COMPARATIVE HISTOLOGICAL STUDY OF CAECUM IN CATTLE, SHEEP AND GOAT

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ABSTRACT

Comparative histology of the caecum of adult cattle, sheep and goat was studied. Caecum of all three animals consisted of four layers namely tunica mucosa, tela submucosa, tunica muscularis and tunica Serosa. Intestinal glands were mostly located at base region of tunica mucosa. In caecum of goat mucus secreting intestinal glands were present in the close vicinity of lamina muscularis and serous secreting glands were present at apical end of tunica mucosa. Tela submucosa was largest in cattle as compared to sheep and goat. Aggregated lymphatic nodules are present in caecum of sheep in the vicinity of lamina muscularis. In caecum of goat tunica serosa was a loose connective tissue.

Key words : Histology, Calecum.

The large intestine has an important function in all ruminants as it is the part of digestive system, whose main function is to breakdown the ingested food into small units that can be absorbed into the tissue and utilized for the maintenance of the organism. Caecum is the first part of large intestine in cattle, sheep and goat also. In the present work an attempt has been made to study the comparative histological structures of the caecum in adult cattle, sheep and goat.

The caecum of six adult cattle, sheep and goat of local non-descript breed were collected from local slaughter house. The caecum was brought to the laboratory, cleaned by running tap water and fixed in the 10% formal saline. Caecum of all three species was processed through graded alcohol for dehydration, clearing in xyline and paraffin embedding. The tissue sections of 5 um thickness were obtained by manually operated microtome machine. These sections were stained in following staining methods:

1) Harri’s Haematoxyline and eosin for general histological observations (Mukherjee, 1990)
2) Silver impregnation stain method for reticulin (Mukherjee, 1990)
3) Verhoeff’s stain for reticular and elastic fibers (Mukherjee, 1990)
4) Crossman’s modification for mallory’s triple stain for collagen and elastic fiber (Singh and Sulochana, 1978)
5) Masson’s trichrome stain for collagen and muscle fibers (Mukherjee, 1990)
6) Mc’ Manus periodic Acid shciff’s (PAS) reaction stain for carbohydrate like glycogen, reticulin and mucin (Mukherjee, 1990)

The wall of caecum consisted of tunica mucosa, tela submucosa, tunica muscularis and tunica serosa in cattle, sheep and goat (Plate 1, 2, 3). Tunica mucosa includes the lining epithelium, lamina propria with glands and lamina muscularis in all three animals (Plate 1).
Tunica mucosa was characterized by the presence of longitudinal folds, absence of villi and the longer, straighter, tortuous, mucus secreting glands with large number of goblet cells (Plate 1). Goblet cells were dispersed among the absorptive columnar cells which are situated near the cell base with oval nuclei. Lamina propria in all three animals consisted of loose connective tissue with blood vessels. This lamina propria has subsanital number of lymphatic nodules mostly located around ileocaecal opening and are largest in cattle than sheep and goat.

Lamina muscularis was composed of inner circular and outer longitudinal layers of smooth muscle and tend to be thin and incomplete in all three species. In caecum of goat intestinal glands are present at the close vicinity of lamina muscularis and serous sereting glands are present at apical end of mucosa.

In sheep aggregated lymphatic nodules were present in the vicinity of lamina muscularis (Plate, 4).

The present observation of tunica mucosa with large intestinal glands, mucosal folds with absence of villi was in collaboration with the similar observation of Dellmann and Brown (1987) in ruminants, Getty (1975), Ghosh (1998), Raghavan(1964) and Bacha and Bacha (2000) in ruminants.

Histological findings of mucosa of caecum lined by absorptive columnar cells with goblet cells in the present study, were similar to Maala and Cumming (1985) in bovine and Estacio and Maala (1996) in philipine carabao (Bubalus bubalis).

Tela submucosa located between lamina mucularies and the tunica muscularis, which consisted of collagen and elastic fiber bundles in all three species (Plate, 2). Among cattle sheep and goat, tela submucosa was largest in cattle.

Tunica muscularis consists of inner circular and outer longitudinal smooth muscle layers, out of which outer muscle layer contains more elastic tissue than the inner layer. In sheep circular muscle fibers were present but in cattle and goat layers were present.

Tunica serosa of cattle and sheep consisted of collagen and elastic fibers (Plate, 2) with blood vessels but in goat it was a loose connective tissue.

The finding in the present study that, tela submucosa with collagen and elastic fiber
bundles was in close collaboration with previous finding of Dellmann and Brown in ruminants (1987).

Histological findings of tunica muscularis of caecum in cattle consisted of inner circular and outer longitudinal smooth muscle fibers was earlier reported by Bacha and Bacha (2000) in ruminants.

REFERENCES


