

Karyotype of *Pipistrellus kuhlii* (Kuhl, 1819) in Turkey (Mammalia: Chiroptera)*

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Abstract: In order to investigate the conventional karyotype of *Pipistrellus kuhlii* (Kuhl, 1819) in Turkey, eight specimens were karyotyped. It was determined that diploid number was $2n=44$, the fundamental number was $FN=54$, the number of the autosomal arms was $NFa=50$. In the chromosome set there was a medium sized metacentric X and small acrocentric Y. A secondary constriction on a medium-sized acrocentric pair was encountered in the metaphase spreads examined.

Key Words: *Pipistrellus kuhlii*, karyotype, Turkey

Türkiye'deki *Pipistrellus kuhlii* (Kuhl, 1819)'nin Karyotipi (Mammalia:Chiroptera)

Özet: Türkiye'deki *Pipistrellus kuhlii* (Kuhl, 1819)'un karyolojisini incelemek için sekiz örneğin karyotipi yapılmıştır. Diploid kromozom sayısının $2n=44$, temel kromozomların kol sayısının $FN=54$, otozomal kromozomların kol sayısının $NFa=50$ olduğu tespit edilmiştir. Kromozom setinde orta büyüklükte bir X ve küçük bir Y bulunmaktadır. İncelenen metafaz plaklarında orta boylu akrosentrik bir kromozom çiftinde ikincil bir boğuma rastlanmıştır.

Anahtar Kelimeler: *Pipistrellus kuhlii*, karyotip, Türkiye

Introduction

In Turkey, the genus *Pipistrellus* is represented by four species, *Pipistrellus savii*, *Pipistrellus nathusii*, *Pipistrellus kuhlii* and *Pipistrellus pipistrellus* [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12]. *P. kuhlii* is very widely distributed bat with a range that extends from southern Europe to Pakistan and most of Afrika [13]. *P. kuhlii* is very important member of Turkish bat fauna. It occurs in all geographic regions of Turkey. In the Cilician coast and Mesopotamia, it is even the most common species at all [14]. The aim of this study is to determine the karyotype of *Pipistrellus kuhlii* in Turkey.

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Materials and Methods

The eight specimens karyotyped (five female and three male) were caught from Antalya and Şanlıurfa in 2004. The karyotyping was carried out according to Patton [15] and Ford and Hamerton [16]. Ten slides were prepared and 10 to 30 metaphase spreads examined from each. Diploid number (2n), the fundamental number (FN) and the number of autosomal arms (NFa) were counted and the shapes of the chromosomes recorded. The specimens were prepared in the conventional museum type. The identification of the species was carried out according to Albayrak [11]. Data were compared with those in the literature.

Results

Pipistrellus kuhlii was determined that diploid number was 44, the fundamental number was 54 and the number of the autosomal arms was 50 in all specimens. The set includes 3 large and one small metacentric pairs, 15 large to small acrocentric pairs, 2 dot-like acrocentric pairs, a medium sized metacentric X and small acrocentric Y (Fig. 1,2). A secondary constriction on medium-sized acrocentric pair was encountered in the metaphase spreads examined.

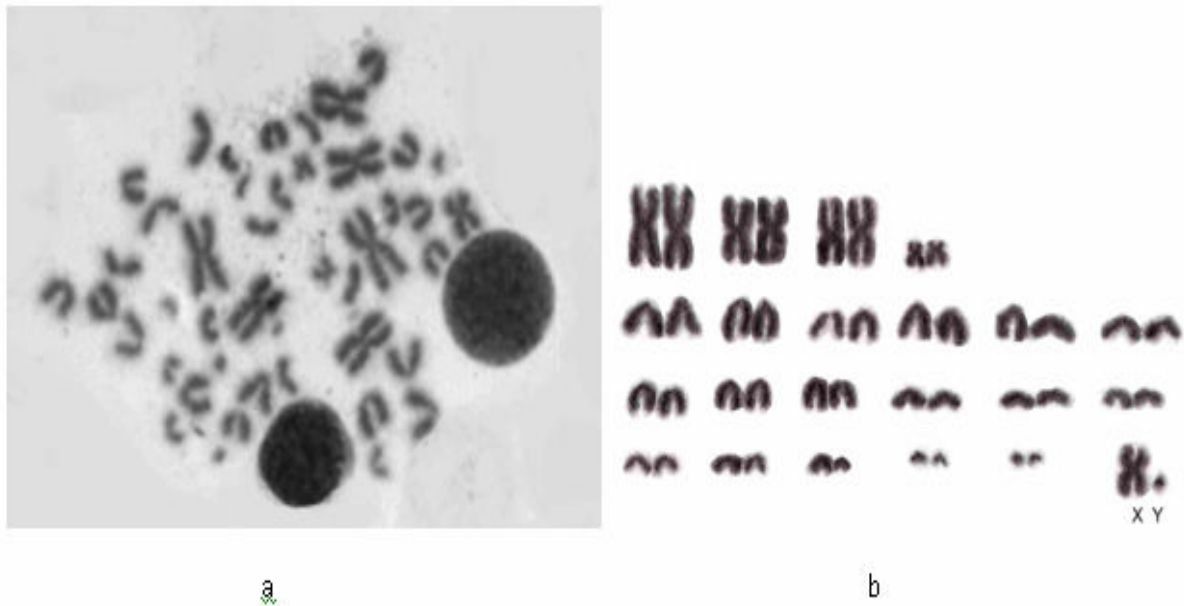


Figure 1. Metaphase spread (a) and karyotype (b) of a male *Pipistrellus kuhlii* from Turkey.

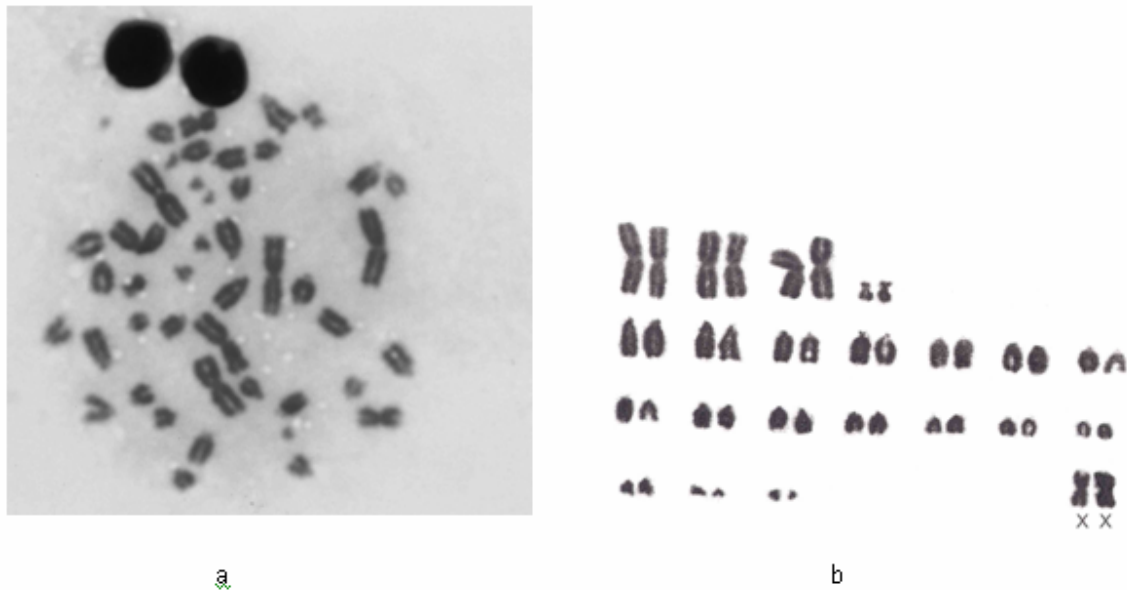


Figure 2. Metaphase spread (a) and karyotype (b) of a female *Pipistrellus kuhlii* from Turkey.

Discussion

Capanna and Civitelli from Italy [17]; Baker et al. from Tunisia [18]; Kulijev and Fattajev from Azerbaijan [19]; Zima from Czechoslovakia [20]; Volleth et al. from Greece [21] studied the karyotype of *P. kuhlii*.

As the number of biarmed chromosomes were accepted as 10 in the set by Kulijev and Fattajev [19], they recorded the number of autosomal arms as 52. According to these researchers X chromosome of *P. kuhlii* was metacentric. However, Capanna and Civitelli ([17], Baker et al. [18], Kulijev and Fattajev [19], Zima [20] and Volleth et al. [21] detected the number of autosomal arms as 50 by accepting the number of biarmed chromosomes as 8. The X chromosome was recorded as metacentric or submetacentric by them. Zima [20] recorded a biarmed X chromosome and dot-like Y chromosome from Czechoslovakia (Table 1). Baker et al. [18] and Heller and Volleth [22] stated that the karyotype, the diploid number and the number of autosomal arms of *Pipistrellus pipistrellus*, *P. nathusi*, *P. kuhlii* and *P. savii* are similar. A secondary constriction on the 15th acrocentric autosome of female *P. kuhlii* specimen from Greece was discovered by Volleth [23]. Volleth et al., [21] determined the diploid number of chromosomes 42 from Madagascar.

Specimens of *P. kuhlii* in Turkey are similar to the specimens of Italy, Tunisia, Libya and Greece from the point of view of the diploid number of chromosomes and the number of autosomal arms. Specimens of Turkey are also similar to the specimens of Azerbaijan because of their metacentric X and acrocentric Y chromosome.

Table 1. A comparison of the chromosomal data for *Pipistrellus kuhlii* (M= metacentric, Sm= submetacentric, A= acrocentric, D= dot-like)

Species	Locality	2n	FN	FNa	M/Sm	A	D	X	Y
<i>P. kuhlii</i> 2♂♂, 1♀	Italy (Capanna and Civitelli, 1966)	44	-	50	8	30	4	M/Sm	A
<i>P. kuhlii</i> 2♂♂, 7♀♀	Tunisia (Baker et al., 1974)	44	-	50	-	-	-	Sm	A
<i>P. kuhlii</i>	Azerbaijan (Kulijev and Fattajev, 1975)	44	-	50	10	26	6	M	A
<i>P. kuhlii</i> 1♂	Czechoslovakia (Zima, 1982)	44	-	50	8	30	4	M/Sm	D
<i>P. kuhlii</i> 1♀	Greece (Volleth et al., 2001)	44	-	50	-	-	-	-	-
<i>P.cf. kuhlii</i> 1♂	Madagascar (Volleth et al., 2001)	42	-	50	-	-	-	-	D
<i>P. kuhlii</i> 5♀♀, 3♂♂	Turkey (This study)	44	54	50	8	30	4	M	A

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