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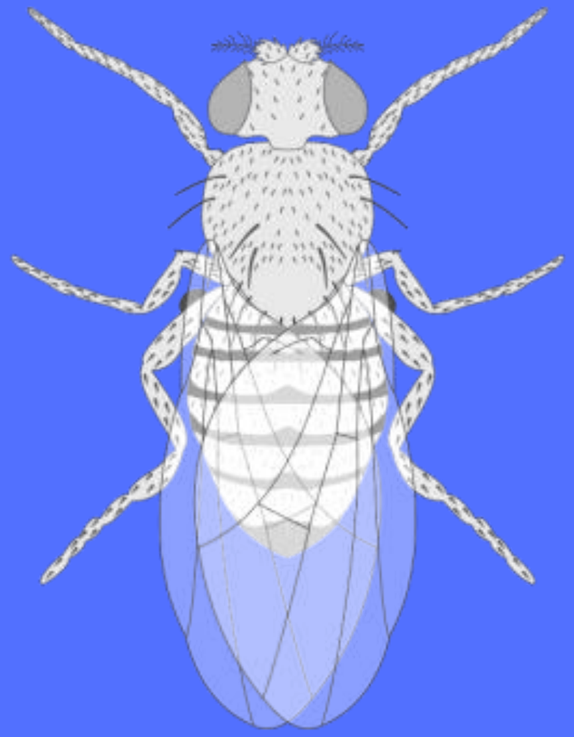

RADIATION GENOMIC RESEARCH IN THE LABORATORY OF NUCLEAR PROBLEMS

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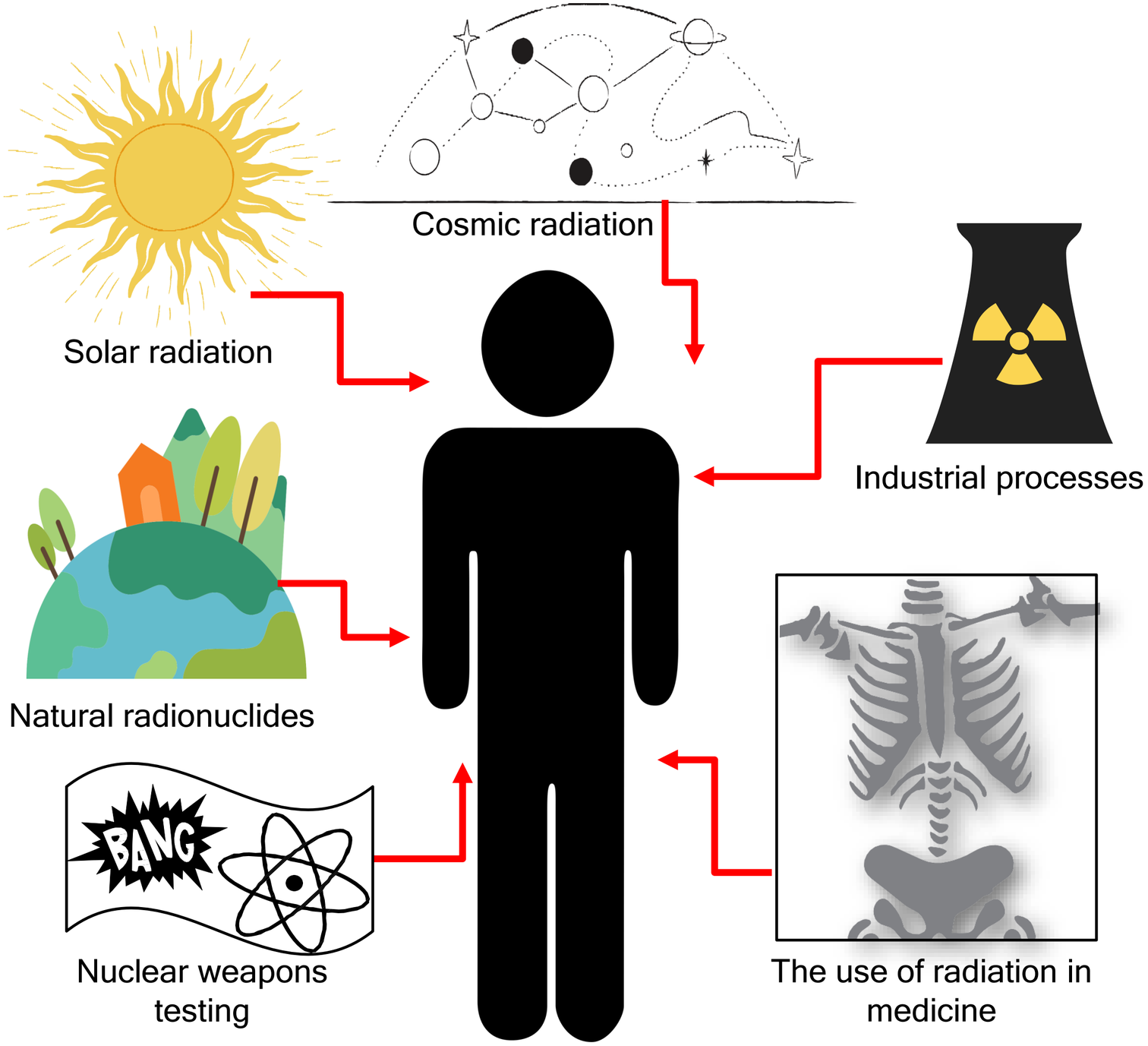


Fig. 1. Natural and artificial sources of radiation

INTRODUCTION

In the modern world, living organisms are increasingly exposed to various sources of radiation. This is facilitated by the use of radiation in medicine, civil and military industries, as well as the presence of a radiation background in nature.

The increased risk of genetic damage to living organisms makes radio-biological research more actual. And the simplest and most suitable object is the fruit fly.

METHODOLOGY

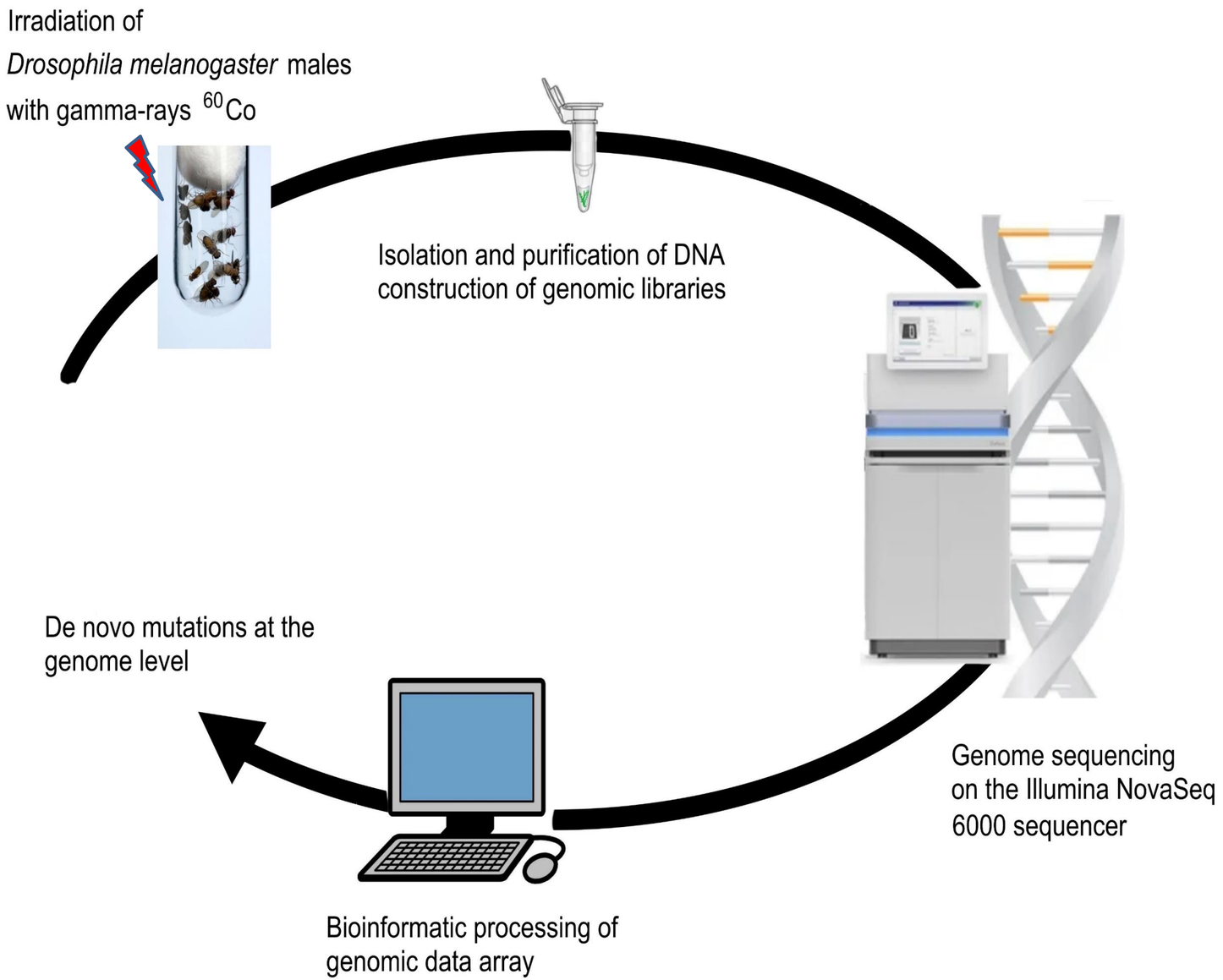
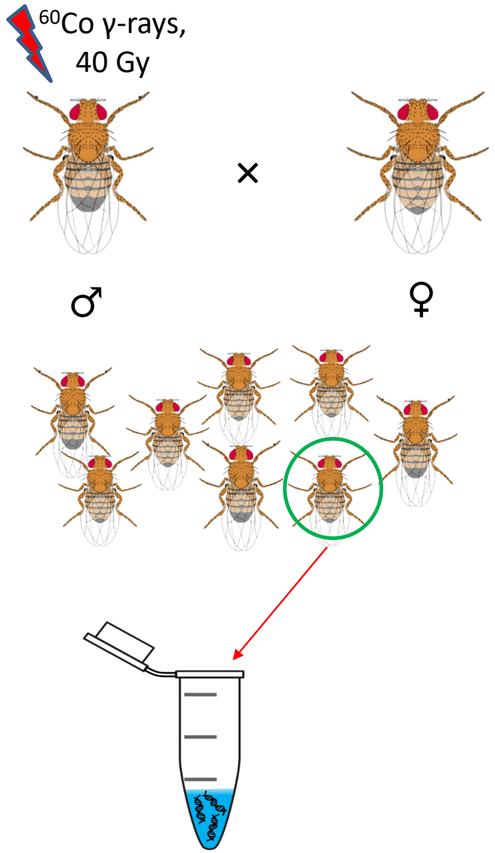


Fig. 2. Stages of experiment

METHODOLOGY



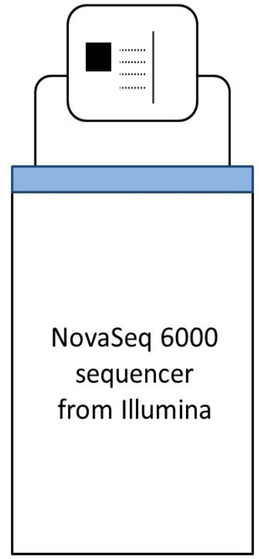
Crossbreeding

Individual selection

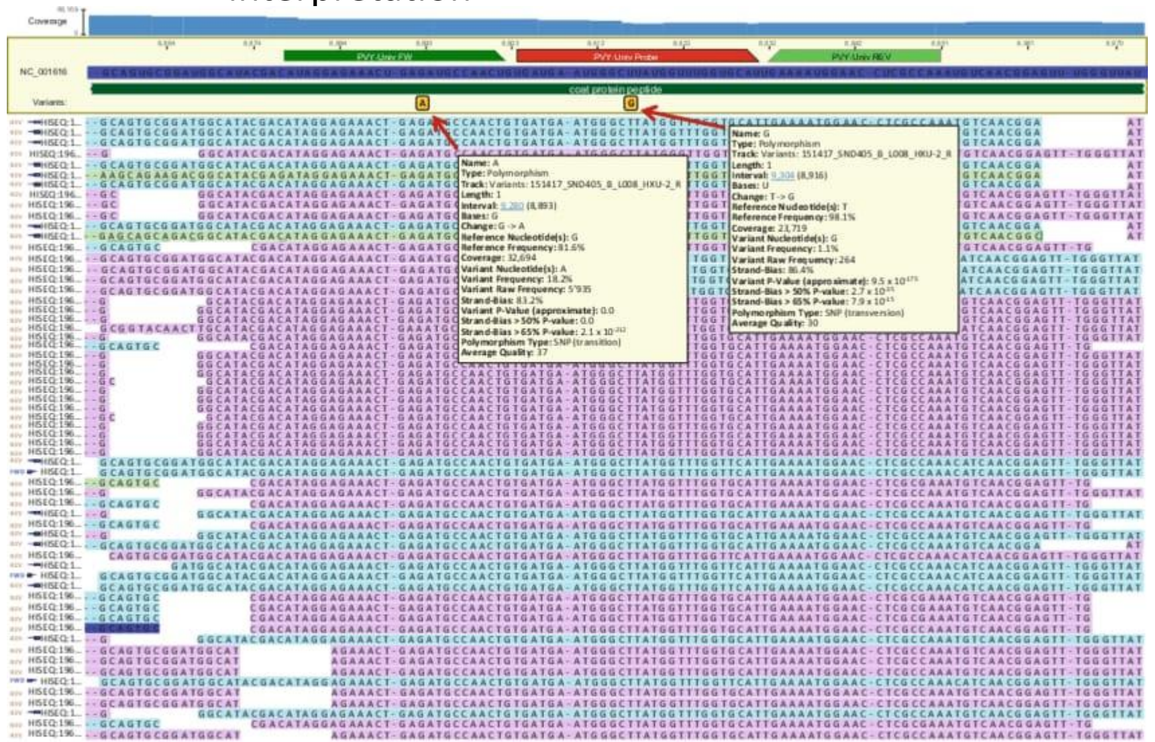
DNA isolation from 1 fly

Sample preparation of DNA libraries

Genome sequencing



Data analysis and interpretation



RESULTS

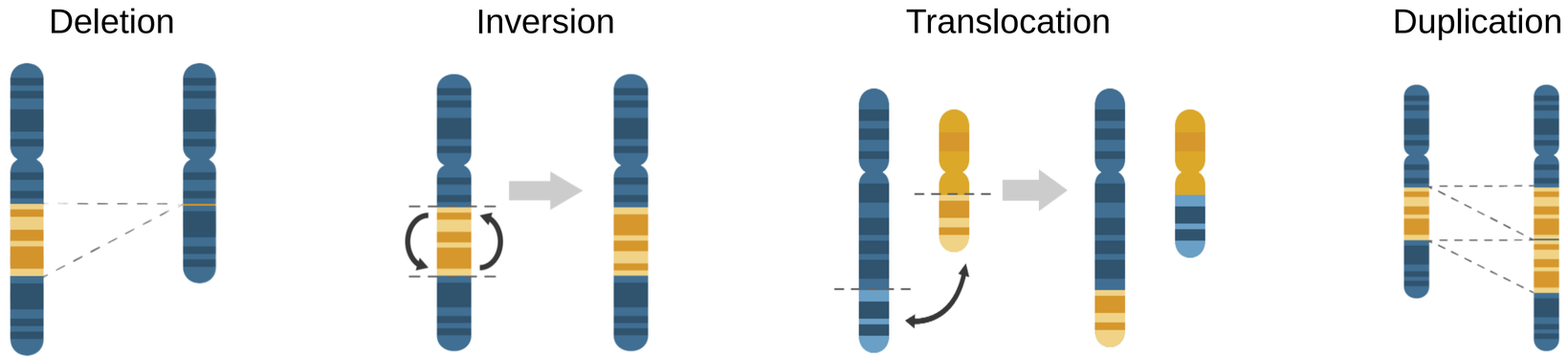


Fig. 3. Change types.

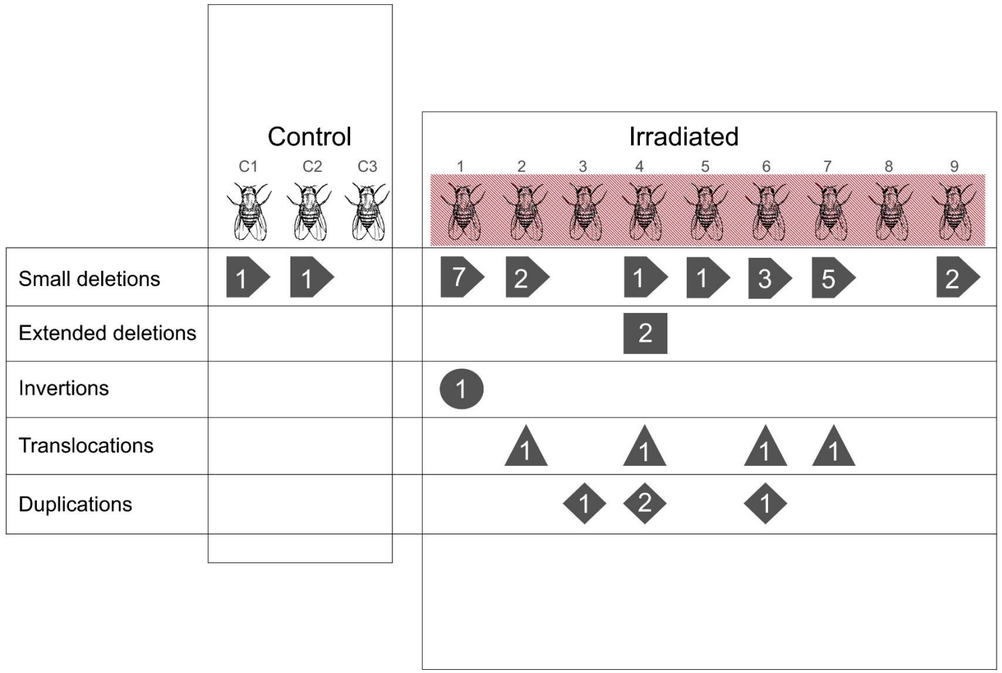


Fig. 4. The number and type of changes for each sample

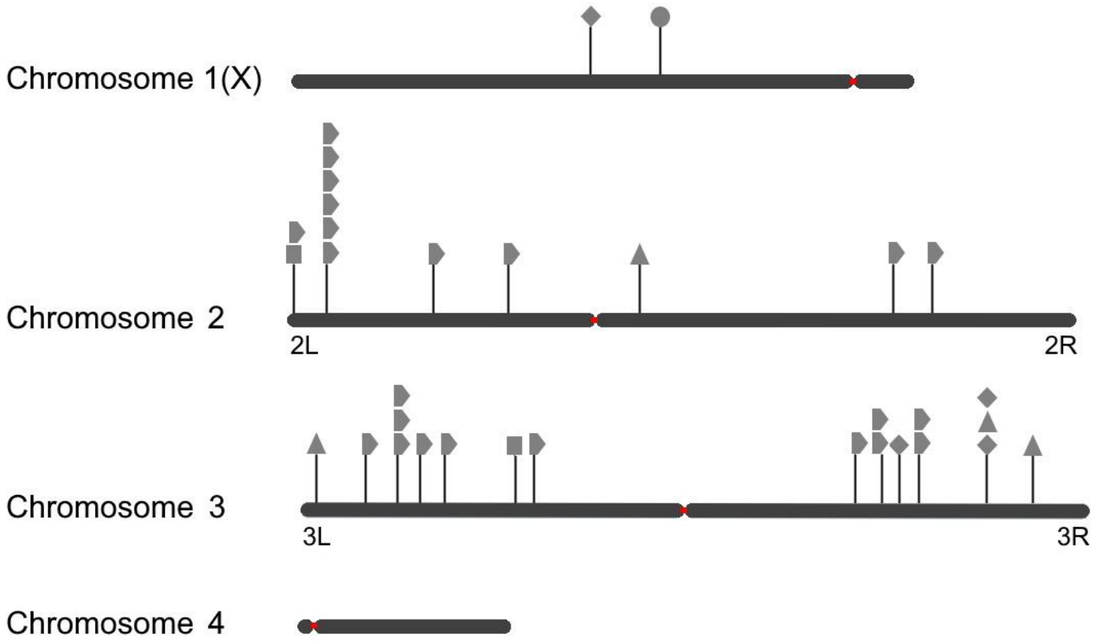
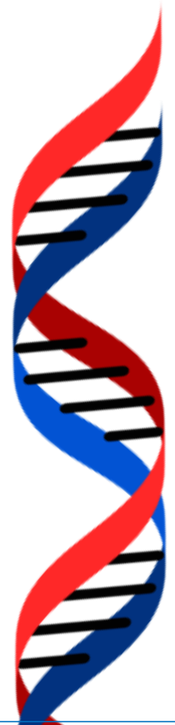


Fig. 5. Localization and distribution of the changes over the genome

CONCLUSIONS and PERSPECTIVES

CONCLUSIONS



The methods chosen in the experiment, correctly selected protocols and high-quality execution made it possible to successfully conduct a pilot experiment.

To a first approximation, we can say that

1. Radiation increases the occurrence of small deletions by 3.5 times.

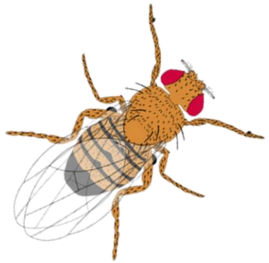
2. Such types of changes as large deletions, inversions, duplications and translocations are characteristic of radiation mutagenesis.

PROSPECTS FOR FURTHER RESEARCH

1. Continued bioinformatics analysis of minor DNA changes (base substitutions, indels).

2. An increase in the sample of the control and gamma-induced groups to obtain not only a qualitative picture, but also quantitative dependences.

3. Conducting experiments with neutrons and carbon ions to reveal the role of various types of radiation in mutagenesis at the genome level.



THANK YOU FOR YOUR ATTENTION!