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BOOK OF ABSTRACTS

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Genetic diversity in *Plantago major* L. populations growing under conditions of radioactive and chemical contamination

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In the Southern Urals there are territories with different types of anthropogenic contamination. East Ural Radioactive Trace (EURT) was formed in 1957 after the accident at the Mayak Production Association. Roughly 74 PBq of radioactive substances were released into the environment. The zone of influence of the Karabash Copper Smelter (KCS) is located about 45 km from EURT. The main pollutants were sulfur dioxide and heavy metals.

The purpose of the research is comparison of the genetic diversity in *Plantago major* L. populations growing under conditions of radioactive or chemical contamination and on background territory.

Variability of 9 microsatellite loci was analyzed in 3 populations from EURT, and 3 from KCS zone, and 2 from background area. We tested two hypotheses: 1) genetic diversity in the *P. major* populations in the EURT zone is increased, since ionizing radiation is a mutagenic factor; 2) genetic diversity in *P. major* populations in the KCS zone is reduced due to the selection of metal-resistant organisms.

High level of inbreeding was revealed in all populations as a result of high rate of self-pollination of *P. major*. Despite the high level of inbreeding, the genetic diversity within the *P. major* populations is high enough. According to values of the mean and effective number of alleles per locus and the number of private alleles, genetic diversity in populations from the zones of chemical and radioactive contamination was lower than in background populations. Mantel test for isolation by distance between KCS and background populations showed that the roads are an important factor in the migration of plantain seeds.

The first tested hypothesis was not confirmed: the *P. major* genetic diversity in the EURT zone was lower than in the background populations, which possibly results from the reduced migration of seeds (genes) in EURT populations due to limited access of people to this territory. Probably, the frequency of radiation-induced mutations in plants with existing doses is not sufficient to compensate for the loss of genetic diversity resulting from isolation. The second tested hypothesis was confirmed: genetic diversity of *P. major* was decreased in the KCS zone, especially at the most polluted site. Despite the flow of seeds (genes) into the population is not limited, not all migrants are able to survive in conditions of high soil contamination. Thus, the reduction of genetic diversity in the *P. major* populations in zones of radioactive and chemical contamination (compared to background plots) occurs due to various reasons.

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