



## REVIEW

on the materials for participation in a competition for the academic position of "Associate Professor", in the field of higher education 4. Natural Sciences, Mathematics and Informatics, PD 4.4. Earth sciences, scientific specialty "Ecology and protection of ecosystems", the discipline "Ecology", announced by the University of Forestry (UF), GP No. 4 /15.1.2021, for the needs of the Ecology, protection and restoration of the environment (EPRE) Department, procedure code ELA- AsP-0121-52.

**Candidate for participation in the competition:** Ch. Assistant Dr. Ralitsa Todorova Kuzmanova

**Reviewer:** Prof. Dr. Mariyana Ivanova Lyubenova, PD 4.3. Biological Sciences, Sofia University "Kl. Ohridski ", Department of Ecology and Environmental Protection

### 1. Brief biographical data about the candidate

R. Kuzmanova was born on June 4, 1974 in the city of Ruse. She graduated from the Sofia Mathematical High School, from a class with advanced study of English, biology and chemistry, in 1992. She received a Master's degree in Ecology, Protection and Restoration of the Environment in 1997 at the University of Forestry. In the same year, she received an additional professional qualification "Teacher of general technical and special subjects and EEP" The scientific title "Doctor", Kuzmanova acquired in 2015 by developing a dissertation in the field of ecology - analysis of abiotic and biotic components of the environment.

She worked at "Ekoglasnost" Non-governmental Association as a secretary and contributor (1998-99), then she was employed at EPRE Department, UF in 1999. She has successively held the positions of assistant, senior assistant and chief assistant. R. Kuzmanova has 21 years and 5 months of work experience at academic positions.

Dr. R. Kuzmanova has passed several specialized trainings, for which certificates have been attached: 4 courses in 2014, respectively - "Photosynthesis training", "Eddy Covariance Training", "Fundamentals of information technologies". Word processing systems, spreadsheets, presentations and business graphics", "Methodology of research, preparation, participation and project management"; 2 courses in 2015 - "Working with Free OpenSource GIS software" and "Working with SPSS" and 1 course in 2018 - "Preparation and management of international research projects", increasing her qualification in research. R. Kuzmanova has also undergone training in 4 courses related to the application of modern teaching methods: "Using modern teaching methods through ICT", "Web technologies. E-learning methods and systems - in 2014 and "Training for work and maintenance of the e-learning platform" Blackboard LearnTM", "Training for a trainer for working with the e-learning platform "Blackboard LearnTM" - in 2013, for which the certificates have been submitted.

Dr. Kuzmanova has listed good professional, communication, coordination and digital skills and competencies. The candidate is fluent in English and Russian in terms of comprehension and



independent level - in terms of speaking and writing. Good proficiency of the office pack and SPSS software and basic skills in AutoCAD and GRASS GIS. She holds a Driving License, category B. According to the information provided, Dr. Kuzmanova is a highly qualified lecturer and researcher with great opportunities for development.

## **2. Conformity of the submitted documents and materials of the candidate to the required ones according to the Academic staff development regulations (ASDR) at UF**

The documents and materials submitted by Dr. R. Kuzmanova fully comply with those required by the ASDR at UF. The candidate covers the minimum required points by groups of indicators where by indicators "D" and "E" she also exceeds them.

## **3. Evaluation of the teaching activity of the candidate**

Dr Kuzmanova is heading a bachelor course of "Ecology" which is part of the specialty "Ecology and Environmental Protection", giving lectures and exercises in full-time (60 + 60) and part-time (28 + 28) training. She conducts lectures and exercises for bachelor students from the specialty "Forestry" - discipline "Ecology and Environmental Protection" for full-time (15 + 30) and part-time (7 + 16) training. R. Kuzmanova also teaches the master's module "Ecological Network" - 20 hours of exercises from the course "Conservation of Biodiversity and Ecological Network" (45 + 45). Although, the information about average annual classroom workload is not presented, it seems they are over 280 hours. She was the research supervisor of a graduate, who defended in 2018 and a reviewer of two diploma works defended in 2016 and 2018.

## **4. Evaluation of the scientific, scientific-applied and publishing activity of the candidate**

### **4.1. Participation in scientific, applied and educational projects**

For the competition, the candidate has submitted a list of 12 projects for the period 2008 - 2020. Largest is the number of research projects - nine, as eight of them are national (NIS) and an international under the cooperative program "Forests" for large-scale and intensive forest monitoring in Bulgaria. Dr. Kuzmanova has been the leader of 3 of the research projects. The research projects are dedicated to the phenological studies, study of risk factors for tree and shrub species, assessment of the state of reclaimed ecosystems, study of erosion in some landscapes, metabolic profile of plants on man-made soils, application of remote methods for assessment of beech ecosystems, also preparation of schemes and primary monitoring of forest ecosystems in a strict and maintained reserves. Two of the projects are educational - updating of school programs in the Faculty of Ecology and Landscape Architecture and Student practices at the Human

Resources Development Operational Program. Dr Kuzmanova was a mentor to 13 students - 6 bachelors from EEP specialty and 7 masters (four from the Environmental Restoration and Environmental Monitoring, two from the Landscape Ecology and 1 from the Settlement Ecology). One of the projects related to the construction of a scientific laboratory in Ecology. The candidate shows activity in the implementation of research projects related to the monitoring, assessment of the state and restoration of components of ecosystems.

#### **4.2. Characteristics of the published scientific results**

For the competition the candidate presented a list of 23 published scientific developments, including a monograph, 8 publications in a referenced and indexed journal - Journal of Balkan Ecology (G7); a publication in a non-peer-reviewed journal and 9 - in edited collective volumes that have been peer-reviewed (G8); As "Others" are also listed - 1 textbook and 3 participations in international conferences that took place in Ankara, Bucharest and Elenite. For the period 2016 – 2019, Dr. Kuzmanova presented evidences for participation in 3 international conferences and a symposia "Research, conservation and management of biodiversity in the European seashores", 2017 - Primorsko, which is not listed. The total number of points for indicator "D" is 357.7 with the required minimum of 200 points.

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

The candidate presented a list of 21 citations, 12 of which are in the Journal of Balkan Ecology, Scientia Horticulturae and Forest Science (D 10), 6 of them are in collective volumes - Forest Condition in Europe, Technical Reports of ICP Forests and Forestry Ideas (D 11), 1 citation is in an unreferred journal (D 12) and 2 - in dissertations. Fourteen publications were cited, approx. 70% of the works of Dr. Kuzmanova. According to the indicator E, the candidate collects 80 points with a required minimum of 50 points.

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

The candidate's contributions are in the field of ecology - plant ecology and plant monitoring; inventory and assessment of landscapes, protected zones (PZ), natural habitats (NH) and ecosystems; biological reclamation of anthropogenically affected terrains. A total of 20 contributions are outlined, as 9 are scientific and 11 are scientific-applied. The original contributions are 11 (7 scientific and 4 scientific-applied).



**I. Group of contributions in the field of plant ecology and plant monitoring - 9 publications and 9 contributions - 5 scientific and 4 scientific-applied, 7 of which are original**

The realized contributions from this group are related to the study of the vegetation period length and the phenological development (swelling of the buds, leafing, flowering, yellowing and leaf fall) of the common beech (communities of Vitinya, Petrohan and Kopitoto at 950 and 1450 m altitude) for an 11-year period - 6 publications (B3, G7.8, D8.1, D8.2, D8.4, D8.7) and 5 contributions were realized - two scientific (1-2) \* and 3 scientific-applied (1-3) \*\*. The scientific and one of the scientific-applied contributions are original. The group also includes contributions to the study of the content of some macro- and microelements in the leaves / conifers of tree species, necessary for their normal growth and development - 3 publications (D7.1, D7.6, D8.6) and 4 contributions - 3 scientific (3-5) \* and one scientifically-applied (4) \*\*. The contributions are original in nature.

**II. Group of contributions from inventory and assessment of the current and forecast condition of landscapes, PZ, types of NH from the ecological network Natura 2000 and ecosystems - 5 publications and 5 scientific-applied confirmatory contributions.**

The realized contributions in this group are related to the inventory of the above-mentioned natural units in the sample areas for large-scale forest monitoring - 3 publications (D8.8, D8.9 and D8.10). The contributions are scientific-applied (5, 6, 7)\*\* and confirmatory.

The group also includes contributions related to the inventory and assessment of the current and forecast status of landscapes, ecosystems and PZ after planned anthropogenic activities - 2 publications (D7.3 and D7.4). The contributions in this group are scientific-applied (8 and 9)\*\* and confirmatory.

**III. Group of contributions related to the analysis of results from biological reclamation for restoration of disturbed terrains and for assessment of their ecosystem services - 3 scientific articles (G7.2, D7.5 and D7.7).**

The contributions in this group are 6 in total - 4 scientific (6-9)\*, of which 2 are original, and 2 scientific-applied original contributions (10 and 11)\*\*.

\* **Scientific contributions:** 1) It was found that the average duration of the vegetation period is 195.4 days, cyclicity in its duration and in the occurrence of phenophases, as well as displacement of spring phenophases in the last decades; 2) The limiting influence of the average monthly temperature of the previous two months and the current month for the phenophase has been established; the threshold value of 7.3 ° C for phenological development has been set and the 124 cooling days required for the "start of leafing" of the common beech communities of Vitinya have been set; 3) The minimum and



maximum limits for nutrient content adopted in 2002 in the leaves of common beech in the Western Stara Planina and in one- and two-year-old conifers of *Picea abies* (L.) Karst and *Abies alba* Mill. from the central and western part of the Rhodopes and the eastern part of Rila have been updated on the basis of data to the period 1986-2016; 4) A comparative analysis has been made with the limits recommended in the MCP-Forests for the content of some macro and microelements in the leaves / conifers of tree species from forests in Europe and Bulgaria; 5) The regional values of the observed elements in the Bulgarian forests have been established; 6) The successive development of the vegetation cover on the embankments of the mines "Maritsa-East" has been studied and three stages in the natural grassing are outlined; 7) The presence of sustainable soil formation processes in the forest areas with longer reclamation and active erosion process and pollution of the neighboring agricultural lands from the unforested embankments has been established; 8) The dependence between the age of the embankments, respectively the duration of the soil formation process, the abundance and the total cover of grass species has been established and 9) The positive effect of liming (regardless of the substrate) and fertilization has been proven, where depending on the norms, the resistance of the plants and their survival shows an increase.

**\*\* Scientific-applied contributions:** 1) A "Chill Days Model" is applied, which is suitable for studying and forecasting the initial phases of the phenological development of beech; 2) Remote methods have been applied and it has been found that the vegetation index (NDVI) has the potential to be used to study the autumn phenological phases of beech; 3) The methodology of IPC "Assessment and monitoring of the impact of polluted air on forest ecosystems" in the part "Phenological observations" has been supplemented; 4) Introduction of the regional peculiarities in the mineral nutrition in the leaf phytomass of the observed tree species, as criteria for the assessments in clean and anthropogenically loaded areas, as well as for the assessment of the load with toxic substances; 5) It has been established that the forest monitoring sampling areas in Strandzha (9 region) and Eastern Rhodopes (10 region) belong to the different types of landscapes: 9 region - 4 groups of landscapes, which belong to 3 subtypes, 2 types and 2 classes, and in 10 region - 5 groups of landscapes, which belong to 2 types and 2 classes; 6) Establishment of the attribution of the forest monitoring sampling areas to types of forest habitats, which are subject to protection in eight PZ of Nature - 2000; 7) For updating the network of sample areas for forest monitoring, it is recommended to set areas in the following forest habitats: 9170 in BG0001032; 9410, 9170 and 9530 \* in BG 0001031; 91AA \* in BG 0000212 and BG 0001034; 8) The landscapes and the main types of ecosystems along the planned route of the international power line "MARITSA EAST" (Republic of Bulgaria) - "NEA SANTA" (Greece) are inventoried and their condition is assessed; 9) The possible impact of the projected construction of the international power line on the NH, object of protection in three PZ of the Natura 2000 network, has been studied; 10) Appropriate plant species and compositions for the purposes of biological reclamation of the disturbed terrains from copper extraction in the Ellatsite mine have been



identified and 11) An indicative economic assessment of a part of the ES provided by reclaimed terrains has been made.

### **5. Assessment of the personal contribution of the candidate**

In 79.2% of the presented scientific production, Dr. Kuzmanova is in the first or second place as an author and she is the first author in 58% of the publications. Regarding the works published in item "D", she is the first author in 57% of the included titles. In the presented four participations in international conferences and symposium, she is the first author of three of the presented four posters. Dr. Kuzmanova was the manager in 33.3% of the implemented projects. It can be concluded that the personal contribution of the candidate in the considered scientific activity is quite well expressed.

### **6. Critical remarks and recommendations**

Evidence for 10 projects is presented and there is no such materials for projects № 1 and № 3 of the list. Evidence of participation in a symposium is also presented, but in the list of publications to "Others", this participation is not noted.

The contributions are not well formulated. The groups of contributions are incorrectly indicated as scientific directions. The scientific contributions are not differentiated from the scientific-applied contributions and the original ones from the confirmatory ones.

I recommend efforts to be made on the phenological research in order to build a database and use it for climate monitoring. Also to expand the analyzes of the data on the study of the succession changes in the biological reclamation of anthropogenically changed terrains and the economic evaluations of the services provided by these terrains.

### **8. Conclusion**

Based on the analyzes of the submitted documentation, it can be concluded that the candidate meets the requirements of the Rules for ASD in UF, has realized scientific production and scientific contributions that make her recognizable in the scientific community. I PROPOSE the candidate Dr Ralitsa Todorova Kuzmanova to take the academic position of "Associate Professor" in the discipline "Ecology" in the Professional field 4.4. Earth sciences.

**Reviewer's signature:**

**The review was submitted to: 10.05.2021**