



REVIEW

of the materials for participation in the competition for the academic position "Professor", field of higher education 6. Agrarian Sciences and Veterinary Medicine, professional field 6.5. "Forestry", scientific specialty „ Forest Melioration, Forest Protection and Special Forest Uses “, in the discipline "Forest phytopathology", announced by the University of Forestry, SG. pcs. 37/ 05/07/2019, Procedure Code: ELA - P - 0419 - 08.

Candidates for the competition are:

1. Assoc. Prof. Sonya Hristova Bencheva

Reviewer: Anelya Zhivkova Pencheva PhD, professor in professional field 6.5. "Forestry" - University of Forestry, Sofia

1. Short biography of the candidate

Associate professor S. Bencheva graduated from The University of Forestry (Higher Institute of Forestry in this time) in 1982 and has since acquired the professional qualification of a Forestry engineer specializing in Ecology and Environmental Protection. Immediately after graduation, she started working as an environmental specialist at the Municipality – Cherven Bryag from 1982 – 1984 and subsequently as a research assistant at the Experimental Station for Rapidly Growing Forest-Tree Species – Svishtov from 1984 – 1996.

She joined the University of Forestry in 1996 as an assistant professor with an emphasis on Forest Phytopathology and Fundamentals of Plant Protection at the Department of Plant Pathology. In 2001 Assoc. prof. S. Bencheva defended her dissertation on "Studies on the Growth and Sustainability of Poplar Branches with an emphasis on Early Selection " and received a PhD degree. She earned the title of Associate Professor of "Forest Melioration, Forest protection and Special Forest Uses" in 2003. Since March 7, 2016, Assoc. Prof. Bencheva has been Head of Department of Plant Pathology and Chemistry. She is a member of the Academic Council of the University of Forestry for the 2016 – 2019 term.

Assoc. prof. Bencheva is bilingual in Russian and English. She has participated in a number of scientific and educational projects, has excellent computer practical skills and holds a diploma in pedagogical competence in the field of forestry. She is a member of the Bulgarian Union of Scientists, a member of the National Forestry Commission of the Executive Forest Agency, as well as of ICP Forests / Expertlist /.

2. Compliance of the submitted documents and materials of the applicant with the requirements in accordance with the Rules for the development of academic staff in the UF;

The number and quality of the presented materials set forward by the applicant fully comply with the requirements as presented in the Rules of the UF for the the academic position of Professor. The articles in refereed and indexed journals authored by Assoc. Prof Bencheva are indicative of her academic contributions to the field of forest protection. This is further

attested by the applicant's active participation in conferences and scientific committees, lectures before professional societies, published textbooks and scientific papers reviews, etc. all which all speak to the outstanding professional qualities of Assoc. Prof. Bencheva.

3. Assessment of the applicant's educational activities

The educational and pedagogical contribution to the field of forestry of the applicant is extremely diverse. In recent years, Dr. Bencheva has held lectures in the following disciplines:

- Forest Phytopathology (Bachelor degree Forestry).
- Forest Protection (Master degree Forestry).
- Integrated Methods of Plant Protection (Master degree Ecology and Environmental Protection).
- Forest Protection Control and Organization (Master degree Business management).
- Introduction to Plant Protection (Bachelor degree Ecology and Environmental Protection).
- Sustainable Land Use (Master degree Ecology and Environmental Protection).
- Ornamental and Forest Plant Pests (Master degree Plant Protection)
- Basics of Agroforestry (Bachelor degree Forestry)
- Agroforestry Systems (Master degree Forestry).

The information provided shows that the applicant's annual duty hours in the period 2004 -2019 vary between 390 and just over 500 hours. She is dedicated to teaching and mentoring both graduate and undergraduate students, having successfully mentored 66 students who have completed their academic work under her direction as of 2018/ These include the following:

- Bachelor degree Forestry – 24 students; Master degree Forestry – 39 and another 3 from Ecology and Environmental Protection and Plant protection.

She also directs two PhD part-time students, one of whom graduated in the past year and the other expected to graduate in 2020.

In 2014, Assoc. Prof. S. Bencheva participated as an invited lecturer in conducting specialized courses for practical training of BFSA management related to the organization of effective phytosanitary control in our country.

In her education approach, the candidate uses modern training technologies and has overseen the construction and equipment of a Phytopathology laboratory in the new building of the UF. In her daily work she expresses a keen desire to improve and update the educational materials with innovations in forest protection practice and phytopathology. Proof in this regard are the textbooks authored by Assoc. Prof. Bencheva, incorporating the achievements of modern forestry science. She should also be commended on her persistence in the introduction of the new discipline of Agroforestry for the UF.

4. Assessment of the applicant's scientific, applied and publication activities

4.1. Participation in scientific, applied and educational projects

Among the most notable projects of the applicant since 2005 stands out her annual participation in the team carrying out the "Evaluation and Monitoring of Forest Ecosystems – Level I and II within the project " FUTURE DEVELOPMENT AND CONSTRUCTION OF A UNIFIED MONITORING SYSTEM FOR FORESTS" program. The database created as a result makes it possible to characterize comprehensively the processes related to the dynamics of the phytosanitary status of forest ecosystems – defoliation and staining of leaves, drying of individual trees or plantations, damage by fungal pathogens, phytophagous insects,

fires, pollution et al. Her work has directly laid the groundwork for national and international management decisions regarding the conservation of forest ecosystems.

The applicant's scientific activity also includes three other projects, the data of which are included in the presented monograph: "Species diversity of saproxylic organisms in the Bistrishko Branishte Biosphere Reserve" /2008/; "Impact of anthropogenic and biotic factors on the phytosanitary status and bioproductivity of beech forests" /2008 – 2010/ and "Reserves and role of dead biomass in forest ecosystems of common beech in the Western Balkan" /2016 – 2017/.

The candidate's involvement in research and education projects has undoubtedly enriched and deepened her knowledge in the subject area, which is essential for her development as a scientist and lecturer.

4.2. Characteristics of published scientific results

The candidate, Assoc. Prof. S. Bencheva has presented a list of 65 scientific and 17 popular science publications. The list of publications concerning this application includes 39 scientific papers, distributed as follows:

- Independent monograph – 1 pc.
- Publications in scientific journals indexed in world-famous databases – 6
- Publications in peer-reviewed journals or papers printed in edited volumes – 22 issues.
- Studies published in edited volumes – 2 pieces
- Published chapters of collective monographs – 4 items
- Textbooks and study aids – 4;

From the submitted scientific papers for the competition, 13 have been published in English and the rest in Bulgarian. Nine of the publications are independent, 8 with one contributing author and 22 are with two or more contributing authors. Assoc. Prof. S. Bencheva is the first author in 7 of the collective publications.

Outside this list remains the applicant's considerable scientific activity related to attending conferences with unpublished papers or posters, two of which are in highly prestigious forums – The 1-st World Congress of Agroforestry – Working Together for Sustainable Land Use Systems. 27 June – 2 July, 2004, Orlando, Florida, USA and Forestry & Bridge to the Future, Sofia, 6 – 9 May, 2015.

Dr. Bencheva is consistent in her research, with a strong interest in macromycetes. The selected topics are relevant for forest protection practice, given the role of wood destroying fungi in the process characterizing the negative changes in the health forest status. The focus of her research is the development of macromycetes and their host plants, in the context of other components of the forest ecosystem.

Another significant aspect of the candidate's research is her work on the bark necrosis diseases of poplars and others forestry and fruit plants. The applicant's involvement in a number of scientific and applied projects has greatly helped to broaden her scope of research and to collect significant biological material, which is reflected in her scientific publications

The results from these studies are the subject of monograph work developed by the applicant. The most part of the presented and commented results in monograph included original data and interpretations.

4.3. Candidate's scientific activity in the literature (citation)

In the provided materials Dr. S. Bencheva includes a total of 63 citations by other authors of 24 of her scientific works. Of these, 21 are in publications from journals, referenced and indexed in world-renowned databases of scientific information, 11 of which are in journals with a significant for our scientific area factor / IF /.

All known citations are carefully accompanied by supporting evidence. The citations

presented by the applicant exceed more than 3 times the requirements indicated in the scientometric indicators for the position of professor at the University Forestry. Their number indicates the appreciation of the professional society for the scientific creativity and knowledge of the applicant.

4.4. Candidate's contributions (scientific, scientific-applied, applied)

Given her all-encompassing work in the last 15 years, her contributions are very broad and affect in multiple areas including forest phytopathology, forest entomology, and forest plant protection. I will review and organize them in the following categories: original scientific contributions, scientific contributions clarifying and explaining existing data, and scientific-applied contributions.

Original contributions

Two pathogens - *Cryptostroma corticale* (Ellis & Everh.) Greg. & S. Waller, the causal agent of bark necrosis of *Acer platanoides* L., and *Delphinella abietis* (O. Rostr.) E. Muller fungus associated with the *Abies alba* Mill needles are recorded for the first time in Bulgaria. The fungus *Ramularia ligustrina* Maubl, settled on *Ligustrum vulgare* L., is also a new described pathogenic species in the country. Novel data on distribution, biology, and ecology of these fungus are presented. The results from studies of the factors that influence the appearance and spread of the pathogens are analyzed in detail. The potential danger of occurrence of new diseases within the territory of the country has been estimated (Publ. 5, 7, 13).

Damage from Apple scab (*Venturia inaequalis* (Cooke) Aderhord) is established on a novel host in Bulgaria – *Sorbus aria* L. This line of work leads to the conclusion that accumulation of infectious background on the new host can increase the risk for the country's orchards. (Publ. 12)

The summarised data on mycotic diversity, including diversity within the group of wood-decay macromycetes, in addition to some ascomycetes associated mainly with bark necrosis in fruit orchards and forest are a significant contribution. Through these studies Assoc. Prof. Bencheva enriches the knowledge of the taxonomy, trophic relationships and the spread of parasitic and saprotrophic fungi in Bulgaria. (Publ. 1, 15, 16, 17, 18, 19, 20, 23, 28, 34)

The following insects are reported as novel to the entomofauna of Bulgaria:

Callidium coriaceum Paykull (Coleoptera:Cerambycidae) (Publ. 3);

Histeromerus mystacinus Wesmael. The species, as well as the subfamily Histeromerinae Fahringer and the genus Histeromerus Wesmael, are reported for the first time of the Balkan Peninsula. (Publ. 4)

Medetera pinicola Kowarz (Diptera, Dolichopodidae) and *Lonchaea fugax* Becker (Diptera, Lonchaeidae. The entomophagous insects are isolated from *Ips typographus* L. and are novel to the fauna of Balkan Peninsula. (Publ. 6)

The studies of the ophiostomatoid fungi causing stain of conifer sapwood, and their association with Ips bark beetles on *Pinus sylvestris* (Publ. 22), are pioneering in our country.

Scientific contributions enriching existing data

The species composition and structure of the wood destroying and saproxil fungus in forest ecosystems are clarified. The studies encompass poplar silviculture (Publ. 27, 29), conifers (Publ. 26), beech (Publ. 20), oak and common hornbeam (*Carpinus betulus* L.) forests (Publ. 20, 30, 31, 35.) Specific data on common pathogens causing bark necrosis /from the genera *Cytospora*, *Phomopsis*, *Fusarium*, *Gibberella*, *Dothichiza*, *Pleospora*, *Pestalotiopsis*, *Platystomum* and *Cryptosphaeria*/ are also provided. The conclusions are based primarily on studies of the pathogen occurrence, distribution, and economic significance in poplar and other

plantations created in Bulgaria.

Other significant contributions in this category include the reports of novel trophic connections and new reservoirs of mycotic species and members of the entomofauna of Bulgaria.

Further contributions include laboratory-controlled infections of *Populus* × *euramericana* cv. Agathe saplings with pathogenic fungus *Cytospora chrysosperma* and *Fusarium oxysporum* isolates. The analysis of this work clarifies the difference in pathogenicity between the two species of fungi. (Publ. 24)

Additionally, the growth of *P.* × *eur.* cv. Agathe and *P.* × *eur.* cv. I - 45/51 in different river site vegetations has been described. When growth trends are compared the more robust features of *P.* × *eur.* cv. I 45/51 when grown on river floodplain become evident. Recommendations for the optimal growing conditions of the poplar cultivars are made based on the above work. (Publ. 24)

Five entomophages of *Ips typographus* (Linnaeus) (Coleoptera: Curculionidae, Scolytinae) were recorded between 2008 – 2014 in spruce forests in three Bulgarian mountains (Vitoshka, Lyulin and Western Rhodopes). (Publ. 6)

The host plants of xylophagous longhorn beetles (Coleoptera: Cerambycidae) in Vitoshka Nature Park and the Bistrisko Branishte Biosphere Reserve were studied in detail and analyzed (Publication 21).

Scientific-applied contributions.

They are primarily related to recommendations for a number of forest protection measures aimed at minimizing damage from the wood destroying fungi. Specific disease management practices including prevention, cultural and genetic tactics, physical and mechanical methods based on ecological principles are provided. (Publ. 26 and others)

I would also like to add Dr. Bencheva's contribution in the transfer of knowledge on agroforestry management practices in Bulgaria. Her publications on the topic consist of comprehensive analyzes of the current knowledge and experience in this novel integrated type of crop production. (Publications 2, 8, 9, 10, 11, 14, 32 and 38) As a result of her work in the field the new discipline of Agroforestry was established at the University of Forestry.

5. Assessment of the applicant's personal contribution

I am convinced of the personal contribution of Dr Bencheva in the materials presented to me. I am a witness to the fact that the major part of the publications is based on the biological materials collected in extensive field work and analyzed at the Phytopathology laboratory at the Forestry University.

6. Critical notes and recommendations

The materials reviewed exceed the requirements for the rank of professor as defined by the Forestry University based both on their quality and quantity. I have no major critical remarks. I would recommend that Assoc. Prof. Bencheva focuses on her current results and considers the impact of anthropogenic pollution and abiotic factors on saproxylic insect and macromycetes. Since most concepts about forest decline are hypothetical the suggested analysis has the potential to answer some of the most relevant problems in plant protection.

7. Personal impressions

I know Dr Bencheva since her appointment at the Forestry University. I consider her a well-respected and meticulous lecturer who demonstrates an exemplary level of professionalism in her duties. She is a very attentive and careful colleague.

Assoc. Prof. Bencheva approaches her scientific work very responsibly, strives for precision, and is very methodical in her choice of topics and a team. She has a personal interest in photography and her skills there allow her to use original photo materials for her publications.

8. Conclusion

It is evident that the candidate is a well-rounded scientist and lecturer with comprehensive specialized skills and knowledge in forest pathology and forest plant protection. My review of her scientific contribution leads me to the conclusion that the volume and content of her work meet all the requirements for the academic title of Professor of Forest pathology, as defined by the University of Forestry policy.

I recommend that the candidate Assoc. Professor Sonya Hristova Bencheva be promoted to a Professor of in the discipline "Forest phytopathology", professional field 6.5. "Forestry".

The review was submitted on:10.9.2019 г.

Reviewer's signature: