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A Study on *Mustela nivalis* Linnaeus, 1766 (Mammalia: Carnivora) in Turkey

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Abstract: In this study, five specimens of *Mustela nivalis* collected from five localities in Turkey were examined based on karyological, morphological, bacular and some ecological aspects. The karyotype of *M. nivalis* has 2n=42, NFa=72 and FN=76. The baculum seems to be similar to that of specimens of *M. nivalis dinniki* from Erivan (Armenia).

Key Words: *Mustela nivalis,* karyology, baculum, Turkey

Türkiye'deki *Mustela nivalis* Linnaeus, 1766 (Mammalia: Carnivora) Üzerine Bir Çalışma

Özet: Bu çalışmada, *Mustela nivalis*'e ait Türkiye'deki beş lokaliteden toplanan beş örnek karyolojik, morfolojik, bakulum ve bazı ekolojik özelliklerine göre incelendi. *M. nivalis* 2n=42, NFa=72 ve NF=76'lık karyolojik değerlere sahiptir. Bakulum *M. nivalis dinniki*'ye ait Erivan (Ermenistan) örneklerinin bakulumuna benzerdir.

Anahtar Sözcükler: *Mustela nivalis,* karyoloji, bakulum, Türkiye

Introduction

Mustela nivalis is distributed in Palaearctic region (1, 2, 3, 4). Hatt (5) recorded *nivalis* from Iraq, Lay (6) from Iran, and Thomas (7) from Bayburt (Turkey). Harrison and Bates (4) gave a specimen from Lebanon, including Turkey in the distribution area of *nivalis* without giving any record locality.

Although the karyotype of *M. nivalis* was given from various countries, there is no karyological study in Turkey. In this study, it was aimed to contributed the karyology and the taxonomy of *M. nivalis.*

Material and Methods

Five specimens of *M. nivalis* were collected from Ankara, Bolu, Balıkesir, Aksaray and Kırklareli. Two specimens from Bolu were karyotyped using the technique of Ford and Hamerton (8). Twenty-five metaphase cells, whose chromosomes were well-stained and well-separated, were examined from each animal. The karyotypes, skulls, skins and bacula are deposited at the Department of Biology, Faculty of Science, University of Ankara.

Results

Habitat: The favorable habitat of *M. nivalis* is the edges of small brooks inside deciduous forests inhabited by small mammals. In this study, it was also found around some villages.

Distribution: Fig. 1 shows the recorded localities of *M. nivalis*

Co-occurring Rodent Species: *M. nivalis* lives in sympatry with *Apodemus sylvaticus, A. agrarius, A. flavicollis, Mis* sp. *Microtus subterraneus, M. guentheri Sciurus vulgaris, S. anomalus* and *Rattus rattus. Apodemus* species are more abundant.

External Characteristics: The fur is dorsally dark brown, ventrally whitish or slightly yellowish white. The line of demarcation is fairly distinct. The tail is short and has the same coloration as the dorsal coloration. The distal parts of fore and hind feet are white on the level of the toes. The rostrum and the nasals are short and relatively laterally flattened. The interorbital constriction is also wide and the zygomatic arc is slender-bulit, the braincase is laterally swollen and oval-shaped. The sagittal ridge is weakly developed, but the lambdoid ridge is always present and well marked. The condyles are slightly visible in dorsal view. The mandible is relatively short and slender (Fig. 2).

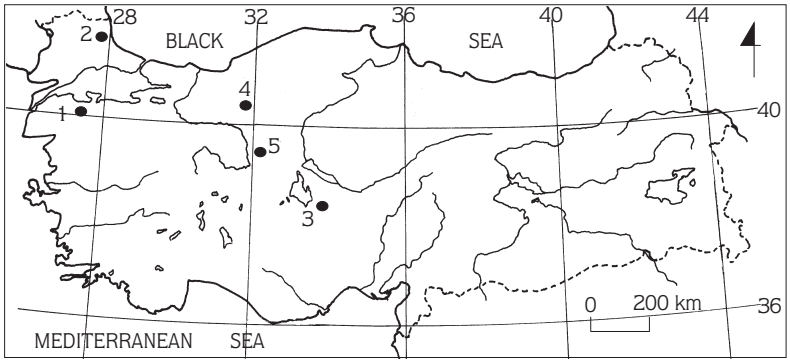

Figure 1. Map showing distribution of *Mustela nivalis* 1. Gönen/ Balıkesir, 2. Demirköy/ Kırklareli, 3. Aksaray, 4. Abant/Bolu, 5. Polatlı/ Ankara

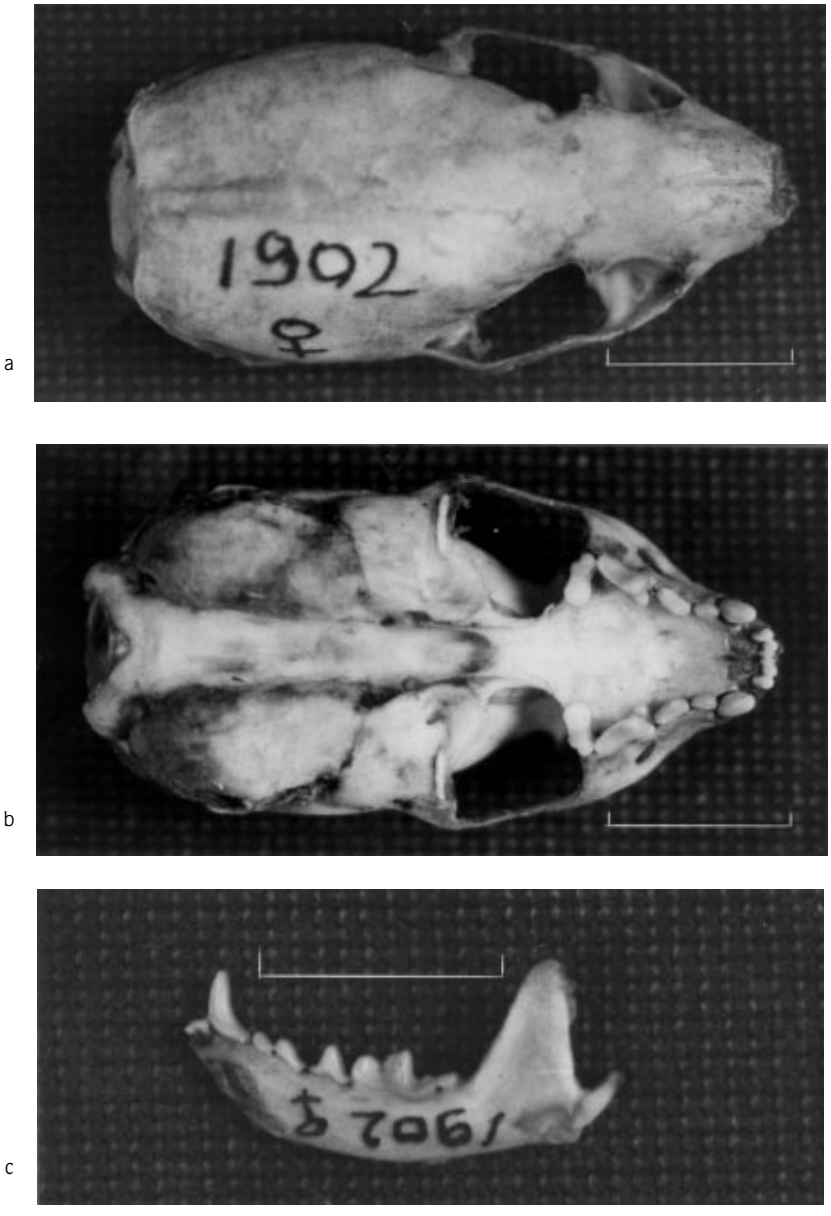

Figure 2. The skull of *Mustela nivalis* from Polatlı/Ankara a. Dorsal, b. Ventral, c. Mandible. Scale: 1 cm.

Table 1. The external and cranial measurements (mm) of *M. nivalis* (n: number of specimens, SD: Standard Deviation)

Characters	n	Mean	Range	±SD
Total length	5	289.4	240-350	43.32
Head and body length	5	213.2	170-255	33.45
Tail length	5	76.2	65-100	12.51
Hind foot length	5	35.0	29-42	4.42
Ear length	5	14.6	10-20	3.66
Weight (gr)	5	123.6	47-225	73.65
Zygomatic breadth	5	22.54	18.7-26.8	3.50
Interorbital constriction	5	8.36	7.8-9.2	8.36
Condylobasal length	5	39.56	35.8-45.7	3.95
Greatest length of skull	5	40.34	36.3-46.4	40.34
Basal length	5	36.72	33.1-42.1	3.48
Mastoid breadth	5	11.80	10.5-13.1	0.93
Height of braincase	5	14.76	13.1-16.1	1.25
Braincase width	5	18.95	16.8-20.1	1.66
Palatal length	5	15.18	13.3-17.2	1.43
Bullae length	5	13.10	11.7-14.6	1.08
Mandible length	5	21.28	17.8-24.3	2.46
Upper molar alveolar length	5	11.64	10.0-12.8	1.07
Lower molar alveolar length	5	12.06	10.2-13.5	1.04

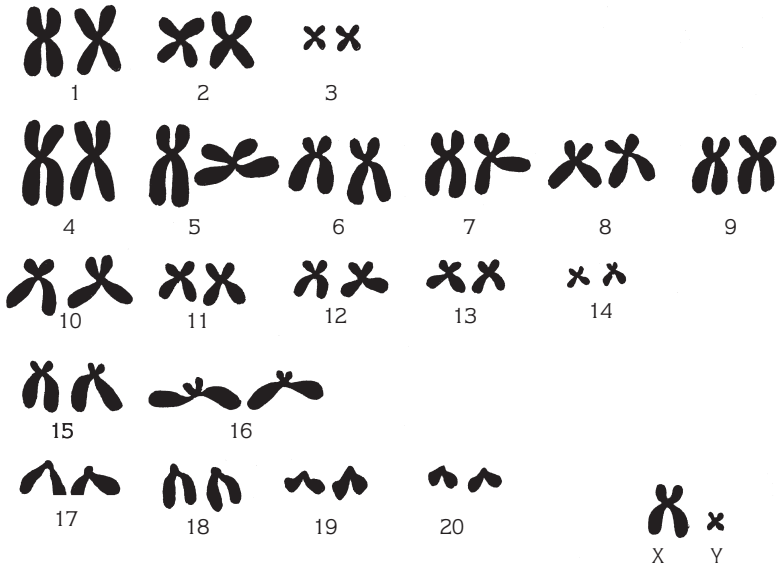

Figure 3. The karyotype of *Mustela nivalis* from Abant/Bolu

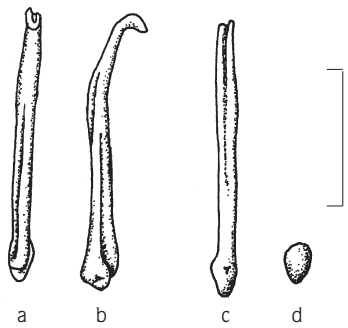

Figure 4. The baculum of *Mustela nivalis* from Gönen/Balıkesir. a. Ventral, b. lateral, c. dorsal, d. basal view. Scale: 1 cm.

Karyology: The diploid number of chromosomes is 2n=42, the number of autosomal arms is NFa=72 and the fundamental number is FN=76. The autosomal set consists of 32 biarmed chromosomes and 8 acrocentrics. The X chromosome is submetacentric and the Y chromosome is small metacentric (Fig. 3).

Baculum: The baculum is 2.5 cm in length and 0.25 cm in base. It is curved in dorso-ventral aspect, and its tip is hook-shaped (Fig. 4).

Specimens examined: 5 distributed as follows: Abant, Bolu, 1; Demirköy, Kırklareli 1; Aksaray 1; Gönen, Balıkesir 1; Polatlı, Ankara 1.

Discussion

Mustela nivalis was recorded by Danford and Alston (9) from the Taurus mountains, by Kock et al. (10) from Elzaığ, and by Neu (11) and Kumerloeve (12) from some parts of Anatolia. In this study, additionally, *nivalis* was collected from Bolu, Aksaray, Ankara and Kırklareli, and one specimen was seen in Akkuş (Ordu). This findings shows that *nivalis* ranges in many parts of Turkey. According to Ognev (13), there is variation based on both age and cranial aspect in *nivalis*. We determined that specimens from Aksaray and Balıkesir are larger than those from Ankara, Bolu and Kırklareli. Also, two specimens from Kırklareli and Bolu that were dark brown were lighter than those which are yellowish brown from the other localities. We compared the body and cranial measurements (Table 1) of five specimens with those given by Ognev (13) from Russia and Harrison and Bates (4) from Lebanon and found that the measurements of three Turkish specimens were consistent with those of specimens from Russia, those of two specimens were different, and in contrast, one specimen from Lebanon was similar to two specimens from Turkey. Corbet (3), Harrison and Bates (4) and Ognev (13) suggested that there are problems in the subspecific status of *nivalis* due to seasonal, sexual and individual variations. In this study, subspecific problems were not dealt with because of poor specimen series.

According to Kral and Zima (14), the diploid number of chromosomes in *nivalis* is 42, most of the autosomal chromosomes are bi-armed, the X chromosome is submetacentric, and the Y chromosome is the smallest bi-armed. The same karyotypes were described by Omodeo and Renzoni (15) in Italy, and by Dzunjev and Tchamokov (16) in Caucasia. These karyological findings are consistent wtih those of the specimens examined in this study.

It was determined that the bacula of two sepcimens from Turkey were similar to the baculum of a specimen identified by Ognev (13) for *M. nivalis dinniki* from Erivan (Armenia).

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