REVIEW

by Prof., Dr. Snejana Petrova Moncheva,
Institute of Oceanology-BAS, Varna - retired
of the materials submitted for participation in a competition for the academic position "professor" at the Plovdiv University "Paisiy Hilendarski"

Field of higher education: code 4. "Natural Sciences, Mathematics and Informatics",
Professional field 4.3. "Biological Sciences" (Phycology)

In the competition for "professor", announced in the State Gazette, No 98/19.11.2024 and on the website of Plovdiv University "Paisiy Hilendarski" for the needs of Department of "Botany and Biological Education" of the Faculty of Biology, as a candidate participated Assoc. Prof. Dr. Ivanka Ivanova Teneva-Dzambazova from the Department of "Botany and Biological Education"

1. GENERAL REPRESENTATION OF THE MATERIALS

By order No. PD-22-439 of 18.02.2025 of the Rector of Plovdiv University "Paisiy Hilendarski" (PU), I have been appointed as a member of the scientific jury of a competition for the academic position of "professor" at PU in the field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.3 Biological Sciences (Phycology), announced for the needs of the Department of Botany and Biological Education of the Faculty of Biology.

Documents for participation in the announced competition were submitted by a sole candidate, Assoc. Prof. Dr. Ivanka Ivanova Teneva-Dzhambazova from the Department of Botany and Biological Education (BBE) of the Faculty of Biology at the PU.

The set of materials presented by Assoc. Prof. Ivanka Teneva **in electronic format is in full compliance with the requirements** of the Regulations for the Development of the Academic Staff of the PU.

The candidate has submitted a list of a total of 73 scientific papers, 9 textbooks and teaching aids, 29 published abstracts from participation in scientific conferences and symposia, and a list of 15 research projects. For this competition, Assoc. Prof. Teneva has presented 18 scientific papers, 2 sections of a monographic collection, 4 textbooks and 4 manuals, and published abstracts/posters from scientific fora. The materials include information on participation in scientific research projects, in editorial boards of journals, successfully defended diploma and doctoral students, a list of reviews for specialized scientific journals, a detailed list of citations, information on participation in the administrative activities of the BF of PU. The information is duly supported by attached proof documents/certificates.

All materials for the competition are different from those for acquiring the ONS "doctor" and the academic positions "chief assistant" and "associate professor", are in accordance with the thematic of the announced competition, and are accepted for review.

I highly appreciate the excellent organization and presentation of the materials, at an academic level, as well as the precision of the information provided.

The candidate submitted a Declaration of Originality and Authenticity and the analysis of the materials **excludes grounds for plagiarism**.

2. BRIEF BIOGRAPHICAL DATA OF THE CANDIDATE

Assoc. Prof. Teneva graduated from the PU in 1995, Master degree - teacher of biology and chemistry. She began her professional career as a high school teacher, later an expert and senior expert in chemistry at the regional inspectorate of the MES in Haskovo, but in practice her research activity began in 2001 with a fellowship at the Center for Environmental Research, Leipzig-Germany. From 2004 to 2007 she was a PhD student at the BF of PU in the Department of BBE , with a topic of the dissertation "Taxonomy, phylogeny and toxic potential of some species of blue-green algae (Cyanoprokaryota)", while at the same time in the period 2005-2007 she was a specialist assistant under the Marie Curie program at Lund University, Sweden. Immediately after obtaining her PhD in 2007, she earned a postdoc position again at Lund University, and until 2009 she worked on the Reintegration Project/Marie Curie Program at the PU. From 2010 to 2013, she was a senior assistant professor in botany, and from 2013 to the present, she holds the academic position of associate professor in the Department BBE of the BF at PU.

Specializations in prestigious research institutions from the very beginning of her research activity have been essential for acquiring knowledge and experience with innovative research techniques in promising scientific areas, which Assoc. Prof. Teneva continues to successfully develop, deepen and enrich to this day and to apply in her teaching activities. She is fluent in German and English, has excellent computer skills (Windows, MS Word, MS Excel, MS PowerPoint), including specialized programs (SigmaPlot, StatView, Canvas, UNICORN, GeneAnalysis, Sequence Analysis, PHYLIP, DNAStar), as well as qualifications for working with modern scientific research equipment. The scientific and teaching career for 20 years has been closely related to phycology and botany as main professional fields with a focus on taxonomy (polyphasic taxonomy and development of new taxonomic criteria), comparative genomic analysis of cyanobacterial strains, biodiversity and population structure of natural water bodies, toxic potential, allelopathic effects, metabolic and biological activity of cyanobacteria and higher plants and studies related to the application of scientific results in practice, in accordance with one of the important priorities of modern science on a national and global scale.

Assoc. Prof. Teneva actively participated in the organizational and administrative activities of the University, as a member of various committees - organization of candidate student campaigns, conducting state exams and defenses of diploma theses, PhD campaigns, attestation of teachers, control council, admissibility in conducted competitions for holding academic positions, participation in scientific juries related to competitions for awarding academic positions, institutional accreditation committees (in professional field 4.3 Biological Sciences and 5.11 Biotechnology, preparation of documentation for program accreditation of the PhD Program "Botany", preparation of a self-assessment report for accreditation of the PhD Program "Botany").

Thanks to her research activities and competencies, Teneva has built the reputation of an internationally recognized scientist (she is a member of the editorial board of the Journal of BioScience and Biotechnology, a member of the board of reviewers and a guest editor of a special

issue of journal Microorganisms "Genomics and Metabolomics of Cyanobacteria", she is a reviewer of more than 20 prestigious international scientific publications), with a significant contribution to the reputation of PU at regional and international level (member of the organizing committee of the 4th Balkan Scientific Conference on Biology, participation in International Fora and Projects, etc.)

3. EVALUATION OF TEACHING AND PEDAGOGICAL ACTIVITY AND QUALIFICATION OF THE CANDIDATE

Teaching is an important component of Assoc. Prof. Teneva's activities and includes a wide range of tasks - author of curricula and delivery of lecture courses and seminars, author/co-author of textbooks and teaching aids, training in laboratory practices and field research, supervision of graduate and doctoral students.

After taking the administrative position " Assoc. Prof.", Teneva is the author of a textbook on Phycology (second revised and supplemented edition), co-author of 3 textbooks (Pharmaceutical Botany Part I and II and revised edition of Part I) and 4 teaching aids (Mycology Study Guide for students from 4 different specialties).

The activities of Assoc. Prof. Teneva also include the development of an impressive number - 17 curricula - 6 in the Bachelor's and 9 for the Master's degree for students from 9 specialties of the Faculty of Biotechnology of the PU (Microbiology and Virology, Bioengineering, Pharmaceutical Biotechnologies, Biodiversity, Ecology and Conservation, Medicinal and Essential Plants, Microbiological Food Control and Safety, Reproductive Biology, Medical Biology and Biodiagnostics) and additionally 2 bachelor's programs for the "Lyuben Karavelov" branch, Kardzhali and 1 program for the branch, Smolyan.

Typical for the entire practice of a teacher with more than 16 years of experience, Assoc. Prof. Teneva has been actively lecturing students in full-time and part-time forms of study over the past 5 years in 8 disciplines in the Bachelor's and 7 disciplines in the Master's degree programs, including conducting exercises in some of them, a significant part of which are related to the topic of the current competition, with the average chorarium for the last 5 years 500 hours of lectures and 344 hours of practical work.

Assoc. Prof. Teneva invested in supervision/cosupervision of diploma and PhD students, in the field of phycology – successfully defended 3 diploma and 2 PhD students in the last 5 years.

I consider the educational and pedagogical activities of Assoc. Prof. Teneva as significant and large-scale, corresponding to the profile of a modern university professor.

4. EVALUATION OF THE CANDIDATE SCIENTIFIC AND SCIENTIFIC-APPLIED ACTIVITIES

All 18 articles submitted for the competition are refereed and indexed in the world-renowned scientific information databases WoS and Scopus. Out of them 3 are full-text reports from international conferences, and the remaining 15 (83%) are published in prestigious specialized international journals such as *Chemosphere*, (IF-5.778), *International Journal of Molecular Sciences* (IF-5.6), *Algal Research*, (IF-5.276), *Plants* (IF-4.5), etc., respectively ~ 40%

of the articles (7) are in journals with rank Q1, 5 (~ 30%) in journals with rank Q2, 2- with rank Q3, and 1- with rank Q4. All articles are in English. The presented 2 book chapters (1 in Bulgarian, 1 in English) are published in thematic Anniversary Collection of the PU. The total IF factor of the articles presented for the competition is 40.602. The active participation of the candidate in scientific fora also deserves attention - 11 international Conferences in our country and abroad and 7 National Fora.

The scientometric analysis substantiates my positive assessment of the candidate's publication activity.

CONTRIBUTIONS FROM THE CANDIDATE'S SCIENTIFIC RESEARCH

Despite being one of the most ancient and studied groups of organisms, cyanobacteria remain a challenge for modern science worldwide in many areas – from biodiversity, taxonomy and phylogeny, bloom phenomena, toxin production and hazard to ecosystem and human health, to the production of biologically active substances with the potential for application in biotechnology, food industry and medicine. Cyanobacteria have been the subject of Assoc. Prof. Teneva's research activities since the beginning of her career and continue to be the focus of her scientific interests to this day, with significant results achieved in a number of poorly studied areas related to this enigmatic group of organisms.

The contributions of Dr. Teneva's scientific research can be summarized in the following main areas:

4.1.Resolving the taxonomic status of controversial species by applying polyphasic taxonomy and developing new taxonomic criteria [B4-1, B4-4, B4-6, D7-12, D7-11, D7-9, D7-3, D7-8]

A strategic direction in Assoc. Prof. Teneva's research is applying/supplementing existing and testing/developing new taxonomic criteria and assessing their potential for refining the taxonomic identification of cyanobacterial strains, respectively enriching the polyphasic approach on which the modern taxonomy of the Cyanobacteria is based. Diverse and large-scale experimental studies of potential biochemical taxonomic markers have been conducted (specific metabolites in experiments with *Phormidium autumnale* and *Microcoleus vaginatus strains*, complemented by analysis of morphological features, TEM analysis of thylakoid structure and molecular genetic analyses based on 16S rDNA); pigment complexes specific to different cyanobacterial lineages were analyzed, in addition to the presence of chlorophyll-b (genera Prochloron, Prochlorothrix and Prochlorococcus) or chlorophyll-d (genus Acaryochloris), the potential of carotenoids (high concentrations in Limnoraphis) and the quantitative ratios of phycobiliproteins were also demonstrated as an additional biochemical criterion; New molecular genetic markers were also tested (the amino acid sequences of the photosystem II proteins CP43 and CP47, the lipoprotein Psb27, as part of photosystem II (PSII), localized in the thylakoid membrane of cyanobacteria; the amino acid sequence of the outer membrane efflux protein (OMEP) of 86 cyanobacterial species/strains with fully sequenced genomes).

The most important original contributions in this area are:

- For the first time, based on metabolomic analysis, 39 compounds have been proposed as biochemical markers for distinguishing between the species Phormidium autumnale and Microcoleus vaginatus [B4-1]
- Through a complex of criteria (morphological, ultrastructural and molecular-genetic analysis) the taxonomic position of Phormidium autumnale and its erroneous association with the genus Microcoleus have been revised, and the original affiliation to the genus Phormidium has been substantiated [B4-1]
- The applicability of the outer membrane efflux protein (OMEP) Psb27 and the photosystem II proteins CP43 and CP47 has been proven as new, first-tested, molecular genetic markers for elucidating phylogenetic relationships in cyanobacteria at the genus and species levels. When comparing OMER- and 16S rDNA-based phylogenetic trees, it was found that OMER is a more suitable marker. [G7-12, G7-11, G7-9].
- The composition and quantity of the pigments phycocyanin, phycoerythrin, allophycocyanin and phycoerythrobilin have been proposed as additional biochemical markers, with potential for distinguishing cyanobacterial strains at the genus and subgeneric level [B4-6]
- The importance and effectiveness of the polyphasic approach in resolving taxonomic cases in natural conditions has been confirmed (on the example of studying the species composition of autotrophic picoplankton in the Northern Salt Pan of Atanasovsko Lake [G7-8] and phytoplankton in Lake Vaya) [B4-4 and G7-3]

4.2. Phytoplankton structure and assessment of the ecological status of freshwaters by applying newly developed indices; toxicological assessment and toxic potential of representatives of Cyanobacteria. [B4-4, B4-2, D7-3, D7-8, D8-1, D8-2]

The biodiversity and structure of phytoplankton is one of the mandatory Biological Quality Elements of the European Water Framework Directive (WFD) and is a priority on the agenda of European environmental policies. Phytoplankton blooms, and especially those of cyanobacteria, due to the production of toxins, are becoming a particularly risky factor in modern conditions of of strong anthropogenic impact, combined with the increasing intensity of climate change. In this sense, the results of the autecological studies conducted by Teneva in a number of specific water bodies (the largest natural lake in Bulgaria - Vaya, declared a "Wetland of International Importance"; the "Studen Kladenets" dam included in the list of of the most representative biodiversity sites for Bulgaria, Atanasovsko Lake - a coastal lagoon used for salt extraction) are particularly relevant, with a markedly complex nature and, in addition to fundamental, have scientific and practical significance in the context of environmental policies in Bulgaria.

The most important original contributions in this area are:

- New data on the qualitative and quantitative composition of phytoplankton in Lake Vaya have been obtained and a trend of increasing abundance and changes in the structure of communities has been established compared to previous data from the last 30 years. An ecological assessment of the ecological state of the lake (western and eastern parts) has been made by applying the HPLI index (Hungarian Lake Phytoplankton Index), agreed as an intercalibration metric by the Geographic Calibration Group "East Continental Lakes" [B4-4]

- New data on the species composition, abundance and taxonomic structure of phytoplankton have been obtained in one of the insufficiently studied water bodies under the WFD - the Studen Kladenets dam. 30 species belonging to six divisions have been identified, with representatives of the divisions Chlorophyta and Bacillariophyta dominating the species richness, and a spatial heterogeneity in the ecological quality of water, related to heavy metal pollution and anthropogenic eutrophication. The need for continuous monitoring of the ecological state (quality) is justified. [D8.1]
- The *Picochlorum oklahomense/Synechococcus sp.* community was reported for the first time in the composition of autotrophic picoplankton (APP) of a European coastal lagoon and the statistically significant optimal abiotic factors identified [G7-8]
- New knowledge was obtained about the toxic potential of the identified dominant cyanobacterial species in Lake Vaya and the concentrations of the cyanotoxins MCs, CYL and STX were estimated in both parts of the lake. For the first time, the presence of cylindrospermopsin in a Bulgarian water body is reported. [B4-4]
- *Anabaenopsis elenkinii* was first reported as a producer of cyanotoxins (ELISA) – microcystins (0.42 ng/mL), cylindrospermopsin (0.10 ng/mL) and saxitoxins (0.05 ng/mL), with a demonstrated concentration- and time-dependent effect on HT-29 tumor cells. A hypothesis was formulated for a potential risk of "cyanobacterial bloom" of this species [G7-3]
- New data were obtained on cyanotoxins in three dams in the Pleven region – microcystins/nodularins in water samples from the Enitsa and Krushovitsa dams and saxitoxins from the Valchovets dam and for associated bloom concentrations (1.03 mg/L to 10.5 mg/L) of dominant species *Planktothrix agardhii, Anabaena spiroides* and *Aphanizomenon flos-aquae,* typical producers of hepato- and neurotoxins. [D8.2]
- New knowledge has been obtained about the allelopathic potential of the cyanotoxins microcystin-LR (MC-LR) and cylindrospermopsin (CYL) and the mechanisms of action on green microalgae: morphological changes (cell shape, cytoplasm granulation and loss of flagella), inhibitory effect on cell motility and chlorophyll fluorescence parameters, non-photochemical fluorescence quenching and the quantum yield of unregulated energy dissipation in PSII. A hypothesis has been formulated about the ecological projections of these impacts in natural conditions [B4-2]

4.3. Biological activity of representatives of Cyanobacteria [B4-3, B4-5, B4-6, D7-6]

- The study of cyanobacteria as a source of promising compounds for practical application in various industries is an innovative field that is still insufficiently explored, given the fact that currently only 10-20% of known secondary metabolites have been characterized. The application of reliable and innovative research approaches, such as the combination of biological analysis (*in vitro and ex vivo tests*, FACS, ELISA) and modern physicochemical approaches (HPLC-MS) in the research of Assoc. Prof. Teneva in this area allows to identify the structure of bioactive cyanometabolites, to decipher the spectrum of their biological activity and to analyze mechanisms of action, with the following **more important contributions**:

- A new approach for the evaluation of immunomodulatory properties of cyanobacterial extracts was developed and applied for rapid screening of *Phormidium papyraceum* extract on the immunophenotype of human leukocytes. In the chemical profile of the non-polar fraction of the extract analyzed by LCESI-MS/MS, at least 112 components of different chemical nature, with multi-spectrum action, were identified. Antibacterial activity against Gram-negative and Gram-positive strains has been confirmed [B4-3]
- New information has been obtained on the chemical composition and biological activity of polysaccharides and secondary metabolites isolated from poorly studied cyanobacterial species – *Anabaena laxa* and *Phormidesmis molle*, in search of immunomodulatory and antioxidant compounds. The extract from *A. laxa* (AL-E) has the highest phenolic content and exhibits the strongest antioxidant activity. [G7-6]
- New knowledge was obtained about the biological activity (antioxidant and toxic potential) of extracts from *Fischerella major*, and 45 components were identified (GC/MS analysis) with different chemical structure and biological activity, including cyanotoxins (microcystins and saxitoxins), which expands the knowledge of this species for its potential of producing biologically active substances with pharmaceutical application and environmental risk [B4-5]
- For the first time, the production of phycobiliproteins from cyanobacterial strains of *Microcoleus autumnalis* and *Leptolyngbya boryana* has been evaluated (large-scale study of 18 strains) with real potential for mass cultivation and biotechnological production from several strains (PACC 5505, PACC 5522, PACC 5527 and CCALA 084). [B4-6]

4.4.Comparative genomic analysis of cyanobacterial strains

Whole-genome sequencing is a revolutionary approach that adds a new dimension to the functional study and elucidation of phylogenetic relationships of cyanobacteria and is the basis for a new type of genomic phylogeny. Due to the extremely high diversity of cyanobacteria, these aspects are still insufficiently studied.

A **pioneering contribution** in this aspect is the study of the degree of similarity through comparative genomic analysis of the cyanobacterial strains *Phormidesmis priestleyi ULC007* and representatives of the genus Phormidium, as well as of phylogenetically closely related filamentous cyanobacteria of the genus Nostoc (7 strains) and the genus Tolypothrix (1 strain) from different geographical areas. In terms of functional specialization, it was found that the majority of genes in the studied cyanobacterial genomes were identified as genes with unknown functions. The main functions of those with known characteristics were defined. *In silico* identification, annotation and analysis of secondary metabolite biosynthesis gene clusters of the most promising target genomes showed the presence of specific secondary metabolic genes that require further detailed analyses [G7-7, G7-10].

4.5.Study of phytochemical, biological and toxicological characteristics of higher plants [G7-1, G7-4, G7-5]

In a sense, the research in this section differs from those in the previous, but I believe that they are in the context of the candidate's thematic priorities and are an indication of Assoc. Prof. Teneva's interest in developing and expanding the scope of her research. The analyses of plant

bioactive compounds and the search for new sources are fundamental for the next generation of innovative approaches to drug development. In this regard, it has been proven that endemic/rare plants generate unique secondary metabolites and can be a source of as yet unidentified chemical constituents with pharmacological potential. Detailed studies of some higher plants from the Bulgarian flora, such as the endemic *Betonica bulgarica* (with a conservation status of "rare species" in the Red Book) and *Marrubium friwaldskyanum* (with a conservation status of "vulnerable") have a pioneering importance in this aspect, with **significant contributions**:

- New knowledge has been gained about the properties of extracts from *Marrubium friwaldskyanum* as a source of valuable compounds with pharmacological potential. Tested (*in vivo* on four human cell lines and *ex vivo* with normal leukocytes) extracts from different parts (stems, leaves and flowers) exhibit diverse properties and complex biological effects - in vitro cytotoxicity and antitumor properties, antibacterial activity and immunomodulatory potential [G7-1]
- New information has been obtained on *Betonica bulgarica* as a source of bioactive compounds with biomedical applications. The methanol extract obtained from the inflorescences was analyzed for cytotoxicity against mammalian cell lines. Its antitumor potential, immunomodulatory properties and the ability to induce apoptosis were established by flow cytometry on human cervical and lung adenocarcinoma cells [G7-5]
- New knowledge has been obtained about the chemical structures and mechanisms of biological activity of xylo-oligosaccharides (XOS) from maize and their toxicity and inhibitory potential against tumor cells have been clarified. It has been established that XOS exhibit antitumor activity (a new dual mode of antitumor action has been established) with a pronounced inhibitory effect on lysosomes, affecting also mitochondrial functionality, as well as a significant antioxidant activity. These important biological properties of XOS can be exploited for the development of improved anticancer therapeutics and functional foods. [G7-4]
- Of particular scientific and applied significance is the study of the ***possibility of creating a vaccine against pollen allergens from grass group 1.***

It is known that allergic diseases are a global public health problem, affecting up to 30% of the population in industrialized societies, with more than 40% of allergic patients suffering from an allergy to grass pollen.

An innovative *in silico* peptide consisting of 20 amino acids was designed as a vaccine against grass pollen allergy. The epitope-based vaccine was validated by molecular docking and *ex vivo* T-cell stimulation assay. Universal T-cell epitopes (covering ~80% of the world population) were selected. The immunogenic peptide can be used to treat patients with grass pollen allergy by triggering the T-cell response and production of competitive IgG antibodies contributing to the identification of universal epitopes as a basis for developing an effective vaccine against a specific group of allergens. [G7-2]

CONTRIBUTIONS TO SCIENTIFIC - APPLIED ACTIVITIES

The new knowledge and results of scientific research, in addition to methodological contribution, substantiate promising projections for application in ecology, medicine, pharmacology and biotechnology, that can be summarized as follows**:**

- The applied integrated polyphasic approach is **a key methodological tool** for taxonomic revision of controversial species and identification of new species (*Anabaenopsis elenkinii*) and picoplankton from isolates of natural samples; Qualitative and quantitative pigment composition are proposed as additional biochemical markers for differentiation of cyanobacterial strains at the genus and subgenus level and for solving taxonomic cases; OMER has been validated as a working molecular genetic marker for phylogenetic analyses and polyphasic taxonomy in cyanobacteria [G7-3, G7-8, B4-6, G7-12].
- The established specific antitumor effect of *Betonica bulgarica* extracts against cervical carcinoma cells makes them a potential source of pharmaceutical development of medicinal products for the prevention and treatment of certain types of tumors; Study of commercially available xylo-oligosaccharides (XOS) sheds light on their potential for tumor inhibition and potential for use in the pharmaceutical and food industries; *Anabaena laxa* and *Phormidesmis molle* are considered valuable resources for the isolation of immunomodulators and antioxidants with possible application in dietetics and medicine; After further clinical trials, the immunogenic peptide designed as a vaccine against grass pollen allergy may be used to treat patients [G7-2]. [G7-6] [G7-4]. [G7-5]
- The potential of 18 cyanobacterial strains for phycobiliprotein production was assessed. The three analyzed strains of Microcoleus autumnalis and one strain of Leptolyngbya boryana, suitable for mass cultivation, produced phycobiliproteins in concentrations promising for biotechnological production and [B4-6].

I assess the contributions of Assoc. Prof. Teneva as significant with an original scientific character and important applied significance. New knowledge and new data have been obtained in various areas of modern phycology and botany. Results of a theoretical and methodological nature, practical applicability and perspective for future research have been achieved.

Evidence of the quality of the candidate's research activity is also the interest of the international scientific community in the published results. Assoc. Prof. Teneva attached information on a total of 455 citations in WoS and Scopus, which also contain citations of articles outside of those submitted for the competition. Two of the articles, with a total of 30 citations, are reported in the attached compliance information for "associate professor", that is why I accept 425 citation for information. Out of the articles for this competition, 12 have been cited, with a total number of citations 96, the citations of publications from indicator B4 contributing to more than 2/3 of the total number, some of which e.g. B4-6 was cited 37 times, G7-4 -19 times, etc. With the exception of 7 (2) citations, all are by foreign authors without Bulgarian participation, in journals, a significant part of which are prestigious specialized ones, with high IF and quartiles Q1-Q2 such as *Chemosphere, International Journal of Molecular Sciences, Algal Research, Plants, Environmental Research, Applied Microbiology, Algologie*, etc. The candidate's H-index is 12. All these define Assoc. Prof. Teneva as a reputable researcher, distinguished among the international research community. No self-citations were found.

5. PARTICIPATION IN RESEARCH PROJECTS

Information is presented on participation in 9 Projects, of which 6 are national and 3 - international, with various sources of funding. Off the national projects, 1 is funded under the OP "Environment 2007-2013"; 1 under the OP "Science and Education for Smart Growth"; 2 from the NSF of the Ministry of Education and Science and 2 from the Scientific Research Fund of PU , and from the international ones - 2 under the program of the National NSF-MES, bilateral cooperation of Bulgaria, respectively with Austria and Russia and 1 from the NSF-MES, under the BS-ERA-NET program. Assoc. Prof. Teneva is the coordinator of 3 national and the Bulgarian team in the international project MARCY with the topic "Molecular approaches for rapid and quantitative detection of cyanobacteria and their toxins from the Black Sea coast". The projects are entirely within the scope of the announced competition and have been used effectively in the research and publication process, as reflected in the acknowledgements in most (16) publications.

6. COMPLIANCE WITH THE REQUIREMENTS OF ADASRB

As can be seen from the summary Table, Dr. Ivanka Teneva not only meets, but also significantly exceeds the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADASRB), for all criteria, as instead of the required 600 points, she presents evidence for 1191.8 points. The same applies to the additional criteria of the FB of PU. Due to an obvious technical error in the sum and inaccuracy in the Compliance Report under ADASRB regarding criteria D11 (3 articles are not included - G7-8,11,12, and there is no information about 2 articles (4 and 20) in the Appendix with the evidence), I accept as total number of citations in the competition 199, respectively 398 points (and not 402), which in no way affects the 4-fold exceedance of the required 100 points under this criteria ***(Table 1)***

7 ASSESSMENT OF THE CANDIDATE'S PERSONAL CONTRIBUTION

I positively evaluate the scientific research activities of Assoc. Prof. Teneva in terms of thematic, methodological approaches and achievements. I also underline the use of an arsenal of modern methods for processing, analyzing and visualizing data, respectively the high academic level of the publication output. The research is certainly large-scale and complex, which implies research teams with different professional competence, typical of modern science. I appreciate the positive and effective collaborations with other universities and institutes of the Bulgarian Academy of Sciences (IBEI, Institute of Microbiology, Institute of Organic Chemistry, Medical University -Plovdiv) as well as business companies (InnoBioTech Ltd., Si Eco Consult Ltd). Nevertheless, the personal participation of the candidate is clearly distinguishable, with an important individual contribution at conceptual level and in the scientific research and publication process itself, as evident from the section "authors' contribution" in the articles (B4-2, B4-3, G7-2, G7-4, G7-5, G7-6), as well as the fact that Teneva has a leading role in more than 60% of the publications (first author in 6 of the articles, corresponding author in 6 articles, second author -1 article).

Table 1 Compliance with the requirements of ADASRB

Group of criteria	Teneva	Min PU	Teneva points	Min ADSRB
A - PhD thesys			**50**	**50**
B4 - publications WoS и Scopus	Q1-2x25=50; Q2-4x20=80		**130**	**100**
Group criteria G			**234**	**200**
G7 -publications WoS и Scopus	Q1-4x25=100; Q2-1x20=20; Q3-2x15=30; Q4-2x12=24; Scopus;SJR 3x10=30			
G8 - book chapter	2x15=30			
Group criteria D D11-citations Scopus	199x2=398		**398**	**100**
Group criteria E			**380.9**	**150**
E13.Superviser of defended PhD thesys	2	2	50	
E14.Participation in national research or education Project	3	2	30	
E15.Participation in international research or education Project	2		40	
E16.Coordination of national research or education Project	3		60	
E17.Coordination of international research or education Project	1		50	
E18.Funds raised for projects coordinated by the candidate	332 880		67	
E19.A published university textbook or textbook used in the school network	4	1	57,1	
E20.A published university guide or guide used in the school network	4		26,8	
TOTAL			**1192,9**	**600**
Teaching experience	16, 08 years	10		
Organizational and administrative experience (for the last 10 years)		at least **in one** of the listed activities		
Participation in the preparation and accreditation procedure	5			
Participation in activities for preparing and updating training documentation				
Developed curricula for Bachelor's and Master's degree programs	17			
Participation in administrative activities, such as attestation committee, ethics committee, etc.	7			
Participation in the preparation of a student candidate campaign	1			
Participation in editorial boards of journals	3			
Participation in organizing international fora	1			
Other activities	5			

8 CRITICAL NOTES AND RECOMMENDATIONS

I have no critical comments on the substance of the attached documents and the overall activity of the candidate. I have some questions - recommendations.

I congratulate the team and Assoc. Prof. Teneva for the initiative to contribute to the Harmful Algal Blooms Information System (HAIS; http://hais.ioc-unesco.org) and the specialized

database (HAEDAT, http://haedat.iode.org) as an authoritative and coordinated global online source of information on harmful algae. But for Bulgaria, so far, only information related to the bloom of the cyanobacteria *Microcystis spp*. in coastal lakes since 2006 has been reflected (Teneva et al., 2010). Is there an idea for including other information and using the data from this database for future studies?

One of the significant results of the research is the revision of the taxonomic position of *Phormidium autumnale* and the proposal to restore its original affiliation to the genus Phormidium. Was this information specifically made available to the WoRMs editorial team, because at my last check (https://www.marinespecies.org, visited on 07.04.2025) there was no change.

Given the contemporary nature and the high quality of the research, I would encourage the scientific team and Assoc. Prof. Teneva to participate more actively in international projects.

9 PERSONAL IMPRESSIONS

I know Ivanka Teneva personally, but I have not participated in a joint research team. I am familiar with her professional qualities on the occasion of the international project related to the Black Sea phytoplankton, and with her overall research activity until 2013 as a reviewer in the jury for awarding the academic position of associate professor. I am extremely happy that the documents submitted for this competition convincingly confirm my impressions of Assoc. Prof. Teneva as an creative, proactive, responsible lecturer and scientist with profound professional competencies and an established reputation of an equitable partner among Bulgarian and foreign scholars. Admirations for her ability to work in a team, to maintain both long-lasting collaborations and to expand the scope of her research and the horizon of her scientific interests and partnerships.

CONCLUSION

The documents and materials presented by Assoc. Prof. Ivanka Teneva meet all the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADSRB), the Regulations for the Implementation of the ADSRB and the relevant Regulations of the Plovdiv University.

The candidate in the competition has presented a significant number of scientific works, published after the materials used in the defense of the ONS "Doctor" and the academic position of associate professor. The results and contributions are original scientific and scientifically applied, in various modern aspects of phycology and botany, outline prospects for future research and application in practice. Her overall activity convincingly presents her as an established researcher, with recognized reputation on a national and international scale. Assoc. Prof. Teneva has an active teaching and pedagogical activity, including the development of new teaching programs for bachelor's, master's and doctoral degrees. **The scientific and teaching qualifications of Assoc. Prof. Teneva are unquestionable.**

The results achieved by the candidate in academic and research activities fully comply with the minimum national and additional requirements of Plovdiv University complying to the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADSRB).

After reviewing the materials and scientific papers presented in the competition, analyzing their significance and the scientific, science-applied and applied contributions, I consider reasonable to give **my positive assessment** and recommend to the Scientific Jury to prepare a report-proposal to the Faculty Council of the Faculty of Biology **for the election of Assoc. Prof. Dr. Ivanka Ivanova Teneva-Dzhambazova. for the academic position "Professor"** at the PU "Paisiy Hilendarski" in the field of higher education 4. Natural Sciences, Mathematics and Informatics professional field 4.3 Biological Sciences (Phycology).

10.04.2025
Varna

Reviewer:
/prof. Snejana Moncheva/