



**Third International
Conference on Radiation
and Applications in Various
Fields of Research**

**June 8 - 12 | 2015
Slovenska Plaža
Budva | Montenegro
www.rad-conference.org**

**RAD
BOOK**

**OF
ABSTRACTS**

PUBLISHER: RAD Association, Niš, Serbia
www.rad-association.org

FOR THE PUBLISHER: Prof. Dr. Goran Ristić

EDITOR: Prof. Dr. Goran Ristić

COVER DESIGN: Vladan Nikolić, M.Sc.

TECHNICAL EDITING: Sasa Trenčić and Vladan Nikolić

PROOF-READING: Saša Trenčić, MA

ISBN: 978-86-80300-00-9

CIP - Каталогизација у публикацији -
Народна библиотека Србије, Београд

539.16(048)(0.034.2)

INTERNATIONAL Conference on Radiation and Applications in Various Fields of
Research (3rd ; 2015 ; Budva)

Book of Abstracts [Elektronski izvor] / Third International Conference
on Radiation and Applications in Various Fields of Research, RAD 2015, June
8-12, 2015, Budva, Montenegro ; [editor Goran Ristić]. - Niš : RAD
Association, 2015 (Niš : RAD Association). - 1 elektronski optički disk
(CD-ROM) ; 12 cm

Sistemski zahtevi: Nisu navedeni. - Nasl. sa naslovne strane dokumenta. -
Tiraž 400. - Bibliografija uz svaki apstrakt.

ISBN 978-86-80300-00-9

a) Јонизујуће зрачење - Дозиметрија - Апстракти

COBISS.SR-ID 215620620



A STRONTIUM-90 ACCUMULATION IN A BONE TISSUE OF YOUNG RODENTS DEPENDS ON A HETEROGENEITY OF STRONTIUM-90 CONTAMINATION OF AN AREA

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The levels of ^{90}Sr accumulation in a bone tissue of small mammals, one species and caught in the same area, can differ up to three orders of magnitude (Il'enko, Krapivko, 1989; Barakhtar et al., 2003). The most likely reasons for this variability are:

1. the animals travel over a gradient of contamination;
2. a different accumulation of ^{90}Sr in an animal feed;
3. a heterogeneity of ^{90}Sr contamination.

The third factor is rarely regarded as a significant because rodents actively move in the area. However, young rodents may lead a sedentary life in a small area. We expected that the heterogeneity of ^{90}Sr contamination is a significant factor to explain the variability of ^{90}Sr accumulation in this group.

The study was conducted on the territory of East Ural radioactive trace. The level of ^{90}Sr contamination was 5.5-11 MBq/m². The animals were caught out at the site of 120*300 sq m in July 2010, in July 2011, in July 2012. We analyzed 554 non-breeding juveniles four rodent species (*Apodemus uralensis*, *A. agrarius*, *Microtus oeconomus*, *M. gregalis*). The specific activity of $^{90}\text{Sr} + ^{90}\text{Y}$ of bone tissue were measured via nondestructive-radiometry. Heterogeneity of soil contamination with ^{90}Sr in a place of the animal capture was determined by measuring the density of beta-particles flux in soil surface of the areas of 100 m² and 400m². The dependence of the logarithm specific activity of ^{90}Sr in bone tissue on the level of soil contamination was established with using a linear regression (outliers were deleted).

The relation between the accumulation of $^{90}\text{Sr} + ^{90}\text{Y}$ in bone tissue and the soil contamination at the site of capture of *M. oeconomus* is statistically significant ($p < 0.01$, coefficient of determination (R^2) = 0.55 for the area of 100 m² and 0.62 for the area of 400 m²). The same relation was ascertained for *A. uralensis* was just in 2010 (R^2 = 0.19 for the area of 100 m² and 0.37 the area of 400 m²). For *A. agrarius* this relation was noted in 2012 (R^2 = 0.13 for the area of 100 m² and 0.30 for the area of 400 m²). *Microtus* are herbivorous rodents, *Apodemus* are omnivorous. The difference in forager sources determines the differences in the R^2 coefficients between species probably.

Thus, ^{90}Sr accumulation depends on heterogeneity of ^{90}Sr contamination even for actively traveling animals like rodents.

This work was supported by the Russian Foundation for Basic Research (grant no. 14_04_01484).