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Research Article

A Study on *Micromys minitus* (Pallas, 1771) (Mammalia: Rodentia) in Turkish Thrace

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Abstract: *Micromys minutus* was recorded from six localities in Turkish Thrace. The external, cranial and karyological peculiarities of the specimens were determined. The dorsal colour of the specimens is dark brownish, being lighter on the sides, but the rostrum and cheek are markedly ochre. Mean tail length relative to body length is 90.5%, and the occipito-nasal length is 18.1 mm. The diploid number of chromosomes was 2n = 68 with NF = 136 and NFa = 132.

Key Words: *Micromys minutus*, distribution, taxonomy, karyology, Thrace, Turkey.

Türkiye'nin Trakya Bölgesinde Yayılış Gösteren *Micromys minitus* (Pallas, 1771) (Mammalia: Rodentia) Üzerine Bir Çalışma

Özet: *Micromys minutus* Trakya'da altı lokaliteden kaydedildi. Örneklerin eksternal, kranial ve karyolojik özellikleri belirlendi. Buna göre, incelenen örneklerin rengi burun ucunda açık sarı, sırta ise yanlara doğru daha açık olmak üzere koyu kahverengi, kuyruğunun baş-beden uzunluğuna oranı ortalama 90.5, occipitonasal uzunluk ise ortalama 18.1 mm'dir. Diploid kromozom sayısı 2n = 68, NF = 136, NFa = 132 bulunmuştur.

Anahtar Sözcükler: *Micromys minutus*, yayılış, taksonomi, karyoloji, Trakya, Türkiye.

Introduction

Micromys is a monospecific genus distributed predominantly in the Palaearctic and marginally in the Oriental region (1-4). The harvest mouse *Micromys minutus* (Pallas, 1771) was first reported in Turkish Thrace by Kurtonur (5). Wilson and Reeder (3) listed 29 populations as synonyms in the ranging areas. Mitchell-Jones et al. (4) reported 16 subspecies in Europe. Niethammer and Krapp (6) included Turkish Thrace to the range of *Micromys minutus brauneri* Martino, 1930. Taxonomic studies on the harvest mouse have been performed by various researchers (7-12). Apart from these, many karyologic studies have been reported by Král (13,14), Lehman and Schafer (15), Tsuchia (16), Bekasova (17), Dzujev and Tembotova (18), Jüdes (19), Solleder et al. (20) and Zima (21). To date, there is no karyological data on the Turkish population of this species. This study aims to contribute to the karyology and distribution of the harvest mouse in Turkish Thrace.

Materials and Methods

Ten specimens were caught from six localities in Turkish Thrace (Fig. 1), and examined with respect to morphological and karyological characteristics. External and cranial measurements (mm) along with weight (g) were taken according to Harrison and Bates (22). All specimens were skinned in the standard museum manner and deposited at the Department of Biology, Trakya University. The skull and baculum were drawn under a binocular microscope. Two males were karyotyped following the colchicine hypotonic citrate technique of Ford and Hamerton (23). Between 10 and 20 slides were prepared for each specimen, and at least 30 well-spread metaphase plates were analysed. The diploid number of chromosomes (2n), the total number of chromosomal arms (NF) and the number of autosomal arms (NFa) were determined.

Abbreviations used in the text: TBL: Total body length, HBL: Head and body length, TL: Tail length, HFL:

Hindfoot length, EL: Ear length, W: Weight, ZB: Zygomatic breadth, IC: Interorbital constriction, CBL: Condylobasal length, ONL: Occipitonasal length, BL: Basal length, NL: Nasal length, MAB: Mastoid breadth, OW: Occipital width, DL: Diastema length, PL: Palatal length, IFL: Incisiva foramina length, MAL: Mandible length, UML: Upper molar alveolar length, and LML: Lower molar alveolar length.

Results and Discussion

Distribution and Habitat: We caught *M. minitus* in six localities around Edirne, Kırklareli and İstanbul (Fig. 1). Previously, Kurtonur (5) recorded this animal from Lake Küçükçekmece near İstanbul. The harvest mouse prefers meadows, marshes and reedbeds in the lake and riversides. The habitat of the Turkish population is consistent with the condition elsewhere in the European population (4).

External characteristics: The harvest mouse has almost the same body size as that of the house mouse (*Mus musculus*). In our material, the maximum TBL and TL were 135 mm and 65 mm, respectively. Tail length is slightly less than head and body length, and the ratio of tail length to body length (TL x 100 / HBL) varied from 82 to 98% (Table). Our measurements are similar to those reported by Niethammer and Krapp (6). According to Markov (24,25) and Vidinic (26), tail length ranged from 47 to 72 mm, HBL from 47 to 66.9 mm, HFL from 14 to 15.3 mm, EL from 7.5 to 10 mm, CBL mm from 14.8 to 18.6 mm, ZB from 8.8 to 10.2 mm and W from 5.6 g to 8.8 g in specimens from the former Yugoslavia and Bulgaria. These ranges covered the means of the Turkish specimens. The dorsal fur of Turkish specimens is dark brownish, being lighter on the sides. Unlike dorsal colour, the rostrum and cheek are markedly ochre. The ears are short, and covered with short, sparse and pale brownish hairs. The tail is markedly bicoloured being dark brownish above, and pale yellowish or dirty white below. These findings are consistent with those of Niethammer and Krapp (6). Both the upper sides of the fore and hind feet are pale brownish, but the soles are completely naked. The hairs on the ventral fur are pale yellowish or whitish, but their bases are greyish. The line of demarcation along the flanks is fairly distinct.

Cranial characteristics: The skull is relatively slender, the rostrum and nasal bones are markedly short. The nasal bones extend beyond the incisors. The brain case is

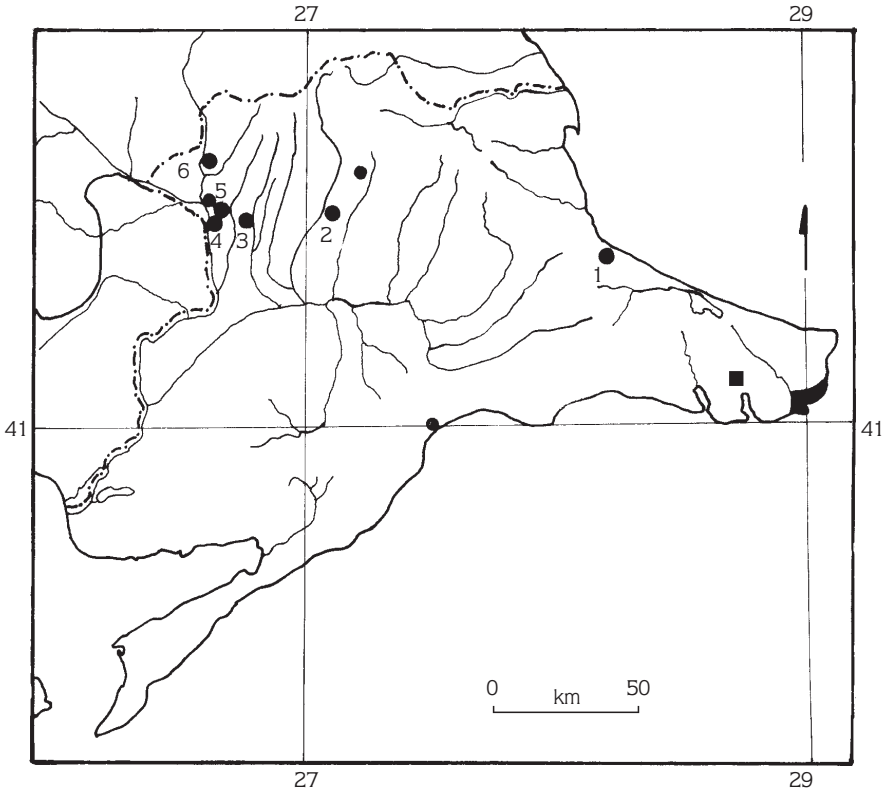

Figure 1. Localities of *Micromys minitus* in Turkish Thrace (l): 1. Karacaköy / İstanbul, 2. Babaeski / Kırklareli, 3. Havsa / Edirne, 4. Tayakadın / Edirne, 5. Güllapoğlu / Edirne, 6. Değirmenyeni / Edirne, and ■ Küçükçekmece / İstanbul (after Kurtonur, 1975).

Table. External and cranial character measurements (in mm) of eight adult *Micromys minitus* from Turkish Thrace. (SD: Standard deviation).

Characteristics	Mean	Range	SD
TBL	127.1	109-135	± 7.7
HBL	66.8	56-70	± 4.4
TL	60.3	53-65	± 4.3
TL x 100 / HBL (%)	90.5	82-98	± 5.6
HFL	14.9	13-16	± 0.9
EL	9.3	8-11	± 0.8
W (g)	9.9	7-14	± 2.5
ZB	9.3	9.0-9.4	± 0.1
IC	3.5	3.4-3.7	± 0.1
CBL	16.9	16.5-17.5	± 0.5
ONL	18.1	17.7-18.4	± 0.2
BL	15.9	15.3-16.1	± 0.3
NL	5.3	3.5-6.6	± 1.0
MAB	6.0	5.8-6.1	± 0.1
OW	9.4	9.0-9.6	± 0.2
DL	4.0	3.5-4.2	± 0.2
PL	7.2	6.9-7.5	± 0.2
IFL	3.5	3.4-3.7	± 1.9
MAL	9.7	9.1-10.0	± 0.3
UML	2.9	2.8-3.0	± 0.03
LML	2.8	2.7-2.9	± 0.05

elongated and broadened. There are no ridges at the margins of frontal, parietal or interparietal bones. The zygomatic arches are slender, and slightly expanded. The squamosal part of the zygomatic arch is not connected to the anterior margin of the auditory meatus. The supraoccipal bone forms the most posteriorly projecting point of the skull, and its median part protrudes backwards. The posterior tip of the occipital condyles and the outer rim of the meatus are not seen in the dorsal view of the skull. The diestama is short, and the incisiva foramina reaching the level of M^1 is almost as long as the diestema. The postpalatal incisiva is small split-shaped. The tip of pterygoid process is almost in contact with the anterior part of tympanic bullae. These cranial peculiarities are consistent with the drawing of Niethammer and Krapp (6), except for the V-shaped posterior margin of the palatine (Fig. 2). The tympanic bullae are not swollen ventrally, being moderate in size. The cusps of molar teeth were found to be similar to the findings of Niethammer and Krapp (6). The mandible is of moderate size, and its coronoid, condyloid and angular processes are markedly separated from each other.

Phallus and baculum: Phallus with small spines is stick-shaped. There is a marked protrusion on its anterior tip (Figs. 3a,b). The baculum is composed of the distal and proximal parts. The distal one has a single cartilageous part. The proximal part consists of the shaft and the base. The shaft and the base are stick- and spoon-shaped, respectively. There is a shallow concavity on the ventral side of the base (Figs. 4a,b,c).

Karyology: The dipliod number of chromosomes is 2n = 68. Autosomes consist of one pair of large and three

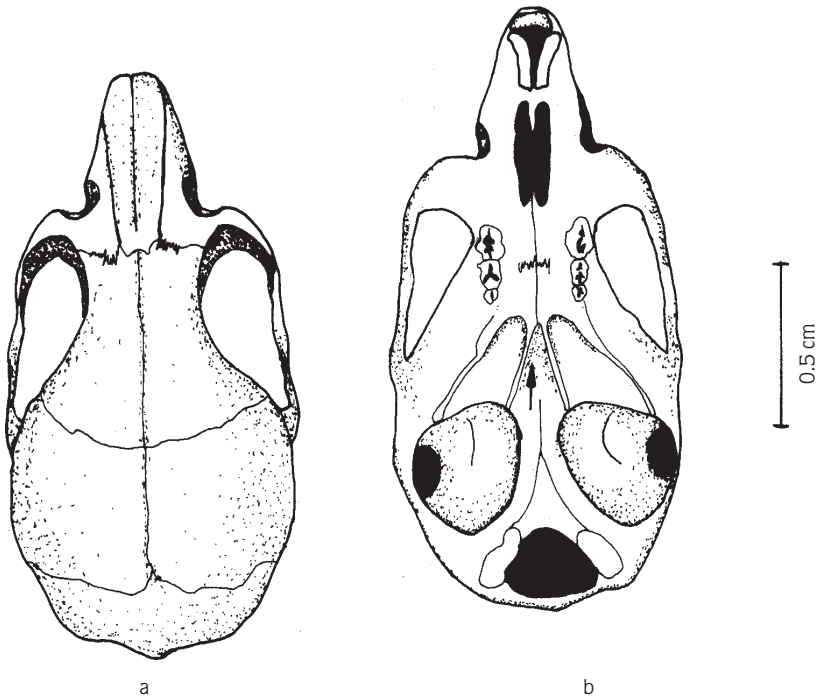

Figure 2. Dorsal (a) and ventral view (b) of *Micromys minitus* skull, the arrow indicates the V-shaped posterior margin of the palatine.

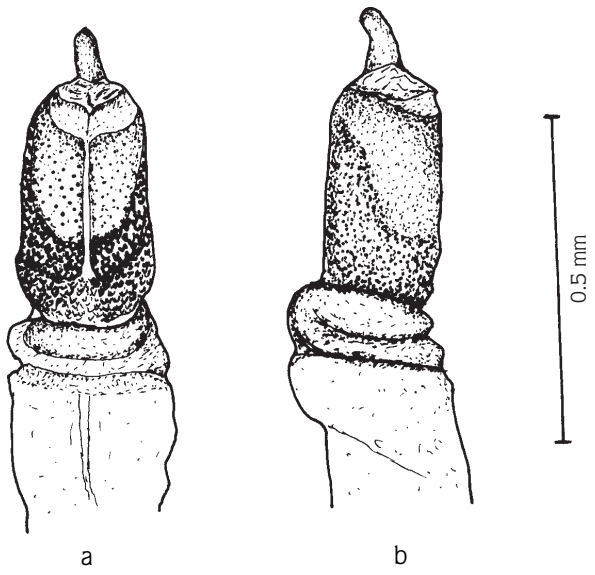

Figure 3. Phallus of *Micromys minitus* (a: dorsal, b: lateral view).

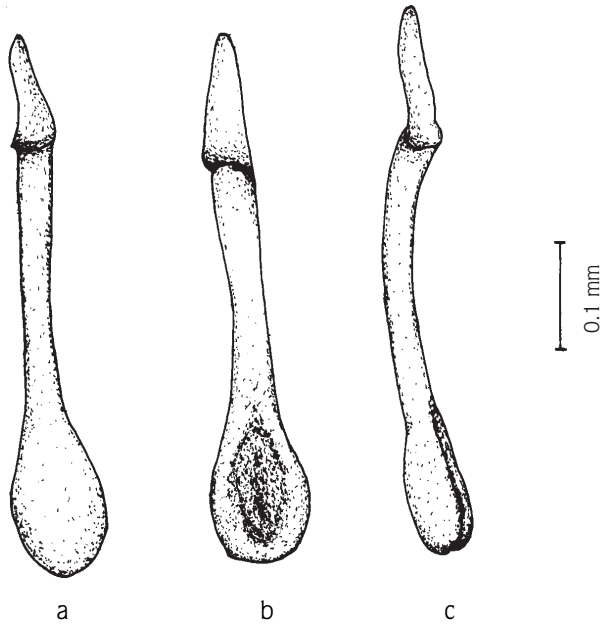

Figure 4. Baculum of *Micromys minitus* (a: dorsal, b: ventral, c: lateral view)

pairs of small metacentrics, and of 29 pairs of subtelocentric or telocentric chromosomes. The X and Y chromosomes are large telocentric and small telocentric, respectively. The NF and NFa are 132 and 136, respectively (Fig. 5). Zima and Kral (27) reported that the karyotype consists of one large metacentric pair and 2-4 pairs of small metacentrics and submetacentrics chromosomes and 28-30 pairs of acrocentrics or subtelocentrics ones. Our findings on the karyotypes of Turkish specimens are consistent with the hitherto known descriptions of the chromosome complement (17-21,27). In addition to the conventional karyotype, Bekasova (17), Jüdes (19), Solleder (20) and Zima (21) published the G- and C-banding patterns of the harvest mouse. According to their results, there are dark centromeric C-bands on all chromosomes, and mostly on the euchromatic regions in the short arms of biarmed autosomal chromosomes. All these findings suggest that

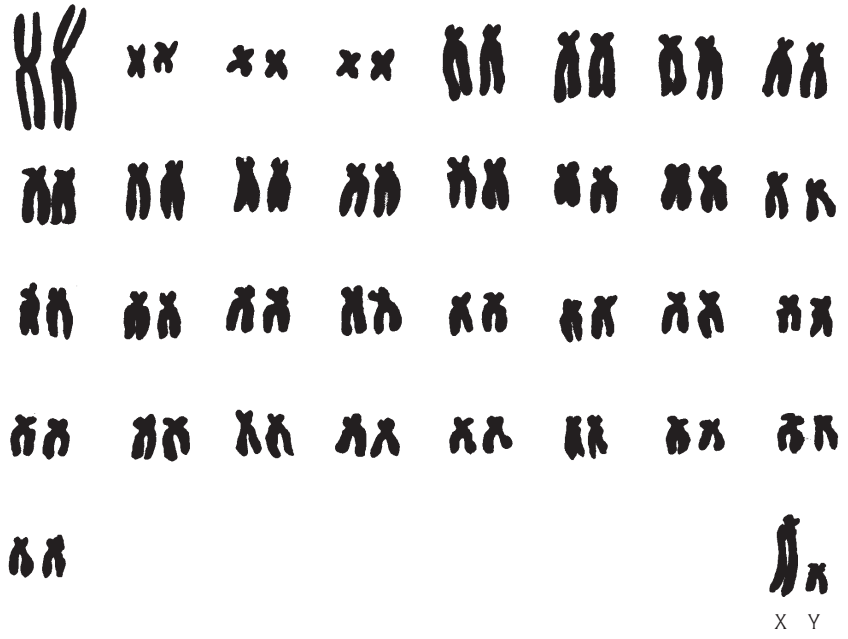

Figure 5. Karyotype of *Micromys minitus* (male), 2n = 68, NF = 136, NFa = 132.

there is no variation in the diploid number of chromosomes. Chromosomal variations rarely occur in the NF and NFa.

Taxonomic remarks: The geographic variation of *Micromys minitus* has been recorded as well as the total body length, relative tail length and dorsal colouration (10,11). Niethammer and Krapp (6) considered these criteria as seasonal and ecotypic variations. They also reported that relative tail length is not a reliable characteristic in subspecific identification. Of 16 subspecies described in Europe (4), *M. m. mehelyi* Bolkay 1925, and *M. m. brauneri* Martino 1930, are geographically closer subspecies to Turkish Thrace. Neither of these two subspecies was described in Serbia and Bosnia. However Miric (28) showed that M. *m. mehelyi* is a synonym of *Mus musculus*. Niethammer and Krapp (6) and Ondrias (9) stated that *M. m. brauneri* is distributed in Greece. When considering the geographical proximity, the Turkish population of *M. minitus* can be included in the subspecies *brauneri*.

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