

MORPHOLOGICAL STUDY AND PREVALENCE OF *TRICHURIS* IN SHEEP IN BAGHDAD PROVINCE, IRAQ

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Abstract

The total recovery of *Trichuris* spp. for sixty specimens collected from three regions (Abu Ghraib, Shulla and AL Bayaah) from Baghdad city was 45%, from January 2021 till the end of June 2021 by direct examination to the intestinal contents and morphological identification for the adult worms. Significant differences ($P \leq 0.05$) were recorded between the region and during months of the study, Abu Ghraib region recorded highest infection rate with 60% (12/20) while Shulla recorded lowest infection rate with 30% (6/20). May recorded the higher infection rate with significant differences ($P \leq 0.05$) referring to other months with 90% (9/10), comparing to January which no infection recorded during it. morphological measurements were recorded for males, females and ova for the isolated nematodes for the total length, anterior narrow filamentous anterior end ratio to the total body length, width as well as the barrel shaped ova measurements.

Key words: Intestinal nematodes, *Trichuris*, Morphology, Sheep, Baghdad.

Introduction

Small animals and mainly sheep considered as a multipurpose animal by their production of meat, wool, milk, skin, and also manure for agriculture purpose in many farmers. Small-scale farming system may fail to get its full economic benefit because of many factors and mainly diseases predominantly prevent optimum productivity (Umur and Yukari, 2005). Gastrointestinal nematodesis concedes one of the main causes of significant economic loss in many countries around the world (Soulsby, 1986). Sub-clinical and clinical parasitic infection in sheep can lead to weight loss and a noticeable decrease in milk gain and wool production and quality (Umur and Arslan, 2000).

Trichuridae Baird, 1853 family considered one of the economically important nematodes with only one genus, *Trichuris* Schrank, and more than 70 nematode species parasitic in wild, domestic and primate mammals (Ravasi *et al.*, 2012; Callejon *et al.*, 2015; Hillman *et al.*, 2017).

Between many species of *Trichuris*, few whipworm infecting the caecum and colon of sheep, goats, cattle and other ruminants in all parts of the world (Bulbul *et al.*, 2020) Its life cycle characterized to be direct and definitive host get infected through ingestion of infective first larval stage inside the eggs which pass the stomach and hatch in the small intestine, the hatched larvae

burrow into the cecal wall and proximal colon where they evolved to mature worms (Urquhart *et al.*, 1987). The penetration of *Trichuris* spp. into the mucosal layer causes mechanical damage and also many histological changes depending on to the degree of infection. The common changes consist of a local erosions, lymphocyte infiltration and mucosal desquamation in the site of attachment and over secretion of the intestinal glands (Iliev *et al.*, 2017). And due to the lack of information about *Trichuris* spp. in sheep in Iraq, this study was conducted.

Material and methods

Samples collection

During six months, from the beginning of Jan 2021 till the end of Jun 2021. Sixtyintestinal specimens collected from different animals of different sex and age directly after animals slaughtering from three areas in Baghdad city (Abu Ghraib, Shulla and AL Bayaah). Intestinal specimens were ligating from each sides and move to the lab for further examination.

Large Intestinal contents were collected, sieved and examined for the parasite investigation and morphological identification. Adult whipworms were collected carefully to preserve them from mechanical damage during the collection process and washed with normal saline and moved to warm 70% Ethanol with few drops of lactophenol (Fadhil *et al.*, 2022), transferred to the parasitology lab in the College of Veterinary Medicine, University of Baghdad.

Statistical analysis

The statistical analyses were done by using SPSS version 16 software. The chi-square test (χ^2) was used to detect the association between the Prevalence between areas and months (Gharban, 2022).

Results

Morphological study

The characteristic morphology of *Trichuris* spp. nematodes can be seen as: long, semitransparent, thin, filiform, anterior body part in which the esophagus can be seen. The posterior section of *Trichuris* body is thick, short, and mostly white. The mouth orifice is small, usually oval, surrounded by small lipsThe anterior end had two lateral, wing-shaped nodes.Sexes dimorphism can be recognized in body size, posterior end structure, and the specific sexual apparatus (Figures 2, 3). Females are significantly longer than males, the males measured 52-79 mm in length in which the anterior narrow filamentous anterior end resemble three-quarters of the length with coiled end harboring single spicule in the posterior end. Furthermore, female measured 30- 66 mm long from which the narrow filamentous anterior section forms two-thirds to four-fifths, At the same time female nematodeswas notably wider at the posterior end (810-825 μm) than males (561- 620 μm).The eggs were characterized bybarrel shape, brown color, with a limpid, two plugs at both ends and measured 65-81 by 31-41 μm covering mass of un-segmented embryo when laid.



Fig (1): Anterior end

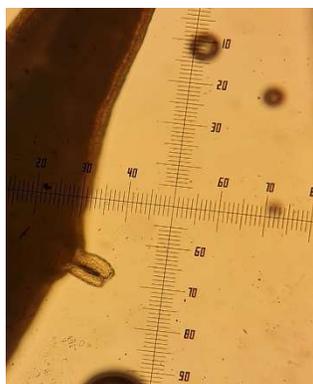


Fig (2): Female (vulva opening)



Fig (3): Male (posterior end)

Prevalence study

Out of sixty intestinal samples collected, twenty-seven identified to be infected with *Trichuris* spp. with total infection rate 45%. Abu Ghraib area recorded the highest infection with significant differences ($P \leq 0.05$) rate with 60% (12/20) followed by Al Bayaah and Al Shulla with 45% (9/20) and 30% (6/20) respectively (Table 1).

Table (1) *Trichuris* spp. infection rate regarding to the areas

Area	No. of samples	Positive	%
Al Bayaah	20	9	45
Abo-Ghraib	20	12	60
Al Shulla	20	6	30
Total	60	27	45

Around the study period, May recorded the higher infection rate with significant differences ($P \leq 0.05$) referring to other months with 90% (9/10), and comparing to Jan in which no infection rate recorded (Table 2).

Table (2) *Trichuris* spp. infection rate regarding the months

Months	No. of samples	Positive	%
January	10	0	0
February	10	1	10
March	10	2	20
April	10	6	60
May	10	9	90
Jun	10	8	80

Discussion

There were many articles deals with the prevalence and seasonal presence of gastrointestinal nematodes in sheep in Iraq (Fadl *et al.*, 2011; AL-Dahar and Al-Amery, 2015) and no articles focusing on the morphology of the *Trichuis* spp. in Iraq. Our recent date for the morphometric data

showed high similarities in male and female average length and eggs with Yevstafieva *et al.*, (2018) and Bulbul *et al.*, (2020). Furthermore, prevalence rate in different areas from Baghdad city showed high infection rate with 45% and was different with many studies (Rehbein *et al.*, 1998; Umur, 2005; Fadl *et al.*, 2011; Yevstafieva *et al.*, 2018). These differences may be referred to the difference in the samples size, geographical area and the environmental conditions and type of management. Highest prevalence was recorded in Abo Ghraib region compare to other regions and this may be related to economic status and the accumulation of sheep's breeding owners in this area.

Cold months affected negatively on the infection rates by recording the lowest infection rates while warm temperature increasing showed positive effect on the increase in the infection rates and this matched with majorities of studies that deals with the prevalence of helminths (Thomas, 1982; Soulsby, 1986; Umur, 2005; Yevstafieva *et al.*, 2018).

Conclusion

Trichuris spp. (Schrank, 1788) is a common intestinal nematode in sheep in different regions in Baghdad city with total infection rate 45%. High prevalence was recorded in Abo Ghraib region compared to others regions. During the study period, the temperature affected directly on the infection rate by the fluctuation on the prevalence rate. May recorded the highest infection rate compared to others and no infection was recorded during January.

References

- AL-Dahar, A. H. H. , Al-Amery A. M. (2015) A Prevalence of abomasal worms in sheep in AL-Kut province abattoir. Iraqi Journal of Veterinary Medicine, 39(2), 38–41.
- Ali, I.F., Houida H.A., Shala. R.F. and Mohammed, Th. S.(2022)Molecular detection for *Parabronemas krjabini* worms in camels (*Camelus dromedarius*) in Al-Najaf l-Ashraf, Iraq. Iraqi Journal of Agricultural Sciences.53(3):584- 588.
- Bulbul, K.H., Akand, A.H., Hussain, J., Shamima, P. and Hasin, D.(2022) A brief understanding of *Trichurisovis* in ruminants. International Journal of Veterinary Sciences and Animal Husbandry, 5(3): 72-74.
- Callejon, R., Cutillas, C., Nadler, S. A.(2015) Nuclear and mitochondrial genes for inferring *Trichuris* phylogeny.Parasitology Research, 114 (12):4591-9.
- Fadl, S. R.and Kalef D. A. , Abbas S. M.(2011) Prevalence of Parasitic Infection in Sheep from different Regions in Baghdad. Iraqi Journal of Veterinary Medicine, 35(1), 204–209.
- Gharban, H. A. (2022). Clinical and Serological Diagnosis of Bovine Hypodermosis in Wasit Province. *Revista Electronica de Veterinaria*, 457-466.
- Hillman, A. E., Ash, A. L., Kristancic, A. R., Elliot, A. D., Lymbery, A. J., Robertson, I. D., Thompson, R. C. (2017) Validation of various parasite detection tests for use in the Australian marsupials quenda (*Isoodonobesulus*) and brushtail possums (*Trichosurus vulpecula*). Journal of Veterinary Diagnostic Investigation, 29 (1), 64–75.
- Iliev, P. T., Ivanov, A., Kirkova, Z., Hristov, K., Dinkova, K., Ananiev, J. (2017). Some parasitological, pathological and immunohistochemical examinations in sheep naturally infected by *Trichurisovis*. Trakia Journal of Sciences, 2;174-178.

- Ravasi, D. F., O’Riain, M. J., Davids, F., Illing, N.(2012) Phylogenetic Evidence That Two Distinct *Trichuris* Genotypes Infect both Humans and Non-Human Primates.PLoS One, 7 (8).
- Rehbein, S., Visser, M., Winter, R. (1998)Endoparasitic infections insheep from the Swabian Alb. Dtsch. Tierarztl. Wochenschr; 105: 419-424.
- Rehbein, S., Visser, M., Winter, R.(1998) Endoparasitic infections in sheep from the Swabian Alb. Dtsch. Tierarztl. Wochenschr. 105: 419-424.
- Soulsby, E.J.L. (1986) Helminths, Arthropods and Protozoa of Domesticated Animals. 7th. Ed., Bailliere Tindall, London.;212-342.
- Thomas, R.J.(1982) Modern strategies for the control of gastrointestinal parasitism in sheep. Outl. Agric.; 11: 73-78.
- Thomas, R.J.(1982)Modern strategies for the control of gastrointestinalparasitism in sheep. Outl. Agric., 11: 73-78.
- Umur, Ş. and Yukari, B. A. (2005) An Abattoir Survey of Gastro-Intestinal Nematodes in sheep in the Burdur Region, Turkey. Turk. J. Vet. Anim. Sci.: Vol. 29: No. 5(18); 1195-1201.
- Umur, P., Arslan, M.(2000). Doramectin Öindo Üalen fektekuzulardamide-ba ÜÝ rsaknematodlar ÝvecanlÝaÜÝrlÝkartÝßÝnaetskisi. T. Parazitol. Derg. ; 24: 67-72.
- Urquhart, G.M., Armour, J., Duncan, J.L., Dunn, A.M. and Jennings, F.W.(1996)Veterinary Parasitology. 2nd Edition, Blackwell Science Ltd., Oxford, 224-234.
- Yevstafieva V. A., Yuskiv I. D., Melnychuk V. V., Yasnolob I. O., Kovalenko V. A., Horb K. O.(2018)Nematodes of the genus *Trichuris* (nematoda,trichuridae), parasitizing sheep in central and south-eastern regions of Ukraine.VestnikZoologii, 52(3): 193–204.