O P I N I O N

of the presented materials, required to qualify in the competition for the academic position "Professor", Field of higher education 6. Agricultural sciences and Veterinary medicine, Professional Field 6.5 Forestry, Scientific Specialty "Forest plantations, breeding and seed production ", Subject "Forest genetics and breeding", announced by the University of Forestry in State Gazette No 37/7.5.2019, code of the procedure FOR-P-0419-07

Candidate:

Assoc. Prof. PhD Peter Zhelev Stoyanov

Author: PhD Nikolina Penkova Tzvetkova, Professor in Professional Direction 6.5. Forestry, Scientific Specialty „ "Forest plantations, breeding and seed production" at the University of Forestry – Sofia, Bulgaria

1. Brief CV of the applicant

Petar Stoyanov graduates with honors from the University of Forestry as a Master of Forestry. After two years of practical experience, he starts his research activity by developing a dissertation on the topic "*Ecological-biological and breeding-genetic studies in the scots pine populations of the Rhodopes*", after the defence of which in 1992 he acquires PhD science degree. At that time, he begins his teaching work at the University of Forestry as an assistant. From 2000 he continues as an Assoc. professor at the Department of Dendrology, which he leads from 2003 to 2007. Within two mandates Dr. Stoyanov is also Vice Rector. He is fluent in several foreign languages. The professional expertise of Assoc. Prof. Peter Stoyanov is recognized with his participation in national and international working groups and committees, professional organizations, scientific councils, many academic procedures, editorial boards of scientific journals (including 2 with Impact factor and 2 with Impact rank). He is also is a reviewer of articles for 12 Impact Factor journals, among which Forest Ecology and Management (IF 3.126) and Biochemical Systematics and Ecology (IF 1,127), and those with Impact Rank.

2. Compliance of the submitted documents and materials of the candidate with the Rules of the Regulations at University of Forestry for development of the academic stuff

The applicant has duly submitted the necessary documents and materials in accordance with the National requirements for occupation of the academic position of "Professor" for professional field 6.5. "Forestry" and those under Art. 60 and Art. 65a of the Rules of its implementation at the University of Forestry. There is also included an extended habilitation reference to the scientific contributions in ten publications in refereed and indexed scientific journals (with IF 10.2 total). These publications fall under the subject "*Population-genetic diversity of conifers in Bulgaria*". Summaries and copies of a total of 105 scientific and applied publications, as well as book reviews, published in scientific journals, are attached. The national minimum requirements for these indicators have been overachieved nearly twice. A reference is also made to

the 601 citations with a total number of points, nearly 16 times above the required minimum. There are 23 articles published in journals with Impact Factor with a total IF of 41.165. A significant part of these 23 issues are in journals with a particularly high factor, such as: Science of the Total Environment (IF 4.61), Journal of Biogeography (IF 4.248), Annals of Botany (IF 3.982) etc. In 10 of these articles (with a total IF of 9.506) the candidate is the first or the second author, and in 5 of the presented 10 articles with the journal Impact Rank (with a total SJR of 1.631) Assoc. Prof. Stoyanov is in the second position. Of the articles in non-refereed scientific journals (21 issues), in 1 he is the only one author, and in 12 he occupies one of the first two places of the authors list. P. Stoyanov is also the leading or one of the leading authors of the referred scientific conference publications (18 issues), as well as of the presented 14 books, chapters of books and monographs, incl. chapters from 3 editions of Springer Verlag and 4 publications in the Red Book of Bulgaria. Out of a total of 18 titles of popular science and applied books, in 14 Dr. Stoyanov is in the leading position. With regards to the requirements section, including participation in research projects, guidance of PhD students and publication of a university manual, the minimum requirements have been exceeded almost 4 times. Thus, the total number of points from all indicators (2525) is about 5 times higher than the required 550 points for this procedure. The information card is completed correctly in Bulgarian and English.

3. Assessment of the applicant's educational activity

Assoc. Prof. Petar Stoyanov's academic engagement includes lectures on "Forest Genetics and Selection", "Forest Tree and Non-Tree Resources", "Biodiversity Conservation" and "Improvement of Tree Species", for Bachelor and MSc students. He has also lectured, including laboratory exercises and practices as modules in the course "Methods in Environmental Research" for the MSc. P. Stoyanov has also co-authored a practical guide to Dendrology and Decorative Dendrology. Under his scientific supervision 93 master's and 14 bachelor's theses have been developed, as well as six PhD dissertation theses (three of which - successfully defended) with topics in the field of forest genetics and breeding and the conservation of genetic diversity. The considerable number of graduates and PhD students, trained by Assoc. Prof. Stoyanov, is a proof for his ability to generate innovative scientific ideas, to provoke the students' interest and to guide them in their first steps in the scientific and experimental field.

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

4.1. Participation in scientific, applied and educational projects

Much of the research topics have been developed with the successful participation of Dr. Stoyanov in 35 national and international scientific projects, 16 of which, including 4 international one, have been under his management. Such active scientific collaboration proves his ability to work in a team, to be the conceptual coordinator and organizer of a research.

4.2. Characteristics of published scientific results

The submissions for the competition contain results from studies in the field of forest

genetics and selection, and more generally, on biological features, systematics and potential for adaptation of tree and shrub species, forest genetic fund conservation and biodiversity in the context of climate change. Some innovative methods for genetic monitoring have been presented. Genetic structure and differentiation, phenotypic and genotypic variation and heterozygosity, natural hybridization and adaptation, as well as the geographical history and post-glacial evolution of populations of conifers and broadleaved trees, including of endemic species, have been studied with biochemical and molecular markers, as well as through their combination with fossil studies, in our country and from different parts of Europe.

Morphological variation and growth of some tree and shrub species have been studied with the use of biometric methods. In the progeny experiments and geographical cultures, the interaction between the genotype and the environment of individual origins of conifers has been investigated, as well as the direction of their reproductive process in natural plantations and seed gardens. The invasion of alien species has been studied as well.

The genetic structure of populations of animal species has been investigated using quantitative genetics methods. Data have been obtained on natural habitats, phytochemistry and pharmacological properties of medicinal plants. The database on vegetation in the Balkans and on biodiversity in some mountains has been supplemented. The natural regeneration and the course of the artificial afforestation following natural disturbances have been monitored.

The range of results achieved in the work of Assoc. Prof. Stoyanov, much wider than the subject of this competition, doubtless enriches the fundamental and methodological basis of his genetic and breeding studies.

4.3. Impact of the candidate's scientific activity in Literature (citations)

More than 270 citations have been found in scientific journals with an Impact factor, incl. in: New Phytologist (IF 7.299), Plant, Cell & Environment (IF 5.624); Science of the Total Environment (IF 5.589), Journal of Ecology (IF 5.172), etc. The candidate also has listed 150 citations in scientific journals without IF, as well as 181 citations in monographs, books and dissertations in Bulgaria and abroad, in conference proceedings and others. This impressive set of citations is an indicator for the high scientific level and relevance of his researches.

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

A significant part of the contributions in the scientific works of Assoc. Prof. Stoyanov are fundamental and are related to the establishment of new scientific facts and to the formulation of hypotheses, the conformation of already established dependencies, as well as the development of original methodological approaches. I will categorize his main contributions into two groups.

A. Contributions with *theoretical and applied aspects*

1. Larger genetic diversity of *Quercus robur* at population level has been established by *isoenzyme or DNA markers*. Higher interpopulation differentiation in *Pinus nigra* compared to *Pinus sylvestris* was found. A high degree of unrelated crossover for *Pinus nigra*, the highest

degree of genetic differentiation in the most spatially distant population of *Platanus orientalis*, a high level of inbreeding in *Pinus mugo*, presumably related to near-crossover are established. Similarities in genetic diversity trends in species with close biological features have been found. Evidence has been obtained that *Abies Borisii-regis* is the result of introgressive hybridization. Specific adaptation of *A. alba* populations to altitude environmental gradient, high degree of differentiation, and significant geographical isolation in *Sorbus torminalis* from Eastern Europe has been observed, with the potential influence of post-glacial migration processes. An average total population differentiation for *Sorbus domestica* with separation into three European groups has been established, as well as high genetic diversity in *Carpinus betulus* populations in the Balkans, originating from different microrefugia. Three geographically distinct groups are indicated for *Quercus cerris*, suggesting that the separation of populations from Italy and the Balkan Peninsula is a consequence of the Middle Pleistocene Ice Age.

2. The study of *morphological and biometric features* assessed the geographical differentiation between the populations of *Juniperus oxycedrus* on the Balkan Peninsula. The best origins of *Pinus sylvestris* in geographical cultures of Belgium have been identified, a relationship between diameter and longitude has been described. Patterns of environmental effects influenced by biometric indicators of *Pinus heldreichii* and data on intermediate inheritance of morphometric features have been obtained for hybrids between *Pinus sylvestris* and *Pinus mugo*, and for morphometric variability in *Betula pendula*. The differentiation between populations of *Sideritis scardica* and *Sideritis syriaca* was determined, with the hypothesis that the population of *S. scardica* belongs to a separate taxon.

3. In *breeding studies*, high rate of survival and inheritance of growth in diameter of half-sib families of *Pinus sylvestris*, a potential possibility for increasing in inheritance coefficient with age, an optional correlation between inheritance of growth and the additivity of the main genetic effects, as well as the role of major genetic effects, have been demonstrated in the full-sib progeny trials of this species. The average growth inheritance rate of *Betula pendula* and *Platanus orientalis* was determined. The systematics and variability of the genus *Populus* have been studied. The genetic belonging of the Bulgarian capercaillie populations to the southern European genetic line was established as well as the low genetic diversity in the wild goat.

B. *Methodological and applied* contributions

A methodological platform of biochemical and molecular genetic markers (including cytoplasmic DNA) has been developed. Some of these markers have been applied for first time in the study of the genetic diversity of *Pinus peuce* where an assessment has been made of their probative weight at specific sites and genetic tests. A joint application of molecular and fossil methods for the study of demographic history and adaptation of individual species has been implemented, as well as the application of microsatellite markers for the study of genetic differentiation.

The following methods have been developed: micropropagation method for decorative birch forms; a method for monitoring forest genetic resources and protecting them in the face of climate change; a set of guidelines for conservation the genetic resources of some oaks, for

identifying habitats of high conservation value, etc.

5. Evaluation of the the applicant's personal contribution

The leading position of Assoc. Prof. Dr. Stoyanov among the authors of nearly half of the articles in Impact Factor and Impact rank journals, those in non-refereed publications and in scientific conferences, as well as in almost all popular science publications, evidently attests to his significant personal contribution. His presence in many teams, mostly international, proves that he is a wanted co-author with his expert botanical and dendrological knowledge, familiarity with the modern statistical methods, authentic methodological and analytical contribution to joint scientific investigations.

6. Critical notes and recommendations

I do not have any significant critical comments on the materials submitted at the competition.

7. Personal impressions

I first met Peter Stoyanov in 1992 during the time of our participation in a joint research project. Since 1994 we have been working in one department, in good collegial atmosphere. He inspires respect with his high erudition, broad professional interests and knowledge, linguistic and general culture, analytical thinking and exceptional dedication to work. Highly valued colleague and lecturer, talented researcher, sought-after consultant in the field of scientific terminology, statistics and methodological approaches in forest science. A high class scientist, with a creative personality, an indisputable authority and popularity, who honorably represents the University of Forestry to the scientific community in Bulgaria and abroad.

8. Conclusion

The rich scientific work, whose original contributions have received wide international recognition, as well as the active teaching and expert activity of Assoc. Prof. Dr. Peter Zhelev Stoyanov entirely meet the National requirements for the academic position of "Professor" and the Regulations for its implementation at the University of Forestry.

I PROPOSE the candidate **ASSOC. PROF. Dr. PETER ZHELEV STOYANOV** to obtain the academic position **"Professor"** on the Subject "Forest Genetics and Breeding", Professional Field **6.5. Forestry.**

Signature:

Date: 09 Sept 2019