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A Cytogenetic Study on the *Pelobates syriacus* (Amphibia, Anura) in Bursa-Turkey

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Abstract: In this study, we karyotyped *Pelobates syriacus* and examined cytological aspects of the chromosomes. The diploid number of chromosomes was found to be $2n=26$, with 11 submetacentric pairs, 1 metacentric pair, and 1 acrocentric pair.

Key Words: *Pelobates syriacus*, chromosome, karyotype.

Bursa'da Yaşayan *Pelobates syriacus* (Amphibia, Anura) Üzerinde Sitogenetik Bir İnceleme

Özet: Bu çalışmada Pelobatidae (Amphibia, Anura) familyasına ait Toprak kurbağası (*Pelobates syriacus*)'nin kromozom yapı ve sayıları incelenip karyotipi saptanmıştır. Sitogenetik incelemeler sonucunda $2n=26$ diploid kromozom bulunmuştur. Yapılan karyotipler sonucunda 13 çift kromozomdan 11 çiftinin submetasentrik, 1 çiftinin metasentrik ve 1 çiftinin de akrosentrik olduğu görülmüştür.

Anahtar Sözcükler: *Pelobates syriacus*, kromozom, karyoti

Introduction

Pelobates syriacus is a species belonging to the family Pelobatidae. Its most prominent character is the large keratinized inner metatarsal tubercle. Typically, it has green-colored maculation spots on the dorsum (Figure 1). It hides underground during the day and leaves to hunt at night. It goes to water only during the reproductive season. Because it is found in every suitable biotope, *Pelobates syriacus* has a wide distribution in Turkey (1).

The numbers, lengths and shapes of the chromosomes in a species are constant, and among related species the chromosomal make-up is similar. However, in rare cases, differences in chromosome number and structure within populations of the same species and/or among related species have been found. In Anura, the most common cytogenetic technique for cytotaxonomic analysis has

been the C-banding technique (2, 3, 4). This type of study is very scarce in Turkey (5). In this paper, we report a cytogenetic analysis of *Pelobates syriacus* in Turkey for the first time.

Materials and Methods

In this study, 10 females and 6 males, a total of 16 specimens, were examined. The specimens were collected from near to Nilüfer Stream, Bursa. The living specimens were brought to the laboratory. 16 hours before sacrifice, 0.3% colchicine solution was injected under the skin into the ventrum. Mitotic chromosomes were prepared from the bone marrows of both the femur and humerus. The bone marrow was flushed out with 0.075 M KCl from the bones and incubated for 7 min at 37 °C (6). Then this material was centrifuged at 1400 rpm for 10 min and fixed in methanol : acetic acid (3:1). Two

slides were prepared for each animal and these were stained with Giemsa solution for 25 min (7, 8). The slides were examined under a light microscope, and 30 well-spread metaphase figures were chosen for observation. Some of these figures were photographed and ordered in the karyotype according to length. For each chromosome, the small arm, long arm and total length were measured and recorded using these karyotypes. The relative lengths and arm ratios were determined from these findings.

Results

The chromosome complement of *Pelobates syriacus* consists of 26 chromosomes. The seventh pair is acrocentric, the thirteenth pair is metacentric and the remaining pairs are submetacentric (Figures 2, 3a and b). The quantitative data measurements (relative lengths and arm ratios) are summarized in Table 1 for each chromosome. Based on the data in Table 1, we can divide the chromosomes into three groups: between the relative lengths of 13.68 and 10.11, there are 5 pairs; between 8.48 and 5.43, there are 3 pairs; and between 4.83 and 3.49, there are 5 pairs of chromosomes.



Figure 1. Dorsal view of a *Pelobates syriacus*.

Discussion

Our results are consistent with other studies showing that *Pelobates syriacus* has 13 pairs of chromosomes (3).

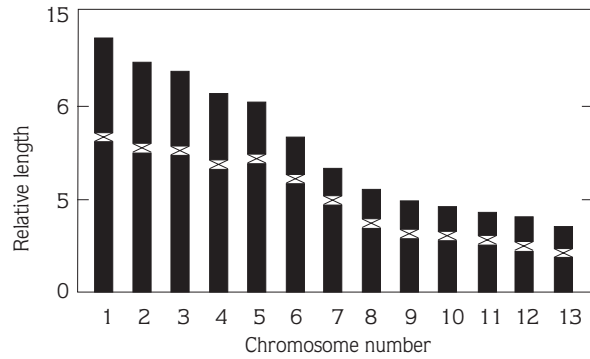


Figure 2. Idiograms of *Pelobates syriacus* chromosomes.

Table 1. Relative lengths and arm ratios of the chromosome pairs in *Pelobates syriacus*.

Pair number	Pelobates syriacus	
	Relative length (X±SE)	Arm ratio (X±SE)
1	13.68± 0.24	1.58± 0.03
2	12.31± 0.12	1.75± 0.05
3	11.84± 0.18	1.80± 0.04
4	10.71± 0.20	1.80± 0.08
5	10.11± 0.16	2.53± 0.14
6	8.48± 0.14	2.56± 0.10
7	6.69± 0.13	2.86± 0.10
8	5.43± 0.15	2.14± 0.15
9	4.83± 0.09	1.85± 0.08
10	4.53± 0.12	1.95± 0.18
11	4.24± 0.13	1.82± 0.11
12	3.97± 0.13	1.63± 0.06
13	3.49± 0.10	1.44± 0.06

In a recent study, *P. cultripes* from Spain and *P. varaldii* from Morocco were also found to have 13 pairs of chromosomes (6). Herrero and Talavera (1988) divided the chromosomes of *P. cultripes* and *P. varaldii* with regard to their relative lengths into three groups, as in our study above (6). It was also shown in the same paper

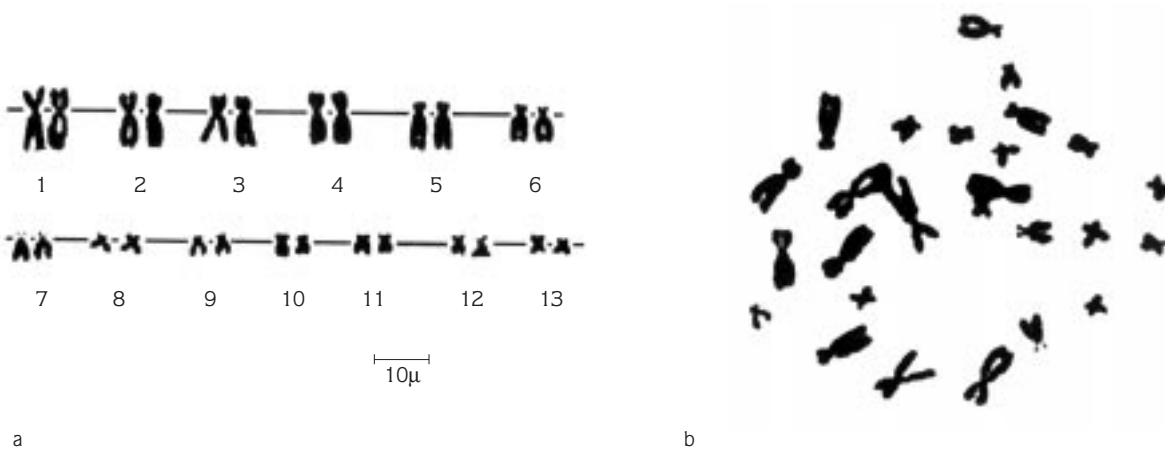


Figure 3. a. Karyotype of *Pelobates syriacus*. b. Metaphase chromosomes of the same animal.

that the fifth, ninth, and tenth chromosomes were acrocentric, that the thirteenth pair was metacentric, and that the others were submetacentric for *P. cultripes*; in *P. varaldii*, it was found that the fifth, seventh, ninth, and tenth pairs were acrocentric, that the thirteenth was

metacentric, and that the other pairs were submetacentric (6). Based on an analysis of cytological characteristics, we determined that the number of chromosomes in *Pelobates syriacus* was $2n=26$.

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