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**RESEARCH ARTICLE**

**PLASMA ELECTROLYTE PROFILE OF ASSAM HILLY GOATS UNDER  
MIZORAMAGRO-CLIMATIC CONDITIONS**

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**ABSTRACT**

A study was undertaken to evaluate the plasma electrolyte profile of Assam hilly goats in Ago climatic condition of Mizoram. Blood samples were collected from adult Assam hilly goats reared under ago-climatic conditions of Mizoram. The plasma was separated from each blood samples and the electrolyte profile was evaluated. The serum phosphorus level observed was  $7.74 \pm 0.28$  mg/dl and level ranges from 7.5 to 8.2, calcium was  $10.74 \pm 0.18$  mg/dl and ranges from 10.5 to 10.9, magnesium was  $2.52 \pm 0.44$  mg/dl and ranges from 2.5 to 2.6, sodium was  $145.4 \pm 1.51$  mg/dl and ranges from 143 to 147, potassium was  $4.52 \pm 0.16$  mg/dl and ranges from 4.4 to 4.8 while the chloride was  $112.2 \pm 1.92$  mg/dl and the value ranges from 109 to 114. The present study established the baseline blood electrolyte profile of normal adult Assam hilly goats under Mizoram Agro-climatic conditions.

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**INTRODUCTION**

Assam hilly goat is found in Assam and its adjoining areas. The body coat is black and sometimes white and the breed is famous for meat production however it is a poor milk yielder. Selected animals of this breed may be suggested for utilization by the poor farmers for their economic upliftment. The knowledge of normal values of biochemical constituents of different animals are of academic as well as practical importance for clinical and experimental interpretations. The availability of minerals in appropriate quantity is a pre-requisite for health and productivity [1]. Herbivorous under natural grazing condition obtain mineral from forage plant. Knowledge of mineral concentration in the body fluid or blood plasma is usually used as a diagnostic tool for assessing variety of disorders. Potassium and glutathione are important component in metabolic activities in mammalian species since the potassium ion is an essential and regulating osmotic balance between cells and the extracellular fluid. The deficiency of these parameters could affect negatively health and efficiency of the animals [2]. Sodium and chloride are critical in the electrolyte balance. In addition, sodium affects the absorption of sugar and proteins from the digestive tract. Salt deficiencies can affect the efficiency of digestion and indirectly the reproductive performance of cows [2]. The electrolytes are very important in homeostasis, nerve impulse transmission, muscle contraction, ovarian steroidogenesis and the process of ovulation [3, 4]. However, no or very few works has been undertaken in relation with

Assam hilly goats under agro-climatic conditions of hilly region. Therefore, there is a need to establish an appropriate electrolyte baseline data of this breed which will help in realistic evaluation of the managerial practices, nutritional and diagnosis of health conditions. Considering this fact, the present study was undertaken to establish the normal electrolyte values of the Assam hilly goats under Agro-climatic conditions of Mizoram.

**MATERIALS AND METHODS**

The present study was conducted at the Department of Veterinary Physiology & Biochemistry, College of Veterinary Sciences & A.H., Central Agricultural University, Selesih, Aizawl, Mizoram. The blood samples were collected from Adult Assam hilly goats reared at the Livestock Instructional Farm Complex of the college. The blood samples (approximately 3 ml) were collected aseptically from jugular vein using pre-sterilized polypropylene disposable syringes and transferred to heparinized non-vacuum tubes. The plasma from the blood samples were separated by centrifugation at 2500 rpm for 5 min in a refrigerated centrifuge machine. The separated plasma samples were then analyzed for the electrolytes in fully automated Dry clinical analyzer (Fujifilm 4000i).

The results were then analyzed statistically using suitable statistical method as per Snedecor and Cochran [5].

## RESULTS AND DISCUSSION

The plasma electrolyte profile of the Assam hilly goats observed in the present investigation is given **Table-1**. The plasma electrolyte profile of the Assam hilly goats estimated in the present investigation is given in table 1. The plasma phosphorus (mg/dl) level ranges from 7.50 to 8.20 with a mean value of  $7.74 \pm 0.28$ . The observed value is comparable with reported value of the mountain goats reared in the Cascade Range of Washington state however lower than the level observed for Black Bengal goats. In the mountain goats reared in the Cascade range of Washington state, the level of serum phosphorus was 7.4 mg/dl and the value ranges between 4.0 to 11.0 [6]. The phosphorus level reported for the adult black Bengal goats was  $3.67 \pm 1.13$  mg/dl and the level ranges between 2.00 and 5.10 [7]. Among the adult Marwari goats the serum phosphorus level reported was  $1.457 \pm 0.030$  mmol/L [8].

**Table 1** Plasma Electrolyte profile of Assam hilly goats

Sl. No.	Parameters	Mean± SD	Range
01	Phosphorus (mg/dl)	$7.74 \pm 0.28$	7.50-8.20
02	Calcium(mg/dl)	$10.74 \pm 0.18$	10.50-10.90
03	Magnesium(mg/dl)	$2.52 \pm 0.04$	2.50-2.60
04	Sodium (mmol/L)	$145.4 \pm 1.52$	143.00-147.00
05	Potassium (mmol/L)	$4.52 \pm 0.16$	4.40-4.80
06	Chloride (mmol/L)	$112.2 \pm 1.92$	109.00-114.00

The observed calcium (mg/dl) level in Assam hilly goats was  $10.74 \pm 0.18$  and ranges from 10.50 to 10.90. As seen for plasma phosphorus, the value estimated for calcium is also comparable with the values reported in literature. In the mountain goats reared in the Cascade range of Washington state, the level of serum calcium was 10.7 mg/dl and the value ranges between 9.5 to 12.1 [6]. Among the adult Marwari goats the serum calcium level reported was  $2.393 \pm 0.038$  mmol/L [8]. The magnesium (mg/dl) level observed was  $2.52 \pm 0.04$  and the value ranges from 2.50 to 2.60. This estimated value in Assam hilly goats is almost similar to the values reported for mountain goats for which the reported value is 3.0mEq/L and the value ranges between 2.04 and 3.40 [6]. The reported value in case of adult Marwari goats is  $0.989 \pm 0.021$  mmol/L [8].

The plasma sodium level (mmol/L) in the present investigation ranges from 143.0 to 147.0 with mean of  $145.4 \pm 1.52$ . This finding is similar to the value reported for mountain goats and Marwari goats. The reported level among the mountain goats reared at the Cascade Range of Washington state was 140 meq/L and the value ranges between 123 and 144 [6].

Among the adult Marwari goats the serum sodium level reported was  $153.3 \pm 0.870$  mmol/L [8]. The observed potassium (mmol/L) level among the Assam hilly goats in the present investigation ranges from 4.40 to 4.80 with a mean of  $4.52 \pm 0.16$ . The observed value is somewhat lower than the reported values for mountain goats and Marwari goats. The reported value for adult Marwari goats was  $5.107 \pm 0.07$  mmol/L [8] while the level among the mountain goats was 6.05 meq/L [6]. The plasma chloride (mmol/L) level observed in the present investigation was  $112.2 \pm 1.92$  and level ranges from 109.0 to 114.0. This estimated value is comparable with the value reported in literature for adult Marwari goats however higher than the mountain goats. Among the adult Marwari goats the observed value was  $110.493 \pm 1.116$  mmol/L [8] while in case of mountain goats the observed level was 96 meq/L and the level ranged between 90 and 105 meq/L [6].

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