

A survey on the prevalence of strongyles species in working donkeys in North-West of Iran

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Abstract Faecal samples for detection of gastrointestinal parasites were collected from 60 donkeys from 6 villages in Marand, North-West of Iran. Faecal samples of 2 donkeys (3.33 %) were negative for parasite eggs. 48 positive donkeys (81.66 %) were infected with a single parasite type, 9 (15.51 %) and 1 (1.66 %) of donkeys had multiple infections with two and three parasites, respectively. The highest prevalence and intensity rate belonged to small strongyles. The overall prevalence of intestinal parasites eggs in the positive donkeys were: strongyles 100 %, *Parascaris equorum* (15.51 %), *Habronema* spp. 1.72 %. Larval identification showed that small strongyle larvae were most frequent (100 %) followed by *Strongylus edentatus* (5.17 %), *S. equinus* (35.71 %) and *S. vulgaris* (26.66 %). This study revealed that donkeys in Iran are infected with a range of helminths, which are representatives of the important pathogenic parasites found in equids worldwide.

Keywords Donkeys · Gastrointestinal parasites · Strongyles · Iran

Introduction

Working equids including horses, donkeys and mules are indispensable farming and working animals in many developing countries, and their health status is important to the farmers. Gastrointestinal parasitism is one of the most important health problems in working equids worldwide

(Getachew et al. 2010). Studies of gastrointestinal parasites in donkeys have uncovered a diversity of helminth species. These studies had shown that helminths in working donkeys were highly prevalent, infection intensities were very high and they are the major health problems of working donkeys in developing countries. The prevalence and the type of internal parasites affecting equids, in general, and donkeys in particular have not been determined to a great extent in Iran. The most common helminths of donkeys are small and large strongyles, tapeworms (Anoplocephlidae), ascarid *Parascaris equorum*, pinworm *Oxyuris equi* and lungworm *Dictyocaulus arnfieldi*. Of these, the strongyles are the parasites most often considered as major causes of parasitic diseases in donkeys. They are frequently responsible not only for generally poor health, but also gastrointestinal dysfunctions including colic, and the potentially fatal condition of acute larval cyathostomosis (Love et al. 1999). Adult forms of strongyles live in the large intestine of donkeys and are commonly categorized as large and small strongyles (Lichtenfels 1975, Lichtenfels et al. 1998). A few studies have been conducted on the parasites of donkeys, but no detailed attempts have been made to study gastrointestinal parasites in donkeys of Iran. The main objective of this study was to determine the prevalence and intensity of strongyles species in donkeys in Marand, North-West of Iran.

Materials and methods

Faecal sample and faecal worm egg count

Faecal samples were collected directly from the donkeys' rectum, or sometimes picked up off the ground if the animals were seen to pass faeces and could be identified, and

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the samples could be picked up immediately. Samples were placed in a previously labeled container. The samples were transported to the Faculty of Veterinary Medicine, Urmia University, and stored at 4 °C until examination. The samples were examined using the flotation (sucrose and formaldehyde/density 1,200) and sedimentation method (Urquhart et al. 1987) at the parasitology section of the faculty of veterinary medicine, Urmia University. The fecal samples were examined by an optical microscope. Each observed egg was identified by using their morphological characteristics as described by Soulsby (1982).

Faecal culture and larval identification

Samples were classified as positive if at least one egg was observed. Faecal samples from donkeys with high egg numbers per gram were cultured. Infection with large and small strongyles was differentiated using larval morphological characteristics according to the key provided by Russell (1948) and Levine (1980).

Results

Eggs of three genera of internal parasites including strongyles spp., *P. equorum* and *Habronema* spp. were detected in the faecal samples of examined donkeys. Two donkeys (3.33 %) were negative for gastrointestinal parasite eggs and 58 donkeys (96.66 %) were shedding eggs. Out of 58 positive donkeys, 48 (81.66 %) were positive for at least one genera. In 9 (15.51 %) and 1 (1.66 %) of donkeys multiple infections with two and three species were observed, respectively. Strongyles had the highest prevalence among examined donkeys with the over all prevalence of 100 % followed by, *P. equorum* (15.51 %) and *Habronema* spp. 1.72 %. Over 45 % of the donkeys examined had strongyle faecal worm egg counts of more than 500, 15 % (600), 30 % (300–400) and 10 % (100–200) EPG. In this study, large and small larvae Strongyles were found including, *S. vulgaris*, *S. edentatus*, *S. equinus*, *Cyathostomum* spp., *Gialocephalus capitatus* and *Poteriostomum* spp. Prevalence of large and small larvae Strongyles were, *S. vulgaris* (72.7 %), *S. edentatus* (13.63 %), *S. equinus* (45.4 %), *Cyathostomum* spp. (100 %), *Gialocephalus capitatus* (46 %) and *Poteriostomum* spp. (27.2 %) respectively (Table 1).

Discussion

This study described the prevalence of strongyles spp., working donkeys in North West of Iran. A few studies have been conducted on the parasites of donkeys, but no detailed

Table 1 Relative percentage of large and small larvae strongyles recovered from coproculture in donkeys

Species of strongyles	Prevalence (%)
<i>Strongylus edentatus</i>	13.63
<i>Strongylus equinus</i>	45.4
<i>Strongylus vulgaris</i>	72.7
<i>Cyathostomum</i> spp.	100
<i>Gialocephalus capitatus</i>	46
<i>Poteriostomum</i> spp.	27.2
<i>Trichostrongylus axei</i>	3.33

attempts have been made to study gastrointestinal parasites in donkeys of Iran. This is the first study to report donkeys strongyles spp. infection prevalence and intensity of infection in Iran. In this study, In addition to being, examined the prevalence of strongyles, also examined other helminths. The study revealed that majority of the donkeys had moderate infection faecal worm egg counts, according to Soulsby (1982), an EPG of 500 suggest mild strongyle infection, 500–1,000 a moderate infection and above 1,000 a severe infection in horses. On this basis, the majority of working donkeys in North West of Iran are moderate infected with strongyles spp. Helminthes prevalence in donkeys in this study were 96.66 %, which is in agreement with Ayele et al. (2006), and Ibrahim et al. (2011) who have reported 96.9, 96.9 % in Dugda Bora District, Hawassa Town, Southern Ethiopia respectively.

The prevalence of donkeys passing *P. equorum* eggs by faeces were 15.51 %, which is in harmony with Yoseph et al. (2001) and Fikru et al. (2005) who have reported 15.7 and 17.1 % in highlands of Wollo province and Western highlands of Oromia in Ethiopia respectively. Our finding in disagreement with Ayele et al. (2006), Mulate (2005), Getachew et al. (2010) and Ibrahim et al. (2011) who have reported 50, 48.8, 51, and 53.7 % in Southern Ethiopia and Ethiopia respectively. (Inasi and Açici 2009) also reported 22.58 % in Turkey. These differences in prevalence might be due to the ecological and climatic differences among localities.

Cultural identification of larvae indicated 100 % prevalence of *Cyathostomes* spp. this is in disagreement with the study of Yoseph et al. (2001) and Ayele et al. (2006). Cultural identification of larvae indicated 72.7 % prevalence of *S. vulgaris* this is in disagreement with the study of Yoseph et al. (2001), Ayele et al. (2006), Getachew et al. (2010) and Ibrahim et al. (2011) who have reported 100, 100, 91.3 and 51.8 % respectively. The prevalence of, *S. edentates* and *S. equines* larvae were, 13.63 and 45.4 % respectively, which is in disagrees with Getachew et al. (2010), Ibrahim et al. (2011) and Ayele et al. (2006). These differences in prevalence might be due to the ecological and climatic differences among localities.

Conclusion

In view of the results of this study, it was concluded that the infections caused by gastrointestinal helminths, especially the strongyles spp. are particularly common in the region, and that greater importance should be given to these parasites. The high parasitic burden and high rate of infection could affect working donkeys in the region. The present study has revealed the presence of a range of strongyles spp., which are representative of the important pathogenic parasites of equids world wide.

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