In memoriam

Prof. Dr. Slobodan Jovanović (1955 –2021)

Just five months ago, we marked Professor Slobodan Jovanović's well-deserved retirement with a very pleasant get-together in the Botanical Garden. At that time, we all expressed our sincere hopes that he would look on the end of his employment at the Faculty of Biology, where he had spent his entire working life, as only a formal legal act, and that he would accept his new position of "retiree" simply as a formal status resulting from the retirement laws, We wished him good health and the continuation of his fruitful work and research on the protection of the flora and vegetation of the Balkan Peninsula. We especially hoped he would continue his research in collaboration with the members of the Department of Ecology and Geography of Plants at the Faculty of Biology.

We wished him good cheer and reminded him that he would always be welcome at the Department of Ecology and Geography of Plants. And so it was until the end of December, when his health suddenly deteriorated, requiring urgent surgical intervention. The operation was difficult, but successful. Although his recovery started well, the situation was unexpectedly complicated by the unfortunate times and space in which we live, and Professor Jovanović was unable to hold out and he left us suddenly and unexpectedly.

Professor Jovanović left us only physically, but not spiritually, because his work and legacy are extensive and very important, and they place him in the group of our most important professors who have left a deep and recognizable mark on our botany and ecology.

In the following pages, I will try to summarize the basic elements from Professor Jovanović's biography, as well as point out his most significant contributions and results in the field of education, science and environmental protection.

Slobodan Jovanović was born in Belgrade on August 31, 1955, where he completed both primary and secondary school. He graduated from the Department of Biological Sciences at the Faculty of Natural Sciences and Mathematics in Belgrade in 1981, after which he enrolled in postgraduate studies in the group for Plant Ecology (1982/83 school year). He defended his master's thesis entitled *Phytocenological Analysis of the Ruderal Vegetation of the Northeastern Part of Belgrade* on March 26, 1986.

In the period from May 4, 1983 to November 30, 1988, Slobodan Jovanović was employed first as a junior assistant, and then as an assistant in the Department of Phytoecology of the Institute for Biological Research Siniša Stanković in Belgrade.

Fig. 2. Teaching in Special Nature Reserve "Šalinački lug" (2009)

He was appointed assistant at the Department of Ecology and Geography of Plants at the Faculty of Biology in Belgrade on December 1, 1988, following which he organized and conducted practical classes in the basic course *Man and the Environment*, as well as teaching courses in the *Protection, Restoration and Improvement of the Environment* and *Phytocenology and Ecology of Vegetation of Yugoslavia and the Balkan Peninsula*. In addition, as the only assistant at the department during 1989 and 1990, he also organized and conducted practical classes in the basic courses *Ecology and Geography of Plants* and *Principles of Ecology*.

He defended his doctoral dissertation entitled *Synecological and Floristic Study of Ruderal Vegetation in the Area of Belgrade* on September 10, 1992 at the Faculty of Biology in Belgrade.

Professor Jovanović was appointed assistant professor in August 1993, after which he took over and independently conducted theoretical and practical classes in the compulsory courses: *Man and the Environment* and *Environmental Protection*. In addition, he independently taught the courses *Protection, Restoration and Improvement of the Environment* and actively participated in conducting theoretical and practical classes in the courses *Flora and Vegetation of the Balkan Peninsula, Urban Ecology, Methods of Ecological Mapping and Protection, Restoration and Improvement of the Environment 1*.

He was elected associate professor at the end of February 2000, upon which, in addition to the pre-existing courses, he also taught the following: *Restoration and Improvement of Ecosystems, Ecology of Man with Urban Ecology, Ecological Aspects of Spatial Planning and Applied Ecology*. After his first re-election as associate professor, he took over the realization of new courses in doctoral studies: *Conservation Ecology and Biodiversity Protection, Ecology of Invasive Species and Applied Ecology and Sustainable Use of Biological Resources*.

In the period from 2004 to 2006, Professor Jovanović was engaged as a visiting professor on the course in *Urban Ecology* at the Faculty of Natural Sciences and

Mathematics, University of Niš, and in the period from 2004 to 2018 he was continuously engaged as a visiting professor at the Faculty of Teacher Education in Belgrade on the courses: *Introduction to Natural Sciences, Getting to Know the Environment* and *Contemporary Understanding of Nature*.

Slobodan Jovanović was the mentor of four, and a member of the defence committee of twenty-one, doctoral dissertations defended at the Faculty of Biology, Faculty of Agriculture, Faculty of Forestry, Faculty of Geography and Faculty of Teacher Education of the University of Belgrade, as well as the Faculty of Natural Sciences and Mathematics of the University of Novi Sad. In addition, he mentored eight master's theses as well as 37 graduate theses.

Professor Jovanović is the co-author of two university textbooks, three high school textbooks in Biology as well as three textbooks and one workbook for primary school.

In addition to the aforementioned teaching activities at the faculty, Slobodan Jovanović was occasionally engaged as a lecturer at the Petnica Science Center, as well as at the Children's Cultural Center in Belgrade, where he gave a series of lectures in the field of Ecology and Environmental Protection. At the same time, he is the author of two accredited courses for the professional development of biology teachers in primary and secondary schools in Serbia, which were successfully realized at the Faculty of Biology in Belgrade in the period between 2003 and 2009.

Professor Jovanović was both an eloquent and inspirational speaker and a skilled writer. If he were among us, I would send him this important text to read, with the message, "Boki, look at it and correct it where you think it is necessary." And I know he would have corrected it so that the sentences would begin to flow more easily, without making me feel bad about his interventions. We called him "Chrysostom," and rightly so, for he was one of the few professors whose regular lectures often ended in a round of applause from the students.

Slobodan Jovanović was the participant or manager of a number of international and national scientific projects, among which The *Green Regulation of Belgrade project Phase II – the preparation of the content and programmes for the development of the cadastre of green areas in Belgrade - mapping of biotopes* and the *Action Plan for the Control of the weed plant Ambrosia on the Territory of Belgrade for the period from 2021 to 2029* stand out as the most important.

He published the results of his scientific and professional work in a total of 241 bibliographic units. He published one monograph of national importance, 14 chapters in monographs of national importance, 29 papers in international journals from the SCI list (of which 7 were in the highest category), 43 papers in journals of national importance (of which 16 were in the top national journals), 3 papers printed in full text from international scientific conferences (one of which was plenary - by invitation), 10 papers printed in full from domestic scientific conferences, 37 abstracts from international scientific conferences, 51 presentations at scientific conferences of national importance printed as abstracts (one of which was plenary - by invitation), as well as 44 professional and popular science works.

Slobodan Jovanović was a member of the Committee for Flora and Vegetation of the Serbian Academy of Sciences and Arts (SASA) since 1996. He was a member of the editorial boards of the scientific and professional journals Acta Herbologica, Nature Protection, and Contemporary Biology, as well as the Red Book of Serbian Extinct and Critically Endangered Taxa and Flora of Serbia 1. He was also an active member of the organizing committees of numerous scientific conferences, including the XI OPTIMA symposium (Belgrade 2004), Biology: State and Perspectives (Belgrade 2007), the 5th Balkan Botanical Congress (Belgrade 2009) and the 7th Balkan Botanical Congress (Novi Sad, 2017).

Professor Jovanović was also a long-term member of the National Council for Biosafety, a member of the Biodiversity Committee of the Serbian Biological Society and numerous technical commissions for the evaluation of environmental impact assessment studies at the Belgrade City Secretariat for Environmental Protection.

He was the recipient of the Golden Charter of the Serbian Biological Society on the occasion of the 65th anniversary of the publication of the Archives of Biological Sciences journal, which was awarded to him in December 2013 for his outstanding and valuable contribution to the development and advancement of biological and related sciences. He was also awarded the Certificate of Appreciation for special merit in preserving and improving the Botanical Garden Jevremovac by the Faculty of Biology, University of Belgrade, on the occasion marking the 160th anniversary of Biology, 40 years of Molecular Biology and 15 years of Ecology and Environmental Protection.

In addition to his scientific research and regular teaching activities, Professor Jovanović also contributed to various other activities at the Faculty of Biology, University of Belgrade. From 1996 to 2001, he first served as assistant director of the Institute of Botany and Botanical Gardens Jevremovac, and from 2001 to 2006 he was elected director of the Institute of Botany and Botanical Gardens Jevremovac for three consecutive terms.

In the period between 2009 and 2015, he served two consecutive terms as president of the Council of the Faculty of Biology, University of Belgrade, and sat on several committees for elections to teaching and research positions at the Faculty of Biology, University of Belgrade, the Faculty of Teacher Education in Belgrade, the Faculty of Pharmacy, University of Belgrade, the Faculty of Veterinary Medicine, University of Belgrade, the Faculty

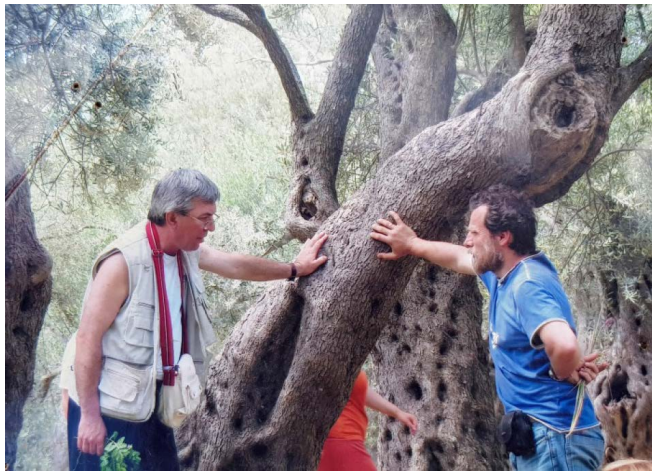

Fig. 3. Fruitful discussions during fieldwork - old olive grove "Maslinada" in Valdanos near Ulcinj (1998)

of Science, University of Kragujevac, and the Faculty of Science, University of Niš, as well as commissions for the nostrification of diplomas obtained at foreign universities.

Life in Science and Nature Protection

Slobodan Jovanović's scientific and research activity includes a complex and wide area of fundamental plant ecology and phytogeography, primarily synecology (phytocenology), floristics, horology and biocenology, but also applied geobotany, and nature conservation in particular, i.e. the preservation and protection of biodiversity in Serbia, possibilities for the phytoremediation of technogenic habitats and degraded ecosystems, as well as the ecology of invasive species. In that sense, Professor Jovanović's scientific work could be categorised into several basic units.

Synecological (phytocenological) studies of the vegetation of Serbia and Montenegro (Tara, Kopaonik, Golija, Mt. Šara, Kosmaj, Željin, Durmitor, etc.). It is important to point out that the objects of his phytocenological research were very different types of vegetation, starting from secondary meadow-pasture types, through hazmophytic, steppe, and vegetation of mountain and alpine peatlands, all the way to primary forest types and anthropogenically conditioned sinurban forms such as ruderal plant communities. The most significant results of such research are, on the one hand, the discovery and description of a large number of new plant communities, many of which are endemic or endemorelic, while on the other hand special attention is paid to syngeneic processes (successive series) in the formation of plant communities, one of the greatest theoretical and practical challenges in modern phytocenology. In that way, Slobodan Jovanović undoubtedly made a significant contribution to improving our knowledge of the vegetation cover not only in Serbia, but also in the entire Balkan Peninsula, especially when it comes to ruderal vegetation. Namely, with his studies of the urban vegetation of Serbia and Montenegro, Slobodan Jovanović stood out as one of the most productive authors in the area of Southeast Europe.

Floristic, chorological and phytogeographical problems are represented in many of Professor Jovanović's works, which contributed significantly to our gaining more knowledge of the distribution of certain species, or entire plant genera characteristic of anthropogenic habitats, such as: *Amaranthus* L. and *Chenopodium* L., but also endangered genera such as *Leucojum* L., about whose presence on the territory of Serbia and Montenegro until then little had been known, or, in the case of certain species, had been completely unknown.

Idioecological topics are also present in the research activities of Professor Jovanović, particularly when it comes to the relationship between morpho-anatomical and physiological-biochemical characteristics of plants and their adaptations to ecological habitat conditions. In this regard, adaptations in ruderal plants to different light regimes and different types of anthropogenic pressure in urban biotopes in the area of Belgrade have been investigated in detail. The results of these studies represent a significant contribution to the knowledge of the ecological strategies of species such as *Ailanthus altissima*, *Polygonum aviculare*, *Taraxacum officinale*, *Cynodon dactylon* and *Plantago major* which allow them not only survival, but also population expansion in specific ecological conditions with pronounced anthropogenic pressure.

Topics related to applied ecology, especially those aspects related to nature conservation, the protection of sensitive or fragile ecosystems, as well as the conservation and protection of biodiversity, are significantly represented in the research work of Professor Jovanović, which is directly related to the narrower scientific field and courses that he successfully realized over the years at the Faculty of Biology. In this regard, a group of works of a monographic character stand out, providing a comprehensive overview of the diversity of the entire flora of Serbia, as well as the need for its protection within certain national parks and other protected areas of Serbia and Montenegro. The same group includes works dealing with the problems of endangerment and the protection of individual plant species, genera and communities, especially those which are rare, endemic and relict. Professor Jovanović made a particularly valuable contribution to the protection of the endangered flora of our country with his participation in the preparation of the first volume of the Red Book of Flora of Serbia, in which extinct and critically endangered taxa were presented.

Urban ecology is the scientific field for which Slobodan Jovanović is most recognized. This primarily refers to the previously mentioned aspects of his research into ruderal flora and vegetation in the area of Belgrade

(phytocenological, floristic-chorological, morpho-anatomical and physiological-biochemical). The synthesis of many years of research in this field culminated in a doctoral dissertation (1992) and later (1994) a monographic publication, *An Ecological Study of the Ruderal Flora and Vegetation of Belgrade*, thus ranking Belgrade among the best studied cities in Europe. In his later research, Professor Jovanović covered a number of other cities in Serbia and Montenegro, advocating for more complex and intensive research not only of ruderal flora and vegetation, but also of the overall urban flora (in a broader sense) in order to gain a better understanding of their role and importance as an integral part of the immediate living environment of modern man and as an extraordinary subject for various urban ecological studies. In that sense, the engagement of Slobodan Jovanović on the conception of the research methodology and realization of the *Green Regulation of Belgrade* project is of special importance. Within this project, from 2004 to 2009 (through several phases) the mapping and evaluation of urban biotopes in the general urban plan of Belgrade is particularly emphasized.

Restoration ecology also attracted Slobodan Jovanović's attention, especially during the last ten years, when he focused his activities on researching the possibility of the bioremediation (phytoremediation) of technogenic habitats in Serbia, i.e. determining the potential of wild plant species for the accumulation of potentially toxic elements from the substrate and their use in the restoration and remediation of devastated habitats. In this field, the results of his research on the bioaccumulation potential of selected species of herbaceous plants which grow in natural, primarily ultramafic habitats are of great significance.

Slobodan Jovanović devoted his recent research efforts to the problems of *ecology and the distribution of invasive plant species and communities*, where the results related to the research of habitat invasibility, as well as the prediction of the spread of invasive species in urban and protected areas of Serbia and Southeast Europe made a significant contribution in this field. In this segment of Professor Jovanović's research, his last great engagement in the development of the *Action Plan for the Control of the weed plant Ambrosia on the Territory of Belgrade for the period from 2021 to 2029* is especially noteworthy.

In addition to everything previously stated, Professor Jovanović also focused a great deal of his attention on the *biocenological (interdisciplinary) approach* to the study of the living world. In these papers, the composition, structure and dynamics of mites (Acarida) and insects (Insecta) in different ruderal communities or individual plant species in the area of Belgrade, as well as within the primary flora and vegetation in the area of the national parks of Serbia and Montenegro and other protected areas are analyzed from the ecological aspect.

Fig. 4. Data sampling - open pits of the Kostolac mine (Kostolac, 2009).

At the same time, works of special scientific importance include those related to the research of complexes of various herbaceous and woody plant species from primary ecosystems, as well as agroecosystems, with plant-lice and parasitoids in the area of Southeast Europe.

Professor Jovanović and the Botanical Garden Jevremovac

Shortly after being elected assistant professor in 1996, Professor Jovanović accepted the position of assistant director of the Institute of Botany and Botanical Garden Jevremovac. He performed the duties of assistant manager until 2001, after which he was elected manager of this organizational unit of the Faculty of Biology for three consecutive terms (2001-2006).

With his ten-year engagement as assistant manager, and later as the manager of the Institute of Botany and Botanical Garden Jevremovac, Professor Jovanović made an immeasurable contribution to the reaffirmation and development of the Botanical Garden Jevremovac, which had been neglected for more than half a century following the death of the famous manager professor Nedeljko Košanin. Thanks to his selfless and dedicated work, the

Botanical Garden Jevremovac is today recognized as one of the historical and educational-scientific foundations of our society, and as such enjoys a special reputation far beyond the borders of our country. Due to the initiative and commitment of Professor Jovanović, the Botanical Garden was reopened to the public after a long period of isolation, and numerous infrastructure projects were launched and completed, including the introduction of public lighting and heating, the complete reconstruction of the Great Old Greenhouse, the reconstruction of the gates and fences around the Botanical Garden, the construction of new and the reconstruction of old paths, the construction and equipping of the Small Glasshouse, and the construction of the Japanese Garden, etc. In this way, the garden has been restored to its former splendor.

Professor Jovanović succeeded in drawing the attention of foreign donors to the importance of the Jevremovac Botanical Garden, which resulted in the financing of numerous projects aimed at improving the infrastructure and the facilities of the University Botanical Garden – the Japan World Exposition fund - JEC Fund (the design and construction of the Japanese Garden); the Embassy of the Kingdom of the Netherlands (the design and construction of the Dutch-Serbian friendship plot); EFG Bank (the design and construction of the European Garden); and LUKOIL SERBIA AD (the design and installation of the busts of Josif Pančić and Nedeljko Košanin) (2003-2006). The programme contents of the Botanical garden Jevremovac have been significantly enriched, by the organization of 21 attractive thematic exhibitions with live plants and mushrooms among other things, which have attracted a significant number of visitors. Thanks to the dedicated engagement of Professor Jovanović and his exceptional cooperation with the media, the Botanical Garden has attracted significant public attention and restored its reputation as a highly important institution for the City of Belgrade and the Republic of Serbia.

Professor Slobodan Jovanović made an indelible contribution to the development of the Institute of Botany and the Botanical Garden Jevremovac, but also the entire Faculty of Biology at the University of Belgrade. Colleagues and students alike will always remember the talent and ease with which he gave such inspiring lectures, the energy and enthusiasm he invested in the revitalization of the Botanical Garden, as well as the love he nurtured for his vocation as a teacher.

And finally, dear reader, let me end this memoir with a few words about Professor Jovanović as a human being and a dear friend. Professor Jovanović and I shared the same office at the Botanical Garden for three decades. Throughout all that time we worked together very constructively and professionally, with sincere mutual respect and appreciation. In fact, it may be hard to believe that we never argued during those thirty years, even in those moments when our approaches to solving certain important problems differed significantly. We always managed to find the best solutions and we never gave up. We were an extraordinary duo, able to achieve great things only because Professor Jovanović was so gentle, reasonable and persistent, because he was a good person who believed in the higher goal and in the common good. In the same way, Professor Jovanović communicated and cooperated with everyone. Whether he was dealing with ministers, directors, deans or housekeepers, craftsmen or gardeners, his approach was always the same - human, with great respect, appreciation and understanding. Therefore, Professor Jovanović's untimely death has hit us all hard, but we find comfort in the fact that his spirit and legacy live on with us, and I am convinced that he will live on in future generations too.

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