

TRICHO-TAXONOMIC STUDIES FOR IDENTIFICATION OF WILD BOAR, *SUS SCROFA* LINNAEUS, 1758 BY DORSAL GUARD HAIRS (SUIDAE: ARTIODACTYLA: MAMMALIA)

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ABSTRACT

The macroscopic and microscopic characters of dorsal guard hairs of *Sus scrofa* Linnaeus, 1758 were examined using optical light and scanning electron microscopes for species identification. The hair of *Sus scrofa* is characterised by brown coat with tinged grey colour hairs, the profile is straight, thicker in diameter ($109.4 \pm 41.1\mu\text{m}$) and have distinct microscopic characters such as irregular wave pattern and close margin of cuticular scales, unicellular regular and simple medulla, and circular shape. The micro and macroscopic characters of dorsal guard hairs can be used predator diet analysis as well as in forensic science as an appropriate reference for the species identification.

Key Words: *Sus scrofa*, tricho-taxonomy, dorsal guard hair, morphological and microscopic characters.

INTRODUCTION

The wild boar, *Sus scrofa*, Linnaeus, 1758 is a bulky, massively built suid, can be differentiated from domestic pig by its black mane extending halfway down the back and the wild form is more hairy than the domestic form. In general, body colour mixed with grey, brown and white hairs. The head is elongated with truncated snout and ends with disc bearing nostrils. Adult males develop tusks, that teeth of upper and lower canine. Wild boars are gregarious, forming herds, active in both day and night and are found in all variety of habitats including cultivated fields along forested areas. It is omnivorous in diet feeds on roots, grasses, crops, tubers, invertebrates and carrion. It is distributed throughout the country except the high Himalayas and desert areas of Rajasthan and Gujarat in India (Prater, 1971; Alfred *et al.*, 2006; Menon, 2014). Threats include

habitat fragmentation, agriculture and farming, livestock grazing, inbreeding and poaching. Conservation status of this species is as per the IUCN Red List- Least Concern; Indian Wildlife (Protection) Act, 1972-Schedule III; CITES-Not Evaluated.

Adequate and systematic knowledge of structure of dorsal guard hair is necessary to identify the species and data generated from macroscopic and microscopic characteristics of dorsal guard hair will provide pertinent information for species identification. Detailed knowledge on the hair structure is required to identify the species, where the morpho-taxonomy cannot give the proper result. In India, the tricho-taxonomic studies have been carried out by many workers on different orders of class Mammalia *viz.*, Koppikar & Sabins (1976); Rajaram & Manon (1985); De (1993); Chakraborty & De (2010); Bahuguna *et*

al. (2010) and Sarkar (2011). However, scanty information is available on the hair structure of *Sus scrofa*. Therefore, the present study was undertaken to provide a complete combination of characters *i.e.* macro and microscopic characters of hairs of Wild Boar for species identification.

MATERIALS AND METHODS

About 10-15 tufts of dorsal guard hair were collected from the mid-dorsal region of three dry specimens of Wild Boar present in the National Zoological Collection, Mammal and Osteology Section of the Zoological Survey of India, Kolkata, India. The samples were washed thoroughly in Carbon tetra chloride after by Chakraborty *et al.* (1996) to remove the dirt of exogenous materials. Macroscopic characters of hairs such as profile,

colour, bands were recorded and diameter and total length were measured through dial calliper. Microscopic characters such as scale position, scale pattern, scale margin and scale margin distance of hair were studied with help of the digital camera fitted on optical light microscope (Olympus BX41) and Scanning Electron Microscope (ZEISS Evo18- Special Edition). The medullary configuration and composition, structure and margins of the medulla were also noted. The measurement values of cuticula and medulla were recorded with the help of optical light microscope. Nomenclature of different parameters were followed by Bruner & Coman (1974); Moore *et al.* (1974); Teerink (1991) and Chakraborty *et al.* (1996) and nomenclature of colour was after by Ridgway (1886).

Table-II. Macroscopic characteristics of the dorsal guard hair of *Sus scrofa*

Coat colour	Brown coat tinged with black and grey hairs
Colour of dorsal guard hair	Bicoloured, <i>Base</i> : Black; <i>Tip</i> : Ivory
No. of colour bands	2
Profile	Straight
Length (mm)	19.7–87.4 (45.8±24.8)
Width (µm)	15.2–149.6 (109.4±41.1)

Table-II. Microscopic characteristics

a. Cuticular scale characteristics		
	<i>Shield region</i>	<i>Sub-shield region</i>
Scale position	Transversal	Transversal
Scale patterns	Irregular wave	Irregular wave
Structure of scale margins	Rippled	Rippled
Distance between scale margins	Close	Close
Scale count/mm length of hair	132–198 (172±18.8)	128–190 (161±20.2)
Length of scale (µm)	87.2–110.4 (100.1±6.1)	19.8–81.1 (69±18.4)
Width of scale (µm)	5.6–10.6 (8.6±1.6)	5.6–10.7 (8.1±1.6)
b. Medullary characteristics		
	<i>Shield region</i>	<i>Sub-shield region</i>
Composition of medulla	Unicellular regular	Unicellular regular
Structure of medulla	Simple	Simple
Margins of medulla	Straight	Straight
Width of medulla (µm)	140–149.1 (145.3±2.5)	99.2–105.7 (102.5±2.5)
c. Shape of cross-section		
	Circular	

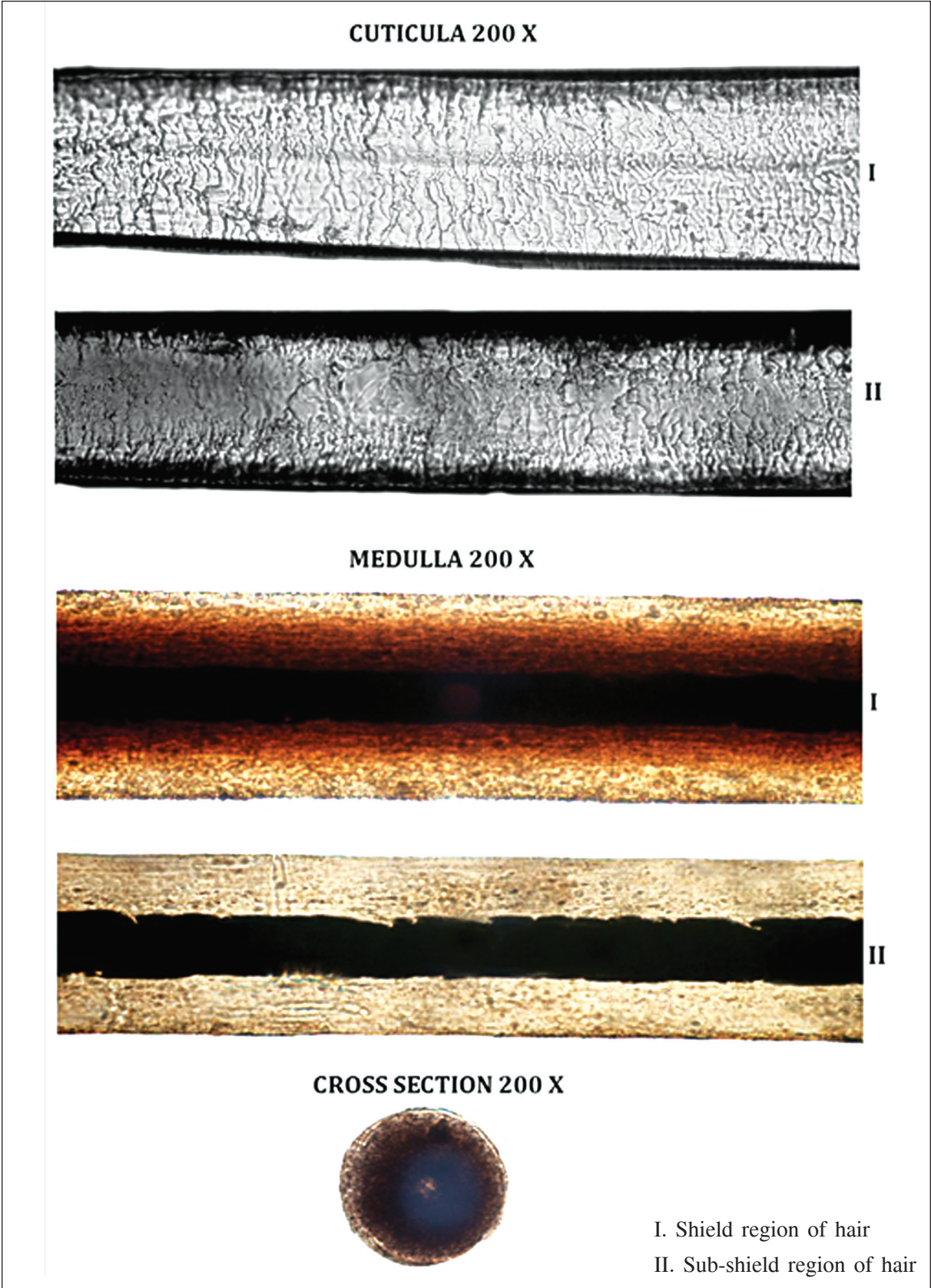


Fig. 1. Microscopic characteristics of dorsal guard hair of *sus scrofa*

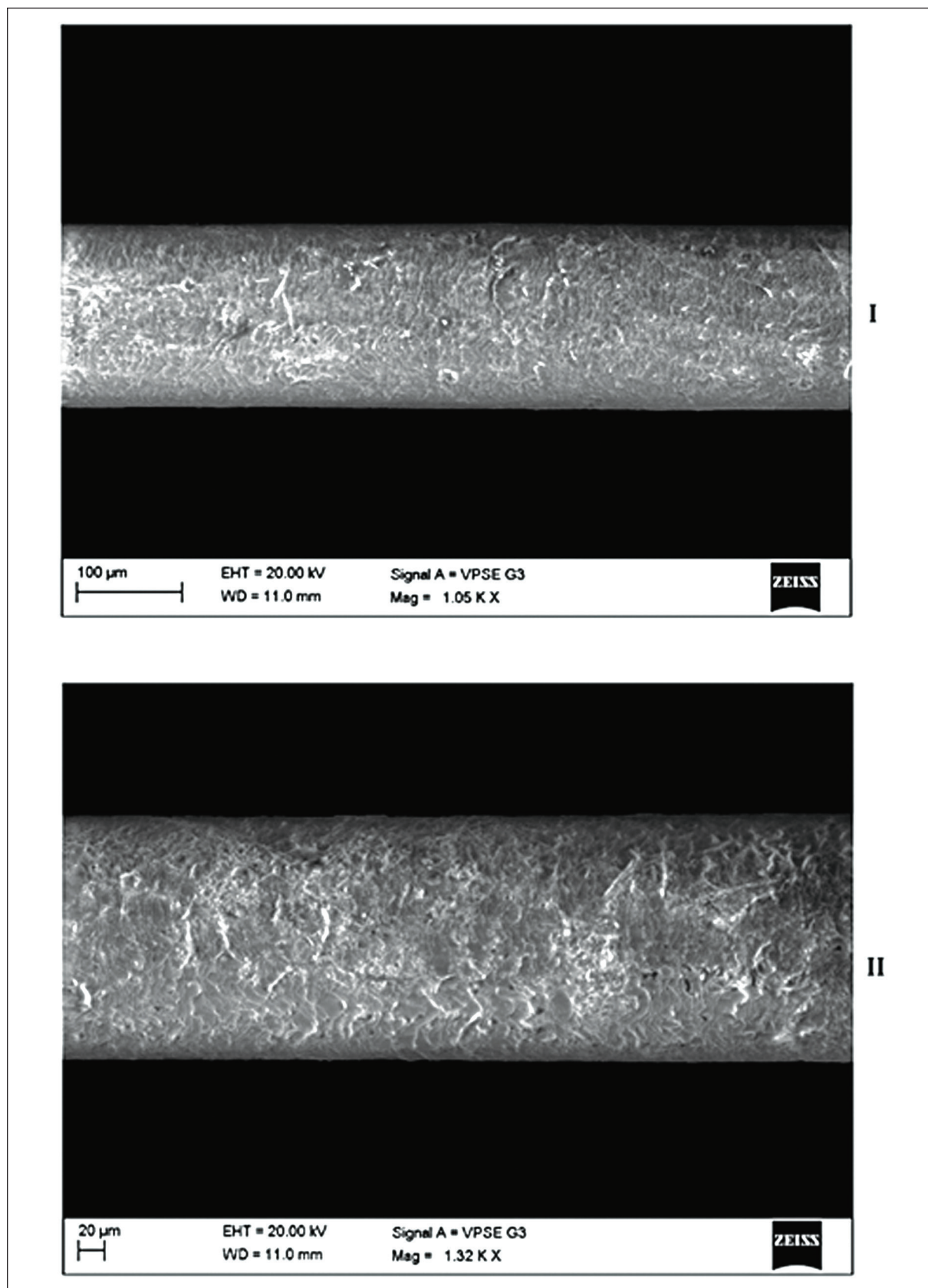


Fig. 2. Scanning electron micrographs of cuticula of *Sus scrofa*

RESULT AND DISCUSSION

The dorsal guard hair of Wild Boar under the family Suidae studied is bicoloured having black and brownish grey alternate band. The mean length and diameter of hair was recorded as 45.8 ± 24.8 mm and 109.4 ± 41.1 μ m, respectively (Table-1). The cuticular characteristics were as: scale position- 'transversal', scale patterns- 'irregular wave', structure of scale margins- 'rippled' and distance between scale margins- 'close'. The medullary characteristics were as: composition of medulla- 'unicellular regular', structure of medulla- 'simple', and form of the medulla margins- 'straight'. The cross-section of hair was observed as circular shape (Image. 1 & 2).

The hair of Wild Boar can easily be distinguished from all other Artiodactyls by its colour and profile, which is always straight,

thicker in mean diameter (109.4 ± 41.1 μ m) and have distinct microscopic characters such as irregular wave pattern and close margin of cuticular scales, unicellular regular and simple medulla, and the shape of cross-section is circular (Table-1). The cuticular characters, medullary configuration and cross-section of the findings are more or less similar to observation of Teerink (1991) in the same species distributed in West-Europe, however, no detailed descriptions of morphological and microscopic characters of hair of *S. scrofa* are available except the microscopic images.

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