



# Microscopic anatomy of the prostate gland in prepubertal and pubertal ram

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**Abstract :** Histologically the prostate gland consisted of capsule, interlobular septa, interstitial tissue, glandular alveoli and ducts. Histoarchitecture of the prostate showed the glandular end pieces were lined by simple cuboidal to columnar epithelium. The solid end pieces were more in prepubertal animals showing its development. The alveoli lumen size increase in pubertal than the prepubertal ram.

**Key words :** Histology, Histochemistry, Prostate, Prepubertal, Pubertal, Ram

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## INTRODUCTION

Very limited information is available in literature on histology and histochemistry of prostate gland in prepubertal and pubertal ram.

## RESEARCH METHODOLOGY

Prostate gland were obtained from twelve Deccani sheep bread rams, Animals were divided into two groups. Each group consists of six animals. Group-I prepubertal (2 to 4 months of age) Group-II Pubertal (10 to 24 month of age). 5mm thickness longitudinal and transverse thin tissue pieces were obtained from Beginning, middle and just before ischal arch region of pelvic part of urethra middle and terminal part of ampullae. The collected thin tissue pieces were fixed in 10 per cent formal saline, 10 per cent neutral buffered formaline, cornoy's fluid. The fixed tissue were processed by adapting the standard method of dehydration through graded alcohol and clearing through xylol and infiltration. Impregnation in the paraffin wax of 58°C to 60°C melting point.

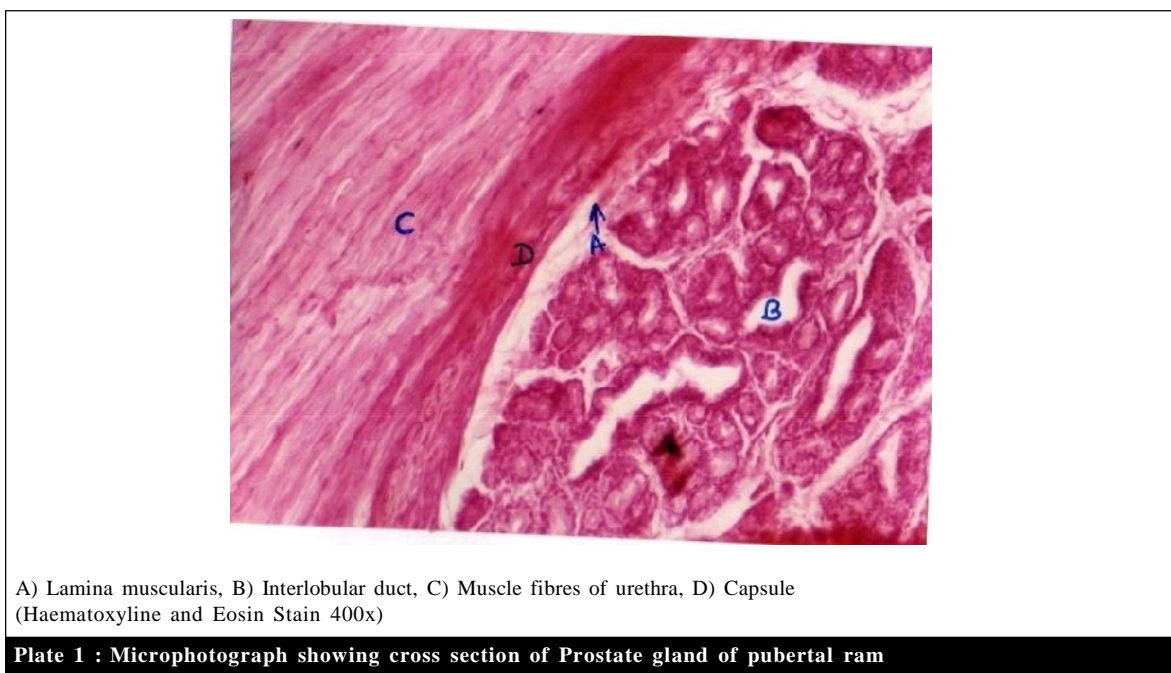
The tissue contained paraffin wax blocks were prepared by arranging brass metal 'L' molds. The thin sections of the tissue were obtained with the help of manually operated Rotatory microtome machine. The obtained thin tissue were put on the water into the tissue floating bath at the temperature 43°C to float the tissue and facilitate the paraffin embedded tissue ribbon while mounting the sections on the glass slide.

The following staining methods were used to stain the tissue for various histological and histochemical observations. Harrie's Haematoxyline and Eosin for general (Mukherjee, 1990), Cross mann's Modification of Mallorys Triple Stain for Collagen and elastic fibres (Singh and Sulochana, 1978), McManus Periodic Acid Schiff's (PAS) stain for demonstration of glycogen and mucin (Mukherjee, 1990). Crystal violet stain for amyloids (Glycoproteins) (Mukherjee, 1990), Modification of Moury's colloidal iron stain for acid mycopolysaccharide (Singh and Sulochana, 1978). The micrometrical observations were recorded with the help of ocular micro meter duly calibrated with stage microns of micrometrical observations were subjected to statistical analysis by standard method of Panse and Sukhatme (1969).

## RESULTS AND DISCUSSION

Histological structure of the prostate gland consisted of capsule, interlobular septa, glandular alveoli, interstitial tissue and ducts.

Prostate gland was covered by thick muscular capsule and was composed of fine collagen reticular and few elastic fibres and smooth muscle fibres (Plate 1). The septa extended deep in the parenchyma and divided the gland into lobes and lobules. The interlobular septae were thin and consisted of collagen, elastic and reticular fibres.



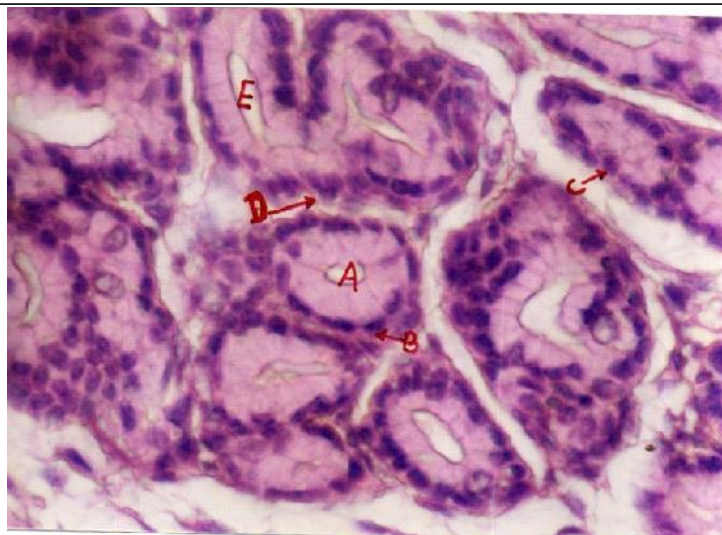
The prostate was observed branched tabuloalveolar gland divided into smaller lobules by interlobular septa. Each lobule consisted of secretory alveoli and a central collecting sinus. The interlobular septa and alveoli were well organized in the pubertal ram than prepubertal (Plate 2).

In prepubertal ram the glandular end pieces were lined by simple cuboidal to low columnar epithelium occupying basal alveoli. The solid end pieces were less in number in pubertal than prepubertal and secretory end pieces were lined by columnar epithelium with spheroidal nuclei occupying basal half of the cells in pubertal ram (Plate 3).

The duct system of prostate gland was consisted of collecting sinus, interlobular and main excretory duct. The excretory duct was lined by stratified squamous epithelium, which became transitional towards its termination.

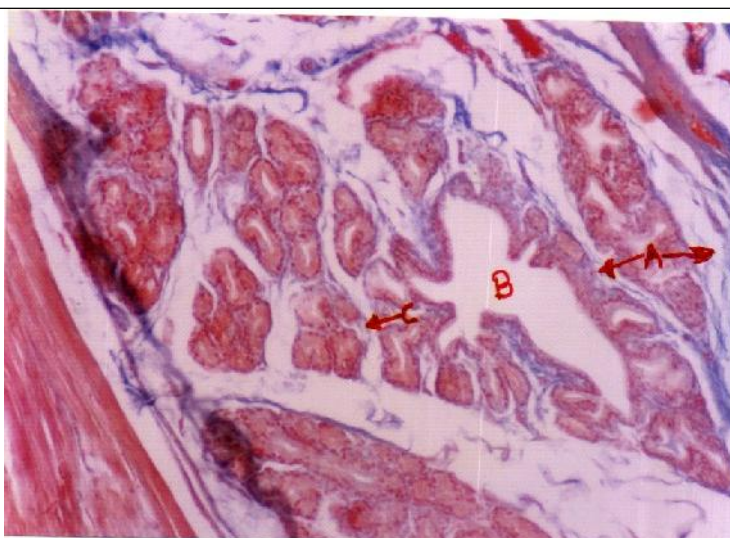
Histological observations of the capsule, septae and interstitial tissue of prostate gland of ram in present study were in accordance with the findings of Kundu (1980); Dellmann (1987); Pyne *et al.* (1989) and Nimse (2003).

The glandular tissue appeared tabuloalveolar. Secretory end pieces were lined by simple columnar epithelium in prepubertal and pubertal. These observations were in agreement with those of Kundu (1980), Faroqui *et al.* (1997)



A) Serous alveolus, B) Basement membrane, C) Interstitial cells  
(McManus Periodic Acid Schiff's Stain 400x)

**Plate 2 : Microphotograph showing cross section of Prostate gland of pubertal ram**



A) Collagen fibres, B) Centre collecting sinus, C) Interstitial cells  
(Crossmann's Modification of Mallory's Triple Stain 400X)

**Plate 3 : Microphotograph showing cross section of Prostate gland of Prepubertal ram**

**Table 1 : Micrometrical observations of prostate glands ( $\mu$ ) in ram**

Group / Parameters		Prepubertal	Pubertal	Statistics
Height of epithelium	Range	9.6-13.44	13.44-17.28	S
	Mean	11.52 $\pm$ 0.29	14.97 $\pm$ 0.56	
Diameter of alveoli	Range	32.24-48.36	40.30-72.54	S
	Mean	44.33 $\pm$ 1.80	55.61 $\pm$ 2.80	
Thickness of Capsule	Range	32.24-56.42	56.42-72.54	HS
	Mean	43.52 $\pm$ 2.14	64.48 $\pm$ 2.08	
Interlobular septa	Range	32.36-48.36	48.36-72.54	S
	Mean	38.72 $\pm$ 1.59	58.03 $\pm$ 2.63	

S = Significant, HS = Highly significant

and Nimse (2003).

The micrometrical values were given in Table 1 and were similar to the values recorded by Gupta and Singh (1982) in goat and Nimse (2003) in buck. The alveoli were lined with tall columnar cells, observed in the present study was in agreement with Dellmann (1987).

PAS method showed intense reaction at the basement membrane, luminal borders of epithelial cells, interstitial tissue, capsule and septa (Plate 3).

Crystal violet staining method showed moderate reaction in the interstitial tissue, secretory alveoli end secretory material of the prostate gland.

Mowry's colloidal iron showed moderate reaction at basement membrane, epithelial lining of alveoli, interstitial tissue. Capsule and septa.

In the present study PAS showed positive reaction at the luminal border of epithelial cells. Which was in agreement with Gupta and Singh (1982) and Dellmann (1987).

Nimse (2003) reported moderate reaction at basement membrane epithelial lining of alveoli for Mowry's colloidal iron. Similar observations were recorded in the present study.

## LITERATURE CITED

**Dellmann, H.D. (1987).** *Text book of veterinary histology Indian 4<sup>th</sup> Edn.* K.M. Varghese Co., Bombay 31, pp. 286-312.

**Faroqui, S.U., Chandra, B. and Pant, H.C. (1997).** Histomorphological study of accessory sex glands in Barbari goats. *Indian J. Vet. Anatomy*, **9** (1/2): 21-28.

**Gupta, A.N. and Singh, Yashwant (1982).** Histological and Histochemical studies on the prostate gland of goat. *Indian J. Ani. Sci.*, **52** (2): 89-95.

**Kundu, P.B. (1980).** Anatomical studies on the accessory male sex glands (gross and microscopic) of the Indian goat (Jamuna Pari and Cross Jamuna Pari). *Indian J. Ani. Health*, 151-154.

**Mukherjee, K.L. (1990).** *Medical Laboratory Technology.* Tata Mcgraw Hill Publishing Co. Ltd., New Delhi. pp.1111-1176.

**Nimse, R.G. (2003).** Histological and Histochemical studies of testis and accessory sex gland in buck M.V.Sc. Thesis, Maharashtra Animal and Fishery Sciences University, Nagpur, M.S. (India).

**Pane, U.G. and Sukhatme, P.V. (1969).** *Statistical methods for Agril. workers.* ICAR Publications, New Delhi, India.

**Pyne, S.K. Sinha, R.D. and Prasad, J. (1989).** Histology of the normal and vasectomised prostate gland of goats. *Indian J. Agril. Sci.*, **59** (11): 1404-1406.

**Singh, U.B. and Sulochana S. (1978).** *Hand book of histological and histochemical techniques.* 2<sup>nd</sup> edn. Premier Publishing House, 5-1-1980, 1<sup>st</sup> floor, Kothi, Hyderabad-95.

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