REVIEW

For the competition procedure for the occupation of the academic position "PROFESSOR" in the Field of higher education 6. Agricultural sciences and veterinary medicine, Professional direction 6.1. Crop Production , Scientific specialty "Ornamental plants", announced in SG no. 62/21.07.2023 with candidate Associate Professor Dr. Valeria Stefanova Ivanova, PhD, from the Agricultural University-Plovdiv, Faculty of Viticulture and Horticulture, Department of Horticulture.

by **Prof. Dr. Bistra Yaneva Atanasova-Dimitrova**, appointed according to Order No. RD-16-901/25.09.2023 of the Rector of the Agricultural University-Plovdiv.

Reviewer: **Prof. Dr. Bistra Yaneva Atanasova-Dimitrova**, Institute of Ornamental and Medicinal Plants, Sofia, Field of Higher Education 6. Agricultural Sciences and Veterinary Medicine, Professional field 6.1. Crop Production, Scientific specialty "Selection and seeds production of cultural plants".
Only one candidate participated in the competition for the academic position "Professor" in the Department of Horticulture, Faculty of Viticulture and Horticulture of Agricultural University-Plovdiv. The documents for the competition have been prepared in accordance with the requirements of the Low on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for its implementation at the Agricultural University-Plovdiv.

1. General data on the candidate's career and thematic development
Associate Professor Valeria Ivanova was born on February 23, 1963 in the village of Alekovo, Lovech region. She graduated from VSI "Vassil Kolarov", now Agricultural University-Plovdiv in the period 1981-1986, with a specialty in viticulture and horticulture, with the qualification of engineer-agronomist and specialization in Floriculture - Master's degree. During the period 1986-1989, she worked as an agronomist, organizer at the Scientific and Production Laboratory of Tissue Cultures (SPLTC) at the Institute of Floriculture, now the Institute of Ornamental and Medicinal Plants (IOMP), Sofia. In 1989, she won a competition for a researcher at the Institute, and until 1991 she worked in the field of bulb flower propagation using tissue culture methods. In 1991 was appointed as an assistant at AU, Plovdiv, passing through the following teaching levels - Senior Assistant (1993-1996) and Chief Assistant (1996-2007). From 2007 to the present, she is an Associate professor at AU, Plovdiv. The educational and scientific PhD degree was acquired in 2003 as a PhD student in a free form of study at AU on the topic: "Optimization of formatting and nitrogen fertilization in the cultivation of chrysanthemum /***Chrysanthemum indicum L.***/ for cut flowers in polyethylene greenhouses".

2. General description of the presented materials
Associate Professor Valeria Ivanova has presented proven, correct and objective information on the scientometric indicators, according to the minimum national requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for its implementation at the Agricultural University-Plovdiv– number of points for the occupation of the academic position "Professor":
- Indicator A - minimum requirements - 50 points, presented materials for 50 points
- Indicator B - minimum requirements - 100 points, presented materials for 100 points
- Indicator G - minimum requirements - 200 points, presented materials for 265.97 points
- Indicator D - minimum requirements-100 points, presented materials for 150 points
- Indicator E - minimum requirements-100 points, presented materials for 145 points
- Total number - minimum requirements - 550 points, presented materials for 710.97 points

It can be seen that the scientific works of Assoc. Prof. Ivanova completely cover and even exceed by 160.97 points (29.26%) the national minimum scientometric requirements for occupying the academic position "Professor".

Publishing activity

Associate Professor Valeria Ivanova presented a list of scientific publications on the nomenclature specialty - 120 of them, of which:

• Publications related to the PhD Thesis - 3 items, which are not subject to review;

• Publications related to the competition for the academic position "Associate Professor" - 39 items, which are not subject to review;

• Publications after the competition for the academic position "Associate Professor" - a total of 78 publications.

In the competition for "Professor" Associate Professor Ivanova participated with a total number of 35 scientific papers in the nomenclature specialty, of which 33 publications, 1 monograph, 1 chapter of a collective monograph, grouped as follows:

• Scientific publications related to the competition and subject to review - 33 publications;

• Scientific publications in journals referenced and indexed in globally acknowledged scientific information databases **Web of Science** or **Scopus** - 15 publications (45.45 %).

Publications in **Web of Science**:

• 6 publications with impact factor (IF), quartile Q4 (*Scientific Papers Series - Horticulture*);

• 4 publications in **Web of Science CABI** (*Agricultural Science and Bulgarian Journal of Crop Science*);

• 1 publication in **Web of Science, Zoological record,** no impact factor (*Journal of BioScience and Biotechnology*);

• 4 publications in **Scopus** with impact rank (SJR) in quartiles Q3 and Q4 (*Acta Horticulturae* and *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*);

Scientific publications peer-reviewed or edited in non-refereed journals - 18 items:

• Publications in magazines - 5 publications (*Plant Sciences and Journal of International Scientific Publication: Agriculture&Food*);

• Publications in conference proceedings - 4 publications (*Proceedings of the 4th international symposium "Ecological Approaches towards the production of the safety food", Bulgaria, 2011 and International Ornamental Plant Congress, Turkey, 2019*);

• Publications in edited collective volumes- 9 publications (*Scientific works of the Union of Scientists, Plovdiv*).

Of the mentioned 35 scientific papers, Assoc. Prof. Ivanova participated independently in 4 publications (11.4%), first author - 15 publications (42.9 %), second- 9 publications (25.7 %), third and next author in 7 publications (20.0 %), which proves her ability to work in a team. Out of 35 works, 24 publications (68.6 %) were printed in English and 11 publications (31.4 %) - in Bulgarian.

3. Main directions in the candidate's research work. Demonstrated skills and aptitude for leading scientific research (project management, attracted external funding, etc.).

• Main directions in the candidate's research work

The main directions in the scientific research work of Associate Professor Valeria Ivanova are mainly related to ornamental plants: increasing the germination of seeds, improving elements of cultivation technologies, regulating growth and development, methods of propagation and methods for the production of seed and planting material, development and optimization of micropropagation protocols, growth regulators and biologically active substances, nutrition and use of ornamental trees and shrubs in landscape sites. The subject of scientific research are species and varieties from different genera and families - annual and perennial ornamental plants, flowering and leaf-decorative potted species, bulbous, tuberous and rhizome perennial flowers, shrubby and woody deciduous and coniferous species.

• **Demonstrated skills or aptitude for leading scientific research (project management, attracted external funding, etc.).**

Associate Professor Valeria Ivanova has proven herself as a successful manager and active participant in scientific national, international and educational projects financed by the National Institute of Scientific Research, the EC and internal funding by the AU. Projects in the field of higher education:

• 1 project under the Operational Program of the EC "Development of Human Resources", with participation in the development of educational materials (2013-2017);

• 2 projects "Student practices" under the Operational Program "Science and Education for Intelligent Growth" (2013-2017 and 2014-2020);

• 2 projects: participation in the Tempus Project S_JEP 11476-96, financed by the EC and development of an independent Tempus Project, 1994.

Scientific projects:

• participation in 2 international projects with China, financed by FNI (2011-2014 and 2016-2019)

• participation in 3 and manager of 13 projects with internal funding from AU, Plovdiv.

Assoc.- Prof. Ivanova is distinguished by extremely active teaching activity (Certificate NOF5-22/27.07.2023) as a teacher with over 32 years of experience at AU- Plovdiv. Her academic employment for the period 2018-2023 is 3832 hours including lectures, exercises and extracurricular employment. The average workload for a year in the last five is approximately 766.4 hours, of which 501.6 hours (65.5%) are lectures, 29.4 hours (3.84%) are exercises and 235.4 hours (30.7%) are extracurricular activities. Assoc.-Prof. Ivanova's teaching activity is predominant in the field of lecture engagement.

The candidate actively participates in training students and young scientific personnel:

• Development of the Curriculum and management of the Master's Course "Ornamental Plants and Landscape Design" for 18 years;

• Head of the "Ornamental Horticulture and Landscaping" specialty;

• Head of the PhD program in "Ornamental Horticulture";

• Author of 3 manuals for floristry exercises at AU, Plovdiv (1995, 2001 and 2022);

• Author of a Monograph on chrysanthemum cultivation;

• Co-author in a collective monograph;

• Supervisor of two successfully defended PhD students, one of whom is under the ERASUM Program;

• Member of the Scientific Jury for the defense of PhD Thesis and for the selection of the Chief Assistant and Associate-Professor.

• Participation in examination committees for admission and candidate minimum of PhD students in various forms of education;

• Supervisor of theses and participation in committees during their defense and in committees during state exams.

5. Significance of the obtained results, proven by citations, publications in prestigious journals, awards, membership in international and national scientific bodies, etc.

The presented citations of the publications in connection with the current competition are 10 citations, with 4 scientific publications cited. The citations are in scientific works published after acquiring the scientific title "Associate Professor", in prestigious journals with an impact factor or impact rank, referenced and indexed in the global databases **Web of Science** and **Scopus**. Associate Professor Valeria Ivanova possesses organizational skills and competencies, and actively participates in the life of AU-Plovdiv. She is a member of the Faculty Council of the Faculty of Viticulture, chairperson of the General Assembly and member of the ERASUM Program committee, and member of the scientific committee of the 1st International Conference "Innovative (Eco) Technology, Entrepreneurship and Regional Development", University in applied sciences, Kaunas, Lithuania, 2015. Member of the Union of Scientists in Bulgaria, Plovdiv since 1997 and is deputy editor-in-chief of "Scientific works of the

Agrarian University" and "Agrarian Sciences" magazine. Associate Professor Valeria Ivanova has specialized in a number of foreign scientific centers and universities: Botanical Garden - Sochi, Russia (1987), Tissue Culture Laboratory - Budapest, Hungary (1989), Training in Molecular Biology Techniques - Czech Republic (1995), Course in Modern Horticulture - Belgium (1996) and International Course on Intensive Vegetable Production under Different Conditions - Israel (1997). Assoc.-Prof. Ivanova's international activities also include lectures on Ornamental Horticulture in Germany, Greece and Lithuania.

SUMMARY REFERENCE

for the fulfillment of the minimum national requirements according to the criteria for a "Professor" in of the Low on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for its implementation at the Agricultural University-Plovdiv in professional area 6. Agricultural sciences and veterinary medicine, Professional direction 6.1. Crop Production

A group of indicators	Criteria	Minimum requirement for the academic position "Professor"	Result of Prof. Dr. Valeriia Stefanova Ivanova
A	1. PhD thesis for awarding the educational and scientific degree "Doctor"	50 points	50 points
B	1. Monograph	100 points	100 points
G	7. Scientific publications that are referenced and indexed in world-renowned databases with scientific information; 8. Scientific publications in non-refereed peer-reviewed journals or in edited collective volumes 9. Published chapter of a collective monograph	200 points	265.97 points
D	13. Citations in scientific publications, referenced and indexed in world-renowned databases with scientific information	100 points	150 points
E	17. Guidance of a successfully defended PhD student; 18. Participation in a national scientific or educational project; 19. Participation in an international scientific or educational project; 23. Published university textbook	100 points	145 points
	Total	**550** points	**710.97** points

6. Significance of contributions for science and practice. A motivated answer to the question to what extent the candidate has a clearly defined profile of research work

I. ORIGINAL CONTRIBUTIONS

1. The possibility of intensive cultivation of chrysanthemum and increasing the yield from cut flowers by increasing the number of shoots per unit area and optimizing the nutritional regime has been proven. A comparative economic evaluation of the production of the cut flower was made and it was proved that the plants with the highest values of the economic indicators were formed with three stems and fertilized with the highest doses of nitrogen. In the plants fertilized with the highest nitrogen rates, a positive effect on the synthesis of leaf pigments, the intensity of photosynthesis, and the activity of peroxidase and nitrate reductase was found. The obtained results can be used as a theoretical basis for scientifically solving chrysanthemum fertilization problems. (monograph B.1.)

2. The possibilities for improving in vitro propagation of ***M. grandiflora*** **L.** and ***M. X soulangeana*** **Soul.- Bod.** by using 2 nutrient media based on MS and DKW supplemented with the cytokinin meta-topolin (mT). The most accelerated propagation was found in both magnolia species with enrichment of the nutrient medium with 7 μM meta-topolin. (publ. 7.2)

3. When growing Asters (***C. chinensis***), Helichrysum (***H. bracteatum***) and Echinacea (***E. purpurea***) in containers, 1 or 2 waterings per week for 3 months have been shown to result in significant growth inhibition and death of plants. Electrolyte leakage and relative water content were found to be dependent on the number of waterings. The highest values of electrolytes (8314.9μS/g) and the lowest percentages of water content (11.5%) were reported for once weekly watering of ***Helichrysum***. (publ. 7.10)

4. For the first time, under in vitro conditions, the effect of osmotic stress caused by water deficit in the mini carnation (***Dianthus caryophyllus*** **f. *spray*, Hort.**), Bulgarian cultivar "Rusalka", was studied. Explant growth has been shown to decrease proportionally with increasing polyethylene glycol concentration and duration of exposure. (publ. 7.14) 5. In vitro propagation of ***G. biloba*** **L.** on MS and WPM nutrient media was achieved for the first time, when culture was initiated from 2-bud shoot tips. (publ. 8.18)

II. METHODOLOGICAL CONTRIBUTIONS

1. It was found that seed treatment with ultrasound for 6 min in ***L. polyphyllus*** **Lindl.** and ***L. mutabilis*** **Sweet** leads to an increase in germination. Higher values of germinating energy, germination, germination duration and amicability, length of hypocotyls and embryonic root, fresh and dry matter were reported in ***L. polyphyllus***. (publ.7.1)

2. Two disinfection methods with 5% calcium hypochlorite solution [$Ca(OCl)_2$] and 2% silver nitrate ($AgNO_3$) were investigated in different explants (apical buds, stem cuttings, nodal segments) from the tip of mature cuttings or actively growing annual shoots of adult trees and seedlings of 3 linden species ***Tilia cordata*** **Mill.**, ***Tilia platyphyllos*** **Scop.** and ***Tilia tomentosa Moench.*** The best disinfection procedure was established with sequential application of $Ca(OCl_2)$ and $AgNO_3$ on explants of actively growing shoots. The best results were obtained with ***T. cordata***. In the propagation of ***T. platyphyllos***, the maximum number of lateral shoots was reported in nutrient medium with meta-topolin, and the highest degree of rooting was achieved on MS medium with ½ macronutrients, enriched with 0.3 mg l-1 indolyl-3-butyric acid (IBA). (publ.7.3)

3. An effective protocol was developed for the in vitro propagation of ***Camptotheca acuminata*** **Decne** on different nutrient media based on MS and DKW and the cytokinins BAP, 2iP and mT. Optimum shoot proliferation rate was found in DKW basal medium supplemented with 2.5 μM mT. The positive influence of 0.3 mgl^{-1} NAA on the number of roots has been demonstrated. (publ. 7.4)

4. A protocol for in vitro propagation of ***Ginkgo biloba*** **L.** was developed and it was found that the cytokinin meta-topolin (mT) significantly improved the proliferation of lateral buds of the species. (publ.

7.8)

5. New procedures for surface sterilization of apical explants of ***Ginkgo biloba* L.** and plum shoots and also cherry embryos were studied for the first time. Silver nitrate or chlorhexidine gluconate was used in different concentrations and exposure times. Both sterilizing agents have been found to be effective (pub. 7.15)

6. A procedure for in vitro shoot culture of ***T. baccata* L.** was improved. The highest frequency of axillary bud induction was reported on WPM medium supplemented with 6.841lM zeatin. (publ. 8.17)

III. SCIENTIFIC CONTRIBUTIONS

1. A comprehensive overview of the biotechnological and conventional methods of propagation of ***G. biloba* L.**, ***T. baccata* L.**, ***M. x soulangeana* Soul.-Bod.** and ***M. grandiflora* L.** (Collective monograph D.9) **2.** The possibility of using ***Verbascum thapsus*** as an ornamental plant was studied and it was found that when seeds are sown in early July, the plants have the best ornamental characteristics- a large number of large flowers and the longest flowering period. (publ. 7.5)

3. A study was carried out to identify damage in ***Dahlia variabilis*** tubers overwintering in the soil. After wintering, tuber numbers and stem and inflorescence biometrics were found to be significantly increased in all three cultivars Vitus, White Ball and Dark Red. Overwintering plants have been shown to enter initial and mass flowering earlier with a longer flowering period of the individual flower and the whole plant. (publ. 7.6 and 8.6)

4. Five new for the country varieties of gladiolus Purple flora, Priscilla, Plum tart, Oscar and Green star were tested and it was found that the most suitable for the conditions of Bulgaria are the varieties Green star and Purple flora, which showed good ornamental characteristics. (publ. 7.7)

5. The phenological development of seeds, obtained from seeds collected on the 75th and 90th day after flowering, of the widespread linden species in Bulgaria- ***T. platyphyllos* Scop.** Correlational dependences between phenological behaviors and climatic conditions were determined. (publ. 7.11)

6. The effect of pre-sowing treatment of ***G. biloba* L.** seeds with different concentrations of GA_3 was studied and it was found that the germination rate of the treated seeds increased to 83.6%. A positive correlation was found between GA_3 concentration and vegetative growth of plants. (publ. 8.1)

7. It was established that the seeds of ***Tilia cordata* Mill.**, ***T. platyphyllos* Scop** and ***T. tomentosa* Moench.** have the fastest growth rate grown from seeds collected on 1.08, 1.09 and 15.08. The tallest are the plants of the species ***T. cordata,*** and with the largest diameter of the stem - ***T. tomentosa.*** (publ. 8.2)

8. The decorative behavior of 3 species of the genus ***Capsicum - C. annuum L., C. frutiscnes L. and C. baccatum L.***- and the possibility of their use as ornamental plants were investigated. ***C. baccatum*** plants were found to be the tallest, with a large number of branches and many fruits, suitable for solitary cultivation and for growing in pots. (pub. 8.3)

9. It was found that of all combinations of IBA and gibberellin (GA_3) investigated in propagation of ***Lonicera nitida* Wils.** by mature cuttings; the 1000 ppm IBA treatment was most effective, resulting in the highest rooting percentage and the best root system characteristics. (publ. 8.8)

10. Differences were found between ***Tilia platyphyllos* Scop.**, ***Tilia cordata* Mill.** and ***Tilia tomentosa* Moench** by duration of some seedling phenophases, depending on the time of seed harvesting, with the earliest flowering and seed maturity recorded in the large-leaved linden (***T. platyphyllos***), and the earliest in the small-leaved linden (***T. cordata***)- early emergence, and in the silver-leaved linden (***T. tomentosa***)– the earliest formation of cotyledons, first and third true leaves. (publ. 8.10)

11. The use of ***Azospirillum* sp.** and ***Bacillus* spp.** with mineral fertilizers leads to the highest values of growth parameters in one-year seeds of ***Gingko biloba* L.** It has been proven that the used biofertilizers have the capacity alone or in combination with mineral fertilizers to increase the nutritional value of the soil mixture. (publ. 8.12)

12. The concentration of ginkgolides A, B, C and bilobalide in the leaves of ***Ginkgo biloba* L.** from trees

in Plovdiv and Hisarya was determined, with the highest content of ginkgolide A, followed by B and C at the beginning of summer, and the highest -low in spring and autumn. (publ. 8.13)

13. The growth characteristics of ***G. biloba* L.** seeds grown in conventional above-ground containers and in containers using the pot-in-pot system were studied. The use of conventional above-ground containers is recommended. (publ. 8.14)

14. The changes in gas exchange and total chlorophyll content in the leaves of seeds of the linden species ***T. grandifolia* Ehrh.**, ***T. argentea* Desf.** and ***T. parvifolia* Ehrh.** It was found that the intensity of photosynthesis and transpiration were highest in the leaves ***of T. parvifolia,*** and the total chlorophyll - of ***T. argentea.*** (publ. 8.15)

IV. APPLIED CONTRIBUTIONS

1. It was established that the treatment of seeds ***of M. grandiflora* L.** with Biolan and Agrostimulin did not improve the germination of the seeds, but they had a favorable effect on the further development of the seeds. Plants obtained from seeds treated with 0.02% Biolan have a larger leaf area and mass, and treatment with 0.005% Agrostimulin has a positive effect on the development of the root system. (publ. 7.12)

2. It was established that in foliar treatment of plants of the species ***T. erecta* L.**, ***T. patula* L.** ***and T. signata* Bartl.** with Panamin Agro the growth characteristics are significantly improved. It is recommended to use a 1.0% solution when producing tagetes seedlings. (publ. 7.9) 3. It has been shown that the application of the controlled-release granular fertilizer **Osmocote** in the substrate for further cultivation of in vitro propagated plants of ***M. grandiflora* L.** and ***M.* x *soulangiana* Sool.- Bod.** positively affects growth and development. (publ. 8.4)

4. It was established that the treatment with 0.01% **Biolan** for 12 hours significantly stimulated the germination of seeds of the Balkan endemic species with valuable ornamental characteristics included in the Red Book of Bulgaria - ***Limonium bulgaricum* Anchev** ***and Goniolimon dalmaticum* (C. PRESL) RCHB. F.,** the effect is genotype specific. (publ. 8.7)

5. A positive effect of Lumbricol biomineral fertilizer has been proven on the annual flowers ***Antirrhinum, Tagetes, Zinnia*** and ***Verbena.*** An increase in seed germination, size of the root system, characteristics of the leaves and the period of the phenophases was found. Treatment with 20% Lumbricol is recommended when producing seedlings of annual species. (publ. 8.16)

6. It was found that when propagating ***Aucuba (Aucuba japonica* Thub.)** by mature cuttings, the highest percentage of rooting was reported when using a peat-perlite substrate, where a good development of the root system was noted. (publ. 8.9)

7. A study was conducted on the use of coniferous species in parks and gardens in 8 settlements, Plovdiv region. The vitality and decorative level of 27 species of the most common conifers and shrubs in our country is defined. It was found that coniferous species are a small part of the total number of plants, with unsatisfactory vitality and decorativeness of most individuals. It is recommended to increase the percentage of species - ***Cedrus, Chamaecyparis, Picea, Pinus, Cupressus, Juniperus.*** (publ. 8.11)

8. Critical notes and recommendations From the presented scientific publications and documents for the competition, I am fully convinced that Assoc.-Prof. Ivanova is an active university teacher and a fully formed researcher. I have no critical comments or recommendations for the candidate.

9. Personal impressions and opinion of the reviewer I have known Associate Professor Valeria Ivanova since 1986, at the Institute of Floriculture (now the Institute of Ornamental and Medicinal Plants), where she did her pre-graduate specialization. Her interest in ornamental plants and scientific activity was appreciated by the management of the institute, after which she was assigned to work as an agronomist-organizer in the Scientific and Production Laboratory of Tissue Culture at the Institute. She was appointed as a researcher after successfully winning a competition. Assoc. Prof. Ivanova is a theoretically fit, hardworking and consistent scientist, capable of working and leading a scientific team.

My impressions are that she is extremely responsible for scientific and teaching activities, respected and valued not only by colleagues, but also by students.

CONCLUSION

Based on the analysis of the pedagogical and scientific activity of the candidate, I believe that Assoc.-Prof. Dr. Valeria Stefanova Ivanova fully fit the minimum requirements for a "Professor" in the Faculty of Agricultural Sciences and the Regulations of the Agrarian University for its application in Professional field 6. Agricultural sciences and veterinary medicine, Professional direction 6.1. Crop Production, Scientific specialty "Ornamental plants". She exceeds the requirements for occupying the academic position, with clearly expressed, active teaching and scientific activity, original scientific and scientific-applied contributions, participation and management of projects, PhD students and graduates. All this gives me the reason to positively evaluate the overall activity of Assoc. Prof. Valeria Stefanova Ivanova and I recommend the honorable Scientific Jury to vote **POSITIVE**, and the Faculty Council of the Agrarian University, Plovdiv to elect Assoc. Prof. Valeria Stefanova Ivanova for " **PROFESSOR**" in professional field 6.1.Crop Production, scientific specialty "Ornamental plants".

Date: 14/11/2023
Sofia

REVIEWER:
/Prof. Dr. Bistra Yaneva Atanasova-Dimitrova/