

GENO-CYTOTOXICITY LEVELS IN FISH FROM CHEMICAL MUNITIONS DUMPSITES (BALTIC SEA)

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Abstract

In the Baltic Sea, there are exclusive zones, where dozens thousands tonnes of chemical munitions (CM) were dumped after the Second World War. The study presents data on environmental geno-cytotoxicity levels in fish inhabiting the dumped CM sites in the Bornholm and Gotland zones. Formation of micronuclei reflecting cytogenetic damage, nuclear buds – extrusion of damaged DNA from nuclei and nucleoplasmic bridges indicating dicentric chromosomes assessed as genotoxicity endpoints. Bi-nucleated and 8-shaped cells indicating alterations in chromosome segregation and cytokinesis and fragmented-apoptotic cells were used for cytotoxicity evaluation. Biomarker responses analyzed in blood erythrocytes of herring *Clupea harengus* and flounder *Platichthys flesus* collected from 54 study stations during ten surveys in 2010-2012. The main finding of the work – significant increase of geno-cytotoxicity in zones closely located to the CM dumpsites. Besides, in 5 stations, located nearby of CW (of 97 studied stations totally), there were found herring specimens, which could be characterized being cytogenetically collapsed. The micronuclei induction was up to 2000-fold, nuclear buds – up to 600-fold, fragmented-apoptotic cells – up to 300-fold increased compared to the reference levels of responses. GIS mapping of genotoxicity risk levels (responses over established background and threshold levels) revealed that in many of studied stations, fish are under high and extremely high genotoxicity risk levels.