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The Karyotype of the Wild Boar *Sus scrofa* Linnaeus, 1758 in Turkey (Mammalia: Artiodactyla)

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Abstract: This study is based on the karyological analyses of 4 *Sus scrofa* specimens obtained from Kırıkkale province in 2003 and 2005. It is the first time that karyotypes of Turkish wild boar specimens were determined. The diploid chromosome number (2n) is 38 and number of autosomal arms (NFa) 60. Karyological data were compared to the relevant literature. The results showed that the Turkish wild boar is different from central and western continental European specimens having 36 chromosomes and is identical to the domestic pig, and ones from east and south-east Europe and the Mediterranean islands.

Key Words: Distribution, karyotype, *Sus scrofa*, Turkey

Türkiye'deki Yaban Domuzu *Sus scrofa* Linnaeus, 1758'in Karyotipi (Mammalia: Artiodactyla)

Özet: Bu çalışma 2003 ve 2005 yıllarında Kırıkkale ilinden toplanan 4 *Sus scrofa* örneğinin karyolojik analizine dayanmaktadır. Türkiye yaban domuzu örneklerinin karyotipi ilk kez belirlenmiştir. Diploid kromozom sayısı (2n) 38, otozomal kol sayısı (NFa) 60 olarak bulunmuştur. Karyolojik veriler ilgili literatürler ile karşılaştırılmıştır. Sonuçlar, Türkiye yaban domuzunun, 36 kromozom sayısına sahip orta ve batı kıtasal Avrupa örneklerinden farklı ve evcil domuz, doğu ve güneydoğu Avrupa ve Akdeniz örnekleriyle aynı olduğunu göstermiştir.

Anahtar Sözcükler: Yayılış, karyotip, *Sus scrofa*, Türkiye

Introduction

One of the mammalian species showing chromosomal polymorphism is the European wild boar, *Sus scrofa*. It was stated that the diploid chromosome number of *S. scrofa* in continental Europe, Central and Far East Asia, and the USA varied from 36 to 38, and in the Mediterranean islands was 38 (McFee et al., 1966; Rary et al., 1968; Gustavsson et al., 1973; Tikhonov and Troshina, 1974; Bosma, 1976; Macchi et al., 1995). In addition, it was reported that the diploid chromosome number of the domestic pig was 38 (Hansen-Melander and Melander, 1974; Gustavsson, 1988; Bosma et al., 1991). Hsu and Benirschke (1967) reported that the diploid chromosome number of the wild boar distributed in the USA, firstly imported from Germany in 1912, was 36. McFee et al. (1966) pointed out that the polymorphism in the diploid number was caused by the Robertsonian translocation.

Some authors (Tunçok, 1935; Erençin, 1977; Kumerloeve, 1978; Turan, 1984) have stated that the whole of Turkey is within the distribution area of *Sus scrofa*. Some authors (Steiner and Vauk, 1966; Huş, 1967; Kumerloeve, 1978; Mayer and Brisbin, 1991) also gave the distribution of *Sus scrofa* on a provincial basis in Turkey. Ellerman and Morrison-Scott (1951), Mohr (1960) and Mursaloğlu (1964) pointed out that the wild boar in Anatolia was represented by *Sus scrofa libycus*.

The purpose of the present study was to determine the karyotype of *S. scrofa* in Turkey for the first time.

Materials and Methods

Four specimens obtained from Kırıkkale province in 2003 (1 ♂, 1 ♀) and 2005 (2 ♂) (Figure 1) were karyotyped. The karyological analysis was performed according to Patton (1967). At least 10 slides were

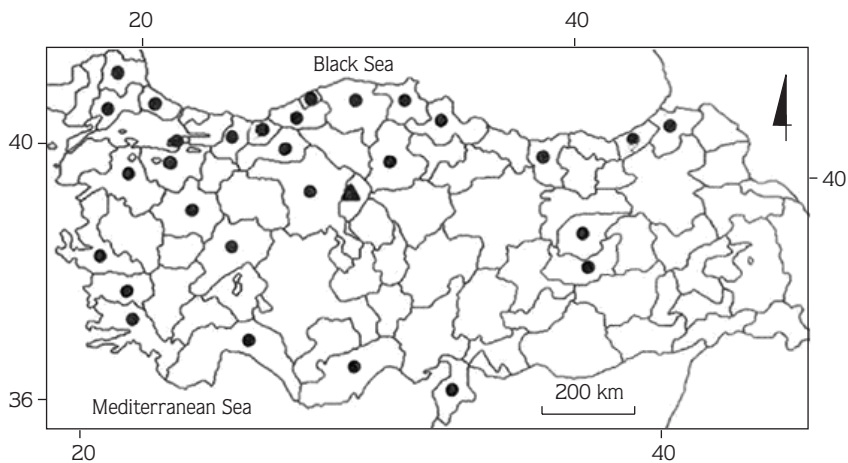


Figure 1. The collection locality of *Sus scrofa* (▲) examined for the karyology and previous records (●) in Turkey

prepared and 10 to 25 well-stained metaphase spreads were examined from each slide. Karyological data were compared with the relevant literature.

The specimens examined are deposited at the Department of Biology, Faculty of Science and Arts, University of Kirikkale.

Results and Discussion

During the fieldwork, 4 piglets, the mothers of which had been shot dead by hunters, were encountered and their karyology was studied.

It was determined that the diploid chromosome number in the young animals was equal to 38 and the

number of autosomal arms was 60. There were 12 metacentric, submetacentric and subtelocentric, and 6 acrocentric autosome pairs in the chromosome set. The X chromosome was medium-sized submetacentric, whereas the Y chromosome was small metacentric. In one of the medium-sized metacentric chromosome pairs, a secondary constriction was observed (Figure 2).

Our karyological data were compared with those obtained from the USA (Hsu and Benirschke, 1967; Rary, 1968), Holland, Yugoslavia, Poland (Rejduch et al., 2003), Italy (Macchi et al., 1995) and Europe (Groves, 1981; Bosma et al., 1991) (Table).

Our karyological data are in agreement with those of the domestic pig and wild boar in Holland, Poland and



Figure 2. A male karyotype of Turkish *Sus scrofa*.

Table. Karyotypic characteristics of *Sus scrofa* from the USA, Holland, Yugoslavia, Poland, Italy, Europe and Turkey. 2n: Diploid chromosome number, NFa: Number of autosomal arms, M: Metacentric, SM: Submetacentric, ST: Subtelocentric, A: Acrocentric, X: X chromosome, Y: Y chromosome.

Country	Species or subspecies	2n	NFa	M/SM/ST	A	X	Y
USA (Hsu and Benirschke, 1967; Rary et al., 1968)	<i>S. scrofa</i>	37	-	-	-	-	-
	<i>S. scrofa</i>	36	60	26	8	SM	M
	<i>S. scrofa domestica</i>	38	60	24	12	SM	M
HOLLAND (Bosma, 1976)	<i>S. scrofa scrofa</i>	38	-	-	-	-	-
	<i>S. scrofa scrofa</i>	37	-	-	-	-	-
	<i>S. scrofa scrofa</i>	36	-	-	-	-	-
YUGOSLAVIA (Zivkovic et al., 1971)	<i>S. scrofa scrofa</i>	38	-	-	-	-	-
ITALY (Macchi et al., 1995)	<i>S. scrofa scrofa</i> (2 ♀♀, 1 ♂)	38	60	24	12	SM	M
	<i>S. scrofa scrofa</i> (2 ♀♀)	37	60	25	10	SM	M
	<i>S. scrofa scrofa</i> (6 ♂♂, 2 ♀♀)	36	60	26	8	SM	M
	<i>S. scrofa domestica</i> (3 ♀♀, 1 ♂)	38	60	24	12	SM	M
EUROPE (Bosma et al., 1991; Groves, 1981)	<i>S. scrofa</i>	38	-	-	-	-	-
	<i>S. scrofa</i>	36	-	-	-	-	-
POLAND (Rejduch et al., 2003)	<i>S. scrofa scrofa</i> (1 ♂)	38	60	24	12	-	-
	<i>S. scrofa scrofa</i> (2 ♀♀, 1 ♂)	37	60	25	10	-	-
	<i>S. scrofa scrofa</i> (1 ♂)	36	60	26	8	-	-
TURKEY (This study)	<i>S. scrofa</i> (3 ♂♂, 1 ♀)	38	60	24	12	SM	M

Yugoslavia with respect to the diploid chromosome number, shape and number of autosomal arms, and shape of the X and Y chromosomes. As can be seen in the Table, the diploid chromosome numbers found for European wild boar populations are 36, 37 and 38, and the number of autosomal arms is 60, resulting from chromosomal polymorphism (Bosma, 1976; Macchi et al., 1995; Rejduch et al., 2003).

In conclusion, our karyotype is identical to those of the domestic pig and some populations of the nominate

form in Europe and Asia. In addition, our data are also similar to those of the domestic pig with respect to having a secondary constriction in one of the metacentric chromosome pairs.

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