Kayotypes for the Grey Hamster, *Cricetulus migratorius* and the Lesser Egyptian Jerboa, *Jaculus jaculus* from Jordan

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KEYWORDS

Jordan, Cricetulus migratorius, Jaculus jaculus, Karyotype.

ABSTRACT

Karyotype of two rodent species, *Cricetulus migratorius* and *Jaculus jaculus* were studied from Jordan. *Jaculus jaculus* karyotype was found to be 2n=48, NFa= 88, while the autosomes consist of five metcentric, 14 submetacenteric and four acrocentric pairs of chromosomes. For *Cricetulus migratorius,* the karyotype was found to be 2n= 22, NFa= and NF=40, while the autosomes consist of three telocentric, four metacenteric and four acrocentric pairs of chromosomes.

النمط الصبغي للهامستر الرمادي *Cricetulus migratorius* والجربوع المصري الصغير *Jaculus jaculus* في الاردن

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الكلمات الدالة

الأردن، الهامستر الرمادي، الجربوع المصري، النمط الصبغي

المُستلخص

تم دراسة النمط الصبغي للهامستر الرماديCricetulus migratorius والجربوع المصري الصغير *Jaculus jaculus* في الاردن. تبين أن عدد الصبغيات للجربوع المصري الصغير 48 صبغياً، والعدد الاساسي 88، منها 14 صبغياً فوق مركزية و14 صبغياً تحت فوق مركزية و4 صبغيات راسية مركزية. كما بلغ عدد الصبغيات للهامستر الرمادي 12 صبغيا، والعدد الاساسي 40 حيث كانت الصبغيات التحت مركزية 3 صبغيات والفوق مركزية 4 و4 صبغيات راسية مركزيةً.

Introduction

Within the past few years our knowledge on the systematics, distribution and ecology of the rodents of Jordan has been greatly expanded (Abu Baker & Amr 2003a, 2003b; Amr *et al*. 2004, 2005; Yousef & Amr 2005). At present, a total of 23 rodent species have been confirmed to occur in Jordan. However, our knowledge on the karyology of the small rodents of Jordan is limited until recently. The first attempt to study the karyotypes for rodents in Jordan was that of Qumsiyeh *et al*. (1986), where they described the karyotype of five rodent species. Recently, our laboratory published results on further six species of the genus *Gerbillus* and seven other rodents collected from various localities in Jordan (Sözen *et al*., 2008; Abu Baker *et al*., 2009). The present investigation aims to study the karyotype for two additional rodent species that were not investigated before and compare their morphology with similar species in the Middle East.

Material and Methods

Specimens representing two rodent species (*Cricetulus migratorius* and *Jaculus jaculus*) and belonging to two families (Gerbillidae and Dipodidae) were captured by Sherman live traps or by digging. Chromosomes were obtained from femoral bone marrow cells and processed as described by Tjio and Whang (1992) and Nadler and Lay (1968). Standard karyotypes were constructed from micrographes of well spread chromosomes. Metaphase chromosomes were arranged in homologous pairs according to size and centromere position. The diploid chromosome number was determined from ten photographed spreads for each species. The fundamental number (FN) was counted after constructing the standard karyotypes, only metacentric and submetacentric chromosomes were considered as bi-armed chromosomes (Volobouev *et al.* 1995). Sex chromosomes were identified from the difference between male and female karyptypes (the presence of an identical X chromosome in both). Animals were examined with respect to karyological characteristics. By examining the photographs of about 20-30 metaphase cells of each specimen, the diploid number of chromosomes (2n), the total number of chromosomal arms (NF) and the number of autosomal arms (NFa) were determined along with metacentrics, submetacentrics, subtelocentrics and acrocentrics with respect to centromere positions. All specimens were then prepared as skins, and deposited at the Department of Biology, Jordan University of Science and Technology Museum (JUSTM).

Results

(1) Lesser Egyptian Jerboa *Jaculus jaculus*
The karyotype of examined animals from Al Hazeem area was found to be 2n=48, NFa= 88. The autosomes consist of five metcentric, 14 submetacenteric and four acrocentric pairs of chromosomes. The sex chromosomes were consists of one submetacentric and one small acrocentic chromosomes, the X chromosome is the largest acrocentric in the set (Figure 1).

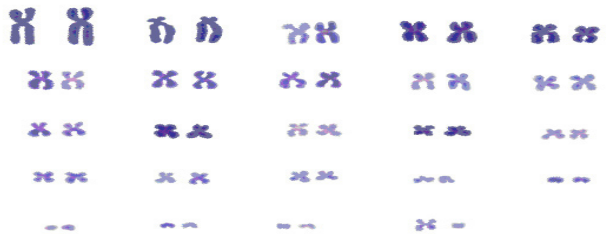

Figure 2: Kaytotype for *Jaculus jaculus* Male.

(2) Gray Hamster *Cricetulus migratorius* (Pallas, 1773)
The karyotype of examined animals from Suf were found to be 2n= 22, NFa= and NF=40. The autosomes consist of three telocentric, four metacenteric and four acrocentric pairs of chromosomes. The sex chromosomes consist of one metacentric and one acrocentric chromosomes (Figure 2).

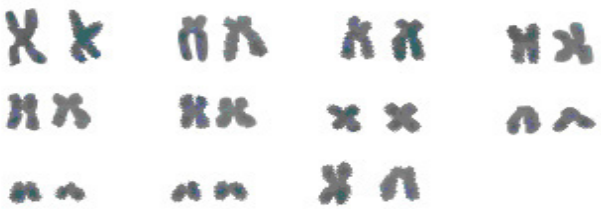

Figure 2: Kaytotype for *Cricetulus migratorius* Male.

Discussion

This work contributes in the understanding of the karyology of the Jordanian rodents. These two species were not investigate in previous studies (Qumsiyeh *et al*., 1986; Sözen *et al*., 2008, Abu Baker *et al*., 2009). The morphology and number of the chromosomes provide useful data for distinguishing similar species of the same genus as well as populations of the same species across their distribution range.

Cricetulus migratorius has a wide range of distribution extending from eastern Europe through Russia and central Asia to Mongolia and western China. The southernmost edge of its distribution extends through Palestine and Jordan (Harrison & Bates, 1992).

Arslan & Akan (2008) reported 2n for *Cricetulus migratorius* from Turkey as 22, and FN =40, with subtelocentric X and Y chromosomes. Sex chromosomes of Russian animals have different size and shape, and considered as acrocentric

(Radjabli, 1975),. On the other hand, isomorphic subtelocentric sex chromosomes were reported by Lavappa and Hay (1979) from Armenia. Jordan represents the most southern range of distribution for this species, and it is well separated from populations in Armenia and Turkey. Perhaps such variations are due to geographic isolations of this species.

The karyological results presented in this study are close to those reported in previous studies. Ben Faleh *et al*. (2010) studies the karyotype for *Jaculus jaculus* in Tunisia. They reported a 2n of 48 chromosomes with a NF ranging from 88-90. Also, they indicated that the X chromosome is submetacentric, while the Y chromosome as acrocentric. In Saudi Arabia, Al Saleh & Khan (1984) reported a 2n=48 and FNa=92, with the a metacentric X chromosome and acrocentric Y chromosome. Shahin & Ata (2001) found a 2n=48 and a FN of 96 in females and 95 in males in specimens collected from Egypt.

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