Evaluation of *Aegle marmelos* in Treatment of Caprine Diarrhoea

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Abstract

Diarrhoea is one of the major problems in goats. Large numbers of landless labourers and marginal farmers have goats as their readymade source of earning, which improves the economic status of farmers and also provides employment to the weaker section of society. The present study was aimed to evaluate the efficacy of indigenous plants *i.e.* *Aegle marmelos* (bael) fruit. Diarrheic goats were selected having 6 animals in a group. The overall response of the treatment was assessed on the improvement of clinical and haemato-biochemical profile of diarrhoeic goats and return of these parameters towards normalcy. Various haematological values like Hb, PCV, TEC, TLC, MCV, MCH and MCHC were found to decrease and biochemical parameters were found to alter before and after treatment.

**Key words:** Diarrhoea, Aegle marmelos, Herbal treatment

Introduction

Large number of landless labourer and marginal farmers consider goats as their readymade source of earning. The unique advantage of goat rearing is its maximum returns with minimum labour and expenditure because of its short generation period and good prolificacy as compared to large ruminants. The incidence of enteritis causing diarrhoea in goat population was reported to be very high¹. The aetiological agent causing diarrhoea in goats are bacterial, viral, protozoa, parasitic, nutritional, management, and stress. The half ripe Bael fruit has astringent property that reduces irritation in the digestive tract and is excellent treatment for diarrhoea and dysentery². The present study was aimed at to evaluate the efficacy of indigenous plant *i.e.*, *Aegle marmelos* (bael) fruit.
Material and Methods

In the study, a total of 243 goats were screened for diarrhoea. 6 diarrhoeic goats were selected from the screened goats for diarrhea and then faecal examination. The study was done in livestock dairy farm, Adhartal, T.V.C.S.C. and at private goat owners in Jabalpur (M.P.) Clinical examination was undertaken for each day ‘0’ prior to treatment and on 5th day, post treatment. Approximately 5gms of faecal samples were collected from diarrhoeic goats. Those goats which were infested with parasites were not included from the group. Clinical examination was undertaken for each day ‘0’ prior to treatment and on 5th day, post treatment. To study haematological parameters blood was collected by juglar vein puncturing using sterilized needle which included Total erythrocyte count, Haemoglobin concentration, packed cell volume and Total leucocyte count. About 5ml of blood was collected from each animal in clean sterilized vials containing EDTA @ 1 mg/ml of blood. The haematological investigations were carried out3.

For biochemical analysis serum was separated and preserved in refrigerator and analyzed for haemato-biochemical investigations which included Serum sodium and potassium, Serum chloride, Serum total protein, Serum albumin, Serum globulin and A:G ratio. The statistical analysis of data was carried out by Simple CRD and paired t-test was applied to data4.

Results

The mean values of Haemoglobin concentration on 0 day were 9.42 on day 5 were 8.33. The haemoglobin concentration reduced significantly by day 5 after treatment indicated by values before and after treatment. The mean values of Total Erythrocyte Count (TEC) on 0 day were 10.78 which reduced to 10.51 by day 5. The values were found to decrease from day 1 to day 5. The mean values of Total leukocyte Count (TLC) on 0 day were 9.92 which also reduced by day 5 to 8.63. The mean value of PCV values also decreased significantly from day 0 to day 5 which was 27.67 on day and 24.17 on day 5. The mean value of Mean corpuscular volume (MCV) on 0 day was 25.70 which reduced to 22.86 by day 5. The mean values Mean corpuscular haemoglobin (MCH) on 0 day was 8.72 which reduced to 7.94 by day 5. The mean corpuscular haemoglobin concentration (MCHC) on 0 day was 34.49 which increased to 34.79 by day 5.

The mean values of serum total protein on 0 day were 6.74 which decreased significantly to 6.59 by day 5. The mean value of serum albumin on 0 day was 3.10 which increased to 3.31 by day 5. The mean value of serum globulin on 0 day was 3.65 which decreased significantly to 3.28 on day 5. The mean values of serum albumin: globulin ratio on 0 day was 0.85 which decreased to 1.01 by day 5. The mean value of serum potassium on 0 day was 5.78 which decreased significantly to 5.07 by day 5. The mean value of serum sodium on 0 day was 130.72 which increased significantly to 142.82 by day 5. The mean value of serum chloride on 0 day was 90.88 which increased significantly to 99.10 by day 5.

Discussion

Body temperature returned normal, which was in agreement with Roy and Sinha5 while increase was observed in body weight from day 0 to day 5. The faecal consistency, which was in
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semi liquid to pasty earlier, became normal in consistency. The diarrheic goats also showed improvement in dehydration and started taking food.

An overview of the haemogram revealed that the values of major haematological parameters of patho-physiological significance in relation to dehydration in diarrhoea i.e. Hb, PCV, TEC, MCV, MCH, MCHC, TLC were observed. All the values were found to be increased. Hb and PCV values were found to be increased on day 0 in all the treatment groups as compared to their corresponding values on Day 5 after treatment which revealed haemoconcentration as a result of water loss from the body due to dehydration because of diarrhoea. The haemoglobin concentration was significantly different from that of control group. The values of TEC also decreased as there was haemoconcentration due to dehydration from day 0 to day 5. Kaur\(^6\) reported gradual and significant decline in mean PCV values from 41.90±1.44% at 48 hours to 39.58±1.75% at 144 hours which was comparable to that of healthy controls. The TLC count in the study exhibiting leucocytosis as an indication of septicaemia and in present study these values in all the treatment groups decreased from day 0 to day 5, which showed common symptom of intestinal infection\(^3,7\) During the process of infection, increased production of leucocytes ensured as a result of bone marrow myeloid cell response. In the present study, biochemical values of total serum proteins and serum globulin were decreased from day 0 to day 5. An increase in the value of day 0 was in agreement with the earlier findings\(^8,9\) of which highlight acute tissue dehydration. The increase in globulin levels on day 0 as seen in the present study value was attributed to associated increase in total proteins due to dehydration. The findings of present study are in agreement with findings of Adam\(^10\) who recorded increased serum globulin concentration.

Serum albumin and albumin: globulin ratio increased from day 0 to day 5. Serum potassium decreased from day 0 to day 5 while serum sodium and serum chloride increased from day 0 to day 5. Hypoalbuminaemia observed in the present study could be due to diminished production associated with intestinal absorption and malnutrition. There was marginal increase in the albumin values after treatment which can be attributed to the increase in the availability and absorption of dietary proteins after treatment. This was in agreement with Walker\(^11\). Increment in albumin-globulin ratio can be attributed to increment in albumin value and decreased globulin value. These observations were in agreement with the findings of Monoiu\(^12\).

The values of serum potassium decreased from day 0 to day 5. Duncan\(^13\) reported metabolic acidosis that might have induced the translocation of potassium ions from intracellular to extracellular compartment, thus raising the plasma potassium concentration i.e. Hyperkalaemia, this was in agreement with Sridhar\(^9\). There was increase in the values of serum sodium from day 0 to day 5. Sodium is the main cation in ECF and is responsible for maintenance of osmotic pressure. Any loss of ECF, as seen in diarrhoea, leads to hyponatraemia. Duncan\(^13\) also reported that decreased ECF H\(_2\)O in diarrhoea result in loss of Na\(^+\) rich fluids and leads to hyponatraemia. The present finding was also in agreement with earlier reports\(^14,15\). The values of serum chloride increased from day 0 to day 5, which might be due to prolonged or increased loss of chloride ions in the intestinal tract during diarrhoea, failure of gastric H\(^+\) and Cl\(^-\) ions to be reabsorbed by villus of small intestine\(^16\). The hyperchloremia observed in all the diarrhoeic goats was in agreement with the findings of Sridhar\(^9\).

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The treatment of goat diarrhoea involves use of antidiarrhoeals and replenishment of fluid and electrolytes in the form of infusion. In the present study bael fruit powder was used which is known to be used for antidiarrhoeal effect. Duke observed that Bael possessed antibacterial, anti-spasmodic, demulcent and anti-viral activity and is also advocated for treating diarrhoea, dysentery and E. coli infections. Bael contains sugars, tannis, furocoumarin as the active ingredient. Its therapeutic effect may be due to presence of tannis and furocoumarin.

**Conclusion**

The present study was conducted on diarrhoeic goats for evaluation of therapeutic effect of *Aegle marmelos* (bael). The notable clinical profile of mild to moderate diarrhoeic goats is characterized by higher haematocrit values, haemoconcentration, hyponatraemia, hypochloraemia and hyperkalaemia during the study. Thus it is concluded that treatment with bael fruit powder takes in 3 to 4 days for recovery and the treatments was safe, eco-friendly, cost effective and easily available.

**References**


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