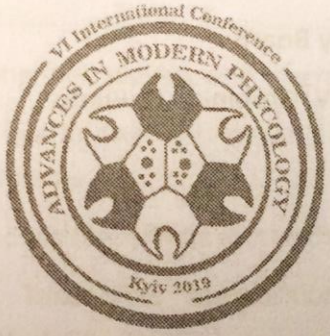
National Academy of Sciences of Ukraine

M.G. Kholodny Institute of Botany

Ukrainian Botanical Society
Phycological Section

VI International Conference

ADVANCES IN MODERN PHYCOLOGY



BOOK OF ABSTRACTS

15-17 May 2019, Kyiv, Ukraine

Kyiv – 2019

UDC 582.26/.27:581.526.32:581.17/19:561

Advances in Modern Phycology: Book of Abstracts of the VI International Conference. – Kyiv, 2019. – 128 p.

ISBN: 978-966-02-8876-8

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Sládeček, were formed by 2354 taxa and the list was formed with the help of works (Kolkwitz, Marsson, 1902, 1909; Pantle, Buck, 1955; Sládeček, 1973; DePauw, Hawkes, 1993; Barinova et al., 2006, in Rus.). For the characteristics of organic pollution according to Watanabe 339 indicators are known for our country (according to Watanabe et al., 1986; Dell'Uomo, 1996). Of the Ukrainian flora amount, for nutrition type preferences, 305 taxa were investigated (making this list was possible due to works: Van Dam et al., 1994; Lenzenweger, 2003; Coesel, Meesters, 2007; etc.). Trophic state was formed by 1301 taxa (according to Van Dam et al., 1994, Kharitonov, 2010, in Rus.; Lenzenweger, 2003; Coesel, Meesters, 2007; http://hydro.chmi.cz/isarrow/taxontable.php?agenda=POV&lng=eng&lng=eng; Barinova, 2017; Barinova, Fahima, 2017).

From the known Ukrainian flora and considering mentioned preferences, the indicator species may be quantified as 2858 species and 3299 infraspecies taxa. The proposed ecological preferences of algae characterize state of aquatic environment in Ukraine and can be used for similar floras. This information is presented in the monography "Algal indication of water bodies in Ukraine: methods and perspectives" (Barinova, Bilous, Tsarenko, 2019).

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LIPIDS BIOSYNTHESIS IN *CHLORELLA VULGARIS* BEIJER. UNDER THE INFLUENCE OF SOME TRACE ELEMENTS

The natural high content of lipids in cells of many microalgae became the primarily reason for obtaining lipid compounds with a varied range of practical applications - from biologically active additives to biofuels (Michalak, 2017). The chemical composition and physical factors changes of the culture medium can modify the chemical composition of algae as well as the ratio of some organic compounds.

As for lipids, the main goal in biotechnological systems is their amount, the formation rate and the ratio of separate classes that can be regulated by various

external and internal factors (Hu, 2004). The most common strategies for enhancing lipid biosynthesis is the influence of chemical factors of growth medium: concentration of CO_2, change in the ratio of N and P, addition of phytohormones and trace elements, etc. At the same time, the high ability of microalgae to bioaccumulation of chemical elements and formation of their biocomplexes with intracellular macromolecules *in vitro* opens up the prospective for obtaining biologically active additives that are enriched with necessary microelements, for example, Se and ions of certain biogenic metals (Doucha, 2009, Grubinko, 2018).

So, the aim of the study was to investigate the direction and intensity of general metabolism and biosynthesis of lipids in *Chlorella vulgaris* Beijer. under specified conditions after thy inclusion of labeled precursors.

Inclusion of ^{14}C-bicarbonate into carbohydrates, proteins and lipids of *Ch. vulgaris* significantly differed as in a control group and under the action of Se, Zn and Cr salts. Under these all conditions, the predominance of the label inclusion in lipids was 2-3 times higher in relation to the intensity of its inclusion in carbohydrates and 9-12 times in relation to the intensity of its inclusion in proteins. In addition, during the action of all trace elements, one third of the ^{14}C-bicarbonate label were stably incorporated into proteins, while in the lipids, the inclusion of $H^{14}CO_3^-$ exceeded the benchmarks by 1.5 after adding Se and Se + Zn, by 1.6 times after adding Se + Cr for conditional control in carbohydrates. It is found that in *Ch. vulgaris* under the actions of Se the process of bicarbonate inclusion into phospholipids (PL) is separately activated, after adding Se + Zn we can observe the decrease of its inclusion into the triacylglycerols (TAG) and its increase in PL and nonetherified fatty acids (NEFA), and after adding of Se + Cr we observed the modification of the label inclusion into TAG and diacylglycerols (DAG).

It should be noted that the lipogenesis activation by the action of the Se, Zn, Cr compounds was confirmed in the majority of cases with the increase in the intensity of ^{14}C-oleate inclusion into different classes of chlorella cells' lipids and the increase of glycerol-3-phosphatacyltransferase (G-3-FAT) activity. This enzyme is key for lipid biosynthesis, which activity was evaluated by the inclusion of ^{14}C-oleate into lipids.

By the intensity of the inclusion of ^{14}C-oleate we established that the general tendency under the action of Se, Zn, Cr salts was a significant increase in the

biosynthesis of PL and to a lesser extent in the TAG and a decrease in the biosynthesis of DAG and partly of NEFA in *Ch. vulgaris*.

At the same time, the high activity of the enzyme G-3-FAT in *Ch. vulgaris* correlated with the maintenance of relatively stationary content of TAG and PL in cells.

Thus, the metabolic peculiarities of lipid metabolism regulation in *Ch. vulgaris* that were studied in a direction of increasing the formation and accumulation of lipids and their separate classes using sodium selenite together with Zn (II) and Cr (III).

These data can be used to obtain lipidous biologically active drugs enriched with essential micronutrients.

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GREEN MONADS SHARING THEIR HABITAT WITH MACROORGANISMS

During the study of green blooms in the North-West Russia the five cases of green monads coexisting with other organisms were detected.

Four different algal taxa were isolated from the eggs of *Rana* L. species. These monads were easily allocated from contents around a germ to agar medium. Later they were identified as *Edaphochlamys debaryana* Pröschold & Darienko, *Chlamydomonas asymmetrica* Korshikov, *Gloemonas* sp. and *Chlorococcum* sp., using light microscopy (LM), transmission electron microscopy (TEM) and sometimes 18S rRNA sequencing. Their morphological characters coinsided mostly with that of earlier diagnosed taxa from free-living green monads.

Only one taxon was occasionally observed on dark-green colored *Sphagnum* sp., which was preliminary identified as *Microglena* sp., based only on LM and TEM.

All examined green monads differ markedly not only in morphology but also in contrasting cellular ultrastructure.

It seems that these algae are not obligate to corresponding associations with macroorganisms, since they were met as free chlamydomonads in different