

PREVALENCE OF GASTROINTESTINAL PARASITES IN HORSES IN LUXOR, EGYPT

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ABSTRACT

Gastrointestinal parasites have a direct effect on the health of equines. This study was conducted to determine the prevalence and significance of gastrointestinal parasites of naturally infected horses in Luxor Governorate, Egypt. A total of 100 horse fecal samples were collected during the period from March - 2020 to February – 2021 from different ages, sexes and stables. All of these samples were examined by different fecal examination techniques including (direct wet mount, sedimentation and flotation techniques). The present study investigate that the total prevalence of infected horses was 15%. There is a relationship between the GIT infection and the age of the horse. The highest percent of infection was recorded by *Strongylus vulgaris* 9 % followed by *Parascaris equorum* 5%, while the percent of infection by *Balantidium coli* was 1% in infected horses. It consequence that horses are highly susceptible to *Strongylus* irrespective of gender and age or even deworming. Control measures should be put in consideration to totally overcome the parasitic infection.

Keywords: Gastrointestinal parasites, *Parascaris equorum*, *Strongylus vulgaris*, *Balantidium coli*.

INTRODUCTION

Gastrointestinal parasites infect several species of equines, including protozoa, helminthes and gastric

maggots of some species of flies; have been associated with ill thrift, reduced growth rates with colic and poor performance (Tatz *et al.*, 2012). Also, larval cyathostomiasis, which is, characterized by diarrhoea, hypoproteinaemia and rapid emaciation, is a critical disease in young grazing horses (Love *et al.*, 1999). The outcome of periodic use of anthelmintic to monitor gastrointestinal

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parasites is the development of anthelmintic resistance and reduced efficacy of available anthelmintic classes (Kaplan *et al.*, 2004; Smith *et al.*, 2015). Several reports in Americas and Europe discuss the resistance of *strongyle* to Benzimidazole and tetrahydropyrimidines (Peregrine *et al.*, 2014).

It has been reported that macrocyclic lactones (ML) treatment is followed by Shortened egg reappearance period (ERP) (Daniels *et al.*, 2016 and Rossano *et al.*, 2010) and that is an early indicator of *strongyle* resistance species. *Parascaris equorum* resistance to macrocyclic lactones also reported in several countries (Peregrine *et al.*, 2014). Such reports focus on the need for controlling the anthelmintic drug usage, to stop the anthelmintic resistance species (Nielsen *et al.*, 2018). (FEC) must be done before treatment to reduce anthelmintic resistance species, and limiting the anthelmintic usage and selective pressure on parasitic infected one (Kaplan *et al.*, 2010). However, the prevalence of infection and anthelmintic resistance in equid population in continuous increasing, because the practice of (FEC) testing couldn't be performed in many working equid populations.

The working horses in Egypt are managed separately with no access to pasture grazing (Salem *et al.*, 2017), therefore, it was hypothesized that the *strongyle* infection prevalence in this working population of horse could be less based on reports from other countries (Ramey *et al.*, 2020; Nielsen *et al.*, 2018). Furthermore, the

information about the doramectin efficacy in equines is limited (Matthee, 2003), despite its common use between equid population (Salem *et al.*, 2017).

The objectives of the current study were to quantify the gastrointestinal parasites burden in working and riding horses in Luxor, Egypt, In order to highlight the factors associated with the severity of gastrointestinal (GI) parasites and perfect treatment and prevention of it.

MATERIALS AND METHODS

A total of 100 horse fecal samples were collected from different ages, sexes and stables, from animal care hospital in Luxor, Egypt. The samples were collected during the period from March-2020 to February -2021. It was collected directly from the rectum, in clean plastic containers (100ml size) with 10% formalin and mixed well and tightly closed then labeled with all information for the animal and breeder included age, sex, and color and general parameters, then the samples were transported in ice box to the parasitology department at faculty of Veterinary Medicine Assiut University. After that, a portion of stool was examined at field by direct wet mount, sedimentation and flotation techniques to identify the gastrointestinal parasites.

ETHICAL ANIMAL RESEARCH

Ethical approval for the study was granted by Animal Care Hospital and Faculty of Veterinary Medicine, Assiut University.

Statistical analysis

The collected data was revised, coded, tabulated, and introduced to a PC using Microsoft Excel. All statistical analysis was done using Stata 14. Data analysis was done for each parameter according to the type of data obtained.

RESULTS

We included 100 Horses from Luxor in this cross-sectional study, demographics data are present in (Table 1) , 63 were males, 28 were females and 9 were Foals. The mean age was 3.3 years. Out of the 100 included horses, there were 16 of them infected, 15 with gastrointestinal parasites (Fig.1), the infected horses presented with different signs as shown in (Fig.2).

Table 1: Baseline characteristics

		N= 100	Mean age (SD) years [Min- Max]
Age		100	3.3 (1.4) [0.75-8]
Gender	Male	63	3.57 (1.27) [1.5- 8]
	Female	28	3.5 (1.26) [2-6]
	Foal	9	0.95 (0.1) 0.75-1
Horses with parasitic infection	Infected	16	2.5 (1.39) [0.83- 5]
	GIT parasite	15	2.45 (1.42) [0.83-5]

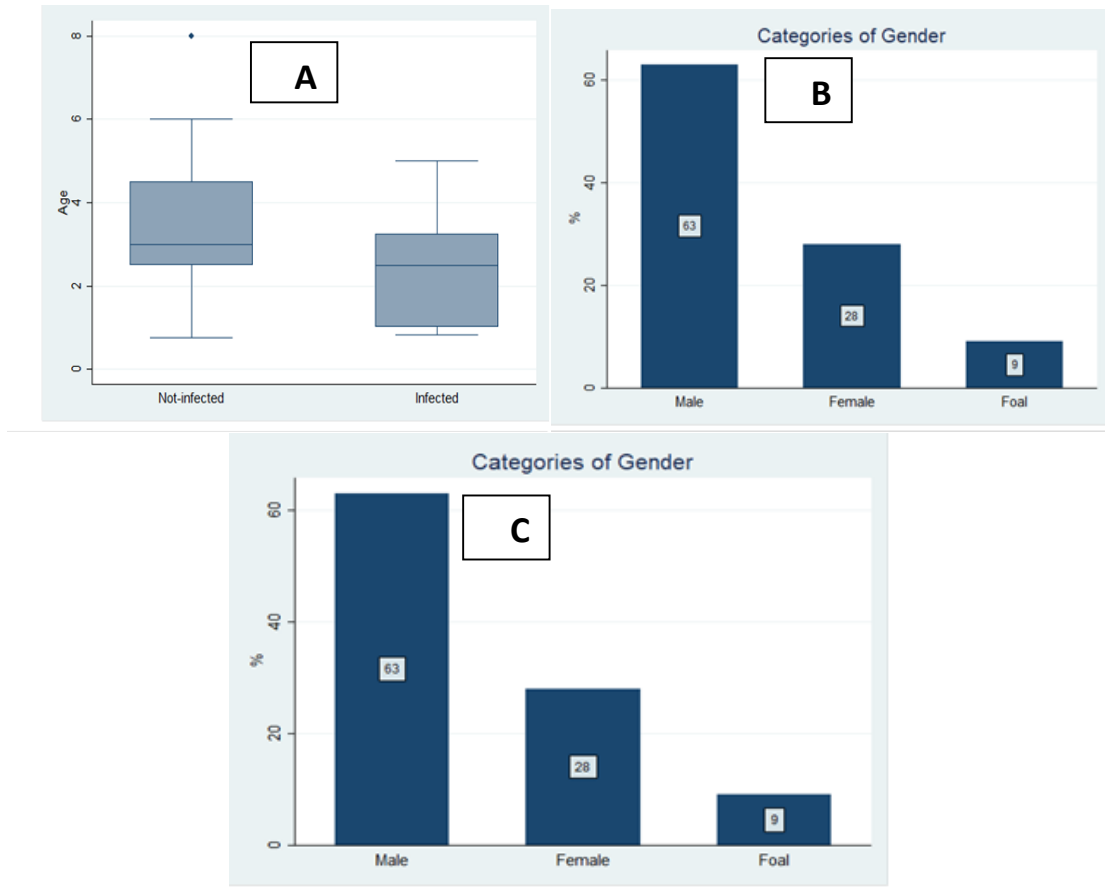


Fig. (1): Demographic characters of studied cases, A: The infected and non-infected cases B: The sex distribution, C: The distribution of different infection.

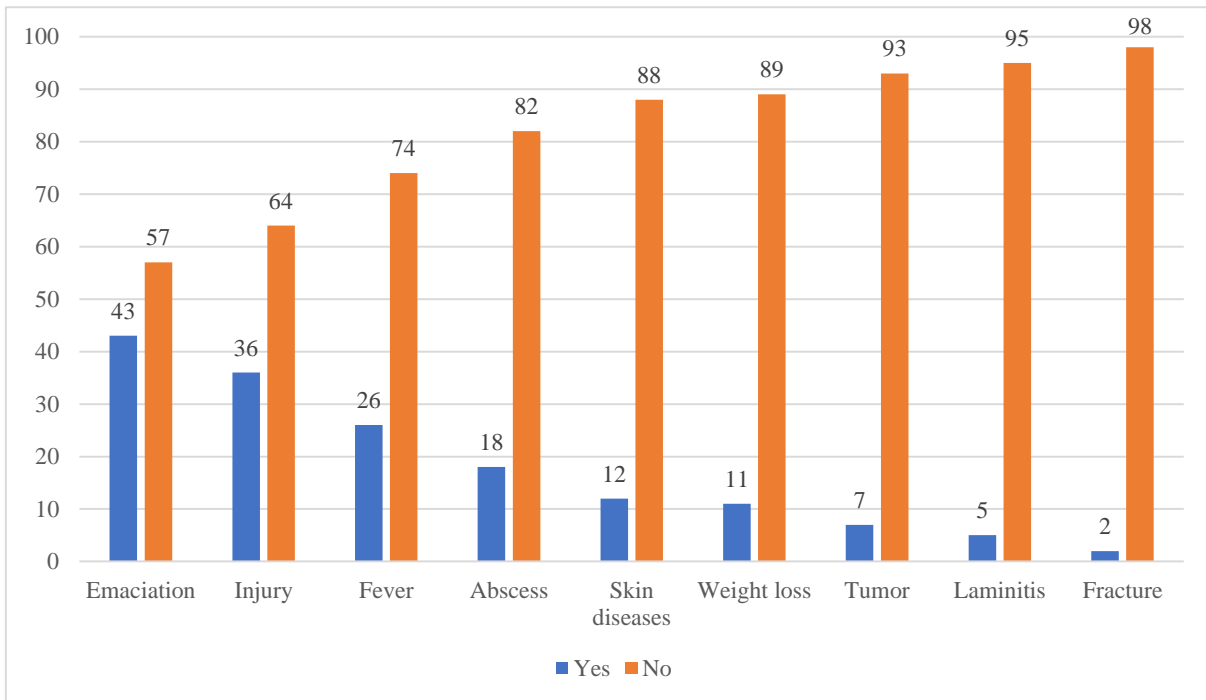


Fig. (2): Symptoms of the included horses

The prevalence of parasitic infection of horses in Luxor was 16% [95% CI 9-25] (Table 2), the main infection is GIT infection with 15% the prevalence of

each GIT parasite subtype in (Table 3) and (Fig.4). Also, there is a relationship between the GIT infection and the age of the horse as shown in (Table 4).

Table 2: Prevalence of Parasitic infection in Horses.

Parasitic infection	Prevalence [95% CI]
	16% [9- 25]
GIT infection	15% [7- 24]

Table 3: Prevalence of GIT infection in Horses.

Parasite	Prevalence [95% CI]
<i>Strongylus vulgaris</i>	9 % [4.2- 16.4]
<i>Parascaris eqourum</i>	5% [1.6- 11.3]
<i>Balantidium coli</i>	1% [0.03- 6]

Table 4: Relationship between the GIT infection and the age of the horses.

Age	Mean Difference Years	95% Confidence Interval		p-value
		Lower	Upper	
	0.96431	0.24	1.69	< 0.01

There was high statistically difference between the age of the infected group and non-infected group using independent t-test, Mean difference= 1 year [95% CI 0.24- 1.69], p-value< 0.01.

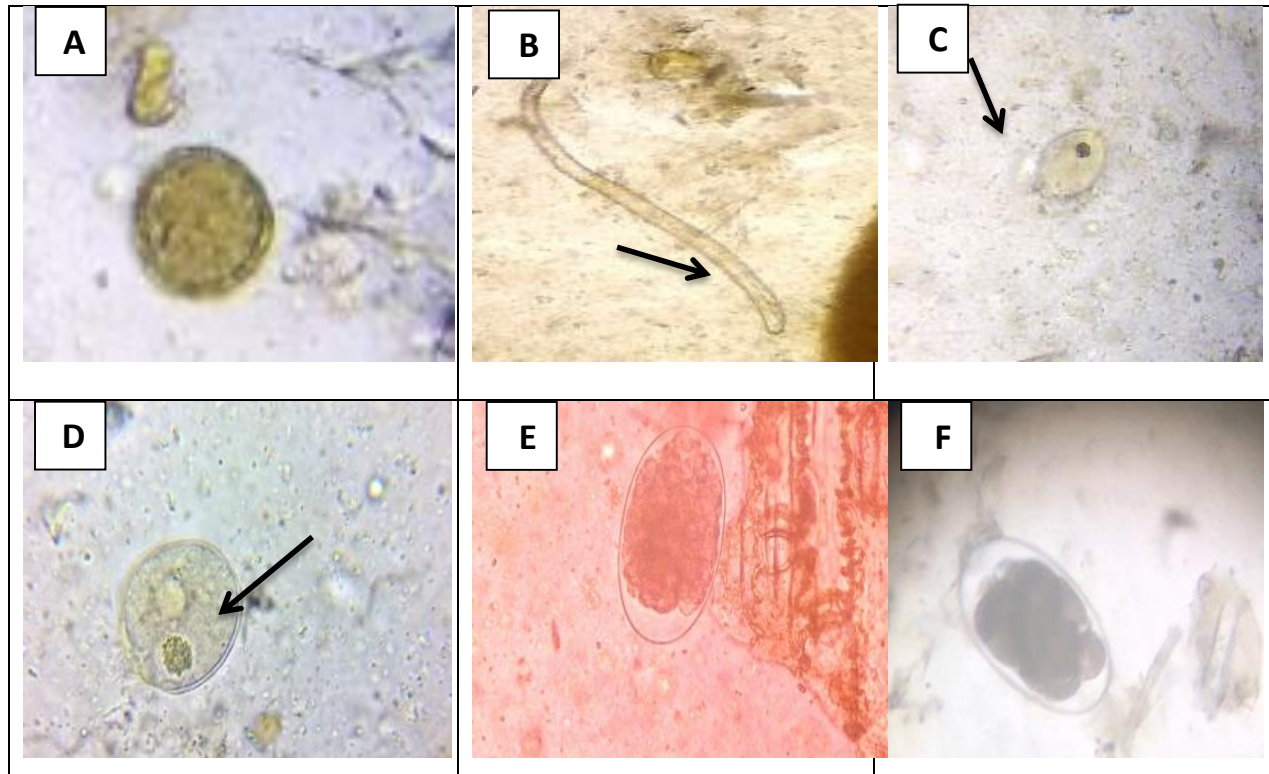


Fig. (3): Different parasitic infection in examined cases, A: *Parascaris equorum* $\times 200$, B: Nematode larva $\times 200$, C& D: Ciliated protozoan parasite trophozoite (Arrow) $\times 400$, E&F: *Strongylus* spp. eggs $\times 100$.

DISCUSSION

From the previously mentioned results, three types of gastrointestinal parasites were recorded in horses in animal care in Luxor governorate during the period from March, 2020 till February, 2021 as follows discussion:

1- The infection rate of *Strongylus vulgaris* in examined horses:

In this study, the occurrence of *Strongylus vulgaris* was reported 9% among 100 examined horses at animal care hospital in Luxor Governorate, from detailed records of examined horses. The occurrence of *Strongylus vulgaris* obtained in this study was lower than those reported by (Shebl *et al.*

et al., 2020) in Egypt, who recorded that, the prevalence of low, medium and high *strongyle* infection was (88.4%) and (21.14%) in Dhamar Governorate, Yemen (Alshaibani, Aldalali, & Alshaibani, 2019) and (99%) in Ethiopia (Abdurezak *et al.*, 2015).

2- The infection rate of *Parascaris equorum* in examined horses:

In this study, the occurrence of *Parascaris equorum* was reported 5% among 100 examined horses at animal care hospital in Luxor Governorate, from detailed records of examined horses. This result was in slight agreement with those reported by (Shebl *et al.*, 2020) (5.1%) in Egypt. While this finding is considered higher than that previously recorded by (Hinney *et al.*,

2011) (3 %) prevalence of *Parascaris equorum* based on faecal examination in horses of different types in Germany.

On the contrary, the occurrence of *Parascaris equorum* obtained in this study was lower than those reported by (Othman and Alzuheir, 2019) who recorded that the overall prevalence rate of *Parascaris equorum* was found to be 15.6% in native horses in West Bank Palestine and (umar *et al.*, 2013) in naigeria who recorded (6.3%) infection rate by *parascaris equorum*.

3-The infection rate of *Balantidium coli* in examined horses:

In this study, the occurrence of *Balantidium coli* was reported 1%.The occurrence of *Balantidium coli* obtained in this study was lower than those reported by (Attia *et al.*, 2018).

The reason for the low prevalence of *parascaris equorum*, *strongylus* and *balantidium* in indigenous ones in this study might be relatively to good management system and environmental hygiene, applied in breeding system in Egypt. Another reason for the presence of regular good deworming programme applied in luxor governorate.

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بعض الدراسات على طفيليات الجهاز الهضمي في الخيول في الأقصر، مصر

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أجريت هذه الدراسة لتحديد أهمية طفيليات الجهاز الهضمي ومدى انتشارها بين الخيول في مدينة الأقصر بمصر. وتم جمع مجموعه ١٠٠ عينة براز من احصنه في مختلف الأعمار والأجناس والإسطبلات. وجمعت كل هذه العينات خلال الفترة من مارس - ٢٠٢٠ إلى فبراير - ٢٠٢١. وأظهرت النتائج أن مدى انتشار هذه الطفيليات ف الاحصنه كان بمعدل ١٥%. وكانت نسبة *Strongylus vulgaris* ف الاحصنه المصابه تصل الى ٩% بينما كانت نسبة الاسكارس ٥% واخيرا تم ايجاد نسبة ١% اصابه بطفيل *Balantidium coli*. وهذه النسب تعتبر الى حد ما ضئيله مقارنة بالابحاث الاخرى. وهذا يشير الى ان نظام الإدارة والنظافة البيئية المطبقة في نظام التربية في مصر جيده الى حد كبير. وايضا لوجود برنامج منتظم جيد للتخلص من الديدان المطبق في محافظة الأقصر.