PRELIMINARY DATA ON THE CARYOTYPE OF *MUS MUSCULUS MUSCULUS* L., 1785 FROM NORTHEASTERN ROMANIA

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Abstract: the present paper presents preliminary data on the karyotype of *Mus musculus musculus* from Northeastern Romania. The diploid karyotype consist of 40 acrocentric chromosomes of decreasing size, the heterosomes are conspicuously of different size, the Y chromosome being the smallest in the set, and the X chromosome the second in size.

INTRODUCTION

The intraspecific taxonomy of *Mus musculus* species complex is a problem which caused great debate among taxonomists, as for example Schwarz & Schwarz (1943), Ellerman & Morison Scott (1951), Marshall (1961), Simionescu (1971), Kotenkova (1998) and Macholan (1998) (Murariu, 2000). The final result was that *Mus musculus* was divided in several subspecies, and among them *Mus musculus musculus* Linne, 1758 and *Mus musculus spicilegus* Petenyi, 1882, witch are the representatives of this species complex in Romania. Subsequent studies using genetic data raised *spicilegus* to species rank (*Mus spicilegus*).

In Romania the above mentioned species are widely distributed, but the morphological characters used to differentiate them are rather subtle and refer to traits such as the fur color or some cranial characteristic. The main character witch differentiates them is an ethological one: *Mus spicilegus* build mounds. An additional character to differentiate this species is the karyotype and especially the morphology of Y chromosome (Bulatova, 1990).

MATERIALS AND METHODS

We investigated one *M. musculus musculus* male specimen captured near Roma village, Botosani county in North Eastern Romania. For chromosomal preparations bone marrow tissue was used (this is a suitable tissues for cytogenetics, 10-42% of erythroblasts and 6-11% of myeloblasts being in metaphase simultaneously). The bone marrow from tibias and iliac spine was extracted by aspiration with a syringe and introduced in 2 – 3 ml colchicines solution (0,3 g colchicines in 1 ml NaCl solution 0,85%, pH = 7) for 2 h. After a centrifugation (800 rpm, 10 min) the supernatant was discarded and 2 – 3 ml of hypotonic solution (sodium citrate 1 %) were added to the sediment. The pellet was resuspended and incubated for 30 min at room temperature. After another centrifugation the pellet was fixed in ethanol – glacial acetic acid (3 : 1) for 25 min. This operation was repeated twice (Raicu et al., 1983). On the last pellet fresh fixative was added and the cells resuspended. Chromosomes spreads were obtained by pipetting a few suspension drops onto slides heated to 45°C. The slides were air-dried and aged for least 24 hours before differential staining in 10% Giemsa in Sörensen buffer, pH 6.88, for 30 min (Pasantes et al., 1996).

In the karyotype the chromosome pairs were arranged in decreasing order.

RESULTS AND DISSCUSIONS

The best known species from cytogenetical viewpoint in *M. musculus* superspecies is the laboratory mice (Committee, 1972), but this is in fact a hybrid between *M. m. domesticus* and *M. m. musculus*, the biggest part of the karyotype originating from the first species and the Y chromosome from the second (Bishop et al., 1985). The researches on *M. m. musculus* cytogenetics are less numerous, for example C and Q banding, AgNOR staining were used by Dev et al. (1975, 1977), and more recently C banding was used by Winking et al. (1991).

Our data show a standard *Mus musculus musculus* caryotype, therefore confirming the results of Dev et al. (1975), Dev et al. (1977) and Winking et al. (1991). The diploid chromosome

set is composed by 40 acrocentric chromosomes of decreasing size. The accurate pairing of chromosomes is difficult without G banding, the differences between adjacent pairs being too small. The pericentromeric heterocromatin is well differentiated and is staining darker even without the use of C banding techniques (Fig. 1 a). The Y chromosome is the smallest in the set and the X chromosome is the second largest chromosome. The size of the Y chromosome witch is comparable with that of the smallest pare of autosomes (Fih. 1 b) confirm the determination of the specimen as *M. m. musculus* and not *M. spicilegus*, in the later species the Y chromosome is about one half of the smallest autosome (Bulatova, 1990, Bulatova & Kotenkova, 1990).

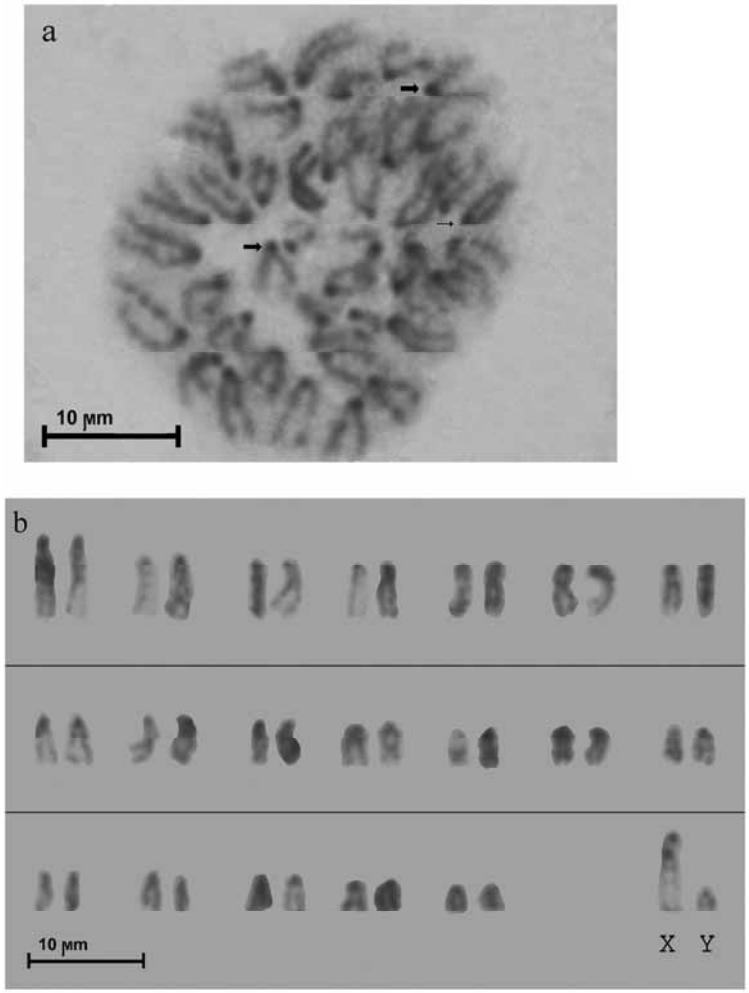

Figure 1. a: Metaphase chromosomes of *M. musculus* showing pericentromeric heterochromatin (black arrows); b: Karyotype of *M. musculus*, note the big Y chromosome as compared to the last pare of autosomes.

CONCLUSIONS

The karyotype of *M. m. musculus* in North Eastern Romania consists of 40 acrocentric chromosomes of decreasing size, corresponding to the standard karyotype of the house mice.

The karyotype is discriminate between *M. m. musculus* and *M. spicilegus* and can be used to confirm the determinations using traditional morphological characters.

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