Most of the work on tongue has been reported during postnatal life in domestic animals. During prenatal life, the reports were available on development of tongue in pig (Tichy, 1991; Sarma et al., 2003).

MATERIALS AND METHODS

The present study was conducted on the tongue of 18 goat foetii which were collected from the slaughter houses in and around Jammu city. Immediately after collection, the weight of each foetii was recorded with the help of analytical balance. The approximate age of the foetii were calculated by formula postulated by Singh et al. (1979) for estimation of age in goat foetus as below.

\[ W^{1/3} = 0.096 \times (t-30) \]

Where, \( W \) = body weight of foetus in gm. \( t \) = age of the foetus in days.

The collected foetii were divided into three groups group-I (below 50 days of gestation), group-II (between 50-100 days of gestation) and group-III (above 100 days of gestation till full term) containing 6 number of foetii in each group. The tongues were dissected out from the foetii and issue pieces from the tip, body, torus linguae and root of the tongue were fixed in 10% neutral buffered formalin solution and processed for paraffin block preparation by alcohol-benzene schedule (Luna, 1968). Tissue sections of 5-6 µ were cut and stained with PAS method for neutral mucopolysaccharides, McManus’ method for glycogen, bromophenol blue method for basic proteins, and Alcian blue method (pH 1.0) for acidic mucopolysaccharides.

RESULTS AND DISCUSSION

Neutral mucopolysaccharides (NMPS): In the present study, the lamina epithelialis of the tongue of the goat foetii in group-I and group-II showed a moderate to strong reaction to neutral mucopolysaccharides (Fig. 1). The interpapillary epithelium exhibited a strong reaction. The propria-submucosa, core of different developing papillae and the lingual intrinsic muscles showed weak reaction to NMPS. The wall of the blood showed strong PAS reactions and the developing lingual glands showed moderate reaction to NMPS (Fig. 1).

In group III, the lamina epithelialis of the tongue of the goat foetii showed a weak to moderate reaction to PAS reaction but the interpapillary epithelium exhibited a strong reaction (Fig. 2). The propria-submucosa core of different developing papillae and the lingual intrinsic muscles showed moderate reaction to NMPS. The cells of the stratum corneum layer of the lingual epithelium in group-II showed intense PAS reaction as also reported in buffalo foetii of CVR from 20 to 40 cm (Verma et al., 2010). The wall of the blood showed strong PAS reactions and the developing lingual glands showed moderate reaction to NMPS (Fig. 1).

Glycogen: The lamina epithelialis of the foetal tongue in group I showed weak reaction for glycogen. However, the interpapillary epithelium of developing papillary placodes exhibited weak to moderate reaction for glycogen particles. In group II, the basal cells of the lingual epithelium showed strong reaction for glycogen, while the apical epithelial cells exhibited moderate reaction. The propria-submucosa of the foetal tongue, intrinsic muscles and the core of the
lingual papillae showed weak to moderate reaction. However, the wall of the blood vessels located between the muscle bundles showed strong reaction for glycogen. The lamina epithelialis of the tongue in this group exhibited moderate reaction, with strong reaction being exhibited by the uppermost stratum corneum layer for glycogen. The basal layer of the lingual epithelium also showed strong reaction for glycogen particles.

The propria-submucosa layer of the tongue along with core of the lingual papillae along with core of the lingual papillae exhibited moderate to strong reaction for glycogen, while the intrinsic lingual muscles were strongly reactive to glycogen. The Von Ebner’s and the lingual glands were strongly reactive to glycogen. Enhanced glycogen content in these glands of this group might be to prepare for the oncoming physiological functions after birth.

**Basic proteins:** In group I, the lingual epithelium and lingual muscles showed weak to moderate reaction for basic proteins. However, the core of the developing papillae and propria-submucosa exhibited a weak reaction. In group II, the lingual epithelium and the core of the differentiating lingual papillae were moderately reactive to basic proteins, while the propria-submucosa, the lingual muscles and the basal cells of the lamina epithelialis showed strong reaction. Similar findings were also reported in buffalo foetii of CVR from 20 to 40 cm (Verma et al., 2010).

In group III of goat foetii, the lingual epithelium and the core of the lingual papillae showed moderate AMPS positive reaction. The propria-submucosa, lingual muscles and lingual glands along with Von Ebner’s glands exhibited moderate to strong reaction to AMPS. The mixed acini of the lingual glands had high content of neutral and acid mucopolysaccharides. The cornified layer was moderately positive, while the muscle fibres were strongly positive and connective tissue was weak to moderately positive for acid mucopolysaccharides.

**Acid Mucopolysaccharides (AMPS):** The lingual epithelium was weakly reactive to AMPS in group I. The epithelium overlying the papillary placodes were weak to moderate reaction. The stratum corneum showed a moderate to strong reaction to AMPS. The papillary core, lingual muscles and propria-submucosa had weak to moderate reaction. All the structures showed similar type of reaction in group II also. The findings corroborates well with those reported in buffalo foetii of CVR from 20 to 40 cm (Verma et al., 2010).

In group III of goat foetii, the lingual epithelium and the core of the lingual papillae showed moderate AMPS positive reaction. The propria-submucosa, lingual muscles and lingual glands along with Von Ebner’s glands exhibited moderate to strong reaction to AMPS. The mixed acini of the lingual glands had high content of neutral and acid mucopolysaccharides. The cornified layer was moderately positive, while the muscle fibres were strongly positive and connective tissue was weak to moderately positive for acid mucopolysaccharides.

**REFERENCES**


