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## Radiosensitivity of Rice to Fast Neutrons

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Determination of radiosensitivity for plant species is important in order to obtain desirable plant characteristics. As a rule, median lethal dose (LD50) is considered as appropriate dose to obtain the highest mutation frequency [1].

Such a task for fast neutrons (FN) is a complex challenge due to the unique properties of neutron radiation, the biological variability of the plant, the difficulty in accurate dosimetry, and the intricate nature of radiation-induced damage. Even for gamma radiation, the LD50 for rice varies widely. For some rice varieties, the LD50 is in the range of 350-390 Gy [2, 3], for different Basmati varieties, the values are lower, about 230 Gy [4], for the Mira-1 variety, 520 Gy [5]. Although many authors consider neutron irradiation as a perspective mutagen for further plant breeding, there is still no clear information on the dose-response relationship. Researchers use different fast neutron sources and rice varieties. There is no clear information for the neutrons, while some studies use 10 Gy to produce a new variety, other sources consider 20, 33 Gy as LD30 for FN [6, 7, 8]. As the specific results may vary depending on the experimental conditions, the variety of rice, and the radiation source, the aim of our research was to study the radiosensitivity of Kazakhstan rice variety "Syr Suluy" on two parameters: seedling growth reduction (GR) and median lethal dose (LD50). The seeds were irradiated by fast neutrons at the EG-5 electrostatic generator in the Frank Laboratory of Neutron Physics, Joint Institute for Nuclear Research (Dubna, Russian Federation). The neutron energy ( $E_n$ ) was 4.1 MeV; neutron flux intensity was  $3 \times 10^7$  particles/cm<sup>2</sup>, studied doses were 10, 25, 40, 50, and 75 Gy.

It was found out that the GR50 dose is 40 Gy, while the LD50 is 50 Gy. These data will be used for further plant mutagenesis studies conducted at the EG-5 and could be extended to other cereals.

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