

## A Study on *Apodemus iconicus* Heptner, 1948 (Mammalia: Rodentia) in Turkey

Ercüment ÇOLAK

Department of Biology, Faculty of Science, Ankara University, 06100-Beşevler, Ankara – TURKEY

Received: 08.03.2002

**Abstract:** The karyological, bacular and phallic aspects of *Apodemus iconicus* Heptner, 1948, in Turkey were examined for the first time. The diploid number of chromosomes was  $2n = 48$ , the number of autosomal arms was  $NFa = 46$ , and the fundamental number was  $NF = 48$ . The X chromosome was large acrocentric, and the Y chromosome was small acrocentric. The baculum was composed of a distal and proximal part, the average length of which was 3.74 mm. The phallus showed two notches near the crater, and a groove extending along the phallus on the ventral side.

**Key Words:** *Apodemus iconicus*, Karyology, Phallus, Baculum, Turkey

### Türkiye' deki *Apodemus iconicus* Heptner, 1948 (Mammalia: Rodentia) Üzerine Bir Çalışma

**Özet:** Türkiye' deki *Apodemus iconicus* Heptner, 1948' in karyolojik, bakulum ve phallus özellikleri ilk kez incelendi. Diploid kromozom sayısı  $2n = 48$ , otozomal kromozomların kol sayısı  $NFa = 46$ , temel kromozom kol sayısı  $NF = 48$ , X kromozomu büyük akrosentrik ve Y kromozomu ise küçük akrosentriktir. Bakulum distal ve proksimal kısımlardan oluşmaktadır. Proksimal bakulum ortalama 3.74 mm uzunluğundadır. Phallusun ventralinde kratere yakın iki çıkıntı ve ventralde uzanan bir oluğu sahiptir.

**Anahtar Sözcükler:** *Apodemus iconicus*, Karyoloji, Phallus, Bakulum, Türkiye

### Introduction

Recently, taxonomic studies have focused on the genus *Apodemus* in Turkey. Filippucci et al. (1) described *Apodemus hermonensis* from Israel. Filippucci et al. (2) recorded *Apodemus hermonensis* from western Turkey. In addition, Verimli et al. (3) separated *A. hermonensis* from *A. flavicollis* on the basis of electrophoresis of blood serum proteins. There is a specific problem in *A. hermonensis*. Recently, Krystufek (4) examined four *Apodemus* types from the eastern Mediterranean and the Middle East in the Natural History Museum, London. According to Krystufek (4), *Mus sylvaticus tauricus* Barrett-Hamilton, 1900, is a senior synonym of *A. hermonensis*, and it is also a junior homonym of *Mus sylvaticus* var. *tauricus* Pallas, 1811. Krystufek (4) stated that *Apodemus sylvaticus iconicus* Heptner, 1948, is a senior synonym of *A. hermonensis* and is also the oldest available name for this species. The karyotype, baculum and phallus of *A. iconicus* in Turkey are unknown. However, the karyological aspects of *A. mystacinus*, *A. sylvaticus*, and *A. flavicollis* were examined by Doğramacı and Kefelioğlu (5), and that of *A. agrarius* by Yiğit et al. (6).

The aim of this study was to determine the karyotype, baculum and phallus of *A. iconicus* in Turkey.

### Materials and Methods

Twenty-four specimens of *A. iconicus* from Ankara, Artvin, Bolu, Bursa, Samsun, Konya and Muş were karyotyped from the bone marrow of the colchicined animals (7). Bacula were prepared according to Lidicker (8). The skulls, skins, phalli and bacula are deposited in the Mammal Collection at the Department of Biology, Faculty of Science, Ankara University.

### Results and Discussion

The specimens examined in the present study were identified based on diagnostic characteristics of *A. hermonensis* (2) and *A. iconicus* (4).

**Karyology:** Diploid number of chromosomes was  $2n = 48$ , the number of autosomal arms was  $NFa = 46$ , and the fundamental number was  $NF = 48$ . Autosomal set consists of 46 acrocentrics. The X chromosome was large acrocentric, and the Y chromosome was small acrocentric

(Fig. 1). We compared the karyological aspects of *A. iconicus* to those of the other species of *Apodemus* in Turkey. *A. iconicus* differs from *A. mystacinus* with respect to the karyological values given by Dođramacı and Kefeliođlu (5), and *A. agrarius* by Yiđit et al. (6). The karyotypes of *A. sylvaticus* and *A. flavicollis* from Turkey were described as  $2n = 48$ ,  $NF = 48$ , and  $NFa = 46$  by Dođramacı and Kefeliođlu (5). The karyotype of *A. iconicus* is similar to that of *A. sylvaticus* and *A. flavicollis* given by Dođramacı and Kefeliođlu (5). The karyotype of *A. sylvaticus* and *A. flavicollis* was also described as  $2n = 48$ ,  $NF = 48$ , and  $NFa = 46$  by Zima and Kral (9). Evidently, *A. iconicus* in Turkey does not differ karyologically from *A. flavicollis* or *A. sylvaticus*.

**Baculum:** The baculum was composed of a distal and proximal part. The distal part had a single curved cartilageous part. It was 1.51 mm in length. The proximal part contained a shaft with a moderately bulbous tip. The shaft was slightly swollen medianly, and in young specimens it was bent in the lateral view. The base was spoon-shaped, and there was a concavity

in the ventral and dorsal views (Fig. 2). The proximal baculum was 3.74 mm in length and 1.74 mm across the base with a thickness of 0.81 mm. We compared the bacullar aspects of *A. iconicus* in Turkey to those (baculum with phallus) described by Williams et al. (10) for *A. mystacinus*, *A. agrarius*, *A. flavicollis*, *A. krkensis* and *A. sylvaticus* in Croatia. According to Williams et al. (10), the bacula of *Apodemus* species have a distal part with three cartilageous parts. The bacula of Turkish specimens with a single distal part seemingly differ from those of *A. mystacinus*, *A. agrarius*, *A. sylvaticus* and *A. flavicollis*. This difference may have resulted from preparation. The baculum of *A. mystacinus* from Lebanon described by Harrison and Bates (11) is larger than that of *iconicus* in Turkey. According to Harrison and Bates (11), a cartilageous process is attached to the distal end of the bone, as is the case in *A. iconicus*.

**Phallus:** The proximal section of the phallus is longer than the distal section, which is more bulbous. There is a ridge on the dorsal side, which does not extend to the proximal section. Some specimens showed two notches near the crater on the ventral side, and a strong groove extending along the phallus. The phallus is covered with epidermal spines. The tip of the distal section is smooth laterally (Fig. 3). The phallic aspects of four *Apodemus* species from Croatia (10) seemingly differ from those of *A. iconicus*, which, however, may have resulted from preparation.

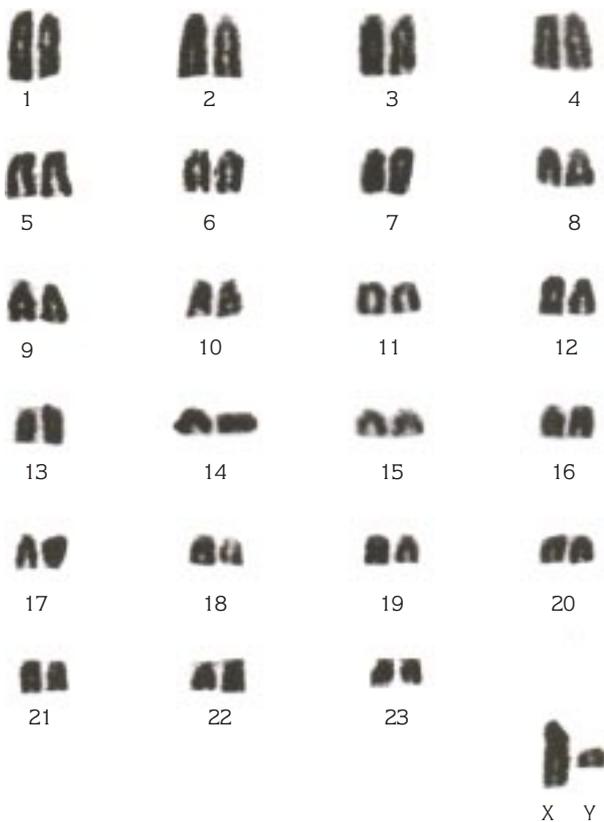


Fig. 1. Karyotype of a male *Apodemus iconicus* from Muş.

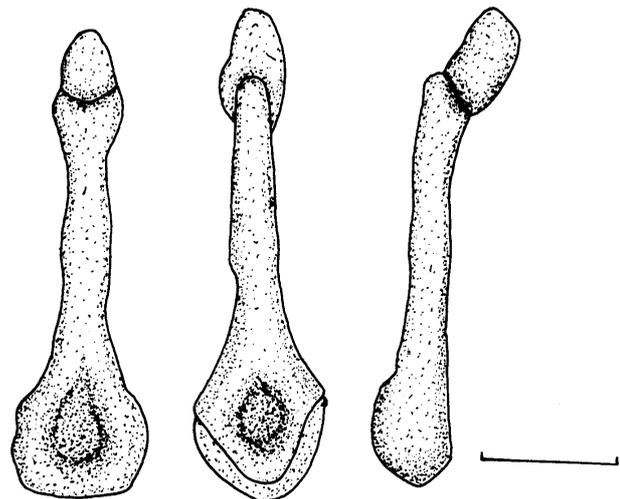


Fig. 2. Ventral (left), dorsal (central) and lateral (right) view of the baculum in *Apodemus iconicus* from Madenköy (Ulukışla). (Scale: 1 mm).

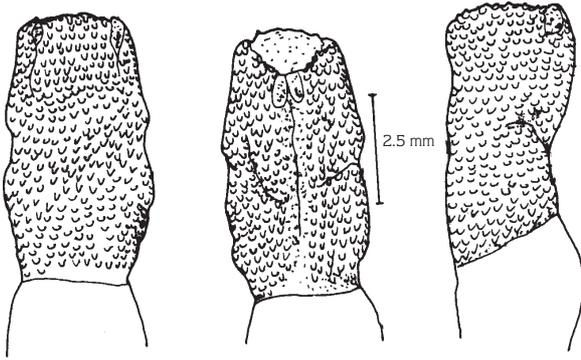


Fig. 3. Ventral (left), dorsal (central) and lateral (right) view of the phallus in *Apodemus iconicus* from Madenköy (Ulukışla). (Scale: 1 mm).

### Acknowledgments

The Research Fund of Ankara University (no: 96050302) and The Scientific and Technical Research Council of Turkey (no: TBAG-1574) sponsored this study.

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