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Histopathological changes of *Parabronema skrijabini* in Sheep in Basrah City.

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ABSTRACT

The study was conducted on sheep of Basra to be slaughtered for local consumption. To inspect and detected the histopathology changes in the abomasum of the infected sheep in Basra South of Iraq. A total of (576) Abomasums of Sheep were collected from Basrah slaughter house in the period from June (2016) to January (2017). This study included the examination of abomasums to determined of parasite *Parabronema skrijabini*. In laboratory, samples were examined the abomasum was opened and the parasites were isolated and a microscopic person was identified. And then cut a small piece of infected abomasum with a limit of 2 cm and put in formalin solution 10% for the purpose of histological study. The result was showed A proliferation of mucosal glandular epithelium and associated of inflammatory cells in the lamina properia ,that larval stage and adult of *P. skrijabini* embedded in sub mucosal layer causing Inflammation of the abomasum, which manifested in leukocytic infiltration in the mucosal observed in infected animals corresponding to control was primarily due to mucus cell hyperplasia. infection of the abomasums causing similar lesions. The cellular response to abomasal nematodes involves the accumulation of inflammatory cells such as leucocytes, eosinophils. Abomasum showed varying degrees of ulceration and congestion of the mucosa.

Keywords: Abomasum, Basrah, *Parabronema skrijabini*, Sheep, histopathology

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INTRODUCTION

Gastro intestinal parasites like helminthes and protozoan affect the health of the small ruminants like sheep and goats and when heavy infections occur those parasites drastically decrease the economic feedback from the small ruminants animal like milk yield reduction in goat and sheep which also interrupt with the digestion of essential macro minerals like calcium and vitamins for the milk production in the mammary glands [1]. Abomasum is one of the most important sites for living bursate nematodes belonging to Trichostrongylidae family, because it is the site in location for four pathogen species of nematodes e.g., *Haemonchus spp.*, *Teladorsagia spp.*, *Ostertagia spp.* and *Trichostrongylus spp.*, meanwhile it was shown that gastrointestinal nematodes could be harmful to the health different of infected animals and causes economic losses due to mortalities, reduce weight gain and other production losses [2]. These parasites cause both acute infections with a rapid onset and high mortality levels and chronic infections, which are commonly subclinical and may lead to insidious and important economic losses [3] via reduction of live weight gain, reduced wool and milk production, and poor reproductive performance [4]. This problem is severe in tropical countries due to highly favorable environmental conditions for helminth transmission [5].

Parabronema skrjabini is one of the nematodes that inhabits in the abomasum of ruminants and has a wide distribution in Africa, Asia and some Mediterranean countries, with a number of studies from Kazakhstan [6], Saudi Arabia [7], Turkey [8], Iran [9] and Iraq [10]. *Parabronemosis* was a disease caused by the nematode *P. skrjabini* parasitized in abomasums of ruminant [11], and these parasites cause a pathological changes in the animal that disrupt digestion and reduce appetite, which in turn affect the host immune status during infection and the ability to prevent parasite establishment and development [12]. Insufficient information is available about possible pathological caused by *P. skrjabini* infection [13]. In Iran record *P. skrjabini* in the abomasum of small and large ruminants with prevalence rates between 1% and 5.43% in sheep [14]. Because this parasite is important as it affects livestock, including sheep, and causes significant economic losses. The aim of the study was to conduct a histopathological changes of abomasums of infected sheep with *P. skrjabini* between slaughtered animals at Basrah city.

MATERIALS AND METHODS

Samples of abomasums were collected from slaughtered sheeps which examined in local slaughter house in Basra city with a period between June 2016 to January 2017 and immediately taken to the laboratory of Parasitology Department of Veterinary Medicine College in Basra University for appropriate examination. The isolated *P. skrjabini* was stored in ethanol alcohol (70%) after isolated from abomasum and examined under dissected microscope searching about the diagnostic features to classification of parasite . 2cm of infected abomasum were fixed in 10% formaldehyde and prepared for histopathological examination with Haematoxyline and eosin stain according to the method by [15], and then examined under light microscope.

RESULTS

The results showed the *P. skrjabini* distribution in the lumen of abomasum in Fig. (1) , and showed the anterior part of *P. skrjabini* female with clear lips (Fig. 2).



Figure (1): *Parabronema skrjabini* adult worms embedded in abomasum of slaughter sheep.

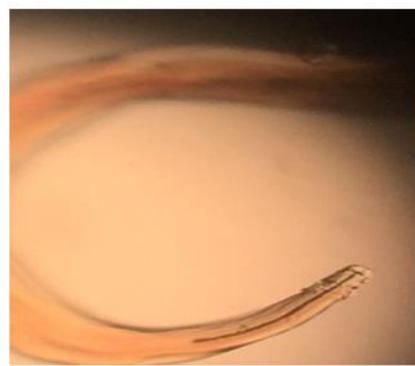
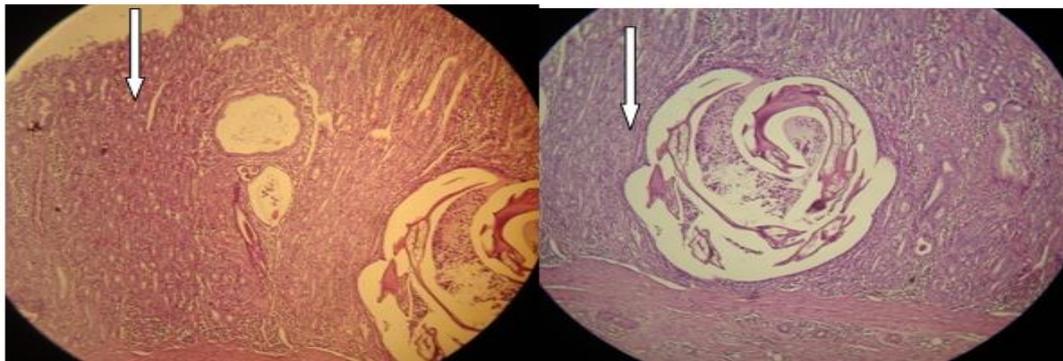


Figure (2): Anterior part of *Parabronema skrjabini* adult worm. note: mouth, lips and alae.

The histopathological section of abomasum infected with *P. skrjabini* showed, an encysted parasites in a large cyst in the lamina propria, pericycstic fibrosis and inflammatory cells, also, presence inflammatory cells in the cyst around the parasite (Fig. 3). While, a pericycstic fibrosis and inflammatory cells noticed in (Fig. 4). But, showed another field cystic dilatation with few inflammatory cells and some contain section of larvae Fig. (5). A proliferation of mucosal glandular epithelium and associated of inflammatory cells in the lamina propria noticed in (Fig. 6), but with focal erosion of mucosal epithelium of superficial Fig. (7).

A proliferation of epithelium of mucose glands in the lamina propria associated with inflammatory cells (Fig. 8). But found a proliferation and hyperplasia of mucose glands in the lamina propria Fig. (9). An erosion of outer mucosal lying In Fig. (10), but showed a section of parasites in depression of superficial mucosa in Figs. (11, 12, 13).A cystic dilatation of mucose glands contain a various stages of parasites and associated with per glandular inflammatory cells (Figs. 14, 15), While, showed a section of parasite Fig. (16), Noticed a lamina propria proliferation of mucose glands associated with inflammatory cells mononuclear lymphocytes(Fig. 17). An erosion of superficial mucose membrane associated with parasites and inflammatory cells, but noticed a proliferation and hyperplasia of mucose glands induced by the parasite Figs. (18, 19). section in abomasum infected with *P. skrjabini* showed a section of parasite Figs. (20, 21, 22).A mucose glands associated with few intra luminal larvae with inflammatory cells and epithelia cells, some with hyperplasia, other with peri glandular inflammatory cells or cellular debris (Figs. 23,24, 25, 26) respectively. A several section of larvae in dilated mucose glands with peri glandular infiltration of inflammatory cells (Figs. 27, 28, 29, 30, 31, 32, 33).A dilated mucose glands with infiltration of inflammatory cells In Figs. (34, 35).While, showed a section of parasites in depression of superficial mucosa in Fig. (36). A several section of larvae in dilated mucose glands with peri glandular infiltration of inflammatory cells showed in Figs. (37, 38).But A section of female in dilated mucose glands with peri glandular infiltration of inflammatory cells in Fig. (39).An erosion of outer mucosal lying with infiltration of inflammatory cells showed in Fig. (40). By the other hand showed an infiltration of inflammatory cells in the lamina propria, Fig. (41).All the above observation compared with control abomasum without any infection (Fig. 42).



<p>Fig (3): Section in abomasum infected with <i>P. skrjabini</i> showed, an encysted parasites in a large cyst in the lamina propria, pericycstic fibrosis and inflammatory cells in the cyst around the parasite. Eosin and Haematoxyline. 10X.</p>	<p>Fig (4): Section in abomasum infected with <i>P. skrjabini</i> showed a pericycstic fibrosis and inflammatory cells noticed. Eosin and Haematoxyline. 10X.</p>
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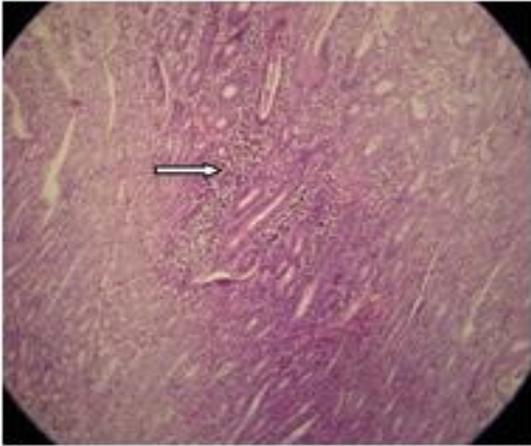


Fig (5): Section in abomasum infected with *P. skrjabini* showed cystic dilatation with few inflammatory cells and some contain section of larvae. Eosin and Haematoxyline. 10X.

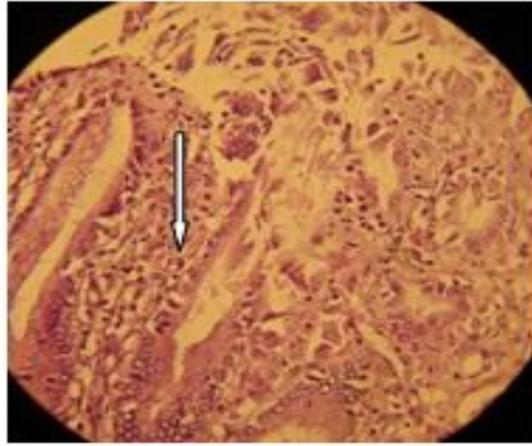


Fig (6): Section in abomasum infected with *P. skrjabini* showed A proliferation of mucosal glandular epithelium and associated of inflammatory cells in the lamina propria noticed. Eosin and Haematoxyline. 10X.

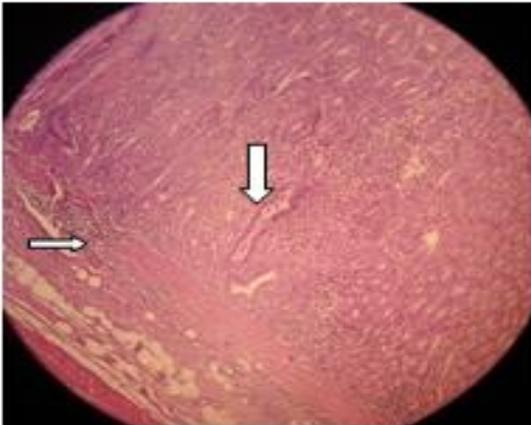


Fig (7): Section in abomasum infected with *P. skrjabini* showed with focal erosion of mucosal epithelium of superficial. Eosin and Haematoxyline. 10X.



Fig (8): Section in abomasum infected with *P. skrjabini* showed A proliferation of epithelium of mucose glands in the lamina propria associated with inflammatory cells. Eosin and Haematoxyline. 10X.

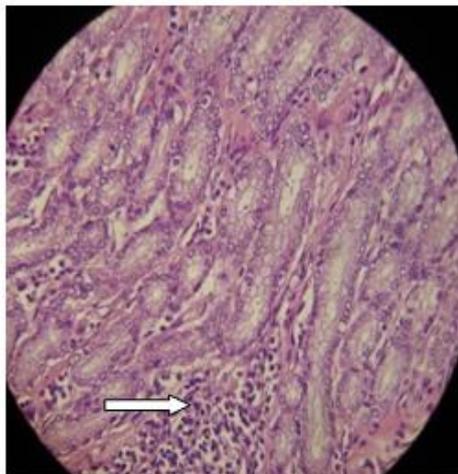


Fig (9): Section in abomasum infected with *P. skrjabini* showed a proliferation and hyperplasia of mucose glands in the lamina propria. Eosin and Haematoxyline. 10X.

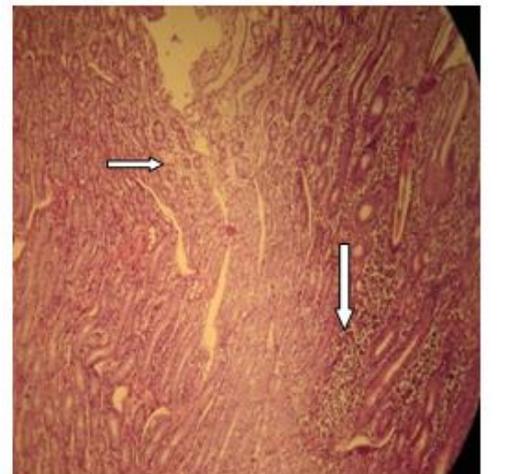


Fig (10): Section in abomasum infected with *P. skrjabini* showed an erosion of outer mucosal lying. Eosin and Haematoxyline. 10X.

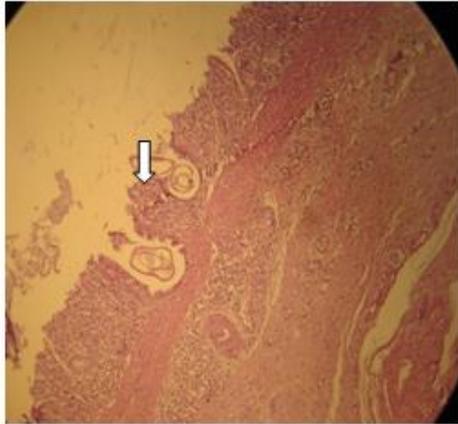


Fig (11): Section in abomasum infected with *P. skrjabini* showed a section of parasites in depression of superficial mucosa. Eosin and Haematoxyline. 10X.

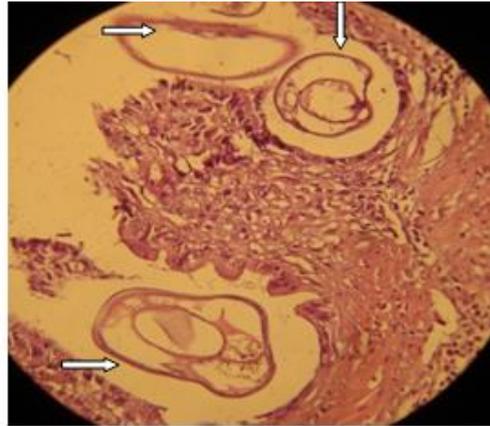


Fig (12): Section in abomasum infected with *P. skrjabini* showed a section of parasites in depression of superficial mucosa. Eosin and Haematoxyline. 40X

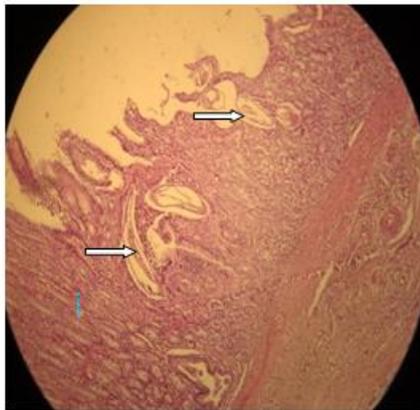


Fig (13): Section in abomasum infected with *P. skrjabini* showed a section of parasites in depression of superficial mucosa. Eosin and Haematoxyline. 10X.

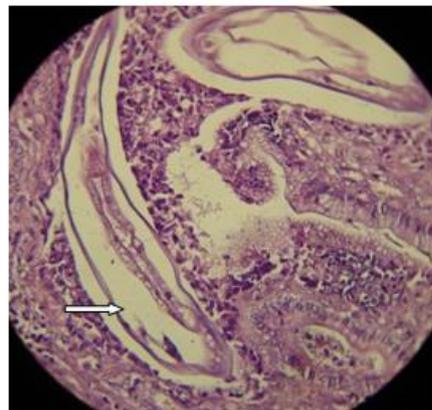


Fig (14): Section in abomasum infected with *P. skrjabini* showed A cystic dilatation of mucose glands contain a various stages of parasites and associated with per glandular inflammatory cells. Eosin and Haematoxyline. 10X.



Fig (15): Section in abomasum infected with *P. skrjabini* showed A cystic dilatation of mucose glands contain a various stages of parasites and associated with per glandular inflammatory cells. Eosin and Haematoxyline. 10X.



Fig (16): Section in abomasum infected with *P. skrjabini* showed showed a section of parasite. Eosin and Haematoxyline. 10X.

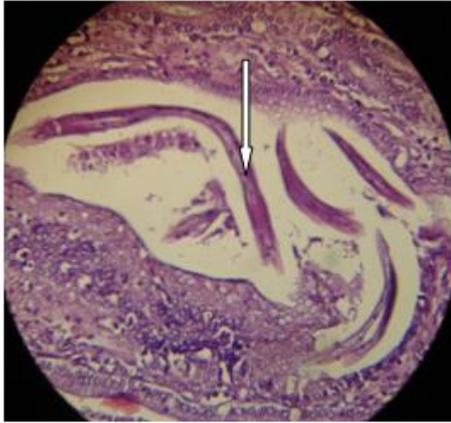


Fig (17): Section in abomasum infected with *P. skrjabini* showed noticed a lamina propria proliferation of mucose glands associated with inflammatory cells mononuclear lymphocytes. An erosion of superficial mucose membrane associated with parasites and inflammatory cells. Eosin and Haematoxyline. 10X.

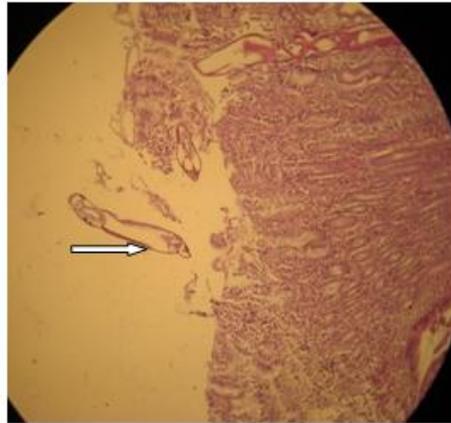


Fig (18): Section in abomasum infected with *P. skrjabini* showed a section of parasites in depression of superficial mucosa. Eosin and Haematoxyline. 10X.

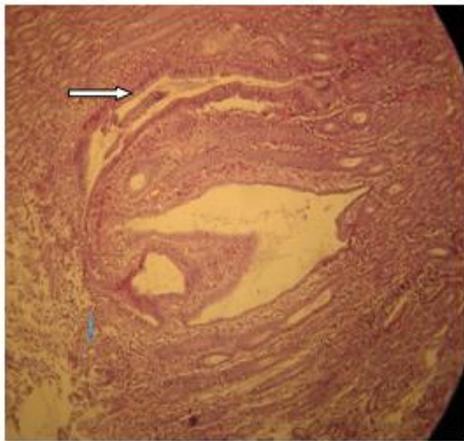


Fig (19): Section in abomasum infected with *P. skrjabini* noticed a proliferation and hyperplasia of mucose glands induced by the parasite. Eosin and Haematoxyline. 10X.

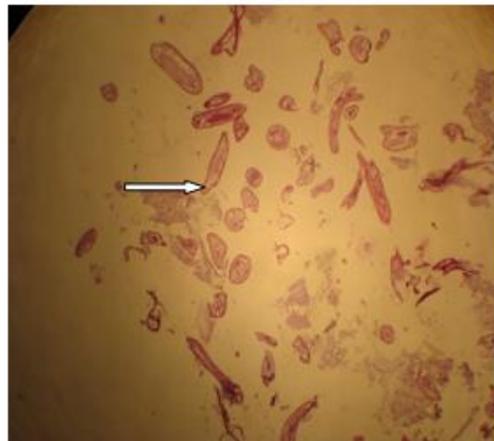


Fig (20): Section in abomasum infected with *P. skrjabini* showed a section of parasite. Eosin and Haematoxyline. 10X.

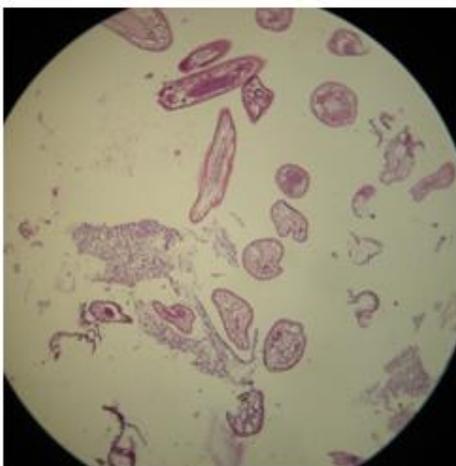


Fig (21): Section in abomasum infected with *P. skrjabini* showed a section of parasite. Eosin and Haematoxyline. 10X.



Fig (22): Section in abomasum infected with *P. skrjabini* showed a section of parasite. Eosin and Haematoxyline. 40X.

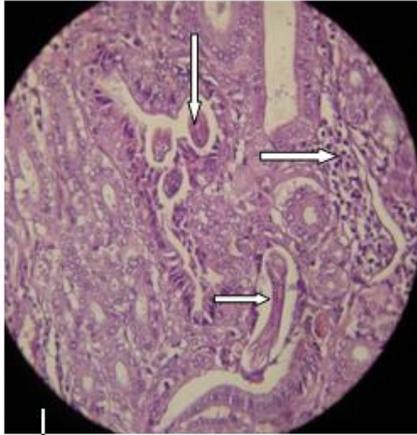


Fig (23): Section in abomasum infected with *P. skrjabini* A mucose glands associated with few intra luminal larvae with inflammatory cells and epithelia cells, some with hyperplasia. Eosin and Haematoxyline. 10X.

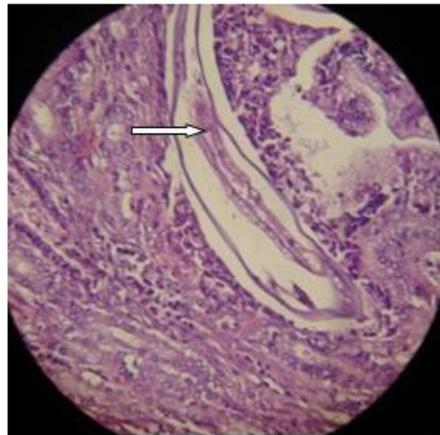


Fig (24): Section in abomasum infected with *P. skrjabini* A mucose glands associated with few intra luminal larvae with inflammatory cells and epithelia cells, some with hyperplasia. Eosin and Haematoxyline. 10X.

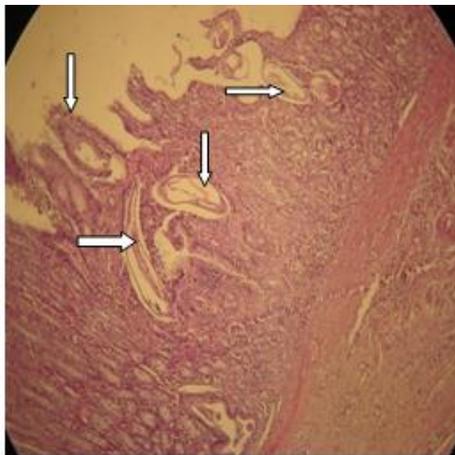


Fig (25): Section in abomasum infected with *P. skrjabini* a mucose glands associated with few intra luminal larvae with inflammatory cells and epithelia cells with peri glandular inflammatory cells. Eosin and Haematoxyline. 10X.



Fig (26): Section in abomasum infected with *P. skrjabini* a mucose glands associated with few intra luminal larvae with inflammatory cells and epithelia cells with cellular debris. Eosin and Haematoxyline. 10X.

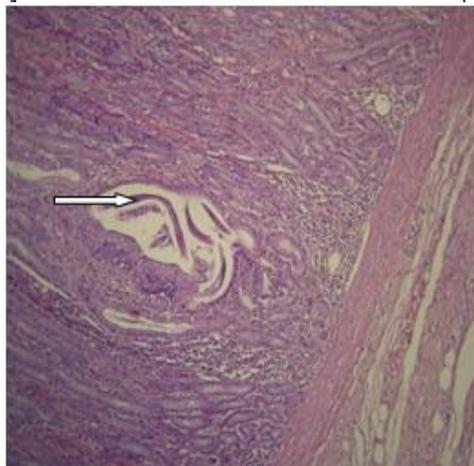


Fig (27): Section in abomasum infected with *P. skrjabini* A several section of larvae in dilated mucose glands with peri glandular infiltration of inflammatory cells. Eosin and Haematoxyline. 10X.

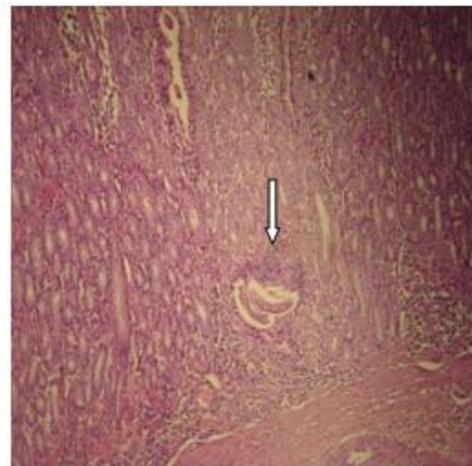


Fig (28): Section in abomasum infected with *P. skrjabini* A several section of larvae in dilated mucose glands with peri glandular infiltration of inflammatory cells. Eosin and Haematoxyline. 10X.

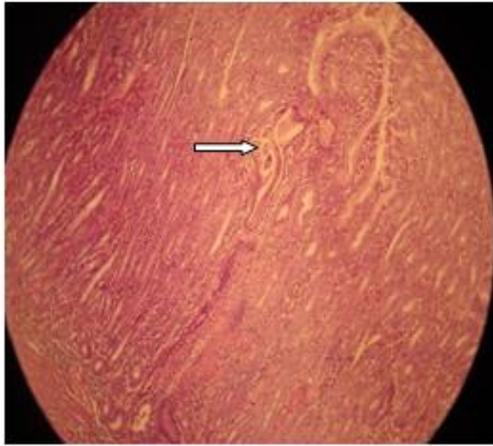


Fig (29): Section in abomasum infected with *P. skrjabini* A several section of larvae in dilated mucose glands with peri glandular infiltration of inflammatory cells. Eosin and Haematoxyline. 10X.

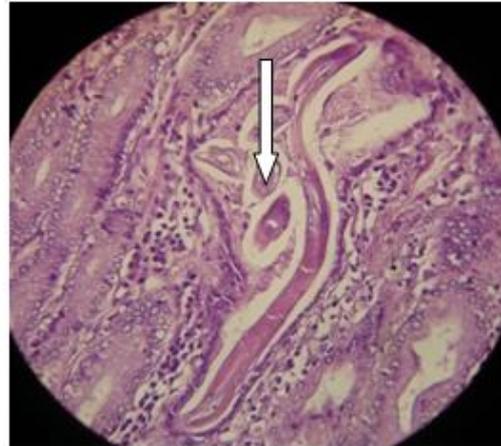


Fig (30): Section in abomasum infected with *P. skrjabini* A several section of larvae in dilated mucose glands with peri glandular infiltration of inflammatory cells. Eosin and Haematoxyline. 10X.

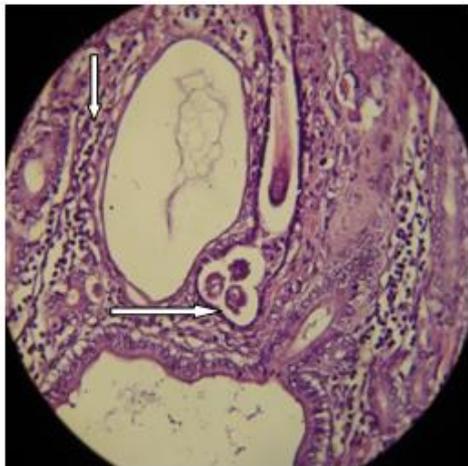


Fig (31): Section in abomasum infected with *P. skrjabini* A several section of larvae in dilated mucose glands with peri glandular infiltration of inflammatory cells. Eosin and Haematoxyline. 10X.

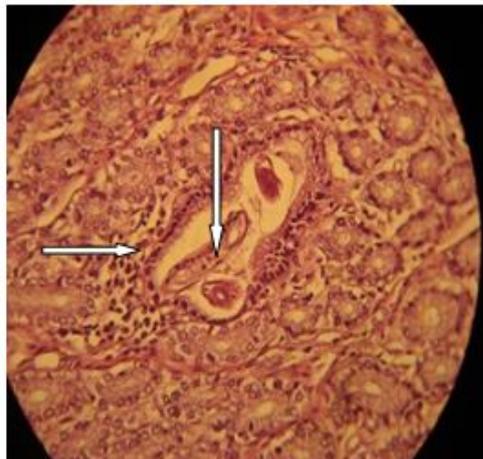


Fig (32): Section in abomasum infected with *P. skrjabini* A several section of larvae in dilated mucose glands with peri glandular infiltration of inflammatory cells. Eosin and Haematoxyline. 10X.

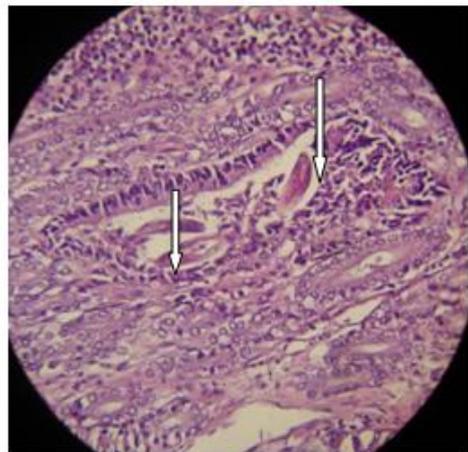


Fig (33): Section in abomasum infected with *P. skrjabini* A several section of larvae in dilated mucose glands with peri glandular infiltration of inflammatory cells. Eosin and Haematoxyline. 10X.

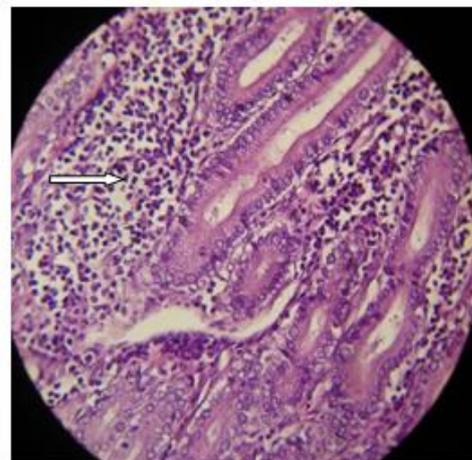


Fig (34): Section in abomasum infected with *P. skrjabini* A dilated mucose glands with infiltration of inflammatory cells. Eosin and Haematoxyline. 40X.

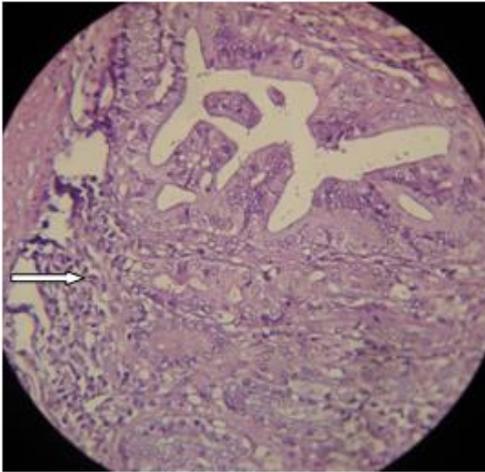


Fig (35): Section in abomasum infected with *P. skrjabini* A dilated mucose glands with infiltration of inflammatory cells. Eosin and Haematoxyline. 10X.

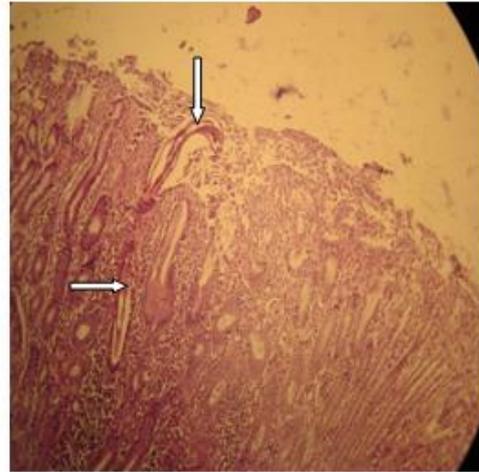


Fig (36): Section in abomasum infected with *P. skrjabini* showed a section of parasites in depression of superficial mucosa. Eosin and Haematoxyline. 10X.



Fig (37): Section in abomasum infected with *P. skrjabini* A several section of larvae in dilated mucose glands with peri glandular infiltration of inflammatory cells. Eosin and Haematoxyline. 10X.

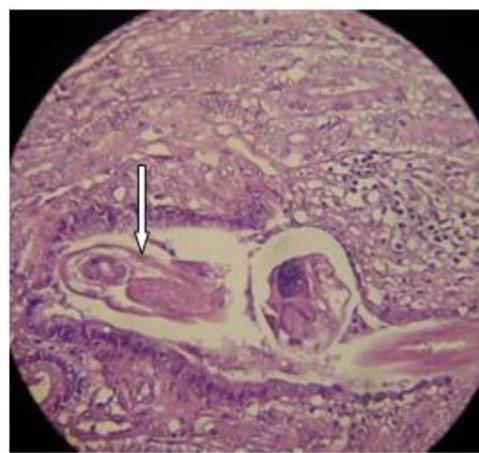


Fig (38): Section in abomasum infected with *P. skrjabini* A several section of larvae in dilated mucose glands with peri glandular infiltration of inflammatory cells. Eosin and Haematoxyline. 10X.

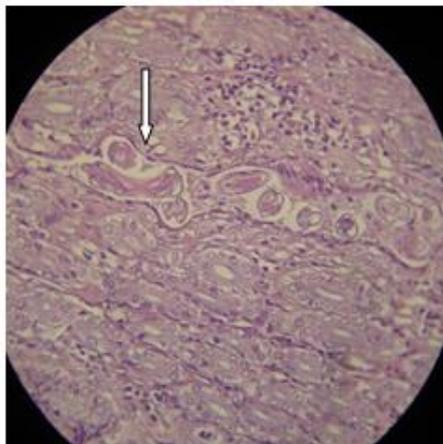


Fig (39): Section in abomasum infected with *P. skrjabini* A section of female in dilated mucose glands with peri glandular infiltration of inflammatory cells. Eosin and Haematoxyline. 10X.

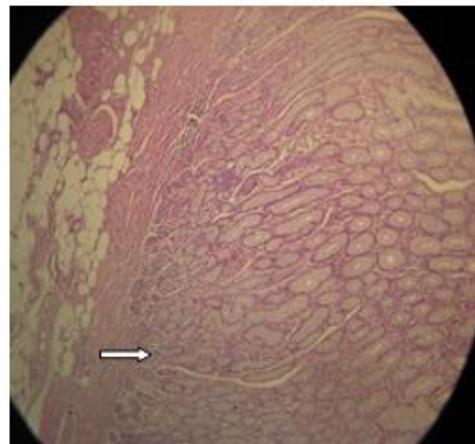


Fig (40): Section in abomasum infected with *P. skrjabini* showed an erosion of outer mucosal lying with infiltration of inflammatory cells. Eosin and Haematoxyline. 10X.

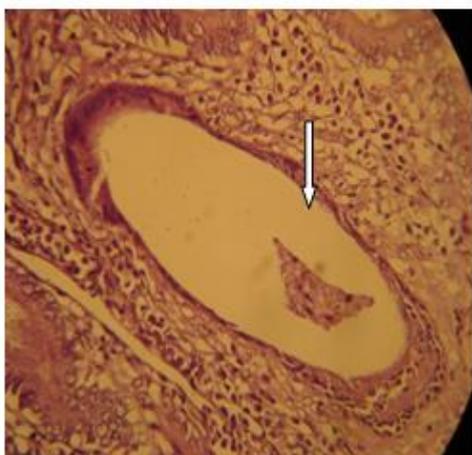


Fig (41): Section in abomasum infected with *P. skrjabini* showed an infiltration of inflammatory cells in the lamina propria. Eosin and Haematoxyline. 10X.

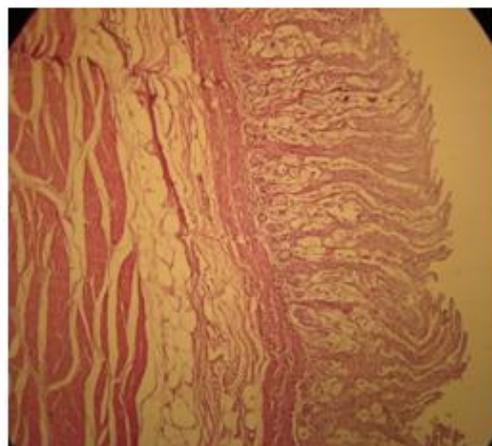


Fig (42): Section in abomasum without any infection as control. Eosin and Haematoxyline. 10X.

DISCUSSION

The result was showed that larval stage and adult of *P. skrjabini* embedded in sub mucosal layer causing Inflammation of the abomasum, which manifested in leukocytic infiltration in the mucosa I observed in infected animals corresponding to control was primarily due to mucus cell hyperplasia, this result agreement with [16]. Hyperplasia of cells is attributed to their activity due to raised plasma gastrin levels that described by [17]. Edema and cystic changes of glands and glandular hyperplasia, could be due to either physical irritation caused by foreign body or the effect of parasitic infection of the abomasums causing similar lesions [18]. The cellular response to abomasal nematodes involves the accumulation of inflammatory cells such as leucocytes, eosinophils agreement with [19]; [20]. [21] they were mentioned that a curious feature of the inflammation caused by parasites is that the parasites may themselves actively recruit granulocytes through secreted chemotaxins. Sloughing and erosion in epithelial lining and cell in some cases show the complete loss of cellular structures this agreement with result of [22]. The mucus gland elongated in infected animal corresponding with the control animals, this agreement with [22]. Abomasum showed varying degrees of ulceration and congestion of the mucosa. Histologically, there were inflammatory reactions mainly of lymphocytes and eosinophils and hyperemia in the abomasal mucosa with hyperplasia of abomasal glands of infected animals There was sloughing of epithelium, dilated and elongated glands with necrosis of the same in some cases with infiltration of inflammatory cells. Similar observations were also made by [23]. Also, the result revealed cystic dilation of mucosal gland and the rapid decrease in abomasal acid secretion, the parietal cells develop dilated and increase mucus secretion, this agreement with [24].

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