



## TRAKIA UNIVERSITY, FACULTY OF AGRICULTURE

### REVIEW

By: *Prof. Dimcho Zahariev Ivanov, PhD*  
*Scientific specialty "Botany"*  
*Bishop Konstantin Preslavsky University of Shumen*

About: competition for a **professor** in the scientific specialty "Ecology and Ecosystem Protection" / professional field 4.3. Biological Sciences, field of higher education 4. Natural Sciences, Mathematics and Informatics /at the Faculty of Agriculture of the Thracian University

#### 1. Information about the competition

The competition was announced for the needs of the Department of Biology and Aquaculture / Faculty of Agriculture of the Thracian University in the State Gazette No. 30/13.04.2021.

I participate in the scientific jury of the competition according to Order No. 1499/18.06.2021 of the Rector of the Thracian University.

#### 2. Information about the candidates in the competition

Documents for participation in the announced competition have been submitted by one candidate: Assoc. Prof. Katya Naneva Velichkova, PhD. The set of documents has been prepared in accordance with the requirements of the Law for the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for the Development of the Academic Staff at the Thracian University.

Assoc. Prof. Katya Naneva Velichkova received a master's degree in Biology and Chemistry at Plovdiv University "Paisii Hilendarski" in 1999. After graduating for two years she working as a biology teacher at the Primary School "St. St. Cyril and Methodius" in the village of Vetren. Two years later she was elected a part-time assistant in Biochemistry at the Veterinary Faculty of the Thracian University. In the period 2004-2007 she was a full-time doctoral student at the Department of Biology and Aquaculture at the Faculty of Agriculture of the Thracian University. In 2008 she received an educational and scientific degree "Doctor" in the scientific specialty "Botany" and briefly worked as a part-time assistant in Plant Systematics at the Faculty of Biology of Plovdiv University "Paisii Hilendarski". Since the autumn of 2008 she has been elected an assistant in the Department of Biology and Aquaculture at the



Faculty of Agriculture of the Thracian University. Since 2010 she has been a senior assistant, and since 2015 she has been an associate professor at the same university. In 2020 she was elected Deputy Dean for Academic Affairs at the Faculty of Agriculture.

In the period 2011-2019 she improved her professional qualification by participating in 8 specializations in several countries: Greece, Turkey, Italy, Spain, Portugal.

### **3. Fulfillment of the requirements for holding the academic position**

The minimum national requirements for holding the academic position of "professor", according to Article 2b of the Law for the Development of the Academic Staff in the Republic of Bulgaria and the additional requirements according to Annex 8.1 of the Regulations for the Development of the Academic Staff at the Thracian University, are fulfilled.

**By group of indicators "A"** Assoc. Prof. Katya Velichkova has successfully defended a dissertation for the award of educational and scientific degree "Doctor", which is certified by a copy of the diploma issued by the Higher Attestation Commission in 2008. This ensures the required 50 points in this group.

**By group of indicators "B"** is presented a habilitation thesis (monograph). All the necessary requirements have been met and the required number of 100 points has been obtained.

**By group of indicators "Г"** are presented 23 publications, referenced and indexed in world-famous databases with scientific information (Web of Science and Scopus), outside the habilitation work. The systematic and approximately uniform publication of the results of the research work makes a very good impression. In the period 2015-2021 the publications in this prestigious group are distributed as follows: 2015 (3 in number), 2016 (4 in number), 2017 (2 in number), 2018 (4 in number), 2019 (6 in number), 2020 (3 in number) and in the current 2021 (1 in number). The distribution of the journals selected for publication is as follows:

#### **In Bulgaria:**

Bulgarian Journal of Agricultural Science – 10 articles

Trakia Journal of Sciences – 2 articles

Agricultural Science and Technology – 1 articles

Journal of BioScience and Biotechnology – 1 articles

#### **In other countries:**

Anales de Biologia (Spain) – 2 articles

Annales Botanici Fennici (Finland) – 1 article

Journal of Central European Agriculture (Croatia) – 1 article

Romanian Biotechnological Letters (Romania) – 1 article



Scientific Papers. Series E. Land Reclamation, Earth Observation & Surveying, Environmental Engineering (Romania) – 1 article

Scientific Papers. Series B. Horticulture (Romania) – 1 article

Sains Malaysiana (Malaysia) – 1 article

Turkish Journal of Fisheries and Aquatic Sciences (Turkey) – 1 article

Various scientific journals have been selected for publication, both in Bulgaria and in other countries. The following scientific journals have the highest impact factor: *Annales Botanici Fennici* ( $IF_{2017}=0.872$ , Q2), *Sains Malaysiana* ( $IF_{2016}=0.480$ , Q2), *Turkish Journal of Fisheries and Aquatic Sciences* ( $IF_{2019}=0.738$ , Q3), *Romanian Biotechnological Letters* ( $IF_{2019}=0.590$ , Q3).

Assoc. Prof. Katya Velichkova is the first author in 4 publications, the second author - in 9 publications, but in 6 of them she is the author for correspondence, the third author - in 6 publications, the fourth or next author in 4 publications. This distribution is very balanced and shows the ability to work in a team. The large number of publications in which she is the first author or correspondent (a total of 10 publications) is proof of her ability to lead both the conduct of research and the process of publishing the results.

With the required 200 points, Assoc. Prof. Katya Velichkova has 232 points in this group.

**By group of indicators "Д"** a list and evidence for a total of 73 citations in articles in journals, which are referenced and indexed in world-famous databases of scientific information (Web of Science and Scopus). A total of 19 publications were cited, and the first two of them, which have 19 and 11 citations each, deserve special attention. The remaining citations are distributed as follows: 1 publication with 8 citations, 1 publication with 4 citations, 7 publications with 3 citations, 2 publications with 2 citations, 6 publications with 1 citation. All this gives grounds for receiving 146 points, which exceeds the requirement for 100 points in this group.

**According to the group of indicators "E"**, Assoc. Prof. Katya Velichkova is the scientific supervisor of a successfully defended doctoral student. The management is jointly with Assoc. Prof. Ivaylo Nikolaev Sirakov, who is a specialist in various scientific fields (field of higher education 6. Agricultural sciences and veterinary medicine, professional field 6.3. Animal husbandry and scientific specialty Fish farming, fisheries and industrial catching). This gives grounds for awarding 50 points for her scientific guidance.

The documents for the competition indicate participation in a total of 11 national scientific and educational projects. For participation in projects are received 110 points.

For a published university textbook in Hydrobotany, of which Assoc. Prof. Katya Velichkova is the sole author, 40 points are awarded.



The total number of points in this group is 200, which makes it completely sufficient and even exceeds the required number of 150 points.

#### **4. Evaluation of teaching activity**

Assoc. Prof. Katya Velichkova has a long enough teaching experience (a total of 15 years in an academic environment), which is evidenced by the autobiographical data presented in point 2 of this review. 7 years have passed from the acquisition of the educational and scientific degree "Doctor" in the scientific specialty "Botany" in 2008 and the selection for an assistant in the Department of Biology and Aquaculture in the same year to the academic degree "Associate Professor" in 2015. The period from then until the current competition is 6 years. These two periods are sufficient for the acquisition of the necessary knowledge and for the development of skills to ensure the degree of readiness of the candidate for the academic position of "professor".

The disciplines in which Assoc. Prof. Katya Velichkova teaches are the following: Hydrobotany, Botany, Summer Educational Practice in Botany, Medical Botany, Essential Oil Crops, Plant Physiology, Hydrobiology in the Bachelor's degree and Protected Areas in the Master's degree. Electronic courses in these disciplines have also been developed. She also teaches a course in Biology and a course in Medical Botany to foreign language students. The disciplines are interrelated and correspond to her professional qualifications and areas of scientific interest. Proof of this are: the subject of scientific publications, the textbook on Hydrobotany published in 2021 and the the management of a successfully defended doctoral student and the participation as a scientific consultant of a second doctoral student, expelled with the right to defense.

The number of hours in lectures is completely sufficient and meets the requirements of Art. 85, paragraph 2 of the Regulations for the Development of the Academic Staff at the Thracian University.

Assoc. Prof. Katya Velichkova is a research supervisor of a large number of successfully defended graduates, which confirms the successful combination of her professional qualities as a lecturer and researcher.

#### **5. General characteristics of the presented scientific papers/publications**

In the research activity of Assoc. Prof. Katya Velichkova the following 4 main directions can be indicated:

**1. Taxonomic research and establishment of new species for the science or flora of Bulgaria (publications with No. 11, 18, 23 and 24).** As a result, a new species of cyanobacteria was discovered for science (publication No. 24). Two new species of green algae (Chlorophyta) have been identified for



Bulgaria (publications with No. 11 and 23). Morphological and ecological analysis of two of these species has been prepared: *Hormotilopsis gelatinosa* Trainor & Bold and *Anabaena rhodopensis* I.K.Kirjakov & K.N.Velichkova (the name of the species is according to AlgaeBase, [https://www.algaebase.org/search/species/detail/?species\\_id=162724](https://www.algaebase.org/search/species/detail/?species_id=162724), as in the publication is listed as *Anabaena rhodopensis* sp. nova). The characteristic of *Muriella australis* J.Phillipson has been supplemented and expanded. The morphology of the indument, the stomata and the pollen morphology of three adventive species from populations in Bulgaria: *Amaranthus deflexus* L., *A. hybridus* L. and *A. retroflexus* L. have been studied (publication No. 18).

**2. Monitoring studies (publications with No. 8, 10, 14, 26, 27 and 30).** Studies have been carried out on the content of heavy metals in the meat of some Black Sea fish species and freshwater fish from open water (publications with No. 8 and 10) or reared with different production technologies (publications with No. 26 and 30). The influence of experimentally polluted waters on *Triticum aestivum* L. cultivars grown in different soil types was studied (publication No. 14). The impact of the main meteorological factors has been assessed and the influence of organic fertilizers as anti-stress agents in the cultivation of *Lactuca sativa* L. varieties has been established (publication No. 27).

**3. Cultivation of microalgae for biomass production and wastewater treatment from aquaculture (publications No. 9 and 12).** It was found that the mixotrophic cultivation with carbon dioxide and glucose of *Chlorella vulgaris* Beijerinck resulted in better biomass, and the photoautotrophic cultivation led to a higher content of chlorophyll, carotenoids and protein (publication No. 12). Two species of microalgae have been described: *Nannochloropsis oculata* (Droop) by D.J. Hibberd and *Tetraselmis chuii* Butcher, which can be successfully used in the biological treatment of aquaculture wastewater (publication No. 9).

**4. Use of plant extracts and synbiotics for antimicrobial activity to improve the hydrochemical, growth, biochemical blood parameters and the quality of fish meat (publications with No. 13, 15, 16, 17, 19, 20, 21, 25, 28 and 29).** The fungicidal activity of extracts of three species of the genus *Amaranthus* L. on five species of mycotoxigenic fungi was studied (publication No. 17). New information has been obtained on the antibacterial and antifungal activity of seaweed extracts distributed in the Black Sea against bacteria and mycetes, including clinical isolates (publication No. 21). The influence of extracts from various medicinal plants (publications No. 20, 28 and 29), synbiotic (publication No. 13), products with increased content of nucleotides (publication No. 19) added to the diet in fish farming was found. The effect of feed with different protein content on the chemical and technological



parameters of the water of a recirculating aquaponic system has been established (publication No. 15). A comparative analysis of the cleaning capacity and productivity of the parts of a model aquaponic recirculation system was made (publication No. 25). The influence of water quality in the aquaponic system on the biomass of *Lactuca sativa* L. has been studied (publication No. 16).

The presented monograph on "Phytoremediation and bioaccumulation properties of species of the genus *Lemna* (Lemnoideae)" is authored by Assoc. Prof. Katya Velichkova. It was reviewed by two habilitated reviewers and has a volume of 152 pages. It describes four new species for Bulgaria of the genus *Lemna*: *L. minuta* Kunth, *L. valdiviana* Philipi, *L. obscura* (Austin) Daubs and *L. perpusilla* Torr. *L. obscura* is reported for the first time in Europe. For the first time the morphology, chorology and ecology of these species in our country are studied. A key for the determination of the species of the genus *Lemna* L. in Bulgaria has been prepared. The possibilities for using species of the genus *Lemna* L. as part of the biological filter in recirculation systems in aquaculture have been studied. Studies have been conducted on the bioaccumulation efficiency of 4 species of the genus of reservoirs in Southeastern Bulgaria and the ability of *L. minuta* and *L. valdiviana* to reduce the levels of heavy metals in water.

## **6. Evaluation of scientific and scientific-applied contributions**

The scientific contributions are particularly significant in floristics: the establishment of a new species of cyanobacteria for science, a new species of higher plant of the genus *Lemna* L. for the flora of Europe, two new species of green algae and four new species of higher plants of the genus *Lemna* L. for the flora of Bulgaria.

Most of the contributions are both scientific and applied, which is more valuable because of their additional practical significance. Some of them are related to the safety of human consumption of certain Black Sea and freshwater fish species, both wild and farmed under controlled conditions. Another part is aimed at establishing the relationship between soil type and the resistance of some cultivated plants to pollutants, as well as the application of microalgae in the biological treatment of aquaculture wastewater. A third of the contributions are related to the possibilities for cultivating some microalgae for biomass production and the possibilities for using additives (including plant extracts) to improve various indicators in fish farming. The fourth group of contributions is related to the results of a study of the fungicidal activity of extracts of higher plants and the antibacterial and antifungal activity of seaweed extracts.

Most of the contributions are original, and a small part - confirmatory. This ratio proves the original approach in choosing topics for research.



## **7. Critical remarks and recommendations**

Two of the journals listed in the bibliography by indicator group „Г“: the Trakia Journal of Sciences and the Agricultural Science and Technology are also indexed in the Web of Science. This can be established by reference in the List of contemporary Bulgarian scientific journals, referenced and indexed in world-famous databases of scientific information (source: National Center for Information and Documentation). For this reason, the Web of Science can be noted in the reference-declaration for fulfillment of the minimum national requirements for holding the academic position of "professor" against the publications in these journals.

The numbering of the cited articles is missing number 16 and therefore the number of cited articles is 19, not 20.

## **8. Conclusion**

The materials presented in the competition announced by Assoc. Prof. Katya Velichkova fully comply with the minimum national requirements for holding the academic position of "Professor" of the Law for the Development of the Academic Staff in the Republic of Bulgaria and the additional requirements according to the Regulations for the Development of the Academic Staff at the Thracian University. Scientific publications and established citations are significant in number, and many of the contributions are original and significant.

In conclusion, I give my POSITIVE assessment and propose to the esteemed scientific jury to vote positively, and to the Faculty Council of the Faculty of Agriculture to choose Assoc. Prof. Katya Naneva Velichkova for the academic position "Professor" in "Ecology and Ecosystem Protection", professional field 4.3. Biological sciences, field of higher education 4. Natural sciences, mathematics and informatics for the needs of the Department of Biology and Aquaculture at the Faculty of Agriculture of the Thracian University.

July 28, 2021 / Shumen

Signature:



(Prof. Dimcho Zahariev Ivanov, PhD)