



Hair morphology of dorsal guard hair of asiatic wild dog *Cuon alpinus* (Pallas, 1811)

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ABSTRACT

The microscopic characteristics of dorsal guard hairs of wild dog *Cuon alpinus* were examined using an optical light microscope for species identification. The hair was characterised by mainly its multicellular and narrow medulla lattice, and oblong or oval shape of cross-section. The microphotographs and characteristics of dorsal guard hair of *Cuon alpinus* presented here can be used as an appropriate reference for the species identification.

Key words: *Cuon alpinus*, dorsal guard hair, microscopic characteristics, tricho-taxonomy

INTRODUCTION

Detailed knowledge on the hair structure is required to identify the species, where the morpho-taxonomy cannot give the exact result. In India, the tricho-taxonomic studies have been carried out by many workers on different orders of class Mammalia viz., Carnivora (Chakraborty and De, 2010), Primates (De, 1993; Sarkar, et al., 2011) and Rodentia (Bahuguna, 2008). The aim of this study is to give a complete physical and microscopic characteristics with high-resolution microphotographs of hair of wild dog *Cuon alpinus* (Pallas, 1811) for species identification.

The wild dog is midway between wolf and jackal, with a more homogeneous colouration. Its coat colour is reddish-brown, with a dark tail and feet and the coat is thicker in winter; ears are filled with woolly whitish hair and bent and rounded at the tip; the tail is relatively long, darker, bushy and bent; distributed in south of river Ganges peninsula from Coorg and Nilgiri hills, and from northwards Jammu and Kashmir to North-eastern India in India; as per International Union for

Conservation of Nature (IUCN) Red List category, it is an endangered species and listed under the Schedule II of the Indian Wildlife (Protection) Act, 1972 and listed in the Appendix –II of The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (Prater, 1971; Menon, 2014).

MATERIALS AND METHODS

The mid-dorsal guard hairs of *C. alpinus* were collected from three dry skins housed in the National Zoological Collections, Mammal and Osteology Section, Zoological Survey of India, Kolkata, India. Macroscopic characteristics of hair such as coat colour, individual hair colour, profile, length and diameter were recorded using hand lens and Vernier caliper. Microscopic characteristics of hair such as cuticular scale position, scale pattern, scale margin and scale margin distance of hair, the medullary configurations of hair such as composition, structure and margins of the medulla of hair and shape of the cross-section of hairs were recorded with the help of an optical light microscope (Nikon- ECLIPSE 50i). To study the

structure of cuticula, the hair samples were washed with different grades of Acetone (50–95 %) and chopped into small pieces, placed separately on the thin film of clear varnish on the microscopic glass slide, and allowed to dry overnight. The dried hairs were pulled off gently with a fine forceps leaving the impression or casts of scales on the thin film of the microscopic glass slide. To study the structure of medulla, hairs were cut into small pieces and placed separately on microscopic glass slide and mounted microscopic glass slide. To study the shape of cross-section, a simple hand sectioning method was performed. Nomenclature of different parameters was followed by Brunner and Coman (1974) and Teerink (1991).

Table 1. Macroscopic hair characteristics of *Cuon alpinus*

Coat colour	Rusty red
Colour of dorsal guard hair	Unicoloured; reddish brown
No. of colour bands	Nil
Profile	Straight
Length (mm)	19.7–87.4 (45.8±24.8)
Diameter (µm)	5.1–9.1 (7.5±1.3)



Fig. 1. Physical Structure

RESULTS AND DISCUSSION

The rusty red coat and reddish brown (individual hair) and straight profile are the macroscopic characteristics of dorsal guard hair *C. alpinus* (Table 1). The cuticular scale characteristics of hair recorded as scale position- ‘transversal’, scale patterns-‘irregular wave’, the structure of scale margins-‘rippled’ and the distance between scale margins- ‘near’. The medullary characteristics of hair observed as the composition of medulla- ‘multicellular’, the structure of medulla- ‘narrow medulla lattice’, a form of the medulla margins- ‘straight’ and the shape of the cross-section of hair is ‘Oblong / Oval’ (Table 2; Fig. 1).

Table 2. Microscopic hair characteristics of *Cuon alpinus*

Cuticular scale position	Transversal
Cuticular scale patterns	Irregular wave
Cuticular Structure of scale margins	Rippled
Distance between cuticular scale margins	Near
Composition of medulla	Multicellular
Structure of medulla	Narrow medulla lattice
Margins of medulla	Straight
Shape of cross-section	Oblong / Oval

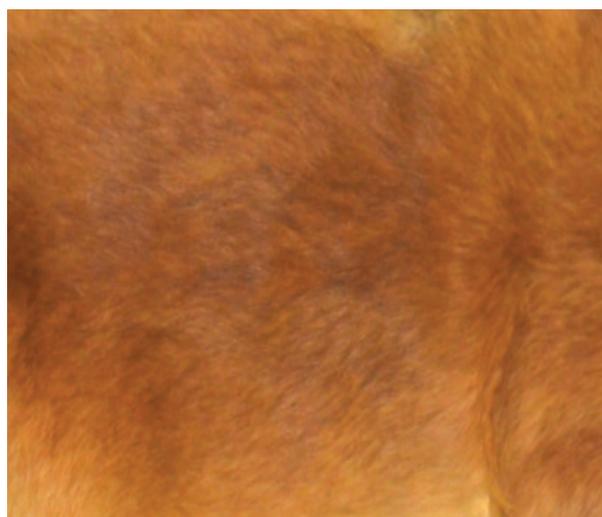


Fig. 2. Dorsal Pelage

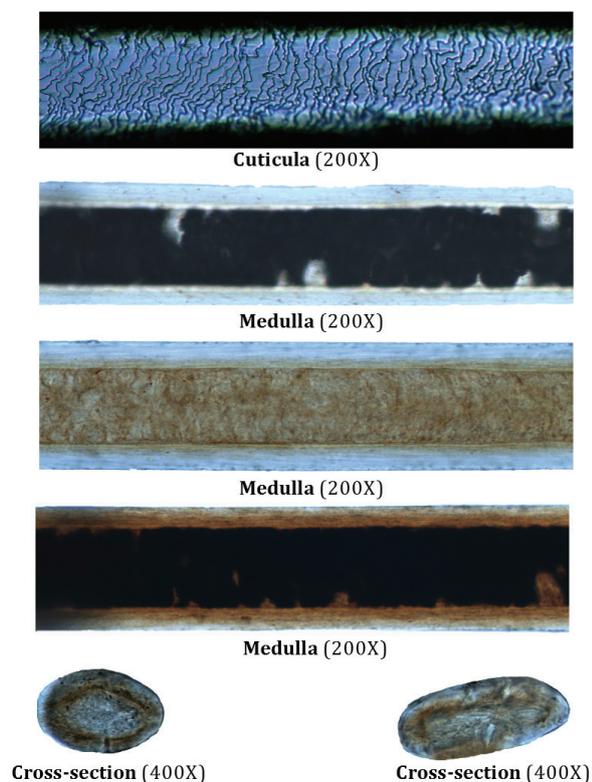


Fig. 3. Cross section of cuticulla and medulla 400 X

The wild dog is generally identified by its coat colour- reddish-brown, with a dark tail (Menon, 2014). Apart from this, its hair microscopic characters i.e. Cuticula, medulla and cross-section can also be used for diagnosing this species. The unique multi-cellular and narrow medulla lattice, and oblong or oval shape of the cross-section are the key characters of hair of this species. This study also supports the findings of Chakraborty and De (2010).

The identification keys along with the high-resolution microphotographs presented here can be used in the animal forensic science, as an appropriate reference for species identification.

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