

**VI International Conference  
ADVANCES IN MODERN PHYCOLOGY**

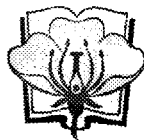


**BOOK OF ABSTRACTS**

**15-17 May 2019, Kyiv, Ukraine**



**National Academy of  
Sciences of Ukraine**

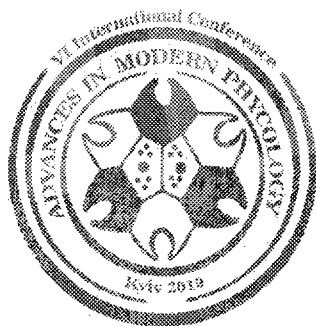


**M.G. Kholodny  
Institute of Botany**



**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.**

**Deputy Editor:** P. Tsarenko

**Managing Editor:** O. Burova

**Editorial Advisory Board:**

O. Vynogradova, V. Grubinko, O. Bilous

ISBN: 978-966-02-8876-8

© M.G. Kholodny Institute of Botany of NAS of Ukraine, 2019

## CONTENTS

Andrusyshyn T.V., Halyniak O.V. Pigmental composition of <i>Chlorella vulgaris</i> Beijer. for actions of metals and non-metals.....	9
Apego Gianina Cassandra May B., Dungog Ma. Rica Teresa B., Yñiguez Aletta T. Phytoplankton assemblage in whale shark capital Donsol, Sorsogon .....	10
Berezovska V.Yu. Algal floristic studies of reservoirs of Kyiv Upland (Forest-Steppe Zone, Ukraine).....	11
Bilous O.P., Barinova S.S., Tsarenko P.M. Algae as indicators of environmental conditions in water bodies of Ukraine.....	13
Bodnar O.I. Lipids biosynthesis in <i>Chlorella vulgaris</i> Beijer. under the influence of some trace elements.....	15
Boldina O.N. Green monads sharing their habitat with macroorganisms.....	17
Borysova O.V., Gromakova A.B. Distribution and ecology of <i>Chara papillosa</i> Kütz. (Charales, Charopyta) in Ukraine .....	18
Bren O.G., Solonenko A.M. Algae of salt reservoirs on the Berdyansk Spit .....	20
Bryantseva Yu.V., Sergeeva A.V. Taxonomic composition of microalgae of the Sevastopol coastal area (Black Sea, Crimea) .....	21
Bryantseva Yu.V., Sergeeva A.V. Ukraine microalgae database.....	23
Bukhtiyarova L.N. Functional morphology of the diatom frustule in systematics of Bacillariophyta.....	24
Cepoi L.E. The influence of oxidative stress on the quality of phycological biomass ...	26
Davydov O.A. Ecological and morfological structure of microphytobenthos in Verbnoe Lake (Ukraine).....	28
Demchenko E. Planozygotes of flagellated volvocales (Chlorophyta) inhabiting ephemeral water bodies and their role in life cycles of these algae.....	29
Dobrojan S.N. Characteristics of morphological indicators of cyanophyte algae <i>Calothrix gracilis</i> F.E. Fritsch cultivated on drew and z-8 nutritive medium ....	31

Dobrojan S.N., Șalaru V.V., Jigău Gh.V., Ciobanu E.D. Utilisation biomass of <i>Nostoc linckia</i> Bornet ex Bornet et Flahault algae as biofertilizer for cultivation sunflower ( <i>Helianthus annuus</i> ) .....	33
Ennan A.A., Shichalyeyeva G.N., Gerasimiuk V.P., Kiryushkina A.N., Tsarenko P.M. Algal flora of the Kuyalnik Estuary: the history of study and current state .....	34
Garkusha O.P. Effect of decomposition of the seaweed wrack on microalgae growth on sandy and rocky supralittoral of northwestern part of the Black Sea.....	36
Genkal S.I., Trifonova I.S. To the morphology and taxonomy of <i>Aulacoseira granulata</i> (Bacillariophyta) .....	38
Gerasimiuk V.P. Microscopic algae of benthos of rivers of the north-western Black Sea (Ukraine) .....	39
Glaser K., Van A. Diversity of diatoms in biological soil crusts.....	40
Gol'din E.B. Cyanobacterial action and histopathology in insects with a different type of nutrition.....	41
Gottschling M., Owsianny P.M., Kretschmann Ju. The importance of the epitype concept for reliable species determination in protists such as dinophytes .....	43
Grubinko V.V. Regulation of metabolism in algae for the production of lipids and biologically active substances .....	44
Hisoriev H. Algae diversity of the Central Asia water bodies.....	46
Holzinger A., Rippin M., Pichrtová M., Arc E., Kranner I., Becker B. Transcriptome analysis and metabolite profiling reveal a vertical differentiation within a <i>Zygnema</i> sp. (Zygnematophyceae, Charophyta) mat from the High Arctic .....	47
Kalashnik K.S. Morphofunctional organization of the “basiphyte-epiphyte” algosystem of the Gulf of Odessa .....	48
Kapustin D.A. The Genus <i>Synura</i> Ehrenb. (Chrysophyceae) in Ukrainian algal flora .....	50
Khudjaev M., Jusupova F., Kurbonova P., Boboev M., Hisoriev H. Algae biodiversity of some water reservoirs of Central and South Tajikistan .....	51
Kirpenko N.I., Leontieva T.O. Growth intensity of <i>Desmodesmus communis</i> Hegew. and <i>D. subspicatus</i> Hegew. et Schmidt in various environments.....	52

Komaristaya V.P., Bilousova K.M. Beta-ionone as a stimulant of carotenogenesis in <i>Haematococcus pluvialis</i> Flotow .....	54
Kondratyuk S.Ya., Hur J.-S. Phycobiont and mycobiont switching in lichen symbiotic association .....	56
Konishchuk M.O., Borysova O.V., Konishchuk V.V., Pankovska H.P. Algae of water bodies in the National Natural Park Pivnichne Podillia (Lviv Region, Ukraine) .....	57
Kovalchuk N.A. Assessment of macroalgal species diversity on water area of the PA "Kurgalsky" (the Gulf of Finland, Baltic Sea) .....	59
Kovalchuk N.A., Hop H. Some quantitative characteristics of the population of <i>Alaria esculenta</i> (L.) Grev. from Kongsfjord (the Western Spitsbergen, 79° N).....	60
Kryvosheia O.M. Diatoms of the Sula River (Ukraine).....	61
Kurbonova P.A. Distribution and ecology of <i>Closterium</i> species (Streptophyta) in Tajikistan .....	63
Maltsev Y.I., Maltseva S.Y., Kulikovskiy M.S. Molecular and morphological investigation of cosmopolitan diatom <i>Hantzschia amphioxys</i> (Ehrenb.) Grunow (Bacillariophyceae).....	64
Maltseva I.A., Maltsev Y.I., Bren O.G., Yarova T.A., Pavlenko O.M., Yakoviichuk O.V. Algae as indicators of the ecological state of marine ecosystems in the coastal part of the Azov Sea .....	65
Mienasova A.Sh. Most ancient Podolia's algae as trigger for the formation of phosphorites.....	67
Mikhailyuk T., Tsarenko P., Glaser K., Holzinger A., Demchenko E., Karsten U. <i>Dictyosphaerium</i> -like morphotype in terrestrial algae: what is <i>Xerochlorella</i> (Trebouxiophyceae, Chlorophyta)? .....	69
Minicheva G.G., Tretiak I.P. Long-term restoration of the Zernov's Phyllophora Field .....	70
Minicheva G.G., Tsetskhladze M.S. Macroalgae of Georgian coast as indicator of ecological status .....	70

Mykhailenko N.F., Zolotareva O.K. Growth rates and photosynthetic energy transduction efficiency of <i>Chlorella vulgaris</i> Beijer. grown in the presence of copper and selenium nanocitrates .....	74
Nikonova S.E. Cyanoprokaryota of the hyperhaline Kuyalnik Estuary (Ukraine) in terms of supplying seawater from the Black Sea .....	76
Novakovskaya I.V., Egorova I.N., Kulakova N.V., Patova E.N., Shadrin D.M. Morphological and genetic characteristics of <i>Coelastrella</i> species from the Urals and Khentey Mountain Systems .....	78
Nyporko S.O., Demchenko E.N. The record of <i>Diplosphaera chodatii</i> Bial. emend. Vischer on moss <i>Homalothecium philippeanum</i> (Spruce) Schimp.....	80
Olshytynska O.P., Tymchenko Yu.A. <i>Cymatopleura</i> W.Sm. s.l. (Bacillariophyta) in the Black Sea bottom sediments .....	81
Pirko Ya.V., Postovoitova A.S., Rabokon A.M., Bilonozhko Yu.O., Kalafat L.O., Korkhovy V.I., Borysova O.V., Tsarenko P.M., Blume Ya.B. Molecular genetic algae profiling of the Selenastraceae family .....	83
Rachynska O.V. Microphytobenthos algae of mussel shells from the Odessa coastal zone as bioindicators of marine environment .....	84
Raida O.V., Burova O.V. The macrophytic algae of Dzhurynskyi and Divochi Sliozy waterfalls (Ternopil Region, Ukraine) .....	86
Romanenko P.O., Vynogradova O.M., Romanenko K.O., Ivannikov R.V., Babenko L.M. Interesting representative of genus <i>Brasilonema</i> Fiore et al. (Nostocales, Cyanobacteria) growing on tropical plants in the greenhouse of the M.M. Grishko National Botanical Garden (Kyiv, Ukraine).....	88
Sadogurskiy S.Ye., Belich T.V., Sadogurskaya S.A. Floristic diversity of macrophytes in marine water areas of nature reserves in the Crimean Peninsula .....	90
Salaru V.V., Semeniuc E.N. Rare species of algae of Moldova.....	92
Sapozhnikov Ph.V., Kalinina O.Yu., Snigirova A.A. Phytoperyphyton of the marine plastic (pet) near the Crete coast.....	93
Semeniuk N.Ye. Assessing stability of Dnipro epiphytic algal communities' taxonomic and quantitative diversity (case-study of Kyiv Water Reservoir) .....	95

Shalygina R.R.,* Shalygin S.S., Redkina V.V., Gargas C.B., Johansen J.R. <i>Stenomitos kolaensis</i> , a new species of cyanobacteria from Kola Peninsula, Russia .....	95
Shelyuk Yu.S. Phytoplankton development in small reservoirs .....	97
Shevchenko T.V. Oligocene Zmiiv algal flora of the Subparatethys (Northern Ukraine) .....	97
Shevchenko T.F., Klochenko P.D., Dubnyak S.S. Epiphyton under conditions of unstable hydrological regime of a cascade plain reservoir .....	100
Shyndanovina I.P. <i>Gonatozygon aculeatum</i> W.N. Hastings and <i>Pleurotaenium simplicissimum</i> Grönblad - new taxa of rare desmids (Zygnematophyceae, Streptophyta) for Ukraine .....	102
Snigirova A.A., Kurakin A.P. Microalgae on the plastic substrates in the coastal area of the Gulf of Odessa (the Black Sea) .....	103
Stepanov S.S. Influence of methanol and H <sub>2</sub> O <sub>2</sub> on lipid bodies accumulation by <i>Chlamydomonas reinhardtii</i> Dang. ....	105
Stepanov S.S. The way to increase the efficiency of production H <sub>2</sub> by <i>Chlamydomonas reinhardtii</i> Dang. ....	107
Stepanova V.A. Rare species of diatoms (Bacillariophyta) of the coast of the Gulf of Finland (Leningrad Region, Russia) .....	107
Terenko G.V. New invasions of alien species of planktonic microalgae into the North-Western part of the Black Sea (Ukraine) .....	110
Tkachenko F.P. Algae of mineralized stream of the slopes of the Tiligul Estuary of the Black Sea .....	112
Trofim A., Bulimaga V. Biochemical composition of Cyanobacterium <i>Calothrix marchica</i> Lemmerm. isolates from Moldovan soils and perspectives in biotechnological applications.....	113
Tsarenko P.M. Algal flora of Ukraine – floristic-geographical and biotechnological aspect.....	115
Tsarenko P.M., Borysova O.V., Konishchuk M.O. Microalgae strains of the IBASU-A collection as a basis for biotechnological studies .....	117

Usenko O.M., Konovets I.M., Mardarevych M.G. Effect of hydroxycinnamic acids on green algae and cladocerans..... 119

Van A. A taxonomic study of strains from the genus *Stichococcus* Nägeli based on ecophysiological, morphological, and molecular data ..... 121

Vynogradova O.M., Mikhailyuk T.I., Gromakova A.B. New and interesting records of Cyanobacteria in biological soil crusts from chalk outcrops of Kharkiv Region (Ukraine) ..... 122

Wojtal A.Z., Pociecha A., Ciszewski D., Cichoń S., Cieplik A. Response of diatoms to the mining of the Zn-Pb ore (South Poland) ..... 123

Yaremych A.V., Karamushka V.I. Phycocyanin content assessment by the spectral response of *Arthrospira platensis* Gomont biomass ..... 124

Zotov A.B. The influence of nitrogen to phosphorous ratio on inter-annual variability of phytoplankton structure of the Odessa Region (the Black Sea, Ukraine)..... 126

taxa were identified by H. Lange-Bertalot with co-authors (Lange-Bertalot et al. 2003) mainly from samples from Sardinia island, 1 taxon is from springs in Germany (Werum and Lange-Bertalot 2004) and 5 new taxa from fresh water bodies and soil of the South Atlantic islands (Zidarova et al. 2010). Until recently, many of the described species were identified with *Hantzschia amphioxys*, which is positioned as a cosmopolitan species.

We have studied morphology, ultrastructure and phylogeny of 13 soil diatom strains, which belongs to *H. amphioxys* s.l. using 18S rDNA, 28S rDNA and *rbcL*. We show that our strains contain five different species of *Hantzschia*, including three new for science. Five strains we identified as *H. abundans* Lange-Bertalot. We indicated an insignificant curvature of the raphe near its external central ends. Four of the examined strains were represented by different populations of *H. amphioxys* and their morphological characteristics are fully corresponded with accepted isolectotype and epitype. The main specific features of this species include 21-25 striae in 10 µm, 6-11 fibulae in 10 µm, 40-50 areolae in 10 µm and internal central raphe endings bent to opposite directions. Three new species were described based on differences with shape of the valves, a significant excess of the dimensional characteristics, a smaller number of striae and areolae in 10 µm and the position of the internal central raphe ends. Based on the study of morphological variability and phylogeny of soil *Hantzschia*-species from different geographical locations we concluded that some sympatric populations of pseudocryptic taxa are exist in Holarctic.

**I.A. Maltseva, Y.I. Maltsev, O.G. Bren, T.A. Yarova,**

**O.M. Pavlenko, O.V. Yakoviichuk**

Bogdan Khmelnytsky Melitopol State Pedagogical University,

20, Hetmanska St., Melitopol, 72312, Ukraine

e-mail: maltseva\_irina@ukr.net

## **ALGAE AS INDICATORS OF THE ECOLOGICAL STATE OF MARINE ECOSYSTEMS IN THE COASTAL PART OF THE AZOV SEA**

The Sea of Azov is socially and economically important for Ukraine. It provides the development of fishing, transportation, recreation and other industries. In general, the ecological situation of the Sea of Azov corresponds to the

global tendencies of anthropogenic transformation of marine ecosystems. At the same time, it is characterized by its own peculiarities such as shallowness, continentality, significant inflow of river waters, and poor connection with the Black Sea.

Algae are used worldwide for the assessment of anthropogenic changes in marine ecosystems (Mocenni and Vicino, 2006; Gharib and Dorgham, 2006; Gharib et al., 2011; Raveh et al., 2015; Wells et al., 2015; Arroyo and Bonsdorff, 2016). Potential of algae used as indicators is much greater than that of physical-chemical methods. For this reason, their use is obligatory according to the requirements of Water Framework Directive (WFD), Marine Strategy Framework Directive (MSFD) (European Commission, 2008).

Research of algae in the Sea of Azov has a long history. The first information about algae of the Sea of Azov and its bay Syvash is represented in the works of K.I. Meyer and V.M. Arnoldi and is dated within the beginning of the 20<sup>th</sup> century. The works were later complemented by both native and foreign scientists (Kovaleva, 2016). Different parts of the Sea of Azov are explored unequally. The algae in the western and southwestern Sea of Azov are the least explored. The latest data go back to the beginning and the middle of the 20<sup>th</sup> century and concern Molochnyi Estuary (Proshkina-Lavrenko, 1950; Vladimirova, 1960 a), Sivash lake (Meyer, 1915; Proshkina-Lavrenko, 1940, 1962; Vladimirova, 1960 b; Ivanov, 1960) and Henichesk Strait (Merezhkowsky, 1902).

In summer 2017, the excessive growth of macrophytic algae was observed in waters of the Sea of Azov in this coastal area. It produced uncomfortable conditions for tourists and residents of the coastal area. The algae proliferated on the surface of water 10-20 meters away from the water's edge. They were thinning out further off the coast. Their samples were taken during the expeditions to 5 stations of the coastal waters of the Sea of Azov (Berdiansk spit (the end of the spit), the area of Lysiacha clough (Berdiansk district), village Botievo, Stepanivka spit, island Biriuchy (border "Chynka")). The object of research was macrophytic and microscopic algae from algal blooms. The material was gathered in accordance with accepted procedures in hydrobiology (Topachevsky and Masyuk, 1984). Nomenclature of representatives is given in accordance with the identification guide of national data collection (Tsarenko et al., 2006).

The main producer of macroscopic proliferations on island Biriuchy, in the area of Lysiacha clough and on Berdiansk spit was *Cladophora albida* (Nees) Kütz., a green alga from an order *Siphonocladales*. On Berdiansk spit there was an

accumulation of filamentous algae with higher aquatic plants (*Zostera marina* L., *Ruppia maritima* L.). On Stepanivka spit, the main producer of macroscopic proliferation was another species from a genus *Cladophora* Kütz. – *Cladophora siwaschensis* K.J. Meyer. However, filaments of this species were not numerous in the area of Lysiacha clough. A great number of discovered diatoms were attached to macrophytes. Only single members of division Rhodophyta were discovered among filamentous algae.

During the research 18 algae species that were a part of proliferation of macroscopic algae were found at different points. They were representatives of the following divisions: Bacillariophyta – 10 species, Chlorophyta – 6 species, Rhodophyta – 2 species.

Thus, information about different algae characteristics is an integral part of understanding and predicting changes in marine ecosystems. It is valuable for both current assessment of ecosystems and long-term monitoring programs.

### **A.Sh. Mienasova**

Taras Schevchenko National University of Kyiv,  
90, Vasylykivska St., Kyiv, 03022, Ukraine  
e-mail: mangelina@ukr.net

## **MOST ANCIENT PODOLIA'S ALGAE AS TRIGGER FOR THE FORMATION OF PHOSPHORITES**

The most ancient and numerous imprints of algae in Podolian Middle Dnister area are found and described from Kalyus Beds. It is Nagoryany Formation of Upper Vendian.

Kalyus Beds are represented by homogeneous, dark-grey, thin-bedded mudstones. Characteristic feature of the beds is the occurrence of phosphorite concretions and two levels with algae remains (Sokolov, Fedonkin, 1985 a, b).

Three species of Vendetian algae make up the Metaphyta complex – *Vendotaenia antiqua* Gnil., *Fusosquamula viasovi* Ass., *Pilitella composite* Ass. In the rock, the algae are non-mineralized elastic brown ribbons, which occur either singly or completely cover of the bedding surface. Vendetenida tapes have a tissue-like structure, but without signs of a conductive system. This proves their algal nature. *Vendotaenia* are among the most ancient Metaphyta. According to the general