

## Investigation of Some Hematologic and Biochemical Parameters in the Serum of Gazelles (*Gazella subgutturosa*) in Ceylanpınar, Şanlıurfa, Turkey

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**Abstract:** Some hematological and biochemical parameters were determined in blood specimens collected from 16 clinically healthy gazelles (*Gazella subgutturosa*). They are bred in a large enclosed area in which they roam freely in Ceylanpınar, Şanlıurfa, Turkey. Average levels for the following hematological and biochemical parameters were found: WBC ( $10.09 \pm 1.50 \times 10^3/\text{mm}^3$ ), RBC ( $11.7 \pm 1.78 \times 10^6/\text{mm}^3$ ), Hb ( $18.85 \pm 1.10$  g/dl), PCV ( $51.64 \pm 3.2$  %), MCV ( $45.1 \pm 0.86$  fl), MCH ( $16.5 \pm 0.23$  pg), MCHC ( $36.68 \pm 0.77$  g/dl), platelets ( $315.70 \pm 33.00 \times 10^3/\text{ml}$ ), glucose ( $66.6 \pm 20.0$  mg/dl), ALT ( $50 \pm 12.0$  IU/l) and AST ( $372.4 \pm 75.0$  IU/l), calcium ( $8.88 \pm 0.26$  mg/dl), phosphorus ( $6.9 \pm 0.50$  mg/dl), sodium ( $154 \pm 5.1$  mmol/l), potassium ( $4.98 \pm 0.37$  mmol/l), and chloride ( $112.8 \pm 2.70$  mmol/l). Wide variations were recorded in the levels of WBC, platelets and glucose as well as in the activities of the enzymes ALT and AST.

**Key Words:** Hematology, biochemical parameters, *Gazella subgutturosa*

### Ceylanpınar (Şanlıurfa, Türkiye)'de Bulunan Ceylanlarda (*Gazella subgutturosa*) Bazı Hematolojik ve Biyokimyasal Parametrelerin Araştırılması

**Özet:** Bu çalışmada, Türkiye'de Şanlıurfa'nın Ceylanpınar ilçesinde etrafı tel örgülerle çevrili serbestçe dolaşabildikleri çok geniş bir alanda yetiştirilen klinik olarak sağlıklı 16 adet ceylandan (*Gazella subgutturosa*) toplanan kan örneklerinde bazı hematolojik ve biyokimyasal parametreler tespit edildi. Ortalama biyokimyasal ve hematolojik değerler; WBC ( $10,09 \pm 1,50 \times 10^3/\text{mm}^3$ ), RBC ( $11,7 \pm 1,78 \times 10^6/\text{mm}^3$ ), Hb ( $18,85 \pm 1,10$  g/dl), PCV (%  $51,64 \pm 3,2$ ), MCV ( $45,1 \pm 0,86$  fl), MCH ( $16,5 \pm 0,23$  pg), MCHC ( $36,68 \pm 0,77$  g/dl), trombosit ( $315,70 \pm 33,00 \times 10^3/\text{ml}$ ), glukoz ( $66,6 \pm 20,0$  mg/dl), ALT ( $50 \pm 12,0$  IU/l) ve AST ( $372,4 \pm 75,0$  IU/l), kalsiyum ( $8,88 \pm 0,26$  mg/dl), fosfor ( $6,9 \pm 0,50$  mg/dl), sodyum ( $154 \pm 5,1$  mmol/l), potasyum ( $4,98 \pm 0,37$  mmol/l) ve klor ( $112,8 \pm 2,70$  mmol/l) olarak belirlendi. ALT ve AST enzim aktivitelerinde olduğu kadar WBC, trombosit ve glukoz düzeylerinde de geniş varyasyonlar kaydedildi.

**Anahtar Sözcükler:** Hematoloji, biyokimyasal değerler, *Gazella subgutturosa*.

### Introduction

Gazelles live in Mongolia, Syria, Iran, Saudi Arabia, Turkmenistan and Turkey. There are presently approximately 2000 gazelles (*Gazella subgutturosa*). They are bred in a large enclosed area in which they roam freely in Ceylanpınar, 141 km southeast of Şanlıurfa, Turkey.

Normal physiological data from wild species are often difficult to obtain, because the number of animals available for study is generally limited, and frequent and systematic sampling can disrupt the management and well-being of the animals (1).

Hematological and biochemical values are important for assessing the health and nutrition of the animals.

Therefore it is essential for the evaluation of clinical tests in veterinary laboratories that a base reference of normal values of clinically healthy animals is available.

Normal values of hematological and biochemical parameters have been reported for domestic and some wild ruminants (2) but there is no information about these values for Turkey's gazelles.

The aim of this study is to determine the normal values of some hematological and biochemical parameters in the gazelles in Ceylanpınar, Şanlıurfa, Turkey.

## Materials and Methods

This study was performed in 16 gazelles born in a desert wildlife reserve for the state production of farm animals in Ceylanpınar. All animals were apparently healthy with no clinical signs of disease. The ages of the gazelles ranged from 1 to 4 years.

Since it has been demonstrated that any sedation with tranquilizing drugs affects the values of basic hematological and biochemical parameters (3), the animals were manually restrained and no sedatives or anesthetics were used. The gazelles were fasted overnight in pens and then examined.

Blood was withdrawn from the jugular vein. Samples were kept in test tubes containing EDTA for hematological parameters and in vacutainer tubes for biochemical analyses. All samples were evaluated on the same day.

Blood samples for biochemical analyses were centrifuged at 3,000 rpm for 10 min, and the serum was decanted. Then the biochemical parameters were obtained using an autoanalyzer (Technicon RAXT). Hematological values were measured by cell counter (Hematil-2000).

## Results

The Table shows the hematologic and biochemical values for *Gazella subgutturosa* and those reported in other published studies.

## Discussion

Gazelles and deer, members of the artiodactylids, are of interest to veterinarians as they may be sylvatic reservoirs of some important livestock diseases such as rinderpest, foot-and-mouth, leptospirosis, and anaplasmosis (4).

Table. Hematologic and biochemical values for *Gazella subgutturosa* from this and other published studies.

Measure	<i>Gazella subgutturosa</i>	<i>Gazella cuvieri</i>	<i>Gazella thomsoni</i>	<i>Gazella granti</i>	<i>Gazella dorcas</i>	<i>Gazella dama</i>	<i>Antilope cervicapra</i>	<i>Phacochoerus aethiopicus</i>	<i>Dama dama</i>	<i>Cervus timorensis rusa</i>
WBC (x 10 <sup>3</sup> /ml)	10.08 ± 1.50	5.52	3.0	4.1		6.85				
RBC (x 10 <sup>6</sup> /ml)	11.70 ± 1.78	5.76	10.2	12.7		9.14				
Hb (g/dl)	18.85 ± 1.10	15.83	16.7	16.0	17.21	13.73	19.24			
PCV (%)	51.63 ± 3.20	52.56	44.9	41.0	43.90	47.40	49.50			
MCV (fl)	45.10 ± 0.86	91.20		32.6	35.06	52.27	39.83			
MCH (pg)	16.50 ± 0.23	27.63			13.78	15.36	15.46			
MCHC (g/dl)	36.67 ± 0.77	30.32		37.9	39.23	29.24	38.83			
Platelets (x 10 <sup>3</sup> /ml)	315.71 ± 33.00	68.33				60.47				
Glucose (mg/dl)	66.60 ± 20.00	80.53		183.0	105.04	115.88	191.03			
ALT (IU/l)	50.00 ± 12.00	25.92			16.69	20.27	21.78		10.80	60.10
AST (IU/l)	372.40 ± 75.00			79.0	68.84	30.46	58.63		67.20	22.30
Calcium (mg/dl)	8.88 ± 0.26		11.0	9.5	10.15	9.64	9.57	11.74	10.42	9.69
Phosphorus (mg/dl)	6.90 ± 0.50		4.8	6.1	8.35	3.55	10.74	7.15	7.43	9.53
Sodium (mEq/l)	154.00 ± 5.10				155.30	151.65	156.04	145.00	135.80	
Potassium (mEq/l)	4.98 ± 0.37				4.39	4.37	5.01	8.60	4.30	
Chloride (mEq/l)	112.80 ± 2.70				106.02	98.45	98.59	102.50	95.60	
Reference:		6	5	5	7	6	7	11	8	9

It is known that almost all diseases cause some biochemical changes in the body. For this reason blood reference values may help in the diagnosis of disorders.

The average values of WBC and platelets of gazelles in this study were higher than those previously reported (5,6). The values of MCV and MCH in this study were comparable to those of *G. dama* (6) and *Antilope cervicapra* (7). However, they are higher than those of *G. granti* and *G. dorcas* (5,7), but lower than those of *G. cuvieri* (6).

RBC and Hb values are comparable to those reported by some other investigators (5-7), but Abaigar (6) reported lower RBC values in *G. cuvieri* and Hb values in *G. dama*.

PCV levels in this study are similar to those of *G. cuvieri*, *G. dama* (6) and *A. cervicapra* (7) but higher than those of *G. thomsoni*, *G. granti* (5) and *G. dorcas* (7).

While the MCHC values found in this study are higher than those of *G. cuvieri* and *G. dama* (6), they are comparable to those of *G. granti* (5), *G. dorcas* and *A. cervicapra* (7).

In this study the glucose values were lower and AST levels were higher than those reported by some other investigators (5-9). Although higher, the AST levels were similar to those from goats (10). It is possible that the low glucose level was related to the long fasting period. Although ALT levels were similar to those of *Cervus timorensis rusa* (9), they were higher than those of other gazelles (6-8). The sodium and potassium levels found in

the present study are similar to the reported values (5-8,11). Only a few studies have reported different values. Scharfe et al. (8) reported some lower sodium levels in *Dama dama* while Keffen et al. (11) reported some higher potassium levels in *Phacochoerus aethiopicus*. The level of calcium obtained in this study is similar to the reported values (5-9,11); few studies (5,11), have reported higher calcium levels.

The phosphorus levels obtained in the present study are in agreement with those reported by other authors (5,7,8,11). However, they were lower in *G. thomsoni* (5) and *G. dama* (6), but higher in *A. cervicapra* (7) and *C. timorensis rusa* (9).

Although the chloride levels were similar to those reported previously (7,11), some investigators reported slightly lower chloride levels (6,8).

The hematological and biochemical parameters attributed to *G. subgutturosa* in this study were almost in agreement with the results of other researchers. However, some variations could be associated with different factors such as species, nutritional status, agro-climatic conditions, management practices and stress of capturing (3,10).

In conclusion, in this study normal hematological and biochemical levels of *G. subgutturosa* in Ceylanpinar were determined. Wide variations were recorded in the levels of WBC, platelets and glucose as well as in the activities of the enzymes ALT and AST. These results may be helpful to veterinarians and other scientists who study the diagnosis of gazelle diseases.

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