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دراسات اكلينيكية وبيوكيميائية لبعض مركبات مصل الدم  
في الجمال السليمة والمصابة بالجرب

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تم دراسة الاعراض الاكلينيكية والبيوكيميائية في عدد ٢٥ من الجمال يتراوح أعمارها  
ما بين ٧ - ٩ سنوات في محافظة سوهاج •

وهذه الجمال كانت تعاني من الاصابة بالجرب الناتج عن طفيل الساركوبتس بدرجات  
متفاوتة حسب انتشارها على الجسم • وتم أخذ عينات من دم ١٥ جمل سليم لضوابط  
للبحث وقد أوضحت هذه الدراسة عن وجود انخفاض معنوي في البروتين الكلي والالبومين  
وكذلك في معدلات الجلوكوز والصوديوم والكلوريد في مصل دم الجمال المصابة بمقارنتها  
بتلك السليمة اكلينيكيًا •

أما بالنسبة لمعدلات الكالسيوم والفسفور الغير عضوي والكرياتنين فكانت الفروق غير  
معنوية •

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**CLINICAL AND SOME BLOOD CONSTITUENTS  
STUDIES ON HEALTHY AND MANGY CAMELS**  
(With 3 Tables)

By  
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**SUMMARY**

Twenty-Five one humped camels (7-9 years old) suffering from mange at Souhag Province were conducted to investigate the clinical signs, some biochemical variations of blood serum associated with the disease status.

The clinical signs revealed various degrees of alopecia, itching, thickening and corregation of the skin on various areas of the animal body.

Biochemical analysis of blood serum revealed highly significant ( $P/0.01$ ) decrease in both total protein and albumin levels and significant decrease ( $P/0.05$ ) in levels of sodium, chloride and glucose in diseased animals if compared with the control camels; Meanwhile the variations in calcium, phosphorus, potassium and creatinine levels were not significantly affected.

**INTRODUCTION**

Mange is the most common and wide spread, highly contagious skin disease of buffaloes and camels. The disease is widely distributed allover the world including Egypt (ISMAIL and AMER, 1976).

RATHORE and LADHA (1974), graduated the mangy camels according to the intensity of infection into three catagories; the most severe cases in which the disease had spreads allover the body with thickening of the skin, keratinization and alopecia (+++); severe cases in which mange had affected all parts of the body with thickening skin but without alopecia and keratinization (++) and moderate cases which have sporadic mangy patches on some parts of their body (+).

Biochemical constituents of blood serum of clinically healthy camels including total protein, electrolytes, calcium, phosphorus, creatinine and glucose have been studies by many investigators (DURAND and KCHOUK, 1958); AYOUB, *et al.* (1960); HOLLER and HASSAN (1966); BARAKAT and ABDEL FATTAH (1970); FAWZIA, *et al.* (1979); EL AMROUSI, *et al.* (1984); OMRAN, *et al.* (1984) and ABD EL ALL, *et al.* (1986).

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Hypoproteinaemia and hypoalbuminaemia were recorded in camels suffered from mange, IBRAHIM, et al. (1981). They recorded also significant decreases in both iron and glucose levels, while transaminases (SGPT, SGOT) were significantly increased while alkaline phosphatase was insignificantly increased.

EL MAGAWARY (1983) recorded highly significant decrease in serum total protein accompanied with significant decrease in albumin in camels suffered from mange if compared with healthy ones. The recorded level for total protein was 6.48 gm% in mangy camels, while in healthy ones was 7.3 gm%, albumin levels were 2.89 gm% 3.80 gm% respectively. The author recorded also significant decrease in levels of sodium, chloride, calcium, phosphorus and magnesium levels of blood serum of mangy camels beside highly significant decrease in glucose levels.

Trials for treatment of mange in camels using different insecticides such as Dorsban, Lindane, D.D.T. and Diazinon were studied by many authors, RATHORE and LOHDA (1974) and ISMAIL and AMER (1976).

The aim of this work is to study the clinical changes in camels, suffering from mange and to investigate the changes of biochemical constituents of blood serum associated with the disease.

### **MATERIAL and METHODS**

Blood samples and skin scrapings were collected from 25 camels suffering from mange, (7-9 years old) and from 15 clinically healthy camels proved to be free from other diseases of the same age at Souhag Province.

The clinical symptoms of the disease were recorded and skin scrapings were collected to investigate the causative agent using 10% sod. hydroxide, by the method of (KELLY, 1974). The blood samples were centrifugated after clotting at 3,000 R.P.M. and the obtained cleared sera were biochemically analysed.

The concentrations of sodium and potassium were estimated using flame-photometer (Corning 400), while chloride levels were determined using chloride analyser Model 925.

Total protein (gm%), albumin (gm%), glucose (mg%), calcium (mg%) and inorganic phosphorus (mg%) were determined using test kits supplied from Biomerieux (Bains/France) and after the methods of WEICHELBAUM (1946); ORUPTF (1974); TINDER (1969); GINDLER and KING (1972) and MORINAL and PROX (1973) respectively. Serum globulin and albumin/globulin ratio (A/G), also calcium and phosphorus (Ca/P) ratio were determined mathematically.

Statistical analysis of the obtained data were performed according to the method of SENDECOR and COCHRAN (1967).

### **RESULTS**

According to the clinical symptoms and severity of the infestation, the diseased camels showed:

- Eight diseased camels having sporadic mangy irregular patches with severe itching on some parts of the body (moderate cases), while 15 of the diseased camels showed mangy lesions with severe itching all over the body with thickening of the skin without alopecia and



### RANGE IN CAMELS

keratinization and considered as severe cases. Two diseased camels having mangy lesions with severe itching covered all the body with thickening of the skin, keratinization and alopecia (most severe cases).

Mean values of biochemical parameters in clinically camels (Control) and diseased ones were illustrated in tables 1,2 and 3.

Microscopical examination for the obtained skin scraping showed sarcoptes spp. for diseased camels, while clinically healthy camels (control) were free from the parasite.

### DISCUSSION

The clinical findings were coincided with those previously obtained by ROTHORE and LADHA (1974) in camels infested with mange. Analysis of blood serum constituents revealed highly significant ( $P/0.01$ ) hypoproteinaemia associated with hypoalbuminaemia in diseased camels if compared with those clinically healthy. The obtained levels are in accordance with those previously obtained by IBRAHIM, *et al.* (1981) and EL MAGAWARY (1983) in camel suffering from mange. Moreover, changes in blood serum globulin were not affected by the disease status. The changes in protein picture can be attributed to the state of anorexia and to skin damage due to disease condition which leads to protein breakdown with consequent change in the plasma protein level (ABD EL AZIZ, 1979).

It is clear from table (2) that a significant decrease in the levels of sodium and chloride in diseased camels were found if compared with the clinically healthy ones. It was also evident that non-significant variations was found in potassium level in both healthy and diseased camels. The obtained results agreed with those previously obtained by EL-MAGAWARY (1983) in similar conditions.

There were non-significant variations in both blood serum calcium and inorganic phosphours levels in healthy and diseased camels. The obtained results are in accordance to those previously obtained by EL-MAGAWARY (1983).

A significant decrease in glucose level was observed in mangy camel if compared with the healthy ones. Similar results were obtained by EL-MAGAWARY (1983) and IBRAHIM, *et al.* (1981) in camels with the same condition. Non-significant variations in blood serum creatinine level was evident between diseased and healthy ones. These can be attributed to toxin excreted by parasites which affect creatinine level. In addition these can be attributed to the loss of appetite and itching conditions in diseased cases (ABDEL AZIZ, 1979).

The study declared the role of sarcoptic mange on the biochemical constituents of the blood serum.

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Table (1)  
Serum protein nitrogenous compounds in healthy and diseased

Condition	Total Protein gm%	Albumin gm%	Globulin gm%	A/G
Healthy	10.1 ± 0.51 (9.6 - 10.2)	4.4 ± 0.7 (3.5 - 5.3)	5.9 ± 0.6 (4.9 - 6.9)	0.8
Diseased	8.07 ± 0.66** (6.9 - 9.1)	2.62 ± 0.89** (1.6 - 4.7)	5.4 ± 0.98 (3.5 - 6.6)	0.5

\*\* Highiy Significant (P/ 0.01).

## RANGE IN CAMELS

Table (2)  
Macro-elements in blood serum of healthy and diseased camels

Conditions	Sodium mmol/L	Potassium mmol/L	Chloride mmol/L	Calcium mg%	Phosphorus mg%	Ca/P
Healthy	138.8 $\pm$ 1.3 (137 - 140)	5.95 $\pm$ 0.5 (5.3 - 6.5)	97.3 $\pm$ 2.2 (95 - 100.0)	7.9 $\pm$ 0.6 (6.8 - 8.9)	5.4 $\pm$ 0.5 (4.9 - 6.1)	1.6:1
Diseased	119.5 $\pm$ 16.5* (89.6 - 137.6)	5.8 $\pm$ 0.97 (3.7 - 8.0)	66.3 $\pm$ 21.1* (36.0 - 102.0)	6.6 $\pm$ 1.2 (4.4 - 8.2)	5.2 $\pm$ 1.8 (2.6 - 7.4)	1.5:1

Table (3)  
Blood serum glucose and creatinine levels  
in healthy and diseased camels

Conditions	Glucose mg%	Creatinine mg%
Healthy	70.9 $\pm$ 5.9 (60. - 77.1)	0.3 $\pm$ 0.04 (0.25 - 0.35)
Diseased	58.9 $\pm$ 11.1* (46.9 - 89.4)	0.9 $\pm$ 0.7 (0.30 - 2.20)

\* Significant (P/ 0.05).