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HAEMOGLOBIN TYPES IN HAIR GOAT BREEDS RAISED IN BURSA REGION

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ABSTRACT: In this study the haemoglobin(Hb) types was investigated in 149 hair goats breed raised in Bursa region. The seperation of haemoglobin types was carried out using the horizontal starch-gel electrophoresis. The frequencies of Hb^A and Hb^B alleles were calculated as 0.83±0.022 and 0.17±0.022, respectively. Differences between expected and observed values of haemoglobin genotypes were insignificant.

Keywords: Blood proteins, haemoglobin types, hair goat

BURSA YÖRESİ KIL KEÇİLERİNDE HEMOGLOBİN TİPLERİ

ÖZET: Bu çalışmada Bursa yöresinde yetiştirilen 149 baş kıl keçisinde Hemoglobin tipleri incelenmiştir. Hemoglobin tiplerinin ayrımında horizontal nişasta-jel elektroforez sistemi kullanılmıştır. Hemoglobin allellerinin frekansları 0.83±0.022 ve 0.17±0.022 olarak hesaplanmıştır. Hemoglobin genotiplerinin gözlenen ve beklenen değerleri arasındaki fark istatistik olarak önemsiz bulunmuştur.

Anahtar kelimeler: Kan proteinleri, hemoglobin tipleri, kıl keçisi

INTRODUCTION

A number of blood protein systems have been found to exhibit heterogeneity in different farm animals. The polymorphic blood traits are useful in studies of relationship between populations, genetic structure of breeds and their evolution. Information on genetic variations of the blood proteins have also been used as an aid in parentage determination and indirect selection.

There are great number of studies in which haemoglobin polymorphism in the blood of numerous foreign goat breeds (Khanolkar et al.,1963; Osterhoff et al.,1972;Garzon et al., 1976; Tucker et al.,1983; Barbancho et al.,1984; Tunon et al.,1987), but such studies with regard to Turkish goat breeds (especially native goat breeds) have been very limited (Yaman, 1976; Erkoç et al.,1987; Elmacı, 1995; Ülkü, 1996).

The present study describes the result of Haemoglobin(Hb) types in Hair Goat breed raised in Bursa region.

MATERIALS AND METHODS

A total of 149 blood sample taken from hair goat breed were analysed. It is major breed, broadly ascribed to Syrian group and widespread in Turkey. It is known locally as the Kil keçi(hair goat) or Adi keçi(Ordinary goat). It is multi-purpose (meat, milk and hair) animal (Porter, 1996)

Blood samples were collected from jugular vein into heparinized test tubes and separated into plasma and red cells by centrifugation. Red cells were washed three times in saline solution and lysed with distiled water. Hemolysates were stored at -20°C until the electrophoretic studies were carried out. Haemoglobin types were identified by starch gel electrophoresis (Braend and Stormont, 1963). The gene frequencies of different haemoglobin's alleles were calculated by direct counting methods(Nei, 1987).

RESULT AND DISCUSSION

Haemoglobin phenotypes HbAA and HbAB controlled by the two codominant autosomic alleles Hb^A and Hb^B in order descending mobilities towards anode were observed(Figure 1).

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Geliş Tarihi :

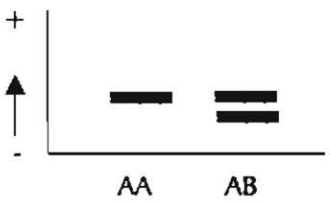

Figure 1. Diagrammatic representation of observed Hb genotypes

Haemoglobin allele frequencies observed in the present materials, together with values published in the literature, are given in Table 1. In the Turkish hair goat breed, like in many other breeds, the frequency of Hb^A allele is considerably higher than Hb^B allele. Because of this, probably Hb^A allele have selective advantage to Hb^B allele.

In this study, population studied is balanced in the Hardy-Weinberg equilibrium(Table 2). Because there are no differences between the expected and observed numbers of the haemoglobin types($P>0.05$).

Table 1. Frequencies of haemoglobin genes in different goat population.

Breeds	N	Hb^A	Hb^B	Reference
Indian goats	100	0.9250	0.0750	Khanolkar et al., 1963
Native Norwegian goat	108	No polymorphism		Efremov and Braend, 1964
Angora, aborter- S.Africa	110	0.9300	0.0700	Osterhoff et al., 1972
Angora, non-aborters- S.Africa	147	0.9400	0.0600	Osterhoff et al., 1972
Granadina	?	0.8834	0.1167	Garzon et al.,1976
Angora, Turkey	184	0.8600	0.1400	Yaman, 1976
Japanese Saanen	79	0.9870	0.0130	Watanabe et al.,1979
Japanese native goat	37	1.0000	0.0000	Watanabe et al.,1979
Ogasawara goats	25	1.0000	0.0000	Watanabe et al.,1979
Yakushima goats	5	1.0000	0.0000	Watanabe et al.,1979
Pakistan goats	3	1.0000	0.0000	Watanabe et al.,1979
Philippines native goats	80	1.0000	0.0000	Watanabe et al.,1979
Thailand native goats	122	1.0000	0.0000	Watanabe et al.,1979
Hungarian native goat	224	0.9540	0.0460	Fesüs et al., 1983
Shinfield	124	0.5050	0.4950	Tucker et al., 1983
Cambridge	8	1.0000	0.0000	Tucker et al., 1983
Compton	13	0.8050	0.1950	Tucker et al., 1983
Babraham	31	0.6950	0.3050	Tucker et al., 1983
Nebo District	168	0.9800	0.0200	Tucker et al., 1983
Boer	48	0.9900	0.0100	Tucker et al., 1983
Angora	7	1.0000	0.0000	Tucker et al., 1983
Saanen	10	1.0000	0.0000	Tucker et al., 1983
Granadina	80	0.8460	0.1540	Barbancho et al., 1984
Murciana	133	0.9320	0.0680	Barbancho et al., 1984
Malaguena	96	0.8440	0.1560	Barbancho et al., 1984
Serrana A.	110	0.9270	0.0730	Barbancho et al., 1984
Spanish goat	?	0.0000	1.0000	Garzon et al., 1985
Jamunapari	592	0.9900	0.0100	Bhat, 1986
Sirohi	30	1.0000	0.0000	Bhat, 1986
Chegu	206	1.0000	0.0000	Bhat, 1987
Changthangi	52	1.0000	0.0000	Bhat, 1987
Ganjam	195	1.0000	0.0000	Panda and Patro, 1987
Black Bengal	20	1.0000	0.0000	Panda and Patro, 1987
Angora, Turkey	831	0.8400	0.1600	Erkoç et al., 1987
Pirenaica	115	0.9800	0.0200	Tunon et al., 1987
Verata	100	0.7200	0.2800	Tunon et al., 1987
Guadarrama	101	1.0000	0.0000	Tunon et al., 1987
Zamorana	110	0.9900	0.0100	Tunon et al., 1987

Berciana	100	0.9600	0.0400	Tunon et al., 1987
Granadina	101	0.8900	0.1100	Tunon et al., 1987
B.Andaluza	100	1.0000	0.0000	Tunon et al., 1987
B.Celtiberica	100	0.7800	0.2200	Tunon et al., 1987
Murciana	100	0.9800	0.0200	Tunon et al., 1987
Negra Serrana	100	0.9800	0.0200	Tunon et al., 1987
Malaguena	100	0.8300	0.1700	Tunon et al., 1987
Canaria	99	0.8000	0.2000	Tunon et al., 1987
Palmera	36	0.9400	0.0600	Tunon et al., 1987
Retinta	108	1.0000	0.0000	Tunon et al., 1987
Dwarf goat	116	1.0000	0.0000	Wussow and Plische ,1990
Angora, Turkey	231	1.0000	0.0000	Elmacı, 1995
MaltaX Hair cross-bred , Turkey	125	0.8760	0.1240	Ülkü, 1996
Hair goat, Turkey	149	0.8300	0.1700	Elmacı, present study

Table 2. Observed and expected values of haemoglobin types and gene frequencies in Hair Goat.

n		Genotypes			Gene frequencies	
		HbAA	HbAB	HbBB	Hb^A	Hb^B
149	Observed	99	50	0	0.83 ± 0.022	0.17 ± 0.022
	Expected	102.65	42.05	4.30		

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