

**Ukrainian Society of Cell Biology
Institute of Cell Biology NAS of Ukraine
Ivano-Frankivsk National Medical University**

6th Ukrainian Congress for Cell Biology with international representation

PROCEEDINGS



18-21 June 2019, Yaremche, Ukraine

6th Ukrainian Congress for Cell Biology with international representation

Proceedings. – Yaremche, 2019. – 176 p.

Proceedings contain the materials of *6th Ukrainian Congress for Cell Biology with international representation*, which was focused on novel insights in cell biology and biotechnology in Ukraine and abroad. The authors are solely responsible for the content of the abstracts.

Edited by:

Prof. Sibirny A.A.
Dr. Sci. Panchuk R.R.
Dr. M. Semkiv

Desktop publishing, cover design by: **Rostyslav Panchuk**

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**TOXIC ENVIRONMENT DIMINISHES THE OXIDATIVE STRESS RESPONSE
IN THE BIVALVE MOLLUSKS**

Lesya Gnatyshyna

Poster 2

Lesya Gnatyshyna^{1,2}, Vira Khoma¹, Natalia Mishchuk¹, Oksana Horyn¹, Victoria Martynyuk¹,
Lubomir Tsaryk¹, Gunta Sprinģe³, Oksana Stoliar¹

1 – Volodymyr Hnatyuk Ternopil National Pedagogical University, M. Kryvonosa Str., 2, 46027 Ternopil, Ukraine;

2 – I.Ya. Horbachevsky Ternopil State Medical University, m.Voli, 1, 46001, Ternopil, Ukraine;

3 – University of Latvia, Miera Str. 3, Salaspils, LV, 2169, Riga, Latvia;

E-mail: Oksana.Stoliar@tnpu.edu.ua

The aquatic inhabitants are chronically exposed to complex impact of the toxic effluents and climate abnormalities. When the native populations are examined, it can be expected either the specific responses of detoxification of the local impacts, or the tolerance to them, or the exhausting of the responses depending on the time and the severity of impact (Pain-Devin et al., 2014). In the current study, we focused on the stress and toxicity responses of two species of bivalve mollusks, *Unio tumidus* and *Dreissena polymorpha* depending on their settlement. The mollusks were sampled at the artificial river sites associated with the hydropower plants (HPPs). In Ukraine, the samples of *Unio tumidus* (Unionidae) were collected in the Dniester River basin from the reservoir of Kasperivtsi small HPP and before the dam of Krasnostavtcy micro HPP and from the sites after the dam of both HPPs. In Latvia, the specimens of *Dreissena polymorpha* were sampled from the reservoir of Riga HPP at Daugava River and from the pristine native lake. Several indices of antioxidant activities and oxidative damage were assayed, and the successfulness of the detoxification of the certain pollutants was evaluated. Integrated Biomarker Index (IBR) elaborated by Beliaeff and Burgeot (2002) was calculated including biochemical and cellular markers (totally 11).

In both species, the mussels sampled in the reservoirs of HPP, have shown the typical responses to the pollution by pesticides and personal care products. Particularly the mussels from the Kasperivtsi demonstrated the depletion of the cholinesterase activity typical for the effect of thiocarbamate pesticides. The concentration of metal-buffering protein metallothionein induced by toxic metals was higher in this group. The level of vitellogenin, determined as alkali labile phosphates, was highest in both groups from the reservoirs. This manifestation of the elevated vitellogenesis is usually caused by the presence in the water of endocrine disruptors. The most known endocrine disruptors in the surface waters are the pharmaceuticals and personal care products. However, in the mollusks from the Latvian sites, their level were similar. Hence, the specimens from the reservoirs indicated the pollution by the typical effluents, particularly in the Kasperivtsi. In the mollusks from both reservoirs, the depletion of GSH/GSSG was found. Unexpectedly, the mollusks from the reservoirs demonstrated lower level of lipid peroxidation products than the groups of comparison and greatest superoxide dismutase (Cu,Zn-SOD and/or Mn-SOD) activities. The standardized data for each marker (IBR) confirm that the manifestations of toxic impact were greatest in the mollusks from the large reservoirs, whereas the oxidative stress responses were intrinsic the specimens from the micro HPP and pristine sites.

Overall, the current study represents the first evaluation of the biochemical indices of bivalve mollusks depending on the water flow regime. They indicate the disagreement of the responses of stress and toxicity in the polluted areas.

This work has been granted by the Ministries of Education and Science of Ukraine and Latvia (Projects 132B and M/35 for O. Stoliar and LV-UA/2017/5 for G. Sprinģe).

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Підписано до друку 12.06.2019 р.

Формат 60x84/8 Папір офсетний.

Гарнітура Times.

Ум. друк. арк. 23.33

Наклад 140 примірників

Друк ФОП Стадник С.О.

79034, Україна, м. Львів, вул. Навроцького, 69,

тел. (38-032) 247-99-82,

Свідоцтво держреєстру:

серія В02, №967439 від 21.09.2009 р.