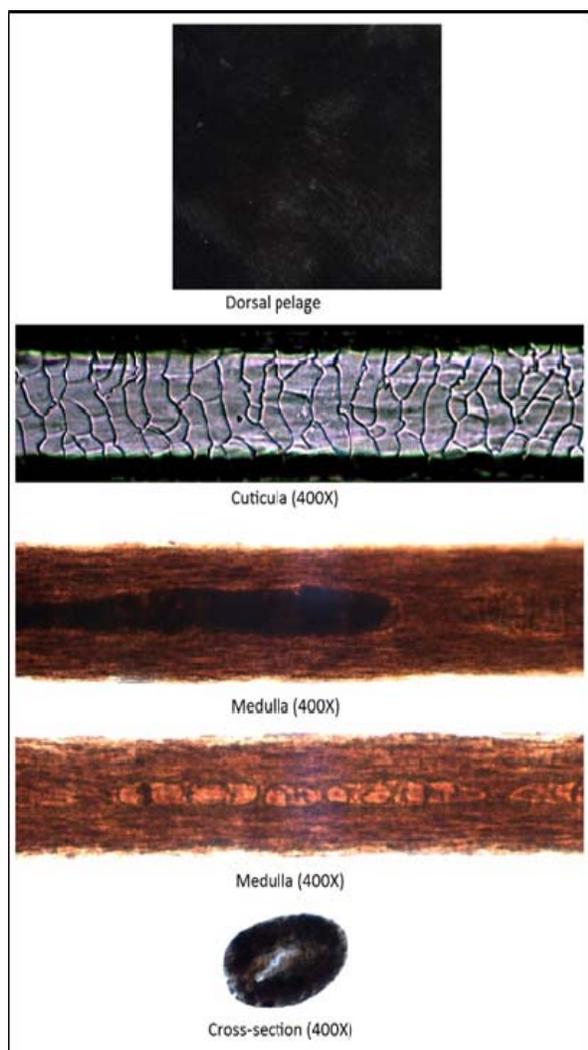


Fig 1: Photo-micrograph of hairs of male *Hoolock hoolock*

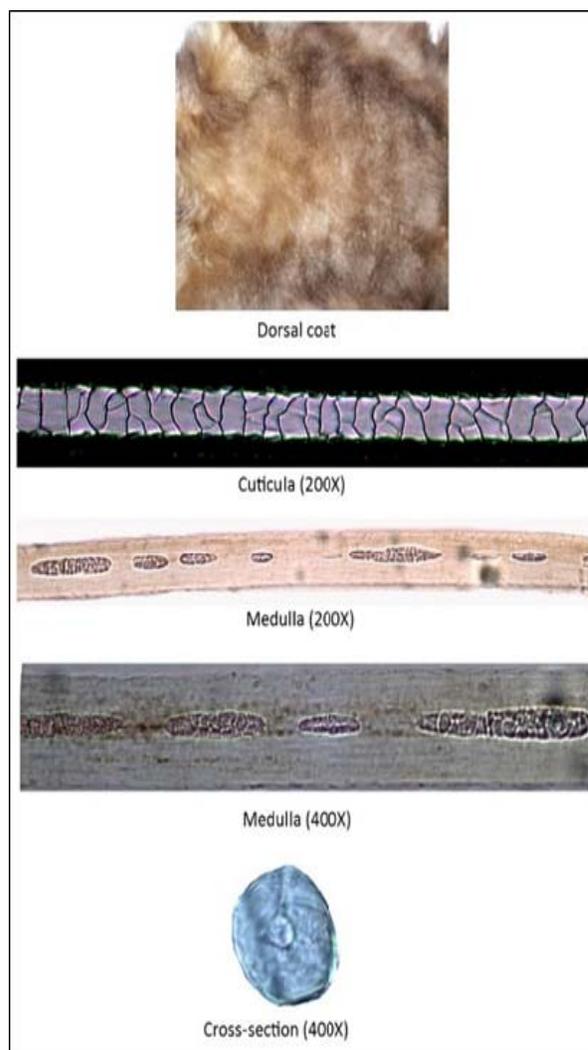


Fig 2: Photo-micrograph of hairs of female *Hoolock hoolock*

H. hoolock can easily be distinguished from all other primates by its coat colour, which was sexually dimorphic [6]. The distinct microscopic characters such as 'regular wave' pattern and 'distant' margin of cuticular scales, 'unicellular' and 'interrupted' medulla, and the shape of the cross-section was 'oval' and 'circular' between the male and female also determines the species identity of *H. hoolock*. Similar observation has been made by De [3] in a study of surface structure of hair of some primates of Indian sub- continent. Sarkar *et al.* [9] have documented the hair characters of five species of the family Cercopithecidae, however, the hair characters are varied comparatively. The mammals of hair can be identified with a combination of microscopic characters [2]. Therefore, this study provides a complete combination of characters of dorsal guard hair of *H. hoolock* for species identification.

4. Conclusion

As mentioned earlier, the *H. hoolock* is an endangered mammal threatened by many factors including the illegal trade. This animal is poached for traditional medicinal uses and for bushmeat consumption. It is one of the prey for large carnivores in wild. Therefore, the photo-micrographs are presented here can be used in forensic science as well as prey-predator food analysis as an appropriate reference for the species identification.

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6. References

1. Brunner H, Comman B. The Structure of Hairs. Inkata Press, Melbourne, Australia. 1974, 170.
2. Chakraborty R, De JK. Atlas on hairs Indian Mammals Part- I: Carnivora: Published by the Director, Zoological Survey India. 2010, 141.
3. De JK. Study of surface structure of hair of some Primates of Indian sub- continent. Records of the Zoological Survey of India. 1993; 93:31-34.
4. Koppiker BR, Sabins JH. Identification of hairs of some Indian mammals. Journal of Bombay Natural History and Society. 1975; 73:5-20.
5. Mayer WV. The hair of California mammals with keys to the dorsal guard hairs of California mammals. American Midland Naturalist. 1952; 38:480-512.
6. Menon V. Indian mammals- a field guide. Hachette (India) Pvt. Limited. 2014, 528.
7. Moore TD, Spence LE, Dugnolle CE. Identification of the dorsal guard hairs of some mammals of Wyoming. Game and Fish Department, Wyoming, 1974, 177.
8. Sahajibal V, Goyal SP, Singh K, Tahkur V. Dealing wildlife offences in India: Role of the hair as physical evidence. International Journal of Trichology. 2010; 1:18-26.
9. Sarkar PS, De JK, Manna CK. Identification of dorsal guard hair of five species of the family Cercopithecidae (Primates: Mammalia). Current Science. 2011; 100:1725-1728.
10. Stains HJ. Field key to guard hair of Middle Western furbearers. Journal of Wildlife Management. 1952; 22:95-97.
11. Teerink BJ. Hair of West-European mammals atlas and identification key. Cambridge: Cambridge University Press. 1991, 223.

12. Wallis RL. A key for the identification of guard hairs of some Ontario mammals. Canadian Journal of Zoology. 1993; 71:587-591.