

**Genetic Consequences of Radiation Exposure for the Pine (*Pinus sylvestris* L.) Population.**

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We studied the inheritance of isoenzyme loci in seeds of the first post-accidental generation and morphological characteristics in the second generation of irradiated pines. Pine is an appropriate object for genetic monitoring due to its high radiosensitivity. In 2004 we collected seeds from the young pine trees (8-10 years) growing in the 30-km zone around the CNPP. These plants grew as a result of natural revival of population and presented second progeny of the irradiated trees. The absorbed doses in 1986 varied from 0.5 up to 40 Gy. Dose rates in 2004 varied from 0.25 up to 25  $\mu\text{Zv/h}$ . We assayed the isoenzyme polymorphism in endosperms using electroforetic analysis in polyacrilamid gel. The haploid endosperm presence allows to study genotype of maternal plant without crossing. The investigation revealed no mutational changes at isoenzyme loci. We observed inheritance of alleles of Gdh, Adh1, Adh2, Skdh1, Skdh2, Got2, Got loci and compared genotypes of heterozygous maternal plants with endospermes. The expected ratio of maternal alleles in haploid endosperm tissues is 1:1 in accordance with Mendelian inheritance. Significant deviation from 1:1 ratio was found at 6 of 7 loci of 50% observed heterozygous trees. The disturbances in the allelic segregation were not found in control. We found high level of morphological abnormalities in second post-accidental generation of pine. The frequency of chlorophyll mutations among two-years-old plants was 1.8%, the growing abnormalities (dwarfness, activation of rest buds)-6.7%, the cases of atavism (dichotomic stem-bifurcation, single sessile needles)-1.6%. Common frequency of morphological abnormalities is 10.1% (not found in control). The length of plants and needles was the same as in control. The quantity of morphological abnormalities didn't depend on dose rate. Disturbances of allele segregation and high level of morphological abnormalities probably result in genetic injures in the second generation of the irradiated plants.