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Seasonal Prevalence of *Cephalopina titillator* Larvae in Camels in Riyadh Region, Saudi Arabia

Abstract: Eight hundred and sixty heads of Camels were randomly selected and examined for infection by the three larval stages of the camel nasal bot-fly *Cephalopina titillator*, during the period from April, 1999 to May, 2000 in Riyadh abattoir, Middle Province, Saudi Arabia. Three hundred and fifty heads of Camels (41%) were infested with first, second and third instars. The highest peak of infested camels was in April, 2000, reaching 99%, while the lowest was in July, 1999 (4%). A total of 1689 larvae of all three instars were collected. The percentage of infestation of the first, second and third larvae were 31%, 35% and 34% respectively, with no significant difference. The mean monthly total number of all three instars per camel head (L/C) had two peaks of abundance in August, 1999 (6.8L/C) and in February, 2000 (7.7 L/C). In two cases, both *C. titillator* and *Oestrus ovis* were found in the same camel in May, 1999 and in March, 2000. The explanation of these incidences will be discussed in the paper.

Keywords: *Cephalopina titillator*- Larvae- Seasonal Prevalence- Riyadh- Saudi Arabia.

Introduction

The camel nasal bot-fly *Cephalopina titillator* (Clark) is a common obligate parasite that causes nasal myiasis in camels. Adult females deposit larvae in the animal's nose. Larvae moult twice while attached to the nasal passages and pharynx. When they are ready to pupate, they crawl back to the nasal passage and are expelled when the animal sneezes and then burrow into the ground. Infested animals lose their appetite and have difficulty breathing, local inflammatory reactions of the

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التوزيع الموسمي للإصابة بيرقات ذبابة نغف أنف الجمال
Cephalopina titillator على الجمال في منطقة الرياض،
المملكة العربية السعودية.

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المستخلص: تم فحص عدد 860 جملاً كان إختيارها عشوائياً للتعرف على نسبة إصابتها بذبابة نغف أنف الجمال *Cephalopina titillator* بجميع أطوارها اليرقية، خلال الفترة من أبريل 1999 وحتى مايو 2000 في مسلخ الرياض، المنطقة الوسطى، المملكة العربية السعودية. بلغ عدد الإصابات 350 رأساً بنسبة 41% من إجمالي عينة الدراسة. وكانت أعلاها في أبريل 2000 حيث بلغت النسبة 99%، وأقلها في يوليو 1999 بنسبة 4% فقط. تم جمع 1689 يرقة مختلفة الأطوار من الجمال المصابة. حيث كانت نسبة يرقات العمر الأول والثاني والثالث هي (31%، 35%، و 34% بالتتابع) مع عدم وجود فرق معنوي. أما متوسط عدد اليرقات الشهري في رؤوس الجمال فقد بلغ أعلى معدل له في أغسطس 1999 (6.8) و فبراير 2000 (7.7) يرقة لكل رأس جم. كانت هناك حالتين وجد فيهما يرقات من ذبابة نغف أنف الغنم *Oestrus ovis* مع ذبابة نغف أنف الجمال *C. titillator* و تمت مناقشة الأسباب التي أدت إلى حدوث هذه الحالات.

كلمات مدخلية: نغف أنف الجمال- ذبابة- إصابة- توزيع موسمي- الرياض- السعودية.

pharynx and congestion of the nasal cavity. Finally they may die from meningitis caused by secondary infections (Hussein *et al*, 1982; Hussein, *et al*. 1983; Musa *et al*. 1989). *Cephalopina titillator* has been reported in Saudi Arabia (Abu Yaman, 1987; El Disougi, 1979; Fatani and Hilali, 1994; Hussein *et al*. 1983), Qatar (Sharma, 1992), Iraq (Abul Hab and AlAfass, 1977), Egypt (Soliman, 1965) and in Sudan (Steward, 1950).

The prevalence of *C. titillator* in total larvae were studied by Hussein *et al* (1983) in Riyadh. However, studies on the population dynamic of infested camels with the first, second and third instar larvae through the year are lacking. The aim of this study is to study the three larval instars of *C. titillator* inside camels' heads and to updated information on the prevalence of each instar in Riyadh abattoir, Central Saudi Arabia, during each month of the year.

Materials and Methods

A total of 860 heads of camels were randomly selected and examined for infection of the three larval instars of the camel nasal bot-fly *C. titillator*, during the period from April, 1999 to May 2000 in Riyadh abattoir. All camels used were males (only males were allowed to be slaughtered in the abattoir) and at the age of less than a year. Given that no information on prior parasitic treatment was obtained and considering the management of animals in the area and also the fact that no dead larvae were found inside camels' heads, it is unlikely that they had received any treatment against nasal parasites.

Riyadh abattoir was visited biweekly. The camel heads were separated and cut from the nose up to the base. Examinations of the cavities were made for the presence of all larval instars and recovered larvae were counted and collected in plastic bags using forceps and transferred to the laboratory. Larvae were identified by species and instars according to Zumpt (1965), and Ferrar (1987). Analysis of variance was used when needed.

Results and Discussion

Examination of 860 camel heads revealed that 350 (41%) were infested with different larval instars of *C. titillator* (Table 1). Hussein *et al.* (1983) examined 2473 camel heads in Riyadh abattoir and found 67.6% infested with *C. titillator*. In the Eastern Province of Saudi Arabia, the infestation rate among 923 camel heads was 52% (Fatani and Hilali, 1994). Probably the reason for the difference between the percentage prevalence is due to the ages of the camels that had been chosen (Abul-Hab and Al-Affas, 1977; Richard, 1979). Hussein *et al.* (1983) used all ages of animals and mentioned that the percentage of infestation was lower in young and old camels than the rest. Fatani and Hilali (1994) used a sample of camels of ages 7-15 years. In North Egypt, the infestation rate with *C. titillator* was only 25% (Morsy *et al.* 1998). The highest level of infestation was recorded in Ethiopia, which reached 85.3% (Wosene, 1991).

The percentage of infested camel heads was low from April 1999 to September 1999, recording the lowest level of infestation in July 1999 (4%). However, the percentage of infested heads increased from October 1999 to reach a peak abundance in April 2000 (99%) followed by a sharp decline in May 2000 (18%, Table 1). This agrees somewhat with Hussein *et al.* (1983) who reported one peak of infestation extending from August to March, and the lowest infestation in July. Fatani and Hilali (1994)

found that the infestation rate showed two peaks in February and in September and the lowest in June in the Eastern Province of Saudi Arabia. Probably this difference related to climatic change between the middle part of Saudi Arabia, which is dry and hot, and the east part, which is humid and hot. In North Egypt, the highest prevalence was in October and the lowest in April (Morsy *et al.* 1998), whereas in Iraq the highest was from September to December (Al Ani, *et al.* 1991). It seems that *C. titillator* adults appear during all months in Saudi Arabia and the surrounding countries and increase in winter and early spring months.

Table (1): Monthly percentage of infested camel heads by *C. titillator* larvae.

Months	Camel Heads		
	Examined	Infested	%
April, 1999	25	7	18
May	70	7	10
June	57	6	12
July	95	4	4
August	59	5	9
September	58	4	7
October	61	44	72
November	51	12	24
December	56	36	64
January, 2000	56	25	45
February	61	52	85
March	60	47	78
April	91	90	99
May	60	11	18
Mean	61	25	41

In this study, a total of 1689 larvae of all three instars of *C. titillator* were collected. The percentage of infestation of the first, second and third instars larvae were 31%, 35% and 34% respectively, with no significant difference (Table 2). The mean monthly number of larvae per camel head (L/C) of the first instar had two peaks, one in September 1999 (2.5 L/C) and the second in February 2000 (2.7 L/C, Table 3). The second instar larvae also had two peaks in August 1999 (3.8 L/C) and in February 2000 (2.7 L/C), while the third instar had two peaks in October 1999 and in February with a smaller number of larvae per camel head (2.3 L/C). In general, the mean monthly total number of all three instars had two peaks of abundance, in August 1999 (6.8 L/C) and in February 2000 (7.7 L/C). Fatani and Hilali (1994) found that the mean monthly total number of larvae per camel head showed two peaks of abundance, during February and September, which agrees with our finding.

Table (2): Number of the three instar larvae and mean number of each larval instar of *C. titillator* per infested camel head during the study period.

Months	Total No of Larvae	Larval instars		
		First	Second	Third
April, 1999	17	4		13
May	15	1	1	13
June	12	2	5	5
July	12	7	5	-
August	34	5	19	10
September	25	10	7	8
October	145	8	44	99
November	33	8	17	8
December	105	42	38	25
January, 2000	112	20	51	41
February	410	139	142	129
March	304	106	106	92
April	453	179	150	124
May	12	-	2	10
Total	1689	527	591	577
Percentage		31	35	34

Table (3): Monthly mean of first, second, third, and total instar larvae of *C. titillator* per infested camel head.

Months	Mean larvae per camel head			Mean total
	First	Second	Third	
April, 1999	0	0.6	1.9	2.5
May	0.1	0.1	1.9	2.1
June	0.3	0.8	0.8	1.9
July	1.8	1.3	0	3.1
August	1	3.8	2	6.8
September	2.5	1.8	2	6.3
October	0.2	1	2.3	3.5
November	0.7	1.4	0.7	2.8
December	1.2	1.1	0.7	3
January, 2000	0.8	2	1.6	4.4
February	2.7	2.7	2.3	7.7
March	2.3	2.3	2	6.6
April	2	1.7	1.4	5.1
May	0	0.2	0.9	1.1

In two cases both *C. titillator* and *Oestrus ovis* L. were found in the nasal cavity of the camel. In the first case, the camel had 17 different stages of *C. titillator* and two first instar larvae of *O. ovis* in May 1999. In the second case, in March 2000, the camel had 167 different stages of *C. titillator* and three first instar *O. ovis*. Probably this is the first time this case has been reported in Saudi Arabia. The reason for that might be the mixture of sheep and camels in

the same barn. Also, *O. ovis* reported by attack animals other than sheep like goats (Pathak-Kml, 1992) and humans (Zumpt, 1965). In addition, with a low population of the main host, which is the sheep and also the short longevity of the adult females, pregnant flies do not find their suitable host quickly enough to attack other livestock (Zumpt, 1965).

It is important to control *C. titillator* using any nasal drench of approved insecticide to reach a maximum benefit for camels. It appeared that two larvae treatment in October and April, when the density of larvae reached maximum, might be effective to control all Larvae stages.

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