МЕЖДУНАРОДНАЯ КОНФЕРЕНЦИЯ

ХРОМОСОМА 2023
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INTERNATIONAL CONFERENCE

CHROMOSOME 2023
ABSTRACTS

5 - 10 сентября 2023, Новосибирск
September 5 - 10, 2023, Novosibirsk, Russia

ИНСТИТУТ МОЛЕКУЛЯРНОЙ И КЛЕТОЧНОЙ БИОЛОГИИ СО РАН
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Сборник материалов содержит тезисы докладов и постеров, представленных на Международной конференции «Хромосома – 2023». Основные результаты, представленные на конференции, посвящены организации и эволюции хромосом и геномов, гетерохроматину, генетической организации интерфазных хромосом, структуре ядра и другим темам. Материалы представляют интерес для научных сотрудников, работающих в области генетики и молекулярной биологии.

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The Abstract book contains materials presented at the International Conference "Chromosome – 2023". Main areas discussed at the conference are devoted to the organization and evolution of chromosomes and genomes, heterochromatin, genetic organization of interphase chromosomes, structure of nucleus and other topics.

These materials may be interested for the scientists working in the field of genetics and molecular biology.

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B chromosome inheritance in *Apodemus flavicollis*

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B chromosomes (Bs) are additional elements to the standard karyotype that are not required for normal growth and development. Bs are predominantly derived from chromosomes of the standard chromosome set. In some species, these supernumerary chromosomes are passed on to the next generation more frequently than would be expected under Mendel's law of segregation. Although the molecular mechanism is unknown, this chromosome drive can occur during premeiotic, meiotic, or postmeiotic division. Inheritance of B chromosomes across generations is unknown in many species, including *Apodemus flavicollis*. The standard karyotype of this species (2n=48) may contain up to eight B chromosomes, but animals with 1B are most common. Animals with Bs are present in all studied populations of *A. flavicollis* in Serbia with different frequencies (0.10-0.64).

Here we studied the transmission rate of B chromosomes in captive-bred pairs of *A. flavicollis*. Juveniles were selected for sex and Bs markers, all of which were determined by PCR. In addition, primary cell cultures and chromosome preparations were performed for animals with positive B markers to select animals with 1B. In this way, we were able to form two combinations of breeding pairs: four pairs with 1B females and 0B males and three pairs with 0B females and 1B males.

In the pairs where the female had 1B and the male 0B, we obtained a total of 20 offspring, 14 of which were carriers of the B chromosome (13 with 1B and one animal was a mosaic with 0-2Bs in the cells). In pairs where males were carriers of 1B and females of 0B, we obtained 10 offspring, of which five animals were carriers of the B chromosome (4 with 1B and one animal was a mosaic with 0-1B).

In our previous studies of more than forty natural populations, the frequencies of animals with Bs were the same in males and females. Also, previous studies of meiotic segregation in males showed that there was no accumulation of Bs, suggesting a general lack of meiotic drive. Herein, for the first time, we found deviations from Mendel's law of segregation in the transmission of Bs by the female sex. Our preliminary results suggest the possible presence of a meiotic drive in the female sex of *A. flavicollis*, in which ¾ of the offspring inherit B from the mother, whereas in the male sex B is inherited according to Mendel's law of segregation. However, the small number of crossed pairs of animals and the small number of litters in the present study indicate the need to continue this experiment to address the issue of Bs transmission across generations in *A. flavicollis*.