



RESEARCH ARTICLE

Comparison of some morphological characteristics of native Turkish dog breeds

Metin Erdoğan¹, Cafer Tepeli^{2*}, Ceyhan Özbeyaz³, Mine D. Akbulut¹, Cevdet Uğuz¹

Özet

Erdoğan M, Tepeli C, Özbeyaz C, Akbulut MD, Uğuz C. Türkiye yerli köpek ırklarının bazı morfolojik özelliklerinin karşılaştırılması. *Eurasian J Vet Sci*, 2012, 28, 2, 106-110

Amaç: Bu araştırma Türkiye'deki yerli köpek ırklarının bazı morfolojik özelliklerini karşılaştırmak amacıyla yapılmıştır.

Gereç ve Yöntem: Araştırmada 30 Kangal Çoban Köpeği, 33 Akbaş Çoban Köpeği, 14 Beyaz Kars Çoban Köpeği, 23 Siyah Kars Çoban Köpeği ve 30 Türk Tazısı olmak üzere farklı yaşlardaki toplam 130 adet köpekten cidago yüksekliği, sağrı yüksekliği, beden uzunluğu, göğüs genişliği, göğüs derinliği, göğüs çevresi, baş çevresi, baş uzunluğu ve yüz uzunluğu gibi beden ölçüleri alınmıştır.

Bulgular: Cidago yüksekliği, sağrı yüksekliği, beden uzunluğu, göğüs genişliği, göğüs derinliği, göğüs çevresi, baş çevresi, baş uzunluğu ve yüz uzunluğu sırasıyla Kangal Çoban Köpeklerinde 76.20, 76.26, 69.19, 26.32, 33.46, 94.01, 58.43, 35.50 ve 14.76 cm; Akbaş Çoban Köpeklerinde 68.11, 68.77, 61.97, 22.32, 28.66, 80.96, 51.88, 31.56 ve 13.72 cm; Beyaz Kars Çoban Köpeklerinde 66.63, 67.91, 64.55, 22.09, 27.44, 80.11, 55.36, 31.94 ve 13.14 cm; Siyah Kars Çoban Köpeklerinde 66.99, 68.05, 63.28, 21.06, 27.90, 78.52, 54.93, 30.39 ve 13.16 cm; Türk Tazılarında ise 62.45, 62.59, 51.44, 16.76, 25.30, 65.27, 35.87, 27.19 ve 11.72 cm olarak ölçülmüştür. Araştırmada incelenen morfolojik özellikler bakımından Kangal Çoban Köpekleri ile ilgili değerler diğer ırklara göre yüksek bulundu ($p<0.05$).

Öneri: Türk Tazılarının ırk özellikleri ve genetik yapılarının belirlenmesine yönelik daha detaylı çalışmaların yapılması gerekir.

Abstract

Erdogan M, Tepeli C, Ozbeyaz C, Akbulut MD, Uguz C. Comparison of some morphological characteristics of native Turkish dog breeds. *Eurasian J Vet Sci*, 2012, 28, 2, 106-110

Aim: The objective of this study was to compare some morphological characteristics of the native Turkish dog breeds.

Materials and Methods: A total of 130 dogs, comprised of 30 Kangal Shepherd Dogs, 33 Akbaş Shepherd Dogs, 14 white Kars Shepherd Dogs, 23 black Kars Shepherd Dogs, and 30 Turkish Tazi, were used in the study. Body measurements such as shoulder height (SH), rump height (RH), body length (BL), front chest width (FCW), chest depth (CD), chest girth (CG), head girth (HG), head length (HL), and muzzle length (ML) were taken in different aged dogs.

Results: Morphological characteristics, specifically shoulder height (SH), rump height (RH), body length (BL), front chest width (FCW), chest depth (CD), chest girth (CG), head girth (HG), head length (HL), and muzzle length (ML), were 76.20, 76.26, 69.19, 26.32, 33.46, 94.01, 58.43, 35.50 and 14.76 cm in Kangal Shepherd Dogs; 68.11, 68.77, 61.97, 22.32, 28.66, 80.96, 51.88, 31.56 and 13.72 cm in Akbaş Shepherd Dogs; 66.63, 67.91, 64.55, 22.09, 27.44, 80.11, 55.36, 31.94 and 13.14 cm in white Kars Shepherd Dogs; 66.99, 68.05, 63.28, 21.06, 27.90, 78.52, 54.93, 30.39 and 13.16 cm in black Kars Shepherd Dogs; 62.45, 62.59, 51.44, 16.76, 25.30, 65.27, 35.87, 27.19 and 11.72 cm in Turkish Tazi, respectively. In conclusion, the study showed that the measurements of these traits in the Kangal Shepherd Dog were significantly greater than those in the other Turkish dog breeds ($p<0.05$).

Conclusion: Detail studies are needed to determine breed characteristics and genetic characteristics of Turkish Tazi.

¹Department of Medical Biology and Genetics, Faculty of Veterinary Medicine, Kocatepe University, Afyonkarahisar, ²Department of Animal Science, Faculty of Veterinary Medicine, Selcuk University, Konya, ³Department of Animal Science, Faculty of Veterinary Medicine, Ankara University, Ankara, Turkey
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*ctepeli@selcuk.edu.tr

Anahtar kelimeler: Türkiye, yerli köpekler, morfolojik özellikler, Kangal, Akbaş, Kars, Tazi

Keywords: Turkey, native dogs, morphological characteristics, Kangal, Akbaş, Kars, Tazi

► Introduction

Historically, the native Turkish dog breeds have been divided into Turkish Shepherd Dogs (livestock guardian dogs) and Turkish Hunting Dogs. In the International Symposium on Turkish Shepherd Dogs held in Konya, Turkey in 1996, the Kangal, Akbaş and Kars Shepherd Dogs were recognized as comprising the first group and the Turkish Tazı as comprising the second (Nelson 1996).

The Kangal Shepherd Dog is considered to be the national dog of Turkey and is reared in places where Akkaraman sheep are bred and especially in the eastern central region of Turkey, specifically Sivas province. Although Sivas and the town of Kangal have been the center of Kangal Shepherd Dog breeding, good examples of the breed can also be found in different regions of Turkey. There are many studies concerning the morphological characteristics of Kangal Shepherd Dogs in Turkey (Kırmızı 1991, Yıldız et al 1993, Özbeyaz 1994, Gönül 1996, Özcan and Altınel 1997, Altınel 1998, Tepeli and Çetin 2000, Onar et al 2001, Tepeli and Çetin 2003, Tepeli et al 2003, Atasoy et al 2005, Daşkiran and Cedden 2006, Daşkiran 2007, Yılmaz 2007). Therefore, it has been possible to determine a breed standard for the Kangal Shepherd Dog using these studies.

The Akbaş Shepherd Dog is a white livestock guardian breed having two coat varieties (long and medium). These dogs are primarily found in the provinces around Ankara, Konya, Afyon, and Eskişehir. Especially, Sivrihisar and its villages are generally considered to be the center of Akbaş Shepherd Dog breeding. Studies on the morphological characteristics of the Turkish Akbaş Shepherd Dog are very limited (Nelson 1996, Tepeli et al 2003, Atasoy et al 2011).

The Kars Dog is found in the northeastern parts of Turkey, in places where Morkaraman sheep are bred. Of the three native Turkish shepherd dog breeds, this breed shows the most variation in coat color and length. Some of the dogs are very similar visually to the Caucasian Owtscharka (Caucasian Mountain Dog) found across the Turkish border with the Republics of Georgia and Armenia. Others resemble the Akbaş Shepherd Dogs. Studies focusing on the morphological characteristics of Kars Shepherd Dogs are also rare (Nelson 1996, Kırmızıbayrak 2004).

The native Turkish Hunting Dog, the Turkish Tazı, is mostly seen in central and southern parts of Turkey. They are used to hunt small game, such as rabbits and fox. Nelson (1996) reported that coat color of Turkish Tazı was not a defining breed characteristic. Further data are needed to determine breed characteristics of the Turkish Tazı.

Morphological characteristics vary greatly among dog breeds. One example is the proportion of head length to head girth, which varies from 0.73 to 0.83

in dolichocephalic dogs and from 0.53 to 0.62 in mesocephalic dogs (Spira 1982, Evans and Christensen 1993). Characteristics such as these are important in distinguishing the breeds and in determining the genetic relationship between them.

This study was carried out to compare some morphological characteristics of native Turkish dog breeds and to determine the main distinctions among these breeds.

► Materials and Methods

• Animals

In this study, a total of 130 dogs, consisting of 30 Kangal Shepherd Dogs, 33 Akbaş Shepherd Dogs, 14 white Kars Shepherd Dogs, 23 black Kars Shepherd Dogs, and 30 Turkish Tazı, were used. The dogs chosen were unrelated, representative of their breed, and different ages (1+ years). Kangal Shepherd Dogs were selected from dogs raised by the Selçuk University Veterinary Faculty Kennel, on private farms, and in villages located in Sivas, Konya, Ankara and Afyon. Akbaş Shepherd Dogs consisted of dogs reared by the Selçuk University Veterinary Faculty Kennel and in villages in Afyon, Eskişehir, Sivrihisar, and Ankara. Kars Dogs were sampled from dogs in villages in Kars, Iğdır, and Erzurum. The Turkish Tazı used in the study belonged to villagers in Konya, Afyon, Eskişehir and Ankara.

In selecting the population to be studied, care was taken to ascertain that the dogs were purebred. In the case of Turkish native dog breeds, no formal registration or certification of purity exists, thus, the burden falls on the researchers to select the research population with care. Two methods of establishing purity were questioning the owners about each dog's parentage and establishing the individual dog's general conformity to accepted breed phenotype (Nelson 1996).

• Data

Morphological body measurements taken in the study were shoulder height (SH), rump height (RH), body length (BL), front chest width (FCW), chest depth (CD), chest girth (CG), head girth (HG), head length (HL), and muzzle length (ML).

A measuring stick was used to measure SH, RH, BL, FCW, and CD, while a tape measure was used to measure CG, HG, HL, and ML. All of the measurements were taken by the same person to ensure consistency. The measurement was performed as described by Tepeli and Çetin (2000) and Özbeyaz (1994). The body measurements used for morphological characteristics are shown in the Turkish Tazı's figure below. Coat colors and coat varieties were also recorded for the dogs in the study.

• Statistical Analysis

The data for the morphological traits (SH, RH, CD, BL,

FCW, HL, HG, CG, and ML) were analyzed with General Linear Model (GLM Multivariate) and the differences for these parameters among breed and age groups were checked with Tukey's test. Descriptive statistic was used for some morphological traits such as coat color types. The statistical analyses were performed in SPSS 17.0 packet program in Windows XP.

► Results

The least square means and their standard errors of the body measurements in the dog breeds are seen in Table 1. The maximum SH, RH, BL, FCW, CD, CG, HG, HL, ML were 76.20, 76.26, 69.19, 26.32, 33.46, 94.01, 58.43, 35.50, 14.76 cm in Kangal Shepherd Dogs, respectively, the minimum for these traits was 62.45, 62.59, 51.44, 16.76, 25.30, 65.27, 35.87, 27.19, 11.72 cm in the Turkish Tazi breed, respectively ($p < 0.05$). There were no significant differences among the means of all body measurements among white Kars, black Kars, and Akbaş Shepherd Dogs; however, the differences regarding all body measurements were significant ($p < 0.05$) between the Kangal Shepherd and the Turkish Tazi breeds.

The maximum HG (58.43 ± 0.88 cm) was found in the Kangal Shepherd Dog, while the smallest one (35.87 ± 0.98 cm) was in the Turkish Tazi breed ($p < 0.05$). The average muzzle length was 14.76 ± 0.26 cm in the Kangal Shepherd Dog, while it was 11.72 ± 0.29 cm in the Turkish Tazi ($p < 0.05$). However, the differences in muzzle length in the three livestock guardian breeds were found to be insignificant. The Turkish Tazi differed significantly from those three breeds. The proportion of HL to HG in Kangal, Akbaş, white Kars, black Kars Shepherd Dogs, and Turkish Tazi were 0.61, 0.61, 0.58, 0.55, and 0.76, respectively ($p < 0.05$).

All Kangal Shepherd Dogs in the study had black muzzles and short double coats ranging from light cream to steel gray, depending on the number of black guard hairs in the coat. The numbers of long and medium coat Akbaş Shepherd Dogs were 21 (63.64%) and 12 (36.36%), respectively. Three (20%) of the white Kars Shepherd Dogs had long coats, while twelve (80%) had medium coats. All black Kars Shepherd Dogs had long coats, and the color ranged from solid black to brown with white on the toes and chest. Two coat varieties were seen in Turkish Tazi. Twenty-two (73.33%) were feathered, and eight (26.66%) were smooth. The feathered had silky flowing hair on the ears, underside of tail, legs, stern, and back of thighs. The smooth had short silky hair over the entire body. This breed showed a large variety in color and color patterns. The observed colors were 18 (60%) black, which includes black with tan markings, 1 (3.33%) fawn, 1 (3.33%) cream, 1 (3.33%) silver, 2 (6.66%) liver, and 1 (3.33%) grey. The observed color patterns were 18 (60%) bi-color, 9 (30%) grizzle, 1 (3.33%) solid and 2 (6.66%) parti-color.

► Discussion

There have been many studies (Kırmızı 1991, Yıldız et al 1993, Özbeyaz 1994, Gönül 1996, Özcan and Altinel 1997, Altiner 1998, Tepeli and Çetin 2000, Onar et al 2001, Tepeli and Çetin 2003, Tepeli et al 2003, Atasoy et al 2005, Daşkıran and Cedden 2006, Daşkıran 2007, Yılmaz 2007) on the morphological characteristics of Kangal Shepherd Dogs. While most of these (Kırmızı 1991, Yıldız et al 1993, Özbeyaz 1994, Gönül 1996, Özcan and Altinel 1997, Altiner 1998, Tepeli and Çetin 2000, Onar et al 2001, Tepeli and Çetin 2003, Tepeli et al 2003, Daşkıran and Cedden 2006, Daşkıran 2007) have been conducted on Kangal Shepherd Dogs reared in government kennels, very few (Atasoy et al 2005, Yılmaz 2007) have been carried out on Kangal Shepherd Dogs raised on private farms or in villages. When these two additional sources were included in this study, there were significant increases in some body measurements; specifically, the Kangal Shepherd Dogs raised on private farms and in villages were larger, being both taller and broader (SH, RH and HG), than those raised in government kennels. This is possibly due to the individual breeders on farms and in villages selecting for traits associated with successful livestock guarding and predation control or due to the individual breeders' personal preferences. Yılmaz (2007) reported the average BL for Kangal Shepherd Dogs raised in the villages was 87 cm. This is significantly higher than in other studies (Kırmızı 1991, Gönül 1996, Özcan and Altinel 1997, Altiner 1998, Tepeli and Çetin 2000, Tepeli et al 2003, Atasoy et al 2005). The difference can be explained by the method used to measure BL in that study (Yılmaz 2007).

Atasoy et al (2011) reported that average SH, BL, CW, CD, CG, HL and ML in Akbaş Shepherd Dogs located in Eskişehir, Sivrihisar and Gölbaşı were 64.42 cm, 66.13 cm, 20.63 cm, 26.82 cm, 82.09 cm, 28.75 cm, and 12.20 cm, respectively. The average SH, RH, BL, CG, HG, HL and ML in one year of Akbaş Shepherd Dogs were 65 cm, 66 cm, 59 cm, 71 cm, 44 cm, 27 cm, and 11.5 cm, in other studies, respectively (Tepeli et al 2003, Tepeli and Çetin 2003). In this study, all these same measurements were greater than those reported by Tepeli et al (2003), Tepeli and Çetin (2003) be-

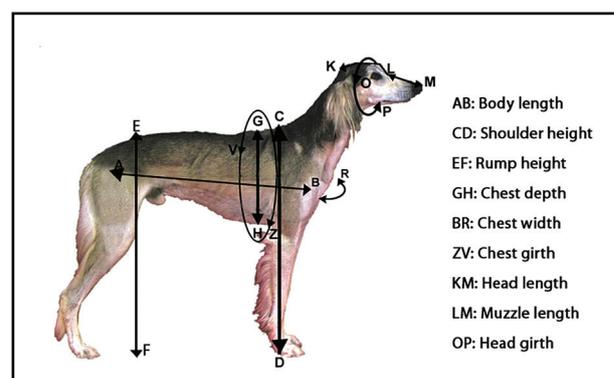


Figure 1. Body parts taken for body measurements in Turkish Tazi.

cause of the age of the dogs, and the inclusion of dogs from private farms and villagers; however, findings of the study for body measurements were in accordance with body measurements of reported by Atasoy et al (2011). This study also supports the conclusion of Tepeli et al (2003) that the Kangal Shepherd Dog breed is larger than the Akbaş Shepherd Dog.

The measurements of SH in Kars Shepherd Dogs have been reported to be as 61-71 cm by Nelson (Nelson 1996). The average SH, CG, BL, FCW, CD, HG, and HL in Kars Shepherd Dogs were 63.9 cm, 77.3 cm, 68.4 cm, 17.5 cm, 26.1 cm, 54 cm, and 30.6 cm, respectively, in another study (Kırmızıbayrak 2004). The SH was reported between 65cm and 85 cm in the Caucasian Ovcharka breed resembling black Kars Shepherd Dog (Wilcox and Walkowicz 1995). Average SH in the study for white and black Kars Dogs was greater than that of Kırmızıbayrak (2004) and was in accordance with Nelson (Nelson 1996) findings. However, average body measurements such as CG, CD, FCW, HG, and HL in black Kars Shepherd Dogs in this study were greater than of Kırmızıbayrak (2004). The differences can be linked to sampling methods of the researches.

SH was measured between 56 cm and 71 cm in Saluki, Kyrgyz Taigan, and Kazakhstan Tazi (Wilcox and Walkowicz 1995, Kovalenko A 2007, Kurmakulov 2007). Average SH in the Turkish Tazi was similar to the other sighthound. The cause of the having the lower body measurements in Turkish Tazi in comparison to the other breeds in this study, can be attributed to their use in hunting and not allowing them staying in a group of shepherd dog breeds which is commonly the case for other shepherd dogs

The differences between the means of the SH, RH, BL, CD, CG, ML and HL were found to be insignificant among Kars (white), Kars (Black) and Akbaş breeds; in Kangal and Turkish Tazi breeds are found as significant ($p < 0.05$). This study showed that Kars (White), Kars (Black) and Akbaş breeds are similar to each other and the Kangal Shepherd Dogs are different from them on the basis of these characteristics. But, the formation of the Kangal Dog populations by the private farm dogs, and the formation of the other breeds populations by the field dogs can be the cause. In private farms, because the economic producing is the main aim, these dogs are fed well-balanced and showed better their genetic capacity. But, because the dogs, bred in the field, are fed with grains, it is possible to be regression in their some characters.

All the measurements obtained in this study, (except body length) for Kangal breed in this study, are generally higher than that of other breeds. The reason is for that being a herd breeding in Gemlik and being a high relationship among dogs can be told (Özbeyaz 1994). The dogs not relative to each other in the private farms constituting most of the Kangal Shepherd Dog populations in this study. In these farms, since the main

Table 1. Least squares means for some body measurements in Native Turkish Dog Breeds (cm).

Factors	n	SH	RH	BL	FCW	CD	CG	HG	HL	ML
		$\bar{x} \pm S.E.$								
Breeds										
Kangal	30	76.20 ^a ±0.90	76.26 ^a ±0.89	69.19 ^a ±0.76	26.32 ^a ±0.60	33.46 ^a ±0.59	94.01 ^a ±1.33	58.43 ^a ±0.88	35.50 ^a ±0.50	14.76 ^a ±0.26
Akbaş	33	68.11 ^b ±1.07	68.77 ^b ±1.06	61.97 ^b ±0.90	22.32 ^b ±0.71	28.66 ^b ±0.71	80.96 ^b ±1.59	51.88 ^b ±1.05	31.56 ^b ±0.59	13.72 ^b ±0.31
White Kars	14	66.63 ^b ±1.49	67.91 ^b ±1.48	64.55 ^b ±1.26	22.09 ^b ±0.99	27.44 ^b ±0.99	80.11 ^b ±2.21	55.36 ^b ±1.46	31.94 ^b ±0.83	13.14 ^b ±0.44
Black Kars	23	66.99 ^b ±1.22	68.05 ^b ±1.21	63.28 ^b ±1.03	21.06 ^b ±0.81	27.90 ^b ±0.80	78.52 ^b ±1.80	54.93 ^b ±1.19	30.39 ^b ±0.67	13.16 ^b ±0.36
Turkish Tazi	30	62.45 ^c ±1.00	62.59 ^c ±1.00	51.44 ^c ±0.85	16.76 ^c ±0.67	25.30 ^c ±0.66	65.27 ^c ±1.49	35.87 ^c ±0.98	27.19 ^c ±0.55	11.72 ^c ±0.29
Sex										
Male	87	69.64 ^a ±0.59	70.31 ^a ±0.58	63.41 ^a ±0.49	22.27 ^a ±0.39	28.97 ^a ±0.39	81.20 ^a ±0.87	52.46 ^a ±0.57	32.27 ^a ±1.49	13.81 ^a ±0.17
Female	43	65.14 ^b ±0.88	65.74 ^b ±0.87	58.94 ^b ±0.74	20.23 ^b ±0.59	27.44 ^b ±0.58	75.68 ^b ±1.30	48.08 ^b ±0.86	29.40 ^b ±1.49	12.48 ^b ±0.26
Age										
1 year	16	65.01±1.26	65.89±1.25	55.86 ^b ±1.06	18.98 ^b ±0.84	25.77 ^b ±0.83	70.57 ^b ±1.86	47.14±1.23	29.65±0.69	12.89±0.37
2-4 years	76	68.12±0.65	68.70±0.65	63.27 ^a ±0.55	21.93 ^a ±0.43	28.75 ^a ±0.43	80.37 ^a ±0.96	51.13±0.64	31.47±0.36	13.34±0.19
Over 5 years	38	68.93±0.86	69.44±0.85	63.48 ^a ±0.72	22.48 ^a ±0.57	29.66 ^a ±0.57	83.04 ^a ±1.27	52.25±0.84	31.37±0.47	13.27±0.25

a, b, c; Different letters at the same column show significant difference at $P < 0.05$. SH: Shoulder height, RH: Rump height, BL: Body length, FCW: Front chest width, CD: Chest depth, CG: Chest girth, HG: Head girth, HL: Head length, ML: Muzzle length

purpose of dog production to make economical profit rather than herd breeding, the conditions of breeding are much better such as better feeding. Also, genetic capacity and diversity of the dogs in these farms are much better than that of individual dogs. The findings of higher body parameters measurement in animals in this study in comparison to the measurements reported by Kırmızı (1991) and Özbeyaz (1994) could be attributed to better farm conditions mentioned above.

The proportion of HL to HG in Kangal and Akbaş Shepherd Dogs were 0.61, 0.60, 0.57, 0.55, and 0.75, respectively ($p < 0.05$).

► Conclusions

Results can be concluded as follows;

- 1) The Kangal Shepherd Dog is the largest native dog breed in Turkey.
- 2) Comparing the proportion of HL to HG, the Turkish Shepherd Dog breeds have mesathicephalic skull types, while the Turkish Tazı has a dolicephalic skull type.
- 3) It can also be said that coat color is one of the breed characteristics for Kangal and Akbaş Shepherd Dogs; however it is not a breed characteristic for Turkish Tazı. Additional studies of the Kars Shepherd Dog are needed to determine the role of color as a breed characteristic.
- 4) Turkish Tazı is very similar in morphology to other sighthounds, such as the Saluki, Kırgız Taigan, and Kazakhstan Tazı, further investigation of the relationship between these breeds is needed.

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