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Contribution to the Taxonomy, Distribution and Karyology of *Martes foina* (Erxleben, 1777) (Mammalia: Carnivora) in Turkey

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Abstract: In this preliminary study, nine Stone Martens were recorded from different localities in Turkey. Their morphological characteristics were found to be consistent with previously published papers. However, the throat patches of Turkish Stone Martens show variations with respect to shape. In addition, it was determined that the morphologic and biometric characteristics of Turkish samples were consistent with those of *M. f. syriaca*. According to the karyological findings, the diploid number of chromosomes and the fundamental number were 38 and 76, respectively.

Key Words: *Martes foina,* distribution, karyolog.

Türkiye'deki *Martes foina* (Erxleben, 1777) (Mammalia: Carnivora)'nın Taksonomisine, Yayılışına ve Karyolojisine Katkılar

Özet: Bu ön çalışmada; Türkiye'nin değişik lokalitelerinden dokuz Kaya Sansarı kaydedildi. Bunların morfolojik karakterlerinin daha önce yayınlanmış makalelerle uygunluk gösterdiği bulundu. Ancak Türkiye Kaya sansarlarının gögüs lekeleri şekil bakımından varyasyonlar göstermektedir. Ayrıca Türkiye örneklerinin morfolojik ve biyometrik karakterlerinin *M. f. syriaca* ile uygunluk gösterdiği saptanmıştır. Karyolojik bulgulara göre; diploid kromozom ve temel kol sayısı sırasıyla 38 ve 76'dır.

Anahtar Sözcükler: *Martes foina,* yayılış, karyoloji.

Introduction

Mustelidae are represented throughout the Palaeartic region by at least five genera according to different authors; Ellerman and Morrison–Scot (1), Corbet (2), Harrison (3), Harrison and Bates (4). Of these genera, *Martes* comprises five species in the palaearctic region (2, 3, 4). One of these species is *Martes foina*, in Turkey. Although distributional records about *M. foina* from Turkey have been presented by Danford and Alston (5), Çağlar (6), and Kumerleove (7). Turkish Stone Martens have been not described in detail yet, and their taxonomy and distribution in Turkey are under discussion. In addition, the karyotype of this species is still unavailable. In this study, distributional records along with karyologic findings of *M. foina* were presented in order to provide comparative materials and knowledge about Turkish carnivores.

Material and Method

This study was based on specimens that were run over by cars on the highways or shot by hunters. The localities from where the specimens were collected are shown in Figure 1. All specimens were skinned and prepared in the standard museum method. External, cranial characteristic measurements (mm), and weight (g) were taken from fresh materials according the method described by Harrison and bates (4). The photographs were originally taken of the skulls, and two female samples from Çankırı (Fig. 1) were karyotyped by using the technique described by Patton (8). A total of 15 slides were prepared for each specimen karyotyped, and a total of at least 30 well–spread metaphase cells from each preparation were analysed. Skins and skulls of the specimens were deposited in Ankara University Faculty of Science.

Results

Martes foina (Erxleben, 1777)

1777 *Mustela foina* Erxleben, Syst. Regn. Anim. 1:458.

Type locality: Germany

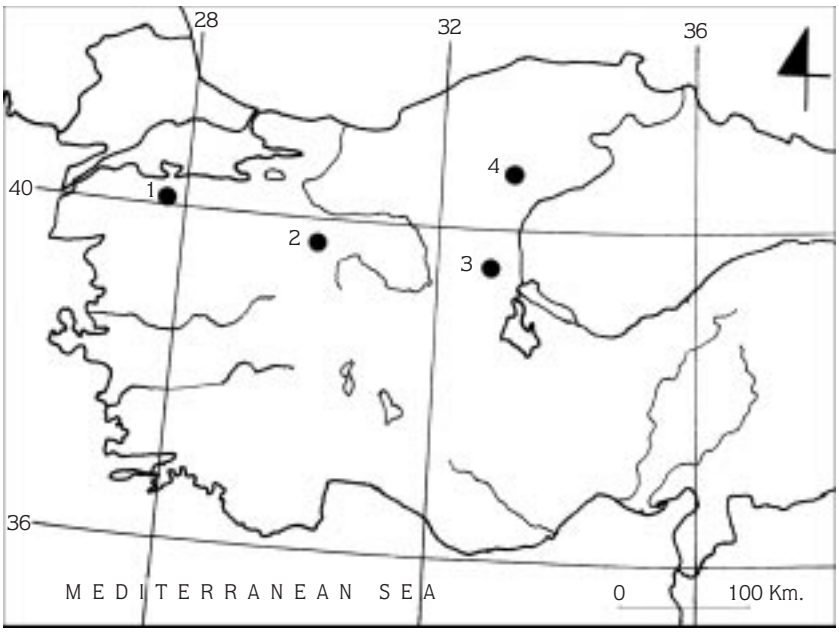

Figure 1. Record localities [illegible] Martens, 1: Gönen/ [illegible] (, 1), 2: Gök [illegible]ışık/ Eskişehir (1), 4: [illegible]nkır (2).

External characteristics: The general form was medium in size with elongated body and relatively short limbs. We examined the both winter and the summer pelages. In late summer, the dorsal fur was dark brownish, and the hair bases were pale cream. That is why the dorsal feature seemed to be slightly mixed with pale cream. The ears were short and covered with short tiny hairs. The colour of tail was almost the same as the dorsal fur, but its colour was darker than the back especially towards the tip of tail, which had long and bushy hair. The limbs were also a similar colour to the dorsal but darker. The ventral pelage was pale creamy buff, and there was a whitish throat patch, and the throat patches of our samples had many different variations with respect to shape. In addition there was a reddish patch in the inguinal region of the females examined. The measurements of external and cranial characteristics are presented in Table 1.

Table 1. The external and cranial measurements (mm) of Turkish Stone Martens, *Martes foina* (n: number of specimens, SD: Standard Deviation).

Characters	n	Average		SD	Range		
Total Length	9	634.6	±	17.4	611	–	652
Head and Body Length	9	395.8	±	8.2	390	–	410
Tail Length	9	240.4	±	19.3	220	–	262
Hind Foot Length	9	75.0	±	6.6	64	–	80
Ear Length	9	37.2	±	3.1	34	–	41
Weight (gr.)	9	1058.0	±	145.0	850	–	1210
Zygomatic Breadth	8	45.9	±	2.2	44.1	–	48.7
Interorbital Constriction	9	16.3	±	1.1	15.3	–	18.2
Condylobasal Length	8	74.1	±	2.6	71.3	–	77.6
Greatest Length of Skull	8	77.0	±	2.5	73.3	–	79.8
Basal Length	8	67.1	±	2.0	65	–	69.5
Mastoid Breadth	9	20.4	±	0.3	20.1	–	21.8
Height of Brain–case	9	27.8	±	0.4	27.3	–	29.7
Brain–case Width	9	34.6	±	1.0	33.8	–	36
Palatal Length	9	35.1	±	1.0	34	–	36.2
Bullae Length	9	15.3	±	0.5	14.7	–	15.9
Mandible Length	9	49.3	±	1.9	47	–	51.7
Upper Molar Alveolar Length	9	30.6	±	1.8	29	–	33.4
Lower Molar Alveolar Length	9	32.4	±	1.9	30	–	34.7

Cranial characteristics: The rostrum and the nasal were short projecting behind the anterior root of the zygoma, the interorbital construction was wide, and the postorbital processes were well developed. The zygomatic arch was slender, the braincase was swollen and the sagittal ridge was present in the males, and the lambdoid ridge was well developed in both the males and females. The condyles were not visible in the dorsal view (Fig. 2 a). The palatal was relatively wide, and there was no notch in its posterior end. The hamular processes were not in contact with the anterior tip of the bullae. The mandible was relatively short and its coronoid process was high (Fig. 2 b, c). Dental formula: i: 3/3, c: 1/1, pm: 4/4, m: 1/2 = 38.

Figure 2. The skull of *Martes foina*, a: dorsal, b: ventral, c: mandible from labial. Scale: 5 cm.

Baculum: Os baculum was in the shape of a curved stick, and it had a small hole, laterally placed at the anterior tip (Fig. 3).

Karyology: Karyologic studies were performed on two female samples from province of Çankırı (Fig. 4). That is why we did not examine sex chromosomes. The diploid number of chromosomes was [illegible]8, and the karyotype was composed of 17 pai[illegible] meta[illegible]submetacentric a[illegible]d 2 pairs of subteloce[illegible]. The fundame[illegible]al numb[illegible]r (FN) was 76. Spe[illegible]n (Balıkesir) 4 , 1 , Gökçekıs[illegible] (Esk[illegible]) , Ankara 1 , Çankırı 2 .

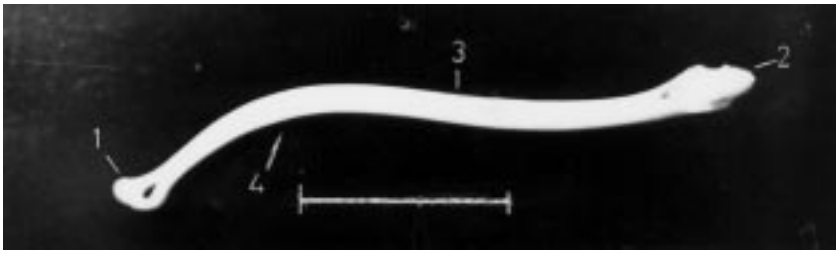

Figure 3. Os baculum of Stone martens, lateral view. 1: anterior tip, 2: posterior base, 3: dorsal, 4: ventral. Scale: 2 cm.

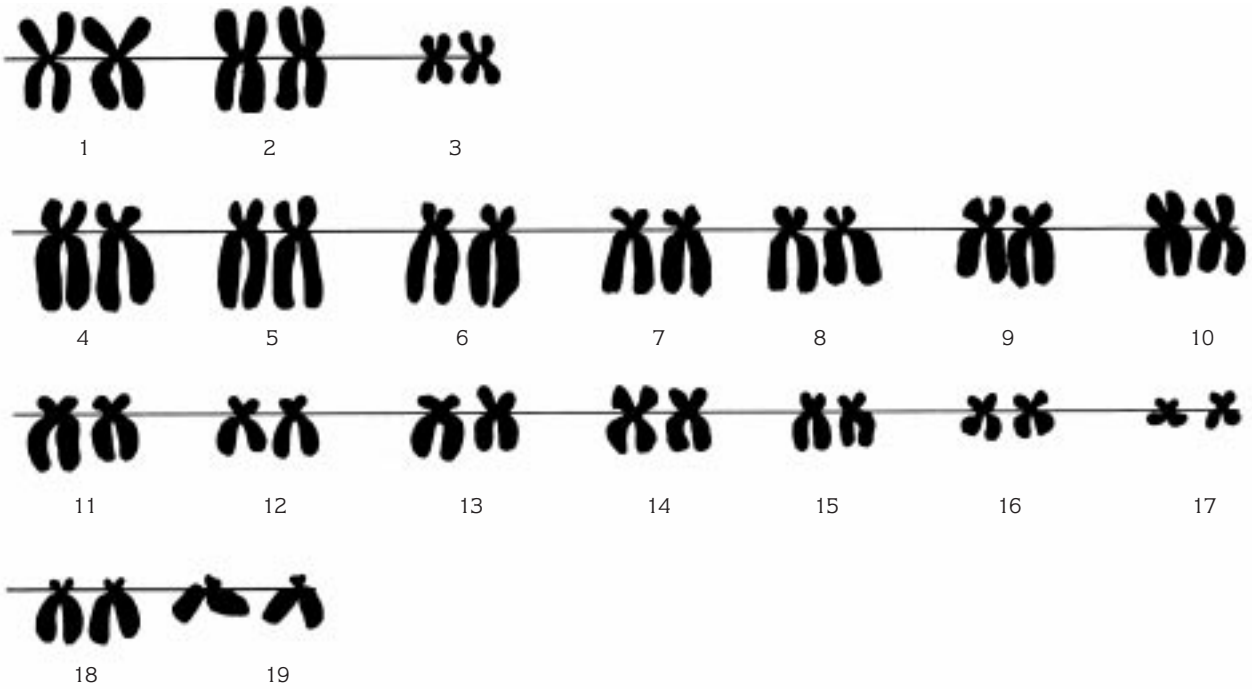

Figure 4. The karyotype of female specimen, 2n: 38, NF: 76.

Discussion

Martes foina was first recorded from Tarsus without any descriptions by Danford and Allston (5). In addition, Çağlar (6) and Kumerleove (7) gave the distributional records from different localities in western and central Anatolia. When taking into consideration these distributional records and our findings, it was concluded that *M foina* is distributed throughout Anatolia. However, Miller (9) has pointed out that it is very difficult to distinguish *M. foina* from *M. martes* by external characteristics alone. Our diagnostic characteristics in external and cranial morphologies of Stone Martens are exactly consistent with those of Miller (9) and Niethammer and Krapp (10). Niethammer and Krapp (10) have specified different shapes of the throat patches for the geographical races of *M. foina*. In contrast to this finding, we noted that it is not a true taxonomic characteristic because of variations of the throat patch in our samples. The type locality of the nominative

subspecies is Germany, and according to Miller (9) their ranging areas extend from central and southern Continental Europe and the Atlantic coast to the Mediterranean coast. In addition the specimens from areas in Syria and Jordan neighbouring southern Turkey have been included in the subspecies. *M. foina syriaca* by Nehring (11), Corbet (2), and Harrison and Bates (4). Harrison and Bates (4) have also suggested that *M. f. syriaca* is distinguishable from the nominative subspecies by its smaller skull and generally paler colour on the back. Miller (9) has reported the condylobasal lengths (mm) for seven specimens of the nominative subspecies as follows: 80.0, 84.6, 78.0, 79.0, 77.6, 84.0. When our adult specimens from western Turkey were compared with those of *M. f. syriaca* reported by Harrison and Bates (4) and the nominative subspecies by Miller (9), the condylobasal length of our specimens was smaller than the nominative subspecies, and the characteristics of the Turkish samples were consistent with the measurements of *M. f. syriaca*. The first data on the karyology of *M. foina* was presented by Ehrlich (12) and Renzoni (13). According to their karyologic findings, the karyotype of Stone Martens was composed of 38 chromosomes. According to Graphodatsky et al. (14), 2n was 38 and FN was 72 for female samples, and the karyotype contained 16 pairs of bi–armed and 3 pairs of acrocentric chromosomes. In contrast, Turkish specimens had no acrocentric chromosomes. Thus, our findings show that 2n is very stable but FN is variable in *M. foina*.

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