REVIEW

on the materials for participation in a competition for occupation of academic position "Associate Professor" in scientific field 6. Agricultural sciences and veterinary medicine, in professional direction 6.5. Forestry, scientific specialty „Silviculture, including Dendrology", subject "Dendrology", announced by the University of Forestry in State Gazette No102 on 7 December 2021, code of the procedure: **FOR-AsP-1121-77**.

Applicant to participate in the competition: **Senior assistant Evgeni Ivanov Tsavkov, PhD**

Prepared the statement: **Prof. Dimitar Petkov Pavlov, DSc,** pensioner, field of higher education 6. Agricultural sciences and veterinary medicine, professional direction 6.5. Forestry, scientific specialty „Silviculture, including Dendrology", nominated for a member of the scientific jury by the rector of the University of Forestry according to order №3ПС-42/04.02.2022.

1. Short biography of the applicant

Evgeni Tsavkov was born on 21 August 1970. Graduated secondary school "St. Kliment Ohridski" in his birthplace Silistra in 1988. Between 13 September 1988 and 24 August 1989 is in the Military School for Reserve Officers "Hristo Botev" in Pleven, specialty engineer in road construction activities. In the period September 1990 – June 1995 he is a student in the Higher Institute of Forestry and Forest Industries (today University of Forestry) and graduates as MSc in forestry. In 2017 he defends his PhD thesis entitled "Morphological and genetic variability of oaks from section *Robur* Reicheb. in Bulgaria" and becomes doctor. The candidate's professional activity begins on 11 October 1995 as a forester at the chair of silviculture in the University of Forestry. His research and lecturer's activity begins since 19 March 1996 as assistant in dendrology, since 1999 is a senior assistant and since 2002 until now – chief assistant in the department of dendrology. He is also a member of the Faculty Council at the Faculty of Forestry (since 2003 until today). Since 1 October 2010 until today the applicant is curator of the museum collection of the University of Forestry.

2. Compliance of the submitted documents and materials of the applicant with those required under the Regulations for Development of Academic Staff at the University of Forestry (RDASUF)

The application documents of Evgeni Tsavkov show that the procedure for the competition has been observed. Presented materials are in accordance with the requirements in paragraph 60 in the regulations for development of the academic staff in the Republic of Bulgaria and their application. The documents are also in accordance with the Regulations for Development of the Academic Staff at the University of Forestry.

The assessment of the conformity of the indices shown in the information with the minimal national requirements for occupation of the academic position associate professor show the following:
Index A – the defended PhD thesis provides the required minimum of **50 points.**
Index B4 – the presented as habilitation work 10 scientific publications in issues, which are reviewed in world-wide scientific data bases, after reduction depending on the number of co-authors, provide **181.07 points.**
Index Г7 – the presented three articles and papers published in scientific issues, reviewed and indexed in world-wide scientific data bases with scientific information, after reduction of the co-authors number, provide **32.5 points.**
Г8 – the presented in this group 30 articles and papers in non-reviewed journals with scientific reviewing and published in collective volumes, after reduction of the number of co-authors provide

115.98 points.
Г10 – the publication presented in this group of studies (published in non-reviewed journals with scientific review and published in reviewed collective volumes) provides **15 points.**
Г11 – the published 7 chapters of monographs, after reduction of the co-authors number, provide **51.87 points.**
Total for group Г - Г7+Г8+Г10+Г11, at minimum requirement of 200 points, brings **215.35 points.**
Index Д13 – the presented 16 citations or reviews in scientific issues, reviewed and indexed in world-wide scientific data base with scientific information or in monographs and collective volumes, provide **240 points.**
In group Д14, the presented 2 citations in monographs and collective volumes with scientific review provide **20 points.**
In group Д15, the presented 2 citations in non-reviewed journals with scientific reviewing provide **10 points.**
Total for group Д - Д13+Д14+Д15, at minimum requirement of 50 points, the candidate has shown citations, which provide 270 **points**.

Total for all indices, at requirement of minimum **400** points**,** the candidate has achieved **716.42** points.

3. Assessment of the applicant's educational activities

Dr. Evgeni Tsavkov has carried out practical exercises in dendrology with students in forestry and ecology and environmental protection. From the academic year 2020/2021, he is a lecturer in dendrology for the BSc students in forestry, both full-time and external degree. He is a co-author of the updated syllabus in dendrology, included in the curriculum 2021 for the students in forestry – both full-time and external degree.

In different periods of his lecturer's activities in the chair of dendrology, he has also participated in the preparation and updating of the subject's curricula for the students in ecology and environmental protection, as well as in the development of the syllabus for the subject dendrology of introduced species for the students in forestry, MSc full-time and external degree.

Senior assistant Tsavkov has developed a course for the distant on-line education in the University of Forestry, which includes full set of educational materials for dendrology. He is a co-author of practical manual in dendrology and ornamental dendrology, as well as of 7 books, manuals and brochures, which support the more efficient education of students and practical workers in the field of forestry and biodiversity conservation. He also takes part in the establishment and facilitation of the scientific laboratory of the chair of dendrology, as well as the university laboratory for biotechnological and molecular-and-genetic studies in agriculture and forestry and veterinary medicine.

The candidate has been a mentor of 4 MSc students and has reviewed 104 diploma works of students in forestry.

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

4.1. Participation in scientific, applied science, infrastructure and educational projects

Senior assistant Tsavkov has participated in the carrying out of 6 international scientific projects: Investigation of populations of oak species in Bulgaria and Romania (Bulgarian-Romanian project, 2009-2011); Close-to-nature and sustainable management of forests (Bulgarian-Swiss project on forests, 1997-2001); Development of sub-alpine forests in Bulgaria under climate changes (financed

by Swiss Research Foundation and the Ministry of Education, Science and Youth; Sensibility of common beech and Norway spruce from the south-east of their occurrence to global climate changes (collaboration programme with Republic of Romania, 2007); Climate and history: dendrochronological, climatic and historical reconstruction of the Bulgarian past 1500-2000 (2011); Integrated investigation of sustainability and management of forests in the Mediterranean region (2014-2018).

The candidate has participated in the development of 4 national research projects financed by the Scientific Fund, of6 research and applied projects financed by other institutions, of 4 projects financed by the University of Forestry according to Regulation №9. As an expert of participates in the development of 8 applied projects.

Senior assistant Tsavkov has participated in 11 national and international research and educational projects, which contribute to the efficiency of his scientific and lecturer's activities. The candidate has participated with 9 reports in national scientific forums and 28 reports in international scientific forums. He has also published 28 scientific-popular articles.

4.2. Characteristics of published scientific results

The total number of presented publications for participation in this competition is 51, from which 15 – in scientific journals, 29 – in proceedings of scientific forums and 7 monograph chapters. According to various indices, they are classified in groups as follows:

Importance: Publications in journals with impact-factor – 2; publications in reviewed foreign journals – 1; publications in reviewed Bulgarian journals – 9; publications in non-reviewed journals – 3; publications in proceedings from national scientific forums – 8; publications in proceedings from international scientific forums – 21.

Place of publication: Articles in international journals – 6; reports in proceedings of international scientific forums – 22; articles in national journals – 8; reports in proceedings of national scientific conferences, sessions and seminars – 7; reports in scientific works of universities and institutes – 1.

Language of publishing: Bulgarian – 18; foreign – 33.

Number of co-authors: individual – 3; with one co-author – 17; with two co-authors – 15; with three and more co-authors – 16.

The published results from investigations are grouped into the following fields:

1. Investigations on the dendroflora of Bulgaria – B4.1, B4.2, B4.4, B4.5, B4.6, Г8.15, Г8.16, Г8.10, Г8.11, Г8.26, Г8.28, Г8.2, Г8.21, Г8.22, Г8.24, Г8.9, Г8.17, Г8.1, Г8.23.

2. Dendrological aspects of introduction and afforestations with tree species in Bulgaria – B4.9, Г8.5, Г8.6, Г11.6.

3. Dendrochronological investigations in coniferous forests – B4.3, B4.7, Г8.7, Г8.12, Г8.13, Г8.12.

4. Investigations on variability and genetic diversity of tree species – B4.3, Г8.7, Г8.13, Г7.3.

5. Ecological investigations and biodiversity conservation – Г8.3, Г8.4, Г11.1, Г11.2.

6. Possibilities for application of historical analysis in dendrology and silvicultutre – B4.7, Г10.1, Г11.3, Г11.4, Г11.5.

7. Investigations on anatomical features, physical indices and chemical composition of wood – B4.8, B4.10, Г8.19, Г8.20, Г8.25.

8. Investigations on using of modern information technologies in education in dendrology – Г7.2, Г8.14, Г8.24.

4.3. Reflection of the applicant's scientific activity in the literature (citations)

The candidate has determined 82 citations of his publications, from which 43 – of 20 publications in scientific issues reviewed and indexed in world-wide data bases with scientific information, 29 citations of

16 publications in monographs and collective volumes with scientific reviewing and 10 citations of 4 publications in non-reviewed journals with scientific reviewing.

4.4. Contributions in the applicant's work (scientific, applied)

Scientific

In the field of widening of scientific knowledge, the following achievements are assessed:

The multifunctional data base for tree plants from the Bulgarian flora established with participation of the candidate. The determined medicinal (B4.1), melliferous (B4.4), as well as calciphyllic (B4.5) species of the Bulgarian dendroflora. The calciphyllic species are divided into obligate and facultative, with enclosed lists of species (Г8.15 and Г8.16).

The analysed dendroflora in various floristic regions and protected territories according to various indices (systematic structure, life forms, biological types, phytogeographic elements, occurrence of species according to altitude above sea level, conservation significance of species) – Strandzha (Г8.10), Rhodopes (Г8.11), Vitosha (Г8.26), Pirin (Г8.28), nature park Zlatni pyasatsi (Г8.2), reserve Chervenata stena (Rhodopes) (Г8.21, Г8.22 и Г8.24). The dendroflora in the mountain regions in Bulgaria was analysed in two aspects – medicinal plants in mountains (Г8.9) and high-mountain denrdoflora (Г8.17).

Dendrofloristic diversity in urban parks has been established – green areas of Silistra (Г8.1) and the Doktorski pametnik garden in Sofia (Г8.23). These investigations, together with the inventory of the current diversity of trees and shrubs in the green areas, give an assessment of the adaptation of the species to the urban environment.

As a contribution in the field of taxonomic nomenclature, the validation of the name of a species, new for the science, is assessed – *Quercus protoroburoides* Donchev & Bouzov ex Tashev & Tsavkov, sp. nov. (B4.6).

A contribution in the field of plants chorology are the established new chorological data about the dendroflora of the Sofia floristic region (B4.2).

In the field of dendrological aspects of the introduction and afforestations with tree species in Bulgaria, the scientific contributions are related to the assessment of results from the introduction of tree species in the Knyazhevo plantation (B4.9 and Г11.6) and forest plantations near Varna (Г8.6) and results from the study on dendrological composition in protection belts afforestations in North-East Bulgaria (Dulovo) (Г8.5), which have shown that best results have been achieved with *Gleditsia triacanthos*, *Quercus robur Quercus cerris*. In the conditions of North-East Bulgaria, the growing features of the Himalayan, Turkish and Austrian black pine were studied. The adaptive capabilities of these species were assessed and recommendations are developed for their use in the establishment of forest plantations in the region.

In the field of dendrochronological investigations of tree species the contributions are related to the established reaction to climate changes (Г11.7). Besides for assessment of the influence of temperature and precipitations, the dendrochronological method is also used for dating of important events for the structure and natural dynamics of coniferous forests in Bulgaria, such as natural disturbances (wind throws, snow breakage, fires, avalanches, fellings, insect calamities, etc.) (Г11.7).

The investigated tree ring chronologies from tree rings of Macedonian pine (B4.7), Heldreich's pine (B4.3, 4.7, Г8.7, Г8.13, Г11.7), Norway spruce and common beech (Г8.12) are basis for the formation of hypotheses and scientific conclusions.

Scientific knowledge is also enriched with the results from study on the mutability by morphological and anatomic characteristics of the Heldreich's pine (B4.3, Г8.7, Г8.13), which do not prove the hypothesis that anatomic peculiarities of leaves are influenced by altitude above sea level, although the number of resinous ducts and the number of stomata on the external surface increase with the altitude above sea level.

During the study on genetic diversity in *Quercus frainetto* Ten. populations in Bulgaria (Г7.3), which are based on isosyme markers, it was established that the level of differentiation between populations is relatively low, while within populations it is higher. It is shown that even relatively small and isolated populations are with high level of genetic diversity, which should be taken into account during silvicultural activities and activities in genetic resources conservation of the species.

Scientific-and-applied contributions

With the participation of the candidate, Methods for determination of forest habitats with high conservation value was developed, using EUNIS classification, and 48 types in Bulgaria were determined (Г8.3). Two types of natural habitats have been determined with participation of the candidate, which were included in the Red Book of Bulgaria, volume 3 – Moesian forests of *Quercus pubescens* (Г11.1) and Moesian mixed thermophyllic forests (Г11.2).

In the field of application of the historical analysis in dendrology and silviculture (В4.7, Г10.1, Г11.3, Г11.4, Г11.5), dynamic and open data base was established about natural disturbances in coniferous forests in Bulgaria for 150-year-long period. The carried out analysis of historical data has shown that from the documented 188 natural disturbances, dominating role in our coniferous mountain forests have played forest fires, wind throws and avalanches (Г4.7, Г.11.5).

Basic changes in various indices of coniferous forests in Bulgaria were analysed (Г11.3) and an attempt was made to clarify changes in the tree composition of forests in the past and today, presence of natural disturbances, as well as deforestation of significant territories in the Rhodopes and Sredna gora Mt. (Г11.4).

Studied and analysed in historical aspect is the establishment of forest structures in Strandzha mountain and the contributions of the first researchers of the flora, vegetation and forest habitats in the mountain (Г10.1).

In the field of investigations on anatomic features, physical indices and chemical composition of wood (В4.8, В4.10, Г8.19, Г8.20 and Г8.25), the influence of oak wood on qualities of wine was established (Г8.19, Г8.20 and Г8.25). Changes were determined in basic technological characteristics of red and rosé wines and of distillates during ripening in oak wood (Hungarian and sessile oak), as well as in wood from other tree species (sweet chestnut and black locust).

Changes were determined in basic indices of wood, such as content of total polyphenols, colour characteristics, content of tannins, monomeric and polymeric pigments and organoleptic characteristics of wine. Special attention is paid to the content of phenol compounds and other extract substances in oak wood and to their extraction. The quantity of phenols, passing into the wine from thermically processed and non-processed oak wood, was established.

Applied contributions

As significant applied contribution, the application of modern information technologies in dendrology education (Г7.2, Г8.14, Г8.24) are assessed, as well as the established data base for the arboretum in Yundola, which demonstrates the capabilities of using GIS in practice and education (Г7.2).

As applied contribution with important applied significance are also the published as scientific-and-popular issues manuals of tree species, including their electronic versions, guides and tables, which make easier the identification of tree species on morphological features.

5. Assessment of the applicant's personal contribution

The experience in science and lectures of the applicant within 25 years and his participation in numerous research and applicable projects give me the reason to assess that he has equal participation in mutual publications and in the realised research, scientific-and-applied and applied contributions.

6. Critical notes and recommendations

1. There is a partial re-covering of the information in the following papers: **Г8.22**. Tashev A. N., Tsavkov E. I., Koev K. C. 2013. Composition of floristic elements and conservation significance of the dendroflora in the biosphere reserve "Tchervenata stena" (Central Rhodopes, Bulgaria). In.: Kordum E.L. (ed.). In.: Kordum E.L. (ed.). Proseedings of International conference of young scientists "Advances in botahy and ecology". Ukraine, Shcholkine, 18-22 June 2013. pp. 346-348, ISBN: 978-966-306-173-9 and **Г8.24**. Ташев А. Н., Цавков Е. И., Коев К. С. 2013. Дендрофлора биосферного заповедника «Червената стена» (Централные Родопы, Болгария). Растительный мир Северной Азии: проблемы изучения и сохранения биоразнообразия//Материалы Всероссийской конференции (Новосибирск, 1-3 октября 2013 г.) – Новосибирск: ЦСБС СО РАН, 2013. – С. 135-138. ISBN: 978-5-9009-5624-4.

2. Contributions in the reference could be presented more generalised and more precisely to show which parts of the results contain the scientific contributions.

3. I would recommend the candidate to focus on generalising fundamental on his own in his future research and education activities and to be a mentor of PhD students in the third phase of education.

7. Personal impressions

My personal impressions from the candidate are from his student years and later, when he was already a lecturer. He has wide interests in various fields, shows thoroughness in acquiring of knowledge, education of students and in research activities. His organisation and fellow-feeling in team works is a prerequisite for participation in various teams and for achievement of significant scientific, scientific-applied and applied results.

8. Conclusion

The presented scientific production of the candidate in specialised research issues, scientific and applied contributions in the fields of dendrology, silviculture, ecology and biodiversity conservation, which have found a response in the scientific community, expert activity in carrying out of national and international projects, published training appliances and the use of modern information technologies in the education in dendrology – all these give the reason for a high assessment of the results of his entire activity. The represented materials cover the minimal national requirements in the Law for Development of the Academic Staff, Regulations for application of the law and Regulations of the University of Forestry for occupation of the academic position associate professor.

Based on a comprehensive assessment of the qualities and the results presented by the applicant, I herewith PROPOSE the applicant Dr. Evgeni Ivanov Tsavkov to take the academic position of associate professor in the subject dendrology in professional direction 6.5. Forestry, scientific specialty „Silviculture, including Dendrology".

30.03.2022 **AUTHOR OF THE STATEMENT:**

Sofia

(Prof. Dimitar Pavlov)