



## Basic Exterior Characteristics of Bulgarian Scent Hound

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Alındığı tarih (Received): 06.11.2013

Kabul tarihi (Accepted): 12.12.2013

Online Baskı tarihi (Printed Online): 16.12.2013

Yazılı baskı tarihi (Printed): 21.03.2014

**Abstract:** The aim of the current study was to determine the basic exterior traits of Bulgarian scent hound. A total of 36 dogs ranging in age from 1 to 5 years old (21 males and 15 bitches) were used for measurements. All measurements obtained from eight variables were compared by student-t test at level  $P < 0.05$  for gender. Means were as follows; withers height (WH) (53.10±0.57 cm), back height (BH) (51.24±0.54 cm), loin height (LH) (52.21±0.53 cm), chest circumference (CC) (63.03±0.50 cm), body length (BL) (62.75±0.72 cm), head length (HL) (23.78±0.17 cm), skull length (SL) (13.97±0.14 cm) and nozzle length (NL) (9.55±0.12 cm). There were significant differences between male and bitch dogs for the means of WH, BH ( $P < 0.01$ ) and LH ( $P < 0.05$ ). In conclusion, more studies of these dogs on all features needs to be done, and systematic breeding of Bulgarian scent hound must be established regarding body structure standards.

**Keywords:** Hounds, standardization, exterior characteristics, dog.

### Bulgar İzci Kopoylar'ının temel dış özellikleri

**Özet:** Bu çalışmanın amacı Bulgar izci kopoylarının temel dış özelliklerini belirlemektir. Çalışmada, 21'i erkek, 15'i dişi, yaşları 1-5 arasında değişen toplam 36 köpek kullanıldı. Sekiz değişkenden oluşan bütün ölçümlere ait veriler,  $P < 0.05$  seviyesinde student-t testi kullanılarak cinsiyetlere göre karşılaştırıldı. Elde edilen bulgulara göre, omuz yüksekliği 53.10±0.57 cm, sağrı yüksekliği 51.24±0.54 cm, bel yüksekliği 52.21±0.53 cm, göğüs çevresi 63.03±0.50 cm, vücut uzunluğu 62.75±0.72 cm, baş uzunluğu 23.78±0.17 cm, kafatası uzunluğu 13.97±0.14 cm ve burun uzunluğu 9.55±0.12 cm oldu. Bulgar izci kopoylarının tüm özelliklerinin belirleneceği çalışmaların yapılması yanında sistemli yetiştirilmelerinin vücut yapılarının standardizasyonu için yararlı olacağı söylenebilir.

**Anahtar kelimeler:** Kopoy, standartlaştırma, dış özellikler, köpek

#### 1. Introduction

All dog breeds in the world are genetically collected in the four main groups while FCI (Federation Cynologique International) separates them into ten groups (Koçkaya et. al., 2013). Hounds, which are commonly used among the hunters in the Balkans, are points to hunting dogs and they can track without seeing the game contrary to the hunting dogs (Urošević, 2006).

Three large groups of hounds in the Balkans were firstly described as a measurement research over than a hundred years ago (Laska, 1905). Results from the research led author to conclusion that Balkan peninsula is "hound spring", that is, hounds from Balkans were used as foundation for creation of numerous hound breeds on the West (Urošević, 2006). Since then although many field studies and standardization works have been

reported, there are many more hounds not mentioned in previous studies (Drobnjak and Urošević, 2009). One of the variety among these non-standardized breeds is Bulgarian scent hound, which differs from described hound breeds by certain exterior characteristics.

Hound breeds of Balkans standardized and approved by FCI are: Serbian hound (standard no. 150) and Serbian tricolor hound (standard no. 229) in Serbia, Scent Hound from the Save Valley (standard no 154), Istrian short-haired Scent Hound (standard no 151) and Istrian wire-haired Scent Hound (standard no 152) in Croatia, Bosnian coarse-haired Hound - called Barak (standard no 155) in Bosnia and Hercegovia, Montenegrin Mountain Hound (standard no 279) in Montenegro. Official nomenclature of FCI classified these dogs in Group VI, Section 1 (hounds), subsection 1.2 (mid-sized hounds) (Anonym, 2012).

There have been no report on Bulgarian scent hound. Literature data on Serbian hound and Serbian tricolor is provided herein, for easier insight and possible morphology comparison between Bulgarian scent hound and its closest relatives on the territory of Serbia.

First study on Serbian hound, then known as Balkans hound was published based on research conducted by Pavlović and Antić (1954). They determined that mean head length was 20,98 cm. Work of these researchers was used as basis for revision of breed standard from that time.

Exterior of Balkans hounds was studied by Urošević et al. (1988). His research determined that mean head length in males of Serbian (then Balkans) hound was 22.50 cm, whereas in bitches mean wither height was 48,60 cm, mean body length was 53.70 cm and mean head length was 21.50 cm. Exterior of non standardized Serbian yellow hound was studied by Drobnjak and Urošević (2009; 2010), Drobnjak et al. (2012) and Urošević et al. (2009a; 2009b). It was reported that mean height at withers in males of Serbian yellow hound was 51.40 cm, mean body length was 59.90 cm and mean head length was 23.60 cm. The present study was carried out to determine some basic exterior traits of Bulgarian scent hound dogs under breeding condition in their homesteads.

## 2. Materials and Methods

The present study used 36 Bulgarian scent hounds (21 males and 15 bitches) ranging in age

from 1 to 5 years old. Eight exterior parameters (withers height, back height, loin height, body length, head length, nozzle length, skull length, chest circumference) were measured and described below (Atasoy et al., 2005; Drobnjak et al., 2010; Özbeyaz, 1994):

- Withers Height: Vertically distance between ground level to highest peak of cido.
- Loin Height: Vertically distance between ground level to highest level of loin.
- Back Height: Vertically distance between ground level to highest level of sacrum.
- Body Length: Range between caput humeri to tuber ischii.
- Head Length: Range between crista occipitalis to the sharp point of os incisum.
- Nozzle length: Range between eye arches to nose point
- Skull length: Distance along the skull from the stop to the external occipital protuberance
- Chest Circumference: Measurement taken around costae which is vertical to body axis starting aback of os scapulae.

The measurements were taken with small Lidtin's stick, a measuring tool comprised of a vernier scale and a ribbon. The data was analyzed and descriptive statistics (mean value with SD, standard error, CV and range of measured values) were given. Homogeneities of intergroup variance were evaluated with Levene test and differences are comparatively discussed using Student-t test. Differences were significant at the 0.05 level. The SPSS v.14 (SPSS Inc., Chicago, Illinois, USA) was used for analysis.

## 3. Results and Discussion

Means and standard errors along with some descriptive statistics for some body measurements of Bulgarian scent hound are presented in Table 1 for males and bitches as well as for both sexes together.

There were significant mean differences between the male and bitch dogs for WH, BH ( $P < 0.01$ ) and LH ( $P < 0.05$ ). However there were no significant mean differences between the male and bitch dogs for the others traits ( $P > 0.05$ ). In this study, mean values of WH, BL, SL and CC were found slightly higher whereas mean value of NL was found lower than those reported by Drobnjak et al (2012) for the Serbian yellow hound.

**Table 1.** Some body measurements of Bulgarian scent hound (minimum and maximum value, coefficient of variation, mean value with standard error)

Measurement	Sex	n	X <sub>min</sub>	X <sub>max</sub>	CV (%)	Mean ± SE	t
<i>Withers height(cm)</i>	Male	21	49.50	58.00	4.31	54.60±0.67	
	Bitch	15	47.00	58.00	5.67	51.73±0.75	3.14**
	Total	36	47.00	58.00	5.66	53.10±0.57	
<i>Back height (cm)</i>	Male	21	47.00	57.00	5.21	52.55±0.59	
	Bitch	15	44.00	57.00	6.40	49.40±0.81	3.12**
	Total	36	44.00	57.00	6.40	51.24±0.54	
<i>Loin height (cm)</i>	Male	21	48.00	59.00	5.29	53.12±0.61	
	Bitch	15	46.00	59.00	6.66	50.93±0.87	2.05*
	Total	36	46.00	59.00	6.15	52.21±0.53	
<i>Chest circumference (cm)</i>	Male	21	57.00	72.00	6.19	63.52±0.85	
	Bitch	15	59.00	72.00	4.56	62.67±0.73	0.75 <sup>ns</sup>
	Total	36	57.00	72.00	4.80	63.03±0.50	
<i>Body length (cm)</i>	Male	21	57.00	70.00	4.89	63.57±0.67	
	Bitch	15	51.00	70.00	7.77	61.67±1.23	1.35 <sup>ns</sup>
	Total	36	51.00	70.00	6.92	62.75±0.72	
<i>Head length (cm)</i>	Male	21	22.00	27.00	4.66	23.95±0.24	
	Bitch	15	21.00	27.00	4.21	23.53±0.25	1.16 <sup>ns</sup>
	Total	36	21.00	27.00	4.51	23.78±0.17	
<i>Skull length (cm)</i>	Male	21	12.00	16.00	7.13	14.07±0.21	
	Bitch	15	13.00	16.00	4.25	13.83±0.15	0.91 <sup>ns</sup>
	Total	36	12.00	16.00	6.11	13.97±0.14	
<i>Nozzle length (cm)</i>	Male	21	8.00	12.00	8.07	9.69±0.17	
	Bitch	15	8.00	12.00	7.67	9.36±0.18	1.32 <sup>ns</sup>
	Total	36	8.00	12.00	7.99	9.55±0.12	

<sup>ns</sup> Non-significant P>0.05, \* P<0.05, \*\* P<0.01

All other measurements were generally similar. Mean nozzle length of 9.55 cm comprises of 41.25% of Serbian yellow hounds' mean head length. Mean skull length comprises of 58.75 % of mean head length. Presented results indicate that mean height at withers of dogs in this population was 53.10 cm and CV was 5.66%,

which indicates that paragenetic factors influence this trait to a certain level. It may be noticed that although the range is considerably large about WH in male of Bulgarian scent hounds, CV value is relatively small, which is a sign that this trait is relatively homogenous throughout the population.

CV of chest circumference was 4.80%, which indicates that this trait is homogenous and does have high heredity, and that it is not under strong influence of paragenetic factors. CV value of CC of males in this population indicates that this trait is susceptible to influence of paragenetic factors.

**Table 2.** Relative measurements in % relative to withers height according to gender

Measurements	Gender		
	Male	Bitch	Total
<i>Withers height</i>	100.00	100.00	100.00
<i>Back height</i>	96.24	95.49	96.49
<i>Loin height</i>	97.28	98.45	98.32
<i>Chest circumference</i>	116.33	121.14	118.70
<i>Body length</i>	116.66	119.21	122.31
<i>Head length</i>	43.86	45.48	46.35
<i>Skull length</i>	25.77	26.73	27.23
<i>Nozzle length</i>	17.74	18.09	18.61

The percentage values of the other body measurements relative to wither height that is based on 100% are shown in Table 2. Body frame of both sex is rectangular and mean BL is about 22.31% longer than WH. The bitches had mean BL is 19.21% greater than mean WH %, which is also 2.55% more than male BL percentage. The rectangular format is the typical characteristics of hound, which is in agreement in this case.

Total BL was 22,31% greater than height at withers, indicating that Bulgarian scent hounds' frame is rectangular, which complies to basic principles of hounds' body proportions. Mean head length of these dogs is 23.78 cm and it stands for 46.35% of height at withers. Head of Bulgarian scent hound is dolichocephalic type. Range was from 21.00 to 27.00 cm. SE of 0.17 and CV of 4.51% indicate that this trait is homogenous and highly heritable in this dog population. External factors exert little to no influence on it. Overall nozzle length to head length ratio is 39.77%, indicating that nozzle is shorter than cranial region.

#### 4. Conclusion

It can be concluded that population of Bulgarian scent hounds, based on basic exterior characteristics, confirms to basic characteristics of hound body morphology. Body length is greater

than height at withers. Research results show that Bulgarian scent hound has strong skeleton and rectangular body format, whose mean height in both sexes averages to 53,10±4,69 cm.

The BL of dogs is 22,31% greater than height at withers. Height at ridges range is large, so it may be concluded that this trait is strongly influenced by breeding conditions. Head length has mean value of 23,78 cm. Range and coefficient variation of this trait are small so it may be concluded that this trait varies little. Same may be told for skull length to nozzle length ratio. Further researches for Bulgarian dogs on other locations and measurement of all parameters are necessary in order to do a standardization and systematic breeding of Bulgarian scent hound.

**Acknowledgements:** This paper was originate within the project " Development of exterior-zootechnic study for the Bulgarian scent hound" which realized by the Center for preservation of indigenous breeds.

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