

## New record of *Lynx lynx* (L., 1758) in Turkey (Mammalia: Carnivora)

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**Abstract:** This paper reports the morphological characteristics of a subadult lynx, *Lynx lynx*, collected in 2005 from Ardanuç in Artvin Province. Pelage color, hair structure, and some cranial measurements of this specimen and other recent records of Turkish lynxes are given, including that from Beyaz Dağ in Şırnak Province in the southeastern part of Turkey collected during field work and a skin from an unknown locality in Isparta. It was concluded that Turkish lynxes are likely to represent the subspecies *L. lynx dinniki* based on a comparison of morphometric values given in the literature.

**Key words:** Lynx, *Lynx lynx*, distribution, Turkey

Eight cat species have been recorded from Anatolia. Three of these (lion, *Panthera leo*; cheetah, *Acinonyx jubatus*; and tiger, *Panthera tigris*) became extinct within historical times and the leopard, *Panthera pardus*, is probably also extinct, because there have been no records since 1974 (Albayrak and Kryštufek, 1997). Today only the caracal, *Caracal caracal*; the jungle cat, *Felis chaus*; the wildcat, *Felis silvestris*; and the lynx, *Lynx lynx*, occur in Turkey (Erençin, 1977; Kumerloeve, 1978; Matyushkin, 1978; Turan, 1987; Johnson, 2002, 2003). These species are critically endangered because of overhunting.

The aim of this study was to determine some taxonomic characteristics of the Turkish lynx in order to establish which subspecies occur in Turkey.

This study comprises a morphological evaluation of cranial measurements and pelage coloration and markings from a subadult female *Lynx lynx* collected

on 10 March 2005 from Ardanuç near Artvin (45°56'N, 38°25'E, 574 m) (Figure 1).

The lynx was preserved as a conventional “round” museum study skin. Fur color was determined using the method of Ridgway (1886). Guard hairs were taken from between the shoulder blades dorsally (specimen no: 1934) and prepared according to the method of Hayat (1972): hair specimens were left in acetone for 30 min, in acetone-distilled water solution (1:1) for 15 min, and finally in distilled water for 10 min. Dried hairs in petri dishes were placed on stubs and coated with gold dust in a Polaron SC 500 for 2 min. The midshaft and cross-section of the hairs were photographed with 1000× magnification using a JSM 5600 scanning electron microscope. Hair scale widths were measured in micrometers and hair scale forms were defined according to Benedict (1957). The skull and mandible were also preserved (Figure 2). The specimen was deposited in the Department

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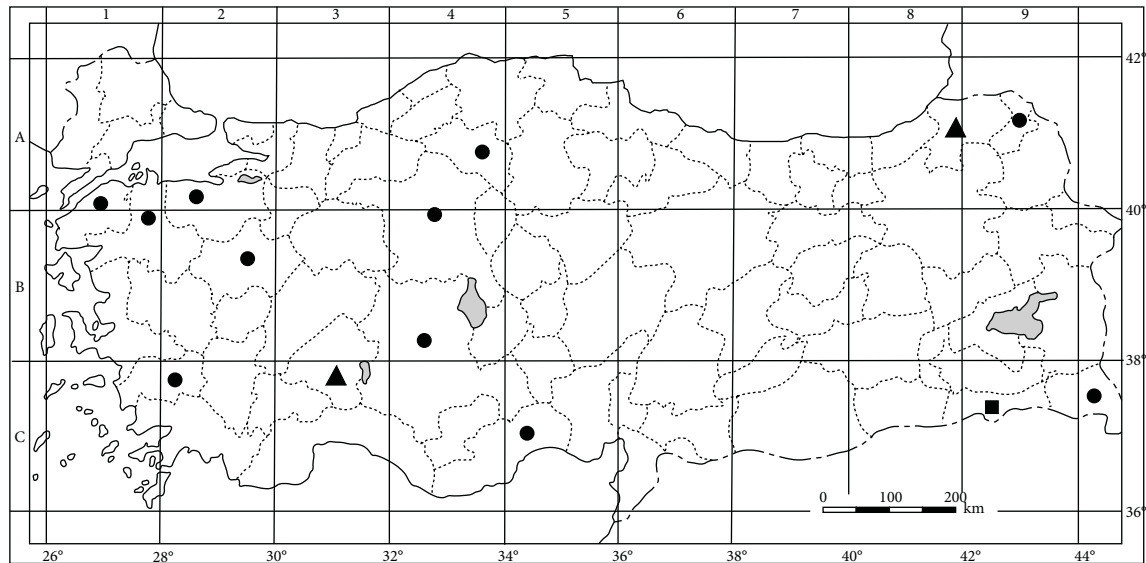


Figure 1. Distribution records of lynx in Turkey (●: previous records, ▲: the collection localities of specimens reported in this study, ■: locality based on sightings).

of Biology, Faculty of Sciences and Arts, Kırıkkale University (Col. No: 1934, ♀, 10 March 2005). This specimen was compared with a flat skin of unknown sex from an adult from Isparta, Şarkikaraağaç, which is in the collection of Süleyman Demirel University (Figure 2), and a male specimen caught in July 1987 from Azort Plateau, Tortum, in Erzurum Province, which has been living in the Ankara Zoo for 20 years (Figure 3). For the evaluation of subspecies level, the present data were compared with those of Heptner and Sludskii (1972).

The dorsal color of the subadult specimen from Artvin is somewhat pale greyish light yellow with a somewhat rusty-reddish on an irregular band running along the longitudinal medial line. There are

pale brownish black spots dorsally. The ventral color is white, very slightly greyish. The dorsal color of the adult specimen from Isparta is light yellowish brown with rusty-reddish on an irregular band running along the longitudinal medial line. Pale brownish black spots are well marked on the dorsal part. The ventral color is paler silver-white. The hair scales are flattened imbricate and a medulla is absent (Figure 4).

It is known that the lynx lives in some parts of Turkey (Figure 1). Recently we recorded it from Beyaz Dağ, İdil, in Şırnak Province in the southeastern part of Turkey.

It was not possible to identify the Ardanuç



Figure 2. Skin (left) and skull (middle) of the subadult female of lynx from Ardanuç, near Artvin, and skin (right) of the adult specimen of lynx from Isparta, Şarkikaraağaç.



Figure 3. A lynx, *Lynx lynx*, from Tortum, Erzurum, in Ankara Zoo (photographed by Dr Selçuk Aktürk).

specimen to the subspecies level, owing to a lack of adequate comparative material. Nevertheless, it seems probable that it belongs to *L. l. dinniki*, because the type locality of *dinniki* (North Caucasian lynx) is very near to the location of the specimen obtained from northeastern Turkey.

From Tables 1 and 2, which quote from Heptner and Sludskii (1972), it can be concluded that the values of the Turkish specimen are smaller than those of *L. l. lynx* and *L. l. carpathica* in lengths of hindfoot, ear, greatest skull, and upper tooth row. These differences are probably because the Ardanuç specimen is a subadult, although the mean values of other measurements fall into the variation limits of *L. l. dinniki*. Harrison and Bates (1991) stated that Arabian specimens show “slightly greater size” than

the nominative form according to Ognev (1935). They also reported that there were markedly individual variations in *L. l. dinniki* in the USSR. In addition, they pointed out that “the bold patterning of the pelage is most usual”. Pelages of our 2 specimens are markedly spotted.

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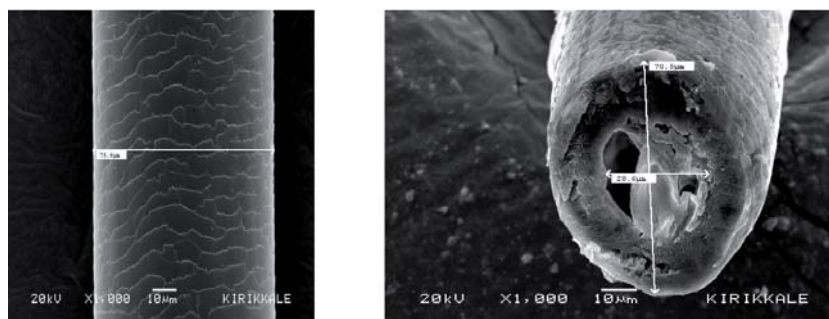


Figure 4. Scanning electron microscopy images showing the scale pattern (left) on the hair shaft and the medulla (right) from dorsal hairs of a Turkish subadult lynx from Ardanuç, 1000 $\times$ .

Table 1. A comparison of external measurements of *Lynx lynx* from Europe, Caucasia (both quoted from Heptner and Sludskii, 1972), and Turkey. n: sample size, r: range, m: mean.

Measurement	Sex	European lynx, <i>L. l. lynx</i> , in Belovezh [?Bialowieza] Forest, Poland? (Nikitenko and Kozlo, 1965)			Caucasian lynx, <i>L. l. dimniki</i> (Kotov and Ryabov, 1963)			Turkish lynx (Ardanuç, this study)		
		n	r	m	n	r	m	n	r	m
Body length	♂	16	76.0–108.0	100.0	4	80.5–95.0	88.4	1		
	♀	21	85.0–100.0	90.0	4	84.0–92.0	88.1	1		92.0
Tail length	♂	16	7.0–24.0	20.2	5	14.5–21.0	17.6	1		
	♀	21	8.0–23.5	19.6	4	16.0–19.0	17.1	1		16.5
Hindfoot length	♂	16	24.0–26.5	24.8	4	22.5–24.0	23.2	1		
	♀	21	20.0–24.0	21.7	4	22.0–24.0	22.7	1		19.5
Ear length	♂	16	9.0–9.6	9.0	4	8.0–9.0	8.6	1		
	♀	21	8.5–9.3	9.0	4	8.0–9.0	8.6	1		6.0

Table 2. A comparison of cranial measurements of *Lynx lynx* from Europe, Caucasia (both quoted from Heptner and Sludskii, 1972), and Turkey. n: sample size, r: range, m: mean.

Measurement	Sex	European lynx, <i>L. lynx</i> , Belovezy [?Bialowieza] Forest and the European part of the USSR (Heptner and Sludskii, 1972)			Caucasian lynx <i>L. l.</i> <i>dimniki</i> (Ognev, 1953)			Carpathian lynx, <i>F. (L.) l. carpathica</i> , Carpathian Mountains, Czech Republic? (Stollmann, 1963)			Carpathian lynx, <i>L. l. carpathica</i> , from the Carpathians in Romania (Stollmann, 1963)			<i>Lynx lynx</i> , Turkey (Ardanuç, this study)	
		n	r	m	n	r	m	n	r	m	n	r	m		
Greatest skull length	♂	31	122.0–164.5	147.7	14	142.9–157.2	151.8	20	147.6–169.2	157.3	-	-	-	-	140.1
	♀	15	121.0–153.9	136.1	8	120.0–145.2	138.7	18	142.4–160.2	147.7	-	-	-	-	-
Condylbasal length	♂	30	111.0–147.5	133.6	28	120.0–144.0	132.3	20	132.0–150.6	141.0	14	130.0–151.4	138.2	-	130.2
	♀	14	109.3–135.8	123.8	16	108.4–141.0	125.2	18	127.6–144.6	132.0	10	134.0–140.3	135.9	-	-
Zygomatic width	♂	30	84.0–164.5	147.7	16	95.3–112.2	106.6	26	101.7–118.2	110.9	14	91.7–114.8	107.2	-	101.2
	♀	14	87.0–104.0	96.9	8	86.5–106.0	99.4	18	99.3–109.4	103.6	10	96.8–110.3	103.9	-	-
Interorbital width	♂	31	24.0–37.6	37.6	18	28.6–35.2	32.7	-	-	-	-	-	-	-	32.2
	♀	15	25.0–33.2	28.9	8	25.3–31.8	29.8	-	-	-	-	-	-	-	-
Postorbital width	♂	31	35.9–44.0	44.0	18	36.2–64.1	47.8	-	-	-	-	-	-	-	42.9
	♀	15	37.6–44.0	40.5	8	38.2–62.8	50.8	-	-	-	-	-	-	-	-
Upper tooth row length	♂	31	42.1–53.6	53.6	18	45.7–59.3	52.6	7	47.9–52.5	50.0	14	42.0–54.1	47.4	-	53.9
	♀	15	42.4–51.0	46.1	8	42.0–54.8	48.8	-	-	-	10	44.1–49.0	45.9	-	-
Upper carnassial tooth length	♂	29	17.5–20.1	20.1	15	17.2–20.0	18.9	-	-	-	-	-	-	-	17.7
	♀	15	18.4–20.3	18.9	8	17.0–19.7	18.2	-	-	-	-	-	-	-	-

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