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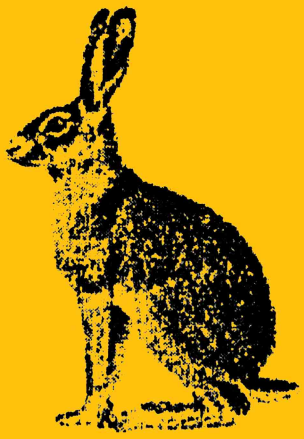

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Non-metrical Variation in Red Vole (*Clethrionomys rutilus*) Populations within East-Ural Radioactive Track (EURT) Zone.

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A study of genetical and morphogenetic after-effects of ecosystem contamination by radionuclids after the Chernobyl accident is one of the actual problems of ecological genetics in Russia. Earlier in 1957 a serious accident (about 2 milliom Ki) was in the South Urals near Kyshtym as a result of which the East-Ural radioactive track (EURT) was formed.

In 1992-1993 authors examined populations of the red vole inhabiting areas with various degrees of radioactive contamination within EURT zone and outside it nearly 100 generations since the event. The aim of the study was to estimate the possible distant after-effects of the weak chronic radiation upon animal morphogenesis on the base of non-metric skull variation analysis which enables a genetic interpretation of the results. The hypothesis of accumulation of epigenetic malformations under the chronic effect of low doses of radiation was tested

Four areas were examined: 1- within the EURT boundaries with the original level of contamination (o.l.c.) of about 5 Ki/sq.km; 2-3 - two control areas near the EURT (about 20-25 km from the first area) with the o.l.c. of about 0.1 Ki/sq.km.; 4 - an additional distant control area in the Visim reserve (about 150 km from the EURT zone). A total of 260 red voles trapped during summer seasons were examined for 32 non-metric skull traits which in the broad sense can be considered as a morphogenetic aberrations. Mean measures of divergence (MMD) between samples from the above-mentioned areas were calculated according to Smith's formula. Additionaly the estimates of intrapopulation "phenetic" diversity were evaluated using Zhivotovsky method (1).

Population monitoring has revealed a higher level of phenetic diversity in the affected zone due to increased frequencies of morphogenetic skull aberrations. The sample from

the contaminated area was shown to be the most unique for MMD distances. The morphological distances between this sample and the nearest control ones were not proportional to geographical distances. Similar effects were found regardless the environmental conditions of the year. It is suggested that a direct stable non-metrical deviation is of genetical origin and can be explained by accumulation of minor genetical aberrations in EURT populations. Probably this genetical rearrangements could cause the increase of radioresistance in vole populations from generation to generation as assumed by Krapivko & Ilienko (2).

Authors discuss the fluctuating assymetry of non-metric traits in a view of the problem of developmental stability and adaptation of animal populations to various environmental conditions.

References.

1. Zhivotovsky L.A., 1991. Population biometry. Nauka. Moskva: 1-271 [In Russian].
2. Krapivko T.P., Ilienko A.I., 1988. Doklady Academii Nauk SSSR 302: 1272-1274 [In Russian].

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