

## A COPROLOGICAL SURVEY OF DONKEY PARASITES IN GHARBIA PROVINCE, EGYPT

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### ABSTRACT

*The present study was conducted during the period from January to July 2010 at Elmehula Elkubra surrounding villages of Gharbia province where living conditions are rural communities. A total of 236 (132 male and 104 female) donkeys were randomly selected from rural places and subjected to qualitative coprological examinations to identify the major parasites involved in parasitic burden. Donkeys were grouped in to two age categories (under two years of age were classed as young and of two to ten years were classed as adult. Comparisons between age groups and sexes were made for donkeys. The parasites encountered in donkeys had a total prevalence of 82.21% (194/236). Single infection was 54.13% (105/194) while mixed infection was 45.87% (89/194). Nematodes had highest prevalence 69.92% (165/236). Strongyles were more prevalent 34.75% (82/236), followed by Parascaris equorum 15.26% (36/236), Oxyuris equi*

12.29% (29/236), *Dictycaulus spp.* 5.94% (14/236) and *Habronema spp.* 1.7% (4/236) respectively. Cestodes as *Anoplocephala spp.* was detected in (13/236) 5.51% while trematodes as *Gastrodiscus spp.* in: (9/236) 3.82 % and *Fasciola spp.* in (7/236) 2.97% respectively. According to sex of studied donkeys, females had higher prevalence 51.28% (121/236) than males 30.94% (73/236) and according to age, the prevalence in younger (up to 2 years) was lower 33.05% (78/236) while in adult donkeys (2-10 years) had higher 49.16% (116/236). Recommendations were given.

**Key Words:** Donkeys, Gastrointestinal nematodes, Fecal examinations.

## INTRODUCTION

Despite the increase in mechanization throughout the world, donkeys are still well deserving of the name 'beasts of burden'. This is shown by the wide spread use of donkeys in rural and urban areas in Africa (*Pearson et al., 1999*). They have a prominent position in the agricultural systems of many developing countries and engaged in income-generating activities (*Marshall and Ali, 2004*). The low level of development of the road transport network and the rough terrain of the country make the donkey the most valuable, appropriate and affordable pack animals under the small holder farming system of Ethiopia (*GebreWold, et al., 2004*).

Many authors investigated parasites affecting donkeys in Africa and worldwide. *El-Seify, et al., (2010)* in Egypt, *Getachew et al., (2010)* in Ethiopia; *Seri et al., (2000)* Khartoum State in Sudan; *Matthee et al., (2000)* in South Africa; *Hasslinger and El-Seify (1996)* in Egypt,

*Hasslinger, et al., (1996), Pandey et al., (1992)* in Morocco; *Ricci and Sabatini; (1992)* in Italy; *El-Seify, et al., (1991)* in Egypt, *Eysker and Pandey, (1989)* in the Zimbabwean high field; *Vercruyssen et al., (1986)*, in Burkina Faso, *El-Seify, et al., (1985)* in Egypt.

The attention given by Governmental and non-Governmental organizations to donkeys has been far below to what it deserves. This might be partly due to the wrong perception that the donkey does not require a lot of care, that when donkeys do get sick they are quick to die, and the donkey's low traditional status (Marshall and Ali, 2004). Despite the considerable numbers and the neglected importance of donkeys in the Egyptian economy, knowledge about the health problems affecting their welfare is unknown as far as we know for most parts of the country. Therefore, the objectives of this study were to determine spectrum of species and prevalence of major parasites involved in donkeys from a rural area of Elmeahala Elkubra surrounding villages of Gharbia Province.

## **MATERIALS AND METHODS**

### **Study Area:**

The present study was conducted during the period from January 2010 to August 2010 at Elmeahala Elkubra surrounding villages of Gharbia Prvince. The daily temperature ranged between 20°C and 40°C during that period.

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### **Study animals and protocol:**

A total of 236 (132 male and 104 female) donkeys, were randomly selected and subjected to qualitative coprological examinations to identify the major parasites involved in parasites burden. Donkeys were grouped in to two age categories. Under two years of age were classed as young (n=78), and adults from two to 10 years of age (116). Comparisons between age groups and sexes were made for donkeys.

### **Fecal samples:**

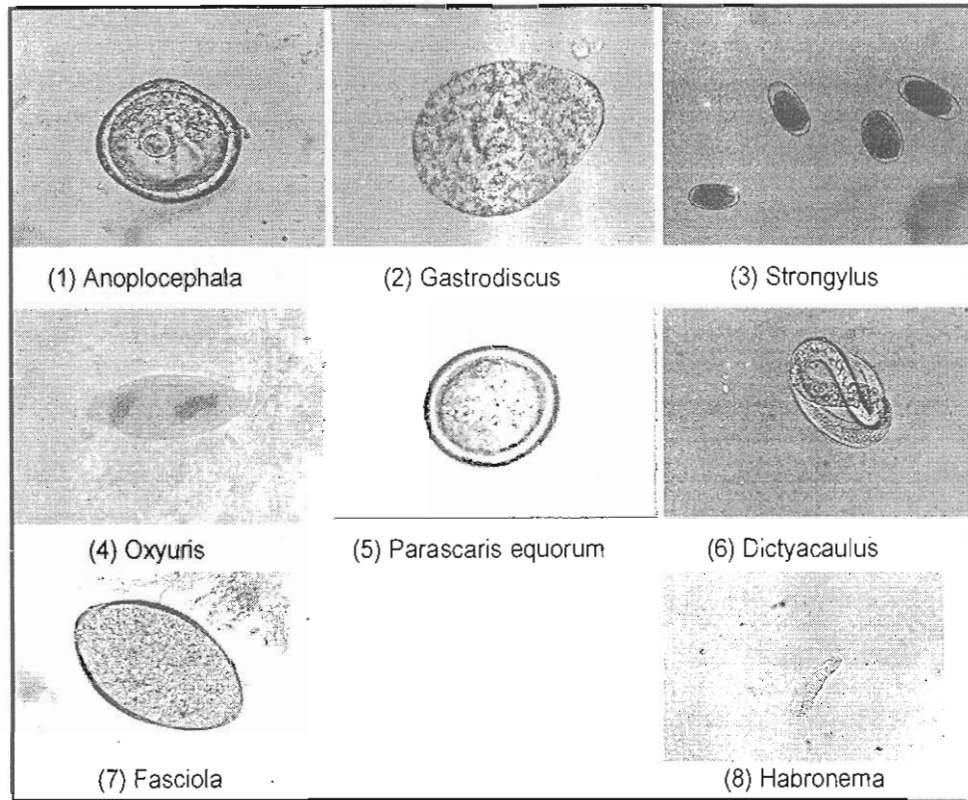
Fecal samples were examined individually for GI nematode, cestodes, and fluke's eggs as well as protozoan cysts, trophozoites and oocysts. Fecal samples were taken directly from the rectum or the ground when donkeys were seen defecating in air and water tight sample vials, then brought to the laboratory of the Parasitology Department of the Faculty of Veterinary Medicine of Mansoura University without preservation within 1-2 hours after collection and kept at 4°C until processing. However the history of these animals was not known

### **Parasitological procedure:**

The fecal samples were carefully examined microscopically using the 10 × objective. All parasites were identified using the keys of *Yamaguti, (1959) and Soulsby, (1982)*. Sedimentation and floatation techniques were used for detection of parasitic stages (*Urquhart et al., 1996; Soulsby, 1982*). Floatation technique was performed using saturated sodium chloride solution (*Willis, 1921*).

## RESULTS

The total prevalence of parasites of donkeys was 82.21% (194/236). Nematodes had highest prevalence 69.92% (165/236). *Strongylus spp.* was the most common species 34.75% (82/236), followed by *Parascaris equorum* 15.26% (36/236), *Oxyuris spp.* 12.29% (29/236), *Dictycaulus spp.* 5.94% (14/236) and *Habronema spp.* 1.70% (4/236) respectively. Cestodes as *Anoplocephala spp.* 5.51% (13/236) while trematodes as *Gastrophilus spp.* 3.82% (9/236) and *Fasciola spp.* 2.97% (7/236) were identified (Table 1). Female animals had higher prevalence 51.28% (121/236) while males had lower prevalence 30.94% (73/236) (Table 2). The prevalence in younger (up to 2 years) was lower 33.05% (78/236) than adult donkeys from 2-10 years 49.16% (116/236) (Table 3). Single infection and mixed infection analysis has revealed that (105/236) 54.13% of donkeys, were infected by a single parasite and (89/236) 45.78% of them were harboring more than one parasite species (Table 4). Photo taken for identified eggs are illustrated in figure 1.



**Fig. (1):** Pictures of donkeys parasites

**Table (1):** Prevalence of Gastrointestinal Parasites in donkeys

| Species                 | Total animals examined | Parasites                 | +          | %            |
|-------------------------|------------------------|---------------------------|------------|--------------|
| Donkey                  | 236                    | <i>Parascaris equorum</i> | 36         | 15.26        |
|                         |                        | <i>Strongylus spp.</i>    | 82         | 34.75        |
|                         |                        | <i>Oxyuris equi.</i>      | 29         | 12.29        |
|                         |                        | <i>Dictycaulus</i>        | 14         | 5.94         |
|                         |                        | <i>Habronema</i>          | 4          | 1.70         |
|                         |                        | <i>Anoplocephala spp.</i> | 13         | 5.51         |
|                         |                        | <i>Gastrodiscus spp.</i>  | 9          | 3.82         |
|                         |                        | <i>Fasciola</i>           | 7          | 2.97         |
| <b>Total prevalence</b> |                        |                           | <b>194</b> | <b>82.21</b> |

**Table (2):** Prevalence of gastrointestinal parasites in donkeys according to sex

| Species                 | Total animals examined | Parasites                 | Total      |              | Male      |              | Female     |              |
|-------------------------|------------------------|---------------------------|------------|--------------|-----------|--------------|------------|--------------|
|                         |                        |                           | +          | %            | +         | %            | +          | %            |
| Donkey                  | 236                    | <i>Parascaris equorum</i> | 36         | 15.26        | 13        | 5.51         | 23         | 9.75         |
|                         |                        | <i>Strongylus spp.</i>    | 82         | 34.75        | 29        | 12.29        | 53         | 22.46        |
|                         |                        | <i>Oxyuris equi.</i>      | 29         | 12.29        | 12        | 5.09         | 17         | 7.21         |
|                         |                        | <i>Dictycaulus</i>        | 14         | 5.94         | 5         | 2.12         | 9          | 3.82         |
|                         |                        | <i>Habronema</i>          | 4          | 1.70         | 2         | 0.85         | 2          | 0.85         |
|                         |                        | <i>Anoplocephala spp.</i> | 13         | 5.51         | 5         | 2.12         | 8          | 3.39         |
|                         |                        | <i>Gastrodiscus spp.</i>  | 9          | 3.82         | 4         | 1.70         | 5          | 2.12         |
|                         |                        | <i>Fasciola</i>           | 7          | 2.97         | 3         | 1.28         | 4          | 1.70         |
| <b>Total prevalence</b> |                        |                           | <b>194</b> | <b>82.21</b> | <b>73</b> | <b>30.94</b> | <b>121</b> | <b>51.28</b> |

**Table (3):** Prevalence of gastrointestinal parasites in donkeys according to age.

| Species          | Total animals examined | Parasites                 | Total |       | Up to 2 years |       | 3-20 years |       |
|------------------|------------------------|---------------------------|-------|-------|---------------|-------|------------|-------|
|                  |                        |                           | +     | %     | +             | %     | +          | %     |
| Donkey           | 236                    | <i>Parascaris equorum</i> | 36    | 15.26 | 13            | 5.51  | 22         | 9.75  |
|                  |                        | <i>Strongylus spp.</i>    | 82    | 34.75 | 29            | 12.29 | 51         | 22.46 |
|                  |                        | <i>Oxyuris equi</i>       | 29    | 12.29 | 12            | 5.09  | 15         | 7.21  |
|                  |                        | <i>Dictycaulus</i>        | 14    | 5.94  | 6             | 2.12  | 8          | 3.82  |
|                  |                        | <i>Habronema</i>          | 4     | 1.70  | 3             | 0.85  | 3          | 0.85  |
|                  |                        | <i>Anoplocephala spp.</i> | 13    | 5.51  | 6             | 2.12  | 6          | 3.39  |
|                  |                        | <i>Gastrodiscus spp.</i>  | 9     | 3.82  | 5             | 1.70  | 6          | 2.12  |
|                  |                        | <i>Fasciola</i>           | 7     | 2.97  | 4             | 1.28  | 5          | 1.70  |
| Total prevalence |                        |                           | 194   | 82.21 | 78            | 33.05 | 116        | 49.16 |

**Table (4):** Prevalence of gastrointestinal parasites in donkeys regarding single infection and mixed infection.

| Species | Total animals examined | Type of parasites (%) |           |                  |           |                 |          |
|---------|------------------------|-----------------------|-----------|------------------|-----------|-----------------|----------|
|         |                        | Total prevalence      |           | Single infection |           | Mixed infection |          |
|         |                        | +                     | %         | +                | %         | +               | %        |
| Donkey  | - 236                  | 82.21                 | (194/236) | 54.13            | (105/194) | 45.87           | (89/194) |



## DISCUSSION

Despite the considerable numbers and the neglected importance of donkeys in the developing countries economy, knowledge about the health problems affecting their welfare is not well known as far as we know for most parts of the world. Therefore, the objectives of this study were to determine spectrum of species and prevalence of major GIT parasites involved in donkeys. The microscopic fecal examination showed that helminthosis was an important health disease of donkeys in the study area. In our study, the rates for single infection (54.13%) were more frequently found than the rates for mixed infection (45.87%) (Table 4). Nearly similar results of mixed infections were detected in 54.8% of the donkeys of Dugda Bora District of Ethiopia (*Ayele et al., 2006*). These data are in accordance with those of other studies (*Asano, 2004; Ragozo, 2002; and Ramirez-Barrios, 2004*). The prevalence of *Strongyle spp.* was 34.75% which was similar to *Seri et al., (2000)* in Sudan who found *Strongylus sp.* (35.8%) and lower than the work of *Yoseph et al., (2001)* in Ethiopia who have reported 100% in donkeys. Similar results were obtained earlier by *Vercruyssen et al., (1986)* from Burkina Faso with a prevalence of 100% for *Strongylus vulgaris*. The prevalence of *Parascaris equorum* was 15.26% which is in agreements with that of *Yoseph et al., (2001)* and *Fikru et al., (2005)* have reported 15.7% and 17.3%, and nearly similar to *Seri et al., (2000)* in Sudan who found *Parascaris equorum* (10.7%) and lower than that of *Mulate, (2005)* who reported 43.8% in Ethiopia. *Oxyuris equi* with prevalence rate of 12.29% was very low compared with the work of *Yoseph et al., (2001)* who

reported 32.4% in Ethiopia. The low prevalence in this study might be due to obtaining samples from rectum and not performing perineal tape method which is recommended for *O. equi* as the gravid females lay eggs in perineal region. The prevalence of *Anaplocephala spp* was 5.51%. This low prevalence could be assumed due to the seasonality of Orbited mites intermediate host (Soulsby, 1982). Similar results were reported in the survey of helminthosis conducted in the central high lands of Ethiopia (Yoseph et al., 2001). Lower prevalence (3.82%) of *Paramphistomid (Gastrodiscus spp.)* was recorded in the present study compared to other reports in Ethiopia (Yoseph et al., 2001; Mulate, 2005). This lower prevalence might be due to the differences in ecological conditions for the development of intermediate snails and the parasite. The maintenance of high infection rate of parasitic helminthes in the study area might be associated with lack of any regular parasitic helminthes intervention program and the management system in the area where many donkeys were allowed to graze together on small plots of land through out the year which facilitates contamination between animals. Therefore in conclusion, This study revealed that working donkeys in the study area are infected with a range of helminthes and arthropod larvae, which are representatives of the important pathogenic parasites found in equids worldwide which are affecting the health and welfare of donkeys in the study area. Government or non profitable development agencies should include donkeys in their priority lists of research and develop sustainable integrated diseases prevention and control programs that are practical for developing communities.

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## الملخص العربي

أجريت هذه الدراسة خلال الفترة من شهر يناير الى اغسطس 2010 في القرى المحيطة بمدينة المحلة الكبرى بمحافظة الغربية حيث المجتمعات ماهولة. تم فحص عدد 236 حمار (132 ذكر و 104 انثى) وكان الاختيار عشوائى من المناطق الماهولة حيث تم عمل فحص نوعى لعينات البراز للتعرف على اهم الطفيليات والتي تمثل خطورة طفيلية. تم تقسيم الحمير حسب العمر الى مجموعتان (تحت عمر سنتان وصنفت المجموعة الصغيرة عمريا ومن عمر سنتان الى عشر سنوات وصنفت المجموعة الكبيرة عمريا. تم عمل مقارنات بين المجموعات العمرية المختلفة وايضا حسب الجنس. كانت نسبة الاصابة بالطفيليات بنسبة 82.21% (194/236). كانت الاصابة بطفيل واحد فى الحمير بنسبة 54.13% (194/105) بينما الاصابة باكثر من طفيل كانت بنسبة 45.87% (89/194). كانت التريماتودا تمثل اعلى نسبة اصابة بنسبة 69.92% (165/236). كانت الاسترونجيلس اعلى نسبة اصابة بنسبة 34.75% (82/236) ويليه الباراسكاريس ايكويرم 15.26% (36/236) ثم الاكسيورس ايكواى 12.29% (29/236) ثم الديكتيوكلوس 9.4% (14/236) والهابرونيماس 1.7% (14/236) بالترتيب. كانت الديدان الشريطية مثل الانوبلوسيفلا بنسبة 5.51% (13/236) بينما كانت التريماتودا مثل الجاستروديسكاس بنسبة 3.82% (9/236) والفاشيولا 2.97% (7/236) بالترتيب. حسب الجنس كانت نسبة الاصابة فى الاناث 51.28% (121/236) اعلى منها فى الذكور 30.94% (73/236). حسب العمر كانت الاصابة فى الاعمار الصغيرة 33.05% (87/236) اقل منها فى الاعمار الكبيرة 49.16% (116/236). اعطيت التوصيات حسب النتائج.