

A LOCAL LIVESTOCK PROTECTION DOG TYPE RAISED IN COKELEZ MOUNTAIN REGION IN DENIZLI PROVINCE OF TURKEY

Orhan Yilmaz¹, Mehmet Ertugrul²

¹Ardahan University, Vocational High School of Technical Sciences, 75000, Ardahan, Turkey

²Ankara University, Faculty of Agriculture, Department of Animal Science, 06110, Ankara
Tel: +90-4782112687/5135, Fax: +90-4782112937

Corresponding author email: zileliorhan@gmail.com

Abstract

This study was conducted to define some morphological characteristics of a local type of Turkish Kangal (Karabas) Shepherd Dogs raised in Denizli province by comparing them with certain other breeds from other regions of Turkey, USA and UK. To this end, a total of 48 (39 males and 9 females) dogs were analyzed with the Minitab 16 statistical software program using ANOVA and Student's T-Test. Descriptive statistics were for withers height 78.7 ± 0.59 , height at rump 78.4 ± 0.60 , body length 87.6 ± 1.14 , heart girth circumferences 91.2 ± 0.86 , chest depth 36.4 ± 0.63 , cannon circumferences 15.3 ± 0.20 and tail length 51.0 ± 0.51 cm, respectively. The overall results of the study demonstrated that Turkish Kangal (Karabas) Shepherd Dogs raised in Denizli province had a very close resemblance to dogs raised in the UK and USA, but that they were larger than the dogs raised in other regions of Turkey. It could be because of better life conditions or higher genotypic capacity.

Key words: Genetic resource, Karabas shepherd dog, morphological trait.

INTRODUCTION

It is believed by scientist that the domestic dog (*Canis familiaris*) is the first domesticated animal (Clutton-Brock, 1995). Belli has found some rock carving figures in the village of Calli, in the district of Kagizman, in Kars province. Those figures showed that dog was used as a hunting tool to hunt deer and/or wild goats in that region (Yilmaz, 2007^b).

The Republic of Turkey is like a bridge between Asia and Europe geographically, thus lots of civilizations either lived or passed through Turkey in ancient times. Hence Turkey has a wide array of domestic animal species such as cattle, water buffalos, camels, horses, donkeys, sheep, goat, dogs, cats, rabbit, bees and poultry including lots of breeds (Wilson et al., 2011; Yilmaz and Ertugrul, 2012^c; Yilmaz and Wilson, 2011; Yilmaz et al., 2012^{a-c})

In Turkey there are about 11 dog breeds and five of those are livestock protection dogs. Turkish Kangal (Karabas) Shepherd, Turkish Akbash Shepherd, Kars (Caucasian) Shepherd, Koyun, and Karaman Dogs are native livestock protection dog breeds of Turkey (Yilmaz and Ertugrul, 2011^{a-c}; Yilmaz, 2012; Yilmaz and

Ertugrul, 2012^{a-e}). Turkish Kangal (Karabas) Shepherd is an elegant livestock protection dog breed which is bred by Turks for centuries (Broadhead, 2003; Yilmaz, 2006; Yilmaz, 2007^a).

The province of Denizli is located in southwest of Turkey and in east of Aegean Region. The province has a passage character among three geographical regions of Aegean, Central Anatolia and Mediterranean. The population of the province is about 0.94 million. Denizli is rich about freshwaters therefore agriculture is a crucial sector in the province (www.denizli.gov.tr, 2012).

A number of studies have been carried out on Turkish Kangal (Karabas) Shepherd Dogs as seen in Table 1. A PhD study was carried out by Kirmizi (1991) on 86 Turkish and 249 German Shepherd Dogs raised at Gemlik Military Veterinary School and Education Centre Commandership (GAVOK) between 1982 and 1990. Yildiz et al. (1993) worked on head sizes of Turkish and German Shepherd Dogs raised at GAVOK. Ozbeyaz (1994) studied the body traits of 59 Kangal Dogs raised at GAVOK. Gonul (1996) carried out a study to determine body traits and training

performance of 202 Turkish and 464 German Shepherd Dogs raised at GAVOK. Tepeli (1996) made a PhD study to determine body traits, growth rate and reproductive performance of 57 Turkish Kangal Shepherd Dogs raised at Research Centre of Veterinary Faculty in Selcuk University. Ozcan and Altinel (1997) worked on some morphological traits of 45 Kangal and 63 German Shepherd Dogs raised at GAVOK. Altuner (1998) prepared a PhD thesis to determine reproductive performance, survival rate, growth and body traits of 32 adult and 167 juvenile Kangal Dogs raised at Ulas Agricultural Management Institution in Sivas province. Tepeli and Cetin (2003) carried out a study on head traits of Kangal and Akbash Shepherd Dogs. In this study 33 Kangal and 30 Akbash Dogs were measured for four head traits. Daskiran (2007) studied to define some morphological traits on 38 Kangal Dogs. The goal of this study is to define some body measurements of local Kangal (Karabas) livestock protection dogs raised in Denizli Province by comparing with livestock protection dogs raised in different regions of Turkey, USA and UK.

MATERIALS AND METHODS

Experimental animals

The Kangal (Karabas) livestock protection dogs in the study were surveyed in September 2012 in the Denizli province (37°46'N; 29°04'E) (www.googleearth.com). A total of 48 dogs, 39 males and 9 females, were studied. The dogs were aged from 1 to 15 years, and divided into three age groups: 1-2 years, 3-4 years, and 5-15 years. In the first group there were 14 males and 2 females; in the second group there were 15 males and 7 females; and in the third group there were only 10 males. The ages of the dogs were determined from the information given by their owners.

Measurements

The sampled dogs were measured for withers height (WH), height at rump (HR), body length (BL) and chest depth (CD) by using a

measuring stick calibrated in centimetres. Other linear measures such as hearth girth circumferences (HGC), cannon circumferences (CC) and tail length (TL) were measured by using a graduated plastic tape (Yilmaz, 2007^a).

Statistical analysis

The data obtained were analyzed using the Minitab 16 statistical software program. Descriptive statistics for body dimensions were analyzed using ANOVA and Student's T-Test that also determined the impact of sex, age and coat colour group on the response variables of WH, HR, BL, HGC, CD, CC, and TL (Anonymous, 2011).

RESULTS AND DISCUSSIONS

As seen in Table 2, between male and female dogs there were significant differences for morphological traits of WH, HR, and BL ($P < 0.01$) and HGC ($P < 0.05$). For all results, significant or not, male dogs yielded higher values than females. The coat colour effect was not significant for all morphological traits.

For the age factor there were significant differences among age groups for the traits of WH ($P < 0.01$), HR, and CD ($P < 0.05$). The age group of 5-15 years old had the higher values than the other two groups.

The phenotypic correlation values displayed in the Table 3 showed that most of the observed values were affected by selected factors. The highest values were found between WH and HR ($r = 0.92$) ($P < 0.01$). Other high values were found between WH and HGC ($r = 0.68$), HR and HGC (0.63) WH and CD (0.51) and WH and CW ($r = 0.50$) ($P < 0.01$), which were higher than $r = 0.50$ ($P < 0.01$). The correlations of CD-BL, and HR-CD, HGC-CD, WH-BL and HR-BL also yielded higher values than $r = 0.70$ ($P < 0.01$). The lowest and the only negative correlation value ($r = -0.05$) were found between BL-CD ($P < 0.05$). Other low correlation values were found between BL-CC ($r = 0.11$) and BL-CW ($r = 0.19$).

Table 1. Some morphological traits on Turkish Kangal (Karabas) dogs

BREED AND SOURCE	WH (cm)	HR (cm)	BL (cm)	HGC (cm)	CD (cm)	CC (cm)	TL (cm)
Kirmizi (1991)	68(♂) 62.9(♀)	-	71.5(♂) 67.4(♀)	-	-	14.7(♂) 14.0(♀)	
Yildiz et al. (1993)	-	-	-	-	-	-	
Ozbeyaz (1994)	69.1(♂) 62.4(♀)	71(♂) 64(♀)	-	82.1(♂) 73.9(♀)	-		
Gonul (1996)	63		71.2	82.3-85.8(♂) 74.8-80.2(♀)	21.1	13.5-14.8(♂) 12.1-14.3(♀)	
Tepeli (1996)	68.9	70.4	63.8	82.6(♂) 78.0(♀)	24.7(♂) 23.0(♀)	13.5(♂) 13.0(♀)	54.5(♂) 51.5(♀)
Ozcanand Altinel (1998)	-	-	-	-	28.8(♂) 26.8(♀)	13.8(♂) 12.7(♀)	46.8(♂) 43.7(♀)
Altuner (1998)	-	-	-	-	-		
Tepeli and Cetin (2003)	-	-	-	-	-		
Daskiran (2007)	71.7(♂) 65.2(♀)	72.1(♂) 64.5(♀)	71.1(♂) 66.2(♀)	-	-		
Yilmaz (2007 ^a)	75.9(♂) 73.3(♀)	74.9(♂) 72.2(♀)	86.4(♂) 81.9(♀)	87.2(♂) 84.9(♀)	31.9(♂) 31.2(♀)	13.4(♂) 13.1(♀)	48.3(♂) 47.2(♀)
(www.akdc.com.uk, 2011)	74- 81(♂) 71- 79(♀)	-	-	-	-		
(www.ukcdogs.com, 2011)	74- 81(♂, 71- 79(♀)	-	-	-	-		

Table 2. Descriptive statistics and comparison results of some morphological characteristics of Turkish Kangal (Karabas) Dogs for different sexes and ages

Traits	Overall (n=48)	Sex		Age (Year)		
		Male (n=39)	Female (n=9)	1-2 (n=16)	3-4 (n=22)	5-15 (n=10)
	$\bar{X} \pm S_{\bar{x}}$	$\bar{X} \pm S_{\bar{x}}$	$\bar{X} \pm S_{\bar{x}}$	$\bar{X} \pm S_{\bar{x}}$	$\bar{X} \pm S_{\bar{x}}$	$\bar{X} \pm S_{\bar{x}}$
WH (cm)	78.7 ± 0.59	79.4A ± 3.62	78.7B ± 0.59	77.3A ± 3.98	78.0A ± 3.32	82.3B ± 3.83
HR (cm)	78.4 ± 0.38	79.1A ± 3.72	75.1B ± 4.54	76.9a ± 4.07	78.0b ± 3.61	81.5c ± 4.12
BL (cm)	87.6 ± 1.14	88.5A ± 6.84	83.6B ± 10.93	84.5 ± 8.81	88.2 ± 7.77	91.2 ± 4.61
HGC (cm)	91.2 ± 0.86	92.1a ± 5.42	87.1b ± 6.85	90.0 ± 6.96	90.8 ± 5.31	93.9 ± 5.34
CD (cm)	36.4 ± 0.63	36.8 ± 4.55	34.9 ± 3.22	36.5b ± 3.32	34.9a ± 3.97	39.7c ± 5.23
CC (cm)	15.3 ± 0.20	15.6 ± 1.19	14.0 ± 1.30	15.3 ± 1.40	15.0 ± 1.34	15.9 ± 1.17
TL (cm)	51.0 ± 0.51	51.7 ± 3.37	47.9 ± 2.71	51.6 ± 2.47	49.8 ± 3.90	52.5 ± 3.75

a, b, c = P<0.05; A, B = P<0.01

* There were no significant differences between means which had not letters of the alphabet in factor groups.

Table 3. Phenotypical correlation coefficients (r) between body measurements in dogs

Traits	WH	HR	BL	HGC	CD	CC
HR	0.92**					
BL	0.47**	0.47**				
HGC	0.68**	0.63**	0.32*			
CD	0.51**	0.48**	-0.05	0.48**		
CW	0.50**	0.41**	0.19	0.41**	0.45**	
CC	0.22**	0.40**	0.11	0.34*	0.49**	0.38**

*P<0.05, **P<0.01

According to the results obtained in this research, Denizli dogs were large-size livestock protection dogs. The results showed that dogs from Denizli were the largest dog group in Turkish Kangal (Karabas) Shepherd dogs by comparing with other studies. Related with the trait of WH the result obtained agreed with only results from the UK and USA Kennel Clubs. The values of WH in this study were lower than the values reported by other researchers of Kirmizi (1991), Yildiz et al. (1993), Ozbeyaz (1994), Gonul (1996), Tepeli (1996), Ozcan and Altinel (1998), Altuner (1998), Tepeli and Cetin (2003), Daskiran (2007) and Yilmaz (2007).

For the traits of HR, BL, HGC, CD and CC all the values reported by Kirmizi (1991), Yildiz et al. (1993), Ozbeyaz (1994), Gonul (1996), Tepeli (1996), Ozcan and Altinel (1998), Altuner (1998), Tepeli and Cetin (2003), Daskiran (2007) and Yilmaz (2007) were lower than the values of this study. It could be concluded that for the traits of HR, BL, HGC, CD and CC, dogs raised in the other regions of Turkey were lower than dogs raised in Denizli province. The value for TL obtained in this study was lower than results reported by Tepeli (1996), but higher than results reported by Ozcan and Altinel (1998) and Yilmaz (2007).

CONCLUSIONS

The results of the current study show that Turkish Kangal (Karabas) Shepherd Dogs raised in Denizli Province have a very close resemblance to the dogs raised in the UK and USA. It could also be concluded that the Turkish Kangal (Karabas) Shepherd Dog raised in Denizli was larger than the dogs raised in other regions of Turkey. The overall results of the current study show that the Turkish Kangal Dogs raised in Denizli region are the largest dog group in Turkey and also are similar in size dogs raised in USA and UK. It can be said that could be because of better life conditions or higher genotypic capacity. The dogs raised in Denizli region can be examined more by scientists.

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