



Comparative histological studies of Jejunum in cattle, sheep and goat

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Abstract : Jejunum in cattle, sheep and goat comprised four types of layers tunica mucosa, tunica submucosa, tunica muscularis and tunica serosa. Tunica mucosa was innermost layer, which comprised lamina propria with number of glands. Intestinal glands were lined by number of goblet cells tall columnar cells and enterochromaffin cells. Lamina muscularis was with circular and longitudinal layers of smooth muscle fibre. Tunica muscularis was comprised of circular and longitudinal muscle fiber. Outmost layer was tunica serosa which was a loose connective tissue with blood vessels.

Key words : Histology, Jejunum cattle, Sheep, Goat

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INTRODUCTION

The Structure of Jejunum is specialized in both its digestive and absorptive functions very mearge information is available.

RESEARCH METHODOLOGY

For the present study the organ Jejunum of cattle sheep and goat of non –discript breed were collected from eighteen animals. Each group comprised six animals. The Jejunum was brought into the laboratory in the ice pack. the tissue samples approximately 5 mm thickness were collected and fixed into the following fixative 10 per cent formaline, 10 per cent neutral buffer formalinecorneys fluid and bouins fluid.

The tissue samples were processed through the gradedalcohol for dehydration, Cleared in the xylene and embedded in the paraffin of 50° to 60° melting point. The tissue comprising paraffin blocks were prepared with the help of the brass 'L' molds. The tissue sections were cut at 3 to 4 μ thickness with the help of manually operated rotary microtome machine. The sections were mounted on the glass slides by applying adhesive (Mukharjee, 1990) these sections were stained by a Harris Haematoxyline and Eosin for general observations (Mukharjee, 1990). Silver

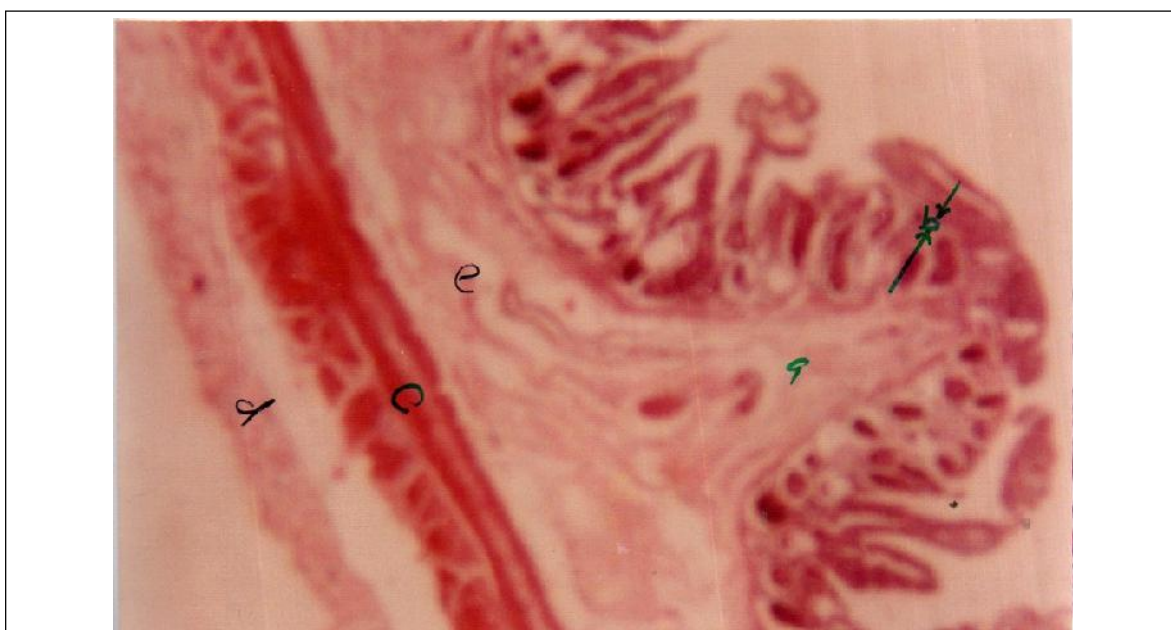
impregnation stain for reticulin (Mukhaje, 1990), Verhoeffs stain for collagen and elastic fibres (Mukhaje, 1990), Crossmans modifications for Mallarys triple stain for collagen elastic and muscle fibre (Singh and Sulochana, 1978) masons Trichrome stain for collagen and muscle fibre (Mukharjee, 1990).

Micrometrical observations were recorded on ocular micrometer duly calibrating with stage micrometer. The micrometrical values were subjected to statistical analysis as per the standard procedures of Panse and Sukhatme (1967)

RESULTS AND DISCUSSION

Jejunum consisted four types of layer namely tunica mucosa, tunica submucosa, tunica muscularis and tunica serosa.

Tunica mucus of jejunum comprised the lining epithelium, lamina propria with glands in cattle (Plate 1). Villi was lined by simple tall columnar absorbing cells with round or oval nucli at their base in cattle, sheep and goat. The apical part of villi was broad, majority of the villi was tall, pointed and stumped in goat (Plate 2).



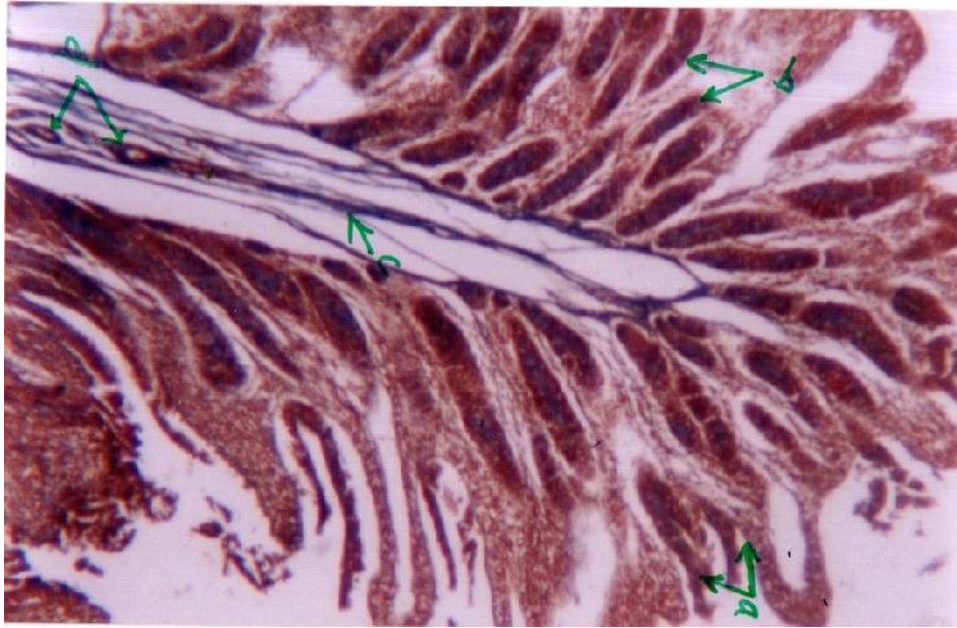
a) Connective tissue, b) Mucosa, c) Tunica muscularis, d) Tunica Serosa, e) Tunica submucosa
(Haematoxyline and Eosin stain, 100 X)

Plate 1 : Microphotograph showing histological structure of Jejunum in cattle

The submucosa comprised of collagen fibres and extend into the lumen (Plate 3) the goblet cells were less numerous at the tip of the villi in cattle sheep and goat. The intestinal glands opens into the pits between the base of the villi.

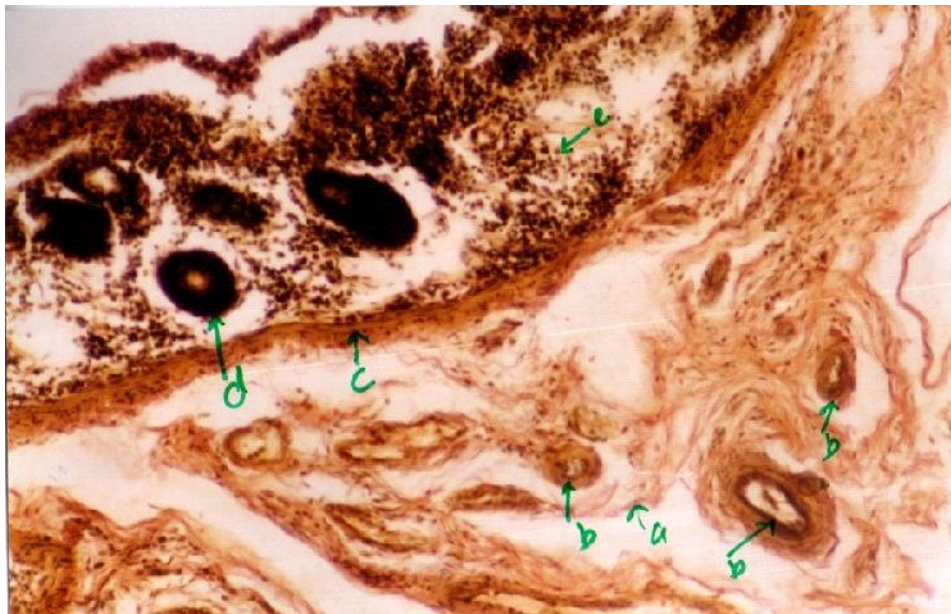
The present observations of tunica mucosa of the tall columnar absorbing cells, goblet cells and villi was in collaboration with the similar observations at Dellmonn and Brown (1987) and Bacha and Bacha (1990) in ruminants and Morales and Peregra (1979) in cattle.

Lining epithelium of jejunum in cattle, sheep and goat revealed simple tall coloumnar epithelium with oval nuclei at the basement membrane. Goblet cells were dispersed among the coloumnar cell. Epithelial lining of the villi in cattle, sheep and goat consisted single layer of cells. Epithelial cells were tall simple columnar. Their apical border possesses a well marked striations and composed of numerous microvilli. Nucleus was oval and placed close to the basement membrane. The goblet cells were found in small number and interspersed among the lining of the columnar cells on the side of villi. They were found in different stages of activities form great swollen appearance all over the



a) Villi, b) Intestinal gland, c) Elastic fibres, d) Blood vessels
(Masson's Trichrome stain, 100 X)

Plate 2 : Microphotograph showing histological structure of Jejunum in sheep



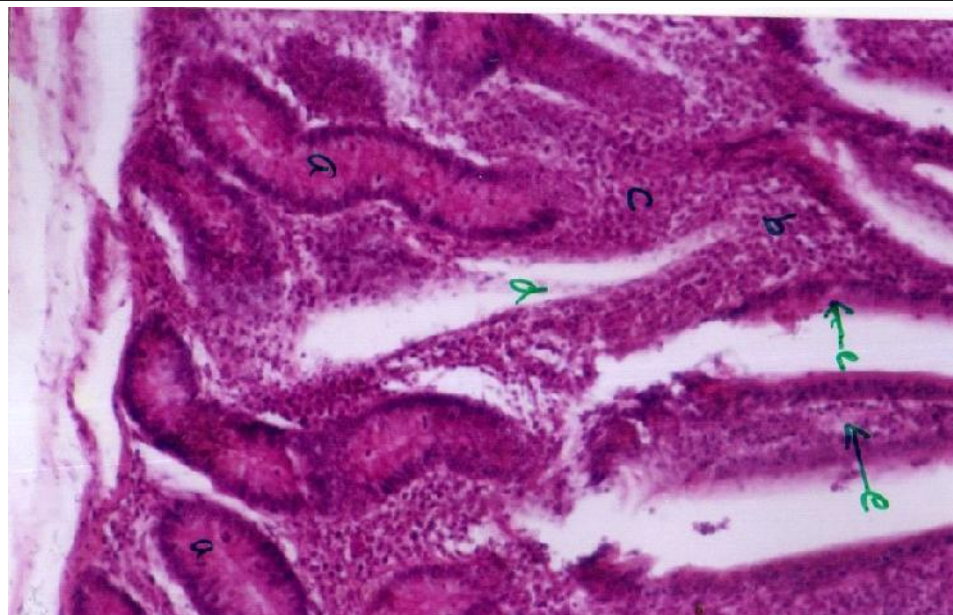
a) Collagen fibres, b) Blood vessels, c) Lamina muscularis, d) Intestinal gland, e) Lymphocytes
(Verhoeff's stain, 100 X)

Plate 3 : Microphotograph showing histological structure of Jejunum in cattle

jejunum in cattle, sheep and goat.

The present observations of epithelium was in close collaboration with previous observations of Dellmann and Brown (1987), Bacha and Bacha (1990) and Mishra and Das (1992) in ruminants.

Lamina propria of jejunum in cattle, sheep and goat was composed of collagen and elastic fibres, muscle fibres



Showing intense PAS positive
 a) Crypts of Lieberkuhn, b) Lamina propria, c) Lymphocytes, d) Lacteal duct, e) Villus
 (Periodic Acid Schiff's stain, 100 X)

Plate 4 : Microphotograph showing histological structure of Jejunum in Sheep

and lymphocytes. It surrounded the intestinal glands. Lamina propria consisted lateral duct emerging from the apical portion of the villi. Loose connective tissue forms the core of the villi. The lamina propria consist of number of intestinal gland. The glands were small oval elongated and straight. These glands were mucous secreting. Similar histological structures were observed in sheep and goat. This present observations of lamina propria of jejunum with loose connective tissue in cattle, sheep and goat was in close collaboration with the previous findings of Dellmann and Brown (1987) and Bacha and Bacha (1990) in ruminants.

Intestinal glands were simple tubular tortuous lined by simple columnar cells, goblet cells and enterochromaffin cells. The glands were oval elongated and straight and arranged in sequence order in villi. Group of glands were located at the base of lamina propria in cattle, sheep and goat (Plate 4). The glands were lined by paneth cells at the base in cattle, sheep and goat.

A present histological finding of simple branched and tubular glands of intestinal gland was in collaboration with Dellmann and Brown (1987) and Bacha and Bacha (1990) in ruminants.

Lamina muscularis comprised circular layer of smooth muscle in cattle, sheep and goat.

The present observations of tunica muscularis were in close collaboration with the previous findings of Dellmann and Brown (1987) and Bacha and Bacha (1990) in ruminants.

Tunica mucosa of jejunum of cattle, sheep and goat consisted of collagen and elastic fibre bundles associated

Table 1 : Micrometrical observations on jejunum in cattle (micrometer)					
Group		Thickness of Tunica Muscularis	Height of Villi	Thickness of Tunica Mucosa	Diameter of Intestinal glands
Cattle	Range	42.92-46.69	40.192-44.001	18.06-20.96	5.40-6.07
	Mean	44.39±1.07	42.616±1.45	19.6 ± 0.17	5.76 ± 0.37
Sheep	Range	19.92-23.12	88.53-92.12	8.732-12.001	3.49-4.11
	Mean	21.51 ± 0.32	90.46 ± 1.53	10.78 ± 0.47	3.93± 0.41
Goat	Range	19.352-23.423	82.394-86.73	8.75-11.536	6.05-6.83
	Mean	21.92 ± 0.42	34.00 ± 1.37	10.675± 0.21	6.37 ± 0.72

with blood vessels nerve fibres.

The present observation of tunica submucosa with collagen and elastic fibres and with, blood vessels in jejunum was in close collaboration with previous findings of Dellmann and Brown (1987) and Bacha and Bacha (1990) in sheep.

Tunica muscularis of jejunum in cattle, sheep and goat was composed of inner circular and outer longitudinal smooth muscle fibres. The external longitudinal smooth muscle layers was small, In between these two layers the connective tissue and myentric plexus were seen.

Tunica serosa of jejunum was on outermost layer consisted of collagen and elastic fibres with blood vessels. It was highly vascular membrane with loose feltwork of connective tissue fibres and mesothelia.

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