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PLASMA DIAGNOSTIC ENZYME PROFILE OF ASSAM HILLY GOATS REARED IN MIZORAM, INDIA

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ABSTRACT

A study was undertaken to evaluate the plasma diagnostic enzyme profile of Assam hilly goats in Ago climatic condition of Mizoram. Blood samples were collected from adult Assam hilly goats, plasma was separated from each blood samples and the diagnostic enzyme profile was evaluated. The plasma AST level was 170.8±3.96 units/L and the level ranges from 164 to 173. The ALT observed was 20.6±1.67 units/L. The Amylase level ranges from 73 to 103 with a mean value of 92.2±11.47 units/L. The GGT level was 154.2±65.38 units/L and level ranges from 73 to 237. The serum Alkaline phosphatase level (units/L) ranges from 91 to 196 with a mean value of 163.8±41.8. The Lactate dehydrogenase level was 534.6±9.91 units/L and ranges from 521 to 547. The level of serum Cholinesterase observed was 1.0±0.0 units/L. The present study established the baseline blood diagnostic enzyme profile of normal adult Assam hilly goats under Mizoram Agro-climatic conditions.

KEYWORDS: Assam hilly goats, diagnostic enzymes, LDH, AST, ALT.

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. Estimation of enzyme activities in biological fluids particularly serum or plasma is of great clinical importance. The raised enzyme levels could be due to

cellular damage, increased rate of cell turn over, proliferation of cells, increased synthesis of enzymes etc. Rise in Serum Glutamate Oxaloacetate Transaminase (AST) activity is noticed in liver disease, muscle and kidney dystrophy, while a decrease is observed in vitamin B_6 deficiency, ovarian hypotension.[1] The Serum Glutamate Pyruvate Transaminase (ALT) is found in many body tissues in small amounts, but is very concentrated in the liver. It is released into the blood when cells that contain it are damaged and typically used to detect liver injury.[2] Alkaline Phosphatase (ALP) is a zinc containing enzyme found to be decreased in animals suspected of zinc deficiency.[3] ALP activity in animals was found to be of diagnostic tool as an indicator of zinc status in ruminants. [4] Hawk *et al*. [5] reported that high serum alkaline phosphatase caused rapid growth of bone in young animals and in the new bone formation. Measurement of LDH levels can be helpful in monitoring treatment for cancer. Noncancerous conditions that can raise LDH levels include heart failure, hypothyroidism, anemia, pre-eclampsia, meningitis, encephalitis, acute pancreatitis, HIV and lung or liver disease. [6] Further, tissue breakdown releases LDH, and therefore LDH can be measured as a surrogate for tissue breakdown, e.g. hemolysis. Therefore, comparison of the measured LDH values with the normal range helps guide diagnosis.[7] Measurement of α-amylase is useful in the diagnosis and treatment of pancreatitis. The elevation of α-amylase activity, however, is not specifically indicative of pancreatic disorder, since the enzyme is also produced by the salivary gland and other organs. Clinical evaluations of patients with acute pancreatitis have shown that pancreatic amylase has a greater sensitivity than total amylase.[8] Gamma-glutamyl transferase (GGT) activity is present in many tissues and it is considered a serum marker primarily for the diagnosis of liver disease in animals. According to some authors the enzyme is tied to the metabolism of glutathione, which has an important role in the entire antioxidative status of the organism. [9] 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 baseline data of the serum enzyme levels of this breed which will help in realistic evaluation of the managemental practices, nutritional and diagnosis of health conditions. Considering this fact, the present study was undertaken to establish the normal serum enzyme level 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, India. 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 ascetically 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 (Hermle-Z236K). The separated plasma samples were then analyzed for the plasma enzyme profile in fully automated Dry clinical analyzer (FujFilm 4000i).

The results were then analyzed statistically using suitable statistical method as per Snedecor and Cochran. [10]

RESULTS AND DISCUSSION

The plasma diagnostic enzyme profile of the Assam hilly goats observed in the present investigation is given **Table-1**.

Table 1: Plasma Diagnostic enzyme profile of Assam hilly goats

Sl. No.	Parameters	Mean± SD	Range
01	AST (units/L)	170.80±3.96	164.00-174.00
02	ALT (units/L)	200.60±1.67	18.00-22.00
03	Amylase (units/L)	92.20±11.47	73.00-103.00
04	GGT (units/L)	154.20±65.38	73.00-185.00
05	ALP (units/L)	163.80±41.82	91.00-196.00
06	LDH (units/L)	534.60±9.91	521-547
07	Cholinesterase (units/L)	1.00±0.00	1.00-1.00

The plasma Aspartate Transaminase (AST) activity observed for Assam Hilly goats under agro-climatic condition of Mizoram in the present investigation was 170.8±3.96 units/L and the activity ranges from 164 to 173. The observed value is higher than the activity reported in literature for Saanen goats, black Bengal goats, mountain goats and goats from Kashmir valley. Among the goats from Kashmir valley, the AST activity estimated was 121.00±20.90 units/ L and the activity ranges between 78.0 and 178.0.[11] The level observed for Saanen goats was 116.45±6.43 units/ L, [12] while the activity among the mountain goats and black Bengal goats were 75 units/ L and 55.17±16.41 units/ L and the level ranges between 50-196 and 38-72.5 respectively.[13,14]

The Alanine transaminase (ALT) activity observed in the present investigation for Assam hilly goats was 20.6±1.67 units/L. The observed activity is comparable with the activity

reported for black Bengal however is lower than the activity reported for Saanen goats and goats from Kashmir valley. The reported ALT activity for black Bengal goats was 15.35±2.55 units/ L and the activity ranges between 12.4 and 19.3,[14] while the activity observed for goats from Kashmir valley was 76.2±73.1 and level ranges between 15.0 and 313.0.[11] The ALT activity among the Saanen goats was 49.25±3.85 units/ L.[12]

The Amylase level ranges from 73 to 103 with a mean value of 92.2±11.47 units/L in the present investigation. The GGT activity observed in Assam hilly goats was 154.2±65.38 units/L and level ranges from 73 to 237. The observed activity is comparable with the reported value for mountain goats. Among the goats capture in the Cascade Range of Washington state, the activity observed was 147 units/L and the value ranges between 117and 185.[13] The glutamyl transferase activity reported for the Saanen goats was 52.83±3.44 IU/L.[12]

The serum Alkaline phosphatase (ALP) level (units/L) in the present investigation ranges from 91 to 196 with a mean value of 163.8±41.8. However, this observed activity is higher than the reported value for mountain goats. The activity reported for mountain goats reared in the Cascade Range of Washington was 48 units/ L and the activity ranges from 22 to 108. [13] Among the Saanen goats the observed activity was 105.1±14.6 IU/L.[12]

The Lactate dehydrogenase level was 534.6±9.91 units/L and ranges from 521 to 547 while the level of plasma Cholinesterase observed was 1.0±0.0 units/L.

CONCLUSION

The plasma profile of some diagnostically important enzymes of the Assam hilly goats was estimated. The values observed in the present investigation is comparable with the values reported earlier for goats from Kashmir valley, Saanen goats, mountain goats etc.

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