МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
ЛЬВІВСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ ІМЕНІ ІВАНА ФРАНКА
МІНІСТЕРСТВО НАУКИ І ВИЩОЇ ОСВІТИ ПОЛЬЩІ
ПОМОРСЬКА АКАДЕМІЯ В СЛУПСЬКУ
ЗАХІДНИЙ НАУКОВИЙ ЦЕНТР НАН УКРАЇНИ ТА МОН УКРАЇНИ
FRIENDS OF LVIV UNIVERSITY, INC., USA

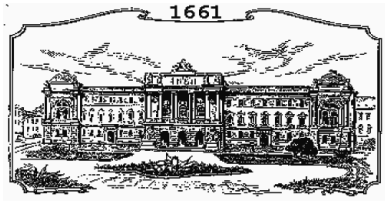
XIV МІЖНАРОДНА НАУКОВА КОНФЕРЕНЦІЯ
СТУДЕНТІВ І АСПІРАНТІВ

МОЛОДЬ І ПОСТУП БІОЛОГІЇ,

присвячена 185 річниці від дня народження Б. Дибовського

(ЛЬВІВ, 10 – 12 КВІТНЯ 2018)

ПРОГРАМА І ТЕЗИ ДОПОВІДЕЙ



ЛЬВІВ – 2018

indigenous bivalve mollusk *Unio tumidus.* To the best of our knowledge, such approach for the evaluation of the ecosystems is used for the first time.

The mussels were sampled in the sites within the middle streams of the river Dniester basin from the Kasperivtsi miniHPP on the river Seret (7,5 MW; 48°40′ N, 25°50′ E) before and after dam (DHPP); Kochubiiv microHPP on the river Jvanchik (< 1 MW; 48°49′ N, 26°23′ E) before and after dam (KHPP) and approved earlier [Falfushynska et al., 2010, 2014] reference site (pond Ivachiv at the upper portion of the river Seret, 49°46′ N, 25°05′ E). The detecting of water chemical composition in the vicinities of HPPs and inthe reference site have shown the prominent distinctions in the level of ammonia, nitrates, phosphates, chlorides, sulphates, ferrum and phenol. However, these distinctions characterised the geographic location more then precise site, because they were common for the sites before and after damp in each case. In opposite, the molecular markers demonstrated prominent differences between the mollusks inhabiting the sites before and after damp. Mollusks from the Kasperivtsi reservoir demonstrated the deep oppression of oxidative stress response, the response of anaerobic shift, activation of the lysosomal enzyme cathepsin D and its efflux typical for autophagy, the signs of DNA instability, neurotoxicity and endocrine disruption. In general, the mussels from the Kochubiiv HPP had better molecular and cellular characteristics than the specimens from Kasperivtsi HPP. However, the groups sampled before damp had the lesser level of the products of lipid peroxidation, most active aerobic methabolism, lower level of cathepsin D activity then the specimens collected after dam. The biomarker of the toxic metals metallothioneins did not demonstrate the differences between sites attesting the absence of industrial pollution in each site.

Summarizing, our results confirm the stress responses and signs of pollution by municipal and/or agricultural xenobiotics in the mussels from HPPs’ areas. The biological effects of hydrological regimes in the vicinities of HPPs are highly dependent on the type of HPP. The biomarkers of the mussels from the reservoir with slow hydrological regime of miniHPP (particularly) and the site with the cyclic changes of hydrological regime of microHPP reflect the signs of adverse effects of aquatic environment. Further investigations will be done to compare the sites with the similar hydrological regimes in the basin of the river Daugava, Latvia.

This work has been granted by the Ministry of Education and Science of Ukraine (Project M/70-2017) and State *Education* Development *Agency* of Latvia (Project LV-UA/2016/5).

Rzymski P.[1], Horyn O.[2], Kokociński M.[3], Budzyńska A.[3], Jurczak T.[4], Poznanskyi D.[2], Rusnak N.[2], Gnatyshyna L.[2], Stoliar O.[2], Falfushynska H.[2]

OCCURRENCE AND TOXICITY OF *CYLINDROSPERMOPSIS RACIBORSKII* IN THE WATER RESERVOIRS OF POWER PLANTS IN UKRAINE

[1]Department of Environmental Medicine, Poznan University of Medical Sciences, Poznań, Poland
[2]Research Laboratory of Comparative Biochemistry and Molecular Biology, Ternopil National Pedagogical University, 2, M. Kryvonosa Str., Ternopil, 46027, Ukraine
[3]Adam Mickiewicz University, Poznań, Poland
[4]University of Łódź, Łódź, Poland
e-mail: falfushynska@tnpu.edu.ua, http://biochemlab.tnpu.edu.ua

Cylindrospermopsis raciborskii is a potentially toxic cyanobacteria which is invading from tropical/sub-tropical towards temperate areas. Strains of this species are potent producers of various toxins including a guanidine alkaloid, cylindrospermopsin (CYN). Over the last decades much effort has been put forward to investigate distribution, ecology and toxicity of European strains of *C. raciborskii*. However, not much is known on the occurrence of *C. raciborskii* in Ukraine. We have undertaken an effort to explore it by sampling a water from water reservoirs of Kasperivtsi Hydrothermal Power Plant (HPP) and cooling pond of Khmelnytsky Atomic Power Plant (APP) in late summer and early autumn of 2017. The distribution and abundance of C. *raciborskii* in relation to water physico-chemical profile (pH, nitrite, nitrate, ammonia, phosphate,

chloride, sulfate, iron, phenols content, total hardness, dissolve oxygen and oxidisability) were measured by standard analytical tests. Further, water samples and filtered phytoplankton biomass were investigated for their presence of known cyanotoxins - microcystins, anatoxin-a and CYN.

Our results showed the dominance of *Cyanobacteria* in all investigated water reservoirs (~92.6-98.0% and ~78.6-92.5% to the total biovolume in HPP water conservation reservoir and cooling pond of APP, respectively). Relatively great fraction of taxonomic group in cooling pond of APP belonged to Chlorophyta (18.9%). For the first time, the occurrence of *C. raciborskii* (1.1-8.5%) in Seret River (upon which HPP is situated) has been shown. Water samples contained no detectable dissolved and particulate levels of studied cyanotoxins. In both water reservoirs we have identified several other species from Aphanizomenonaceae, *Leptolyngbyaceae*, *Phormidiaceae*, Microcystaceae and *Pseudanabaenaceae* families including, *Planktothrix agardhii*, a potent microcystins producer and *Aphanizomenon gracile*, a potent producer of CYN. The dissolved and particulate contents of studied cyanotoxins were however below detection limits.

When all biological parameters were analyzed using Principal Component analysis, two distinct groups were identified. The first one was related to Factor 1, and it included nitrate- and ammonia-ions as well as the total hardness which were found to be positive associated with the presence of *Aphanizomenon gracile, Dolichospermum* sp., *D. flos-aquae* and *Anabaenopsis cunningtonnii*, whereas sulfate and phosphate anions were negatively associated with the abundance of abovementioned cyanobacteria. Meanwhile the second group was related to Factor 2 included chloride and iron ions and *L. redeckei, M. aeruginosa and Pseudanabaena* sp. C. raciborskii did not correlate with any determined water parameters and/or cyanobacteria.

Our findings indicate that *C. raciborskii* can also be found in Ukrainian water reservoirs. No CYN was found in filtered water and phytoplankton biomass preliminary suggesting that Ukrainian strains are incapable of production of this toxin. Further molecular, biochemical and ecotoxicological research on isolated strains is urgently needed on possible toxicity of *C. raciborskii* to conclude whether the occurrence of this species in Ukraine is of any ecological and/or health threat.

This work has been granted by the Ministry of Education and Science of Ukraine (Projects ## MV-1, M/70-2017, 131B).

Stec M., Astel A.

ACTIVE INGREDIENTS OF SUN PROTECTORS – EFFECT ON ENVIRONMENT AND LIVING ORGANISMS

Environmental Chemistry Research Unit,Pomeranian University in Slupsk
Arciszewskiego Str. 22b,76-200 Slupsk, Poland
e-mail: marcin.stec@apsl.edu.pl

In the last 20 years an increase in the incidence of malignant skin tumors has been observed. One of two main reasons for their occurrence is the excessive exposure to UV radiation [Riker et al., 2010]. In order to reduce hazard resulting from long-term sunbathing an application of sun creams containing UV filters is recommended as the most effective form of protection [Krause et al., 2012].

The cosmetic sun filters are substances of complicated chemical composition. The goal of their application is to minimize negative effects caused by long-term exposition on solar radiation. According to the protective mechanisms sun filters can be divided into organic compounds with the ability of ultraviolet radiation absorption and mineral origin that reflect solar radiation [Sharifan et al., 2016; Kępska, 2014; Sobańska, 2008; Serpone et al., 2007]. Analyzing their structure and presence of functional groups sun filters can be divided into derivatives of benzophenone, benzotriazole, p-aminobenzoic acid, camphor, trai, salicylates and cinnamates.

UV filters are active compound of many cosmetics intended for both everyday and protective use. They could be found in the formula of lipsticks, creams, balms as well as hair and nail lacquers.

T

U

V

W

Y

Z