Microscopic study was conducted on the large intestine of sheep comprising of three parts, caecum, colon and rectum. The wall of large intestine throughout its length consisted of tunica mucosa, tunica submucosa, tunica muscularis and tunica serosa. Tunica mucosa contained simple columnar epithelium, lamina propria with intestinal glands lymphatic nodule and lamina muscularis. Lymphatic nodules are aggregated and present in the vicinity of lamina muscularis. Glands were lined by tall columnar cells, goblet cells and argentaffin cells throughout the large intestine. Goblet cells were highest in the rectum and had only one circular layer of smooth muscles but in colon and rectum it consisted of inner circular and outer longitudinal layer of smooth muscle.

Though the cattle, sheep and goat are ruminants but their feeding material is too different as sheep and goat are browsers and have ability to digest and absorb nutrients from many types of leaves, as it is inability in cattle. Large intestine is made up of a series of tubular organs whose main function is to breakdown the ingested food into small units that can be absorbed in to the tissue and utilized for the maintenance of the organism. The paucity of literature on the large intestine of sheep has inspired the authors to record the histological observations of large intestine in sheep.

The large intestines of six adult sheep of local non-discript breed were collected from local slaughter house. The parts of large intestine were fixed in the 10% formal saline. These parts were processed through graded alcohol for dehydration. Clearing in xylene and paraffin embedding. The tissue sections of 5 μm thickness were obtained by manually operated microtome machine. The sections were stained in following staining methods.

A) Harris’s Hematoxylin and Eosin for general histological observations (Mukherjee, 1990).
B) Silver Impregnation stain method for reticular fibers (Mukherjee, 1990).
C) Verhoeff’s stain for reticular and elastic fibers (Mukherjee, 1990).
D) Crossman’s modifications for Mallory’s triple stain for collagen and elastic fiber (Singh and Sulochana 1978).
F) McManus Periodic Acid Schiff’s (PAS) reaction stain for carbohydrate like glycogen, reticulin and mucin (Mukherjee, 1990).

Mowry’s colloidal Iron stain for demonstration of mucoprotein, neutral and acid mucopolysaccharides (Singh and Sulochana, 1978).

Four types of layers are present in all the three of large intestine namely Tunica mucosa, Tela submucosa, Tunica muscularis and Tunica serosa (Plate 1, 2,3). Tunica mucosa consisted of simple columnar epithelium, lamina propria and lamina muscularis (Plate 2). Tunica mucosa was characterized by the presence of longitudinal folds projecting in to the lumen, absence of villi and the longer, straighter tortuous intestinal glands with goblet cells. Lamina propria comprised collagen and elastic fibers with blood vessels. Aggregated lymphatic nodules are present in the vicinity of lamina muscularis and these are surrounded by fine collagen fiber trabaculae.

Intestinal glands were tubular, straight, densely packed, tortuous lined with tall columnar
cells, goblet cell and argentaffin cell. These intestinal glands are convoluted and mostly arranged in rows in colon (Plate 2). Two types of smooth muscle layer present in lamina muscularis, i.e. inner circular and outer longitudinal. Elastic tissue was less prominent in lamina muscularis. Near the junction of rectum with anus, sheep has a rather large venous plexus in the lamina propria of the rectum. There are highest numbers of goblet cells in rectum of sheep than caecum and colon, whereas caecum has lowest number of goblet cells.

The present observation of large intestinal glands, mucosal folds and absence of villi was previously reported by Raghavan (1964), Getty (1975), Ghosh (1998), Bacha and Bacha (2000) in ruminants. Maala and Cumming (1985) in bovine and estacio and Maala (1996) in philippine carabao (Bubalus Bubalis) also reported similar findings that mucosa of large intestine lined by absorptive columnar and goblet cells as in the present study. The lamina muscularis contained inner circular and outer longitudinal layer of smooth muscle reported earlier by Ramkrishna and Gadre (1998) in ruminants.

Tela submucosa was the layer present between lamina muscularis and the tunica muscularis. It comprised collagen and elastic fiber bundles (Plate 3). Blood vessels and nerve fibers also present in tela submucosa. Tunica muscularis consisted of circular muscle fibers in caecum and inner circular and outer longitudinal muscle fibers in colon and rectum (Plate 2). The
present observation of tunica muscularis of colon and rectum was in close observation with findings of Dellmann and Brown (1987) in ruminants but not with caeum.

Outermost layer of large intestine was tunica serosa. It was a loose connective tissue comprised of collagen and elastic fibers (Plate 2) and blood vessels.

REFERENCES


