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SHORT PAPERS

Cytogenetical study in *Spalax leucodon* Nordm. in Moldavia (Rumania)

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1. INTRODUCTION

Investigations performed by several authors (Matthey, 1959; Walknowska, 1963; Soldatovic *et al.* 1966) have shown a chromosome polymorphism in the species *Spalax leucodon* Nordm. Different populations from the South Soviet Union, Bulgaria and Yugoslavia display $2n = 48$ and $2n = 54$. Raicu, Bratosin & Hamar (1968) identified in two Rumanian populations two different karyotypes (i.e. $2n = 50$ and $2n = 56$) which supports the idea of chromosome polymorphism in this species. The present paper reports further investigations in a *S. leucodon* population from Moldavia (Rumania).

2. MATERIAL AND METHODS

In this study we have used three animals (one female and two males) of *Spalax leucodon* Nordm. (Order Rodentia, Family Spalacidae) from Perieni and Bacau in Moldavia (Rumania).

The animals were injected with 0·06 % colchicine. After 2 h they were killed and the bone marrow was taken for the study of mitosis, and testis for the study of meiosis. The material was treated with hypotonic sodium citrate, in alcohol–acetic acid (3:1) and finally stained with Giesma solution.

RESULTS AND DISCUSSION

The 27 pairs of autosomes of *Spalax leucodon* ($2n = 56$) from Moldavia (Rumania) consist of two metacentrics (10 and 13), three submetacentrics (5, 8 and 12), eight subtelocentrics (1, 2, 3, 4, 6, 7, 9 and 11) and 14 acrocentrics (14–27). The heterosomes in females (Fig. 1) are represented by a pair of X chromosomes which are the longest subtelocentrics. In the male (Fig. 2) the Y chromosome is a submetacentric of medium size.

The karyotype of *S. leucodon* from Moldavia reported previously by us (Raicu *et al.* 1968) was somewhat different, because of our failure to identify the heterosomes in the unique female of that study. The present paper is, thus, a correction and completion of our first one.

A study of meiosis in the male (Fig. 3) has shown that the sex chromosomes are heteropycnotic at leptotene, and already at diplotene the sex vesicle had completely disappeared and the heterosomes could be distinguished. In metaphase I we have found 28 bivalents, the heterosomes being the longest of all. The long arm of the X chromosome is less contracted and isopycnotic, and consequently it is less stained than the other

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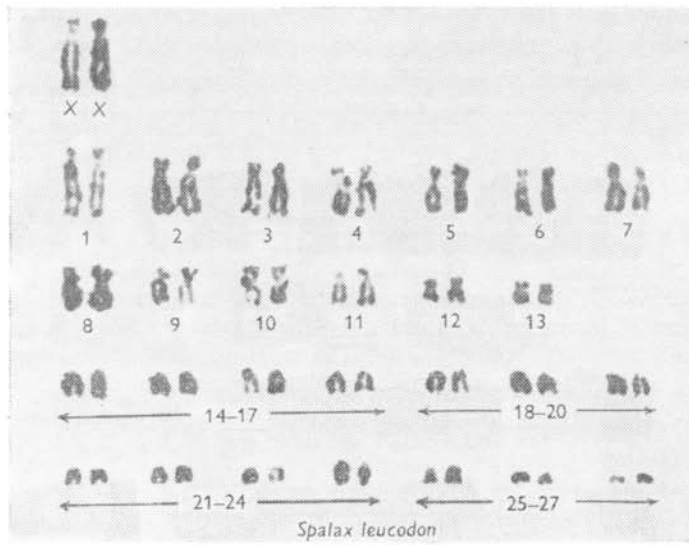
part of the bivalent (Fig. 4). A partial homology was inferred between the short arms of the *X* and *Y* chromosomes, since they associate side by side.

The study of meiosis and mitosis in *Spalax leucodon* from Moldavia (Rumania), as compared with other populations from Rumania (Transylvania) and other countries (Bulgaria, Yugoslavia and the Soviet Union), show considerable differences not only with respect to the number of chromosomes, but also in their structure. Our cytogenetical



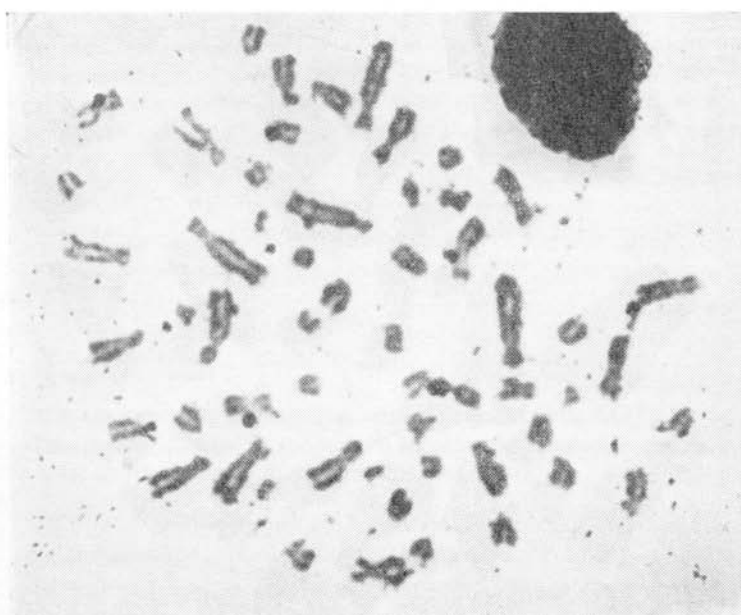


Fig. 1. Female karyotype of *Spalax leucodon* from Moldavia (top) and their metaphase plate (bottom).

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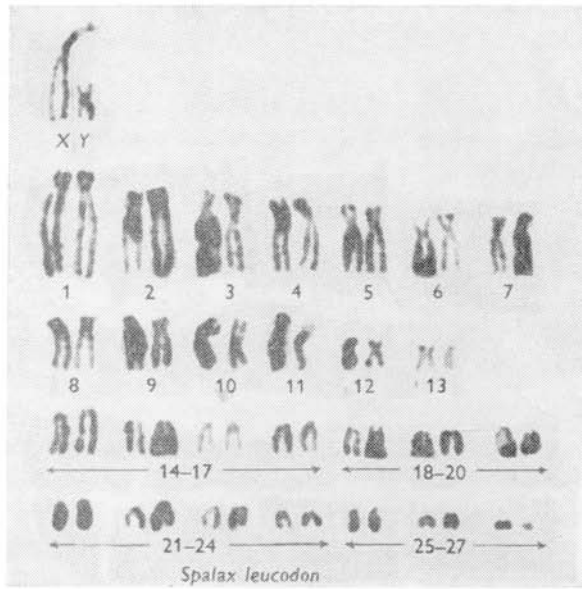
studies prove that the *Spalax leucodon* of Moldavia is a very well established population. Probably the change in the number of chromosomes within the same species of animals (*S. leucodon*) originating from various regions in different countries is due to a Robertsonian fusion/fission process, favoured by the lack of migration possibilities. In rodents,



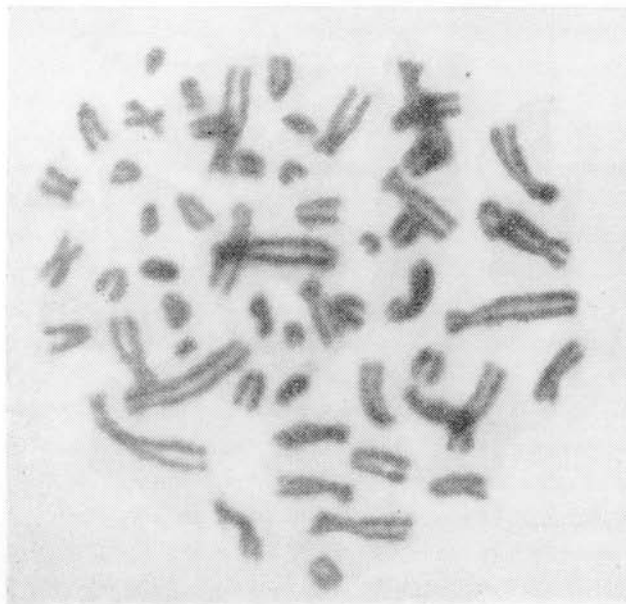


Fig. 2. Male karyotype of *S. leucodon* from Moldavia (top) and their metaphase plate (bottom).

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only a few examples of chromosome number variations within the same species are known (Matthey, 1963, 1964, 1966; Ohno *et al.* 1966; Yasida, Nakamura & Fukaya, 1965, etc.).

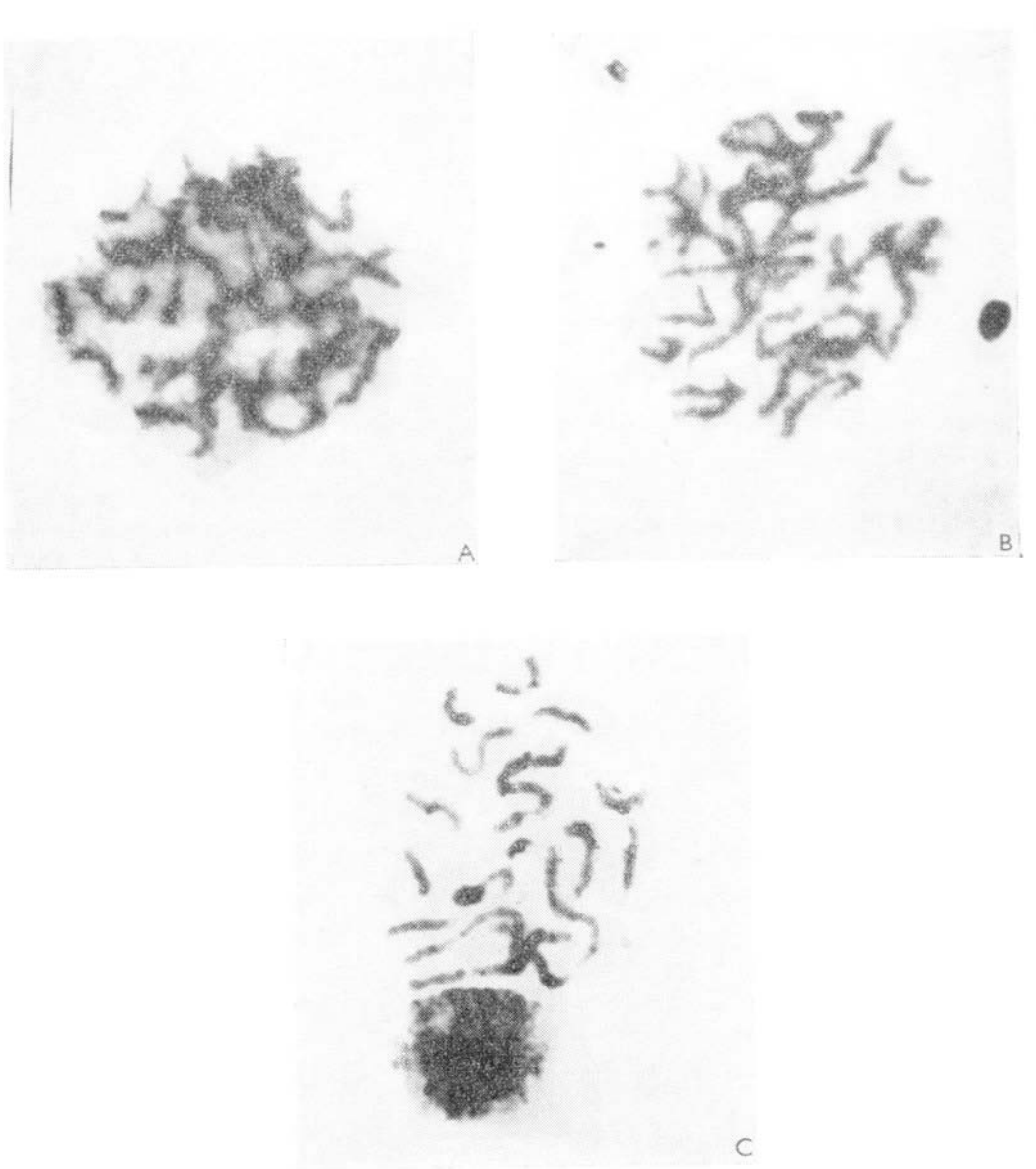

Fig. 3. Male meiosis in *S. leucodon*: various stages of pachytene (A, B, C).

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3. CONCLUSIONS

A cytogenetic study of three animals from a population of *Spalax leucodon* from Moldavia (Rumania) reveals a very well established karyotype ($2n = 56$), differentiated from other populations originating from various regions. The chromosomal polymorphism within this species is due probably to a Robertsonian process favoured by geographical isolation.

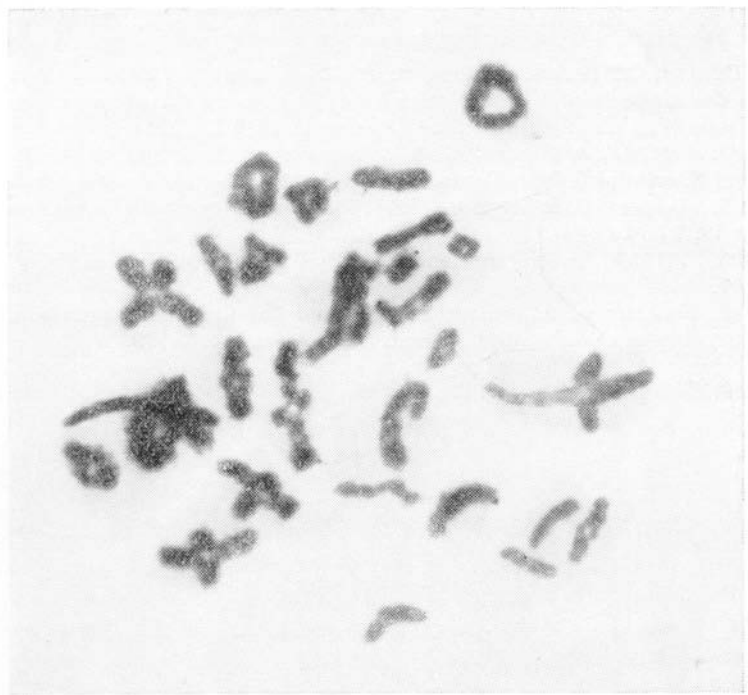

Fig. 4. Metaphase I in male meiosis of *S. leucodon*: at 3 o'clock the bivalent formed by the sex chromosomes.

SUMMARY

The karyotype of *Spalax leucodon* ($2n = 56$) from Moldavia (Rumania) shows 27 pairs of autosomes: two metacentrics, three submetacentrics, eight subtelocentrics and 14 acrocentrics. The *X* chromosomes are the longest subtelocentrics and the *Y* chromosome is a submetacentric of medium size. In metaphase I we have found a partial homology between the short arm of the *X* and the *Y* chromosome.

The population of *S. leucodon* from Moldavia shows considerable differences of karyotype as compared with other populations of the same species from the south of Europe. This species presents a high degree of chromosomal polymorphism in different populations.

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