HISTOCHEMICAL STUDIES ON THE CAUDA EPIDIDYMIS AT DIFFERENT POSTNATAL AGES IN ASSAM GOAT (CAPRA HIRCUS)

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ABSTRACT
The present study was conducted on eighteen male Assam goats ranging in age from day old to 10 months divided into six post natal age groups viz. group-I (0-day), group-II (2 months), group-III (4 months), group-IV (6 months), group-V (8 months) and group-VI (10 months) consisting of three animals in each group. Tissue pieces were collected from cauda epididymides and subsequently fixed in Bouin’s solution. All the tissues were processed for paraffin sections. 5-6 µ thick sections were stained for different stains for demonstration of various histochemical substances viz. McManus method for glycogen, Alcian Blue method at pH 1.0 for acid mucopolysaccharides, Fuelgen reaction for nucleic acids and Mercuric Bromophenol Blue method for Protein. The connective tissue of the capsule and trabeculae showed an weak reaction for basic proteins in day-old kids, while a moderate reaction was seen in the kids from 2 months of age onwards. Again, the stereo cilia and the luminal contents of the epididymal tubules showed a weak to moderate reaction to basic proteins from 4 month of age onwards. The basement membrane of the tubules were moderately reactive to glycogen in all the age groups except in day-old kids. The tubular epithelium of the cauda epididymis exhibited weak reaction to acid mucopolysaccharides in the kids from birth to 4 months of age, and moderate reaction from 6 months onwards. The nuclei of the lining epithelium of the epididymal tubules in day old kids exhibited moderate Fuelgen reaction while the reaction was reduced in older animals.

Key words: Assam goat, Cauda epididymis, Histochemistry, Post natal ages.

INTRODUCTION
India possesses 122.92 millions of goats of which 29.06 lacs are found in Assam (Anonymus 2003). Goat husbandary plays an important role in socio-economic condition of the rural people. Post natal anatomical studies on the male genital system at various ages, particularly the testis and its tubular system are important to know the anatomical growth and development.

Rajani et al. (2002) studied histochemical localization of carbohydrates, protein and lipid in the epididymis of the prepubertal and pubertal rats. Again, localization of glycogen, acid mucopolysaccharides and nucleic acid had been demonstrated in the epididymides in rabbit (Johnson and Hunter, 1971), cat (Viotto et al., 1988), the present study has been aimed to elucidate the age related post natal histochemistry of the cauda epididymis in Assam goat and which is the first ever study of its kind in this indigenous breed of goat.

MATERIALS AND METHODS
A total of 18 male Assam goats raised under semi intensive system of rearing varying in age from 0-day to 10 months were used in the present study. The animals were divided into six age groups viz. group-I (0-day), group-II (2 months), group-III (4 months), group-IV (6 months), group-V (8 months) and group-VI (10 months) consisting of three animals in each group. The animals were sedated by giving intramuscular injection of Siquil (Triflupromazine Hydrochloride) @ 1mg/Kg body weight and subsequently anaesthetized by administering...
intravenous injection of Intravel Sodium (Pentobarbital Sodium) @ 15 mg/Kg body weight (Hall et. al, 2000). After induction of proper level of anesthesia, the animals were sacrificed. Then, each epididymis was separated from the testis and divided into caput, corpus and cauda based on the external morphology. Tissue pieces were collected from the cauda epididymides and subsequently fixed in Bouin’s solution prepared as per (Luna, 1968). All the tissues were processed for paraffin sections (Luna, 1968) by alcohol- xylene method using ceder wood oil. Sections were cut at 5 μ thickness using a Rotary Microtome (Thermo, Germany) and stained for various stains for demonstration of various histochemical substances viz. McManus method for glycogen, Alcian Blue method at pH 1.0 for acid mucopolysaccharides, Fuelgen reaction for nucleic acids and Mercuric Bromophenol Blue method for Protein (Humason, 1967).

RESULTS AND DISCUSSION

In this study, the connective tissue of the capsule and trabeculae showed a weak reaction for basic proteins in day-old kids, while a moderate reaction was seen in the kids from 2 month of age onwards. But the nuclei of the smooth muscle cells of the peritubular tissue exhibited moderate to strong reactions (Fig. 1). The tubular epithelium of the cauda epididymis revealed weak reaction to basic proteins but the intensity of reaction increased with advancement of age. Again, the stereo cilia and the luminal contents of the epididymal tubules showed a weak to moderate reaction to basic proteins from 4 month of age onwards. In support of these present findings, Rajani et al. (2002) also reported that the capsule, epididymal tubules and the peritubular connective tissue were reactive to basic proteins in rats and the post pubertal animals showed more intense reactions.

In this study, faint PAS reaction was noticed in the connective tissue of the capsule, trabeculae and intertubular connective tissue stroma in day-old kids and the intensity of reaction increased slightly to moderate in the animals of older age groups. The basement membrane were moderately reactive to glycogen in all the age groups except in day-old kids. Similar observations had been reported by Pal and Bharadwaj (1986) and Gayake et al. (1999) in buffaloes and Rajani et al. (2002) in rat. The epididymal tubular epithelium showed mild to moderate reactions in younger (day old to 6 months of age) and older goats (8 months to 10 months old goats), indicating almost similar PAS reactivity in these segments of the epididymis. Gayake et al. (1997) observed that the alveoli and ducts of the caput and cauda epididymis showed mild and moderate PAS reaction for glycogen in calves and adult buffaloes, respectively, which perhaps supported the present findings in Assam goats. On the contrary, Viotto et al. (1988) reported that the tubular epithelial cells of the caput epididymis exhibited more strong PAS reaction as compared to that of corpus and cauda in cat and it was suggested that the major secretion of neutral and acid mucopolysaccharides occurred in the initial part of the epididymis, having a protective function for the spermatozoa in cats.

The capsule, trabeculae and the interfollicular stroma of the epididymis showed a weak reaction for acid mucopolysaccharides in the male goats at all the ages under study. Further, the tubular epithelium of all the three segments of the epididymis exhibited weak reaction to acid mucopolysaccharides in the kids from birth to 4 month of age, and moderate reaction from 6 month of age onwards. These present findings could be compared to the observations of Pal and Bharadwaj (1986) in Indian buffaloes stating that, the epididymal epithelium showed the presence of more amounts of acid mucopolysaccharides in the pre pubertal animals.

The nuclei of the smooth muscle cells and fibrocytes of the capsule, trabeculae and the intertubular connective tissue showed mild reaction

FIG. 1: Photomicrograph of the intertubular connective tissue (ICT) and apical border of the principal cells (arrows) of the cauda epididymis in a six months old buck showing reactions to basic proteins, Bromophenol Blue stain, 400 X.
in older Assam goats. The nuclei of the lining epithelium in day old kids exhibited moderate reaction while the reaction was reduced in older animals. More Fuelgen reaction observed in the tubular epithelial cells of the day old kids might be accounted for their enhanced mitotic activity and increased nucleoprotein content within their nuclei. Conversely, the tubular epithelium of the cauda of 6 month old goats showed strong reaction for nucleic acids (Fig. 2). The sperm cells located within the tubular lumina were moderately Fuelgen reactive in 6 month old and strongly reactive in 8 and 10 month old bucks (Fig. 3). These findings were in agreement with the reports of Rajani et al. (2001) stating that the nuclei of the lining and the sperm cells of the epididymal tubules in rat were moderately Fuelgen reactive in pre pubertal animals, while the post pubertal rats showed more intense reaction.

**CONCLUSIONS**

The present study was conducted to study the localization of various histochemical substances in the cauda epididymis at different post natal ages in Assam goats. From this study it was evident that, the different histochemical components of the cauda epididymis showed an increasing pattern of activity as the age of the male goats advanced except for acid mucopolysaccharides and Nucleic acids. The reaction of the acid mucopolysaccharides remained mild in all the parts of the corpus epididymis at various post natal ages of the Assam goats.

**REFERENCES**