Comparative Gross and Histological Studies on Nasal Cavity of Black Bangal Goat and Garole Sheep

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SUMMARY

In the present study tissue samples were collected from external naris, nasal cavity of six healthy adult black Bengal and Garole sheep for gross and histological observations. There was no much variation detected in gross structures of nostril and nasal cavity in two species. The outer most surface of naris of goat and sheep was lined by stratified squamous epithelium and nasal cavity was lined by ciliated psudostratified columnar epithelium. Nasal epithelium showed several cell types including ciliated, secreting, basal and brush cells. The distribution of glands was more in sheep as compared to goat.

Key words: Anterior naris, Black Bengal goat, Garole sheep, Histology, Nostrils

Garole sheep and Bengal goat are the two important native species of West Bengal. Utility of Garole sheep is mainly as a mutton producer, whereas Black Bengal goat is known for its high prolificacy, good meat quality and disease resistant power. The present study has been undertaken on the gross and histological studies on the nostril and nasal cavity in Black Bengal goat and sheep.

The samples were collected from six adult Black Bangal goat and Garole sheep of either sex. Nostril and nasal cavity of goat and sheep were taken from Tangra slaughter house, Kolkata. The samples were collected from external nares and nasal cavity. Gross measurements were done with the help of measuring tape and digital caliper. The samples were fixed in 10% neutral buffered formalin. The tissues were then routinely processed to prepare the paraffin blocks. Then section of 5 μ were cut and stained with various stains (Luna, 1968).

The cavity of the nose was divided by an osseo cartilaginous septum into two equal halves (Fig. 2). Both the cavities were found to be occupied by dorsal nasal concha, ventral nasal concha and middle nasal concha and the ethmoid cells (Fig. 3). The dorsal meatus was very narrow, middle meatus communicated with the dorsal recess. This meatus divided into dorsal and ventral grooves by the middle nasal choncha. The dorsal groove was situated between the dorsal and middle conchae and communicated with the maxillary sinus. The structure of the nasal cavity and placement of the nasal conchae and disposition of dorsal, ventral and middle meatuses in between the conchae has also been described by Gupta et al. (2012) in a similar manner.

Histological observation of anterior naris of goat and sheep revealed that the outer most surface was lined by stratified squamous epithelium and the epidermal thickness were 153.13±12.75 μ and 342.24±24.16 μ in case of goat and sheep, respectively (Fig. 4). The epidermal thickness was more in case of sheep. The number of epidermal strata was counted and recorded 14.2±1.08 cells/µm² and 28.7±4.1 cells/100 µm² in case of goat and sheep, respectively. It was revealed that the number of septa was more in case of sheep as compared to goat.

Numerous hair follicles were identified at the outer most layer of the anterior nares in case of goat and sheep.
In case of goat towards the internal surface of the anterior nares, the number of hair follicles were scanty as compared to the external surface. However, in case of sheep no hair follicle was found in the internal surface of the anterior naris. Sebaceous and sweat gland were enormous in case of goat (Fig. 4). Distribution of mesocrine glands within the dermal component was similar in both the species. The collagen fibres were irregularly distributed within the dermal component in both the species (Fig. 5) but in and around the alar cartilage, the fibres were irregularly oriented in sheep. Elastic fibres were abundantly distributed around the hair follicles and within the dermal component in both the species.

A ciliated pseudostratified columnar epithelium lined the middle nasal meatus. The epithelium showed several cell types including ciliated, secretory, basal and brush cells. The nasal gland mostly serous and mixed types were identified with in the lamina propria of the nasal concha. Aggregation of lymphocytes in the form of lymph node was revealed within the nasal mucosa of both the species. However, Kahwa and Purton (1996) reported similar observation in Kashmeri goat where they observed pseudostratiﬁed ciliated columnar epithelium in the nasal mucous membrane. The glands of the respiratory region of nasal cavity exhibited PAS positive reaction in both the species (Fig. 6).

The glands were located in the deeper layer and very few were superficial in case of the sheep. The number of glands was more as compared to goat. The number of goblet cell in the epithelial lining was also more and lymphatic nodules were more frequent in goat. Sima Katz and José Merze (1977) reported in the vestibular region, only ducts of the gland showed PAS-negative and below the septum there was the infraseptal gland with PAS-negative acini. This was in agreement with our findings.

REFERENCES