

Histopathological study of tapeworm infection in *Ovis bharal* (L.) from Solapur district (M.S) India

Atul Humbe¹, Swati Jadhav², S.N.Borde² and S.S. Chandanshive¹

¹Department of Zoology, S.G.R.G. Shinde college Paranda Dist- Osmanabad (M.S.) India

²Department of Zoology, Dr. B.A.M. University Aurangabad (M.S.) India. 431004, India

Abstract

Histopathological study of cestode parasite has been studied to find the pathological changes and extent of damage of the intestinal layers of *Ovis bharal* (L.). The worm *Stilesia shindei* is having scolex with four suckers, which is large, rounded, which are used for attachment of worm to the intestine of host *Ovis bharal* (L.). The heavy infection of *Stilesia shindei* damage the intestinal layers i.e. mucosa, submucosa, and lamina propria, submucosa with profuse infiltration of eosinophils, lymphocytes and the plasma cells. When host-parasites equilibrium is disturbed, serious disease in host is the consequence, resulting in depletion or weakening of host.

Keywords: Histopathology, intestinal layers, *Ovis bharal* (L), *Stilesia shindei*.

INTRODUCTION

The study of the host parasitic relationship in cestodes is complex one involving inter actions between at least two and some times more genital systema namely those of the parasites it's intermediate and it's definitive host. Thus a cestode if it has to survive must be suitably adapted to the morphology physiology biochemistry immunology and ecology of its hosts. During the life cycle of cestode, it is accomplished twice in different host. In *Capra hircus* (L.) and *Ovis bharal* (L.); the mechanism of parasites establishment varies from species to species and also depends on the stage of parasite, host tissue and environmental conditions. The degree of the response by each host to this tissue contact is related to the nature of the tissue site invasion and also to the intimacy of the host or parasite contact it is also related to the stage of development of the invading organisms whether it is an adult or larva eg. The host parasitic contact established in the life cycle of *Taenia saginata*. The host parasite relationship has studied by various authors. The development and experimental pathology of *Echinococcus multilocularis* and alveolar hydatid [1,2] and helminthic disease in ruminants [3]. Mukherjee et. al [4] reported massive infection of a sheep with amphistomes and the histopathology of parasitized rumen. Nobel [5] studied histopathology of *Paramphistomiasis*. Sharma et. al [9] studied on the pathogenicity due to immature *Paramphistomes* among sheep and goats. Singh [10] observed histopathology of the duodenum and rumen during experimental infection with *Paramphistomum cervi*. Srivastava [11] reported the study on life history and pathogenicity of *Cotylophoron cotylophorum* [12] of Indian ruminants and a biological control to

check infestation. Biology and pathogenicity of *Cotylophoron cotylophorum* is also reported [13]. A successful parasite usually does not cause death to the host must cause diseases and the same time produce a low degree immunity so that the host become susceptible to the same infection over and over again. The researchers not yet area of host-parasite relationships will become more aware of the special approaches, difficulties and challenges which characterize this field.

MATERIAL AND METHODS

For the histopathological study, intestines of *Ovis bharal* (L.) were dissected to observe the rate of infection. Some *Ovis bharal* (L.) were found to be infected and some non infected. Both infected and non infected hosts intestine were dissected and fixed in Bouin's fluid to study histopathological changes. The fixative inhibits the post mortem changes of the tissues. Then tissues were washed, dehydrated through alcoholic grades, cleared in xylene and embedded in paraffin wax (58-62°C).

The blocks were cut at 7 μ and slides were stained in Eosin haematoxylin double staining method and mounted in the DPX. The photomicrographs were taken with the help of camera.

RESULTS AND DISCUSSION

Parasitism of cestodes with their respective hosts is shown in the histopathological studies. This study is carried out with micro-technique where the sections were cut at 7 μ on a rotary microtome and stained with Haematoxylin & Eosin stain. Healthy intestine showed, healthy villi and all layers are clearly observed, where as infected intestine has been observed that the worm attached to the mucosal layer of intestine and slowly invades to the deeper layers of the host tissue. The genus *Stilesia* was erected by Railliet in 1893 [8] from *Ovis aries* in Europe, Asia and Africa, In the present worm *Stilesia shindei* having scolex semicircle towards anterior region, mature proglottid two to three times broader than long, testes arranged in two groups, 4-5 in each groups, vagina posterior to cirrus pouch and ovary compact.

Received: Oct 11, 2011; Revised: Nov 15, 2011; Accepted: Dec 26, 2011.

*Corresponding Author

Dr. Atul Humbe
 Assistant Professor & Head, Dept. of Zoology, S. G. R. G. S. Mahavidyalaya
 Paranda, Dist. Osmanabad, (M.S.) India.

Tel: +91-9404677028; Fax: +91-9404677028
 Email: atul.s.humbe@gmail.com

The study was observed that the worm *Stilesia shindei* attaches and invades the intestinal villi. It inflicts injuries to the necrosis of tissue due to pressure of parasites was of common occurrence. Inflammation in intestinal tissue at the sites of attachment was observed. Parasites when make contact with a host at cellular level, the host reacts bringing into cellular and serological reaction, which is an inflammatory reaction. It is thought that the host is able to distinguish between self and non-self material, it is not clear as to how these recognition is carried out at molecular level. Recognition must occur on or near the surface of the susceptible cells and probably it may require contact between the material and the recognizing cells. Sprent has given an excellent account about the onset of inflammation is characterized by local dilation of the capillaries (vasodilatation). The host-parasites relationships in case of helminth parasites result into large scale damage at the site of attachment [6]. In the present study Photo plate No. 1. Shows the healthy intestine, healthy villi and all layers are clearly observed, where as in Photo plate No. 2. Infected intestine has been observed

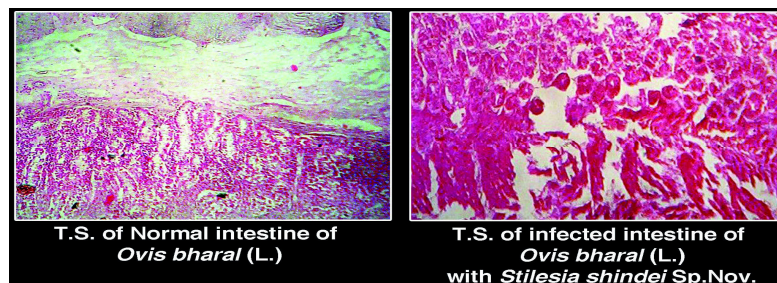
that the worm attached to the mucosal layer of intestine and slowly invades to the deeper layers of the host tissue. In T.S. of intestine of *Ovis bharal*, it has been observed that the *Stilesia shindei* attached to the mucosal, sub-mucosal and muscularis mucosa of intestine and slowly damaged the host intestinal tissue and it destroys the intestinal epithelium of villi showing cestodes are highly destructing to intestine of *Ovis bharal*.

CONCLUSION

From above histopathological discussion it can be concluded that cestode parasite *Stilesia shindei* to finds the nutritive material from the intestine of hosts *Ovis bharal* which is essential for their nourishment and growth.

Photograph No. 1. Photograph showing the T.S. of normal intestinal layer in the *Ovis bharal*.

Photograph No. 2. Photograph showing the damage in the sub mucosa layer caused by the *Ovis bharal*.



Photograph 1

Photograph 2

ACKNOWLEDGEMENT

The author is sincerely acknowledged to Late Dr. Baba Jadhav, Prof. & Head, Department of Zoology, Dr. B.A.M. University, Aurangabad and Principal of S.G.R.G. Shinde college Paranda Dist-Osmanabad (M.S.) India for their support and blessings.

REFERENCES

- [1] Cameraton, T. W. D. 1960. The development and experimental pathology of *Echinococcus multilocularis* and alveolar hydatid. *VII Internat Cong Hydatidiasis Soc Ital Parasitol* 2: 381.
- [2] Chaudhari, S. S., Gupta R. P. and A. K. Sangwan 1993. Helminthic disease in ruminants of Haryana and their control-A review. *Agric. Rev.* 14 (3): 121-132. [3] Horak, I. G. 1967. Host Parasite Relationships of *Paramphistomum microbothrium* in experimentally infested ruminants with particular reference to sheep. *Onderstepoort J. Vet. Res.* 34: 451-540.
- [3] Mukherjee, R. P. and V. P. Sharma. 1902. Massive infection of a sheep with amphistomes and the histopathology of parasitized rumen. *Indian Vet. J.* 39: 668-670.
- [4] Nobel, T. A. 1956. Histopathology of *Paramphistomiasis*. *Ref. Vet.* 13: 155-157
- [5] Prasad, K. D., B. N. Sahai and G. J. Jha, 1974. Observation on pathogenicity and histochemistry of experimental infection in *Cotylophoron cotylophorum* in goats. *Proc. Nat. Acad. Sci. Indian Sect. B.* 44: 202-208.
- [6] Price, E. W. and A. Meintosh. 1953. Two new trematodes of the genus *Cotylophoron* Stiles and Goldberger. 1910 from American Sheep. In: Thapar Commemoration Volume, Dayal, J. and Singh, K. S. (Eds). 227-232
- [7] Railliet A. 1893. *Traite de Zoologie Medical et agricole*, 2nd ed. Paris, pp.736.
- [8] Sharma, Deorani, V. P. Sahai and R. D. Katiyar, 1967. Studies on the pathogenicity due to immature *Paramphistomes* among sheep and goats. *Indian Vet. J.* 44: 199-205.
- [9] Singh, R. P., Sahai B. N. and G. J. Jha. 1984. Histopathology of the duodenum and rumen during experimental infection with *Paramphistomum cervi*. *J. Vet. Parasitol.* 15: 39-46
- [10] Srivastava, H. D. 1938. A study on the life history and pathogenicity of *Cotylophoron cotylophorum* (Fischoeder, 1901). Stiles and Goldberger, 1910 of Indian ruminants and a biological control to check infestation. *Indian J. Vet. Sci.* 8: 381-385.
- [11] Stiles, and Goldberger. 1910. "A study of the anatomy of Watsonine westsoni of man and nineteen allied species of mammalian trematode worms of the super family *Paramphistomidae*". *Bull. U. A. Treasury Department Hyg. Lab.* 60: 1-259.
- [12] Varma, A. K. 1961. Observation on the biology and pathogenicity of *Cotylophoron cotylophorum* (Fischoeder, 1901). *Helminthol.* 35: 161-165.