

Prevalence of *Monezia expansa* and *Fasciola hepatica* in Libyan and Sudanese camels Misurata - Libya 2019

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انتشار طفيلي *Fasciola hepatica* و *Moniezia expansa* في الجمال الليبية والسودانية في مصراتة – ليبيا عام 2019.

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Abstract

In this study. One hundred and twenty camels (60 Libyan camels and 60 Sudanese camels), were post-mortem examined for the occurrence of *M. expansa* and *F. hepatica*. During the period from Jan to Dec 2019. The results showed that the incidence rate of infection among Libyan camels was (39) 65% and in Sudanese camels was (37) 61.6%.

According to the age, the incidence rate among age group <3 years old was 25 (41.6%); 22 (36.6%) in L. and S. camels respectively. and age group > 3 years old was 14 (23.3%); and 15 (35.0%) in L. and S. camels respectively.

According to seasons, the highest incidence rate was in summer and spring 12 (80.0%) in Libyan camels, as for the Sudanese it was 15 (100%) in summer and 8

(53%) in spring and the infection with *monezia expansa* in the two breeds, while the infection with *Fasciola hepatica* was only with s camels

according to sex (males and females) 23 (38.3%), 16 (26.6%) and 17 (28.3%); 20 (33.3%) in L. and S. camels respectively.

The overall rate of *M. expansa* in L. and S. camels was (65.0%) and (53.3%) respectively, and 5cases (8.33%) of *F. hepatica* in S. camels.

Keywords: Prevalence- Libyan camels - Sudanese camels - Monizia expansa -Fasciola hepatica.

الملخص

في هذه الدراسة 120 جمل (60) جمل ليبي، 60 جمل (سوداني تم الكشف Post للكشف عن دودة المونيزيا عنها بطريقة mortem examination اكسبينسا ودودة الفشيولا هبتكا في الفترة من يناير إلى ديسمبر 2019 أظهرت النتائج كالتالي: إصابة 39 (65.0%) للإبل الليبية وإصابة 37 (61.6%) للإبل السودانية ومن حيث الفئات العمرية الأكثر من ثلاث سنوات أظهرت النتائج إصابة 25 (41.6%)، و 22 (36.6%) للإبل الليبية والسودانية على التوالي. أما الفئة العمرية الأصغر من ثلاثة سنوات، كانت النتائج 14 (23.3%)، 15 (35.0%) للإبل الليبية والسودانية، أما من حيث المواسم فإن الإصابة كانت الأكثر في فصل الصيف والربيع 12 (80.0%) أما في الإبل السودانية فكانت النتائج 10 (66.6%) في الصيف، 8 (53.33%) في الربيع.

أما من حيث الجنس فإن نسبة الإصابة كانت في الذكور 38.3 - 26.6% في الإبل الليبية والسودانية، أما الإناث فكانت نسبة الإصابة 28 - 33.3% في الإبل الليبية والسودانية على الترتيب. أما معدل الإصابة العام لدودة المونيزيا كان 65.0 - 53.3% للإبل الليبية والسودانية على التوالي، أما من حيث الإصابة بدودة الفشيولا فكانت نسبة الإصابة 8.33% في الإبل السودانية فقط.

الكلمات المفتاحية: الانتشار - الإبل الليبية - الإبل السودانية.

Introduction

Camels are considered one of the most important economic animals in arid and semi-arid regions, where they play a vital role in supporting food security and livelihoods. They provide essential resources such as milk, meat, and transportation for populations living in these harsh environments. In recent years, the importance of camels has increased due to their high nutritional value, particularly as camel milk is characterized by low cholesterol and sugar levels and a high content of vitamin C, making it suitable for human consumption in challenging climatic conditions .

Despite their remarkable ability to adapt to harsh environmental conditions, camels remain susceptible to various parasitic infections, especially gastrointestinal helminths, which directly affect their health and productivity. Among these parasites, the cestode *Monezia expansa* and the trematode *Fasciola hepatica* are considered the most significant, as they cause digestive disturbances, weight loss, and reduced productivity, ultimately leading to economic losses in the livestock sector.

The prevalence of these parasitic infections is influenced by several factors, including age, sex, and breed, in addition to environmental and seasonal factors such as temperature and humidity, which play a crucial role in the life cycle and transmission of parasites. Furthermore,

geographical variations and differences in management systems may result in significant differences in infection rates across regions and countries.

In this context, epidemiological studies are of great importance, as they aim to determine the prevalence of parasitic infections and identify the associated risk factors. Such studies are particularly essential in countries that rely heavily on livestock resources, such as Libya, where improving animal health directly contributes to economic development.

Accordingly, this study aims to investigate the prevalence of *Monezia expansa* and *Fasciola hepatica* infections in Libyan and Sudanese camels in Misurata city, as well as to analyze the influence of factors such as age, sex, and season. The ultimate goal is to provide scientific data that can support the development of effective control and prevention strategies against these parasitic infections.

Literature Review

Parasitic infections represent one of the most significant health constraints affecting livestock production worldwide, particularly in arid and semi-arid regions where camels play a vital economic and social role. Among the various parasitic infections, gastrointestinal helminths, including cestodes and trematodes, have been widely reported to affect camel health and productivity. The present literature review synthesizes previous studies related to the prevalence, epidemiology, and impact of *Monezia expansa* and *Fasciola hepatica* infections in camels and other livestock species.

Camels are considered highly adaptable animals capable of surviving in harsh environmental conditions. However, despite their resilience, they are not immune to parasitic infections. Hussain et al. (2016) highlighted that parasitic diseases in camels can lead to significant hematological and biochemical alterations, ultimately affecting their productivity and health status. Similarly, Ali et al. (2016) reported that parasitic infections may contribute to subclinical conditions that reduce milk yield and overall animal performance.

The gastrointestinal tract of camels is commonly affected by helminth parasites, including cestodes such as *Monezia expansa* and trematodes such as *Fasciola hepatica*. According to Borji et al. (2010), these parasites are among the most frequently encountered helminths in camels, particularly in regions where environmental conditions favor their life cycles. The transmission of these parasites is influenced by grazing behavior, intermediate hosts, and climatic conditions.

Monezia expansa, a cestode parasite, is primarily found in the small intestine of ruminants. Although it is more commonly reported in sheep and goats, several studies have documented its presence in camels. Sissay (2007) reported a prevalence rate of approximately 53% in sheep, indicating a high level of infection in grazing animals. Similarly, EL-Sraiti (2019) observed prevalence rates ranging between 3% and 40% in Libyan and Spanish sheep, with higher infection rates during summer and spring seasons. These findings suggest that environmental conditions play a crucial role in the transmission dynamics of *M. expansa*.

Seasonal variation is a key factor influencing the prevalence of parasitic infections. Studies have consistently shown that higher temperatures and humidity levels during spring and summer create favorable conditions for parasite development and transmission. This is supported by findings from multiple studies indicating increased infection rates during these seasons. For instance, EL-Sraiti (2019) reported peak infection rates of *M. expansa* during summer, followed by spring, which aligns with the general understanding of parasite ecology. On the other hand, *Fasciola hepatica*, commonly known as the liver fluke, is a trematode parasite that primarily affects the liver of infected animals. It has a complex life cycle involving

intermediate hosts, typically freshwater snails. The prevalence of fascioliasis varies significantly across regions and animal species. Wadood (2005) reported prevalence rates of 7.2% in sheep and 8.3% in cattle in Iraq, while Khetam et al. (2017) found prevalence rates of 3.61% in cattle and 4.5% in sheep. These variations highlight the influence of environmental and ecological factors on the distribution of the parasite.

In addition, AL-Salamy et al. (2013) documented the presence of *Fasciola hepatica* in both humans and farm animals, emphasizing its zoonotic importance. The study demonstrated that fascioliasis is not only a veterinary concern but also a public health issue. Similarly, Haridy et al. (1999) reported increasing prevalence rates of fascioliasis in Egypt, indicating a growing concern in endemic regions.

Gender and age are also important determinants of parasitic infections. Several studies have reported higher infection rates in females compared to males, possibly due to physiological stress associated with reproduction. Arsalan et al. (2019) found that fascioliasis was more prevalent in female animals, which may be attributed to hormonal and nutritional factors. Furthermore, younger animals tend to exhibit higher susceptibility to parasitic infections due to their immature immune systems. Tasawar et al. (2007) reported that goats aged between 13 and 34 months had higher infection rates compared to older animals, suggesting age-related immunity development.

In camels, the prevalence of *Fasciola* species is generally lower compared to other ruminants, but it still poses a significant risk. Aysen et al. (1999) reported very low prevalence rates in camels compared to cattle and sheep, which may be attributed to differences in feeding habits and ecological exposure. However, other studies have indicated that camels can act as reservoirs for trematode infections under certain conditions.

Geographical variation also plays a critical role in the epidemiology of parasitic infections. Studies conducted in different regions have reported varying prevalence rates due to differences in climate, management practices, and availability of intermediate hosts. For example, Jesca Nakayima et al. (2017) reported the presence of trematodes, including *Fasciola gigantica*, in camels and donkeys in Uganda, highlighting the widespread distribution of these parasites across different ecological zones.

Moreover, Muhammad et al. (2018) conducted a comprehensive study on gastrointestinal helminths in camels and found that trematodes were among the most prevalent parasites, followed by nematodes and cestodes. This finding underscores the importance of continuous monitoring and control of parasitic infections in camel populations.

The economic impact of parasitic infections in livestock cannot be overlooked. Infected animals often exhibit reduced weight gain, decreased milk production, and increased susceptibility to other diseases. These effects collectively result in significant economic losses for farmers and the livestock industry. Therefore, understanding the epidemiology and risk factors associated with parasitic infections is essential for developing effective control strategies.

In addition to prevalence studies, several researchers have emphasized the importance of ecological and epidemiological terminology in parasitology. Margolis et al. (1982) provided a standardized framework for defining key concepts such as prevalence, intensity, and abundance, which are essential for accurate data interpretation and comparison across studies. Overall, the literature indicates that parasitic infections, particularly those caused by *Monezia expansa* and *Fasciola hepatica*, remain a significant concern in livestock production systems. The prevalence of these parasites is influenced by multiple factors, including environmental conditions, host characteristics, and management practices. Despite the availability of

numerous studies, there is still a need for region-specific research, particularly in underrepresented areas such as Libya, to better understand the epidemiology of these infections.

The current study contributes to this body of knowledge by providing data on the prevalence of these parasites in Libyan and Sudanese camels in Misurata. Such studies are crucial for informing control programs and improving animal health and productivity in the region .

Material and Methods

The study was carried out between January to December 2019 in Misurata Slaughter House, in Geran region. A total of 120 camels (60 Libyan camels and 60 Sudanese camels raised in Misurata - Libya).

Aged between < 3 years to > 3 years were examined for the presence of *Monezia expansa* and *Fasciola hepatica*. The parameters studied were overall prevalence, sex and breed. The collected samples were transported to Parasitology

Laboratory in Faculty of Medical Technology - Misurata - Libya. To know them and classify them infection. The injury rate is calculated according to the following formula

$$\% = \frac{\text{no of infection}}{\text{no of examined}} \times 100 \text{ (Margolis et al; 1982).}$$

Study area: The average minimum temperature in the district is 13 C, while the average maximum temperature is 36 C. The climate of this district is dry and humid with the average humidity level of 68%.

Table (1) Prevalence of parasitic infection among sex and age distribution of Libyan and Sudanese camels.

| Animal | On. exam | No. infected | | Age | | Total |
|-----------------|----------|--------------|--------------------------|------------|-------------|------------|
| | | M % | F % | <3 years | >3 years | |
| Libyan camels | 60 | 23(38.3)% | 16(26.6) % | 25(41.6) % | 14(23.3)% | 39(65) % |
| Sudanese camels | 60 | 17(28.3)% | 20(33.3) % 20(33.3) % | 22(36.6) % | 15 (35.0) % | 37(61.6) % |

M = males

F = females

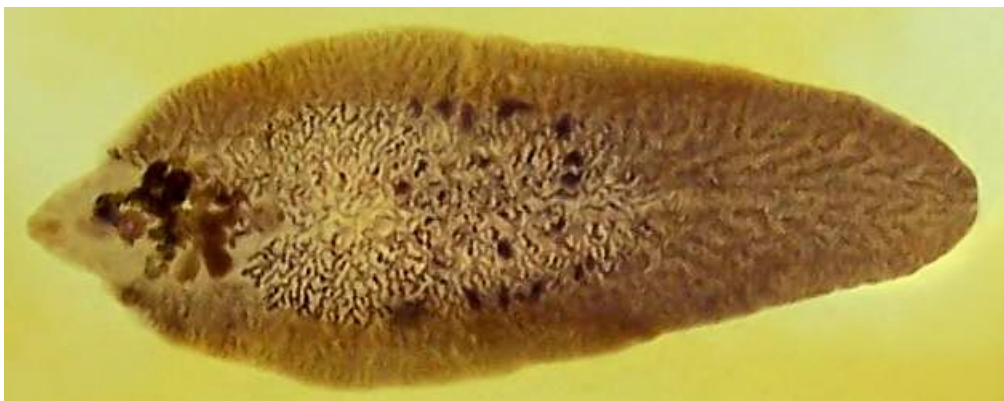
Table (2) Prevalence of infection with *Monezia expansa* *Fasciola hepatica* among Libyan camels according to seasons.

| Season | No. exam No. exam | No single infection | | Double infection | Total |
|--------|----------------------|---------------------|--------------------|------------------|------------|
| | | <i>M. expansa</i> | <i>F. hepatica</i> | | |
| Spring | 15 | 12 (80.0)% | 0 (0.0)% | 0 (0.0)% | 12 (66.6)% |
| Summer | 15 | 12 (80.0)% | 0 (0.0)% | 0 (0.0)% | 12 (80.0)% |

| | | | | | |
|----------|----|------------|----------|----------|-----------|
| Autumn | 15 | 9 (60.0)% | 0 (0.0)% | 0 (0.0)% | 9 (80.0)% |
| Winter | 15 | 6 (40.0)% | 0 (0.0)% | 0 (0.0)% | 6 (40.0)% |
| N. Potal | 60 | 39 (65.0)% | 0 (0.0)% | 0 (0.0)% | 39 (65)% |

Table (3) Prevalence of infection of Sudanese camels with *Monezia expansa* and *Fasciola hepatica* according to seasons.

| Season | No. exam No. exam | No single infection | | Double infection | Total number |
|----------|-------------------|---------------------|--------------------|------------------|--------------|
| | | <i>M. expansa</i> | <i>F. hepatica</i> | | |
| Spring | 15 | 7 (53.3)% | 0 (0.0)% | 0 (0.0)% | 8 (53)% |
| Summer | 15 | 10 (66.6)% | 5 (33.3)% | 15 (100.0)% | 7 (46.6)% |
| Autumn | 15 | 7 (46.6)% | 0 (0.0)% | 0 (0.0)% | 7 (46)% |
| Winter | 15 | 7 (46.6)% | 0 (0.0)% | 0 (0.0)% | 7 (10.0)% |
| N. Potal | 60 | 32 (53.3)% | 5 (8.3) % | 15 (25.0)% | 37 (61.6)% |



Fig(1) *Fasciola hepatica*



Fig 2 *Monezia expansa*

Results and discussion

One hundred and twenty camels (60 Libyan camels) and (60 Sudanese camels) were post-mortem examined for the

occurrence of *Monezia expansa* Fig (2) and *Fasciola hepatica* Fig(1). The prevalence of parasitic infection among sex in Libyan

camels (38.3 in males, 26.6% in females, and 28.3% in males, 33.3% in Females in Sudanese camels.

Prevalence of infection with parasites according to age in L. camels (< 3 years - 41.6%, > 3 years 23.3%).

in S. camels (<3 years 36.6% and > 3 ⇒ 35.0%). Table (1). Prevalence of infection with parasites among L. and S. camels according to Seasons. In L. camels 66.6, 80.0, 60.0, 40.0% in spring, summer, autumn and winter respectively.

in S. camels 53.3, 66.6, 96.6 and 46.6% in spring, summer, autumn and winter respectively.

The overall rate of infection was 65.0% in L. camels and 65.0% in S. camels. Table (2,3).

The prevalence of *Fasciola hepatica* in slaughter animals at Basrah abattoir is 7.2% in sheep and 8.3% in cow (Wadood

2005), and 3.61% in cow and 4.5% in sheep (khetam et al 2017),

and 3.61% in sheep (AL - Salamy et al 2013).

In Iraq: the prevalence of *F. hepatica*. In cattle (3.33%) in female and 0.82% in males).

(AL - Juboury 2008). A survey on liver infection with *F. gigantica* among slaughtered animals in Iraq, the overall rate was 36.73% in cattle and 1.6% in sheep. (AL- Barwary 2008), (Haridy et al, 1999) reported; the overall prevalence of

F. hepatica as 2.02% for sheep and goats; 3.54% for cattle and 1.58% for buffaloes (Aysen et al 1999) reported the prevalence

of Fascioliasis as 1.2; 0.04 and 0.0% in cattle, sheep, goats and camels. Relationship between age and *F. hepatica* in goats

35.71% in age group of 13-34 months and lowest (18.8%) in age group of > 36 months. The difference was significant ($p < 0.05$) (Tasawar et al, 2007). Prevalence of *Monezia expansa* infection

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among Libyan and Spanish sheep were (3.0 – 40.0%) respectively, prevalence of *M. expansa*

among Libyan and Spanish sheep according to seasons was 33.3 - 53.3% in summer followed by spring 33.3-40.0% respectively. (EL- Sraiti 2019). The prevalence of *M. expansa* in sheep

48.3% was very close to the finding in Ethiopia 53.0% (Sissay, 2007). trematodes were detected in S.camels as *F. gigantica* (Jesca Makayima, 2017), Trematodes (*F. gigantica*, *F. hepatica*),

were found the most prevalent parasite's type followed by

nematodes and cestodes (Muhammad et al, 2018). The overall prevalence of Fascioliasis in small ruminant population was 37.24% (Hasnain Javed 2019), Fascioliasis was more prevalent in females as compared to males. According to age the prevalence was higher in animals with 6-12 month of age.

(Arsalan et al, 2019) These registered are equal to the other results.

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Compliance with ethical standards*Disclosure of conflict of interest*

The authors declare that they have no conflict of interest.

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