Research article

**Moniezia benedeni in camels (Camelus dromedarius) in Iraq**

Anisimova EI.¹  Al-Fatlawi MAA²

¹Scientific and practical center of the national academy of sciences of Belarus for biological resources, Minsk, Belarus
²Department of Microbiology and Parasitology, College of Veterinary Medicine, University of Al-Qadisiyah, Iraq

Corresponding Author Email: anis-zoo@yandex.ru
Co-Author Email: monyer.abd@qu.edu.iq

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Abstract

The purpose of the herein study was to explore the infestation prevalence of the gastrointestinal helminths that affect Iraqi camels. For such reason, intestines from 120 camels obtained that were directly searched for the occurrence of such infestation. Among all samples, 15(12.5%) were recorded infected with Moniezia benedeni. 48 and 72 camels examined in Al-Diwaniyah and Najaf abattoir from September to December 2012, which have Moniezia benedeni 8.3% and 15.2% respectively. First and second age groups (G1, G2) showed a rate of infection at 12.5% and 11.5%, while the third group (G3) was 13%. Female appears highly infection a rate than male (13.6%, 9.4%). A number of isolated Moniezia benedeni were 1-6, with range 2.6 cestodes per infected camel. Measurement of Moniezia benedeni was 48.9 length and 2.76 cm width.

Keyword: Moniezia benedeni, Camels, Dromedarius, Iraq.

Introduction

In the areas of the world that are considered as desert-based environment, camels play important roles in serving the needs of various economic purposes. These purposes are ranged from supplying people with efficient sources of food, milk and meat, to a terrain-suitable and inexpensive way of transportation. An economic-destroying problem that facing the camel herds in the world is the high incidence of parasitic infestation (1). Wide ranges of creatures are susceptible to gastrointestinal helminthes and are strongly weakened by those parasites. High mortalities and economical-insufficient production are the main results that such parasitic infestations do. The most affected areas in the world by these helminthes are the tropical-based regions (2). These high mortalities and economic-destroying parasitism are linked to the wide-spread of nematodes (3-8). There are multiple effects that these helminthes could apply on the affected hosts which include but not limited to lowering of appetite, decreasing of nutrient uptake, disturbance of gastrointestinal motility, and inefficient milk and meat productions. There are no clear clinical signs that are related to the parasitic infestation; however; the above-mentioned effects could be recognized (9). When look at the environment that camels live in; it would not be believable that these worms could cause infestation in such conditions. However, these conditions and their animals increase the incidence of infestation by 77 species (10). Moniezia benedeni is a tapeworm that causes low-incident infestation when compared to that for M. expansa. The infestation by this worm is more prevalent in Africa. Sub-acute or chronic catarrhal gastritis is the main condition that this worm could induce. To apply more and effective protection processes, epidemiological information should be available from different animal hosts to keep tracking these infestations. In order to introduce such efficient prevention criteria, spring-prophylactic treatment by anthelmintic
medicines advised to eliminate any opportunities for these worms to cause infestations. Increasing the effectiveness of any prevention protocols should follow merging between various procedures such as the use of anthelmintic medicines, feeding-based criteria, bio-controlling applications, and vaccination-related programs (11). However, the incorporation between increasing resistance of these worms against some anthelminthic medicines and lacking of effective protection protocols has led for the incidence and the prevalence of the infestation by these worms to be elevated (12, 13), Table (1).

| No. | Researcher | Country   | Rate of infection % | Notes       |
|-----|------------|-----------|---------------------|-------------|
| 1   | 14         | Ethiopia  | 31                  |             |
| 2   | 15         | Saudi Arabia | First time record | Occasional |
| 3   | 16         | Egypt     | First time record   |             |
| 4   | 17         | Pakistan  | 7.8                 |             |
| 5   | 18         | Abu Dhabi | First time record   | Moniezia Spp. |
| 6   | 9          | Iran      | 4                   |             |

It has been recognized that females have more infestation/tapeworm burden than that in males (19). On the other hand, workers have revealed that males have higher rates than females in the cases of severity of infestation (number of eggs in a fecal sample) and its prevalence (20). These rates might go down during the seasons of parturition and with increasing age of animals. Predisposing effecters such as weathered- and environmental-based conditions increase the rates of preserving eggs and or larvae and infesting animals by these parasitic agents. For such reasons, seasonal variations might be introduced to affect the infestation and prevalence rates (21). The intended aim of the current investigational study was to explore the infections of camels with Moniezia benedeni, and this is the first study in this direction in Iraq.

Materials and Methods

Ethical approval

The Animal Ethical Committee of Veterinary Medicine College, University of Al-Qadisiyah, Iraq, has approved the present study under permission No: 338

For this study and from Al-Diwaniyah and Al-Najaf city slaughter houses, various ages and sexes of 120 dromedaries were engaged after slaughtering to obtain separated gastrointestinal parts via ligation processes and placed them in labeled containers. The collected samples were then iced-transferred to a Lab where they were processed within 2 hrs. after the collection of the samples. The process of Cestoda collection was mentioned in (22). In a brief, the collected parts of the gastrointestinal tract were open and searched for the presence of these tapeworms. The intestinal parts were also rinsed down into a tray to use the contents for further examination. Ethanol at a concentration of 10% was used to preserve the specimens for later examination.

Results

Table (2) shows the collected results that are related to the infestation rates. The total rate of Moniezia benedeni was 12.5%. In Najaf was highly infection rate (15.2%) than in Al-Diwaniyah (8.3%). September showed 14.3%, October was 14.7%, November 11.11% and December lowest infection rate (10.3%) Figures (1) (2). Differences between aging groups appear highly infection rate in third age group (5 year and more) (13%) than
first and second age groups (less than 2 years and 2 to less than 5 years) (12.5% and 11.4%) Table (3). Female has highly infection rate (13.6%) than male (9.4%) Table (4). Number of cestodes were arranged from 1-6 and with mean 2.6 Moniezia benedeni per infected camel Table (5). The measurement of Moniezia benedeni isolated in this study was 48.9*2.76cm Table (6).

Table (2) the rate of infections in camels with Moniezia benedeni according to months and provinces

| No. | Months  | Al-Diwaniyah | Al-Najaf | Total |
|-----|---------|-------------|----------|-------|
|     | Exam    | Infected    | %        | Exam  | Infected | %   |
| 1   | September | 6  | 1  | 16.6 | 15  | 2  | 13.3 | 21  | 3  | 14.3 |
| 2   | October  | 14 | 2  | 14.3 | 20  | 3  | 15  | 34  | 5  | 14.7 |
| 3   | November | 16 | 1  | 6.3  | 20  | 3  | 15  | 36  | 4  | 11.1 |
| 4   | December | 12 | 0  | 0    | 17  | 3  | 17.6 | 29  | 3  | 10.3 |
| Total | 48    | 4  | 8.3 | 72  | 11 | 15.2 | 120 | 15 | 12.5 |

Table (3) the number of infected camels with Moniezia benedeni according to age

| No. | Months | <2 | >2<5 | 5 and more | Total |
|-----|--------|----|------|------------|-------|
|     | Exam.  | Inf. % | Exam. | Inf. % | Exam. | Inf. % | Exam. | Inf. % |
| 1   | Sep.   | 4   | 0   | 0  | 6  | 1  | 16.6 | 11  | 2  | 18.1 | 21  | 3  | 14.3 |
| 2   | Oct.   | 10  | 1   | 10 | 2  | 20 | 19  | 10.5 | 34  | 5  | 14.7 |
| 3   | Nov.   | 5   | 0   | 0  | 13 | 1  | 7.7 | 18  | 3  | 16.6 | 36  | 4  | 11.1 |
| 4   | Dec.   | 2   | 50  | 1  | 0  | 6  | 0  | 21  | 2  | 9.5  | 29  | 3  | 10.3 |
| Total | 16    | 2   | 12.5| 35 | 4  | 11.4| 69  | 9   | 13  | 120 | 15 | 12.5 |

Table (4) the rate of infections in camels with Moniezia benedeni according to sex

| No. | Months | Male | Female | Total |
|-----|--------|------|--------|-------|
|     | Exam.  | Infect. % | Exam. | Infect. % | Exam. | Infect. % |
| 1   | Sep.   | 5   | 1   | 20 | 16  | 2  | 12.5 | 21  | 3  | 14.3 |
| 2   | Oct.   | 10  | 1   | 10 | 24  | 4  | 16.6 | 34  | 5  | 14.7 |
| 3   | Nov.   | 8   | 0   | 0  | 28  | 4  | 14.3 | 36  | 4  | 11.1 |
| 4   | Dec.   | 9   | 1   | 11.1| 20  | 2  | 10  | 29  | 3  | 10.3 |
| Total | 32    | 3   | 9.4 | 88 | 12  | 13.6| 120 | 15 | 12.5 |

Table (5) the number of Moniezia benedeni in the infected camels

| No. | Months | 1-2 | 3-4 | 5 and more | Total |
|-----|--------|-----|-----|------------|-------|
|     | Exam.  | Inf. % | Exam. | Inf. % | Exam. | Inf. % |
| 1   | Sep.   | 2   | 1   | 0  | 0  | 3 |
| 2   | Oct.   | 3   | 1   | 1  | 5 |
| 3   | Nov.   | 2   | 1   | 1  | 4 |
| 4   | Dec.   | 1   | 2   | 0  | 3 |
| Total | 8   | (53.3%) | 5  | (33.33%) | 2  | (13.3%) | 15 |

Table (6) the length and breadth of isolated Moniezia benedeni from infected camels

| No. | Months | 10-30cm Length*breadth | 31-60cm Length*breadth | 61-96cm Length*breadth | Total Length*breadth |
|-----|--------|------------------------|------------------------|------------------------|---------------------|
|     | Exam.  | male                   | female                 | male                   | female              |
| 1   | Sep.   | 2  | (24.5*2.35cm) | 1  | (56.2*2.2cm) | 2  | (74.5*3.15cm) | 5  | (50.8*2.64cm) |
| 2   | Oct.   | 3  | (24*2.83cm)  | 5  | (46.8*2.92cm) | 5  | (76.2*2.74cm) | 13 | (52.8*2.6cm)  |
| 3   | Nov.   | 4  | (29.5*2.67cm) | 5  | (40.6*2.82cm) | 5  | (74.4*2.86cm) | 14 | (49.5*2.79cm) |
| 4   | Dec.   | 3  | (24.6*2.63cm) | 3  | (36.6*2.76cm) | 2  | (69*2.7cm)  | 8  | (40.2*2.7cm)  |
| Total | 12    | 14 | (26*2.64cm)  | 14 | (43.2*2.79cm) | 14 | (74.2*2.83cm) | 40 | (48.9*2.76cm) |
Discussion

To the best of our knowledge, the literatures indicated that there have been no studies that investigated the prevalence rates of gastrointestinal infestation by Moniezia benedeni in dromedary, Camelus dromedaries, of Iraq. Slaughterhouse-based survey was purposed to investigate the occurrence rates of gastrointestinal cestodes in the intestines of slaughtered camels from Al-Diwaniyah and Najaf cities. From 21 September to 11 December 2012, intestinal parts were separated by ligation and sent to a Lab. The rate of the infestation by Moniezia benedeni in these camels was 12.5%. This rate is considered as lower than that of (14) in Ethiopian dromedaries 34%, but high than camels in Iran 4% (9), and Pakistan 7.8% (14). A possible explanation for this difference is that the immunological stat of camel different. The rates of infestation by these tapeworms might be varied according to different reasons such as age of animals. The severity and burden of infestation by these tapeworms were revealed to be the highest in young camels (19), and this could go back to the fact that older camels have more efficient immune responses, due to recurrent attacks of worms, than that in young camels (23).

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