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CLINICAL AND HAEMATOLOGICAL CHANGES IN CAMEL INFESTED WITH TRYPANOSOMA EVANSI AND MICROFILARIA

(With 3 Tables & 3 Figs.)

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التغيرات الاكلينيكية والدموية في الجمال المصابة بالتريبانوسوما والفلاريا

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بالفحص الاكلينيكي والميكروسكوبي للدم لعدد ٥٠٠ جمل (١٠ ـ ١٣ سنة) في مناطق مختلفة من محافظة أسيوط . اتضح وجود ١٥ حيوان مصاب بالتريبانوسوما، ١٢ حيوان مصاب بالميكروفلاريا. درست الاعراض المرضية الاكلينيكية لكل مرض فكانت الجمال المصابة بالتريبانوسوما مصحوبة بالضعف العام ، الهزال وارتفاع الحرارة . أما الجمال المصابة بالفلاريا فكانت تعاني الضعف العام ، فقدان الشهية ، بهتان الأغشية المخاطية وارتفاع الحرارة بالاضافة الى ورم في الخصية يصل الى حجم كرة التنس ويمتد في بعض الحالات الى أسفل مابين الفخذين مما يؤثر على حركة الجمال عند المشى. عولجت الحيوانات المصابة ودرس التركيب البيتولوجي للدم قبل العلاج وبعده، وقد اتضح من الدراسة أن وجود طفيل الفلاريا في دم الجمال المصابة لايرتبط بالليل أو النهار ولكن وجوده مرتبط بارتفاع درجة حرارة الجسم.

SUMMARY

Among 500 native camels (10-13 years) belonged to different localities at Assiut Governorate, 15 animals were infected with trypanosoma evansi and 12 animals with microfilaria species.

The clinical signs of trypanosomiasis included emaciation, weakness with paler mucous membrane and dry scruffy coat, intermittent fever (38.5-40.1°C), the animal stand with his nose somewhat depressed and head hanging forward, the eyes dull and half closed with conside rable amounts of tears.

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In filariasis group, the camels showed severe weakness, paler mucous membrane, loss of appetite, elevation of body temperature (39.7°C), in addition both scrotum and testicles were swollen and attained the size of a tennis ball and sometimes extended downwards along the inside of both thighs. The affected camels showed stiffeness in movement and wide gait. It was also found that the presence of microfilaria in the blood was not affected by night and day and enhanced by fever status.

Haematological studies: Revealed that, in trypanosomiasis, there were severe oligocythemia with significant decrease in both haemoglobin and packed cell volume. Normocytic hypochromic anaemia was also observed associated with leucocoytosis, eosinophilia and monocytosis.

Concerning filariasis, the affected camels showed oligocythemia, with significant decrease in both haemoglobin and packed cell volume. Microcytic hypochromic anaemia was also observed associated with leucocytosis and eosinophilia.

INTRODUCTION

Cytological analysis of the blood might reveal a remarkable and valuable informations about the general health of the animals. Also they might help in diagnosis, prognosis and treatment. Only a few scattered data have been reported on the analysis of camels blood (BARON, 1982).

PARKAR (1980) reported that the infestation of camels with trypanosoma evansi produced a wasting disease characterized by intermittent fever, weakness, anaemia and emaciation. The author added that trypanosoma appeared in the peripheral blood during the febrile attack.

GEORGI (1985) and ARAFFA (1990) described the trypanosomiasis as usually takes a chronic course, characterized by remittent fever, anaemia and emaciation while acute form was characterized by persistant fever, with demonstration of trypanosoma in the peripheral blood. The author observd another signs including weakness, oedoema of limbs lower abdomen and thorax as well as lacrymation.

NADIM and SOLIMAN (1967) proved the presence of significant decrease in erythrocytes and haemoglobin concenteration in camels naturally infested with trypanosomiasis.

JATKAR and PUROHIT (1971) concluded that anaemia after trypanosoma infection was not due to depression of bone marrow function but to destruction of erythrocytes

with consequent production of immature red cells in the peripheral blood.

EL-MAGAWARY (1983) studied the haematological picture in camel trypanosomiais before and post-treatment. He concluded the presence of a highly significant decrease (P/ 0.01) in arythrocytes, haemoglobin contents, P.C.V. and neutrophils.

BRANDER, et al. (1982) mentioned that treatment by a single dose of 5 gms, Naganol gave 100% cure in camels suffered from trypanosomiasis.

UDALL (1954) reported that a single dose of naganol was sufficient to cure camels infested with trypanosomiasis.

EL-ATRASH (1980) and HIGGINS (1983) concluded that application of suramin (Naganol) at 10 mg/kg given at the end of March and the end of July seems to give good protection to camels living in or crossing endemic areas.

During the last few years, Ivermectin was tried in the treatment of buffaloes infested with parafilaria species (PATNAIK and PANELE, 1963). Also, BURG, et al. (1978) and THEODORIDES (1985) reported that the ivermectin (Ivomec) are a relatively new family of antiparasitic agents with efficacy against some external as well as internal parsites following parental adminstration.

ABU EL-MAGED, et al. (1988) showed that the efficacy of ivermectin in the treatment of Dipetalonema evansi infestation in camels. They revealed that, this drug was effective against the worm and its larvae in the blood by a dose of 1 ml/50 kg.b.w. Furthermore there was reduction of the clinical signs and gradual disappearance of microfilaria larvae from the blood occur to reach zero within 4 weeks post-treatment.

The aim of the present investigation is to study the haemogram of camels infested with T.evansi and microfilaria before and after treatment.

MATERIAL and METHODS

Materials:

A total number of 500 camels 10-13 years) were used in the present study. Clinical and laboratory examination revealed that 15 animals were infected with trypanosoma evansi, while the remainder (12) were infected with microfila species.

Samples:

Whole blood and blood serum samples were obtained from each animal by veinpuncture through jugular vein for haematological studies.

Whole blood sample:

Were used for the evaluation of haematological picture total erythrocytic count (T.R.B.Cs), haemoglobin content (Hb) packed cell volume (P.C.V), total leucocytic count (T.W.B.Cs) and differential leucocytic count (D.L.C).

Detection of microfilaria:

Was by concenteration technique by draw 1 ml of blood in 10 ml of 2% glacial acetic acid, mix well, centrifugate and examined the sediment after the methods of KELLY (1984).

1 - Total erythrocytic count, haemoglobin content and total leucocytic count were determined using blood cell counter (CX 310) and (DC 210).
2 - Packed cell volume (P.C.V): Packed cell volume was carried out using micro-haematocrit tubes after SIMMONS (1976).
3 - Mean corpuscular volume and mean corpuscular haemoglobin concenteration. Mean corpuscular volume (M.C.V) and mean corpuscular haemoglobin concenteration (M.C.H.C) were calulated mathematically after the method described by McCURNIN (1985).
4 - Differential leucocytic count (D.L.Cs): Differential leucocytic count was determined after staning the blood films with Giema stain using 4 field meander method (COLES, 1980).

Methods of treatment:

1 - **Naganol (Bayer):**

Naganol was used for the treatment of camel trypanosomiasis. The drug was obtained in 5 gm bags and used as 10% solution in distilled water and prepared directly before administration A dose of 50 ml of this solution was given by interavenous injection in the jugular vein of the camel. Blood smears were prepared 24 hours after treatment and every week for a period of 2 months. Also, another dose of naganol was given to camels at the 30th day.

2 - **Ivomec (ivermectin, MSD) England:**

Ivomec is the break through injectable parasiticide for camels, sheep and cattle. Its effectivity controls internal and external parasites that impair livestock health and productivity.

RESULTS

The clinical signs of trypanosomiasis including emaciation, weakness with pallor of mucous memberane and dry scruffy coat, intermittent fever (39.5 to 40.1°C), the

head hanging forward and the eyes dull and half closed with considerable amounts of tears.

Filariasis in camels showed that, their appetite was hardly affected, severe weakness, paleness of the mucous membrane, harshness of the coat, high body temperature (39.7°C). In addition, both scrotum and testis were swollen and the swelling sometimes was extended downwards along the inside of both thighs. Microscopical examinatin revealed the presence of both trypanosoma evansi and microfilaria species in blood of diseased animals (Fig. 1).

Mean values and ranges of haematological picture of blood of healthy and diseased camels were presented in table (1-3).

DISCUSSION

Blood parasites:

Trypanosoma in the infected camels can be detected microscopically in the peripheral circulation only during fits of fever Fig. (2). Diseased camels were treated using Naganol (Suramin or Antrypol) in a double dose by I/V of 5 gm (10%) gave 100% cure of the infected camels. This results was agreable with the findings obtained by ABD EL-LATIF (1957) and EL-MAGAWARY (1983).

Haemogram picture of diseased camels revealed a significant decrease in total erythrocytic count, haemoglobin content and packed cell volume with significant increase ($P/\_\_$ 0.01) in total leucocytic count. In addition marked eosinophiiia and monocytosis were recorded, table (1). The obtained data coincided with those previously obtained by NADIM and SOLIMAN (1967); JATKAR and PUROHIT (1971) and RAINSINGHANI, et al. (1981). On the other hand, significant improvement in haemogram picture of infested camels returned to their normal values after 45 days post-treatment, table (1).

Regarding filariasis in camels, it was belevied that the presence of microfilariae in the preipheral blood was affected by night and day. But in this study, the presence of microfilariae in the blood of diseased camel could be easily detected in sufficient numbers in the films periodically. The periods were synchronic with those of fever. Fulleborn procedure was the most suitable technique for obtaining microfilariae from the blood film, Fig. (3).

Haematological findings in camels with filariasis rvealed a significant decrease in total erythrocytic count, haemoglobin content and packed cell volume, while a highly significant increase in total leucocytic count accompained with lymphocytosis, eosinophilia and neutropenia were detected in diseased camels tables (2 & 3). Diseased

camels were treated using five injections of Ivomec in a dose of 1 ml/50 kg b.wt. gave a significant improvement in the haemogram values, general healthy condition and appetite which extended from the twenty fourth day post treatment with Iveomec as shown in table (2 & 3). This simulate these obtained by ABU-EL-MAGED, et al. (1988).

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Table (1): Mean values of haematological picture in pre and post-treatment in trypanosomiasis of infected camels.

Parameters	Itemes	Pre-treatment	Post-treatment						
			1 st day	5 th day	10 th day	15 th day	30 th day	45 th day	60 th day
R.B.Cs T/Lx10^{12}	X ± S.E	6.44± 0.24**	6.76± 0.15**	7.17± 0.7**	7.25± 0.05**	7.52± 0.12*	7.75± 0.13	7.85± 0.15	8.0* 0.20
	Range	5.82- 6.92	6.20- 7.10	6.95- 7.35	7.10- 7.38	7.26- 7.95	7.32- 3.10	7.35- 8.15	7.40- 8.60
H.b mg %	X ± S.E	7.65± 0.23**	7.81± 0.19**	8.27± 0.11**	8.41± 0.09**	9.05± 0.09**	10.91± 0.08*	11.09± 0.09	11.25± 0.11
	Range	6.90- 8.30	7.20- 8.31	7.95- 8.65	8.20- 8.74	8.82- 9.23	10.74-11.14	10.85-11.31	10.96-11.63
P.C.V. %	X ± S.E	22.40± 0.51**	22.80± 0.37**	23.00± 0.44**	24.20± 0.37**	25.00± 0.45*	25.60± 0.51	26.40± 0.51	25.30± 0.37
	Range	21.00-24.0	22.00-24.0	22.00-24.0	23.00-25.0	24.00-26.0	24.00-27.00	25.00-28.0	26.00-28.0
M.C.V. U^3	X ± S.E	34.88± 0.82	33.74± 0.49	32.06± 0.43	33.35± 0.32	33.20± 0.32	33.01± 0.14	33.62± 0.26	33.37± 0.45
	Range	32.69-37.29	32.54-35.48	30.77-33.33	32.39-34.25	32.61-34.39	32.59-33.33	32.25-34.36	32.93-35.14
M.C.H.C. %	X ± S.E	34.12± 0.33**	34.26± 0.43**	35.97± 0.43**	34.48± 0.29**	36.22± 0.34**	42.70± 0.61	42.05± 0.51	41.78± 0.11
	Range	32.86-34.64	32.73-35.22	34.58-37.27	33.84-35.65	35.38-37.08	41.26-44.75	40.39-43.40	41.54-42.15
W.B.Cs G/Lx10^9	X ± S.E	27.48± 0.22**	26.22± 0.35**	24.97± 0.53**	23.19± 0.53**	22.22± 0.41**	18.88± 0.26*	18.20± 0.17	17.80± 0.19
	Range	27.49-28.40	25.10-27.30	23.15-25.60	22.18-25.10	21.30-23.60	18.15-19.60	17.82-18.79	17.28-18.35
Neutrophils %	X ± S.E	37.40± 0.32	37.40± 0.32	37.60± 0.25	37.80± 0.20	37.80± 0.37	38.20* 0.58	38.60± 0.25	38.60± 0.51
	Range	36.00-38.0	37.00-38.0	37.00-38.0	36.00-39.0	37.00-39.0	37.00-40.00	37.00-40.00	38.00-39.00
Band cells %	X ± S.E	0.40± 0.25*	0.40± 0.25*	0.60± 0.25	0.80± 0.37	0.80± 0.20	1.20± 0.20	1.20± 0.20	1.20± 0.20
	Range	0.00-01.00	0.00- 1.00	0.00- 1.00	0.00- 2.00	0.00- 1.00	1.00- 2.00	1.00- 2.00	1.00- 2.00
Eosinophils %	X ± S.E	8.60± 0.25**	8.20± 0.20**	8.20± 0.20**	7.80± 0.20**	7.80± 0.20**	7.60± 0.25	7.20± 0.20	6.80± 0.20
	Range	8.00- 9.00	8.00- 9.00	8.00- 9.00	7.00- 8.00	7.00- 8.00	7.00-8.00	7.00- 8.00	6.00- 7.00
Basophils %	X ± S.E	0	0	0	0	0.20± 0.20	0.20± 0.20	0.20± 0.20	0.20± 0.20
	Range	0	0	0	0	0.00- 1.00	0.00- 1.00	0.00- 1.00	0.00- 1.00
Lymphocytes %	X ± S.E	50.20± 0.20	50.20± 0.20	50.00± 0.32	50.00± 0.45	50.00± 0.32	50.00± 0.32	50.00± 0.45	50.00± 0.45
	Range	50.00-51.00	50.00-51.00	49.00-51.00	49.00-51.00	49.00-51.00	49.00-50.00	49.00-51.00	49.00-51.00
Monocytes %	X ± S.E	3.80± 0.20**	3.80± 0.22**	3.60± 0.25*	3.60± 0.10	3.40± 0.25	3.40± 0.25	3.20± 0.20	2.80± 0.20
	Range	3.00- 4.00	3.00- 4.00	3.00- 5.00	3.00- 5.00	3.00- 4.00	3.00- 4.00	3.00- 4.00	2.00- 3.00

* Significant (P < 0.05). ** Highly significant (P < 0.01).

Table (2): Mean values of erythrocytic picture in pre and post-treatment in filariasis of examined camels.

Conditions	Items	R.B.Cs. T/L x10^{12}	H.b %	P.C.V. %	M.C.V.U^{3}	M.C.HC. %
Pre-treatment :						
	X ± S.E	7.20± 0.09**	7.62± 0.27**	21.50± 0.50**	29.88± 0.34**	35.43± 0.43**
	Range	7.11- 7.28	7.35- 7.89	21.00-22.0	29.54-30.22	35.00-35.86
Post-treatment values :						
1 st day	X ± S.E	7.21± 0.10**	7.64± 0.29**	22.50± 0.50**	31.23± 0.29**	33.92± 0.51**
	Range	7.11- 7.30	7.35- 7.92	22.00-23.0	30.94-31.51	33.41-34.43
4 th day	X ± S.E	7.22± 0.10**	7.38± 0.38**	23.50± 0.50**	32.55± 0.25	33.07± 0.90**
	Range	7.12- 7.32	7.40- 8.15	23.00-24.0	32.30-32.79	32.17-33.96
8 th day	X ± S.E	7.25± 0.11**	7.81± 0.39*	23.50± 0.50**	32.44± 0.18	33.40± 0.78**
	Range	7.13- 7.36	7.42- 8.20	23.00-24.0	32.26-32.61	32.62-34.17
12 th day	X ± S.E	7.26± 0.11**	7.86± 0.31**	24.50± 0.50**	33.77± 0.20	32.07± 0.61**
	Range	7.15- 7.36	7.55- 8.17	24.00-25.0	33.57-33.97	31.46-32.68
16 th day	X ± S.E	7.29± 0.11**	7.92± 0.28**	24.50-0.50**	33.61+0.18	31.07± 0.47**
	Range	7.18-07.40	7.65-8.20	24.00-25.0	33.43-33.76	30.60-31.54
20 th day	X ± S.E	7.32± 0.14**	9.99± 0.17	24.50± 0.50**	33.50± 0.07	39.16± 0.12
	Range	7.18-07.45	9.82-10.15	24.00-25.0	33.43-33.56	39.04-39.28
24 th day	X ± S.E	8.06± 0.14	10.21± 0.25	26.50± 0.50	32.88± 0.05	38.51± 0.20
	Range	7.92± 8.20	9.96-10.43	26.00-27.0	32.83-32.93	39.31-38.70
28 th day	X ± S.E	8.20± 0.09	11.05± 0.42	27.50± 0.50	33.56± 0.23	40.17± 0.80
	Range	8.10- 8.29	10.63-11.47	27.00-28.0	33.33-33.78	39.37-40.96
32 th day	X ± S.E	8.26± 0.06	11.07± 0.42	27.50± 0.50	33.31± 0.34	40.24± 0.80
	Range	8.19-8.32	10.65-11.49	27.00-28.0	32.97-33.65	39.44-41.04

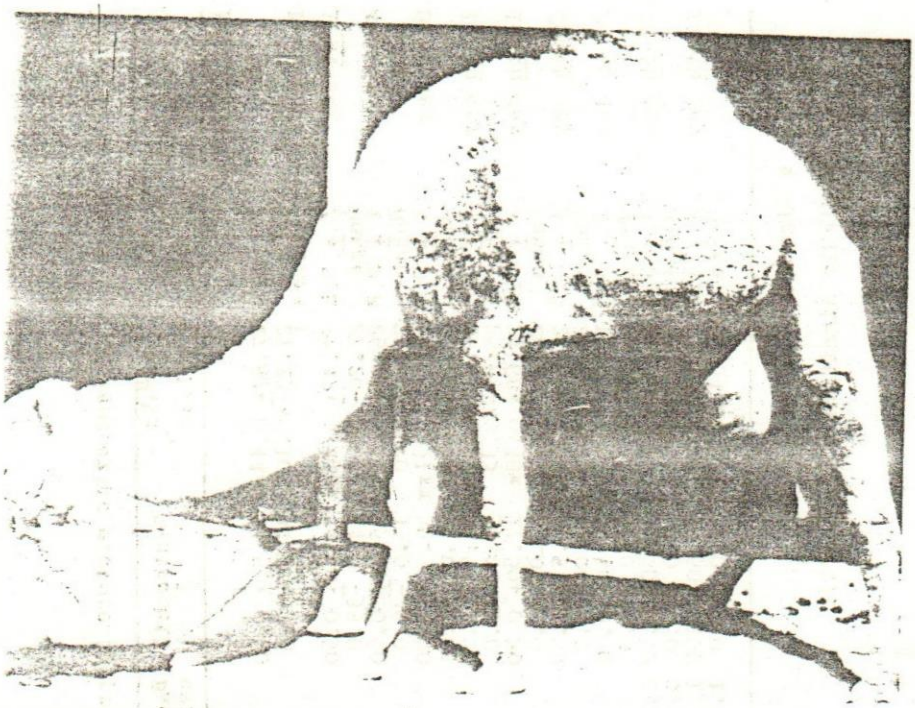
* = Significant (P < 0.05). ** - Highly significant (P < 0.01).

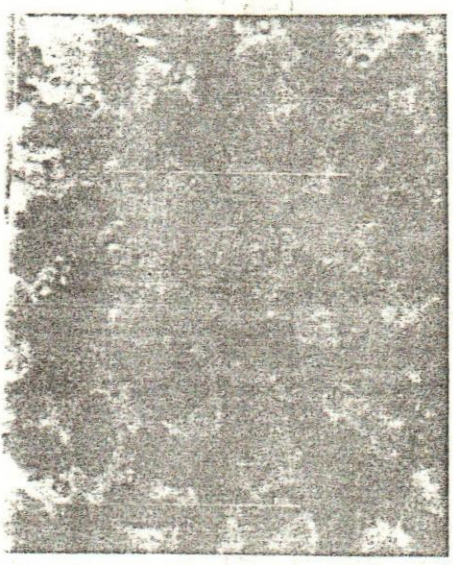
Table (3): Mean values of leucocytic picture in pre and post-treatment in filariasis of examined camels.

Conditions	Items	W.B.Cs G/L x 10^9	Neutrophils %	Band cells %	Lymphocytes %	Monocytes %	Eosinophils %	Basophils %
Pre-treatment:								
	X ± S.E	27.67± 0.44**	34.50± 0.50	0	52.50± 0.50	1.50± 0.50	11.50± 0.50*	0
	Range	27.23-28.10	34.0 -33.0	0	52.00-53.00	1.00-2.00	11.00-12.00	0
Post-treatment values :								
1 st day	X ± S.E	27.42± 0.21**	34.50± 0.50	0	52.50± 0.50	1.50± 0.50	10.50± 0.50*	0
	Range	27.20-27.63	34.0 -35.0	0	52.00-53.00	1.00- 2.00	10.00-11.0	0
4 th day	X ± S.E	26.75± 0.45**	35.50± 0.50	0	52.50± 0.50	1.50± 0.50	10.50± 0.50*	0
	Range	26.30-27.20	35.0 -36.0	0	52.00-53.00	1.00- 2.00	10.00-11.00	0
8 th day	X ± S.E	26.05± 0.31**	36.50± 0.50	0	51.50± 0.50	1.50± 0.50	10.50± 0.50*	0
	Range	25.74-26.36	36.0 -37.0	0	51.00-52.00	1.00- 2.00	10.00-11.00	0
12 th day	X ± S.E	26.01± 0.32**	36.50± 0.50	0	51.50± 0.50	1.50± 0.50	10.50± 0.50*	0
	Range	25.69-26.33	36.0 -37.0	0	51.00-52.00	1.00- 2.00	10.00-11.00	0
16 th day	X ± S.E	24.68± 0.48*	37.50± 0.50	0	51.50± 0.50	1.50± 0.50	9.50± 0.50	0
	Range	24.20-25.15	37.0 -38.0	0	51.00-52.00	1.00- 2.00	9.00-10.00	0
20 th day	X ± S.E	24.68± 0.48*	37.5 ± 0.50	0	51.50±00.50	1.50± 0.50	9.50± 0.50	0
	Range	24.20-25.15	37.0 -38.0	0	51.00-52.00	1.00- 2.00	9.00-10.00	0
24 th day	X ± S.E	17.69± 0.84	37.50± 0.50	0	51.50± 0.50	1.50± 0.50	8.50± 0.50	0
	Range	16.86-18.53	37.0 -38.0	0	51.00-52.00	1.00- 2.00	8.00- 9.00	0
28 th day	X ± S.E	17.58± 0.76	38.50± 0.50	0.50±0.50	51.50± 0.50	1.50± 0.50	7.50± 0.50	0.50±0.50
	Range	16.82-18.33	38.0 -39.0	0.00-1.00	51.00-52.00	1.00-2.00	7.00-8.00	0.00-1.00
32 th day	X ± S.E	17.43± 0.79	38.50± 0.50	1.50±0.50	50.50±0.50	1.50± 0.50	7.50± 0.50	0.50±0.50
	Range	16.64-18.22	38.0 -39.0	1.00-2.00	50.00-51.00	1.00-2.00	7.00-8.00	0.00-1.00

* Significant (P < 0.05).

** Highly significant (P < 0.01).





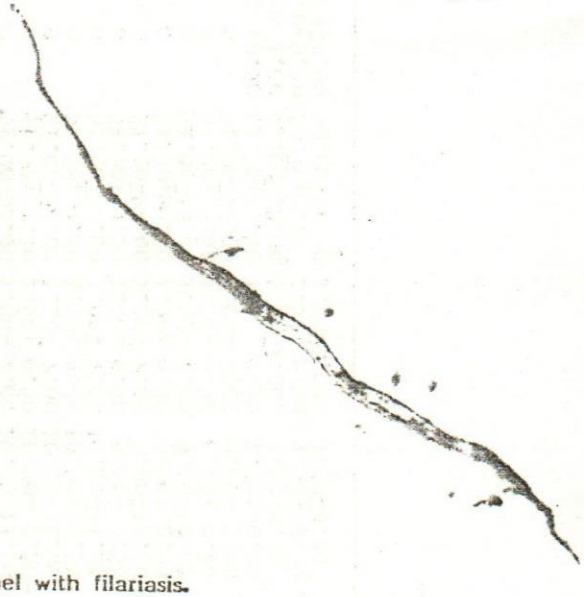


Fig. (1): Oedema of the testicles in camel with filariasis.
Fig. (2): Blood smear showing Trypdnosoma evansi in infested camels. (X 1000).
Fig. (3): Blood smear showing microfilaria in infested camel (X 200).