

STRUCTURE TRANSFORMATIONS OF ENDOCRINE SYSTEM ORGANS DURING ADAPTATION TO INCREASED RADIOACTIVITY

OLGA V. ERMAKOVA

Institute of Biology, Komi Scientific Centre, Ural Division of Russian Academy of Sciences, 28, Kommunisticheskaya St., Syktyvkar, 167982, Russia.
e-mail: ermakova@ib.komisc.ru

It is well known that during ecological monitoring of contaminated territories registration of early abnormalities in an organism is hampered by man-caused influence of habitat. Under these circumstances study of both structural and functional changes in organs and tissues of rodents inhabiting radioactive contaminated territories is of great importance. Study of structural features of endocrine glands, hormones of which trigger the process of active adaptive changes in an organism, is very important in radio-ecological surveys. Basing on long-term study of voles we have determined that long-term living by rodents on the territories characterized by increased natural and artificial radioactivity (radium contaminated fields in the Komi Republic and 30-km zone of Chernobyl APS) substantially influences morpho-functional state of endocrine system organs, causing quantitative and qualitative changes. It is demonstrated that population processes modify biological consequences of small dose chronic ionizing radiation in habitat. We noticed the following: high heterogeneity of histological changes of thyroid gland and adrenal gland as a response to radioactive habitat contamination; disorder of interconnection among different links of endocrine system; dependence of radiation effects on gender, age, degree and character of radiation contamination of a habitat as well as duration of radioactive influence. We have got data on morphological characteristics of thyroid gland and adrenal gland during different phases of population amount of this kind of rodents. It was discovered that effectiveness of radiation influence is not the same during different periods of population cycle. Presence of voles on the territories characterized by increased radioactivity causes chronic tension of adrenal cortex (increasing of the organ mass, enlarging of thickness of *zona fasciculata* and *zona reticularis*). Destructive-necrotic processes combine with manifestation of reparative regeneration. This is best marked during peak of population amount. There are histo-functional changes in the thyroid gland with hypofunction sign: enlarging of follicles and flattening of thyroid epithelium cells, colloid uptake and induration, proliferation of follicular epithelium into follicle lumen. We determined that more considerable structural abnormalities in endocrine system organs are discovered during their high functional activity influenced by radiation exposure.

Set of morphological changes of thyroid gland tissue and adrenal cortex among voles from radioactive contaminated territories on one hand, plays significant role in adaptation, enabling organism to cope (to some extent) with negative radiation effect, on the other hand shows signs of premature ageing and is a basis for pathological abnormalities.