

## REVIEW

regarding the competition for the academic position of "Associate Professor", in the professional field 6.2. Plant Protection (Herbology, physiological and phytopathological mechanisms in plant protection), published in State Gazette No. 63/01.08.2025 with candidate Senior Assistant Professor Dr. Maria Zhivkova Kaschieva

**Reviewer: Prof. Dr. Veselin Yordanov Dochev**, lecturer at the Department of Plant Protection at Shumen University "Episkop Konstantin Preslavski".

### **1. Regulatory requirements and documentation for the competition**

Pursuant to Order No. RD-16-238/31.10.2025 of the Rector of Shumen University "Episkop Konstantin Preslavski", I have been appointed as a member of the scientific jury for conducting a procedure for filling the academic position "Associate Professor", in professional field 6.2 Plant Protection, scientific specialty Plant Protection (herbology, physiological and phytopathological mechanisms in plant protection), announced in State Gazette No. 63/01.08.2025.

In the competition for "associate professor" announced in the State Gazette No. 63/01.08.2025 by Shumen University "Episkop Konstantin Preslavski" for the academic position of "Associate Professor" in the scientific specialty Plant Protection (Herbology, physiological and phytopathological mechanisms in plant protection), the only candidate is Senior Assistant Professor Dr. Maria Zhivkova Kaschieva from the Shumen University "Episkop Konstantin Preslavski". The competition documentation has been prepared and presented in paper and electronic form in accordance with the requirements of the Academic Staff Development Act of Bulgaria and the Regulations for its application at Shumen University "Episkop Konstantin Preslavski".

### **2. Brief introduction to the candidate.**

Sr. Asst. Prof. Dr. Maria Zhivkova Kaschieva was born on 03.04.1978 in Shumen. She graduated from Shumen University "Episkop Konstantin Preslavski" in the year 2000 with a Master's degree (Agrochemistry with Farming and Agribusiness). In 2002, she was enrolled in a doctoral programme at the Agricultural Institute of Shumen, which is part of the National Center for Agricultural Sciences (later renamed to Agricultural Academy of Sofia). Her doctoral thesis is in the field of "Selection and Seed Production of Cultivated Plants", which she successfully defended in 2005. In the period 2021-2022, she acquired a Master's degree in the field of "Ecologist, Management and Protection of Ecosystems" at Shumen University "Episkop Konstantin Preslavski". Since 2011 she has been a Senior Assistant Professor at Shumen University "Episkop Konstantin Preslavski", where she teaches the following disciplines: "Plant Physiology", "Agrochemistry", "Herbology", "Selection and Seed Production".

### **3. Scientometric indicators of the presented scientific production.**

The report submitted by Sr. Asst. Prof. Dr. Maria Kaschieva on the fulfillment of the minimum national requirements for holding the academic position "Associate Professor" in professional field 6.2 "Plant Protection" shows that based on the published scientific papers and the scientific research activities of the candidate for acquiring the academic position "Associate Professor" with a required minimum of 400, she has 480.4 points, which in this case means that she meets the minimum national requirements. The candidate's scientific production is presented as follows:

#### **By indicator group "A"**

The candidate got 50 points after defending a dissertation on the topic: "**Enrichment of the gene pool of fodder beet through the application of *in vitro* techniques and cytological and morphological characterization of the resulting plants**". With it, she acquired the educational and scientific degree "Doctor".

#### **By indicator group "B" (indicators 3 and 4)**

In this group, a habilitation thesis (monograph) is presented on the topic: "Inventory of weed diversity in arable areas located in the Protected Area BG0002051 'Kaliakra Complex'". The monograph is written on 122 pages and it was published this year. The total number of points is 100, with 100 points required.

#### **By indicator group "G" (sum of indicators G5 to G12)**

A monograph on the topic "Saffron crocus (*Crocus sativus* L.) from the field to the spice" is noted under indicator "G5". The same is not presented as the main habilitation thesis. The monograph is written on 154 pages and it was published this year. The total number of points for this indicator is 100 with 100 points required.

Under indicator "G7", a total of seven scientific articles are presented that are refereed and indexed in world-renowned databases with scientific information - Web of Science and Scopus. The articles are printed in the following journals: Bulgarian Journal of Agricultural Science, Chemistry; Bulgarian Journal of Science Education, International Journal of Current Microbiology and Applied Sciences, Journal of Mountain Agriculture on the Balkans, Acta Scientifica Naturalis and others. For this indicator, the candidate gets a total of 67.5 points.

Under indicator "G8", a total of twelve articles are noted that are published in non-refereed journals with scientific review and edited collective volumes. In total for the entire indicator group "G" (from "G5" to "G12"), the candidate gets 230.4 points out of the required 200 points.

Of the 19 scientific publications submitted, she's first author in 4 articles, she's second author in another 7, and in the remaining publications she is the third and subsequent author. For

all materials with which the candidate participates in the competition, a certificate of absence of plagiarism is submitted.

#### **By indicator group "D"**

Under indicator "D13", out of the scientific papers of Sr. Asst. Prof, Dr. Maria Kaschieva 4 articles are cited in 4 scientific publications, refereed and indexed in world-renowned scientific databases or in monographs and collective volumes, and there are 10 citations in non-refereed journals with scientific review. The total number of points is **100** with **50** required.

#### **4. Significance of contributions to science and practice.**

I fully accept the presented comprehensive report on the contributions from the research carried out. I am convinced that the research is the personal work of the candidate.

##### **4.1. Contributions of practical importance.**

- The first of its kind comprehensive scientific and practical guide for saffron production in Bulgaria has been created, which examines various aspects of saffron production: plant protection, technological, commercial and cultural aspects.
- It has been established that the most widespread on the surface of sorghum seeds and sorghum-Sudan hybrids is the phytopathogenic fungus *Alternaria alternata* (Fr.) Keissl., which points towards the possibility of correct selection of a suitable agent for seed disinfection before sowing.
- 7 species of phytopathogenic fungi have been identified (*Alternaria alternata*, *Alternaria solani*, *Aspergillus ssp.*, *Mucor ssp.*, *Helminthosporium turcicum*, *Fusarium moniliforme*, *Peronosclerospora sorghum*), belonging to 6 genera, which are the seed mycoflora of sorghum seeds. The combination of pathogens in seeds damages the sprouts and worsens the quality of the seeds, which again points to the possibility of the correct choice of a suitable agent for seed disinfection before sowing.
- The disease "curl", caused by the phytopathogen of *Taphrina deformans var. armeniaca*, has been identified in apricot plantations in the Shumen region. For apricot, this disease is of little economic importance, but there is a risk of expanding its distribution area.
- An in vitro method for obtaining haploid plants from fodder beet has been implemented in practice. Implementation of an in vitro method for obtaining haploid plants from fodder beet (*Beta vulgaris* L. var. *crassa*).
- Effective nutrient media for organogenesis from passaged calli of unfertilized seed buds from different genotypes of fodder beet have been developed.
- The addition of silver nitrate to the culture medium for in vitro rooting of fodder beet increases the rooting rate of plants. Optimization of the culture medium for rooting of fodder beet was achieved by using 1, 2, 3 and 4 mg/l AgNO<sub>3</sub>. The use of higher concentrations of AgNO<sub>3</sub> is necessary only in the presence of more persistent bacterial contamination of the medium.
- An interdisciplinary approach has been successfully applied and methods typical of agricultural practice have been integrated in the ecological restoration of disturbed natural

habitats. The genesis of the methods used is irrelevant, as long as they work well, are relatively cheap and easy to apply in the restoration of different natural habitats. Each method has its place in practice in a wide range of restoration activities, having its positive and negative sides.

➤ Aqueous infusion of oregano reduces root length of *C. sativus* L. and *T. aestivum* L. by inhibiting cell division and inducing chromosomal changes in *Allium cepa*. These results demonstrate the potential of these infusions as a source of active biological substances that could be used in agriculture, and of oregano - as a plant with herbicidal potential.

➤ *Origanum vulgare ssp. vulgare* and *Adonis vernalis* possess antibacterial properties. Aqueous infusions of *Origanum vulgare ssp. Vulgare* also possess antibacterial activity, and aqueous infusions of *Adonis vernalis* exhibit a stronger inhibitory effect compared to the tested oregano. Aqueous infusions of these plant species have potential for use in the fight against bacterial phytopathogens and in biological plant protection.

➤ Plant extracts in a 1:1 ratio of poplar (*Populus ssp.*) and thyme (*Thymus ssp.*) inhibit the growth of mycelium and the germination of spores of the phytopathogenic fungus *Alternaria alternata* f. ssp. *stevae*, in stevia, and the application of these extracts could be found in the organic production of stevia.

➤ Allelopathic activity of aqueous extracts of wild plants *Origanum vulgare ssp. vulgare* has been established. This characteristic of wild oregano can be further studied as a tool in experimental weed control programs.

➤ The antibacterial activity of Br-oxph against the phytopathogenic bacterium *E. amylovora* has been studied for the first time. The compound Brom oxyphosphol (Br-oxph) has bactericidal activity, which allows it to be tested in the fight against various phytopathogenic bacteria.

➤ The amount of precipitation and the temperature sums are the main factors for the accumulation of biomass in Sudan grass and the sorghum x Sudan grass hybrids. There is a significant correlation between the intensity of shoots and the accumulation of biomass. The number of developed shoots is strongly dependent on the agroclimatic conditions. The parameters of biomass and the dry matter accumulation occur at different levels depending on the genotype. In the sorghum x Sudan grass hybrids, high productivity is combined with intensive accumulation of dry matter.

#### **4.2. Contributions of theoretical significance.**

➤ An inventory of weeds in arable areas within Protected Area BG0000573 "Kaliakra Complex" has been conducted. The list of weeds is not final and shows species heterogeneity in the weed communities. The heterogeneous weed composition is a sign of high ecological value of arable areas, since heterogeneous weed communities are less competitive with cultivated plants.

➤ During the inventory of weeds in arable areas, protected plant species with high conservation value were identified as weeds, such as Aromatic Matthiola (*Matthiola odoratissima* (M.Bieb.) R.Br.), Thin-stemmed wormwood (*Artemisia lerchiana* Weber, syn. *Artemisia fragrans* Willd.) and Dobrudzha oats (*Avena eriantha* Durieu). These plant species develop very well in cultivated areas (flowering, seed formation and pod formation are observed),

which indicates the presence of adaptation mechanisms of plants to the conditions in cultivated areas.

➤ The study of the weed composition is an important part of the fight against weeds in cultivated lands, and the soil weed seed bank gives an idea of the weed seed diversity in the soil. Thanks to the study of the weed composition, a real assessment is obtained as to which production system should be used (e.g. organic production or *no till* technologies).

#### **5. Scientific and applied, teaching and organizational activities.**

Sr. Asst. Prof. Dr. Maria Kaschieva has participated in delivering lectures and exercises in the disciplines: "Plant Physiology", "Agrochemistry", "Herbology", "Selection and Seed Production". She has completed a course in Forest Pedagogy/Forest Pedagogue, which allows her to organize educational activities in nature, organize training in Forest Pedagogy, carry out work with students and teachers and work in nature. She has also completed courses in BDS EN ISO 19011:2018: Guidelines for auditing management systems, a course in BDS EN ISO/IEC 17065:2012: Conformity assessment. Requirements for certification bodies for products, processes and services. She is a member of a narrowly profiled international association Eurasian Dry Grassland Group (EDGG); she is a member of the scientific committee of The International Young People Scientific Conference "The environment – research, charge, administration", University of Craiova, Faculty of agronomy. She has completed a short-term specialization in Romania, University of Craiova, and mobility under the Erasmus+ programme in Romania at the same university. In the period 2016-2020 she was a member of the Faculty Council of Faculty of Natural Sciences. Since 2023, she has been a member of the Academic Council of Shumen University "Episkop Konstantin Preslavski". Quality Manager of the Department "Plant Protection, Botany and Zoology" in the period 2016-2020. Course leader in the specialty "Pedagogy of Teaching in Biology and Chemistry" courses 1 through 4, and "Plant Protection" courses 1 through 4 since 2012. She is engaged in photography, has 2 photography exhibitions, one of which is solo, is the winner of the Shumen Municipality Award for Culture of 2024 in the "Fine Arts" section.

#### **6. Participation in national and international scientific projects and programs.**

In 2024, Sr. Asst. Prof. Dr. Maria Kaschieva completed a mobility under the Erasmus+ program in Romania, at the University of Craiova.

#### **7. Critical notes and recommendations.**

I have no critical notes or questions regarding the submitted documents and the overall scientific production of the candidate.

#### **8. Conclusion.**

The documents submitted to me for review in the competition show that the scientific research, teaching, applied and publication activities of **Senior Assistant Professor Dr. Maria Kaschieva** comply with the Academic Staff Development Act of the Republic of Bulgaria and the Regulations for its implementation at the University of Shumen.

All this gives me reason to evaluate her overall activity **POSITIVELY**.

I would like to propose that the esteemed Scientific Jury also vote positively, and award **Senior Assistant Professor Dr. Maria Kaschieva** the academic position of "**Associate Professor**" in the field of higher education: 6. Agricultural Sciences and Veterinary Medicine; professional field: 6.2 Plant Protection (Herbology, physiological and phytopathological mechanisms in plant protection).

02.12.2024  
Shumen

  
Reviewer:   
/Prof. Dr. Vesselin Dochev/