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ACTIVE SURVEY STUDY OF HAEMONCHOSIS IN SLAUGHTERED SHEEPS AND GOATS AT BASRAH ABATTOIR, BASRAH PROVINCE, IRAQ

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ABSTRACT

In the current study a total of (705) slaughtered sheeps and goats were examined, divided into (556) sheep and (149) goat which were taken from Basrah slaughter house during the period between June 2016 to January 2017.

The total number of infected animals with Haemonchosis were (90) which is divided into (78) sheep and (12) goats while the total number of isolated worms from the abomasum was (2439) for both sheep and goats with total percentage of infection12.76 % which was divided in to (14.02% and 8.05 %) in sheep and goats respectively, while the intensity of infection was about (27.1)which divided into(27.12and 26.91) in sheep and goats respectively.

INTRODUCTION

Among the diseases that compel the survival and productivity of cattle, sheep and goats a gastrointestinal nematode infection known as Haemonchosis that caused by *Heamonchus contortus* which have overwhelming importance **(1).** So, Haemonchosis is an economic disease that causes rapid death, depletion and severe anemia to their

hosts **(2).**

H. contortus is related to trichostrongylidae nematode and this parasite is a great pathogen which is considered the most economically important that establishes in the abomasum of goats , sheep, camels and other ruminants of nearly all subtropical and temperate areas at worldwide distribution **(3).**

(4) noticed that the main source of nutrient of these nematode is blood, therefore the infection with this parasite can cause in young animals anemia, anorexia, weight loss, reduced in wool growth that in some causes result in death associated with little ruminant production and this was dependent upon the amount of infection.

Debilitating infection with *H. contortus* is commonly seen in young animals while in older animals the develop of resistance to the infection occur **(5). (6); (7)** explained that the dangerous of Haemonchosis by the adult female of the parasites which have the ability to produce a huge number of eggs which cause extensive pasture contamination and the blood-feeding nature of this parasite causes variable degrees of anemia that lead finally to mortality. **(8)** reported that the prevalence of infection with *H. contortus* in Iran which was (77.20%), and a similar percentage found by **(9); (10); (11)** which reported a high percentage of infection with *H. contortus* in Ogaden. in Iran the percentage of infection with Haemonchosis was (44%) **(12).**

(13) and **(14)** found that in Saudi Arabia after examination of slaughtered male sheep's abomasum the infection percentage with *H. contortus* is 21.33% and 47.9% respectively. While, in Saudi Arabia after examination of the abomasum of slaughtered sheep **(15)** reported that the infection with *H. contortus* in Egypt was 7,9%.

In Iraq, specially Basrah city a study by **(16)** examined 661 abomasum of sheep and recorded the prevalence rate of infection with *H. contortus* was 19.06%. While **(17)** found that the percentage of infection with *H. contortus* was 1.66% after the examination of 770 sheep.

Aims of the Study

This study designed for each aim below:

Detection and diagnosis of *H. contortus* between slaughtered sheep and goats in Basrah city. This aim include surveys study of *H. contortus* among slaughtered animals (sheep and goats) to detect the prevalence of *H. contortus* in Basrah province.

MATERIALS AND METHODS

Samples Collection

A random visit to the Basrah slaughter house in Basrah province (twice a week) from June 2016 till January 2017 to examine abomasum of slaughtered animals (sheep and goats).

Organs Examination

The abomasum of the slaughtered animals were brought to the laboratory of Veterinary Parasitology at the College of Veterinary Medicine in Basrah University, and examined carefully to detecting parasites, which were isolated from the infected abomasum. After that the worms were washed many times with normal saline (0.9%) according to the method by **(18).** After being recognized, the worms were rinsed in containers with 70% ethyl alcohol which was stored at room temperature for other tests.

The parasitological terms which were used under this work according to **(19)** are as follows :

$$\text{Prevalence}(\%) = \frac{\text{N. Infected animals}}{\text{N. Examined animals}} \times 100$$

$$\text{Infection Intensity} = \frac{\text{N. Parasite species}}{\text{N. Infected animal}}$$

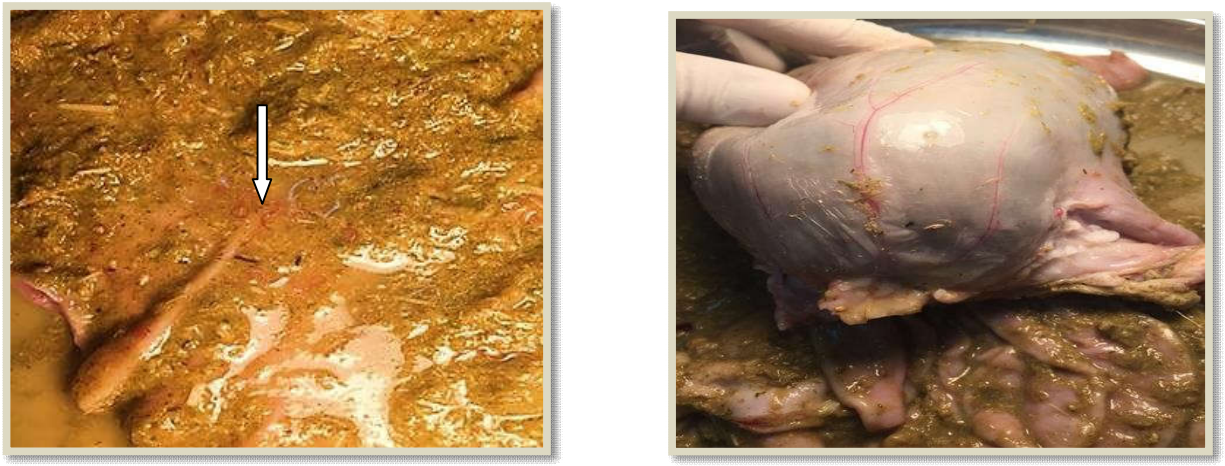
RESULTS

Microscopic Study

The isolated worms were placed on glass slide then examined by using compound light microscope in order to determine the morphological characteristic.

The number of infected abomasum under this study was (90)which include (78)

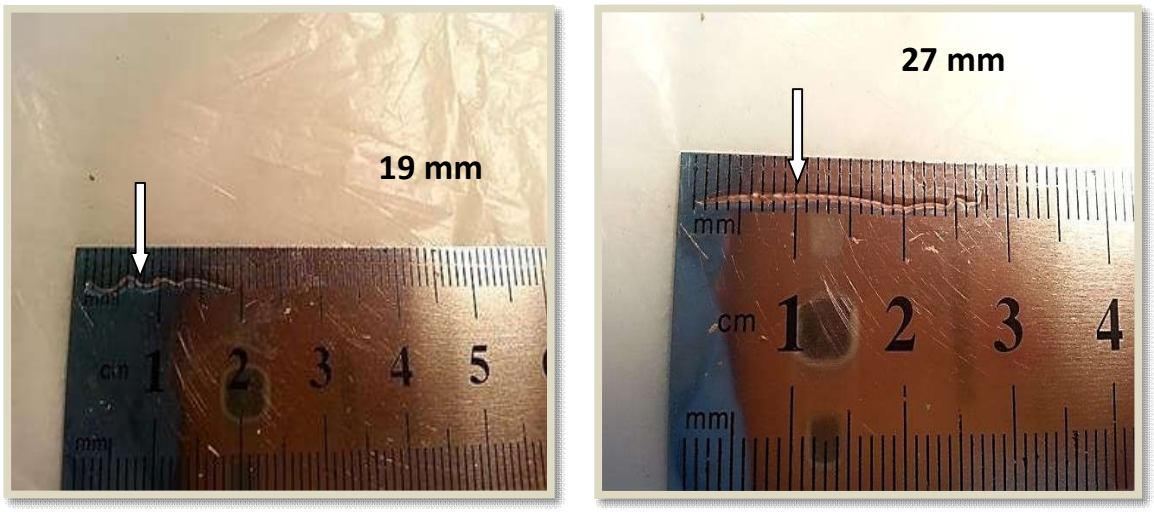
infected sheep and (12) infected goats. The infected abomasum with *H. contortus* show in (Picture,1).



(A) (B)

Picture (1): Infected Abomasum With *Haemonchus contortus* (A, B)

While, the total number of the isolated worms was(2439), the length of males was (9-20 mm) while females length was (14-32 mm) length as shown in the (Picture,2), Figs. (1,2) show the existance of ova from uterus, vulver flap and copulatory bursa with Y shape.



(A) **(B)**

Picture (2) : (A) male, (B) Female of *Haemonchus contortus*

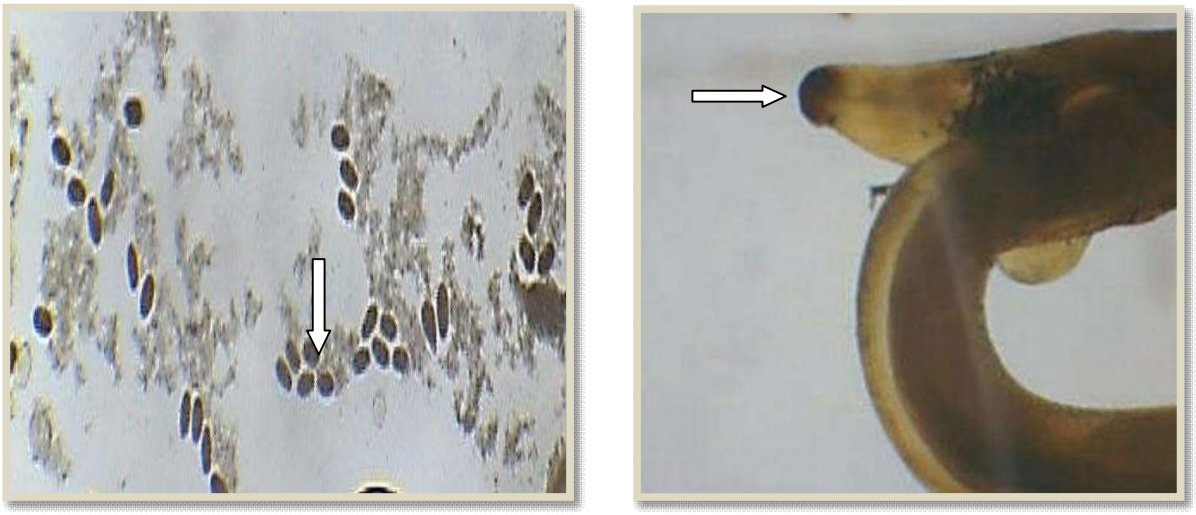


Fig.(1): Female of *Haemonchus contortus*, (A) The ova exited with the uterus,(B) The vulvar flap.

(A) **(B)**

Fig. (2): (A) Male of *Haemonchus contortus* with copulatory bursa in the posterior part and (Y) shape. (B) Female of *Haemonchus contortus* with the medal part which show the uterus filled with ova.

Survey Study

The samples that were collected during the period of research recorded under different conditions such as month, sex and type of animal. The total number of the examined animals were (705), the total number of infected animals was (90). The examined sheep were (556) which are divided in to (402) males and (154) females, from these, the infected sheep were (78) which are divided in to (53), (25) males and females respectively.

The total percentage of infection in the sheep was between (13.18% and 16.23%) for males and females, respectively. The statistical analysis results showed that there were a significant differences between the percentage of infection in sheep males and females ($P< 0.05$) (0.038), also The intensity of infection of sheep showed a significant difference between males and females (0.041).

By the other hand, the statistical analysis of the percentage of infection and the intensity of infection between males and females sheep depending on the months shows that the higher percentage of infection recorded in October, while, the higher intensity of infection recorded in June, and the percentage of infection showed a significant differences under (P<0.05) (0.035), also the intensity of infection showed significant differences (0.017) (table,1). The total number of the examined goats were (149) , which are divided in to (143) males and (6) females, while, the total number of infected goats were (12) which were males only, so, the total percentage of infection was (8.39%) for males only.

The statistical analysis of the percentage of infection in males shows that there was a significant difference (0.044), also the intensity of infection in males showed a significant difference (0.038). On the other hand, the analysis of the percentage and the intensity of infection in males depending on the months show that the higher percentage and intensity of the infection were recorded in September (0.011) which means there was a significant difference (P< 0.05) (Table2).

Table(1):The total number of the examined and infected sheep with *Haemonchus contortus*

h	f Exam		f Inf.		Percentage of Inf. %		sity of Inf.	
	Male	Female	male	female	Male	Female	male	Female
June	15	15	1	3	6	20	0.25	195.5-
July	64	34	12	8	19	*23	2.6	11.65
August	69	29	4	2	6	7	22.5	4.16
September	29	28	6	5	21	18	8.90	1.63
October	84	26	27	6	*32	23	19.39	2.695
November	37	8	2	1	5	12	68-	7.66
December	70	14	1	0	1	0	37	0
January	34	0	0	0	0	0	0	0
Total	402	154	53	25	13.18	16.23	14.65	12.47

with percentage and intensity of infection under probability P< 0.05
*Percentage of Inf. (male& female): P= 0.038.
-Intensity of Inf. (male& female): P= 0.041.
*Percentage of Inf. (month): P= 0.035.
-Intensity of Inf. (month): P= 0.017

Table(2):The total number of the examined and infected goats with *Haemonchus contortus* with percentage and intensity of infection under probability P< 0.05

Month	No. of Exam		No. of Inf.		Percentage of Inf. %		Intensity of Inf.	
	Male	Female	Male	Female	Male	Female	Male	Female
June	14	3	2	0	14	0	74	0
July	32	2	3	0	9	0	13.33	0
August	26	1	3	0	12	0	9.33	0
September	14	0	3	0	*21	0	29.33-	0
October	16	0	1	0	6	0	19	0
November	8	0	0	0	0	0	0	0
December	26	0	0	0	0	0	0	0
January	7	0	0	0	0	0	0	0
Total	143	6	12	0	8.39	0	26.91	0

*Percentage of Inf. (male): P= 0.044.
-Intensity of Inf. (male): P= 0.038.
*Percentage of Inf. & -Intensity of Inf. (month): P= 0.011.

The total number of the isolated worms from the infected sheep and goats was (2439). In sheep, the total number of worms was (2116) which was divided into (973) males and (1143) females .the statistical analysis of the number of worms in both infected male and female showed that there were a significant difference (0.04). While in goats, the total number of worms was (323) isolated from males only. The statistical analysis of the number of the worms in male showed a significant difference (0.01), and the intensity of worms in both sheep and goats was

(0.015) which means there was a significant difference (P< 0.05) (Table,3).

Table (3) : The total number of *Haemonchus contortus* isolated from both sheep and goats under probability P< 0.05

Month	No. of worms in sheep		No. of worms in Goats	
	Male	Female	Male	Female
June	1	*782	148-	0
July	52	233	40	0
August	135	25	28	0
September	98	18	88	0
October	*446	62	19	0
November	204	23	0	0
December	37	0	0	0
January	0	0	0	0
Total	973	1143	323	0

*No. of worms in sheep (male & female): P= 0.04.
*No. of worms in sheep & -No. of worms in Goats (male): P=0.01.
*No. of worms in sheep & -No. of worms in Goats (month): P=0.015

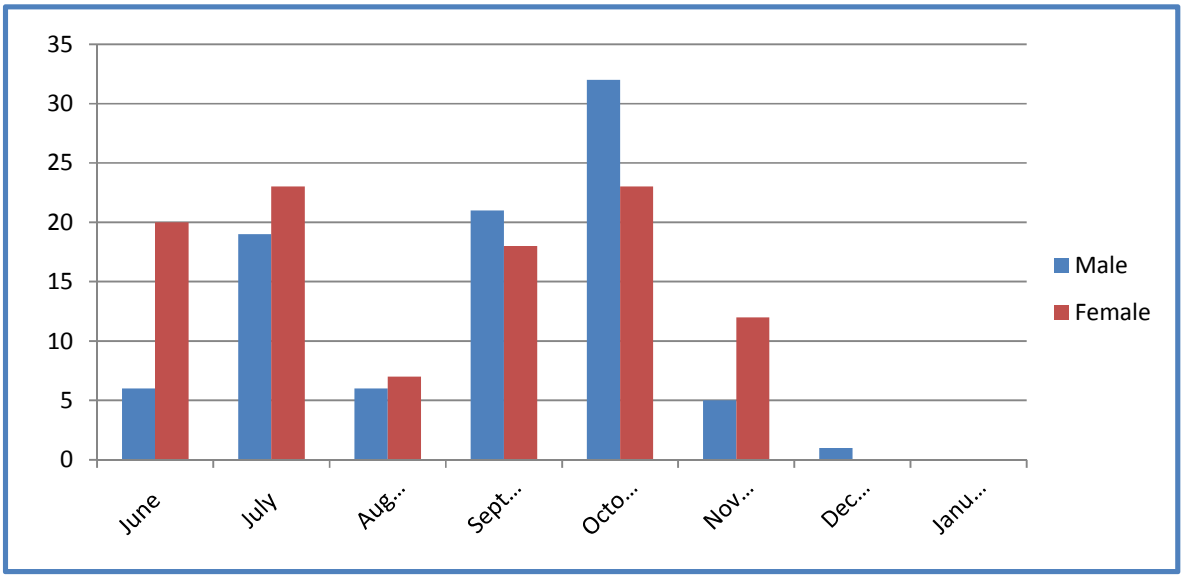


Fig.(3): The percentage of infection in sheep

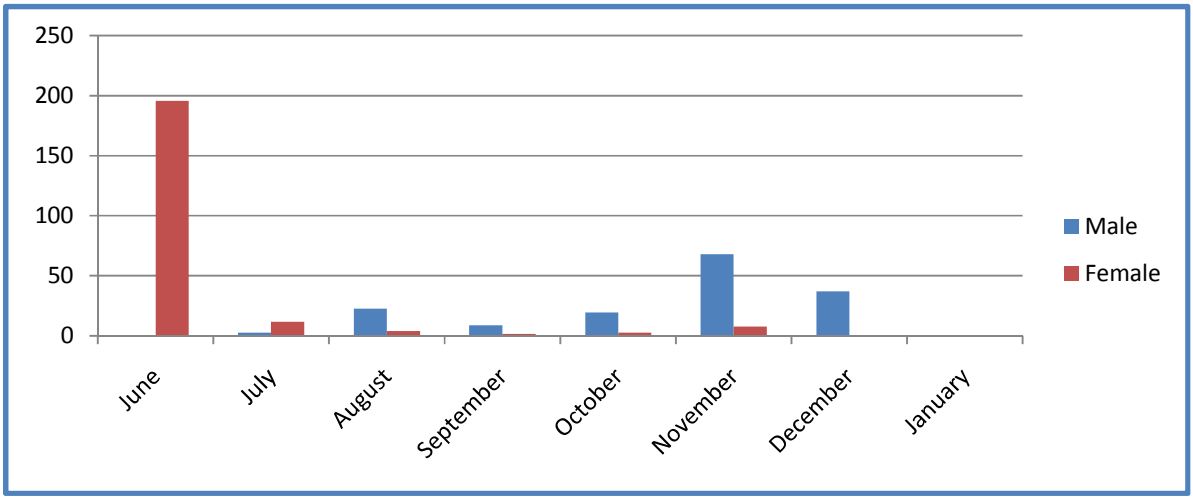


Fig. (4): The intensity of infection in sheep.

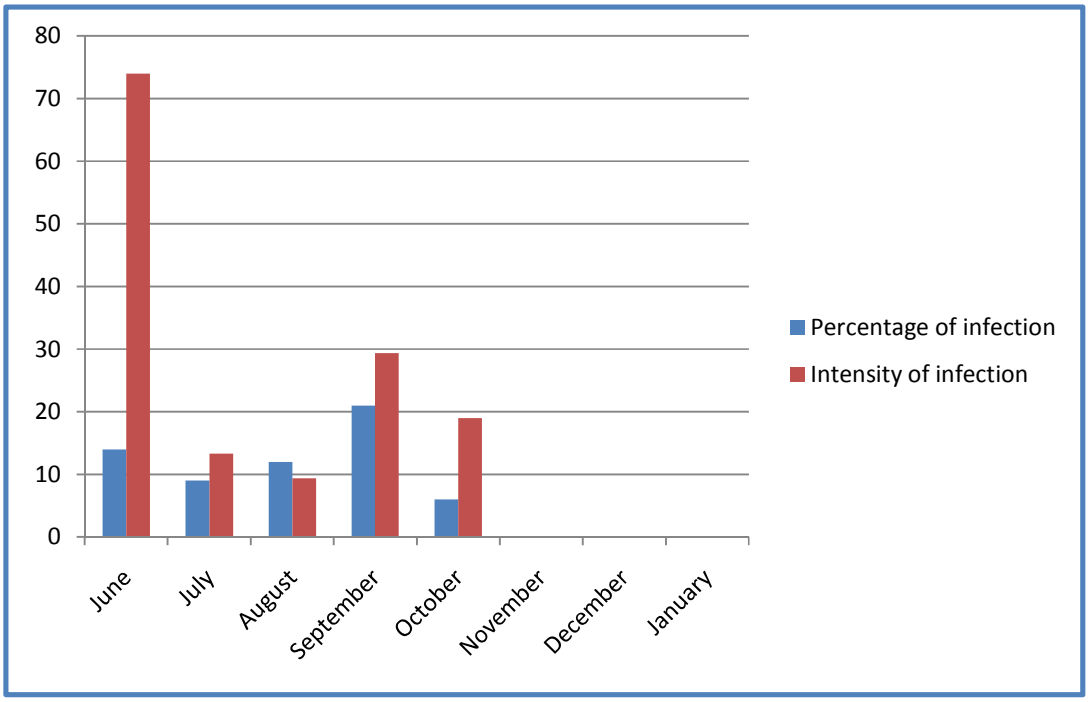


Fig.(5): The percentage of infection& The intensity of infection in Goats

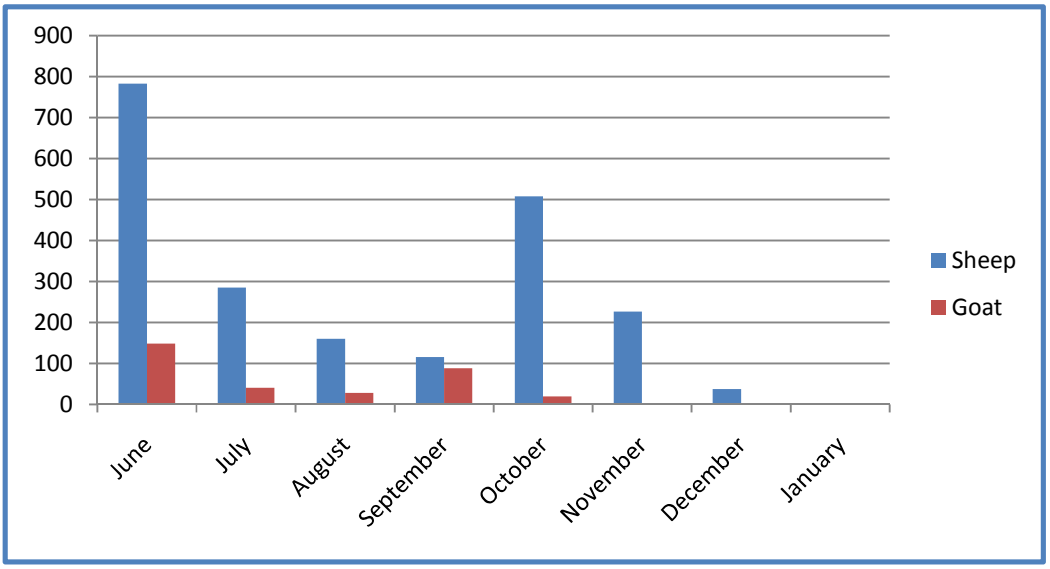


Fig.(6): The number of worms isolated from sheep & goats.

DISCUSSION

The microscopic study showed that the total number of isolated adult worms were (2439) from both sheep and goats, and the measurements of these worms was (9-20 mm) in males and (14-32mm) in females, this varied in measurements depending about the type of host, region and parasite strain.

The measurements of adult *H. contortus* that were reported in the present study show agreement with other measurements which were reported by different researchers around the world, like:

(20) recorded the measures of *H. contortus* for both adult males and females were (9.55-11.85 mm in length and 0.15- 0.29 mm in width); (18.38-24.50 mm in length and 0.32-0.64 mm in width) respectively. While, **(21)** in Saudi Arabia recorded the male's body length were (13.1) mm. and (14.4) mm in both *H. contorts* and *H. placei* respectively, while the average female's body length was measures (18.5 and 19.6) mm in both *H. contorts* and *H. placei* respectively. But, **(17)** in Basrah city/ southern Iraq pointed of views that the measurements of *H. contortus* were (14) mm for male, while, female was (23) mm . On the other hand, **(16)** recorded the measures of males and females which was (15) mm Body length for males, and (24.5) mm Body length for female. The epidemiological study during the period of this study shows different results such as the total percentage of infection in sheep was (13.18 –16.23) for both males and females respectively which there was a significant difference $P<0.05$while in goat the percentage of infection was (8.39) for males only which shows a significant difference $P< 0.05$, on the other hand, the intensity of infection in sheep was (14.65–12.47) for males and females respectively which shows a significant difference $P<0.05$ and in goats, the intensity of infection was (26.9) which shows a significant difference $P< 0.05$.was (26.9) for males only. The variation in the infection is due to several reasons like the environmental conditions such as type of soil, humidity, temperature, PH and weather and because of *H. contorts* preferred to survive in hot and humid, therefore it can see the percentage of infection increase during summer, spring and started to decrease during autumn while in winter there was no infection found. On the other hand, the other condition effect on the infection was the variability of nutrition for the host, the age and the sex of host.

The total percentage of infection in the present study was 12.76 % , this result agrees with **(22)** and **(23)** in Iran while it was very low as compared with other studies around the world, In Iran **(12);** in Eastern Ethiopia **(24); (25)** in Pakistan; in Bangladesh **(26)** and in Kashmir **(27).** The difference in prevalence reported by these studies could be accounted on the basis of differential management practices, natural resistance, drug treatment, local geo-climatic factors and nutrition .

In Nigeria **(28)** recorded that the abomasum of 200 goats and 100 of sheep were examined, goats and sheep had the prevalence of (78.5) and (85%) for *Haemonchus* sp. respectively, on the other hand, **(29)** recorded in Pakistan that out of total 380 examined fecal samples 96 were positive for *H. contortus* and the percentage of overall prevalence was 25.26%. Also, **(30)** in Hilla city in Iraq recorded the prevalence of *Haemonchus*, and showed no significant variation (P>0.05) between the infected sheep and goat which were recorded high percentage in females of sheep (48.64%) while in males were (27.63%),also the high infection was recorded in females of goats (39.53%) while in the males were (20.83%),which show disagreement with the results of this study.

In conclusion The barber's pole worms *H. contortus* with (12.76 %) percentage means Basrah province has good environmental properties for growth and complete the life cycle. , and the staining with alum carmine stain showed that this worms can be stained and recognize the body organelles.

دراسة مسحية لداء الهيمونكس بين الاغنام والمعز المذبوحة في

مجزرة البصرة، مدينة البصرة، العراق

هدى عبد الحسين عباس , سوزان عبد الجبار عبد العزيز

فرع الاحياء المجهرية والطفيليات البيطرية، كلية الطب البيطري، جامعة البصرة

الخلاصة

تم في الدراسة الحالية فحص (705)حيوان مصاب بمرض الـ Haemonchosو قسمت الحيوانات المفحوصة الى (556) أغنام و (149) معز والتي أخذت من مجزرة البصرة في الفترة الممتدة مابين شهر حزيران 2016 الى شهر كانون الثاني2017.

كان العدد الكلي للحيوانات المصابة (90) حيوان مقسمة الى (78) أغنام و (12) معز بينما كان عدد ديدان الـ *Haemonchus contortus*الكلية المعزولة (2439) دودة.

أظهرت نسبة الإصابة الكلية حوالي(12.76) موزعة الى (14.02) في الأغنام و (8.05) في المعز، بينما كانت شدة الإصابة الكلية حوالي (27.1) موزعة الى (27.12) في الأغنام و (26.91) في المعز .

REFERENCES

1. **Perry, B.D.; Randolph, T.F.; McDermott, J.J.; Sones, K. R. and Thornton, P. K.,** Investing in Animal Health Research to Alleviate Poverty. International Livestock Research Institute; Nairobi, pp: 148.(2002).

2. Urquhart, G.; Armour, J.; Duncan, J. L.; Dunn, A. M. and Jennings, F. W., A mathematical model for the ontogeny of *Fasciola hepatica* in the definitive host . Veterinary parasitology. Second Edition,Parasitol.56,13-20.(1996).

3. Troell, K.; Mattson, J. G.; Alderborn, A. and Hoglund, J., Pyrosequencing analysis identifies discrete populations of *Haemonchus contortus* from small ruminants. Int. J. for Parasitol.,33:765-771. (2003).

4. Noble, E. R.; Noble, G. A.; Schad, G. and MacInnes, J. A., The Biology of Animal Parasites. 6th Edition. Lea and Febiger, Philadelphia. USA. Pp:574.(1989).

5. Onyenwe, I. W.; Onwe, C.; Onyeabor, A. and Onunkwo, J. I., Abattoir-Based Study of the Susceptibility of Two Natural Infected Breeds of Goat to *Haemonchus contortus* in Nsukka Area of Enugu State, Nigeria. Animal Research International 2: 342-345.(2005).

6. Catongi, P. M.;, Prichard, R. K.; Ranjan, S.; Gathuma, J. M.; Munyua, W. K.; Cheruiyot, H. and Scott, M.E., Hypobiosis of *Haemonchus contortus* in natural infections of sheep and goats in a semi-arid area of Kenya. Vet Parasitol. 77(1):49-61. (1998).

7. Waller, P.J.; Bernes, G.; Rudby-Martin, L.; Ljungström, B. L. and Rydzik, A., Evaluation of copper supplementation to control *Haemonchus contortus* infections of sheep in Sweden. Acta Vet. Scand; 45:149–160.(2004).

8. Gadahi, J. A.; Arshed, M. J.; Ali, Q.; Javaid, S. B. and Shah, S. I., Prevalence of gastrointestinal parasites of sheep and goat in and around Rawalpindi and Islamabad, Pakistan. Veterinary World, 2(2),51-53.(2009).

9. Bersissa ,K. and Abebe ,W., Abomasal Nematodes of small ruminants of Ogaden region, eastern Ethiopia: Prevalence, worm burden and species composition. Revue. Med. Vet., 157:27–32. (2006).

10. Wang, M.; Yang, J. and Zhang, K. Q., Characterization of an extracellular protease and its cDNA from the nematode-trapping fungus *Monacrosporium microscaphoides*. Canadian journal of microbiology, 52(2), 130-139.(2006).

11. Fentahum, T. and Luke, G., Small ruminant haemonchosis: prevalence and associated determinants in randomly selected restaurants and hotels of Gondar Town, Ethiopia. Eur J Appl Sci, 4,168-172.(2012).

12. Garedaghi, Y. and Bahavarnia, S. R., Prevalence and species composition of abomasal nematodes in sheep and goats slaughtered at Tabriz town, Iran. J. Anim. Sci. Adv, 3,37-41. (2013).

13. Al-Gabir, A. MD., Diagnostic and serological studies on gastric nematodes infesting sheep in Al- Riyadh. Ph. D., Thesis, Zoology Department, Girls Collage of Education in Al-Riyadh.(1995).

14. El-Azazy, O. M. E., Seasonal changes and inhibited development of the abomasal nematodes of sheep and goats in Saudi Arabia. Veterinary parasitology, 58(1-2),91-98.(1995).

15. Sultan, K.; Desoukey, A.Y.; Elsiefy, M.A. and Elbahy, N. M., Abattoir Study on the Prevalence of Some Gastrointestinal Helminths of Sheep in Gharbia Governorate, Egypt. Global Veterinaria, 5(2):84-87.(2010).

16. Bahidh A. A., Some epidemiological and diagnostic aspects study on abomasum nematodes in the sheep of Basrah province /Iraq, M. Sc. thesis. Coll. Vet. Med., Univ. Basrah. Pp:104.(2011).

17. Faraj, K. B., Study of Abomasum and Cecum Nematodes of Sheep and Goats in Basrah province / Iraq, M.Sc. thesis. Coll. Vet. Med., Univ. Basrah. Pp:101.(2012).

18. Farhan, H. S., Morphological and Molecular Study of *Fasciola gigantica* In Buffaloes and Cows. M.Sc. thesis, Coll. Vet. Med., Univ. Basrah.(2016).

19. Margolis, L.; Esch, G. W.; Holmes, J. C.; Kuris, A. M. and Schad, G., The use of ecological terms in parasitology (report of an ad hoc committee of the American Society of Parasitologists). The Journal of Parasitology, 68(1),131-133.(1982).

20. Kuchai, J. A.; Ahmad, F.; Chishti, M. Z.; Tak, H.; Ahmad, J.; Ahmad, S. and Rasool, M., A study on morphology and morphometry of *Haemonchus contortus*. Pakistan J. Zool, 44(6),1737-1741. (2012).

21. Degheidy, N. S.; Al-Malki J. S. and Al-Qmari, F. I., Some Epidemiological Studies of Caprin Heamonchosis in Taif, Saudi Arabia. Biological & Environmental Sciences, 125- 132.(2014).

22. Yagoob, G.; Hossein, H. and Asso, F., Prevalence of abomasal nematodes in sheep slaughtered at Baneh town. American Journal of Animal and Veterinary Sciences, 8(3),142-145.(2013).

23. Tehrani, A.; Javanbakht, J.; Jani, M.; Sasani, F.; Solati, A.; Rajabian, M. and Mohammadian, M., Histopathological study of *Haemonchus contortus* in Herrik sheep abomasum. J. Bacteriol. Parasitol, 3(5),144.(2012).

24. Sissay, M. M.; Uggla, A. and Waller, P. J., Prevalence and seasonal incidence of nematode parasites and fluke infections of sheep and goats in eastern Ethiopia. Tropical Animal Health and Production, 39(7),521-531.(2007).

25. Tasawar, Z.; Ahmad, S.; Lashari, M. H. and Hayat, C. S., Prevalence of *Haemonchus contortus* in Sheep at Research Centre for Conservation of Sahiwal Cattle (RCCSC) Jehangirabad District Khanewal, Punjab, Pakistan. Pakistan. J. Zool.,42(6):735-739.(2010).

26. Nuruzzaman, M.; Haque, M. H.; Sarker, S. and Begum, N., Abomasal Nematodes in Goats Slaughtered at Different Abattoir of Thakurgaon District, Bangladesh. Journal of Scientific Research, 4(2): 491 -497.(2012).

27. Irfan, T.; Chishti, M. Z. and Ahmed, F., Epidemiological studies of abomasal nematodes of sheep of Kashmir Valley with particular reference to *Haemonchus contortus*. University of Kashmir, Nature and Science; 11(10).(2013).

28. Gana, J. J.; Makun, H.; Chiezey, N. P. and Tekdek, L. B., Epidemiological study on abomasal nematodes in slaughtered small ruminants raised in the guinea savannah zone of Nigeria. Sokoto Journal of Veterinary Sciences, 13(2), 26- 33.(2015).

29. Lashari, M. H. and Tasawar, Z., Prevalence of some gastrointestinal parasites in sheep in southern Punjab, Pakistan. Pakistan Vet. J., 31(4): 295-298 .(2015).

30. AL-Hasnawy, M. H. M., Prevalence and pathogenicity of Haemonchosis in sheep and goats in Hilla city/Iraq. J. Babylon University, Pp:7.(2014).