

Редакционный совет

академик РАН Е.А.Ваганов
академик РАН К.С.Александров
академик РАН И.И.Гительзон
академик РАН В.Ф.Шабанов
чл.-к. РАН, д-р физ.-мат.наук
А.Г.Дегерменджи
чл.-к. РАН, д-р физ.-мат. наук
В.Л.Миронов
чл.-к. РАН, д-р техн. наук
Г.Л.Пашков
чл.-к. РАН, д-р физ.-мат. наук
В.В.Шайдулов
чл.-к. РАО, д-р физ.-мат. наук
В.С. Соколов

Editorial Advisory Board

Chairman:

Eugene A. Vaganov

Members:

Kirill S. Alexandrov
Josef J. Gitelson
Vasily F. Shabanov
Andrey G. Degermendzhy
Valery L. Mironov
Gennady L. Pashkov
Vladimir V. Shaidurov
Veniamin S. Sokolov

Editorial Board:

Editor-in-Chief:

Mikhail I. Gladyshev

Founding Editor:

Vladimir I. Kolmakov

Managing Editor:

Olga F. Alexandrova

Executive Editor for Biology:

Nadezhda N.Sushchik

CONTENTS / СОДЕРЖАНИЕ

Olga P. Dubovskaya

Evaluation of Possible Causes of Non-Predatory Mortality of Crustacean Zooplankton in a Small Siberian Reservoir

— 3 —

Iosef I. Gitelson and Genry M. Lisovsky

Creation of Closed Ecological Life Support Systems: Results, Critical Problems and Potentials

— 19 —

Olesya N. Makhutova and Elena B. Khromechek

Fatty Acids of Sestonic Lipid Classes as a Tool to Study Nutrition Spectra of Rotifers and Ciliates in a Siberian Eutrophic Reservoir

— 40 —

Tatiana V. Rozhko, Nadezhda S. Kudryasheva,

Maria A. Aleksandrova, Lidia G. Bondareva,

Alexander Ya. Bolsunovsky and Galina V. Vydryakova

Comparison of Effects of Uranium and Americium on Bioluminescent Bacteria

— 60 —

Ekaterina I. Shishatskaya, Olga N. Voinova,

Anastasya V. Goreva, Olga A. Mogilnaya

and Tatiana G. Volova

Biocompatibility of Polyhydroxybutyrate Microspheres: in vitro and in vivo Evaluation

— 66 —

Sofiya A. Ushakova, Alexander A. Tikhomirov,

Vladimir V. Velichko, Igor G. Zolotukhin,

Yuriy A. Kudenko and Tamara K. Golovko

The Estimation of the Stability of Plants Constituting the Photosynthesizing Unit of Bioregenerative Life Support Systems for Including Them into the Plant Waste Mass Exchange

— 78 —

Компьютерная верстка И.В. Гревцовой

Подписано в печать 15.12.2007 г. Формат 60х84/8. Усл. печ. л. 19,7.
Уч.-изд. л. 19,0. Бумага тип. Печать офсетная. Тираж 1000 экз. Заказ 502.
Отпечатано в ИПК СФУ. 660041 Красноярск, пр. Свободный, 79.

Editorial board for Biology:

Sergey I. Bartsev
Alexander Y. Bolsunovsky
Tatiana G. Volova
Eugene S. Vysotski
Nikolai A. Gaevsky
Egor S. Zadereev
Valentina A. Kratasyuk
Elena N. Muratova
J. Woodland Hastings
Frank D. Salisbury
Malcolm K. Hughes
Ernst-Detlef Schulze
Akira Osawa
Takayoshi Koike
Marc D'Alarcao

*Свидетельство о регистрации СМИ
ПИ № ФС77-28-725 от 29.06.2007 г.*

**Tatiana G. Volova, Galina S. Kalacheva
and Alexander Steinbüchel**

Biosynthesis of Multi-component Polyhydroxyalkanoates by the
Bacterium *Wautersia Eutropha*

— 91 —

Tatiana A. Zotina

The Biomass of Macrophytes at Several Sites of the Upper
Reaches of the Yenisei River

— 102 —

УДК 574.5:591.524.12.08

Evaluation of Possible Causes of Non-Predatory Mortality of Crustacean Zooplankton in a Small Siberian Reservoir

Olga P. Dubovskaya*

*Institute of Biophysics of Siberian Branch of Russian Academy of Sciences,
Akademgorodok, Krasnoyarsk, 660036 Russia ¹*

Received 1.09.2007, received in revised form 1.12.2007, accepted 15.01.2008

Non-predatory specific mortality (NPSM) of dominant zooplankton species, Daphnia (longispina group) and Cyclops vicinus, was estimated during 1997-2000 sampling seasons on the basis of a new direct method: live/dead sorting and sediment trap measurements. Simultaneously measured ecological factors, such as water temperature, pH, dissolved oxygen, biomass of cyanobacteria, diatoms, greens and euglens, levels of polyunsaturated fatty acids of $\omega 3$ family, α -linolenic (ALA) and eicosapentaenoic (EPA), were considered as possible causes of the mortality using multivariant canonical correlation analysis. Toxicity was discarded on the basis of another set of study of the reservoir. As found, the best predictor of Daphnia mortality was EPA level, negatively correlated with NPSM value. Nevertheless, large part of variance of Daphnia mortality and practically all variance of Cyclops NPSM remain unexplained and need future investigation.

Keywords: non-predatory mortality, Daphnia, Cyclops vicinus, ecological factors, canonical correlation analysis.

Introduction

Dynamics of zooplankton populations are known to be of great importance for overall functioning of aquatic ecosystems. Abundance of zooplankton evidently depends on two factors: growth (somatic and generative) and mortality. Meanwhile, data on mortality are very sparse compare to that of growth due to methodical problems (e.g., Polishchuk and Ghilarov, 1981). Consumption by predators, fish (e.g., Luecke et al., 1990; Hulsmann et al., 1999) and invertebrates (e.g., Razlutskiy, 1996; Wojtal et al., 1999) are often the main cause of zooplankton mortality in many locations and seasons. Nevertheless, non-predatory mortality also can play a determinant

role (Luecke et al., 1990; Boersma et al., 1996; Mehner et al., 1998; Dubovskaya et al., 1999; Hulsmann and Weiler, 2000; Hulsmann and Voigt, 2002). In general, causes of non-predatory mortality of zooplankton are believed to be limiting physical and chemical factors, disease, senescence (Velimirov, 1991) and also food (edible phytoplankton) limitation (Luecke et al., 1990; Boersma et al., 1996). However, particular causes of variations of the non-predatory mortality in diverse sites and periods are still unknown. Non-predatory mortality estimations were indirect and included double error, connected with estimations of birth rate and consumption by fish. Finding of any quantitative correlation of such unreliable

* Corresponding author E-mail address: dubovskaya@ibp.krasn.ru

¹ © Siberian Federal University. All rights reserved