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Study on the large intestinal worms in Iraqi camels and the extent of infection

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Abstract:-

Camels has great importance in all the countries of the world and Arab countries, including Iraq, but there is not enough studies in Iraq about the infection of camels with worms this is why we were selected the research .We collected (180) gastrointestinal tract (large intestine) and (180) samples of faeces of Iraqi camels in age between (1 year - 15 years) for both sexes. The total number of animals was (180) animals, the number of healthy animals for she camels and camels (149) animals (82.8%), the number of infected animals was (31) by (17.2%) for both sexes. The number of infected she camels were (18) by (10%) and the number of infected camels were (13) by (7.2%). Thus, the percentage of females was higher than that of males .There were significant statistical differences between males and females at ($p \leq 0.05$). During the study, we noticed that camels infected with heavy infestation of worms did not show any clinical symptoms. The results showed that the highest rate of infection was in age (1 year - 3 years) with number (5) and (2.8%) followed by the percentage of she camels in age (13 - 15 years), camels in age (1 year - 3 years) and age (4 years - 6 years) with number (4) and (4.21%) , the lowest percentage (0.55%) and (1) in camels in age (10 years - 12 years) and (13 years - 15 years). The results of the preparation of large intestinal worms recorded in each month of the year , the highest number of worms recorded in May (145) in a standard error is (± 32) and October comes in the second grade number (68) and a standard error is (± 18.3) .The lowest number of worms was recorded in August and September in number of (3) and (8) by a standard error (± 0.5) and (± 4.1) respectively. Thus, there is a significant statistical difference of ($p \leq 0.05$) between hot and cold months. The most common type of infection was *Oesophagostomum venlosum* (13%), *Oesophagostomum columbianum* (0.64%), the highest number of *Oesophagostomum spp* was (145) in May and the lowest number was recorded (2) in February and December, the other type of parasite is *Trichuris globulosa* recorded by (3.2%) and finally we record *Entrobious spp.* it scored the lowest percentage (0.36%). In our study, we also examined samples of faeces that showed the sample of the infected camels several types of eggs for different worms not only for worms of the large intestines, but also the worms of the stomach and small intestine and this is indicative of the mixed infection of those camels. Despite this infection, the camel did not show strong clinical signs of infection, except for wasting and diarrhea. The highest rates of ovulation are (2400) and (2900) during May and June respectively. The lowest number of eggs was (550) and (750) during July and August or in the months of high temperature.

Keywords: infection, camels, worms, large intestine, Iraqi.

INTRODUCTION:-

The arid countries of Africa and Asia thrive in camel breeding to the ability of camels to survive and produce under severe environmental conditions in the desert and semi-desert regions of the world because this animal is tolerated by the drought of the areas where it is raised and the lack of food and water and gives high productivity of meat, milk and lint [1 , 2,3]. At present there is a growing awareness of camel's role in beauty and the main source of milk and meat for nomadic shepherds as well as urban residents of many countries in North Africa and the Middle East [4]. Now in the Arabian Gulf countries camel races are popular [1,5].

The number of camels in (2001) was (19) million, (17) million were one hump and (2) million two humps [6]. In (2006), the number of camels in arid areas in the world about (20) million heads, (14 million) heads in the Arab region (75%) in Africa, and (25%) in Asia. In Iraq, the number of camels in the last two decades decreased to less than (10,000) head after estimated at more than (50) thousand Head in the seventies [7]. The living of camels in dry desert environment is not suitable for the growth and reproduction of parasites, but despite these conditions there are numbers of infected camels do not show any clear clinical signs except in some cases that were suffering from weakness, wasting and in some cases the loss of animals such cases were observed in The animals that suffered from the mixed infection, thus the infection of camels with worms less dangerous than in other ruminants [8]. Iraq is one of the countries rich in livestock, including camels, as they are spread in large numbers. The researchers have been interested in studying small and large intestinal parasites and blood parasites because of their impact on the health and productivity of the animal as a result of anemia caused by these parasites, which leads to a lack of meat and milk production and wool [9] The Iraqi camels did not receive studies parallel to the importance of this economic animal, especially in terms of parasites, except for a study conducted [10] and a study conducted [11] on internal parasites and three studies on parasites of blood, which are: [12], study [13] about the extent of injury of Iraqi camels with Sura [14]. We conducted this study which included:-

1. Isolation and diagnosis of large intestinal worms.
2. Determine the seasons of their spread.
3 .Determination of age and sex in which the proportion of infection.

The goal of the study is to develop plans to protect the animal from infection parasites and then protect this animal wealth from infection, which in turn affects our economy.

The method of work :-1. Collection of samples:

Samples were collected from Iraqi camels, whose ages ranged from (1 year to 15 years). These samples were collected for the period (1/9/2016) till (30/9/2017).We collected (180 samples) faeces, (180) gastrointestinal tracts, large intestine part in range(15 samples) of feces and large intestine per month of camels that were brought to slaughter in Karbala, Najaf and some camels that were slaughtered in religious occasions in the holy city of Kadhimiya and Karbala. The camel was divided into (10) groups by age for males (camel) and females (she camel) as shown in table (1).

Table number (1) shows number of groups of Iraqi camels by age, sex, total number and percentage

Sex	Age / Year	Total Number	Percentage%
She camel	(1 – 3 years)	28	15.6
Camel	(1 – 3 years)	37	20.5
She camel	(4 – 6 years)	24	13.33
Camel	(4 – 6 years)	31	17.2
She camel	(7 – 9 years)	11	6.11
Camel	(7 – 9 years)	13	7.22
She camel	(10 – 12 years)	10	5.6
Camel	(10 – 12 years)	9	5
She camel	(13 – 15 years)	9	5
Camel	(13 – 15 years)	8	4.44
Total		180	100

2 - Examination of the contents of the intestines to calculate the numbers of worms and the diagnosis of types: -

The large intestine samples were taken directly from the camels that were Slaughtered at the sites mentioned above. We were

tying the end of the large intestine and the end of the small intestine then cutting it to take the large intestine only to portion and preserve the contents of the large intestine and then conduct the examination by emptying the contents then opening them along and washing them well. (40 mesh / ang) ,the contents were examined without any dilution. The contents of the intestines were placed in a glass vessel and examined under a microscope for isolating, calculating and diagnosing worms, we relied on males to diagnose species as mentioned [9, 15].

3Calculation of the number of eggs in the stool: -

We collected (180) samples of faeces directly from the rectum of animals were placed in special folders and we worked on the account of the preparation of eggs in the manner of Mac Master [15, 16,17] by taking (3 g) of feces and mix it with (42) cm ^{3} of the water well and then filtered with a filter (60) mesh /cm^2 , then take (15) cm ^{3} of leachate and put in a clean test tube then put the tube in the centrifuge (1500) cycle / minute, pour the leachate and take the deposit mix with a saturated solution of sodium chloride so that the volume reaches(15 cm ^{3}) and turn the tube several times in order for the solution to mix well then withdraw it with a Pasteur pipette in order to ant One side of Mac Master modified slice size (0.15 cm ^{3}) to calculate the number of eggs and multiplied by the number of (100) to obtain the number of eggs per grams of faeces.

4-**Statistical Analysis:-**

Collected data were entered in a Microsoft Excel before transferred to SPSS program. The Statistical Package for Social Sciences (SPSS) for Windows version 20 was used for all appropriate statistical analysis. The differences were considered statistically significant when p≤ 0.05.

5-Pictures:-

Photos of the detected eggs of parasites and the worm were captured directly from microscope eye piece using digital camera (Sony, 16.1 MP) and stored in computer.

RESULTS AND DISCUSSION:-

Despite the importance of camels in all the countries of the world and the Arab countries, including Iraq, but there is not enough studies in Iraq about the infection of camels with worms except study [10,11] for this reason I was selected the subject of the research . Collected (180) digestive tract and (180) samples of faeces for Iraqi camels, which ranged in age (1 year - 15 years) for both sexes. The total number of animals (180) animal, number of un infected animals was (149) by (82.8%) and infected animals (31) by (17.2%) for both sexes. The number of infected she camels was (18) by (10%) and the number of infected camels (13) by (7.2%). These percentages recorded a significant statistical difference between males and females at the level (p≤ 0.05(,thus, the percentage of female infection is higher than that of males as shown in table (2), this is consistent with [9,10] and is not consistent with [17, 18,19] No significant statistical difference was recorded at(p≤ 0.05).

The study showed that the infected camels with worms despite the large number of infected worms, they did not show any clinical symptoms,this is consistent with [8].Also the study showed that camels suffered with mixed infection consistent with [8,11].

The results indicate that the highest percentage of infection was in age (1 - 3 years) with number (5) and (2.8%), the high percentage is due to the possibility of excessive slaughter of this age group of camels, followed by the age of (13 year - 15 years) in she camels , (1 year - 3 years) and age (4 years - 6 years) in camels in number(4) by (2.21%), the injury rate for the age groups (13 year - 15 years) in she camels due to weak immunity and resistance to diseases due to age, pregnancy, childbirth and lactation while the camels in groups (1 year - 3 years old) and age (4 years - 6 years) due to poor health and animal management programs from veterinary clinics, breeders and to the excessive slaughter of these age groups this is consistent with [20 , 21 , 22,23] . The lowest percentage (0.55%) by number of (1) in she camels in age (10 years - 12 years) and age (13 years - 15 years), the reason is due to lack of the number of camels that slaughtered in this age as shown in table (3).

Table (2) shows the total number of Iraqi camels ,healthy and infected camels and their percentage

Sex	Age / Year	No. Infected	Percentage%	No. Healthy	Percentage %	Total Number	Percentage%
She camel	1 – 3 (years)	5	2.8	24	13.33	29	16.11
Camel	1 – 3 (years)	4	2.21	32	17.77	36	20
She camel	4 – 6 (years)	3	1.7	21	11.66	24	13.3
Camel	4 – 6 (years)	4	2.21	27	15	31	17.22
She camel	7 – 9 (years)	2	0.55	9	5	11	6.11
Camel	7 – 9 (years)	2	1.11	11	6.11	13	7.22
She camel	10 – (12years)	5	2.8	5	2.8	10	5.6
Camel	10 – 12 (years)	1	0.55	8	4.44	9	5
She camel	13 – 15 (years)	4	2.21	5	2.8	9	5
Camel	13 – 15 (years)	1	0.55	7	3.9	8	4.44
Total		31	17.2	149	82.8	180	100

Table (3) shows the numbers of Iraqi camels and its percentage of infected and healthy camels by age and sex

Sex	No. Infected	Percentage %	No. Healthy	Percentage %	Total Number	Percentage %
She camel	18	10	64	35.6	82	45.6
Camel	13	7.2	85	47.2	98	54,4
Total	31	17.2	149	82.8	180	100

The results of the preparation of large intestinal worms recorded in each month of the year was the highest number of worms in May bynumber of (145) and the error is (± 32) and October in the second grade number (68) and a standard error is (± 18.3). The lowest number of worms was recorded in August and September by (3) and (8) by a standard error (± 0.5) and (± 4.1) respectively, Thus: there is a significant statistical difference about (p≤ 0.05) between hot and cold months, Injuries were in months that are moderate of the year in Iraq and lowest in the hot and dry months of the year as shown in table (4) ,this corresponds with [19,24,25] and does not agree with [26].

Table (4) shows the rate of large intestinal worms recorded in each month and the standard error in Iraqi camels

The months	M	± SE	*Oesophagostomum spp.*	*Trichuris globulosa*
January	21	3.1	14	7
February	24	6	2	22
March	28	6.4	28	-
April	14	5	14	-
May	145	32	145	-
June	37	10.6	10	27
July	13	4.5	8	5
August	3	0.5	3	-
September	8	4.1	7	1
October	68	18.3	63	5
November	42	11.8	39	3
December	15	3.9	2	13

Table (4) shows that the highest number of worms was seen in May and the lowest number was recorded in August.

The highest intestinal worms recorded in the Iraqi dialect are *Oesophagostomum venlosum*, which recorded the highest infection rate (12.2%). The highest number of worms in this species is (148) parasites in one animal, the second type is

Oesophagostomum columbianum in number (3) by (1.11%) while the highest number recorded of (*Oesophagostomum spp*) was (145) in May and the lowest number is (2) in February and December as shown in table (5, 6). The other types of parasites seen in the study were *Trichuris globulosa* (3.2). The highest number of parasites recorded in one animal is (14) and the rate of infection was recorded in the second grade compared with other species. The highest number of records for this species during the months of the year was (27) (March, April, May and August) as shown in Table (5, 6). This parasite is usually found in the intestines and colon and causes intestinal irritation and hemorrhagic bleeding similar to the condition of the *hemococcus* [27].The type *Entrobious spp.* recorded the lowest number of animals was (0.36%) and the highest number of animals recorded was (45) parasites as shown in table (5, 6). The presence of the parasite *Entrobious spp.* in the camel's rectum is considered rare because this parasite is one of the important human parasites the presence of such worms to the mixing with humans this led to the possibility of contamination of various sources of nutrition and then the transmission of infection is available, this is consistent with [27, 28] have found a difference in the infection of camels worms due to changes that occur in environmental conditions.

Table (5) showes the type of large intestinal worms detected and their percentage in Iraqi camels

Type of parasite	highest number of worm detected in one animal	Number of infected animals	Percentage %
Oesophagostomum Venlosum	148	22	12.2
Oesophagostomum Columbianum	3	2	1.11
Trichuris globulosa	14	6	3.3
Entrobious spp.	45	1	0.6

Table (5) explains the types of large intestinal worms discovered and their percentage in Iraqi camels and the highest number of each type of worms in one animal.

Table (6) shows the rate of worms from the large intestines in each month and the standard error in Iraqi camels

The months	M	± SE
January	21	3.1
February	24	6
March	28	6.4
April	14	5
May	145	32
June	37	10.6
July	13	4.5
August	3	0.5
September	8	4.1
October	68	18.3
November	42	11.8
December	15	3.9

Table (6) shows the rates of worms from the large intestine in each month of the year and the standard error in Iraqi camels.

We adopted the diagnosis of worms on male worms according to the method and description [15, 9] as illustrated in pictures (1,2,3,4,5,6)

Figure (1) shows the back of a parasite male *Oesophagostomum Venlosum*

Figure (2) shows the front of parasite *Oesophagostomum Venlosum*

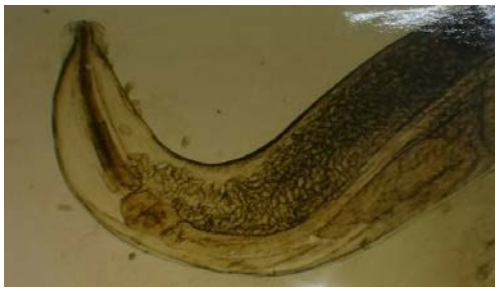

Figure (3) shows the front of parasite *Entrobious spp*

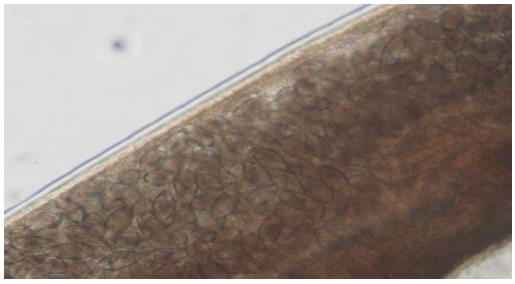

Figure (4) shows the female of *Trichuris globulosa* parasite

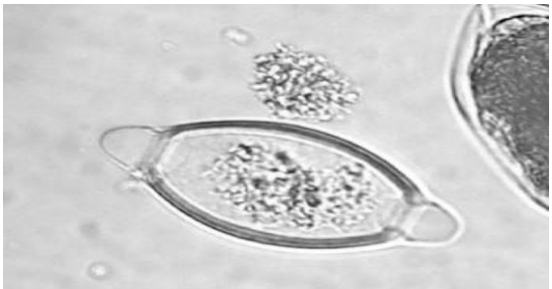

Figure (5) shows the fecal examination revealed that *Trichuris spp.*

Egg

The study showed that the sample of faeces of some infected camels several types of eggs for different worms not only for large intestinal worms but also for stomach and small intestines worms this is the evidence of a mixed infection of those camels. Despite this infection, the camel did not show strong clinical signs of injury, except for simple wasting and diarrhea, this is consistent with [8] The highest rates of eggs were (2400) and (2900) during the months of May and June, respectively, as shown in table (7) this indicates the phenomenon of spring height because the high rates of eggs offered are proportional to the rates and numbers of worms seen calculated during the months of the year during the spring months, this increase was explained by [29,30] as a result of the decline of the immune susceptibility of camels and this may be due to the geographical location, it is noted in the desert areas are increasing numbers of eggs to reach the larvae and restore the effectiveness of the new spring during said by[24, 31,32]. The lowest number of eggs was (550) and (750) during the months of July and August as shown in table (7) this may be due to the severity of drought , high temperatures for high climatic conditions of the region in Iraq and the possibility of survival of eggs and larvae of intestinal worms is very poor [33, 34, 35].

Table (7) explains the highest and lowest rates of eggs raised from camels during the cold and dry months of the year.

Table (7) shows the rate of worms eggs from the large intestine / gram of feces in each month and the standard error in Iraqi camels

The months	The highest number of eggs / g of feces per animal	Rate of eggs / g of feces per animal	**± SE**
January	1050	850	86.5
February	1800	900	159.9
March	2700	2300	41.5
April	3500	2000	199.3
May	2900	2400	55.7
June	3850	2900	150
July	1000	550	76.5
August	900	750	98
September	1900	1100	90
October	2100	1150	145.5
November	2000	1300	69.8
December	1750	950	157.6

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