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Studies on the cestode *stilesia* railliet, 1893 intestinal infection in *Capra hircus* L. with reference to histopathology

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The present work was carried out to study the histopathological changes in the intestine of *Capra hircus*, naturally infected with the Anoplocephalidean cestode, *Stilesia pandeyae*. It has been seen that the cestode *Stilesia pandeyae* approach the villi floating in the lumen, some worms are seen attached to the tissues of the intestine, the villi of crypts of liberkuhn are ruptured, destructed and shifted apart by the penetrating the worm. Not much effort is put by the parasite to survive in the intestine and the scolex is not so much helpful. It seems that the environment of the intestine is quite favourable for the worm *Stilesia* Railliet, 1893 which is rich in protein, glucose and fat content. So the worm finds it easy to absorb the same through tegument for growth and nourishment.

Key words : Cestode, *Capra hircus* L., Histopathological observation, *Stilesia pandeyae*

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INTRODUCTION

In host parasite relationship, host provides a suitable environment to parasite and in turn parasite either directly or indirectly injuries host and also deprives host getting required nutritional requirements. Cestodes are said to absorb semi digested material from the intestine and it has been assumed that these worms lie in a both of semi digested 'soup' from which they can absorb nutrient, metability and *in vitro* studies suggest that a complex nutritional relationship occurs between cestode and its host. The parasite establishes itself in host body which cause pathogenicity and this many lead to a condition which exist in the host, specially are due to influence of parasites on host. Host parasites relationship results in gain of one organism and loss of another. It leads to various diseases and disorders. The present communication deals with the study of histopathology of Anoplocephallidean cestode *Stilesia pandeyae* intestinal tapeworm of host *Capra hircus* L.

RESEARCH METHODOLOGY

To record the rate of infection and histopathological study, intestines of *Capra hircus* L. were dissected to observe the rate of infection. Nearly all the dissected intestines were heavily infected with cestode parasites. The worms almost blocked the passage of food material in the intestines. The free worms were separated and identified as *Stilesia pandeyae*. Both infected and normal hosts intestine were dissected and fixed in Bouin's fluid to study histopathological changes.

The fixed materials from Bouins fluid were removed, washed, dehydrated through alcoholic grades, cleared in xylene and embedded in paraffin wax (58-62^{0}C). The sections were taken at 9µ and slides were stained with aldehyde fuchsin, bromophenol blue, eosin Ehrlich's Haematoxylin and Sudan Black-B for the detection of histopathological changes. Best slides or sections were selected and keenly observed under the microscope for histopathological study. The parasites were seen both in a free state in the lumen and also in attached condition.

RESEARCH FINDINGS AND ANALYSIS

Genus *Stilesia* was erected by Railliet (1893) for *Taenia globipunctata*, Rivolta, 1874. The present communication deals with histopathological changes in intestine of *Capra hircus* L. infected with *Stilesia pandeyae* by examining the stained serial sections of the tissue. It has been seen that amongst the worms approaching the villi floating in the lumen, some worms get attached to the tissues of the intestine, the

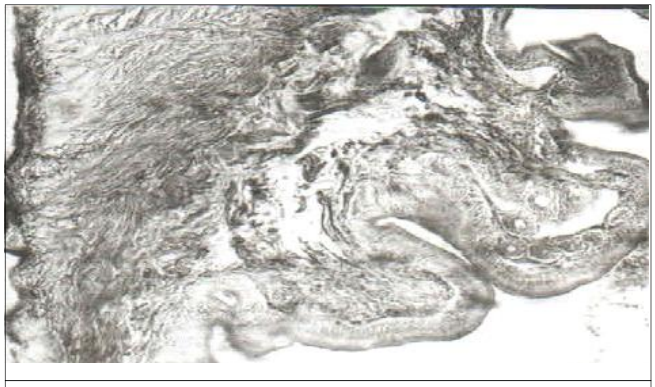

Fig. 1: Healthy intestinal villi of *Capra hircus*

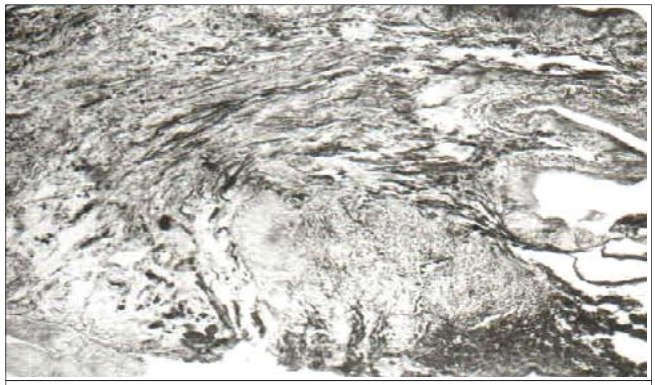

Fig. 2: Infected intestinal villi of *Capra hircus by Stilesia* sp.

villi of crypts of liberkuhn are ruptured, destructed and shifted apart by the penetrating the worm, whereas few reach upto the circular muscle layers, almost embedded in the inner tissues of the intestine, surrounded by the host's tissue. Peculiarly it is seen, the pH in the intestine is quite normal and so the parasite does not find any difficultly in floating in the lumen and also in piercing the intestinal tissues.

The villi of the host, which were disrupted and shifted apart from their original position, get extended in length into finger- like projections, encircling in length into the invaded parasites. This activity may be to exhaust the food material into this invaded area. Whatever proteins are presents in the surrounding villi are utilized by the parasite, the inner tissues have much quantity of protein content, seen by histochemical techniques. Glucose and fats are much more at the invaded sites, transferred from the other area. The cells encircling the parasite are transformed into leucocyte cells and later into lymphocytes and eosinophilic cells, to secrete a sticky substance which envelope the parasite, restricting it from further advancement, and exhausting it from food materials. This long activity of the host tissues requires a large amount of glucose and fats, seen histochemically in the host tissues. There are also a number of neurosecretory cells in this encircling area of the worm, may be for the secretions of some toxic substances to restrict the parasite at one place. It absorbs much food reserves for its nourishment from a particular area. It is seen that the parasite is in no loss but host gets damaged upto some extent, not much and also is in loss of its own reserve materials, though it has tried its level best to restrict the parasite at one place and suffocate it.

Similar finding has been reported by Jadhav *et al.* (2008) from intestine of *Gallus gallus domesticus* parasitized by *Davainea* sp. Nanware *et al.* (2005) reported intestinal infilammation and vasodilation of intestinal tissue of *Carcharias acutus* by *Phoreobothrium* sp. and intestinal villi disturbed by the invasion of scolex of *Moniezia* inhabiting intestinal tract of *Capra hircus*. Nanware and Bhure (2011) studied histopathological observation of *Capra hircus* L. infected with *Stilesia jadahave*. Their result shows the worm is not having very close contact but it has developed very weak contact and attached loosly to crypts of Liberkuhn.

Pathan *et al.* (2011) from intestine *of Aetomylaeus nichoffii* parasitized by *Uncibilocularis* sp. His observation shows infected intestinal tissue gets broken due to penetration of hooks and formed ulcer. Khatoon *et al.* (2002) studied the total destruction and necrosis of all layers of the intestinal wall. In some regions, severe destruction occurs only in the mucosa and sub-mucosa *Nesokia indica* parasitized by *Syphacia* sp. Such types of changes were also observed in fishes parasitized by *Anisakis* larvae (Bilqees and Parveen, 1996). Destruction of the epithelium at the point of attachment was observed by some workers and large numbers of detached cells of epithelial and connective tissue origin in the paramucosal lumen (Chaicharn and Bullock, 1967). Similar abnormalities were observed in the present study but here the mucosal layer disintegrated to form granular masses. The damage was severe, resulting in a condition like sessile adenoma, and in some places the mucosal region was thickened, producing a condition like pedunculate adenoma. Some of the infected intestinal sections represent a collapsed mucosal layer; a similar condition has also been reported in other animals (Bilqees and Fatima, 1995). Granulomatous lesions were also observed involving muscularis mucosa. This may be due to the parasite moving deeper into the host tissue, resulting in severe tissue damage. Such types of lesions were reported by (Bilqees, 1995). Kapustina (1978) noted damage to intestinal mucosa adjacent to the strobila of *K. sinensis*, which was attributed to cestode feeding strategies, migration of the parasite in the gut, and previous sites of attachment. Gupta and Srivastava (2007) observed heavy infection of *Fasciolopsis buski* damaging lamina propria, submucosa and mucosa with profuse infiltration of eosinophils, lymphocytes and plasma cells of pig intestinal tissue. Ahuwalia (1960) studied the histopathology of *Gastrodicoides hominis* a digenean trematode of pig and reported leucocytic infiltration and mucosal epithelium destruction. Haque and

Siddiqui (1978) reported infection of *Fasciolopsis buski* causing surface desquamation and destruction of mucosal epithelium, infiltration of eosinophils and plasma cells. Khadap (2009) reported plug formation at ruptured epithelial portion which may have formed from lymphocytes and eosinophilic cells of intestinal tissue of *Gallus domesticus* parasitized by *Cotugnia*.

Conclusion:

It reveals that the tapeworm, *Stilesia pandeyae* is successful in surviving and growing well until its reproduction. The worms are seen attached to the tissues of the intestine, the villi of crypts of liberkuhn were ruptured, destructed and shifted apart by the penetrating the worm. The host is in loss, not able to drive away the parasite or to kill it by secreting toxins in the cavity formed by the encircling villi.

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