Histomorphological and Histochemical Studies on the Dorsal Buccal Gland of Sheep (*Ovis aries*)

A. D. Singh¹, R. K. Jain²* and Pawan Kumar³

Department of Veterinary Anatomy, College of Veterinary Sciences
LLRUVAS, Hisar-125 004 (Haryana)

Received: 27 February, 2012; Accepted: 02 May, 2012

ABSTRACT

The present study was conducted on the dorsal buccal gland of ten healthy adult sheep of local mixed breed. Histologically, the gland was compound tubulo-alveolar being surrounded by less distinct capsule. The gland was sero-mucous with predominance of mucous alveoli. The mucous alveoli showed positive reaction to mucosubstances, glycogen, mucopolysaccharides, mucin and Sudanophilic lipids while serous cells were negative to all these histochemical reactions.

Key words: Histomorphology, Histochemistry, Dorsal buccal gland, Sheep

The major as well as minor salivary glands contribute to the secretion of saliva which plays an important role in keeping the ruminants healthy by facilitating mastication and deglutition. It also helps in restoration of normal ruminal pH and microbial protein synthesis to be used as dietary proteins. A very little work has been conducted on minor salivary glands; hence the present study was aimed to study the dorsal buccal gland of the sheep.

MATERIALS AND METHODS

The present study was conducted on ten healthy adult sheep of local mixed breed of either sex. The tissues from rostral, middle and caudal regions of the dorsal buccal gland were collected and processed for paraffin and frozen sectioning techniques. The sections were stained with Harris' hematoxylin and eosin stain (Luna, 1968), Crossman's trichrome stain for collagen fibres (Crossman, 1937), Gomori's stain for reticular fibres, Weigert's method for elastic fibres, Alcian blue for mucosubstances (pH 2.5), PAS-Alcian blue method for mucosubstances (pH 2.5), Best's carmine method for glycogen, McManus' PAS method for glycogen, Diastase digestion method, Colloidal iron stain for acid mucopolysaccharides, Mayer's mucicarmine method for mucin, Sudan black-B method for fats, oil-red-o in propylene glycol method for fats (Luna, 1968), Nile blue method for neutral and acidic lipids (Drury and Wallington, 1967). Micrometry was done with the help of ocular micrometer.

RESULTS AND DISCUSSION

Histologically, the dorsal buccal gland was compound tubulo-alveolar gland being surrounded by less distinct capsule. The alveoli were of different shapes and dimensions and their diameter ranged from 62.45 µ to 75.87 µ with an average of 69.27±1.73 µ. The alveoli were lined by pyramidal shaped cells having broader bases. The height of cells varied from 12.55 µ to 19.59 µ. The cytoplasm of the cells was finely granular, eosinophilic and presented a vacuolated appearance due to washing of mucous during processing. Strongly basophilic nuclei situated towards the basement membrane had very dense chromatin material which masked the appearance of nucleoli. The wide alveolar lumen ranged from 7.45-16.50 µ.

The interlobular septae contained loose irregular connective tissue having mixed distribution of collagen, reticular and elastic fibres along with fibroblasts, fine blood capillaries, few nerve fibres, nerve bundles and small sized...
Fig. 1. Photomicrograph of dorsal buccal gland showing mucous (M) and serous (S) alveoli in the parenchyma of gland.
H. & E. × 400

Fig. 2. Photomicrograph showing strong PAS-AB positive reaction in mucous alveoli (M) and large interlobular duct (D1).
PAS-Alcian blue × 100

Fig. 3. Photomicrograph showing strong Alcianophilic reaction in mucous alveoli (M).
Alcian blue × 100

Fig. 4. Photomicrograph showing muci-carminophilic positive reaction in mucous alveoli (M) and absent in serous alveoli (S).
Mayer’s mucicarmine method × 400

Fig. 5. Photomicrograph showing positive reaction for colloidal iron in mucous alveoli (M).
Colloidal iron method × 400

Fig. 6. Photomicrograph showing PAS positive reaction in mucous alveoli (M). Note PAS positive goblet cells (arrow) in large interlobular duct (D1).
McManus’ PAS method × 100
the presence of glycogen in addition to other mucopolysaccharides. The mucous alveoli showed a very strong positive reaction for acidic mucopolysaccharides in contrast to neutral mucopolysaccharides (Fig. 2). A very strong Alcian blue reaction indicated the presence of mucosubstances (Fig. 3). Mucous alveoli showed strong reaction to mucin by Mayer's mucicarmine method indicating the presence of acid prosthetic groups (highly complex sulphuric acid) in mucin (Clara, 1940). However, the ducts were negative for this reaction (Fig. 4). Mucous alveoli showed an intense positive reaction for acid mucopolysaccharides by colloidal iron method (Fig. 5). The fatty material was unevenly distributed in the cytoplasm and showed mild reaction with Sudan black-B. Nile blue sulphate and oil-red-o showed weak reactions for lipids. The interlobular duct was surrounded by loose irregular connective tissue, fibroblasts and myoepithelial cells (Fig. 6). The serous alveoli exhibited negative reaction to all histochemical staining techniques indicating the absence of mucopolysaccharides as reported by Parida and Das (1992) in domestic ruminants and Gupta et al. (2000) in buffalo.

REFERENCES


