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# Prevalence of Intestinal Cestodes of Camels (*Camelus dromedary*) at Tumbool Slaughterhouse

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**Abstract:** ***This study was conducted to determine the prevalence, classification and identification of small intestinal cestodes of camel (Camelus dromedary) in Butana Area, Central Sudan. The whole contents of the small intestine were taken from 215 camels at Tumbool slaughterhouse during the period from December 2008 to November 2009. Contents of the small intestine were collected once immediately after slaughtering of the camels and brought to Tumbool Camel Research Center for processing the samples. The collected adult worms were counted, classified, and measured (length and width of worms), then examined macro and microscopically for the identification. Results revealed that 69.3% (149 out of 215) of the total investigated camels were infected with intestinal cestodes. Among the recovered 1180 small intestinal cestodes, seven worm species were detected (Moniezia expansa , Moniezia benedi , Avitellina spp, Stilesia spp Thysansona Actinoide, Thyzanesia giardi and Mesocestoides spp.). On the other hand, the results indicated that the infection rate of animals by one species of cestodes was (63.3%), by two spp was (29.5%) and by three spp was (7.3%). It noticeable that, it is the first time only in this study to detect the prevalence of Mesocestoides. Spp.; Thysansona ; Actinoide and thyz nesia girdi in camels in Sudan.***

**Keywords:** Dromedary, cestode, worm burden, Tumbool

## 1. Introduction

Parasitism is one of the major problems that affects the productivity and performance of camels [1]. Parasitic diseases either lower the working efficiency or even may result in death of the animals or sometimes are potential danger for public health like hydatidosis. The gastrointestinal helminth parasites adversely affect the nutritional status of the animals [2], whereas the ectoparasites harm the camel due to their parasitic nature and serve as a vector for transmission of a wide variety of pathogens [3]. The numbers of camel slaughtered for human consumption at Tumbool slaughterhouse were found to be 4000 heads during 2007 (TCRC Annual Reports), while in 2008 was increased up to 5337 heads. Due to the increasing importance of the role of camels in arid and semi-arid lands, special attention on the epidemiological investigation and integrated approach in the control of camel diseases is required to reach the maximum benefit of camel herding. In addition to the scarcity of research concerning camel cestodes in Sudan, therefore, this study was generated to investigate the prevalence of intestinal cestodes of camels (camelus dromedary) at Tumbool Slaughterhouse, central of Sudan.

## 2. Materials and Methods

The whole contents of the small intestine were taken from 215 camels at Tumbool slaughterhouse during the period from December 2008 to November 2009. The basic information such as age, sex and breed were record for each animal. The contents were processed individually for identification and classification of intestinal cestodes.

Weekly 5-10 samples were taken from the slaughtered camels at Tumbool slaughterhouse as follows: After opening of every carcass, double ligature was applied to each end of small intestine, the contents were removed and collected in a large labeled bucket. The collected samples were immediately processed at the Tumbool camel Research Center laboratory. The collected worms of each animal were then stored individually into labeled sampling vials within a mixtures of glycerin and 70% alcohol or 5% hot formalin for stretching, after 7 days, it was washed with water and stored in 70 alcohol and glycerol for re-examination and identification. The worms were spread in Petri dishes and identified by using a binocular research microscope according to [4], [5]

### 2.1. Statistical analysis

The analysis of data was done using Statistic Package of Social Science (SPSS version -10). Mean percentages were subjected to Chi-square test and significance considered at $P<0.05$.

## 3. Results

### 3.1. The prevalence of intestinal cestode

The results of this study showed that 149 out of 215 examined camels (*Camelus dromedarius*) were infected with different intestinal cestodes, constituting (69.3%) as a total infection rate. This infection rate was significantly higher among female camels (74.5%) than that among male camels (25.5%).

### 3.2. Identification of recovered worms:

Identification of adult worms revealed the presence of seven different helminth parasites from the small intestine.

### 3.3. Infection rate, worm burden and cestode distribution:

Out of the 149 camels, 80 harbored *Stilesia* spp.;59 harbored *Avitellina spp*.; *Moneisia spp* present in 45 camels; *Thysansoma actienoide* in 27 camels; whereas, *Thyzansoma girdi* worms are present in two camels and *mescestode spp.* in only one camel. Worms burdens as shown in Table (1) indicated that *Stilesia* spp count was the highest (581) with a mean of 7.26 worms/ animal ranging between 1- 70 worms, while that of *Thyzanesia* was lowest with a mean of 1.5 worm/animal and worm burden (2). The worm's counts for other parasites are as follows: 479 for *Avitellina* spp.; 79 for *Moneizia* spp.; 35 for T*hysansoma actinoide* and 3 for *mesocestoide* spp.(Table 1). The present study represents the first attempt to survey intestinal cestode of camel examined at post-mortem in Butana area.

**Table 1:** Distribution of intestinal cestodes encountered in camels at postmortem examination

| Parasite spp. | No of infected camels | Total Worm counts | Burden/camel | |
|---|---|---|---|---|
| | | | Range | Mean |
| *Stilesia spp.* | 80 (53.7%) | 581 | 1-70 | 7.26 |
| *Avitillina spp.* | 59(39.6%) | 479 | 1-100 | 8.12 |
| *Moniezia spp.* | 45(30.2%) | 79 | 1-7 | 1.7 |
| *Thysanosoma spp.* | 27(18.1%) | 35 | 1-3 | 1.3 |
| *Thyzanezia spp.* | 2(1.3%) | 3 | 1-2 | 1.5 |
| *Mesocestode spp.* | 1(0.67%) | 3 | -------- | 3 |

### 3.4. Types of infection

The present study revealed that 94 camels (63.3%) infected by a single species of cestodes counting 695 and representing the 7 species recovered. Mixed infection with two species is present in 44 camels (29.5%) counting 372 worms, whereas only 11camels harbored three species and counting 113 worms (Table 2).

**Table 2:** Numbers and percentages of single and mixed infections with intestinal cestodes in camels and their burdens

| Infection type | No. of infected camel | percentage | Total worm count | Mean worm burden |
|---|---|---|---|---|
| Single | 94 | 63.1% | 695 | 7.39 ns |
| Double | 44 | 29.5% | 372 | 8.45ns |
| Triple | 11 | 7.4% | 113 | 10.27ns |
| Total | 149 | ------ | 1180 | 7.92 |

Ns: Not significant (p. > 0.5)

## 4. Discussion

Surveys of camel's helminthes in Sudan are rare and mainly available for nematodes, therefore, this research is the first attempt to survey intestinal cestode of camels in the Butana region. In the present study (69.3%) of the examined camels at Tumbool slaughterhouse were found to harboring intestinal cestodes including seven species. Concerning the prevalence rates of intestinal cestodes observed in this study were similar to previous works done in different regions of the Sudan [6], [7], [8], [9]. However, [7] reported a low prevalence rate of *M. expansa* (5.9%) in Khartoum province compared with (30%) in this study. Prevalence of *Avitellina* species (70.5%) is also higher compared with (20%) encountered by [10], [9]. In other countries, tape worm *Avitellina* spp was reported by [11], [12], [13]. In this study *Thysansoma actinoide*, *Thyzanisia girdi* and *Mesocestides* species recovered from camels for the first time in this region. Higher incidence of single parasitic infections of cestodes in camels than mixed infections may be due to the fact that cestodes and specially *Moniesia* species are large worms enough to block other worms. Similar results were obtained by [10], [9]. On the other hand, multiple infections by two or more species of cestodes may be due to the stress raised from the first infection leading to susceptibility to other infection.

## 5. Conclusion

- *Thysanosoma actinoide*, *Thyzanesia girdi* and *Mesocestode spp* were considered to be reported for the first time in camels in Sudan.
- Most camel cestodes spp identified in this study were *M. expansa, M. benedi, Avitellina spp and Stilesia spp.*
- *Stillesia spp* recorded highest prevalence rate (53.7%) followed by *Avitellina spp* (39.6%), and, *Moniezia spp.* (30.2%). While, *Thysanosoma spp., Thyzanezia spp* and *Mesocestode spp* recorded lowest prevalence rate (18.1%, 1.3% and 0.67%) respectively

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