

Prevalence of Helminth Parasites of Horses in and Around Hawassa Town, Southern Ethiopia

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Abstract: The present study was carried out from November 2008 to March 2009 in and around Hawassa town to identify and determine the prevalence of helminth species and its associated risk factors in Horses. For this purpose, a total of 190 fecal samples were collected randomly from naturally infected horses for examination of the presence of helminth parasites. The overall prevalence of different types of helminth eggs and helminth species in this study were 97.9 %. 4 horses were free from any parasites (2.1%) and mixed infections were detected in 83.2% of horses. From fecal examinations those animals infected with one, two, three and four types of parasite were: 28 (14.7%), 56 (29.5%), 68 (35.8%), 34 (17.9%), respectively. The parasites encountered were 85(44.7%), 70 (36.8%), 31 (16.3%), 65 (34.2%), 106 (55.8%), 54 (28.4%), 63 (33.2%) and 7 (3.7%) were positive for *Strongylus vulgaris*, *Strongyle edentatus*, *Strongyle equines*, *Oxyrus equi*, *Parascaris equorum*, *Strongyloides westeri*, *Triodontophorus tencollis* and *Dictyocaulus arnfieldi*, respectively There was statistical significant difference ($P < 0.05$) in prevalence of *S. edentatus*, *S. equines* and *T. tencollis* between the body conditions as examined by coproscopy. There was statistically no significant difference ($p > 0.05$) in prevalence of *Strongyle vulgaris*, *Oxyrus equi*, *Parascaris equorum*, *S. westeri* and *D. arnifielde* within the body conditions. Statistically significance differences in prevalence of all the listed parasites among the age groups were not observed ($P > 0.05$) as examined by coproscopy.. From this study it can be concluded that body condition can be considered as one of the important factors which influence the occurrence of some helminth parasites in horses. It is recommended that owners should be trained to improve the management system, especially in terms of the level of nutrition so that the animal can have good body condition that confers some level of resistance against helminthes infection.

Key words: Horses • Fecal Samples • Hawassa • Helminth • Prevalence

INTRODUCTION

All over the world, horses are exposed to helminth parasites from many orders and genera resulting in significant morbidity and mortality [1].

Horses are important animals to the resource-poor communities in rural and urban areas of Ethiopia, providing traction power and transport services at low cost. The low level of development of road transport network and rough terrain of the country make equines the most valuable appropriate and affordable pack animals under the small holder farming system [2]. In areas where draft power is a constraint for crop cultivation a pair of well conditioned equines could be used as an alternative

draft power sources for secondary and tertiary land preparation [3].

Horses are prone to number of infectious and non-infectious diseases. Horses are exposed to a complex mixture of intestinal parasitic helminths. Among these parasites such as large and *small Strongyles*, *Ascarids*, *pin Worms*, *Gastrophilus*, *lung worms*, *fluke* and *tape worms* are the common problems encountered in most veterinary clinics. Mixed specie infections are most commonly found to infect the horses [4]. These parasites share with the equine digestive nutrients and lead to retard growth or reduce work out put, discomfort and pains of various degrees and even mortality of the animals [5].

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Intrinsic factors like age and sex are found to affect the strongyle infections and egg-excretion [6, 7].

A study was designed with to achieve the objectives: To determine the epidemiology of various gastrointestinal helminthes of horses based on quantitative coprological examination; to record the effect of age, body condition score on the prevalence of natural infections.

MATERIALS AND METHODS

Study Area Description: The study was carried out in Hawassa in southern Ethiopia situated 275 km south of Addis Ababa (the capital of Ethiopia) at a latitude of 7°04'N and a longitude 38°31'E on the escarpment of the Great Rift Valley. The altitude ranges from 1650 to 1700 m above sea level. The mean annual rainfall and temperature are 900-1100 mm and 27°C, respectively. The population of donkey (*Equus asinus*), mule (*Equus hemionus*) and horse (*Equus caballus*) for Hawassa town are 13961, 369,5161, respectively. The total livestock population of Sidama zone is estimated to constitute, 1,721,341 cattle, 228,941 goats, 457,465 sheep, 204,460 equines, 725,540 poultry and 44,492 beehives [8].

Study Animals and Design: Cross-sectional study was conducted on 190 randomly selected horses of indigenous breed found in Hawassa town and in the localities around Hawassa town. Faeces samples were carried out correspondingly with the required data (sex, age, owner, etc.) were recorded. Fecal samples collection and examination was carried out from horses which were dewormed with anthelmintics three months ago.

Fecal Sample Collection and Examination: Fecal samples were collected and transported to parasitology laboratory of Hawassa University, College of Agriculture for examination. Fecal examination was carried out by direct smear, sedimentation and floatation technique and for identification of some parasites to species level fecal samples were cultured and the larvae were recovered using Bearman apparatus technique.

The larvae were then identified under lower power microscope (10X objective), based on the shape and number of gut cells, relative size and shape of larvae's tail [9, 10]. The floatation fluid used in this study was supersaturated solution of sodium chloride (NaCl) salt prepared in the laboratory. The procedure given by Urquhart *et al.* [11] was followed for the above parasitological methods. The Eggs were identified using ova identification keys [12].

The age of horses was estimated from the dental eruption and wear as described by Svendsen (13). Age was conventionally classified as Young (0-2) years (n=55), adult (3-15) years (n=46) and old (>15) years (n=89). The body condition scoring was based on the criteria of NEWC [14] and body condition of animals was classified into poor and good.

Statistical Analysis: The data were analyzed using the chi-square test according to the species, age and body condition of animals. In all cases, the SPSS version 16 was used and the confidence level was held at 95% and the results were considered significant when $P < 0.05$.

RESULTS

Coprospectical Examination: out of 190 horses 97.9% of them were positive for different types of parasite eggs and parasite spp, namely *Strongyle vulgaris* (44.7%), *Strongyle edentatus* (36.8%), *Strongyle equines* (16.3%), *Oxyrus equi* (34.2%), *Strongyliod westeri* (28.4%), *Parascaris equorum* (55.8%), *Triodontophorus tencollis* (33.2%) and *Dictoicaules arnifieldae* (3.7%) (Table 1). Concurrent infections with three species of helminthes were more common 68 (35.8%) than infections with one 28 (14.7%), two 56 (29.5%), four 34 (17.9%) species of helminth and four animals were free of any parasite (2.1%). Mixed infections were detected in 83.2% of the horses.

The prevalence of helminth in both body condition groups (good and poor) was determined in coproscopy. The coproscopy results revealed that, the highest prevalent helminthes in good body condition animals was *Dictoicaules arnifieldae* (71.4%) and the least was *Strongyle edentatus* (30%).

Similarly, in Poor Body Condition Animals the Highest Prevalent Parasite: was *Strongyle edentatus* (70%) and least was *D. arnifieldae* (28.6%). There was statistical significant difference ($P < 0.05$) in prevalence of *S. edentatus*, *S. equines* and *T. tencollis* between the body conditions as examined by coproscopy. There was statistically no significant difference ($p > 0.05$) in prevalence of *Strongyle vulgaris*, *Oxyrus equi*, *Parascaris equorum*, *S. westeri* and *D. arnifieldae* within the body conditions (Table 2).

The prevalence of helminthes in different age groups (young, adult and old) were determined by coproscopy technique employed. The results revealed that the prevalence of helminthes with age was *Oxyrus equi* (33.8%) and *D. arnifieldae* (25.8%) was the highest and

Table 1: Relative percentage of larvae of different helminth parasites recovered from coproculture

Species of parasite	Prevalence
<i>Strongyle vulgaris</i>	44.7%
<i>Strongyle edentatus</i>	36.8%
<i>Strongyle equines</i>	16.3%
<i>Oxyrus equi</i>	34.2%
<i>Parascaris equerum</i>	55.8%
<i>Strongyliod westeri</i>	28.4%
<i>Triodontophorus tencollis</i>	33.2%
<i>Dictoacaules arnifielde</i>	3.7%

Table 2: Prevalence of parasites between the body condition scores of horses

Spp of parasite	Body condition			X ²	P-value
	Poor	GOOD			
<i>Strongyle vulgaris</i>	60%	40%		0.44	0.3
<i>Strongyle edentatus</i>	70%	30%		7.23	0.005
<i>Strongyle equines</i>	41.9%	58.1%		3.6	0.04
<i>Oxyrus equi</i>	63.1%	36.9%		1.3	0.16
<i>Parascaris equerum</i>	59.4%	40.6%		0.4	0.3
<i>Strongyliod westeri</i>	61.1%	38.9%		0.4	0.3
<i>Triodontophorus tencollis</i>	68.3%	31.7%		4.56	0.023
<i>Dictoacaules arnifielde</i>	28.6%	71.4%		2.4	0.12

Table 3: Age wise prevalence of parasites

Spp of parasite	Age group			X ²	P-value
	Young (0-2years)	Adult (3-15)	Old (>15)		
<i>Strongyle vulgaris</i>	31.8%	24.7%	43.5%	0.79	0.6
<i>Strongyle edentatus</i>	32.9%	24.3%	42.8%	0.9	0.6
<i>Strongyle equines</i>	25.8%	19.4%	54.8%	0.99	0.6
<i>Oxyrus equi</i>	33.8%	20%	46.2%	1.55	0.46
<i>Parascaris equerum</i>	28.3%	20.8%	50.9%	2.07	0.34
<i>Strongyliod westeri</i>	31.5%	18.5%	50%	1.34	0.5
<i>Triodontophorus tencollis</i>	27.1%	23.7%	49.2%	0.24	0.88
<i>Dictoacaules arnifielde</i>	28.6%	42.8%	28.6%	1.56	0.45

lowest in young, respectively. In adults *Dictoacaules arnifielde* (42.9%) and *S. westeri* (18.5%) were also the highest and lowest respectively, in old age the highest was *Strongyle equines* (54.8%) and the lowest was *Dictoacaules arnifielde* (28.6%). Statistically significance differences in prevalence of all the listed parasites among the age groups were not observed (P>0.05) as examined by coproscopy (Table 3).

DISCUSSION

The results of this study confirm that helminth infections are highly prevalent in horses of in and Around Hawassa Town, Southern Ethiopia. A greater proportion of sampled horses were found infected with various helminth parasites and results are consistent with the findings of other studies [7, 15]. The overall prevalence of different types of helminth eggs and helminth species in this study were 97.9 %, which is in line with previous report from Ethiopia by Tolossa and Ashenafi [15] in horses of Arsi-Bale highlands of Oromiya Region and Usluand Guclu[16] in Turkey who reported prevalence of 84.4% and 100%, respectively. In current study mixed infections were detected in 83.2% of horses which is higher than the finding of Tolossaand Ashenafi [15] in

horses of Arsi-Bale highlands of Oromiya Region, Mahfooz *et al.* [17] in Pakistan and Uslu and Guclu [16] in Turkey who reported 59.1%, 5% and 50%, respectively.

The prevalence of *parascaris equorum* was 55.8%. This finding is disagree with Tolossa and Ashenafi [15], Getachew [17] in the Ethiopian, Mahfooz *et al.* [17] in Pakistan, Uslu and Guclu [16] in Turkey, Fikru *et al.* [19] in Ethiopia highlands and Aftab *et al.* [20] in horses of Lahore-Pakistan who reported 11.7%,16.2%, 12%, 10.81%, 17.1% and 10.92%, respectively. These finding are relatively lower than the present finding, this could be due to variation in manage mental condition of the study animals used, probably most of the animals included in the previous study may dewormed, sample size and sampling method used may also be responsible for such variations. This study showed that the level of *parascaris equorum* infestation had no significant variation between the age groups and body condition scores.

Oxyuris equi with prevalence rate of 34.2 % was very high when compared with the work of Tolossa and Ashenafi [15], Mahfooz *et al.* [17], Uslu and Guclu [16] in Turkey, Fikru *et al.* [19], AFTAB *et al.* [20] in horses of Lahore-Pakistan and Krecek *et al.* [21] in horses in RSA who reported 1.8%, 12%, 1.8%, 2.1%, 6.32% and 24%, respectively.

The prevalence of *strongloid westeri* in the present study was 28.4%, which is different from the work of Tolossa and Ashenafi [15], Morariu *et al.* [22], in Romania and Uslu and Guclu [16] in Turkey who reported 0.7 %, 9.6% and 7.2 %, respectively. However, the current study is in agreement with Wannas *et al.* [23] who reported prevalence of 22.72%, respectively.

Prevalence of 3.7% of *Dictyocaulus arnifieldi* was recorded in the present study that is higher than report of Tolossa and Ashenafi [15], with prevalence of 0.5% and in line with Saeed *et al.* [24] in Pakistan with prevalence of 2.5%. Climatic and environmental differences between countries and differences in access to drugs may partly explain the variation in these estimates.

Species of large strongyle identified in sampled horses included; *S. vulgaris*, *S. edentatus* and *S. equines*. The prevalence of *S. vulgaris* (44.7%) observed in this study were lower compared to those reported by Gebreab [25] where it was found that *S. vulgaris* 80 % in horses of Debre Zeit town. Similarly, Krecek *et al.* [21] reported a prevalence of 94 % for *S. vulgaris* in horses of South Africa. The prevalence of *S. edentatus* (36.8%) is comparable with record of Eydal and Gunnarsson [26] who reported a prevalence of 40% and higher than Saeed *et al.* [24] in Pakistan with prevalence of 19.65%. Prevalence of *S. equines* (16.3%) recorded in the current study which is not in accordance with previous study by Saeed *et al.* [24] in Pakistan with prevalence of 23.03%. The differences in intensity of infection could be due to variations in parasite biology relating to climatic conditions, differences in use of anthelmintics.

CONCLUSION

This study revealed that the predominant parasites occurring in and around Hawassa's horses were *Parascaris equorum* followed by *Strongyle vulgaris*. The study confirmed that among the different age groups old horses were found to be most susceptible and infested severely. Similar to several previous studies, this study also confirmed that helminthes parasites are more prevalent in animals with poor body condition than well-conditioned animals. From this study it can be concluded that age and body condition can be considered as one of the important factors which influence the occurrence of some helminthes parasites in horses. Parasitic control and protective actions will be necessary in order to utilize horses more efficiently.

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