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REVIEW

FROM **PROF. DR. ZDRAVKO HUBENOV – NATIONAL MUSEUM OF NATURAL HISTORY, BULGARIAN ACADEMY OF SCIENCES** OF THE MATERIALS, PRESENTED FOR PARTICIPATION IN A COMPETITION FOR THE ACADEMIC POSITION OF **PROFESSOR** IN THE FIELD OF HIGHER EDUCATION 6. AGRICULTURAL SCIENCES AND VETERINARY MEDICINE; PROFESSIONAL DIRECTION 6.5. FORESTRY; SCIENTIFIC SPECIALTY **40406 – FOREST MELIORATION, FOREST PROTECTION AND SPECIAL FOREST USAGE** FOR THE NEEDS OF THE DEPARTMENT OF FOREST ENTOMOLOGY, PHYTOPATHOLOGY AND HUNTING FAUNA AT THE FOREST RESEARCH INSTITUTE, BULGARIAN ACADEMY OF SCIENCES, PUBLISHED IN THE SG, ISSUE № 51, 05.06.2020

By order № RD 15-285 from 10.08.2020 of the Director of the Forest Research Institute, Bulgarian Academy of Sciences I have been appointed a member of the scientific jury in a competition for the academic position of "**professor**" in the field of higher education 6. Agricultural sciences and veterinary medicine, professional direction 6.5. Forestry (scientific specialty **Forest melioration, forest protection and special forest usage**), announced for the needs of the Department of Forest entomology, phytopathology and hunting fauna at the Forest Research Institute, Bulgarian Academy of Sciences.

Assoc. Prof. Dr. Margarita Ilieva Georgieva from the Department of Forest entomology, phytopathology and hunting fauna participates in the announced competition as a candidate.

BIOGRAPHICAL DATA

Margarita Georgieva graduated with a master's degree in Forestry in 1998 at the University of Forestry - Sofia (with a master's degree in forestry). From 1998 to 2006 she was an engineer at the Department of Forest entomology, phytopathology and hunting fauna of the Forest Research Institute, Bulgarian Academy of Sciences. From 2006 to 2010 she was an assistant. In 2010, after defending her dissertation "*Diseases on *Pseudotsuca menziesii* (Mirb.) Franco and their impact on the introduction of the species in Bulgaria*" she acquired the educational and scientific degree "Doctor" in the scientific speciality Forest melioration, forest protection and special forest usage. She was a senior assistant from 2010 to 2015 and an associate professor in the same field after 2015. She has specialized at the Mendel University in Brno (Czech Republic), Sarajevo University (Bosnia and Herzegovina), Uppsala University (Sweden). and the University of Brussels (Belgium) She is currently an Associate Professor in the Department of Forest entomology, phytopathology and hunting fauna of the Forest Research Institute. Margarita Georgieva has participated in 45 international and national scientific forums for the last 6 years and has worked on over 30 projects (international and national), as a leader of 6 of them. She is author of 120 scientific publications - monographs, studies, reports, books and popular science articles. She is supervisor of the two PhD students.

The presented data show the qualification, research experience and scientific activity required for participation in the competition for a professor.

ACCORDANCE OF THE PRESENTED MATERIALS WITH THE REQUIREMENTS

The set of materials (on paper and electronically) presented by Assoc. Prof. Dr. Margarita Georgieva is in accordance with the Law for RASRB and the Regulations of the Bulgarian Academy of Sciences for application of the Law for RASRB and the Regulations on the terms and conditions for obtaining scientific degrees and for holding academic positions at the Forest Research Institute, Bulgarian Academy of Sciences. The set includes documents described in the application of the candidate (№ 1-22) to the Director of the Forest Research Institute (№ СБ-01-745 from 04.08.2020) for admission to the announced competition for professor in the field 6.5. Forestry (scientific specialty **Forest melioration, forest protection and special forest usage**). The documents are presented in 2 folders. The documents for the competition have been prepared precisely and clearly reflect the activity of Assoc. Prof. Dr. Margarita Georgieva.

THE REFERENCE OF THE CONTRIBUTIONS correctly and accurately reflects the achievements of the participant in the competition. It contains the most significant results and conclusions from the research.

Table 1. Minimum number of points required for the scientific position “professor” and the indicators achieved by the candidate according to the presented documents

Indicators		Number of points	Number of the candidate's points
A	1 – dissertation „Doctor”	50	50
B	4 – monograph or publications in the referenced journals [12]	100	210
G	7 – publication in the referenced journals (Q1, Q2, Q3, Q4) [31]	30	169
	8 – publication in the non-refereed and referenced journals [22]	10	64
	10 – published study [1]	15	4
	Total required minimum	200	237
D	13 – citations in refereed journals and monographs [90]	15	1350
	14 – citations in unrefereed and peer-reviewed monographs [14]	10	140
	15 – citations in unrefereed and peer-reviewed journals [37]	5	185
	Total required minimum	200	1675
E	18 – Participation in a national scientific project [10]	15	150
	19 – Participation in an international scientific project [7]	20	140
	20 – Leadership of a national scientific project [5]	30	150
	21 – Leadership of an international scientific project [1]	40	40
	Total required minimum	100	480
Additional indicators for the Forestry Research Institute	Leadership of PhD students, lecture courses, participation in editorial boards, reviews, participation in scientific forums, etc.	+	184
Total sum of the indicators [exceeded 4.4 times]		650	2836

DESCRIPTION OF THE PRESENTED MATERIALS

The research activity is well reflected in the competition documents. Assoc. Prof. Dr. M. Georgieva has presented 71 publications beyond those with which she acquired the academic position of associate professor: one study, 43 articles (referenced - with impact factor or equivalent), 22 articles in journals and series (without impact factor) - in specialized, peer-reviewed and edited issues), and 5 popular articles. 47 articles and one study have been published in English. 66 of the publications are co-authors. The independent publications include 2 articles, 2 published reports and one popular science article. Of the co-authored publications, she is the first author of 20, second - of 9 and third and next - of 42 articles. Assoc. Prof. Dr. M. Georgieva has published in 12 foreign and international editions. Of the abstracts and posters of the scientific forums (45 for the last 6 years, 43 in co-authorship), 31 are in English. The publishing activity of Assoc. Prof. Dr. M. Georgieva exceeds the minimum requirements more than 2 times.

MAIN DIRECTIONS AND CONTRIBUTIONS

The scientific contributions are significant, original and mostly fundamentally applied. The main part of them are in the field of the phytopathogens, applied entomology (parasitoids and entomopathogens), invasive biology and biomonitoring. The research work of Assoc. Prof. Dr. M. Georgieva is in the field of entomology, phytopathology and ecology. She is not engaged in direct implementation activities due to the nature of the field in which she works. However, her ecological studies of the insect and fungal phytopathogens, clarification of the role of the entomopathogens and parasites on important pests, the sanitary monitoring of the forest communities, the impact of the invasive pests and the correction of some traditional ideas are of substantial practical importance. The contributions represent a new direction and prove with new means significant aspects of the existing scientific fields. Some of them may be taken as the formulation of a new theory or hypothesis and may contribute to obtaining a number of confirmatory facts. The contributions from the research presented in the publications of Assoc. Prof. Dr. M. Georgieva are in several directions.

Mycotaxonomic, morphological and biological contributions. The role of the wounds on the *Pseudotsuga* stems in the *Allantophomopsis* spore infection has been established (№ 58). Four new fungal pathogens of the genus *Pinus* in Bulgaria have been identified by molecular biological and morphological methods and 12 mycopathogens have been reported (№ 45, 59, 60, 66). The circle of the genus *Dothistroma* hosts has been expanded (№ 61, 62). Methods for prevention and control are defined. For the first time in Bulgaria, mycelial cultures have been isolated on a nutrient medium (№ 66, 68, 81). The risk of penetration of *Fusarium circinatum* in Bulgaria was analyzed and a methodology for morphological and molecular diagnostics of the species was developed (№ 78, 79, 84, 85). The possibilities for monitoring, the probability of development together with other mycopathogens and possible insect vectors have been clarified (№ 84). The rate of spread of the invasive

species *Lecanosticta acicola* in Bulgaria has been established (№ 81). New pathogens of *Picea abies*, hybrid poplars and *Fagus sylvatica* have been found for the mycosis of Bulgaria (№ 63, 71). The development of the detriments of 4 invasive pathogens on the native species of the genus *Pinus* was determined (№ 94). The condition of the forests of *Castanea sativa* and the development of a number of pathogens associated with the xylophagous insects that spread spores are examined. The relationship between the sanitation and altitude in *C. sativa* communities was determined (№ 53, 73).

Biology and ecology of harmful insects. The invasive species *Corythucha arcuata* in 2 types of oak has been established. The expansion of its range and its food plants are considered (№ 50, 96). The biology of *Thaumetopoea pityocampa* in Bulgaria and 3 other countries has been studied in detail (№ 81, 91). The mortality, zones of expansion, phenology, dynamics of the hatching of larvae, parasites and mycopathogens were explored (№ 52, 57, 67, 69, 72, 74, 80, 82, 83, 86, 87, 88, 89, 92, 95, 100, 110). It has been studied *Th. solitaria* and under laboratory conditions *Th. pinivora* (№ 64, 109).

Parasites on harmful insects. New parasitoids of *Thaumetopoea pityocampa* have been found and the parasite complex in Bulgaria, Bosnia, Greece and France has been examined (№ 51, 52, 54, 80, 83, 86). The most effective regulators of the host number and mortality have been determined. Three types of parasites on the eggs of *Th. solitaria* have been established (№ 64). Data from the last 17 years for the complex of parasites on the phytophagous insects in the area of the Plovdiv Forest Protection Station are summarized (№ 70). Three types of parasites of the family Tachinidae on *Lymantria dispar* have been established (№ 93).

Mycopathogens on harmful insects. Three new pathogens were established in *Th. pityocampa* in the Rhodope Mts. (№ 87). Isolates were made and DNA fragments were sequenced. New scientific associations of the hyperparasitic fungus *Syspastospora parasitica* by species of the genus *Beauveria* have been found (№ 88). The successful introduction of the mycopathogen *Entomophaga maimaiga* in *Lymantria dispar* - a typical example of a biological control against this big pest in deciduous forests is considered (№ 70). The results of the spread of *E. maimaiga* in other countries of the South-Eastern and Central Europe were analyzed (№ 77, 99). The effect of this entomopathogen on other lepidoptera has also been studied (№ 55).

Sanitary monitoring of the forests. Economically significant forest species have been studied (*Fagus sylvatica*, *Pinus sylvestris*, *P. nigra* and *Quercus ceris*). Good condition of the forests of *F. sylvatica* (№ 76) and significant negative changes in the forest communities of *P. sylvestris* below 700 m a.s.l. have been established (№ 106, 107, 112). At this altitude, a number of fungal pathogens and harmful insects worsen the condition of the communities. The deteriorated condition of *Q. ceris* forests associated with a mycopathogen of the genus *Hypoxylon* has been found (№ 97, 101). The communities of the Belasitsa Mts. for fungal pathogens and insect pests (№ 97, 120) and the tree vegetation in an urban environment (№ 67, 115) were studied.

Other contributions. For the first time, remote methods were used to assess the sanitary condition of the forest communities in hard-to-reach areas (Gorna Kuria and Chuprene reserves) and the condition of trees and shrubs in urban environments using an unmanned aerial vehicle. The rate of drying in *Picea abies* communities as a result of the development of *Ips typographus* was determined.

SIGNIFICANCE OF THE OBTAINED RESULTS (CITATION RATE)

The achievements of Assoc. Prof. Dr. M. Georgieva are accepted with confidence by the specialists and have been cited many times. Her publications have been cited 141 times and 90 citations are in the prestigious refereed editions (with impact factor or equivalent). There are 20 citations by the Bulgarian authors. The most cited (with 14 citations) is the work № 14, published in the „Forest Ecology and Management” (concerning the communities of *Castanea sativa*). The citations are by specialists who work in related fields and cover the main part of her publications. In the articles with citations of the works of Assoc. Prof. Dr. M. Georgieva there are no ones with a critical content. They are used to get acquainted with the morphology, taxonomy and biology of certain pathogens in the forest communities, to specify particular questions of the monitoring, sanitary problems and forest protection, destruction of the insect pests, acquaintance with a number of invasive taxa and others. The number of citations exceeds the accepted requirements 8.4 times (Table 1).

LEADERSHIP AND PARTICIPATION IN PROJECTS

The materials of the competition reflect the work of Assoc. Prof. Dr. M. Georgieva in 23 projects (15 national and 8 international). She has been a leader of five of the national and one of the international projects. The projects have a scientific and applied nature, international or national funding and concern the monitoring of the xylophage insects, the role of the fungal pathogens, the sanitary condition of forests, the cross-border cooperation, the risk of unfavorable events in the forests, Natura 2000, remote methods for forest vegetation assessment, ecosystem services, etc.

EDUCATIONAL AND PEDAGOGICAL ACTIVITY

TRAINING OF PHD STUDENTS. Under the leadership of Assoc. Prof. M. Georgieva two PhD students have been working since 2016 and 2018 (full-time and part-time), specialty Forest melioration, forest protection and special forest usage. Their work is in the field of phytopathology. The theme of the first thesis is the influence of *Sphaeropsis sapinea* on the species of the genus *Pinus*. The theme of the second thesis is related to the influence of *Cryphonectria parasitica* on the communities of *Castanea sativa*.

TRAINING OF GRADUATED STUDENTS. Scientific consultant of 1 graduated student (defended with a high mark) at the Faculty of Forestry of the University of Forestry, Sofia.

SCIENTIFIC FORUMS. The participation of Assoc. Prof. M. Georgieva in the scientific seminars and conferences (national and international) is impressive. In the last 6 years she has participated with posters and reports (31 in English) in 45 scientific forums.

EVALUATION OF THE PERSONAL CONTRIBUTION

The investigations of the forest ecosystems often require teamwork. At the same time, the constant participation of many authors in a large number of common publications makes it difficult to assess the individual participation of the each one (whether it is methodical, experimental, expert, analytical and synthetical). It should be noted that in some cases it is not easy to establish the real personal contribution of the candidates. From the presented documents under the competition, a high personal contribution of Assoc. Prof. Dr. M. Georgieva in the implementation of the research work and the publication of the materials is established. This contribution is evident in the publications related to the phyto- and entomopathological explorations where her activity is the most clearly outlined. The scientific qualification of Assoc. Prof. Dr. M. Georgieva is indubitable. The results achieved by her in the research activity exceed the specific requirements of the Forest Research Institute and those of the Bulgarian Academy of Sciences, accepted in connection with the Regulation for application of ZRASRB.

C O N C L U S I O N. The candidate in the competition **Assoc. Prof. Dr. M. Georgieva** had presented a sufficient number of scientific works published after the materials used to acquire the academic position of associate professor. In the works of the candidate there are original scientific and applied contributions, which have received international recognition as a representative part of them are in journals and scientific series published by international academic editions. After getting acquainted with the materials and scientific works presented in the competition and analysis of their significance as well as the scientific and scientifically applied contributions, **I give a positive assessment and recommend to the Scientific Jury and the Scientific Council to vote for the acquisition by Assoc. Prof. Dr. Margarita Ilieva Georgieva of the academic position "Professor" at the Forest Research Institute, Bulgarian Academy of Sciences in a professional field 6.5. Forestry; Forest melioration, forest protection and special forest usage.**

Sofia,
5.10.2020

Reviewer:

/ Prof. Dr. Zdravko Hubenov /