

Prevalence of Gastro-intestinal Parasites in Horses and Donkeys in Al Diwaniyah Governorate

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Abstract

The study was included hundred of fecal samples of horses and donkeys (44 horses and 56 donkeys) males and females at age (2-6) years were collected from the period (1/11/2009–30/10/2010). The parasites were encounter in 100% of horses and donkeys. Among the parasites that detected in horses, the prevalence of *Strongylidae*, *Parascaris equorum*, *Strongyloides westri*, *Trichostrongylus axei*, *Oxyuris equi* *Cryptosporidium* spp., *Balantidium coli* and *Eimeria* spp. were 50% , 40.90%, 22.72%, 25% ,11.36%, 20.45% 15.90% 6.81% respectively. In donkeys, the prevalence of *Strongylidae*, *Parascaris equorum*, *Strongyloides westri*, *Trichostrongylus axei*, *Oxyuris equi*, *Dictyocaulus arnfieldi*, *Cryptosporidium* spp., *Balantidium coli*, *Eimeria* spp. and *Entamoeba coli* were 57.14%, 32.14%, 28.57%, 17.85%, 17.85%, 17.85%, 19.64, 17.85%, 10.71% and 3.57% respectively. The single parasitic infection in this research was 50%, 28.57% and the mixed infection was 50%, 71.42% in horses and donkeys respectively. The statistical analysis reveal significant differences in the percentages of infections in different ages in horses and donkeys ($p < 0.01$), while there were no significant differences in the percentages of infections of males and females of horses and donkeys ($p < 0.05$).

Introduction

Equines are said to have the largest collection of parasites of all domestic livestock. These parasites cause damage to the animals both during the infection phase and then again after these larval stages have emerged and developed fully to adult parasites (2). In parasitological studies carried out in different cities of Iraq on horses and donkeys, helminthic infections were reported in horses (3-6) and donkeys

(7), based on faecal examinations. In addition, protozoal infections occur in horses and donkeys. In horses, (8) was recorded four genera of protozoa and (9) was recorded *Eimeria* spp. in horses in Mosul city. This study was carried out to determine the prevalence of endoparasites according to faecal examination in horses and in donkeys in Al Diwaniyah city.

Material and Methods

In this study, 100 faecal samples, 44 of horses (24 females and 20 males) and 56 of donkeys (30 females and 26 males) collected from city center, Al-Shafeya, Al-Saniya, Al-Daghara and Khairy village were examined. The ages of animals ranged (2-6) years. The samples of fresh faeces were placed in nylon bags and sent

to the laboratory for parasitological examinations. The samples were examined with Sheather's sugar saturated flotation method, sedimentation method, and direct smear method. The Diagnosis of the eggs and larvae depended on the special shape of each one (10).

Results

The prevalence of parasitic infections based on faecal examinations, was found to be 100% in horses and donkeys and in all areas where the samples were collected including the horses center of Noria. As it was demonstrated in fecal examinations, among parasites determined in horses, the prevalence of *Strongylidae* (50%),

Parascaris equorum (40.90%), *Strongyloides westri* (22.72%), *Trichostrongylus axei* (25%), *Oxyuris equi* (11.36%), table 1, and 19 horses (43.18%) affect with intestinal protozoa, it were *Cryptosporidium* spp. (20.45%), *Balantidium coli* (15.90%) and *Eimeria* spp. (6.81%), table 3. Regarding to donkeys

55 (98.21%) of them were infected with nematodes, it were *Strongylidae* (57.14%), *Parascaris equorum* (32.14%), *Strongyloides westri* (28.57%). The prevalence of *Trichostrongylus axei*, *Oxyuris equi* and *Dictyocaulus arnfieldi*

were 17.85%, table 2. Fecal examinations prove that 29 donkeys (51.78%) affect with intestinal protozoa, it were *Cryptosporidium* spp. (19.64), *Balantidium coli* (17.85%), *Eimeria* spp. (10.71%) and *Entamoeba coli* (3.57%), table 3.

Table (1) the number and percentage of infection with each one of nematodes in both sex of horses

Nematodes	Males		Females		Total	
	No.	%	No.	%	No.	%
<i>Strongyles</i> spp.	12	60	10	41.66	22	50
<i>O. equi</i>	3	15	2	8.33	5	11.36
<i>P. equorum</i>	10	50	8	33.33	18	40.90
<i>T. axei</i>	5	25	6	25	11	25
<i>S. westri</i>	5	25	5	20.83	10	22.72

Table (2) the number and percent of infection with each one of nematodes in both sex of donkeys:

Nematodes	Males		Females		Total	
	No.	%	No.	%	No.	%
<i>Strongyles</i> spp.	20	76.92	12	40	32	57.14
<i>Oxyuris equi</i>	7	26.92	3	10	10	17.85
<i>Parascaris equorum</i>	6	23.07	12	40	18	32.14
<i>Trichostrongylus axei</i>	5	19.23	5	16.60	10	17.85
<i>Strongyliodes westri</i>	10	38.46	6	20	16	28.57
<i>Dictyocalus arnfieldi</i>	8	30.76	2	6.60	10	17.85

Table (3) the number and percentage of protozoal infection of horses and donkeys:

Protozoal species	Horse		Donkeys	
	No.	%	No.	%
<i>Eimeria</i> spp.	3	6.81	6	10.71
<i>Cryptosporidium</i> spp.	9	20.45	11	19.64
<i>Balantidium coli</i>	7	15.90	10	17.85
<i>Entameoba coli</i>	-	-	2	3.57
Total	19	43.18	29	51.78

The diagnosis of eggs and larvae of *Strongyles* Spp. (figure 1), eggs of *P. equorum* (fig. 2), eggs of *S. westri* (fig. 3), eggs and larvae of *D. arnfieldi* (fig. 4), eggs and female of *O. equi* (fig. 5) , eggs of *T. axei* (fig. 6), the special form of ciliated protozoa *B. coli* (fig. 7) was done

and the oocyst of *Eimeria* spp. and *Cryptosporidium* spp. (fig.8,9). The post mortem examination shows the attachment of *Gasterophilus intestinalis* at the wall of stomach and makes pits (fig.8, 9).

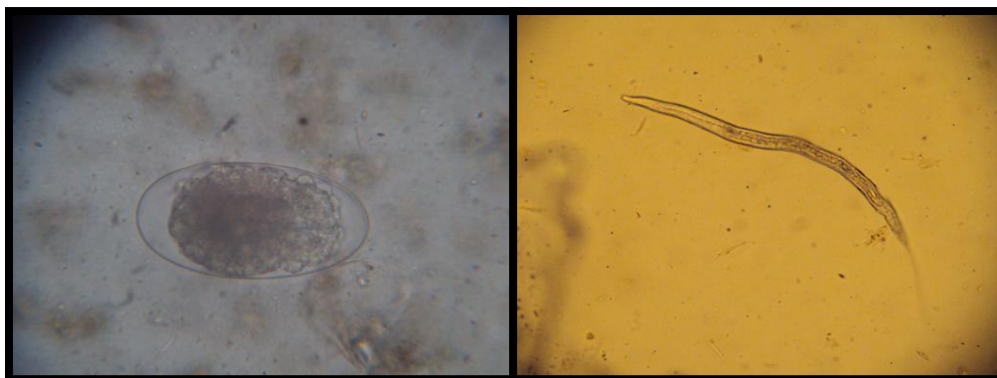


Fig. (1) Egg and larvae of *Strongylus* spp. in flotation method X40

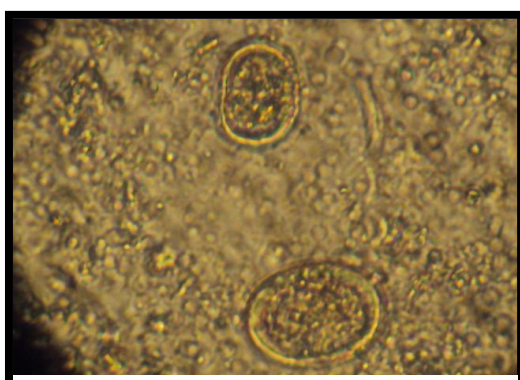


Fig. (2) Eggs of *Parascaris equorum* in flotation method X40



Fig. (3) Egg of *Strongyloides westri* in flotation method X40



Fig.(4) Larvated egg of and larvae of *Dictyocaulus arnfieldi*. in flotation method 40 X

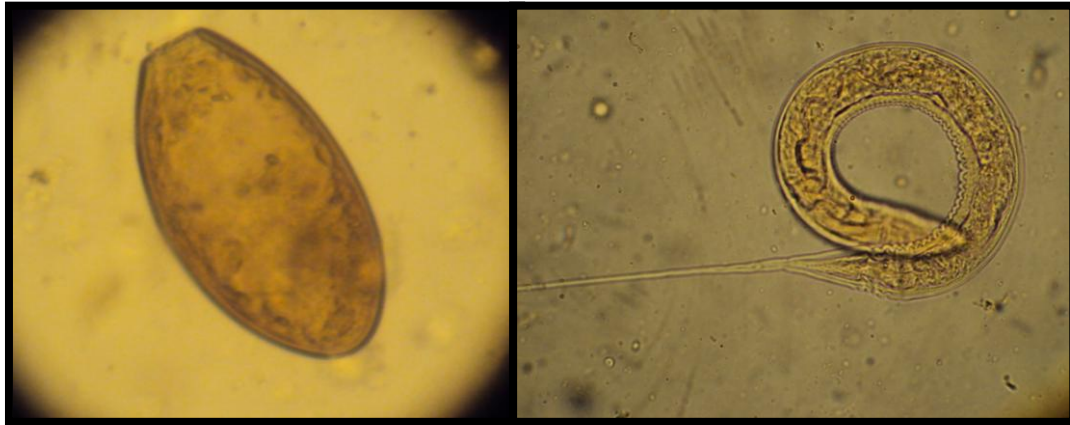


Fig. (5) Egg of and female of *Oxyuris equi* in direct smear method 40 X



Fig. (6) Egg of *Trichostrongylus axei*. in direct smear method 40 X



Fig.(7) Trophozoite of *B.coli* . in direct smear method 40 X

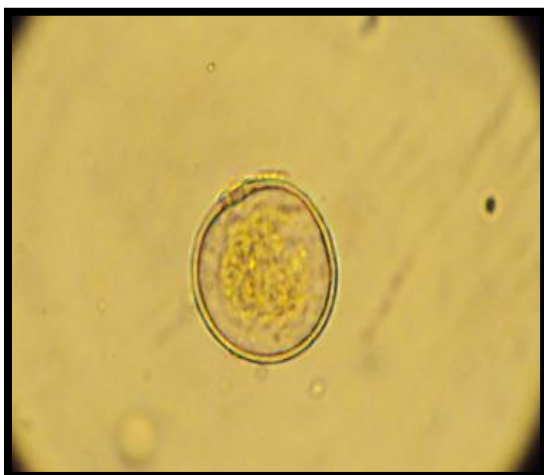


fig.(8) oocyst of *Eimeria* spp. in flotation method 40 X

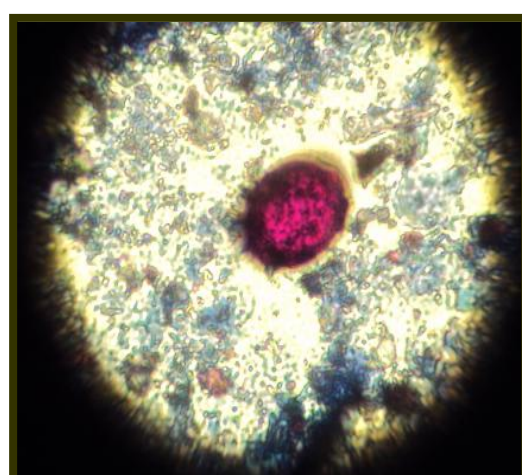


Fig.(9) Oocyst of *Cryptosporidium* spp. in acid fast stain method 100 X.



Fig. (10) Deep pits in gastric wall of donkeys



Fig. (11) Four larvae on the internal wall of donkey's stomach

The parasitic infection was divided into single parasitic infection, it was 50%, 28.57% and mixed infection, it was 50%,

71.42% in horses and donkeys respectively, table 4.

Table (4) reveals the number and percentage of single and mixed infection in horses and donkeys:

Animal	Single infection				Total		Mixed infection				Total	
	Nematodes		Protozoa				Nematodes & Protozoa		2 species of Nematodes			
	No	%	No	%	No.	%	No	%	No	%	No.	%
Horse	18	40.91	4	9.09	22	50	15	34.09	7	15.90	22	50
Donkey	15	26.78	1	1.78	16	28.57	28	50	12	21.42	40	71.42
Total	33	33	5	5	38	38	43	43	19	19	62	62

Discussion

According to faecal examinations, the prevalence of *Strongylidae* was 50% in horses that accordance with (11) recorded 55.5% and disagreement with the results of (5,12,13) who recorded 72.9%, 86.4% and 68% respectively. Strongyles have large numbers of genera and species so their percents usually represented (75-100) percent of whole nematodes infections (14). On other hand among 56 donkeys there were 22 (57.14%) donkeys given positive result to *Strongylus* spp. infection

that was lower than the result of (15, 7) who recorded 100%, 70% respectively. Regarding to the percent of *Parascaris equorum* in horses was 40.90% which was similar to the results were recorded by (11, 5) 45% and 38.4% respectively, while it was differed with (3) who found few numbers of worms especially in young horses in Baghdad, and (6) 64% in Basrah. In donkeys, the rate of infection was 32.14% that similar with the result of (6) 40% and corresponding with the finding of

(13 and 7) who recorded the same rate (20%). *Trichostrongylus axei* was confirmed in 25% of examined horses, this result higher than the results of (3) of horserace in Baghdad and (5) who recorded 10% and 8% respectively. While it was not recorded by (9, 4, 15). In donkeys, it was 32.14% that similar to (17, 7) was 40% and 33.35% but differed with (16) 6.6% and it was not be evidence for (15, 18). In mules *P. equorum* recorded by (19) 63.33%. The clinical disease of *P. equorum* related with the conditions that allow the accumulation of infective eggs because it doesn't has free living larvae, and larvae two inside egg is infective stage and this mostly occur indoor pens (20). *Trichostrongylus axei* was confirmed 25% of examined horses, this result higher than the results of (3) of horserace in Baghdad and (5) who recorded 10% and 8% respectively, while it was not recorded by (9, 4, 15, 13). In donkeys, it was 32.14% that similar to (17, 7) which was 40% and 33.35% but differed with (16) 6.6% and it was not be evidence for (17, 18). In mules, it was 8.66% (19). The prevalence of *Strongyloides westri* in horses was 22.72% more than the results of (11, 5) which was 1.6% and 11.2%. In donkeys the percentage of *S. westri* was 28.57% that elevated than the resultes of (15, 7) 12.34% and 10 %. *Oxyuris equi* was verified 11.36% in horses, it was higher than the results of (5) 4.8% and (21) 7% who defined in the post mortum examination. while *O. equi* not recorded by (3, 9, 4). In donkey *O. equi* was 17.85% this differs with the results (6) 6.6%, and (16) 6.6%. The differences in the percentages of infection with *S. westri* and *O. equi* may due to lack of treatment of horses and poor hygiene measures in stables. Related to *Dictyocalus arnfieldi* was not confirm in horses in this study, and the studies (4, 15, 13) in addition to *D. arnfieldi* not recorded in the mules by (19). While it recorded by (11, 9, 5) who verified 0.04%, 2%, and 24% respectively. In donkeys, it was 17.85% in agreement

with (6) 13.3%, but disagreement with (17) was recovered 32%. The variation among species of equines that were examine in the different above studies play a role in difference of infection with *D. arnfieldi*. The gastrointestinal parasites were more prevalent in cold season than hot and rainy season. The infection with helminthes parasites was notice to be higher at the beginning of the rainy season (22). The trematodes were recorded neither horses nor donkeys in this study although the sedimentation technique was use for several times and these results were comparable to the finding of (3-5). (20) indicated that the horses resistant to trematodes infection. It overcomes on the migration of this worm inside their bodies in early stages, so a few numbers are reaching to liver. The recent research was recorded the infection with four genera of intestinal protozoa. *Eimeria* Spp., was 6.81% in horses as mixed infections, like the result of (9, 8) they recorded 4% and 10.96% and unlike the findings of (11, 13) who recorded 0.6% and 0.5% respectively. In donkeys was 10.71% differ with (15) who recorded 3.7%. *Cryptosporidium* spp. was verify 20.45% in horses similar to the results of (23, 13) were recorded 17% and 15% respectively and differed with the results of (8) 8.14%. In donkeys was 19.64% differed than the result of (24) who recorded 9.4% in foals and mature horses in western Poland as the overall infection. *Balantidium coli* prove 15.9% in horses and 17.85% in donkeys, our finding nearly similar to the results of (25) in human 12% and in pigs 33% and disagree with (8) who recorded 85.71% in horses. In the last, only two donkeys (3.57%) affected with *Entameoba coli* as mixed infections. When the post mortem examination was done to the infected donkey, *Gastrophilus intestinalis* larvae of botfly were found attached in the wall of the stomach in pyloric region. It cause a pit at the site of attachment this similar with the result of (5, 18).

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انتشار الطفيليات الداخلية في الخيول والحمير في محافظة الديوانية

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الخلاصة

شملت الدراسة جمع 100 عينة براز من الخيول و الحمير (44 من الخيول و 56 من الحمير) ومن كلا الجنسين تراوحت أعمارها بين (2-6) سنة خلال الفترة ما بين (2009/11/1 - 2010/10/30) وفحصها للتعرف على أنواع الطفيليات الداخلية المصيبة لها. أظهرت نتائج فحوصات البراز أن الخيول والحمير مصابة 100% و بشكل طبيعي بأنواع عديدة من الطفيليات الداخلية ومنها التي حددت في الخيول ديدان المستديرات *Strongylidae* , صفر الخيول *Tricostrongylus axei* , الديدان الخيطية *Strongyloides westri* , المستديرة الشعرية *Parascaris equorum* , دقيقة الذيل الخيلية *Oxyuris equi* , البوغ الخبيء *Cryptosporidium spp.* , القربي المهدب *Balantidium coli* , والكوكسيديا *Eimeria spp.* وبنسبة 50% , 40.90% , 22.72% , 25% , 11.36% , 20.45% , 15.90% و 6.81% على التوالي. أما الحمير فكانت مصابة بالمستديرات *Strongyles* , صفر الخيول *Parascaris equorum* , المستديرة الشعرية *Tricostrongylus axei* , الديدان الخيطية *Strongyloides westri* , دقيقة الذيل الخيلية *Oxyuris equi* , ديدان الرئة *Dictyocaulus arnfieldi* , القربي المهدب *Balantidium coli* , البوغ الخبيء *Cryptosporidium spp.* , الكوكسيديا *Eimeria spp.* , والاميبا المعوية *Entamoeba coli* وبنسبة 57.14% , 32.14% , 17.85% , 17.85% , 17.85% , 19.64% , 10.71% , 3.57% على التوالي. وقد ظهرت يرقات ذباب النغف *Gasterophilus intestinalis* عند إجراء الصفة التشريحية لأحد الحمير المصابة. شكلت الإصابة المفردة بنسبة 50% و 28.57% والإصابة المختلطة بنسبة 50% و 71.42% في الخيول والحمير على التوالي. وقد شخصت أجناس وأنواع الديدان المذكورة اعتماداً على الأشكال المميزة لبيوض كل جنس ونوع ويرقات بعضه. بينت نتائج الدراسة أن هناك فروقات معنوية في نسب الإصابة بين أعمار الحيوانات المختلفة في الخيول والحمير (تحت مستوى احتمال 0.01) بينما لا توجد فروقا معنوية في نسب الإصابة بين الذكور والإناث تحت مستوى احتمال (0.05).