

SCIENCE FOR ALL AT VMU KAUNAS BOTANICAL GARDEN



As a picturesque green area with rich botanical displays and collections, innovative programmes for education and cultural and community events, Kaunas Botanical Garden attracts more than 60 thousand visitors per year. Education projects are for visitors of all ages: children, families, teachers, students and adults. Recently, numerous new initiatives and unique exhibitions have been developed for students and school communities to increase the public's environmental awareness.



↑ A group of scientifically-minded youngsters investigate different issues in a biweekly workshop conducted by two teachers ©The Carl Zeiss Microscopy Center

Kaunas Botanical Garden (KBG) of Vytautas Magnus University is a multifunctional university botanical garden located close to the centre of Kaunas city. KBG is a partner in the Lithuanian Academy of Science's project for the 'Development of a National Science Communication System in Lithuania'. This project provides funding for the NSO laboratory, which began in 2009. The NSO laboratory provides an informal education programme for young explorers who join the project individually or through their school, when carrying out specific experiments as part of the curriculum. Our students learn how to use microscopes,



test tubes, automatic pipettes etc. and become accustomed with the main rules of the laboratory: using chemicals, making solutions, growing crystals and studying specimens taken from nature (e.g. plant pigment thin layer chromatography). Scientists from the Kaunas universities are invited to give classes for children in the NSO laboratory. The childrens' creativity and learning is encouraged by getting them to teach each other. You can see examples of the experiments carried out in this video <http://www.youtube.com/channel/UCzQeA8BjDObFNoDXbpOlzEQ>.

In summer, the NSO laboratory organises summer field expedition camps for schoolchildren. The team of children, guided by two teachers, explore nature in the garden. They investigate and learn about the many ponds, trees and flowers and take part in the Biodiversity Rally. This involves learning how to identify plants, birds and insects, following plant pollinators, searching for evidence of wild animals, collecting specimens for examination under the microscope and much more. For example, our young explorer, Deividas (aged 17), wanted to ascertain whether densely growing populations of the invasive *Heracleum sosnovskyi* can be efficiently eradicated by covering its habitat with black plastic. We accepted his proposal and supported him to carry out the investigation. He discovered that the seed bank of *H. sosnovskyi* is entirely eliminated after covering for four months and that 15 species of local plants start to colonise the area within 4 months of removal. Moreover, he performed in vitro experiments and showed that, contrary to the accepted belief, the germination of *H. sosnovskyi* seeds is not dependent on light, yet light is required for the further seedling development. The presentation of his results was awarded by the 3rd prize in the European Contest of Young Explorers.

Particularly popular with university students are night expeditions, organised in collaboration with the zoology experts from Kaunas T. Ivanauskas Museum of Zoology. During two such nights, entomology fans were lucky enough to catch four unregistered species and two insects from the Red Data Book of Lithuania. They also observed bats and night birds.

To spread our way of working further, in collaboration with the Lithuanian Centre of Non-formal Youth Education, we delivered a seminar on informal education in NSO Laboratory for school teachers in 2015.

↑ NSO laboratory outdoors: getting ready for the 'insect rally' ©TGertruda Stuopyte

Our students learn how to use microscopes, test tubes, pipettes. They become accustomed to the standard processes of a laboratory: using chemicals, making solutions, growing crystals and studying specimens collected in the field



↑ After a theoretical explanation our visitors enthusiastically help to remove leaves with larvae of horse-chestnut leaf miner ©Vida Mildaziene

We also have a range of environmental activities for a variety of audiences.

In 2015, KBG started the *Green Gardening* project in partnership with the neighbouring school – St. Francis gymnasium. We helped them realise their dream of being able to design and grow their own vegetable, herb and ornamental garden. The site, at KBG, is considered a special new display for our visitors.

Environmental education for adults and the development of exhibitions has been funded by a programme from the Ministry for the Environment that aims to disseminate information on environmental issues to society. The project entitled *Zaliasis aleksotas* involved a variety of activities for the local community, including: 12 distance learning seminars, 50 online TV programmes and 200 online radio broadcasts. We also organized 12 public events; for example community volunteers were invited to the garden to help in the eradication of *Heracleum sosnovskyi* and *Cameraria ohridella*, and support other environmental management activities.

In 2011-2013, the unique B. Galdikas oak grove was planted at KBG. This was at the behest of the famous anthropologist Professor B. Galdikas, who wanted to plant an oak grove in Lithuania to raise awareness of deforestation. The B. Galdikas oak grove comprises 100 genetic clones of Lithuania's 50 most famous oaks. Amongst them - 40 are from natural heritage monuments. Their seedlings were prepared by a Kedainiai forestry officer, Juozas Girinas, who grafted the branches (scion) taken from famous trees to pedunculated oak rootstocks. Each seedling has a patron (indicated on its label) who is the person or the group who planted the oak and has the responsibility to care for it in future. The grove attracts many visitors because it represents the idea of world-wide biodiversity protection. Even members of the Indonesian parliament planted oaks in the grove during their visit to Kaunas in 2014.

The unique exhibition *Plants for Bioenergy* (2013-2014) was also under the umbrella of the *Zaliasis aleksotas* project. It involved displaying 50 plant species used for biofuel with descriptions of their properties and with interpretation about the need to switch to renewable energy sources.

In summary, we have presented the very diverse range of educational activities in KBG. Those which come under science communication are directed towards all groups of society. The hope is that this will give the public, of all ages, an understanding and appreciation of the work of a botanic garden, environmental science and the importance of plants and plant conservation.



Teams of children and teachers take part in the 'Biodiversity rally' – learning how to identify plants, birds and insects, following plant pollinators, searching the traces of wild animals, and collecting specimens for examination under the microscope.



↑ *After a theoretical explanation our visitors enthusiastically help to remove leaves with larvae of horse-chestnut leaf miner ©Vida Mildaziene*

Our night expeditions are particularly popular with university students. During these we share stories about the relationship between plants and insects

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← *Planting oaks with prof. Birute Galdikas
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