

Social news

Professor Nikola Ljubešić – on the occasion of his seventieth birthday



Professor Nikola Ljubešić was born on May 18, 1940, in Komarevo near Sisak. He attended elementary school in Cepelište and Petrinja and completed high school in Sisak. He enrolled in the study of biology at the Faculty of Science of University of Zagreb and obtained a BSc Degree in 1964. At the same Faculty, he enrolled in the post-graduate biology programme in the field of experimental biology. In 1966, he earned his MSc Degree and, in 1971, he defended his PhD thesis.

In 1964, Professor Ljubešić joined the Laboratory for Electron Microscopy at the Ruđer Bošković Institute (RBI) where he spent his entire career. In 1974, he acquired the title of research associate and continued his career path by becoming higher research associate in 1980, followed by the title of senior scientist in 2001. Over the years, he carried out a number of duties at RBI: he was the Head of the Laboratory for Electron Microscopy, and served, in several mandates, as the Head of the Division of Organic Chemistry and Biochemistry, and afterwards of the Division of Molecular Genetics. Also, for a number of years he was appointed a member of the RBI's Executive Board.

In 1973, and again from 1986 till 1988, Professor Ljubešić continued his scientific specialization in the laboratory of Prof. Eberhardt Schnepf at the Department for Cellular Biology (Lehrstuhl für Zellenlehre), University of Heidelberg, Germany.

For his professional achievements and endeavors in the popularization of science Professor Ljubešić received several awards. In 1986 he was awarded the »Narodna tehnika« Republic's Prize. For his dedicated work on the investigation of plastids, he won in 1998, together with Professor Mercedes Wrischer, the Croatian Academy of Sciences and Arts (HAZU) Prize. In 2005, Professor Ljubešić received the Annual State Prize for Popularization and Promotion of Science (in the field of natural sciences). In 2006, he was elected an associate member of Croatian Academy of Sciences and Arts.

Professor Nikola Ljubešić is the author or co-author of 112 scientific papers, and the co-author of one University textbook. During his scientific career, his interest was primarily focused on the structure and function of plastids, plant organelles with versatile morphology and functions. In his research, he placed special emphasis on electron-microscopic investigations of the conversions between various plastid types. He initiated his career with investigations on ultrastructural changes occurring in plastids during yellowing (senescence) and subsequent greening of tobacco leaves, in which he particularly followed the

processes of thylakoid degradation and reconstitution as well as morphology of plastoglobules. These investigations became the main part of his MSc Thesis entitled »A contribution to understanding the submicroscopical structure of chloroplasts«. Later on, in his doctoral thesis entitled »Transformations of plastids in the subepidermis of the fruits in the genus *Cucurbita*«, he described the processes of plastid conversion during growth, ripening and decay of pumpkin fruits. These investigations revealed immense ultrastructural variability in chromoplasts found in fruits of varieties of *Cucurbita pepo* and *Cucurbita maxima*. Especially intriguing was the discovery of the regreening of mature fruits, more specifically, the possibility of re-building the thylakoid system in photosynthetically inactive chromoplasts. His fascination with chromoplasts in pumpkin fruits led to further extensive research on chromoplasts found in flowers and fruits of different species. Especially interesting were chromoplasts in the flowers of *Hypericum perforatum*, *Thunbergia alata* and *Liriodendron tulipifera*, as well as in the fruit and sepals of *Physalis alkekengi* and the fruit of *Solanum capsicastrum*. These studies not only demonstrated the amazing morphological diversity of chromoplasts in different plant species, but also showed that ultrastructurally distinct chromoplasts can be found in different tissues of the same part of the plant, as exemplified by the flowers of *Thunbergia alata*. His studies of chromoplasts showed not only their fascinating morphology, but also their complex biogenesis. In his efforts to elucidate the mechanisms underlying formation of different chromoplast substructures, especially important were his studies on different herbicides influencing carotenoid biosynthesis. These studies showed a strong connection between the amount and composition of carotenoids and the formation of the particular carotenoid-containing structure. Apart from chromoplasts, a significant part of the scientific interest of Professor Ljubešić was dedicated to chloroplasts found in different 'Aurea' plant varieties (such as *Zelkova serrata* 'Aurea' and *Euonymus japonicus* 'Aureomarginatus'), in which leaves exposed to high-light intensities turn golden-yellow. These investigations led to the detailed descriptions of the processes involved in the disassembly of the photosynthetic apparatus during leaf yellowing, as well as the processes of thylakoid system reassembly, which can occur if such yellowed leaves are exposed to low light conditions.

In more than 45 years of dedicated scientific investigation using electron microscopy led to Professor Ljubešić becoming widely known as an expert in the field of plant cell ultrastructure. Moreover, with his exceptional knowledge and expertise in microscopy, he has been a collaborator in solving many scientific problems of his fellow biologists, as well as other scientists, notably biomedical researchers and chemists with whom he established long and fruitful collaborations. He has also restlessly catalyzed the connectivity of electron microscopists from different fields and institutions, thus immensely contributing to the development of electron microscopy in Croatia.

Professor Ljubešić contributed significantly to publishing of the most significant Croatian scientific biological journals, »Periodicum biologorum« and »Acta Botanica Croatica«, either by his regular submissions of scientific papers, or by being a member of the Editorial Boards for a number of years. In »Priroda«, the oldest Croatian journal for the popularization of science, he was a member of the Editorial Board for more than ten years, and also acted as the Editor in Chief.

Along with his work in science, for a number of years he was involved in education, enthusiastically sharing his broad knowledge and experience in microscopy and cell biology

with generations of students. He participated in lecturing within the scope of graduate and post-graduate studies at the Faculty of Science (at which he taught as a full professor since 1997), Faculty of Pharmacy and Biochemistry, Faculty of Medicine, and Academy of Fine Arts of University of Zagreb, and at the Faculty of Education of J. J. Strossmayer University of Osijek. He was also a supervisor of a number of BSc, MSc and PhD thesis.

Professor Nikola Ljubešić was, and still is, exceptionally active in a number of professional societies. In the Croatian Natural Sciences Society (HPD) he performed many duties, while in one mandate he was its president. He was one of the founders of the Croatian Society for Plant Biology and of the Croatian Biological Society (HBD), in the latter being awarded the »Zdravo Lorković« Plaque for exceptional contribution to the work of the Society. Professor Ljubešić was also one of the founders of the Section for Electron Microscopy within the HPD which later developed into the Croatian Society for Electron Microscopy and finally Croatian Microscopy Society. He has also greatly contributed to the work of »Matica Hrvatska«, in which he was the founder of a Division for Technical Culture and Division for Natural Sciences and Mathematics.

Professor Ljubešić was also the president of the 7th Croatian Biological Congress, one of the organizers of a Symposium dedicated to Zdravko Lorković, as well as two international scientific meetings, numerous professional and scientific conventions, and a number of professional excursions.

In more than 45 years of fruitful work by Professor Ljubešić, it is hard to distinguish scientific and professional achievements from his exceptional talent in the popularization of the natural sciences. In this respect, he was very fond of working with younger generations. Already after completion of his studies, he became a member of the Committee for Biology within the Movement »Nauka mladima« that later developed into the association of young natural scientists – »Znanost mladima«. He was the leader of many summer schools for young biologists, with those organized on the Velebit mountain being particularly successful. Without exaggeration, today we can say that he was, and still is, the »spirit« of this Movement, and that he is well known as such even in the most remote corners of Croatia.

With the same passion and joy that he showed in the laboratory studying microscopic structures, Professor Ljubešić also discovered nature in its »macroscopic« dimensions – as a passionate mountain climber conquering mountain tops, and also as an admirer of the stars in the night sky. He is a member of the Croatian Climbing Society, Croatian Astronomical Society, and was even the director of Zagreb's observatory. Therefore, although Professor Ljubešić is by vocation a biologist, it would be more correct to describe him as versatile natural scientist.

Along with his many interests and duties, too many to mention, Professor Ljubešić has always found time to patiently share his wide knowledge and experience with younger colleagues but also to help and support them, as a mentor and as a colleague. He has always been able to bring the spirit of tolerance and optimism in the working environment, and his enthusiasm and friendliness has always been the source of a pleasant and constructive atmosphere. All of his co-workers have unforgettable memories of excursions that he has organized, and that have always been a very welcome break from the laboratory work.

On behalf of all his colleagues, we wish Professor Nikola Ljubešić, on the occasion of his 70th birthday, that he may continue to solve the »microscopically tiny« puzzles of nature

with the same curiosity and enthusiasm. Also, it is our special wish that he may enjoy many more beautiful moments discovering the splendors of nature by hiking on mountain trails and catching magnificent sights from mountain tops.

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