

REVIEW

Concerning to: Competition for acquisition an academic position “*Associate Professor*” in

Professional direction 6.1 *Crop Production*, Scientific specialty “*Breeding and Seed Production of Cultivated Plants*”

Announced in the State Gazette, issue 65/06.08.2021

with candidate Nadia Georgieva Daskalova, Ph “Doctor” in “Breeding and Seed Production of Cultivated Plants”, “Chief Assistant Professor” at the Department of “Crop Production” at the ITF of Technical University - Varna.

Reviewer: Ana Stoilova Saldzhieva, Doctor of Science in “Breeding and Seed Production of Cultivated Plants”, Professor.

1. General information and biographical data.

Ch. Ass. Prof. Nadia Daskalova PhD graduated from High Agricultural Institute, now AU - Plovdiv, in 1997 and obtained a *Master's degree “Agro-Engineer in Plant Protection”*. In 1996-1997 she graduated the Free Faculty of High Agricultural Institute – Plovdiv and obtained “*Pedagogical qualifications in Pedagogy*”. Her first job was at the Dobrudzha Agricultural Institute in 1997. In the autumn of 2011 she started as a part-time lecturer in the newly established Department of “*Crop Production*” at TU-Varna, and in February 2012 she was appointed an *Assistant Professor* in the same department. In 2015 she defended Dissertation thesis on the topic “*Selection in synthetic hexaploid wheat and hybrids for improving of some breeding traits*” and obtained educational and scientific degree “*Doctor*” in “*Breeding and Seed Production of Cultivated Plants*”. In 2016 she won a competition and was appointed *Chief Assistant Professor* in the Department of “*Crop Production*” at the KF (now ITF) of the Technical University - Varna. She has a total work experience of 24 years, of which 14 years of scientific and 10 years of teaching.

She improved her qualification by participating in two mobility's *Erasmus+* at the University of “*Gotse Delchev*” - Northern Macedonia, 2018 and the University in Foggia – Italy, 2019. She has three participations with scientific reports at international forums and one at a national conference, after acquiring the educational and scientific degree Ph “*Doctor*”. In her scientific work she uses English and various statistical programs.

2. General description of the presented materials. The candidate has submitted for review total of 32 scientific works, 4 teaching aids, and a list of 13 research projects. 27 scientific works, that are outside the dissertation, are accepted for review and are taken into account in the final evaluation, 4 teaching aids and 13 research projects. 5 scientific papers on the dissertation are not reviewed. Scientific

works for review include 1 habilitation monographic work and 26 scientific publications, of which:

- **13 pcs.** in referenced and indexed journals in world-renowned scientific information databases (*Web of Science* and *Scopus*), the indicator **G 4.7**;

- **13 pcs.** in non-refereed scientific peer-reviewed journals, the indicator **G 4.8**.

The submitted *Reference for the Minimum Requirements for "Associate Professor"* (*Appendix No.5.1*) shows that Ch. Ass. Prof. Nadia Daskalova, PhD covers the *Minimum National Requirements* and additional requirements of the ITF of TU - Varna, for the academic position "*Associate Professor*".

According to group of indicators "A" - at least 50 points. Indicator 1.1 - Defensived dissertation for the award of educational and scientific degree Ph "Doctor" on the topic: "Selection in synthetic hexaploid wheat and hybrids for improving of some breeding traits" year of defense: 2015 (Appendix No.4 - copy of the Diploma for PhD).

According to group of indicators "B" - Habilitation work - Monograph - at least 100 points. Indicator B 3.3. - Monograph on the topic: "Production of synthetic amphiploids in the group Aegilops-Triticum-Secale-Dasypyrum and their application in the home wheat breeding". Authors: Daskalova, N. and P. Spetsov, year of publication - 2020, ISBN 9786192410964, 151 pages. (Appendix No.5.1 - Monograph, Indicator 3.3 and Appendix No.6.1 - List of Scientific Papers participating in the Competition, Indicator 3.3) A separation Protocol is presented, the participation of Ch. Ass. Prof. N. Daskalova PhD is 70% (Appendix No.5.2 - Separation Protocol).

According to group of indicators "G" - at least 200 points accumulated by the indicator publishing activity. The total number of points based on evidence is 203.4.

*According to indicator G 4.7. Ch. Ass. Prof. Nadia Daskalova PhD presented 13 scientific publications, of which 9 in English and 4 in Bulgarian (Appendix No.5.1, Indicator 4.7 and Appendix No.6.1, Indicator 4.7). Of these, **8 publications are in world renowned foreign scientific journals, with IF, in a scientific information database Web of Science** (Nos.1-3 and Nos.5-9). The other **5** issues are published in Bulgarian journals, which are also *in the world databases (Web of Science and Scopus), but do not have IF* (No.4 and Nos.10-13).*

*According to indicator G 4.8. 13 publications are presented, of which **8 pcs. in Bulgarian** and **5 pcs. in foreign scientific journals** (Appendix No.5.1, Indicator 4.8 and Appendix No.6.1, Indicator 4.8).*

Group of indicators "D" - at least 50 points, accumulated according to Indicator 5.13 and Indicator 5.15 - Citations. The total number of points for this group of indicators is 190 - 3.8 times above the minimum.

Indicator 5.13 lists **11 citations in the world databases**, of which **5 pcs.** are in articles in **journals with IF**; **1 pc.** is in chapter of book; **3 pcs.** are in articles in the **Scopus database**; **1 pc.** of **Web of Science** and **2 pcs.** are in **Web of Science** conference articles (*Appendix No.5.1, Indicator 5.13 and Appendix No.5.4, Indicator 5.13 - List of citations*).

According to Indicator 5.15. - **5 citations** are indicated, **4 pcs.** in foreign non-refereed scientific peer-reviewed journals and **1 pc.** in a dissertation thesis (*Appendix No.5.1 and Appendix No.5.4, Indicator 5.15*).

Ch. Ass. Prof. Nadia Daskalova PhD presented **4 teaching aids - 1 textbook** "*Handbook of Herbology*", 2017 and **3 handbooks** for laboratory and practical training (*Appendix No.8.2 - List of teaching aids and books*).

3. General characteristics of the research and scientific-applied activity of the candidate. Ch. Ass. Prof. N. Daskalova PhD has participated in the development of **13 projects**, 11 at TU-Varna and 2 at DZI - General Toshevo (*Appendix No. 8.4 - List of projects*). Of the projects (11) at TU-Varna, 10 are internal, targeted by the state budget one is implemented with the financial support of the *Operational Program "Development of the Competitiveness of the Bulgarian Economy"*. The projects with №1, 2, 3, 6 and 7 contain materials, object of the research interests of candidate. The first project – No.1 to DZI - General Toshevo (*Appendix No.8.4, II - List of projects*) is international, funded by the *International Atomic Energy Agency - Vienna*, the second is national.

The main direction in her research work is related to remote hybridization (interspecific and intergeneric) in wheat, in order to obtain hybrids and amphiploids, and their application in selection. The scientific production of Ch. Ass. Prof. Nadia Daskalova PhD includes research in the following current areas of selection:

- Studies related to the cross-ability of wheat with its related species in the *Triticinae* group to obtain fertile hybrids;
- Derivation and characterization of synthetic amphiploids as a valuable starting material for the selection of common wheat and *triticale*;
- Application of created AFP in the selection of high-yielding and quality lines of bread and durum wheat, with resistance to environmental stressors;
- Biochemical studies - genetic diversity and composition of high- and low-molecular-weight glutenins and gliadins in AFP and synthetic lines, and electrophoretic studies of reserve endosperm proteins in *Ae. tauschii* (2n=14, DD);
- Creation of low-stemmed inbred rye lines for application in the selection of wheat and *triticale*;
- Selection of einkorn (*Triticum monococcum* and *Triticum sinskajae*).

4. Assessment of the pedagogical training and activity of candidate.

According to Indicator J 7.29. From the submitted Reference for Minimum Requirements for “Associate Professor” (*Appendix No.5.1*) the necessary auditorium employment has been provided - lectures on the scientific discipline “*Phytopharmacy*” (from 2016-2017 to 2020-2021) with a hourly rate of **78 teaching hours**, of which **62 teaching hours** are for the last three years.

Laboratory work and practical training were conducted with full-time and part-time students from *Bachelor’s Degree, Agronomy* and *Master’s Degree*, in Master’s Programs “*Production of sowing and planting material*” and “*Seed Production and Plant Protection*” in various important agronomic disciplines: *Crop production* - three parts; *Plant protection* - four parts; Selection and seed production of cultivated plants; *Genetics and Biotechnology, Phytopharmacy, Entomology* and *Phytopathology*. Lectures on “*Phytopharmacy*” have been given for students graduating with a Bachelor's degree in another professional field (*Appendix No.8.1 - Report on teaching and research activities*).

Ch. Ass. Prof. N. Daskalova PhD has developed **6 training programs** (*Appendix No.8.3 – Developed training programs*), **2 pcs.** for *Master’s Degree* and **4 pcs.** for *Bachelor’s Degree*, in 4 different disciplines: training program “*Phytopharmacy*” for *Master’s Degree*, included in the curriculum of specialty “*Seed production and plant protection*” and “*Production of seeds and planting material*”; training programs on: “*Training practice - Plant Protection*”, “*Production practice – Crop Production*” “*Phytopharmacy*” and “*Production experience*”, for *Bachelor’s Degree*, included in the curriculum of specialty “*Agronomy*”.

5. Main scientific and applied scientific contributions. I accept the contributions indicated by the candidate. The main contributions include the following:

SCIENTIFIC CONTRIBUTIONS

1. It has been found that common winter wheat crosses relatively easily with species of the genus *Aegilops*. The embryo rescue method has been used successfully to obtain hybrid plants with species of *Triticum, Aegilops* and *Secale* (*Publications Nos.1a, 9a and Monographic work, to the 3rd group - proving with new means of essential new aspects*);
2. “Amphiploid × wheat” crosses have been found to have advantages over the reciprocal combination: they had better seed germination and more viable hybrid plants without embryo rescue (*Publications Nos.4, 2a, 9a, to the group 4 – new methods and technologies*);
3. Synthetic amphiploids, products of interspecific and intergeneric hybridization in the group of bread wheat including *Triticinae*, were characterized by basic

morphological and biological traits important for the selection of common and durum wheat (*Monographic work, to the 3rd group - proving with new means of essential new aspects*);

4. New 27 amphiploids with species of the genus *Aegilops*, 6 synthetics, 4 forms of *triticale* (selection in octaploid populations) and 3 samples with the participation of *Dasypyrum villosum* were obtained and studied (*Monographic work, to the 3rd group - proving with new means of essential new sides*);
5. By backcrossing of AFPs/*Triticum aestivum* varieties, addition and replaced lines were obtained (from *Ae. Ovata*) (*Monographic work, to the 3rd group - proving with new means of essential new aspects*);
6. New data have been obtained for the wild diploid species *Aegilops tauschii* ($2n=14, D^1D^1$) as a valuable donor of unique alleles encoding reserve proteins of interest for selection, other than those in bread wheat (*Publications Nos. 2, 3, 5a, 6a, 7a, 8a, 11a, 13a and Monographic work, to the 3rd group - proving with new means of essential new aspects*);
7. New subunits (1Dx2+1D11 and 1Dx4+1Dy10.1) have been found in hexaploid amphiploids (*Triticum dicoccum/Aegilops tauschii*) originating from the wild species *Aegilops tauschii*, which can be used as a new genetic plasma to improve the quality of wheat (*Publication No.3, to the 4th group - new methods, compositions and technologies*).
8. Transfer of new proteins from synthetic hexaploid line - SHW-530-1 (*Triticum dicoccum/Aegilops tauschii*) has been made to two varieties of bread wheat Albena and Slavea (*Triticum aestivum*). A unique gliadin was found that is not expressed in both parents (*Publication No.6, to group 4 - new methods, compositions and technologies*).
9. High polymorphism of high molecular weight proteins of amphiploids with G genome inherited from *Triticum timopheevii* ($2n=28, GGAuAu$) was found. New allelic variants have been identified in Clu-G1 of synthetic wheat that are not typical for *Triticum aestivum* (*Publication No.8a, to group 4 - new methods, compositions and technologies*).
10. By applying the PAGE phoresis, 7 main protein fractions for the rye high molecular weight secalins were established, of which 2r (single) and the pair 5.3r+7r were published for the first time (*Publications Nos. 9, 13, to the 4th group - new methods, compositions and technologies*).

METHODOLOGICAL CONTRIBUTIONS

1. An individual selection was applied in combination with the electrophoretic method of reserve proteins, to create new lines of common winter wheat, with new qualities (*Monographic work, to the 4th group - new methods and technologies*).

SCIENTIFIC AND APPLIED CONTRIBUTIONS

1. Seven high-yielding synthetic wheat lines with the participation of the wild species *Aegilops tauschii* in crosses with tetra- and hexaploid wheat varieties were derived (17O, 17H and 18H from AFP32; 11O and 12H from AFP106; 15O and 13H from AFP107) (*Monograph - new methods and technologies*);
2. Two-grained einkorn lines (*Triticum dicoccum*) were obtained, with the participation of amphiploid 5BAP, resistant to powdery mildew: *N₂G32* resistant to six, *N₂G33* to two and *N₂G34* to five races of powdery mildew (*Publication No.7 - new methods and technologies*);
3. As a result of selection of low-stemmed inbred rye lines, two low (99-101 cm) and one (stem height 126 cm), formed the largest and heaviest seeds, were selected (*Publications Nos.9, 13 - new methods and technologies*).

APPLIED CONTRIBUTIONS

1. Common wheat lines were obtained from the cross *Triticum aestivum* × *Aegilops variabilis* with resistance to fungal pathogens inherited from the wild species (*Publication No.2 - new methods and technologies*);
2. Eight common wheat lines were obtained with the participation of the synthetic amphiploid No.530, comprising a unique gliadin subunit in its genotypes (*Publications Nos.3, 6, 10a and Monograph - new methods and technologies*);
3. Ten durum wheat lines were created with the participation of amphiploid 8BAP, containing the subunit 1Ax2* inherited from *Triticum boeoticum*. Most of them have γ -gliadin 45, for high grain quality (*Publication No.7 and Monograph - new methods and technologies*).

6. Significance of contributions to science and practice. Contributions are definite contribution for development of genetics and selection of cultivated plants, in particular of wheat, and agricultural science. Great progress has been made in exploiting the genetic potential of wild species related to bread wheat. New and unique genes for grain quality, disease resistance and others have been discovered and transferred to the genome of cultivated wheat by previously created and well-studied amphiploids. Research on the polymorphism of reserve proteins in seeds of wild species as well as synthetic lines of cultivated wheat obtained with their participation have an original contributing character. The obtained new forms - amphiploids and synthetic lines represent a valuable genetic reserve, with great potential for future use through its improved protein composition and resistance to stress factors. Many of them carry alleles of the wild species and are rated as resistant to fungal diseases (powdery mildew and rust) and high in protein. The obtained synthetic wheat lines have pronounced selection qualities and could be used as a starting material in the selection and as direct new varieties.

The submitted materials are in the scientific specialty and scientific field of the competition. In general, the Monograph and presented scientific papers have a high scientific and scientific-applied value. The conducted researches are at a high scientific level, and the results obtained have undoubtedly scientific and applied significance.

The scientific publications submitted by Ch. Ass. Prof. Nadia Daskalova PhD show high quality and are recognizable by the International Scientific Community, in the scientific field in which she works. Many of her scientific works have been published and cited in referenced and indexed journals in renowned data basis with scientific information, including with IF. She is *the first author* in the Monographic work and in *10 issues (76.9%)* of the publications under *Indicator G. 4.7.*, which outlines her leading role in their development.

7. Critical remarks and recommendations. I have no significant critical remarks on the presented materials.

8. Personal impressions and opinions of the reviewer. Ch. Ass. Prof. N. Daskalova PhD is ambitious, highly erudite, with multilateral scientific interests, with an individual approach and works well in scientific teams.

CONCLUSION

Ch. Ass. Prof. Nadia Daskalova PhD presents a scientific production the quantitative indicators of which cover and in some cases exceed the *Minimum National Requirements*. Given the relevance and depth of research and contributions to the development of plant genetics and breeding, in particular wheat, and agricultural science, I believe that the candidate meets the requirements of *the Law on Development of Academic Staff in the Republic of Bulgaria* and *the Rules for its implementation* and *the Rules of TU - Varna*, to hold the academic position of "Associate Professor". The overall analysis of the research activity of the candidate, of her academic, professional and teaching experience give me a reason to give a **Positive assessment**.

Based on my acquaintance with the submitted scientific works, their significance, the scientific, scientific-applied and applied contributions contained in, I find reasonable **to propose Ch. Ass. Prof. Nadia Georgieva Daskalova PhD to take the academic position of "Associate Professor"** in the professional direction 6.1 *Crop production* in the scientific specialty "Breeding and seed production of cultivated plants".

Заличена информация
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3.11.2021
Chirpan

REVIEWER:
(Prof. A. Stoilova DSc)