Cytogenetical and haematological studies of gastropod snails within the Chernobyl accident Exclusion Zone

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The cytogenetical effects of long-term irradiation in embryo tissue of gastropod snail (Lymnaea stagnalis L.) as chromosome aberration rate as well as change of structure, level of differentiation, death and cytogenetical stability of hemolymph cell population has been studied. Our researches were carried out during 1998-2007 in water bodies within the Chernobyl Exclusion Zone - lakes Azbuchin, Dalekoye-1, Glubokoye, Yanovsky Crawl, Uzh River and Pripyat River. The results compared to the data from the control lakes - Vyrlitsa, Opechen' and Goloseevo, located within the Kiev City area. The absorbed dose rate for snails from research water bodies within the exclusion zone was registered in the range from 1.8 mGy/year to 3.4 Gy/year. The highest rate was found in snails from lakes Dalekoye-1 and Glubokoye, the lowest - from Pripyat River and Uzh River. Molluscs from the control lakes were characterized by absorbed dose rate about 0.3 mGy/year. The lowest rate of chromosome aberration was determined in molluscs form the control lakes - 1.1-2.0 %. About 3.3 % of aberrant cells were registered in snails from Pripyat River. In snails of Uzh River the aberration rate was about 5.7 %. The highest rate was found in snails from Dalekoye-1 Lake and Glubokoye Lake - 21-23 %. In snails from Yanovsky Crawl chromosome aberration rate was about 18 % and in Azbuchin Lake - about 20 %. The decrease of total agranulocyte quantity in cell population occurs due to decreace of amoebocytes and increase of granulocytes, which involves in phagocytic raction. In hemoliph of snails from Dalekoye-1 Lake, Azbuchin Lake and Glubokoye Lake the quantity of death cells averages 36.2 %, 39.2 % and 43.8 % respectively, the part of phagocytic cells averages 44.3 %, 41.2 % and 45.0 %, as well as decrease of the young amoebocytes quantity to 13.2 %, 20.1 % and 9.5 % respectively. The insignificant quantity of abnormal cells and micronuclei has been observed as well. In the control water bodies the part of death cells averages from 2.2 to 5.3 % and the quantity of phagocytic was at level 3.0-4.2 %. The quantity of young amoebocytes have useful increased here to 79.7-89.6 %.

Article published by EDP Sciences and available at http://www.radioprotection.org
or http://dx.doi.org/10.1051/radiopro:2008592