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PINE TREES SEND A WARNING TO NUCLEAR COMMUNITY

Genetic malformations have been found on the pine trees of Sosnovy Bor, the most 'nuclear' town of Russia located 80 km west of the center of St. Petersburg. The mutations confirmed by the geneticists from Obninsk and environmentalists from Sosnovy Bor testify to the increased level of mutagenicity of the environment in the vicinity of nuclear-industrial complex.

These results have not been taken into account in political decisions on building new and extending the lifetime of old nuclear facilities on the Baltic coast.

In the feasibility studies of new projects involving the operation of nuclear facilities a special attention should be paid to the safety of all living organisms and, naturally, to the health of current and future generations of people. The norms of radiological safety fail to take into account the long-term consequences for the environment and wildlife, which are caused by the slightly increased, but continuously present radiation doses.

The impact on living organisms becomes dramatic, when these small doses are accompanied by other polluting factors.

The methods of biological indication enable to determine the influence of small radiation doses on living bodies even if the concentrations of radionuclides in the environment are considered to be low (within sanitary norms).

The pine tree (*Pinus sylvestris* L.) is one of the plants, which are sensitive to the chemical and radioactive contamination. Any deviations from the norm found on it warn about a hazard for other plants, animals and people.

In 1997-2001 experts from the Institute of agricultural radiology (Obninsk) carried out research studies on the environmental mutagenicity in the influence zone of Sosnovy Bor nuclear complex, i.e. in the town of Sosnovy Bor (5 km to the West of Leningrad NPP) and near the township of Bolshaya Izhora (20 km from the nuclear plant in the direction of St. Petersburg).

The actively dividing cells (young needles and sprouting seeds) of pine trees growing near the nuclear complex and in Sosnovy Bor featured the level of genetic mutations several times higher than 20 km from Leningrad NPP in the direction of St. Petersburg. **And this is a statistically authentic difference!** Amazing is that pine trees growing in Sosnovy Bor have been found to suffer from certain severe mutative changes rare even in the contamination zone of Chernobyl NPP.

Living organisms are subjected to the impact from the whole complex of external factors (radiation, chemicals, etc.), so it is difficult to specify the responsibility of each in their deterioration. In this case the synergy effect can play its role, i.e. the combination of several factors causes more serious consequences than the calculated arithmetic total.

The authors of research work note that due to the combined impact of chemical contamination and ionizing radiation, the severity of cell injury increases, and this is exactly what has been observed in Sosnovy Bor. Taking into account that Sosnovy Bor is not a center of chemical industry, these data give additional reasons for getting alarmed and consider the health of nuclear town residents and their children with all seriousness it deserves.

The results of research studies have been published in Russia and abroad (about 20 publications).

Most available for the general public is the article:

S.A. Geraskin (a), L.M. Zimina (b), V.G.Dikarev (a), N.S. Dikareva (a), V.L. Zimin (b), D.V. Vasiliev (a), A.A.Oudalova (a), L.D. Blinova (b), R.M. Alexakhin (a), Bioindication of anthropogenic effects on micropopulations of *Pinus Sylvestris*, L. in the vicinity of a plant for the storage and processing of radioactive waste and in the Chernobyl NPP zone, - Journal of Environmental Radioactivity 66 (2003) 171 -180, www.elsevier.com/locate/jenvrad.

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(b) Khlopin Radium Institute, St. Petersburg, Sosnovy Bor Regional Environmental Laboratory, Russia

Will atomville Sosnovy Bor hear the alarming voice of pine trees?

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