



Morphological Characteristics of the Cakal, Mulakat and Oriental Pigeon Breeds Raised in the Marmara Region of Turkey

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ABSTRACT

This study was aimed to determine the morphological characteristics of Cakal, Mulakat and Oriental roller pigeon in Marmara region in Turkey. The study materials were consisted of 300 pigeons reared in 16 different enterprises. The pigeons were examined for plumage colour, markings, head crest and foot feathers, eye colour, number of wing feathers, number of tail feathers, body weight and some other morphological measurements. Statistically significant differences were observed between the sex groups for body weight, head width, beak depth, trunk length ($P<0,001$) in Cakal, Mulakat and Oriental pigeons. It was determined that, in comparison to the local Turkey pigeon breeds (Bursa and Thrace roller, Ankara Tumbler, Squadron Flyer, Dewlap) raised in Turkey, the Cakal is small-sized, the Mulakat is medium-sized and the Oriental is large-sized. Furthermore, the comparison of the age groups for some morphological measurements demonstrated that the Oriental and Cakal pigeons grew slower than the Mulakat pigeon.

Key words: Breeds, Cakal pigeon, Mulakat pigeon, Oriental pigeon, Turkey.

INTRODUCTION

Since ancient times, pigeons have been appraised and raised by humans, owing to the broad array of features they offer (form, meat production, use of pigeon manure for soil fertility, use of pigeons as carriers/messengers based on their homing instinct and impressive navigation skills, etc.). Over thousands of years and especially during the last two centuries, the pigeons have undergone a continuous and intensive selective breeding by pigeon fanciers (Hollender and Miller, 1981). It is reported that there are at least 800 domestic pigeon varieties worldwide (Vogel *et al.*, 1994).

Several researchers have classified pigeons based on their morphological features or performance characteristics (İşcen, 2014; Hollender and Miller, 1981; Vogel *et al.*, 1994). Roller pigeons are classified among performing birds. Different from tumbler pigeons, rollers perform multiple consecutive backward somersaults during a single series, while in flight (Entrikin and Erway, 1972). While flying, rollers throw their head back towards the tail and rotate around their own axis when descending. In the meantime, rollers may flap their wings or rotate with open wings. Thus, these birds have a distinctive flight style (İşcen, 2003).

The Cakal, Mulakat and Oriental breeds are rollers, which have been raised in the Marmara regions of Turkey for many years. The Cakal tends to fly in groups and its rolling distance is indicated as 20-30 m. The Mulakat, which fly in groups at high altitudes for long periods, are known to soar swiftly and perform somersaults at low altitude. Oriental has a long breeding history in Middle Eastern and Asian countries including India, Iran, Iraq, Syria and Turkey (İşcen, 2003).

Despite their important place in the Turkish cultural heritage and local animal genetic pool, to date, very few scientific studies have been published on the pigeons raised in Turkey. (Balci *et al.*, 2018; Erdem *et al.*, 2018; Resmi gazete; Soysal *et al.*, 2011).

This study was aimed at determining the morphological

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characteristics of the Cakal, Mulakat and Oriental rollers raised in the Marmara regions of Turkey.

MATERIALS AND METHODS

This study was conducted in the years 2018 and 2019, on pigeons of the Cakal, Mulakat and Oriental roller genotypes. The permission for the study was obtained from Namık Kemal University Ethics Committee of experimental animal (Protocol no: 2017-09). The animal material of the study comprised a total of 300 pigeons (50 males and 50 females of each genotype), including Cakal rollers from 4 flocks (numbers of pigeons; 23, 37, 27 and 13) in the Tekirdağ province and its districts, Mulakat rollers from 5 flocks (numbers of pigeons; 35, 17, 10, 25 and 13) in the Tekirdağ and Bursa provinces and their districts and Oriental rollers from 7 flocks (numbers of pigeons; 14, 17, 27, 10, 8, 11 and 13) in the Tekirdağ and Balıkesir provinces and their districts and the Lüleburgaz district. The age and sex of each animal was determined based on the records kept at the pigeon flocks. The animals were assigned to four age groups as

follows: 10-23 months, 24-35 months, 36-47 months, 48 months and older. Each animal was individually examined for plumage colour, markings and the head crest and foot feathers and these morphological characteristics were recorded together with body weight measurements. The plumage colours of the pigeons were described using the terms used in common by the pigeon fanciers. The plumage colours of the animals were identified, based on the descriptions of the body plumage colour, wing markings, tail markings and head markings. The numbers of the wing and tail feathers were determined by counting. The wing feathers were counted in the order of the primary, axial and secondary (p-a-s) feathers. The pigeons were weighed on a precision balance accurate to 0.01 g. A metal ruler was used for the measurement of the body length of each pigeon, whilst a tape was used to measure the wingspan, wing length, body length, tail length and chest circumference. The chest width and depth, head length and width, beak length and depth and shank diameter were measured with the aid of a digital calliper. All measurements were performed as described by Atasoy *et al.* (2013).

Statistical analyses

The statistical significance of the differences between the age and sex groups for the morphological characteristics investigated was analyzed by Variance Analysis Technique (ANOVA: Least Squares Method). Statistical Package for Social Sciences 18 (SPSS 18) software was used for statistical analyses and subsequently factors that reveal significant effects were compared in Duncan test (Duncan, 1955; Düzgüneş *et al.*, 1987).

RESULTS AND DISCUSSION

The morphological characteristics investigated in the pigeons included in this study are presented in Table 1. The

plumage colours observed include black (predominant body colour black; Fig 1A), white (predominant body colour white; Fig 1B), red (predominant body colour red; Fig 1C and Fig 3A and 3B), blue (predominant body colour blue with stripes on the wings; Fig 2A), tile blue (predominant body colour a cloudy tone of blue; Fig 2B), ashy-smoky (predominant body colour a greyish blue with two rows of stripes on the wings; Fig 1D), yellow (predominant body colour yellow; Fig 1E) and tiger (speckled) (predominant body colour white with reddish black speckles; (Fig 1F), red speckles (Fig 1G), grey speckles (Fig 1H). Head, wing and tail markings can be observed in the three genotypes examined in this study. The head shape observed in the three genotypes are ellipsoid. The descriptions of the head markings that can be observed are as follows: veil (white colour on the lower surface of the beak), kohl-tinge (white feathers extending from the back of the eye to the ear; Fig 2C), T-pattern (T-shaped white feathers on the head; Fig 2D). The descriptions of the wing markings that can be observed are as follows: white-wing (presence of white feathers on the wings; Fig 3B), stripes (a single row or two rows of coloured stripes generally observed on the wings, but in some cases also observed on the tail; Fig 1D). The only tail marking that can be observed in the pigeon breeds included in this study is described as the white-tail (presence of white feathers on the tail; Fig 3B).

The Mulakat breeds were observed to have a head crest and foot feathers and the legs were covered with short feathers, referred to as spats. In some pigeons, the feathers were white colour. The most common plumage colour observed in this breed was blue. However, dark blue, light blue and tile blue (cloudy blue) plumage was also encountered in the Mulakat (Fig 2A and 2B). While the tail was white in its entirety, the number of white feathers on the

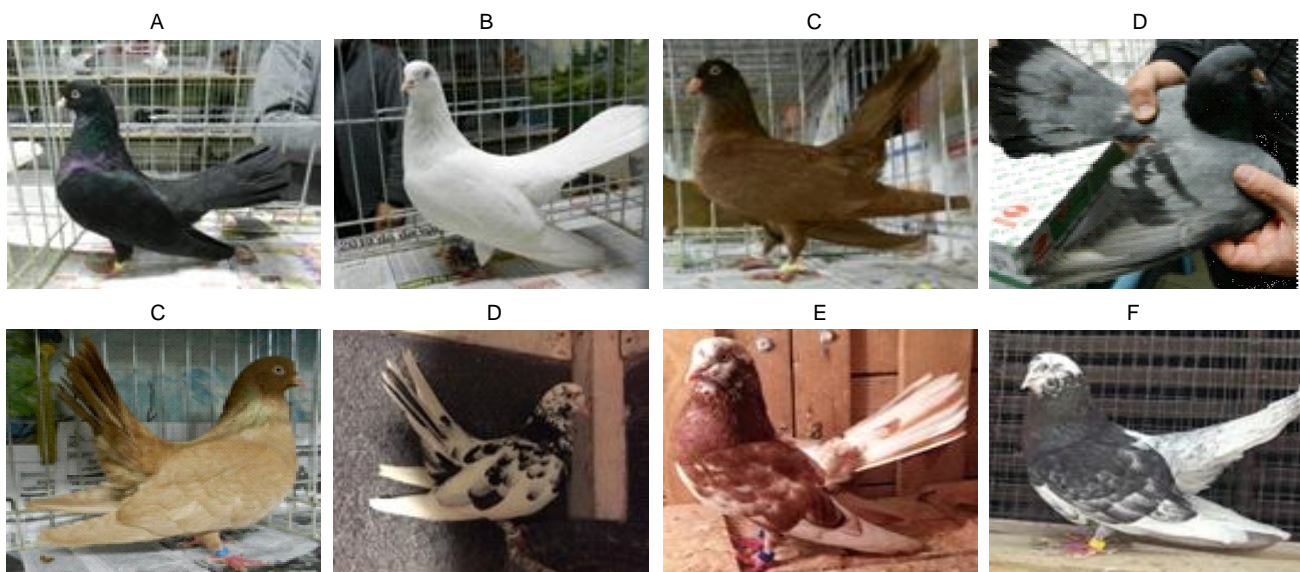


Fig 1: Plumage colour and markings in Oriental Pigeons.

(A.Black, B. White, C. Red, D. Ashy-smoky and stripes, E. Yellow, F. Black tiger, G. Red tiger, H. Grey tiger)

wings varied. In the present study, of the Mulakat examined, 22 had 7 white wing feathers and 78 had 8 white wing feathers. The eye colour of this breed was blue and dark or light dusty rose.

The Cakal breeds were observed not to have a head crest and foot feathers. The plumage colour was red (Fig 3A and 3B). In this breed, plumage colour may become lighter with the advance of age. Therefore, some pigeon fanciers described two different plumage colours for the Cakal (yellow or a rust-like colour and red). The eye ring was distinct and light cream coloured. While the tail was white in its entirety, the number of white feathers on the wings varied. In the present study, of the Cakal examined, 26 had 6 white wing feathers, 27 had 7 white wing feathers and 46 had 8 white wing feathers. In view of their markings, these pigeons are referred to as being white-winged and white-tailed.

The Oriental birds had the leg feathers referred to as "spats". In this breed, the tail had an upright and almost perpendicular posture and the wings were maintained below the tail, but did not touch the ground. The Oriental had six main plumage colours, namely, black, white, red, ash, yellow and tiger (black speckled, red speckled and grey speckled) (Fig 1A, 1B, 1C, 1D, 1E, 1F, 1G and 1H). The eye colour of this breed was either white or white with yellow speckles or white with red speckles.

Artificial selective breeding applied by pigeon fanciers in association with the impact of varying environmental factors have produced numerous pigeon genotypes (Bartes, 2003; Hollander and Miller, 1981; Shapiro and Domyan, 2016). Therefore, pigeons show morphological variances for plumage colour, markings and several body features.

Statistical values pertaining to certain body features of the age and sex groups are presented in Tables 2, 3 and 4. Statistical analyses demonstrated significant differences between the age groups for chest circumference and width, tarsus diameter, head length and width, beak length (P<0.001), wingspan, chest depth (P<0.01) and wing length (P<0.05) in the Oriental; body weight, head length and width, chest width, beak depth, wingspan (P<0.001), body and tail length, chest depth and beak length (P<0.05) in the Cakal; and body length, chest circumference, tarsus diameter (P<0.001) and beak length (P<0.05) in the Mulakat.

In the present study, the age groups of the Oriental and Cakal rollers having been determined to significantly differ for morphological characteristics. This results indicative the slow development of both genotypes. On the other hand, the differences observed between the age groups of the Mulakat having been determined to be statistically insignificant suggested that this breed completes its growth and development at an earlier age, compared to the other two genotypes investigated. Furthermore, statistically significant differences having been determined between the age groups for wing length (P<0.05), wingspan (P<0.001) and tail length (P<0.05) in the Cakal pigeons and for wing length (P<0.05) and wingspan (P<0.01) in the Oriental

Table 1: Distribution of investigate material according to the genotypes (Çakal, Mülakat and oriental pigeon), colour and several morphological characteristics.

	MULAKAT						ORIENTAL						CAKAL			
	Dark Blue	Light Blue	Cloudy Blue (Tile blue)	Black	White	Red	Yellow	Tiger	Ash	Red	White	Black	White	Red	White	Red
Plumage colour	52	27	21	25	23	29	11	5	7	100						
Plumage colour ratio (%)																
Marking	Veil	Kohl-tinge	T-pattern	No Marking	Stripes	White with yellow speckles	White with red speckles	White with red speckles	White with red speckles	White wing-white tail	White with red speckles	White with red speckles	White with red speckles	Rose	Rose	White
Marking ratio (%)	27	32	6	35	7	15	15	10	10	100	10	10	10	24	24	76
Eye colour	Blue	Light dusty rose	Dark dusty rose	Dark dusty rose	White	White with yellow speckles	White with yellow speckles	White with red speckles	White with red speckles	White	White with red speckles	White with red speckles	White with red speckles	Rose	Rose	White
Eye Colour ratio (%)	17	47	36	36	75	15	15	10	10	100	10	10	10	24	24	76
Number of wing feathers	8-1-9	9-1-9	9-1-9	11-1-11	11-1-11	10-1-11	10-1-11	10-1-11	10-1-11	8-1-10	8-1-10	8-1-10	8-1-10	9-1-10	9-1-10	8-1-10
Number of wing feathers ratio (%)	87	13	13	13	87	13	13	13	13	87	13	13	13	87	13	13
Number of tail feathers	12	13	13	13	14	15	16	17	18	14	15	16	17	14	15	16
Number of tail feathers ratio (%)	93	7	7	7	27	30	23	11	9	52	30	23	11	52	30	18

Table 2: The least square means of some body morphometric characteristics in Cakal pigeons ($\bar{x} \pm S\bar{x}$).

CAKAL	n	Body Weight (g)	Head Length(mm)	Head Width(mm)	Head Length(mm)	Beak Length(mm)	Beak Depth(mm)	Trunk Length (cm)	Tail Length(cm)
Total	100	374,02±3,42	51,29±0,21	18,94±0,20	20,44±0,15	5,77±0,06	10,09±0,07	13,95±0,15	
Gender									
Female	51	370,17±4,06 ^a	50,54±0,35 ^a	18,28±0,25 ^a	20,56±0,22	5,54±0,09 ^a	9,87±0,10 ^a	13,72±0,11	
Male	49	378,03±5,54 ^b	52,06±0,20 ^b	19,64±0,29 ^b	20,32±0,20	6,01±0,07 ^b	10,33±0,90 ^b	14,19±0,28	
Age									
10-23 months	13	331,38±5,48 ^a	50,46±0,20 ^a	18,25±0,50 ^a	19,95±0,46 ^a	5,29±0,05 ^a	9,80±0,17 ^a	14,11±0,16 ^{ab}	
24-35 months	38	358,73±4,83 ^b	47,74±0,34 ^a	17,89±0,31 ^a	20,14±0,22 ^a	5,67±0,11 ^b	10,14±0,13 ^{ab}	14,09±0,15 ^{ab}	
36-47 months	29	392,55±3,11 ^c	53,01±0,20 ^b	19,36±0,29 ^b	21,10±0,31 ^b	5,81±0,09 ^b	10,36±0,11 ^b	13,32±0,45 ^a	
48 months and over	20	403,92±5,18 ^c	52,27±0,35 ^b	20,79±0,30 ^c	20,38±0,27 ^{ab}	6,22±0,12 ^c	9,82±0,11 ^a	14,40±0,10 ^b	
	n	Chest Depth (mm)	Chest Circumference (cm)	Chest Width (mm)	Wing Length (cm)	Wingspan (cm)	Body length (cm)	Tarsus Diameter (mm)	
Total	100	62,08±0,31	20,58±0,21	49,03±0,26	30,56±0,15	62,29±0,34	33,60±0,39	4,25±0,03	
Gender									
Female	50	62,88±0,35 ^a	20,06±0,39 ^a	48,99±0,30	30,06±0,15 ^a	60,94±0,46 ^a	33,60±0,39	4,20±0,04	
Male	50	61,23±0,50 ^b	21,11±0,11 ^b	49,07±0,42	31,09±0,24 ^b	63,69±0,44 ^b	32,63±0,42	4,31±0,05	
Age									
10-23 months	9	61,57±1,08 ^a	20,42±0,15	46,69±0,75 ^a	29,73±0,36 ^a	59,86±0,92 ^a	33,92±1,04	4,25±0,07	
24-35 months	24	61,78±0,47 ^a	19,98±0,52	47,68±0,33 ^a	30,38±0,21 ^{ab}	61,78±0,42 ^{ab}	32,90±0,53	4,19±0,05	
36-47 months	30	61,32±0,56 ^a	20,91±0,12	50,68±0,37 ^b	30,74±0,30 ^b	62,31±0,67 ^b	32,70±0,30	4,26±0,05	
48 months and over	37	64,09±0,56 ^b	21,34±0,17	50,72±0,32 ^b	31,20±0,36 ^b	64,80±0,78 ^c	33,65±0,66	4,37±0,07	

*: P<0,05; **: P<0,01; ***: P<0,001,

a, b, c : Means within a column with different letters are significantly different (p<0.05).

Table 3: The least square means of some body morphometric characteristics in Mülakat pigeons ($\bar{x} \pm \text{SX}$).

MÜLAKAT	n	Body Weight (g)	Head Length (mm)	Head Width (mm)	Beak Length (mm)	Beak Depth (mm)	Trunk Length (cm)	Tail Length (cm)
Total	100	328,96±2,07 ***	52,74±0,13	19,03±0,19 ***	19,59±0,14	5,55±0,05 ***	11,34±0,08 ***	13,61±0,08 ***
Gender								
Female	50	317,22±2,32 ^a	52,53±0,15	17,83±0,11 ^a	19,49±0,17	5,14±0,03	10,95±0,10	13,18±0,06
Male	50	340,70±2,52 ^b	52,96±0,21	20,23±0,27 ^b	19,69±0,24 *	5,96±0,05	11,73±0,10 ***	14,05±0,11
Age								
10-23 months	9	325,33±4,06	52,24±0,47	18,69±0,14	18,94±0,25a	5,44±0,18	12,00±0,28 ^c	13,55±0,21
24-35 months	24	321,45±1,61	52,65±0,25	18,90±0,38	19,07±0,15a	5,52±0,11	10,75±0,19 ^a	13,60±0,16
36-47 months	30	331,76±4,02	53,02±0,22	19,03±0,39	19,53±0,27ab	5,55±0,09	11,45±0,10 ^b	13,58±0,15
48 months and over	37	332,43±4,22	52,69±0,23	19,20±0,32	20,15±0,28b	5,61±0,08	11,47±0,10 ^b	13,67±0,13
	n	Chest Depth (mm)	Chest Circumference (cm)	Chest Width (mm)	Wing Length (cm)	Wingspam (cm)	Body length (cm)	Tarsus Diameter (mm)
Total	100	59,02±0,48 ***	20,87±0,04	51,02±0,34 *	29,82±0,16 ***	65,43±0,31	34,23±0,13 ***	4,61±0,04 ***
Gender								
Female	50	56,29±0,66 ^a	20,82±0,05	50,27±0,63 ^a	28,64±0,19	64,97±0,33	33,33±0,15	4,81±0,07
Male	50	61,75±0,45 ^b	20,92±0,08 ***	51,78±0,24 ^b	30,99±0,15	65,90±0,52	35,13±0,13	4,42±0,05 ***
Age								
10-23 months	9	56,80±0,59	20,22±0,08 ^a	49,94±0,48	30,86±0,41	67,88±1,12	35,10±0,69	4,11±0,08 ^a
24-35 months	24	60,50±0,88	20,82±0,10 ^b	50,54±0,78	29,97±0,23	64,79±0,58	34,27±0,23	4,43±0,07 ^b
36-47 months	30	59,67±0,85	20,91±0,04 ^b	52,11±0,62	30,02±0,28	65,71±0,53	34,18±0,19	4,65±0,07 ^{b,c}
48 months and over	37	58,09±0,91	21,02±0,08 ^b	50,72±0,57	29,31±0,33	65,03±0,52	34,04±0,24	4,82±0,08 ^c

*: P<0,05; **: P<0,01; ***: P<0,001,

a, b, c : Means within a column with different letters are significantly different (p<0.05).

Table 4: The least square means of some body morphometric characteristics in Oriental pigeons ($\bar{x} \pm Sx$).

ORIENTAL	n	Body		Head		Beak		Trunk		Tail	
		Weight (g)	Head Length (mm)	Width (mm)	Length (mm)	Depth (mm)	Length (cm)	Length (cm)	Length (cm)	Length (cm)	
Total	100	448,51±1,73	51,62±0,19	21,17±0,08	18,59±0,08	5,35±0,04	10,02±0,05	14,21±0,10			
Gender											
Female	48	438,56±2,33 ^a	50,86±0,29 ^a	21,18±0,12	18,31±0,14 ^a	5,11±0,06 ^a	9,75±0,05 ^a	14,36±0,19			
Male	52	457,70±1,76 ^b	52,33±0,21 ^b	21,16±0,12	18,84±0,07 ^b	5,58±0,05 ^b	10,26±0,07 ^b	14,07±0,10			
Age											
10-23 months	37	445,74±2,65	50,68±0,28 ^a	20,98±0,16 ^a	18,08±0,16 ^a	5,24±0,09 ^{ab}	10,08±0,08	14,36±0,22			
24-35 months	41	451,63±3,12	52,16±0,32 ^{bc}	21,61±0,09 ^b	18,82±0,09 ^b	5,54±0,05 ^b	10,07±0,08	14,30±0,12			
36-47 months	12	451,00±2,48	52,93±0,29 ^c	20,81±0,18 ^a	18,84±0,04 ^b	5,29±0,06 ^{ab}	9,85±0,06	14,02±0,21			
48 months and over	10	443,00±5,28	51,34±0,38 ^{ab}	20,48±0,18 ^a	19,16±0,19 ^b	5,05±0,11 ^a	9,75±0,18	13,54±0,27			
	n	Chest Depth (mm)	Chest Circumference (cm)	Chest Width (mm)	Wing Length (cm)	Wingspan (cm)	Body length (cm)	Tarsus Diameter (mm)			
Total	100	60,07±0,36	23,53±0,13	58,11±0,22	26,50±0,21	62,03±0,33	37,83±0,36	4,59±0,03			
Gender											
Female	48	58,81±0,52 ^a	23,12±0,20 ^a	57,74±0,23	26,32±0,32	62,36±0,38	40,57±0,47 ^a	4,47±0,03 ^a			
Male	52	61,23±0,45 ^b	23,90±0,14 ^b	58,46±0,36	26,67±0,29	61,73±0,52	35,30±0,22 ^b	4,70±0,03 ^b			
Age											
10-23 months	37	60,34±0,83	22,47±0,16 ^a	58,62±0,37 ^c	26,01±0,39 ^{ab}	62,29±0,46 ^b	37,31±0,58	4,46±0,04 ^a			
24-35 months	41	59,65±0,39	23,98±0,15 ^b	58,64±0,27 ^c	27,00±0,30 ^{bc}	62,84±0,48 ^b	38,68±0,60	4,69±0,03 ^b			
36-47 months	12	61,29±0,65	24,76±0,33 ^c	55,62±0,53 ^a	25,41±0,49 ^a	59,25±1,03 ^a	37,88±0,96	4,72±0,07 ^b			
48 months and over	10	59,33±0,87	24,16±0,32 ^b	57,07±0,63 ^b	27,60±0,61 ^c	61,10±1,24 ^{ab}	36,25±0,91	4,52±0,07 ^a			

*: P<0,05; **: P<0,01; ***: P<0,001,

a, b, c : Means within a column with different letters are significantly different (p<0.05).



Fig 2: Plumage colour and markings in Mülakat Pigeons.

(A. Blue, B. Cloudy blue or Tile blue, C. Veil and kohl-tinge marking, D. T-pattern marking)

pigeons revealed that wing feathers continue to grow and alter with age in these genotypes.

The morphometric measurements performed in the present study demonstrated that while the body size of the Cakal was larger than that of the Bursa roller and smaller than that of the Thrace roller, Alabadem, the Mulakat was larger than the Bursa roller and Alabadem and smaller than the Thrace roller and the Oriental roller was larger than all three of the Bursa and Thrace rollers and Alabadem (Balci *et al.*, 2018; Resmi Gazate; Soysal *et al.*, 2011). Furthermore, all three of the Cakal, Mulakat and Oriental rollers were determined to be smaller than the large fleet fliers raised in Anatolia and the Dewlap (Özbaşer *et al.*, 2016; Özbaşer and Gündüz, 2018).

The beak lengths of the Cakal, Mulakat and Oriental rollers (20.44, 19.59 and 18.59 mm, respectively) were found to be smaller than those of the squadron pigeon and dewlap, both of which are described as pigeon breeds with long beaks and were ascertained to be larger than that of the Baska pigeon, a breed known for its small and short beak (Erdem *et al.*, 2018; Özbaşer and Gündüz, 2018). In general, the differences observed for beak length between the age groups were statistically significant. Levi, (1947) reported that the structure of the beak may vary with the diet of the bird.

It has been reported that the tail structure affects the flying speed and manoeuvrability of birds (Berg and Biawener, 2008). The results of the present study showed that the tail lengths of the Cakal, Mulakat and Oriental rollers (13.95, 13.61 and 14.21 cm, respectively) were large, similar to those of the Bursa (13.73 cm) and Thrace rollers (14.67 cm) (Balci *et al.*, 2018; Soysal *et al.*, 2011) and were greater than those of some divers (Edremit Butterfly pigeon: female 13 cm, male 13.60 cm and the Dewlap: 13.45 cm), tumblers (Ankara Tumbler: 13.45 cm) and fleet fliers (12.32 cm) (Atasoy *et al.*, 2013; Erdem *et al.*, 2018; Özbaşer *et al.*, 2016; Özbaşer and Gündüz, 2018). These results suggest that the structure of the tail may affect the performance characteristics of the bird.

Body weight values reported by Pares-Casanova and Kabir (2019) for Parlour roller pigeons (240-370g) are lower than those determined for the Oriental (448.51g) and similar to those determined for the Cakal (374.02g) and Mulakat roller (328.96 g) in the present study. Furthermore, body

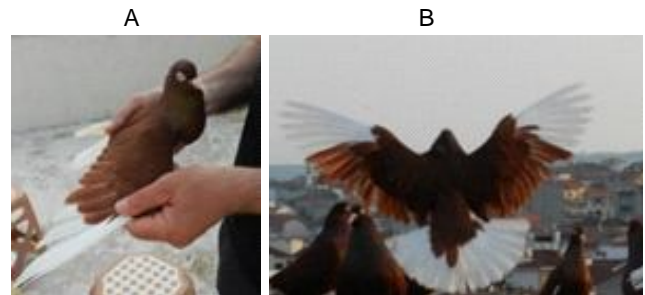


Fig 3: Plumage colour and markings in Cakal pigeons.

(A. and B. Red, White wing-white tail marking).

weight values reported by Rose *et al.* (2006) for *Columbia livia* pigeons (females 344 g, males 356 g) were observed to be smaller than the body weights measured in the Oriental and Cakal and greater than the values measured in the Mulakat in the present study.

In previous studies carried out in pigeons raised in Bangladesh, it was reported that while the different varieties presented with different morphological characteristics, some birds also showed similarities for plumage colour (white, tiger patterned, black-and-white mottled, blue, multi-coloured and white-tailed) (Kabir, 2014; Kabir, 2015).

CONCLUSION

In comparison to the local pigeon breeds raised in Turkey, it was determined that the Cakal is small-sized, the Mulakat is medium-sized and the Oriental is large-sized. The comparison of the age groups for some morphological characteristics demonstrated that the Oriental and Cakal rollers have a slower growth and development rate than the Mulakat. With this study, the morphological characterizations of the three pigeon genotypes (Cakal, Mulakat and Oriental rollers) were carried out. In future studies, we are planning to investigate the genotypic characterization of these pigeons and their relations with other country genotypes.

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