

Editorial

Lydia A. Semkina has celebrated her 80th birthday

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Lydia Alexandrovna Semkina was born on January 24, 1939. Her father, Alexander G. Pustozеров was the Head of the Meteorological Station in Shadrinsk, Kurgan Region. In 1939 he participated in the All-Union Exhibition of Achievements in the National Economy (VDNKh) in Moscow. Unfortunately, Lydia's father perished at the battlefield in World War II. With her outstanding abilities and entrepreneurship, Lydia's mother Yekaterina G. Pustozerova managed to raise and provide higher education for her four children. For this purpose, she moved closer to



Lydia Alexandrovna on her 80th birthday.
January 24, 2019



Diploma of All-Union Exhibition of Achievements in the National Economy awarded to Lydia's father

Sverdlovsk (now Yekaterinburg), to Verkhnyaya Pyshma. She had always saved vegetable seeds at her former places of residence in Chernigov, Bashkiria and Shadrinsk and thus introduced many new vegetable crops to the local agriculture at a time when commercial seed production did not yet exist. She distributed seeds and seedlings of cucumbers, tomatoes and other vegetable crops to her neighbours around the town. Lydia

certainly inherited her love for plant cultivation and propagation from her mother.

Lydia attended School No. 2 in Verkhnyaya Pyshma, where the biology teacher, a WWII veteran, ran a one-hectare school agricultural and horticultural plot. Starting from grade four, schoolchildren raised a variety of vegetables, studied crop rotation and learned how to graft using a collection of orchard trees. In her sixth grade, Lydia was already knowledgeable in all aspects of plant cultivation. She participated twice and was awarded two medals at the All-



One of Lydia's school diplomas

After finishing high school, Lydia entered the Sverdlovsk Agricultural College, where from her freshman year she was engaged on research work in the Department of Agriculture, working on the topic of the Head of Department's doctoral dissertation. After graduation, she started working at the Botanical Garden (Ural Branch RAS) in Sverdlovsk, while also being a PhD student from 1965 to 1968. In 1969 she defended her PhD thesis entitled *Morpho-physiological variability*



Lydia conducting lab research as a PhD student



Biochemical analysis of plant anthocyanins

in woody plants: traits connected with infraspecific variability of leaf coloration. This was the start of her work in botany under the enthusiastic leadership of Stanislav A. Mamaev who, after defending his PhD thesis and at the invitation of Stanislav S. Schwartz, had left Moscow for Sverdlovsk to lead the newly organized Botanical Garden. Along with scientific research, collection-building and improvements in the Garden territory constituted a large part of the staff's activities. At the time, the working day lasted for 12–13 hours, as there were only ten employees. All of them also assisted in the processing of scientific data intended for the doctoral dissertation and book by S.A. Mamaev. His successful defence brought about a relief in 1972; from now

on, Lydia could pursue her own research goals.



Field work. Urals, 1966



Field work. Collecting a crop of potatoes



Botanical Garden Research Group. Lydia is fifth from left; S.A. Mamaev, Director of Botanical Garden is next to her on left

Lydia A. Semkina's scientific interests have followed four main directions.

1. A study of red-leaved varieties in woody plants (1968–1977). She published ten papers on this topic and returned to it in 2016 with another publication combining a review and applications of contemporary methods. It was published in the *Zhurnal Obshchei biologii* (*Journal of General Biology*) under the title *On the physiological role of permanent and temporary accumulation of anthocyanin pigments in the leaves of woody plants*.
2. Major problems in the study of intraspecific variability and chemosystematics of woody plants (1978–1989). 15 papers were devoted to this topic.
3. Results and problems of the introduction of woody plants in the Urals (1977–2018), which generated 70 publications.
4. Studies of *Helianthemum nummularium* (L.) Mill. and *Juniperus communis* L. coenopopulations (2006–2019), with 9 papers covering these topics.



Lydia's travels (clockwise from top right). Trip to Patagonia. January 2002. Leading the first international botanical excursion in the Urals, 2003. Field trip across Southern Urals, 2003. Visiting Kew Gardens, UK, 2004, with flowering squill.

Summarizing her research of 30 years, in 2000 L.A. Semkina defended her Doctor of Biological Sciences thesis entitled *Intraspecific variability and population ecology of woody plants: Implications for the introduction work*.

The species specificity of isozyme spectra as well as specificity of flavonoid and anthocyanin content, the parameters that define leaf colouration in many woody plants, have allowed the use of biochemical tests when studying patterns of intraspecific variability and population structure. Analysis revealed differentiation among individuals in natural populations as far as the composition of their isozymes. A study of colouration variability demonstrated the specificity of the anthocyanin content for every plant organ. Thus, while the qualitative composition is similar in red and green cones of Siberian larch, they differ as far as the proportion of cyanidin glycosides. In red-leaved varieties of common barberry,



3rd Global Botanic Gardens Congress in Wuhan, China, 2007. Lydia is second from left; her PhD student Olga V. Epanchintseva is next to her on left

the main pigment is peonidin-monoglycoside (75%), while during the temporary formation of anthocyanins, cyanidin-monoglycoside becomes the dominating (70%) pigment. The specificity of anthocyanin content is also manifested at the genus level. Thus, leaves of North American species of *Crataegus* contain only one type of anthocyanin (cyanidin), while leaves of Eurasian

species contain two anthocyanin glycosides.

To characterize overall tolerance of introduced species, the method of fluorescent profiles of leaves and bark phelloderm was used. It was demonstrated that the primary processes of the light energy transformation during photosynthesis are species-specific and change consistently over the seasons and during ontogenesis. The adaptation processes of plants with different winter hardiness during the introduction period include transformations of the structural and functional organization of chloroplasts, i.e. changes in the proportion of activities of photosystems I and II.



Lydia with her favourite plant subject, hawthorn. 2007



Lydia and her colleague and friend Irina Belyaeva in the Botanical Garden, Yekaterinburg. 2019

A survey of six coenopopulations of two rockrose species *Helianthemum nummularium* (L.) Mill. and an endemic relict *H. baschkirorum* (Luz ex Kupat.) Juz. in Bashkortostan and southern Chelyabinsk Region has demonstrated that the studied *Helianthemum* populations have a complex spatial and age structure with the dominance of virginal as well as young and mid-aged

individuals at the reproductive stage. The studied coenopopulations are stable, with a regular seed reproduction.



The Governor of Sverdlovsk Region, Eduard E. Rossel, awards L.A. Semkina with Medal of Merit to Fatherland. 2006

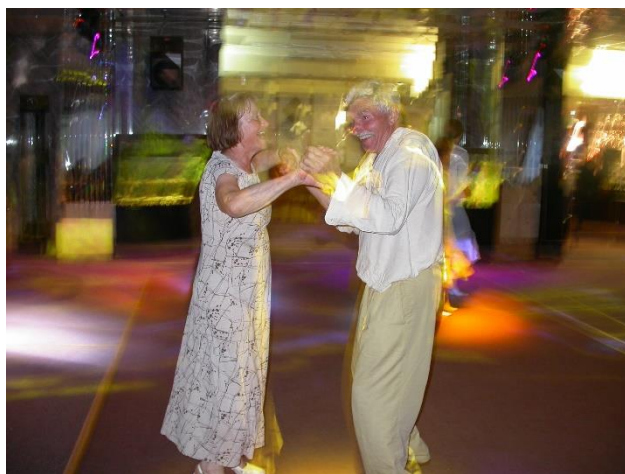


Lydia's award, Medal of Merit to Fatherland, Second Degree



Decree of President of Russian Federation, V.V. Putin, awarding Lydia with Medal of Merit to Fatherland

For her excellent work, Lydia Alexandrovna has been awarded government diplomas and medals. It is fair to say that she devoted her entire scientific career to the Botanical Garden in Sverdlovsk/Yekaterinburg, where she has worked for 55 happy years—always



Lydia—a dancing queen

with a smile and sparkling eyes and in a good mood. Thanks to her amazing ability to engage with people, she has always been at the heart of scientific events and celebrations, enlivening them with her culinary surprises and contagious dancing. Having a light-hearted, cheerful personality and very generous heart, she easily finds collaborators and friends among her colleagues.

She has travelled widely across Russia and abroad, returning with new plants for experimental acclimatization in the Urals. Despite her age, Lydia is still active scientifically and physically, working hard in her private garden as well as in the Botanical Garden of the Ural Branch RAS.

Dear Lydia Alexandrovna, many happy returns of the day! Your colleagues are wishing you many happy years ahead!



Lydia's award—Order of the Botanical Garden, Yekaterinburg for Best Human Being from colleagues and friends to commemorate Lydia's 80th birthday



Celebration of Lydia's 80th birthday at the Botanic Garden, Yekaterinburg

Contribution edited by Irina Kadis. All photographs from the personal archive of L.A. Semkina