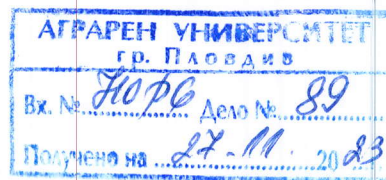


REVIEW



by Prof. Ivan Dimitrov Kiryakov, PhD, Dobrudzhan Agricultural Institute - General Toshevo, District of Higher Education 6. Plant breeding and veterinary medicine, professional direction 6.1. Plant protection, scientific specialty "Plant protection (Phytopathology)", appointed as a member of the scientific jury by Order No. RD 16-902/25.07.2023 of the Rector of the Agricultural University - Plovdiv.

regarding the competition for "Associate professor" in the scientific specialty "Plant Protection (Phytopathology), professional direction 6.1. Plant protection, announced in State Gazette No. 62 of 21.06.2023 with candidate Ch. assistant Neshka Georgieva Piperkova-Kiryakov, PhD.

1. General data about the career and thematic development of the candidate.

In the competition for "Associate professor" in the scientific specialty "Plant Protection (Phytopathology)", announced in State Gazette No. 62 of 21.06.2023 from the Agricultural University - Plovdiv, as a candidate participates Ch. Assistant Neshka Georgieva Piperkova-Kiryakova, PhD, lecture from AU - Plovdiv.

Chief Assistant Neshka Georgieva Piperkova-Kyryakov, PhD, was born on 22.08.1961. In 1987, she acquired the Master's degree at Higher Agricultural Institute "Vasil Kolarov" - Plovdiv, majoring in "Plant Protection". From 1988 to 1999, he was an assistant in the department of "Phytopathology" at AU - Plovdiv, and from 1999 he held the academic position of chief assistant at the same department. In 2013, he obtained the scientific degree "doctor" after successfully defending his dissertation on the topic "A study on peach curl leaf (*Taphrina deformans* /Berk./ Tul.)". He is fluent in written and spoken English and Russian languages. In 1993, she specialized in the University of Bologna, Italy - field of electron microscopy, and in 1994 she took part in a course in Modern Gardening at the University of Leuven, Belgium.

2. General description of the presented materials.

According to the attached list of papers, in the competition for "Associate professor", Neshka Piperkova, PhD, participated with a total production of 27 works, grouped as follows:

- Scientific publications on the nomenclature specialty - 27 items, of which:
 - Publications related to the doctoral dissertation – 3 items, *which are not subject to consideration*;
 - Publications with an impact factor – 6 items, IF=15,765;
 - Publications in peer-reviewed and refereed scientific journals – 11 items;
 - Publications in conference proceedings – 2 items.

The personal participation of Neshka Piperkova, PhD, in the mentioned works is illustrated by the fact that 3 are independent, in 7 he is the first, in 5 he is the second, and in the remaining 9 he is the third and subsequent author.

- Study guides – 2 issue (co-author).

To prepare the opinion, 24 items are subject to analysis.

I consider it necessary to point out that the candidate covers the minimum number of points required by the Law on the Development of the Academic Staff in the Republic of Bulgaria for the occupation of the academic position "Associate professor" in the field of higher education 6. Plant breeding and veterinary medicine, as the total number of points from the mandatory indicators amounts to 594.8 with a required 400. In any of the groups of indicators, the excess is significant.

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

The main directions of the research activity of Neshka Piperkovap, PhD, are related to diagnosing new or poorly studied phytopathogens for Bulgaria, anatomical changes in the host as a result of pathogen invasion, as well as researching the possibilities of using some plant extracts and antagonists as biopesticides. This enables the candidate to be involved in the development of a National project under the "Healthy Foods for a Strong Bioeconomy and Quality of Life" program, as well as in an international project related to the integrated protection of plants in the conditions of climate change. During the period 2017 - 2019, the candidate is the head of a project financed by AU - Plovdiv. Participation and/or leadership in these

projects is a certificate of the candidate's professionalism, his ability to work in scientific teams and lead research projects.

4. Evaluation of the pedagogical preparation and activity of the candidate. Its role in the training of young scientific personnel.

The teaching experience of Neshka Piperkova, PhD, dates back to 1988, as an Assistant in the Department of Phytopathology at AU - Plovdiv. The total number of hours (lectures, exercises and extracurricular activities) for the period 2018-2023 amounts to 3130.7.

He is the supervisor of more than 25 graduates who have successfully defended their diplomas in the OCS "Bachelor" and OCS "Master".

I consider the above information to be reliable evidence regarding the applicant's teaching experience.

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

The significance of the scientific research of the Neshka Piperkova, PhD, in the field of plant pathology is confirmed by the significant number of citations (40 items) in publications printed in scientific journals, with over 70% of them published in publications indexed in the world database SCOPUS. The total number of works cited is 8, and in 4 of them the candidate is the lead author.

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.

Following the scientific works submitted for review, four main directions can be formulated in the research of Neshka Piperkova, PhD: i) Diagnosis and determination of the etiology of poorly researched or new phytopathogens for Bulgaria; ii) Clarification of pathological changes in the plant-pathogen system; iii) Determination of the potential of some essential oils and antagonists with a view to their use as biopesticides in the control of fungal phytopathogens; iv) establish the

efficacy of some fungicides to control fungal pathogens. These studies are closely related to the scientific specialty for which the competition is announced. The contributions of the candidate's research work can be formulated as follows:

Contributions of a strictly original character

- For the first time in our country, the causative agent of black root rot (black foot) on vine and plum *Dactylonectra pauciseptata* was identified (*Publication 1*). The identification of the pathogen is based on the morphological and cultural characteristics of the isolates, their pathogenicity, as well as by applying DNA-based technologies for sequencing part of the histone *H3* gene;
- For the first time in the scientific literature, a virus provisionally designated *Cherry virus Trakiya* was reported in cherry (*Publication 3*). The virus was identified using next-generation sequencers (NGS) of total RNA, resulting in its assignment to the order *Picornavirales*. The symptomatology of the virus is described, as well as the genomic organization of the isolated two-cystone virus;
- Powdery mildew symptoms were observed for the first time on Myrobalan 29C (*Prunus cerasifera* Ehrh.) rootstock (*Publication 9*). Based on the morphological features of the isolates and their pathogenicity, the pathogen was assigned to the genus *Podosphaera*, suggesting that it may be *Podosphaera tridactyla*, but the authors recommend that definitive identification be based on DNA-based methods for which samples were taken;
- For the first time in Bulgaria, an announcement was made about the manifestation of stem shells and leaf spotting on American blueberry (*Publication 14*). Based on the cultural characteristics, morphological features and pathogenic test, the causative agent of the disease was assigned to the genus *Pestalotiopsis*. The authors envisage further molecular studies for definitive identification of the species.

Contributions of a confirmatory and scientific-applied nature

- Changes in several biochemical parameters were studied in *Taphrina deformans*-infested and non-infested plant parts of peach plants (*Publication 2*).

It has been proven that the established changes are characteristic not only of plant parts colonized by the pathogen, but also of non-infected organs. These results confirm the opinion of other authors from the world literature about the systemic nature of the development of the pathogen;

- The antagonistic activity of *Trichoderma viride* (isolate Tr 6) was confirmed against *Macrophomina phaseolina* and *Fusarium* spp. (Publication 8). A good antagonistic activity of *Trichoderma viride* was found against the saprophytic form (yeast-like) of *Taphrina deformans*, which can be considered as an original contribution (Publication 13);
- Moderate antimicrobial activity of essential oils extracted from 4 *Juniperus* species was found against *Fusarium* spp., *Botrytis cinerea*, *Colletotrichum* spp., *Rhizoctonia solani* and *Cylindrocarpon pauciseptatum* (Publication 4). Weak antifungal activity of the investigated essential oils of 7 species of the genus *Hypericum* was found against *Fusarium* spp., *Botrytis cinerea*, *Colletotrichum* spp., *Rhizoctonia solani* and *Aspergillus* sp., which confirms the opinion of other authors (Publication 5);
- Anatomical changes occurring in leaves after tissue colonization by *Taphrina deformans* are described (Publication 6). TEM analysis of the mesophyll cells of healthy and *T. deformans* infected peach leaves showed significant ultrastructural differences (Publication 7). Pathogenic hyphae penetrate the expanded middle lamella, enter the cell walls of infected plant cells and affect their structure. Strong destructive processes leading to unbalanced growth and changes in the shape of colonized cells, as well as degradation of chloroplasts, were found. The observed ultrastructural changes are associated with the disruption of the function of the mesophyll cells and lead to rapid aging and death of the leaves;
- The research carried out on the changes in some physiological parameters of the leaves of the Fayette variety infected with *T. deformans* show that the pathogen has a strong influence on their physiological status - increased water content and water potential, preservation of the transpiration rate, strong inhibition of the general photosynthesis, increased content of phosphorus and potassium, etc. (Publications 15 and 16);
- In vitro tests were conducted to determine the efficacy of a range of fungicides against *Macrophomina phaseolina* and *Fusarium* spp. (8), *Gleosporium*

amygdalinum (11), the saprophytic form of *T. deformans* (13). The presented results have a strict practical orientation.

7. Critical notes and recommendations.

I have no objections to the scientific works submitted to me for review.

8. Personal impressions and opinion of the reviewer.

My personal impressions regarding the candidate's career development are the result of the presented scientific output and academic references. I believe that Neshka Piperkova, PhD, is a highly qualified scientist and teacher in the field of Plant Protection. In support of this opinion, I can point to the significant contributions of an original nature, appreciated by the scientific community at home and abroad, through the significant number of citations.

CONCLUSION

Based on the analysis of the pedagogical, scientific and scientific-applied activity of the candidate, I believe that Ch. Assistant Neshka Georgieva Piperkova-Kiryakova, PhD, meets the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its Implementation and the Regulations for Implementation of the Agrarian University.

Based on the scientific production presented, highly appreciated by the scientific community at home and abroad, the rich teaching experience in the professional field of Plant Protection, the significant number of successfully defended diplomas, the participation and/or management of national and international scientific projects give me reason to rate **POSITIVELY** all her activity.

I take the liberty of proposing to the members of the respected scientific jury to vote **positively**, and the Faculty Council of the Faculty of "Plant Protection and Agroecology" of the Agricultural University - Plovdiv to elect **Neshka Georgieva Piperkova-Kiryakova** as "**Associate professor**" in the scientific specialty Plant protection (phytopathology).

03.11.2023

DAI – General Toshevo

REVIEWER:


/Prof. Ivan Kiryakov, PhD/