

# HAEMATO-BIOCHEMICAL CHANGES IN CAMELS INFESTED WITH MANGE DURING WINTER AND SUMMER SEASON

Gorakh Mal, D. Suchitra Sena and M.S. Sahani

National Research Centre on Camel, PB No. 07, Bikaner-334001, Rajasthan, INDIA

## ABSTRACT

The present work was aimed to study the haemato-biochemical alteration in mange infested camels in comparison to the normal healthy camels during winter and summer seasons. There was significant ( $P < 0.01$ ) decrease in haemoglobin (Hb) and neutrophils, while a significant increase in eosinophils, lymphocytes, aspartate aminotransaminase (AST), alanine aminotransaminase (ALT), triglycerides, urea and glucose were seen in mange infested camels during winter season. During summer season decrease in albumin content and an increase in total leucocyte counts (TLC), eosinophils, monocytes, AST, ALT, triglycerides, urea was observed. This study indicated that winter is most conducive for spread of mange infection and treatment during this period should be supplemented with supportive therapy along with acaricides.

**Key words:** Acaricide, camels, haemato-biochemical, mange, season

Camel, an economically important multipurpose animal in the arid and semiarid regions of the world suffers from this ectoparasitic infestation posing a major threat to its health and resulting in economic loss to camel farmers (Blood *et al*, 1983). Epizootiological studies regarding mange were previously studied among different species of livestock (Datt *et al*, 1978) and in camels (Rathore and Lodha, 1973). Although mange infestation is definitely a seasonal problem and is seen in October to March (Basu *et al*, 1951). Rathore and Lodha (1973) and Sena *et al* (1999) reported the incidence through out the year but they found winter as most conducive for the spread of mange. The present work was aimed to study the variations of the haemato-biochemical parameters of mange infested camels in comparison with healthy camels during winter and summer seasons.

## Materials and Methods

A total of 32 camels were included in the present study and were divided into four groups as follows:

Group A had 8 clinically infested mange camels and group A<sup>1</sup> had 8 healthy camels in winter season. Group B had 8 clinically infested mange camels and group B<sup>1</sup> had 8 healthy camels in summer season.

Blood was collected from the naturally infested mange and healthy animals in sterile glass vials using disodium ethylene diamino tetraacetic acid (EDTA) @ 1mg/ml of blood. Blood was also collected in sterile tubes without anticoagulant for serum separation.

Haematological parameters viz., haemoglobin (Hb), total leucocyte count (TLC), differential leucocyte count (DLC) were done on the day of collection. Serum was used for estimation of biochemical parameters viz., alkaline phosphatase (ALP), aspartate aminotransaminase (AST), alanine aminotransaminase (ALT), cholesterol, triglycerides, urea, glucose, total proteins, albumins, globulins, A/G ratio by using diagnostic kits (Ranbaxy Diagnostics, New Delhi). The results were analysed statistically by t-test for their significance (Snedecor and Cochran, 1994).

## Results and discussion

The results of haemato-biochemical parameters during different seasons are presented in the Table 1. The haematology of sarcoptic camels during winter revealed a decrease in the Hb content and an increase in TLC in mange camels. The DLC showed neutropenia, eosinophilia, lymphocytosis during winter season. During summer season, Group B revealed increase in TLC, eosinophils and monocytes. Decrease in Hb, neutrophils and increase in lymphocytes were statistically significant ( $P < 0.01$ ) in mange infested camels during winter season (Group A). The biochemical parameters in mange infested camels during winter season revealed a significant increase in AST, ALT, triglycerides, urea, glucose and reduction in the albumin content. During summer season increase in the AST, ALT, triglycerides, urea, decrease in the ALP and albumin content were seen. No significant changes were noticed in ALP,

SEND REPRINT REQUEST TO GORAKH MAL

**Table 1.** Haemato-biochemical parameters of mange camels in comparison to healthy camels during winter and summer seasons (mean±SE).

Parameters	Group A	Group A <sup>1</sup>	Group B	Group B <sup>1</sup>
<b>Haematological</b>				
Haemoglobin (gm/dl)	7.90**±0.17	10.50±0.60	12.02±0.38	11.15±0.40
TLC (/C. mm.)	9965±341	9000±600.70	9366±245	8850±700.60
<b>DLC (%)</b>				
Neutrophils	38**±2	48±2	46±1	49±1
Eosinophils	11*±1	7±1	9±2	6±1
Lymphocytes	47**±1	39±2	38±1	40±2
Monocytes	2*±1	5±1	7±1	5±1
<b>Biochemical</b>				
ALP (IU/L)	62.03±9.90	78.85±10.15	77.27±8.93	80.24±11.80
AST (IU/L)	63.94*±3.26	45.63±7.50	49.13±4.14	47.62±7.59
ALT (IU/L)	9.24*±0.72	6.70±1.50	6.32±0.84	5.00±0.42
Cholesterol (mg/dl)	24.06±3.88	29.16±3.65	24.04±2.59	29.30±5.18
Triglycerides (mg/dl)	25.97**±4.73	10.65±1.50	9.23±1.39	8.75±2.90
Urea (mg/dl)	36.90*±4.08	31.70±1.68	29.66±1.84	27.72±0.35
Glucose (mg/dl)	108.71**±9.31	90.60±6.85	104.53±4.92	95.80±7.65
Total Protein (g/dl)	6.25±0.48	5.60±0.20	5.49±0.07	4.85±0.78
Albumin (g/dl)	3.20±0.31	3.51±0.25	2.88±0.09	2.90±0.15
Globulin (g/dl)	3.05±0.40	2.09±0.50	2.62±0.30	1.95±0.76
A/G ratio	1.05	1.68	1.09	1.49

\*\* , \* Significant at P<0.01 and P<0.05, respectively.

cholesterol, total proteins, globulins and A/G ratio in animal of all group in both the seasons. Mourad *et al* (1987) and Radwan *et al* (1987) reported almost similar results. The changes in the mean values of the haemato-biochemical findings of mange camels in comparison to healthy camels were more during winter season than in summer season.

The difference in haematological values in mange infected camels in comparison to healthy camels in both these groups might be attributed to the fact that winter is more congenial for rapid mite multiplication and resulted in inflammation and haemoglobinaemia. However, eosinophilia was noticed in both the groups and was characteristic finding in mange infected camels. The change in the biochemical parameters of mange infected camels during both the seasons might be due to the impairment of liver functions in severe infections which have resulted in high levels of ALT, triglycerides, glucose, urea and lowered cholesterol levels. Elevated AST levels might be contributed to the fact that the enzyme is released into the circulation following injury or death of the cells. Higher total serum proteins might be primarily due to elevated immunoglobulin levels and a decrease in the albumin content as an osmoregulatory response.

In present study, the physiological effects of the parasite on the host were more during winter season, mainly due to altered metabolism of the host. It also points out to the need of a supportive therapy along with acaricides during winter season.

### References

- Basu BC, Balarama Menon P and Sengupta CM (1951). Studies on the mange mites of livestock in India. The Indian Veterinary Journal 22:143-49.
- Blood DC, Radostits OM and Henderson JA (1983). Veterinary Medicine, 6th Edition, ELBS and Bailliere, Tindall, U.K. 1310 pp.
- Datt SC, Tikaram SM and Satija KC (1978). Studies on the incidence of mange in livestock in Hisar. The Haryana Veterinarian 17:112-15.
- Mourad IM, Karram MH, Abdell All TS and Abdel Salam FA (1987). Clinical and some blood constituents studies on healthy and mangy camels. Assiut Veterinary Medical Journal 19:154-59.
- Radwan YA, Abdon OM, Samia AH and Arab RMH (1987). Efficacy and safety of Ivomec against camel mange. Veterinary Medical Journal Giza Egypt 35:83-94.
- Rathore MS and Lodha KR (1973). Observations on sarcoptic mange in camels (*Camelus dromedarius*) in Rajasthan. Incidence and intensity. The Indian Veterinary Journal 50:1083-88.
- Sena DS, Kumar R and Sahani, MS (1999). Incidence of sarcoptic mange in camels. The Indian Veterinary Journal 76:556-57.
- Snedecor GW and Cochran WG (1994). Statistical Methods. 8<sup>th</sup> Edition. Iowa State University Press, Ames, Iowa.