

Opinion

for the PhD thesis for acquiring Educational and Scientific Degree "Doctor"

on the topic: "Biological activity of products of *Coelastrrella* sp. BGV "

of the full doctoral student Tanya Stavreva Toshkova-Yotova

by Prof. Maya Petrova Stoyneva,

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This Opinion has been drafted in my capacity as a member of the Scientific Jury in connection with the defense procedure pursuant to Order 876 / 13.10.2020 of the Director of the Institute of Physiology of Plants and Genetics of the Bulgarian Academy of Sciences (IPPG-BAS) Assoc prof. Dr. Rumyana Vasilevska-Ivanova.

The dissertation presented for defense is dedicated to the study of the biological activity of substances produced from an original Bulgarian strain belonging to the green evolutionary line. In view of the constantly growing interest in microalgae due to their potential for practical application in almost all spheres of human activity, the relevance of the developed topic is more than obvious. In this sense, the Introduction and the Literary Review provide a serious justification for the choice of the dissertation topic.

The PhD thesis has a volume of 135 pages of text and contains 29 figures and 8 tables, as well as a bibliographic list of 315 titles, 7 of which are in Cyrillic.

The experimental work was carried out in the Laboratory of Experimental Algology of IPPG-BAS (where the dissertation works) and in the laboratories of the Institute of Experimental Morphology, Pathology and Anthropology with Museum-BAS (IEMPAM-BAS) and Institute of Organic Chemistry with a Centre for Phytochemistry – BAS (IOCCP-BAS). In this regard, it should be noted that most of the presented work goes beyond the purely algological and purely physiological research and includes both chemical and biomedical research. This is clearly seen from the precisely formulated five tasks with four subtasks, set in connection with the main goal of the thesis, as well as from the detailed description of the various methods used. The application of so many methods is extremely rare in dissertations of this type and deserves special attention. I consider it important that when choosing the site, studies were conducted with three more registered strains of the selected genus *Coelastrrella*.

The results obtained in terms of growth characteristics, as well as from qualitative analyzes and quantitative measurements of biologically active substances, along with those from the conducted experiments are presented in great detail and are grouped according to the

set tasks. Due to the limited scope of the opinion, I will not list all the original results obtained here, but I will emphasize that they are the basis for a serious future multifaceted use of the studied Bulgarian microalgal strain.

As many of the mentioned possibilities for this use are related to proven antitumor as well as high antioxidant activity at high levels of both total phenols and especially of flavonoids from the group of polyphenols, the obtained data are of particular importance for the prevention and treatment of socially significant diseases. Encouraging results have also been obtained for the therapeutic potential of extracts from the studied strain against fungal infections caused by *Candida albicans*, as well as against a wide range of different bacteria. All conclusions are a completely logical continuation of the presented clearly and precisely formulated results. This also applies to the defined scientific contributions of original scientific and applied nature.

There are some technical mistakes in the dissertation, but they in no way diminish the value of the presented work, which, in addition to being important and interesting in its design, is made precisely, which is an honor for both the dissertation and her research consultant Assoc. prof. Dr. Plamen Pilarski.

My personal impressions, created by our several meetings during the defenses and pre-defenses of colleagues, are too few to appreciate the personal qualities of the dissertation. But according to her scientific articles and dissertation, she is a serious and promising young colleague, working with a desire to implement and apply new methods and topics.. This is evidenced by the presented scientometric data with two articles in indexed journals (one with IF, Q2 and one with SJR, Q3) and her participation with three posters and one report in four scientific forums.

In conclusion, I would like to note that the presented dissertation together with the received credits, with the publications and the participations of the dissertation fully meets the criteria of the Academic Staff Development Act in the Republic of Bulgaria. Therefore, I believe that the dissertation presented to me for an opinion should be admitted to defense and I recommend to the members of the esteemed Scientific Jury to evaluate it with dignity by awarding Tanya Stavreva Toshkova-Yotova the educational and scientific degree of Doctor in Biological Sciences, Scientific specialty Plant Physiology.

16.11.2020

Prof. Maya Petrova Stoyneva