

OPINION

on the materials submitted for participation in a competition for the academic position "Professor", in the discipline "Forest entomology" in the field of higher education 6. Agrarian sciences and veterinary medicine, professional area 6.5. Forestry, scientific specialty "Forest melioration, Forest protection and Special forest uses", announced by University of Forestry in the SG, 102/08.12.2023 (procedure code ELA-P-1123-113)

Candidate for participation in the competition: Associate Professor Danail Dimitrov Doychev PhD

Prepared the opinion: Prof. Sonya Hristova Bencheva PhD, University of Forestry; 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", member of the scientific jury (order of the Rector of the University of Forestry 3ИИС-199/04.06.2021).

1. Brief biographical data

Assoc. prof. Danail Doychev graduated from the Technical School of Electrical Engineering and Automation, Sofia in 1991. In 1999, he graduated as a Master Engineer in Forestry at the Forestry University, where in 2014 he received the Educational and Scientific Degree "Doctor" after successfully defending his dissertation on the topic "Bark beetles (Coleoptera, Curculionidae, Scolytinae) in Scots pine (*Pinus sylvestris* L.) plantations in Southwest Bulgaria - species composition, distribution and damage".

From 1993 to 2000, he worked as an operator in Rectifier stations in the Metropolitan City Transport Company. From 2000 to 2002 he was an assistant, from 2002 to 2005 - senior assistant, from 2005 to 2015 - chief assistant, and from 2015 to the present - associate professor at the Department of "Plant Pathology and Chemistry" at Forestry University.

Assoc. prof. Doychev participated in 15 national and international scientific research projects and applied tasks, being the leader of two of the projects. Participated in program and institutional accreditation committees in 2011 and 2018. He participated in 3 courses to improve his qualifications. He speaks Russian, uses English. Has excellent digital skills.

2. Conformity of the submitted documents and materials of the candidate with the minimum requirements, according to the Regulations for development of the academic staff in the University of Forestry

The scientific production presented by assoc. prof. Danail Doychev, the attached documents and materials correspond to the requirements in the Regulations for the development of the academic staff at the University of Forestry. The reference shows the implementation and exceeding of the minimum required points for the academic position of "Associate Professor".

Fulfillment of the minimum requirements by groups of indicators for AP "Professor"

Group of indicators	Contents	Required for professor/score	Performed by assoc. prof. Danail Doychev
A	Indicator 1	50	50
Б	Indicator 2	-	-
B	Indicator 3 or 4	100	144,57
Г	Indicators 5-12	200	236,57
Д	Indicators 13-15	100	300
E	Indicators 16-24	100	135
Total Points		550	866,14

3. Characteristics and assessment of the candidate's activity

3.1. Learning and teaching activity

The attached information for the past nine years shows that the candidate fulfills the required

academic work.

In the period 2015-2023, Assoc. Prof. Doichev gives lectures, exercises and learning practices in the disciplines: "Forest Entomology" (Bachelor degree Forestry); "Forest Protection" (Master degree Forestry), "Introduction of plant protection" (Bachelor degree EEP); "Integrated methods of plant protection" (Master degree EEP); "Ornamental plant protection" and "Plant protection in greenhouses" (Master degree Landscape Architecture). He is a co-author and participant in updating the curricula of these disciplines.

Assoc. Prof. Doichev was a scientific consultant to a full-time PhD student Land. arch. Stoika Ruseva, who successfully defended her dissertation on "Major pests of Cupressaceae species in Bulgaria" in 2020. Currently, he is the scientific supervisor (together with Prof. S. Bencheva) of full-time doctoral student Eng. Simeon Slavov with the topic of the dissertation "Distribution of *Biscogniauxia mediterranea* (De Not.) Kuntze and related insects in Bulgaria". He has supervised 25 successfully defended graduates from the specialty "Forestry".

3.2. Other professional and creative activities

Assoc. prof. Danail Doychev has provided evidence of the following activities:

- **Scientific expertise:** participation with an opinion in the composition of two scientific juries in competitions for the Academic position "Professor", one for AP "Associate Professor" and two for obtaining the Educational and Scientific Degree "Doctor"; in six scientific juries in competitions for AP "Chief Assistant"; as well as in a committee for the selection of AP "Assistant".

- **Applied expertise:** prepared four expertises for assessing the health status of tree and shrub plants.

- **Participation in scientific forums:** the candidate has participated in poster sessions at 7 scientific forums.

- **Participation in national expert workgroups:** in the National Commission for Forest Protection at the Executive Agency for Forests at the Ministry of Agriculture and Food for the period 2015-2023.

- **Participation in work committees at Forestry University:** for scientific activity at Faculty of Ecology and Landscape Architecture; for the preparation of materials for program accreditation of a doctoral program in professional area 6.5 "Forestry" and scientific specialty "Forest melioration, Forest protection and Special forest uses"; for the organization, conduct and reporting of a competition for funding of projects.

4. Assessing scientific, applied research and publication activities of the candidate

For the current competition, Assoc. Prof. Danail Doichev has submitted a list of 40 scientific publications.

Distribution of the number of publications according to their type

Types of publications	number	points
Scientific publications in journals referenced and indexed in world-renowned scientific information databases	29	312,15
• for indicator B (habilitation thesis)	10	144,57
• for indicator Г	19	167,57
Papers in edited proceedings of international scientific forums	3	8,66
Articles in edited collective volumes	3	10,33
Published chapter in collective monograph	5	50
Общ брой точки		381,14

Three scientific papers related to his PhD thesis are also described, as well as 41 scientific publications, 2 teaching aids, etc., submitted in the competition for the AP "Associate Professor", which are not subject to consideration in the competition for AP "Professor".

According to the requirements, with 10 of the publications in refereed and indexed editions in world databases, a habilitation report entitled "Possibilities of using ecological methods in forest

protection" was prepared.

A total of 29 scientific publications were published in refereed and indexed journals, 7 of them in Web of Science with IF (impact factor), 13 in Scopus with SJR and 9 in Web of Science without IF. Two of the publications are in non-refereed peer-reviewed journals.

Of the total number of publications, 32 are in English and 8 in Bulgarian.

Number of co-authors in the publications:

- individual – 1 pcs
- with one co-author – 12 pcs
- with two or more co-authors – 27 pcs
- leading author – 5 pcs.

4.1. Participation in scientific, applied and educational projects

Assoc. Prof. Danail Doichev presented a list and evidence of participation in 1 educational and 7 national scientific and applied projects, being the head of one of them.

4.2. Characteristics of published scientific results

The publications with which Assoc. Prof. Doichev participates in the competition for AP "Professor" were made in the refereed and indexed editions: *Biologia*, *Journal of Forest Science*, *Journal of the Entomological Research Society*, *Fragmenta entomologica*, *Baltic Journal of Coleopterology*, *Acta zoologica bulgarica*, *Historia naturalis bulgarica*, *Ecologia Balkanica*, *Silva Balcanica*, *ZooNotes*, *Spixiana*, *Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa"*, *Proceedings of the BAS*, as well as in edited scientific collections.

4.3. Reflection of the candidate's scientific activity in the literature (citation)

In the list of established citations Assoc. Prof. Doichev presents 20 citations of 3 publications in referenced and indexed in world databases editions (with attached evidence), with which the minimum requirements of the citation criterion are covered three times over. In his curriculum vitae, he lists 340 citations found. A Scopus search shows the presence of 111 citations (91 of which after 2015) of 29 publications of Assoc. Prof. Doichev which is evidence of the serious interest of the scientific community in the candidate's work.

4.4. Contributions in the works of the candidate (scientific, scientific-applied, applied)

The research work of Assoc. Prof. Doichev includes important contributions in several main scientific directions:

- Faunistic studies of forest insects
- Monitoring of forest ecosystems
- Damage caused by biotic and abiotic factors to forest tree species
- Dead wood and associated saproxylic organisms
- Natural regulators of forest insect populations
- Laboratory and field trials of xylophagous control.

A. Scientific contributions

• Faunistic studies of forest insects

- **New species** of dipterous insects found for the fauna of the Balkan Peninsula: *Medetera pinicola* Kowarz and *Lonchaea fugax* Becker (B4.1); new to the fauna of Bulgaria Hymenopterans: *Rhimphoctona xoridiformis* (Holmgren) and *Aproceros leucopoda* Takeuchi (B4.4, Γ7.11); a species new to Bulgaria from the family Cucujidae (Coleoptera) – *Pediacus dermestoides* (Γ7.20); a species new to the fauna of North Macedonia from the family Buprestidae (Coleoptera) – *Sphenoptera cuprina cuprina* Motschulsky (Γ7.16); new for the NP "Abruzzo, Lazio and Molise" (Italy) 19 species and subspecies of Coleopterans (Γ7.17); eight new species and subspecies of longhorn beetles for Belasitsa and one for Vitosha (Γ7.13, Γ7.15).

- Summary **data on the distribution** in Bulgaria of jewel beetles from different subfamilies – Agrilinae (31 taxa), Buprestinae (47), Chrysochroinae (19) and Polycestinae (13) (Γ7.21, Γ7.23,

Г7.25, Г7.28).

- **New food plant data:** summarized and supplemented data on 104 trophic relationships between 54 tree and shrub species and 93 Cerambycidae taxa in Bulgaria (Г7.12, Г7.13, Г7.15, Г7.27); *Paliurus spina-christi* Mill. has been established as a new food plant for *Chrysobothris leonhardi* Obenberger (Г7.23); a trophic relationship of the invasive plant *Impatiens glandulifera* Royale with larvae of the *Pristerognatha fuligana* (Denis & Schiffermüller) and *Phytoliriomyza melampyga* (Loew) insect was established; the cork oak (*Quercus suber* L.) established as a new food plant in Bulgaria for insects: *Acmaeodera crinita* Spinola, *Acmaeodera ottomana* (Frivaldszky), *Chrysobothris leonhardi* Obenberger, *Lichenophanes varius* (Illiger), *Callimus angulatus* (Schrank), *Xyleborinus saxesenii* (Ratz.) (Coleoptera) and *Neurothaumasia ankerella* (Mann) (Lepidoptera) (Г7.27).

- **New localities** of: pine processionary (*Thaumetopoea pityocampa*) in Western Bulgaria (Г8.34); *Roptrocercus xylophagorum* (Ratz.) in Western Rhodopes (Г7.1); bark beetle *Dendroctonus micans* Kug. in Vitosha (Г7.2); *Phytoliriomyza melampyga* (Loew) in Plana and Lozenska Planina (Г7.22).

- The differences in the hatching times of the caterpillars of the pine processionary moth for its continental and Mediterranean forms have been confirmed (Г7.19).

• **Dead wood and associated saproxylic organisms**

- A total of 104 species of fungi (Г7.29) and 24 species of insects from 14 families (Г8.31) were found during research on the stocks of dead forest biomass in beech plantations from Western Stara Planina and Vitosha. The species composition of saproxylic insects depends to the greatest extent on the age of the plantations and the presence of large-sized dead wood (stems and branches), regardless of the altitude and the density of the surveyed sites. Five of the species found are part of the European Red List of saproxylic beetles of the International Union for Conservation of Nature (IUCN) – *Cerambyx scopoli* Fuessly, *Denticollis rubens* Piller & Mitterpacher, *Isoriphis melasoides* (Laporte de Castelnau), *Isoriphis nigriceps* (Mannerheim) and *Sinodendron cylindricum* (L.).

- **For the first time in Bulgaria**, common beech was established as a food plant for *Agrilus olivicolor* Kiesenwetter and *Xylosteus spinolae* Frivaldszky (Г8.31).

Б. Scientific and applied contributions

• **Monitoring of forest ecosystems**

- The methodology for complex assessment and the results obtained with the integrated application of unmanned aerial vehicles and traditional entomological and phytopathological methods for the field survey of the phytosanitary status of two protected areas in the Western Stara Planina - the Gornata Korja Reserve and the Chuprene Biosphere Reserve are presented (Г7.14). The main insect pest for spruce forests is *Ips typographus* L., with 126 bark beetle outbreaks established in Gornata korja and 712 in Chuprene, and for fir trees – *Pityokteines curvidens* (Germar).

- The surveys carried out during the period 2008-2020 under the international cooperative program "Assessment and monitoring of the influence of polluted air on forest ecosystems" in Western Stara Planina, Sredna Gora, Vitosha, Plana, Strandzha, Rhodopi show an improvement in the condition of the observed forest stands (Г8.32, Г8.36, Г8.37, Г8.38, Г8.39, Г8.40). Abiotic factors are of leading importance for the phytosanitary condition of the studied forests. Snow and wind damage periodically observed in coniferous forests make them a favorable environment for bark beetles and facultative parasites to develop. Snow and wind damage is a periodic problem in beech forests as well.

- The main biotic factors deteriorating the condition of coniferous forests are the top bark beetle and the pine processionary beetle (for white pine) and the European spruce bark beetle (for spruce). Characteristic damage (mining of the bark) on beech is caused by the larvae of *Ectoedemia liebwerdella* Zimm., which are a prerequisite for the development of fungi of the genus *Nectria* (Г8.40). As the most serious threats to the Scots pine the bark beetles *Ips acuminatus*, *Ips sexdentatus* and *Tomicus piniperda*, for spruce – *Ips typographus*, and for the Austrian pine - the fungus *Sphaeropsis sapinea* (Г8.36). In 2019, the invasive oak lace bug *Corytucha arcuata* (Say) (Г8.38)

was found in oak forests. Of the leaf-gnawing insects, *Lymantria dispar* is the most important for oak forests, whose attacks have sharply decreased after 2015, which is explained by the successful introduction in Bulgaria of the entomopathogenic fungus *Entomophaga maimaiga* (Г8.37, Г8.38). The Yellow mistletoe (*Loranthus europaeus*) is widespread on the oaks in Strandzha mountain, disrupting the normal assimilation of the trees in case of a strong attack (Г8.37).

• **Damage caused by biotic and abiotic factors to forest tree species**

- During field surveys in the Gornata Koria and Chuprene reserves in Western Stara Planina in 2017, 16 species of insects were found in Gornata Koria and 9 in Chuprene, with bark beetles, weevils and longhorn beetles predominating. Attacks by the bark beetle *Ips typographus* are the main threat in spruce forests in both reserves (Г7.24).

- The studies and laboratory analyzes give reason to conclude that the browning and drying of the needles of *Pinus mugo* found in the summer of 2018 in the area of the Belmeken dam (Rila mountain) is due to the unfavorable weather conditions in the winter of 2017-2018, when the amount of precipitation was significantly less than normal and extreme temperature changes were observed. Fungi of the genera *Lophodermium*, *Hendersonia* and *Neofusicoccum* found in dry needles are characterized as weak parasites, appearing secondarily, or as endophytes, which under physiological stress due to changes in certain environmental factors can become latent pathogens, worsening the condition in mugo pine (Г7.26).

- **For the first time in Bulgaria**, the spread of *Biscogniauxia mediterranea* (De Not.) Kuntze in cork oak plantations in Maleshevska Planina was studied. Cork extraction has no visible impact on the phytosanitary status of the trees. A significantly higher risk of developing parasitic fungi occurs in coppice management, where they cause saplings to dry out (Г7.27).

- **New for Bulgaria** are the associations of the cork oak with ten species of xylobiont insects. Eight of them are also potential vectors of *B. mediterranea* (Г7.27).

- An assessment of the health status of conifer plantations in Bulgaria was made. The main threats to pine forests are indicated, among which damage from wind, wet snow and ice is leading, creating prerequisites for an increase in the number of xylophagous insects and occurrence of attacks on large areas. A system of silvicultural, preventive and organizational measures aimed at suppressing calamities and improving the health of forests is proposed (Г8.30).

• **Natural regulators of forest insect populations**

- **New for Bulgaria parasitoid/host relationships:** *Coeloides bostrichorum* Giraud and *Dendrosoter middendorffi* (Ratz. on *Ips typographus* (B4.1); on *Rhagium inquisitor* (L.) – *Ontsira antica* (Wollaston); on *Morimus asper funereus* Mulsant – *Ischnoceros rusticus* (Geoffroy); on *Prionus coriarius* (L.) – *Billaea triangulifera* (Zetterstedt); on *Phymatodes testaceus* (L.) – *Doryctes leucogaster* (Nees), *Spathius umbratus* (F.), *Helcon angustator* Nees; on *Molorchus minor* (L.) – *Helcostizus restaurator* (F.); on *Tetropium castaneum* (L.) – *Rhimphoctona xoridiformis* (Holmgren); on *Prionus coriarius* – *Billaea adelpha* (Loew) (B4.4); on the caterpillars of *Thaumatopoea pityocampa* – *Bothria frontosa* (Meigen) (B4.9).

- **New for Bulgaria predators:** *Medetera pinicola* Kowarz and *Lonchaea fugax* Becker on *Ips typographus* (B4.1); *Oecanthus pellucens* (Scop.) (Orthoptera, Gryllidae) – on larvae of *Thaumatopoea pityocampa* (B4.7).

- **New for Bulgaria nematode/bark beetle relationships:** *Cryptaphelenchus diversispicularis* Korenchenko – *Pityogenes chalcographus*; *Parasitylenchus dispar* (Fuchs) – *Ips typographus*; *Parasitorhabditis subelongati* Slobodjanjuk – *Pityogenes chalcographus*; *Prothallonema tomici* Nedelchev, Takov and Pilarska – *Tomicus piniperda*; *Bovianema* sp. – *Pityogenes conjunctus*; *Bursaphelenchus* spp. – *Dryocoetes autographus* (Ratz.), *Ips sexdentatus*, *I. acuminatus*, *Orthotomicus laricis* (F.), *O. erosus*, *Pityogenes quadridens*, *Hylurgus ligniperda* (F.), *Tomicus piniperda* (L.) and *Taphrorychus villifrons* (Dufour); *Cryptaphelenchus* spp. – *Orthotomicus erosus*, *Pityogenes quadridens*; *Neoparasitylenchus* sp. – *Orthotomicus erosus*; *Panagrolaimus* sp. – *Orthotomicus erosus*; *Parasitaphelenchus* spp. – *Ips sexdentatus*, *I. acuminatus*, *Tomicus piniperda*; *Parasitorhabditis* spp. – *Tomicus piniperda*, *Pityogenes chalcographus*; *Parasitylenchus* sp. –

Dryocoetes autographus; *Sulphuretylenchus* sp. – *Orthotomicus laricis* (B4.5).

- **Entomopathogenic fungi:** For the first time *Beauveria bassiana* (Bals.) Vull. has been isolated from adults of *Attelabus nitens* Voss (B4.5); *Beauveria bassiana* was also found on *Dryocoetes autographus* and *Hylurgops palliatus* (Gyll.) (B4.3), as well as on *Ips typographus*, together with *B. caledonica* (B4.6).

- **Microsporidia:** За първи път по *Pityogenes chalcographus* се установява наличието на микроспоридии от род *Nosema* (B4.5).

- Infection of *Ips sexdentatus* with **protozoa** of the genus *Gregarina* was established (B4.3).

- The results of the studies of naturally occurring pathogens on *Ips typographus* in Bulgaria for the period 2003-2018 are summarized, and one virus, one unicellular, one microsporidia, one entomopathogenic fungus and five nematode species were found (Г8.33).

- Data on established fungal infections in various insect pests (beetles and butterflies) in Bulgaria are summarized. A total of 18 species of entomopathogenic fungi were identified from 12 species of bark beetles and 10 species of butterflies over a sixty-year period (Г8.35).

• **Laboratory and field trials of xylophagous control**

- Tests to evaluate the virulence of *Beauveria bassiana* and *Metarhizium anisopliae* by treating adult bark beetles *Ips typographus* (B4.2). The potential of the Bulgarian strains for combating the *Ips typographus* (B4.6) as well as other bark beetles by treating stem sections has been established (B4.2). Pathogenicity of the entomopathogenic fungus *Metarhizium pemphigi* against the *Ips typographus* is reported for the first time (8).

- The investigation of the insecticidal activity of essential oils from *Origanum vulgare hirtum* and *Monarda fistulosa*, as well as a hexane fraction from *Tanacetum cinerariifolium* against adults of *Ips typographus* showed that its viability was affected by all tested extracts (B4.10).

5. Assessment of the candidate's personal contribution

The scientific contributions of Assoc. Prof. Danail Doichev are indisputable and show a very good ability for independent and team work, which is confirmed by the large number of specialists who participated in joint projects and publications with him.

6. Critical remarks and recommendations

I have no remarks on the scientific production of Assoc. Prof. Danail Doichev. My criticism is directed only at the preparation of some materials for the competition::

- There is no summary report on classroom occupancy (it is only available for the disciplines).

- Contributions are presented in too much detail and are not categorized as scientific and applied.

- References to contributed publications are also not categorized by criteria, but are represented by numbers only.

7. Personal impressions

My joint work with Assoc. Prof. Danail Doichev showed that he is dedicated to his work, with a desire for development and self-improvement, a responsible and responsive colleague. I do not doubt his personal involvement in every work presented. His ability to work in a team is highly valued, which is evidenced by the large number of collective publications and projects with his participation.

8. Conclusion

After a detailed acquaintance with the documents and materials submitted by the applicant, and established compliance with the requirements of the Regulations for the development of the academic staff at the University of Forestry, I propose Associate Professor PhD Danail Dimitrov Doychev to be elected as an "Professor" in the discipline "Forest entomology" in a professional field 6.5. Forestry.