



Hortus Botanicus
Universitatis Posnaniensis

International Conference on Accessibility

„Botanical garden: A green world for everyone!

Educational activities for visitors

with special needs

in green spaces”

ABSTRACTS

June 9-12, 2019

Poznań, Poland

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VSTUPTĚ • KOM IN • WEJDŹ • GYERE BE



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Book of abstracts

International Conference on Accessibility
„Botanical garden: A green world for everyone!
Educational activities for visitors with
special needs in green spaces”

The 11th International Meeting and Conference
of Botanic Gardens Network from the Baltic Sea Region

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(XLIX Conference of the Botanic Gardens and Arboreta in Poland)

Ogród Botaniczny: Zielony świat dla każdego! Działania
edukacyjne dla zwiedzających o specjalnych potrzebach
w przestrzeniach zielonych

9-12 June | Poznań
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RADA OGRODÓW BOTANICZNYCH
I ARBORETÓW
w Polsce



— OGRÓD —
BOTANICZNY
U N I W E R S Y T E T U
M A R I I C U R I E - S K Ő D O W S K I E J
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I PRZEMYSŁU ROLNO-SPOŻYWCZEGO
W SZRENIAWIE



SPECJALNY OŚRODEK
SZKOLNO-WYCHOWAWCZY
DLA DZIECI NIEWIDOMYCH
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Śląski Ogród Botaniczny



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Welcome

Since ancient times, gardens have been areas bringing people closer to nature, places of finding mental balance and physical health. In an era of progressive urbanization and computerization of our neighborhood and every-day life, their educational and social role becomes more and more important.

The necessity to adjust green spaces and ways of environmental communication to people of all ages, of different physical state and perception has been lately often underscored by practitioners and researchers. Bringing the natural world closer to individuals by means of various methods engaging all human senses becomes especially essential when we take into consideration the fact of many people's more and more common immersion in virtual world, which is so detached from nature. At the same time, new technologies give us possibilities of communication that have been unattainable before.

I would like to encourage you to exchange experiences concerning the idea of increasing accessibility of green spaces for all groups of visitors. I hope that with a joint effort, discussion and reflections we can create visitor-friendly gardens and bring the natural world closer to our guests, so that it becomes a source of delight, inspiration and personal development.

Justyna Wiland-Szymańska

Director of the Botanical Garden of the
Adam Mickiewicz University in Poznań

Programme

9 June 2019 – Sunday

Botanical Garden of the Adam Mickiewicz University in Poznań
(AMU Botanical Garden), Dąbrowskiego 165, 60-594 Poznań

16:00 – 20:00 | Registration
20:00 – 22:00 | Welcome Party

10 June 2019 – Monday

7:45 | Transfer from the Adam Mickiewicz Square
(Plac Adama Mickiewicza) in Poznań to the Faculty
of Biology of the Adam Mickiewicz University in
Poznań

Faculty of Biology of the Adam Mickiewicz University in Poznań
(*Collegium Biologicum*), Uniwersytetu Poznańskiego 6
(Umultowska 89), 61-614 Poznań

8:00 – 9:00	Registration	
9:00 – 9:15	Welcome	
9:15 – 11:15	Session I	<i>Chair: Vince Zsigmond</i>
11:15 – 11:45	Coffee break	
11:45 – 12:45	Poster Session	<i>Chair: Jerzy Puchalski</i>
13:00 – 14:00	Lunch	
14:00 – 15:00	Transfer to the AMU Botanical Garden	

Botanical Garden of the Adam Mickiewicz University in Poznań,
Dąbrowskiego 165, 60-594 Poznań

15:00 – 16:00	Workshop Session I	15:00 – 16:00	Sesja referatowa I (oral presentations only in Polish)
			<i>Przewodniczący: Józef Mitka</i>

16:00 – 16:30

Coffee break

16:30 – 17:30	Workshop Session II	16:30 – 17:30	Sesja referatowa II (oral presentations only in Polish) <i>Przewodniczący:</i> <i>Waldemar</i> <i>Buchwald</i>
17:30 – 19:00	Guided tour of the Botanical Garden of the Adam Mickiewicz University		
19:00 – 20:00	Transfer to the Kórnik Arboretum (additional tour)		
20:00 – 21:30	Sightseeing of the Kórnik Arboretum		
21:30 – 22:15	Transfer to the Adam Mickiewicz Square (Plac Adama Mickiewicza) in Poznań		

11 June 2019 – Tuesday

8:00	Transfer from the Adam Mickiewicz Square (Plac Adama Mickiewicza) in Poznań to the Faculty of Biology of the Adam Mickiewicz University in Poznań
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Faculty of Biology of the Adam Mickiewicz University in Poznań
(*Collegium Biologicum*), Uniwersytetu Poznańskiego 6
(Umultowska 89), 61-614 Poznań

9:00 – 11:00	Session II	<i>Chair: Paweł Kojs</i>
11:00 – 11:30	Coffee break	
11:30 – 14:30	Transfer to and sightseeing of the Spatial Orientation Park of the Special Educational Centre for Blind Children in Owińska	
14:30 – 17:00	Transfer to Poznań & lunch	
17:00 – 18:30	Guided tour around the Old Market Square in Poznań	
20:00 – 23:00	Gala Dinner in Student Dormitory Hanka, Niepodległości 26, 61-714 Poznań	

12 June 2019 – Wednesday

Post conference tour

Tour in English

8:30	Transfer from the Adam Mickiewicz Square (Plac Adama Mickiewicza) in Poznań to Szreniawa	
9:30 – 12:30	Sightseeing of the National Museum of Agriculture and Agricultural and Food Industry in Szreniawa	
12:30 – 14:00	Meeting for the members of the Botanic Gardens Network in the Baltic Sea Region / Sightseeing of the Museum and Education Center of the Wielkopolski National Park for other tour participants	
14:00 – 15:00	Lunch (The Wielkopolski National Park Head Office in Jeziory, 62-050 Mosina)	
15:00 – 18:00	Tour in the Wielkopolski National Park	
18:00 – 21:00	Dinner in Jeziory	
21:00	Transfer to the Adam Mickiewicz Square (Plac Adama Mickiewicza) in Poznań	

Wycieczka dla grupy polskojęzycznej (Tour in Polish)

9:00	Wyjazd z Placu Adama Mickiewicza w Poznaniu do Wielkopolskiego Parku Narodowego		
10:30 – 14:00	Wycieczka w Wielkopolskim Parku Narodowym		
14:00 – 15:00	Obiad (Siedziba Dyrekcji Wielkopolskiego Parku Narodowego w Jeziorach, 62-050 Mosina)		
15:00 – 18:00	Wycieczka do Muzeum Narodowego Rolnictwa i Przemysłu Rolno-Spożywczego w Szreniawie	15:00 – 18:00	Walne zebranie dla członków ROBIA
18:00 – 21:00	Kolacja w Jeziorach		
21:00	Powrót na Plac Adama Mickiewicza w Poznaniu		

Detailed programme

Session I 10.06.2019 9:15 – 11:15	<i>Chair: Vince Zsigmond</i>
9:15 – 9:35	Paul Smith Botanic Gardens, more than just a pretty face? How we deliver societal impact
9:35 – 9:55	Jarmila Skružná et al. From the exhibition A touch of nature to international project Botanical garden: COME IN! – From the margin of attention to the great interest...
9:55 – 10:15	Åsa Kågeson TD - The Accessibility Database, a method of empowering people
10:15 – 10:35	Jane Stoneham Helping people engage with their environment in new ways
10:35 – 10:55	Ewa Antoniewska, Dagmara Lib, Narcyz Piórecki Universal Sensory Garden in the Bolestraszyce Arboretum
10:55 – 11:15	Marie Křiváková, Jitka Datinská Interpretation of the White Carpathians for people with physical disabilities

Session II 11.06.2019 9:00 – 11:00	<i>Chair: Pawel Kojs</i>
9:00 – 9:20	Erzsébet Fördős-Hódy Universal design in Botanical Gardens
9:20 – 9:40	Zsuzsa Szendi Hungarian Gardens of Senses
9:40 – 10:00	Jana Dvořáčková Association of Horticulture therapy in the Czech Republic
10:00 – 10:20	Zuzana Galle Lipka – school facility for environmental education is involved in environmental education for more than 25 years
10:20 – 10:40	Eva Sahlin Using Nature Based Therapy for rehabilitation and prevention – results from Green Rehab at the Gothenburg botanical garden
10:40 – 11:00	Eva-Lena Larsson Presentation of a successful nature-based rehabilitation model to help people with burnout to regain health and work capacity

<p>Sesja referatowa I 10.06.2019 15:00 – 16:00 (oral presentations only in Polish)</p>	<p><i>Przewodniczący: Józef Mitka</i></p>
<p>15:00 – 15:20</p>	<p>Marianna Darzynkiewicz-Wojcieszka O roślinach jadalnych oczami migrantów. Nocne opowieści podczas Nocy Muzeów w Ogrodzie Botanicznym Uniwersytetu Warszawskiego</p>
<p>15:20 – 15:40</p>	<p>Agnieszka Krzymińska Kwiaty do ozdoby, leczenia i konsumpcji</p>
<p>15:40 – 16:00</p>	<p>Jolanta Lisiecka Warzywa żywią, leczą i zdobią</p>
<p>Sesja referatowa II 10.06.2019 16:30 – 17:30 (oral presentations only in Polish)</p>	<p><i>Przewodniczący: Waldemar Buchwald</i></p>
<p>16:30 – 16:50</p>	<p>Mariola Olejniczak Niepełnosprawni – pełno(s)prawni odbiorcy kultury</p>
<p>16:50 – 17:10</p>	<p>Michał Kosiedowski Wykorzystanie zaawansowanych technologii ICT dla włączania społecznego osób z niepełnosprawnością intelektualną</p>
<p>17:10 – 17:30</p>	<p>Małgorzata Wojciechowska-Paszczak Nowa przestrzeń edukacyjna w ogrodzie</p>

Abstracts

Oral sessions (English)

Universal Sensory Garden in the Bolestraszyce Arboretum

Ewa Antoniewska, Dagmara Lib, Narcyz Piórecki

Arboretum i Zakład Fizjografii w Bolestraszytach;
arboretum@poczta.onet.pl

Keywords: sensory garden, arboretum, universal garden.

The Universal Sensory Garden, adapted for the needs of disabled people, was opened in the Bolestraszyce Arboretum in 2007. It is located near the entrance to the Arboretum so it can be easily reached and offers close proximity to the car park and the building with sanitary facilities.

The plants in the garden were selected in such a way that they appeal to different senses and provide a wide range of tactile, olfactory, and auditory experiences. The collection comprises herbs, crop plants, and wild edible plants, which are characterized by interesting shapes and textures, vivid colors, and intense smell.

The plants are located on specially designed elevated flowerbeds, providing an easy access for both the blind and people in wheelchairs. Another important element of the garden is the retaining walls, which at the same time perform the function of benches. All plants are accompanied by information plates with descriptions in the Braille alphabet for the blind and in big print to meet the needs of the elderly visitors.

By immersing their hands in small pools of water, the visitors are able to touch various species of aquatic plants, while the soothing murmur of water from a small cascade provides auditory sensations for the blind people.

The layout of the garden is clear and straightforward, with broad paths allowing easy movement for people in wheelchairs. An important part of the garden is a specially designed “Through the Touch” art gallery and a typhlo-planetarium.

The sensory garden is suitable for conducting educational activities for the disabled and the elderly, but also for other visitors of the Arboretum. People with visual impairments are offered assistance of the qualified guides – typhlo-pedagogues.

Association of Horticulture therapy in the Czech Republic

Jana Dvořáčková

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Keywords: horticulture therapy, work with plants

Emerging Association connects providers, educators and other interested parties in the field of horticultural therapy. The purpose of the Association is propagation and development of horticulture therapy as targeted, planned and reflected therapeutic process. The aim of such process is to increase or at least maintain physical, mental, cognitive and social functions and self-sufficiency of participants. The main means of this process are work with plants, activities in garden and contact with nature in the presence of professional therapist thus ensuring achievement of specific clinically defined goals.

Associations of horticultural therapy are spread worldwide. The first association was established in the United States of America. The USA is considered the cradle of horticultural therapy. Except the US, horticultural therapy has its place in Canada, Australia or New Zealand. In Asia, we can find horticultural therapy in Japan, Korea or in Hong Kong. Horticultural therapy is also known in Europe. Association of horticultural therapy exists in many countries, e.g. the United Kingdom, the Netherlands, Germany, Austria, Switzerland or in Scandinavia.

Universal design in Botanical Gardens

Erzsébet Fördős-Hódy

Universal Design Information and Research Centre; etikk@etikk.hu

Keywords: universal design, accessibility.

The presentation shows the connection and the difference between accessibility and universal design – origin and developing of concept, current experience of accessibility in Hungary's Botanical Gardens. The 7 principle of universal design will be perceived. The presentation talks

about the examinations of user groups and rehabilitation engineer, summarizes the positive and negative examples, proposes good designs.

Lipka – school facility for environmental education is involved in environmental education for more than 25 years

Zuzana Galle

Lipka - školské zařízení pro environmentální vzdělávání Brno, příspěvková organizace; zuzana.galle@lipka.cz

Keywords: horticultural therapy, old gardens

In response to years of experience with positive impact of stay in nature to both children and adults, our attention is focused on horticultural therapy. At present, several of Lipka's facilities use horticulture therapy regularly with different target groups. For this reason we built new or specifically re-built old gardens of some facilities so that the equipment of these gardens is suitable for horticultural therapy and for the needs of their users.

We cooperate with organizations focused on elderly people, adults with mental disabilities, children with specific needs or on people in difficult (social) situations. Each target group has its specific needs and specific outputs that need to be reached. It affects the organization of work with these groups.

This presentation introduces different activities, garden equipment, results and unexpected, pleasant side effects of horticultural therapy. It also refers to Lipka's educational activities connected to horticultural therapy.

TD - The Accessibility Database, a method of empowering people

Åsa Kågeson

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Keywords: database, community

TD is a unique database in Sweden that offers information to inhabitants and visitors about accessibility in day-to-day life. It covers everything from outdoor areas, stately homes and hotels to medical centres and libraries. Whilst many people want to play an active part in community life and take advantage of what society has to offer, not everyone has the same opportunity to do so. The aim of TD is that every establishment, service or space is described sufficiently well to make it easy for you to decide if you want to visit it or not. TD is based on legislation, UN conventions and regulations. Gothenburg botanical garden as well as 7242 other facilities such as museums, shops, restaurants, parks, gardens and trails are now connected to the Accessibility database and the numbers are growing. TD – necessary for some good for all!

Interpretation of the White Carpathians for people with physical disabilities

Marie Křiváková, Jitka Datinská

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Keywords: ecological education, natural garden, special needs

Even people with special needs want to know and protect nature. Since 2014, Veronica Center in Hoštětín tries to make White Carpathians and ecological education accessible for those people. We checked their needs and options connected to the visit. We created Plan of interpretation of natural and cultural heritage of White Carpathians for people with special needs. The premises of Veronica Center were adjusted and special programmes were created for those groups of visitors. In an exemplary natural garden, where garden education and garden therapy take place, we

created a "trail of senses" that encompasses labels in Braille type. Together with people with special needs we organize events and work on removing the barriers.

Presentation of a successful nature-based rehabilitation model to help people with burnout to regain health and work capacity

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Keywords: stress related mental disorders, burnout, garden, nature, rehabilitation.

Green Rehab at Gothenburg Botanical Garden offers help to individuals with stress related mental disorders, burnouts, who have been on long term sick leave. Green Rehab started in 2006 and during the last 14 years over 700 patients have taken part in different programmes. All the participants attending Green Rehab are employees of Region Västra Götaland. Most of them work in healthcare. They have received help earlier from the public health care or from the occupational health care and in many cases made attempts to return to work but failed and are in a stalled rehabilitation process. The average age of the participants is 47 with an age span of between 25 and 63 years. Nine out of ten are women. A team of six professionals is employed in the rehab theme: a biologist, a gardener, an occupational therapist, a psychotherapist and two physiotherapists. In the programme the participants do gardening, nature walks, handicrafts, relaxation, talking sessions and art therapy. The programme extends over 28 weeks and at the end of the period the participants gradually go back to work. Direct after the end of the programme 90% of the participants go back to active life, work or study. The effect remains even after 18 months. Green Rehab has continuously been evaluated and there has also been research linked to the programme.

Using Nature Based Therapy for rehabilitation and prevention – results from Green Rehab at the Gothenburg Botanical Garden

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Keywords: Nature-Based Rehabilitation; burnout; depression; garden and nature activities; health care utilization; sick leave.

Background: A considerable amount of research has explored a wide variety of health effects on humans when exposed to nature environments. In Sweden Nature Based Rehabilitation (NBR) has been used as a rehabilitation model for individuals diagnosed with stress related mental disorders over the past 15 years. The effects on physical and mental health of participants at Green Rehab (a NBR within the Gothenburg botanical garden) were studied during 10 years. Self-assessment instruments for measuring burnout, depression, anxiety and well-being, and data from regional and national registers were used.

Results: Results showed decreased scores on burnout, depression and anxiety, and increased well-being scores and significantly reduced health care utilization. A large movement from ordinary sickness benefit to rehabilitation benefit was observed. The results point to beneficial effects of using Nature Based Rehabilitation for this patient group and for enhancing a stalled rehabilitation process.

Conclusions: Firm multidisciplinary support on a regular basis, the group design of the NBR and the environmental support from nature and garden, collectively, seem to be a valuable aid towards improved mental health and return to work, as well as in reducing health care utilization.

From the exhibition A touch of nature to international project Botanical garden: COME IN! – From the margin of attention to the great interest...

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Keywords: visitors with special needs, education, botanical garden, methodology.

The activities of Prague Botanical Garden revolve around people with special needs for more than 20 years. Started with small exhibitions, we've spread the topic of making botanical gardens accessible across Europe. The 3 year long intensive cooperation of an international project team has brought its fruits: the exhibition for all senses, the methodology of work with visitors with special needs - but most of all – new experience, skills and rich inspiration for all involved.

**Botanic Gardens, more than just a pretty face?
How we deliver societal impact**

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Keywords: economic, social, environmental, impacts, botanic gardens.

Botanic gardens are established and managed for many different purposes, including for visitor attraction, public education, science and conservation. Despite their multi-functional role in society, few botanic gardens measure the *impacts* of their work. In fact, botanic gardens can and do have major economic, social and environmental impacts, and provide a range of essential services to their visitors, neighbours and sponsors.

The economic impacts of a botanic garden are measured in a number of ways, including as visitor attractions bringing tourists and visitors from outside the region with significant spill over spending that benefits the wider community and as organisations that enhance the

aesthetic and recreational value of a neighbourhood, increasing the value of nearby properties, and local government income.

Botanic gardens also provide important social impacts. Major incentives for visitation are aesthetic and recreational with positive impacts on visitors' mental and physical health. In addition, botanic gardens are providers of both formal and informal education to adults and millions of schoolchildren worldwide. The impacts of the social services provided by botanic gardens are hard to measure and even more difficult to monetise but it is likely that these are amongst the most valuable services to society provided by botanic gardens – particularly in urban settings where the majority of botanic gardens are situated.

Finally, botanic gardens have positive impacts on the environment by influencing visitors in the way they interact with nature, and by deploying their specialist skills in science and horticulture. Where botanic gardens differ substantially from museums is in holding diverse collections of living plants in their landscapes and seed banks. They conserve or cultivate at least a third of all known vascular plant diversity and more than 40% of threatened plant species – including many species that are extinct in the wild. This living material opens up a wide range of possibilities for conservation and use, including prevention of extinction, species reintroductions, ecological restoration and scientific investigations into a wide range of uses, encompassing agriculture, horticulture, forestry and biotechnology.

Helping people engage with their environment in new ways

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Keywords: inclusive design, accessibility, sensory engagement, disability.

Improving accessibility in botanic gardens benefits visitors of all ages, especially people with disabilities. The aim of this talk is to show how making all aspects of the visitor experience accessible and responsive to sensory exploration can help venues become more inclusive and welcoming to visitors with disabilities.

Improving access relates to the whole visitor experience – from how visitors get to and around the gardens, to the detail within it and how people can interact with the messages and activities. Access improvements range

from changes to infrastructure to enhance routes and facilities, to simple, small-scale changes that can open up new ways for visitors to engage with the experiences on offer.

This talk will draw on techniques developed by the Sensory Trust. For example, showing how the Access Chain can be used to review and plan access improvements through all steps of the visitor journey, from people deciding to visit, through the experiences in the garden, to leaving for home. Inclusive approaches to visitor experience will be highlighted to show how interactions and communications can be shared with the widest audience.

The importance of sensory engagement techniques will be highlighted as a means of creating deeper, more meaningful and memorable experiences. Sensory engagement can engage a wider range of visitors and helps people explore their environment in new ways - to take a fresh view of something, use all the senses, create new memories. These techniques have proved powerful in helping people live well with dementia, as well as with children with disabilities and their families. More generally, the techniques have been found to open up new experiences and perspectives for all visitors by encouraging people to interact through all the senses. This ensures that visitors can enjoy the gardens in ways that are most meaningful to them.

The talk will highlight how the approach helps organisations provide high quality visits, widening their visitor base and minimising the need for additional access support or costly retrofits. It helps organisations take a fresh view of their place and to see new approaches to interpretation, education and exhibit design.

Hungarian Gardens of Senses

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Keywords: solutions, sensitizing, training.

The presentation shows some good examples from Hungary – services and solutions specially designed for people living with different disadvantages offered by arboreta and botanical gardens and other special

gardens. The Hungarian Association of Arboreta and Botanic Gardens organized a sensitizing workshop for those employees of the member gardens who meet and deal with children and visitors with special needs. The workshop was interactive by using different creative problem-solving and training technics. The presentation shows the conclusions of this very successful initiative.

Oral sessions (Polish)

O roślinach jadalnych oczami migrantów. Nocne opowieści podczas Nocy Muzeów w Ogrodzie Botanicznym Uniwersytetu Warszawskiego.

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Słowa kluczowe: rośliny jadalne, migranci, edukacja, jedzenie.

Spacery po Ogrodzie nocą? Czemu nie! Noc, brak świateł, muzyka – wszystko to sprawia, że w zupełnie inny sposób niż zwykle poznajemy przyrodę.

Od wielu lat, w maju, w Ogrodzie Botanicznym Uniwersytetu Warszawskiego organizujemy wydarzenia w ramach Nocy Muzeów, tj.: gry terenowe, iluminacje, wywiady z roślinami, spotkania z ciekawymi ludźmi, w tym z migrantami.

W 2017 roku podjęliśmy współpracę z Kuchnią Konfliktu – miejscem, gdzie krzyżują się drogi migrantów z różnych stron świata. „Smakowity rajd” powstał przy współpracy z mieszkającymi w Polsce osobami z: Rumunii, Iranu, Białorusi, Kongo, Algierii i Ukrainy.

Tematem, który łączy wszystkie te osoby jest jedzenie. Poprosiliśmy więc migrantów, by opowiedzieli nam o roślinach, które są im bliskie, które znają z dzieciństwa, za którymi tęsknią mieszkając w Polsce. Wysłuchaliśmy wzruszających, osobistych opowieści i na ich podstawie przygotowaliśmy materiały, które z zupełnie innej perspektywy

opowiadały naszym zwiedzającym o często pospolitych roślinach, takich jak: mniszek, berberys, czarny bez. Historie ludzi spletały się z historiami roślin, tworząc nowe opowieści i zachęcając do rozważań, a jednocześnie pozwalając odkryć Ogród w zupełnie nowej roli – miejsca, gdzie rośliny łączą różne grupy ludzi.

Wykorzystanie zaawansowanych technologii ICT dla włączania społecznego osób z niepełnosprawnością intelektualną

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Słowa kluczowe: niepełnosprawność intelektualna, zaawansowane technologie ICT

Dynamiczny rozwój technologii ICT stworzył nowe możliwości wspierania osób z różnorodnymi niepełnosprawnościami i pełniejszego włączania ich w życie społeczne. Jednym z rodzajów niepełnosprawności, dla których powstanie takich technologii jak podłączone do sieci Internet terminale mobilne z ekranami dotykowymi czy technologie z zakresu sztucznej inteligencji mają szczególnie duże znaczenie dla udostępniania rozwiązań wspomagających codzienne życie jest spektrum niepełnosprawności intelektualnych. Odpowiednio skonstruowane narzędzia ICT stanowiąc mogą dla osób z tego typu niepełnosprawnością swoistego rodzaju protezę.

Tego typu rozwiązania tworzone są, we współpracy z organizacjami angażującymi się w bezpośrednią opiekę nad osobami z niepełnosprawnością intelektualną (o.n.i.) takimi jak Stowarzyszenie Na Tak, w Poznańskim Centrum Superkomputerowo-Sieciowe (PCSS). Pierwszym eksperymentem zastosowania technologii ICT dla wsparcia o.n.i. było opracowanie opartej o komputer z ekranem dotykowym aplikacji wsparcia pracownika z niepełnosprawnością intelektualną. Aplikacja ta umożliwiała koncentrację uwagi swojego użytkownika na pojedynczym zadaniu z harmonogramu pracy, z jednoczesnym przypominaniem o sposobie realizacji zleconego zadania i monitorowaniem czasu jego wykonania. Eksperyment ten był inspiracją dla podjęcia prac w ramach projektu SelfFind, które zaowocowały

opracowaniem pakietu aplikacji na telefony komórkowe typu smartfon dla osób z lekką i umiarkowaną niepełnosprawnością intelektualną, wspierających je w takich obszarach jak realizacja planu dnia, bezpieczne przemieszczanie się czy uzyskanie pomocy w sytuacji kryzysowej.

Doświadczenia PCSS z zastosowaniem nowoczesnych technologii ICT w aplikacjach wspomagających codzienne funkcjonowanie o.n.i. pozwalają zaproponować wykorzystanie tych technologii także w wzbogacaniu doświadczeń o.n.i. z florą. Połączenie znanych z aplikacji SelfFind dotykowych interfejsów użytkownika dostosowanych do potrzeb o.n.i. z technikami rozszerzonej rzeczywistości czy technologiami Internetu Rzeczy zaowocować może powstaniem rozwiązań ułatwiających o.n.i. korzystanie z oferty ogrodów botanicznych czy nauki samodzielnej opieki nad niewielkim ogrodem.

Kwiaty do ozdoby, leczenia i konsumpcji

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Słowa kluczowe: rośliny ozdobne, hortiterapia, jadalne kwiaty.

Rośliny ozdobne stanowią ważny element życia człowieka. Stosuje się je przede wszystkim w celu zwiększenia estetyki otoczenia. Są obecne w ogrodach zarówno w postaci roślin jednorocznych, dwuletnich, trwałych niezimujących w gruncie, jak i bylin. Ich ozdobą są kwiaty oraz liście o różnych kolorach i kształtach. Z ich udziałem zakłada się sezonowe kwietniki i wieloletnie rabaty zarówno w ogrodach przydomowych, jak i w terenach zieleni miejskiej. Wykorzystywane są także do aranżacji balkonów i tarasów. Rośliny ozdobne pochodzące z innych stref klimatycznych upiększają także mieszkania, jednocześnie poprawiając jakość powietrza. Mają bowiem zdolność do zmniejszania liczby mikroorganizmów i pochłaniania szkodliwych związków.

Rośliny ozdobne produkowane pod osłonami i w gruncie są przeznaczane na kwiat cięty. Przygotowywane z nich kompozycje towarzyszą człowiekowi na co dzień, ale także w uroczystych chwilach jego życia.

Przebywanie wśród roślin dostarcza przyjemnych doznań. Stymulują one wzrok, oddziałując na psychikę człowieka. Mają różną teksturę, grubość, co jest wyczuwane poprzez dotyk. Odbierane wrażenia mogą wpływać na poprawę samopoczucia i pamięci. Olejki eteryczne wydzielane przez różne części roślin relaksują lub pobudzają. W ogrodzie w jednym czasie mogą być stymulowane wszystkie zmysły, dzięki czemu wpływają na integrację sensoryczną. Są zatem nieodłącznym elementem hortiterapii.

Ponadto wiele roślin ozdobnych ma właściwości lecznicze. Stosowane są one do produkcji leków. Mają także zastosowanie w kosmetyce i przemyśle perfumeryjnym.

Około 180 gatunków roślin ozdobnych ma również jadalne kwiaty, które uważane są za żywność funkcjonalną. Dostarczają one nie tylko wrażeń smakowych i wzrokowych, ale zawierają także m.in. składniki mineralne, witaminy, karotenoidy, flawonoidy, błonnik, wielonienasycone kwasy tłuszczowe, fitosterole i polifenole. Rośliny ozdobne mogą być zatem wykorzystywane we wspomaganiu leczenia wielu chorób cywilizacyjnych.

Warzywa żywią, leczą i zdobią

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Słowa kluczowe: hortiterapia, rośliny warzywne, zdrowie.

Warzywa to rośliny zielne, których różne organy stanowią pożywienie dla ludzi. Na kuli ziemskiej występuje około 8 tysięcy gatunków roślin, które mogłyby być zaliczone do warzyw. Obecnie na świecie uprawia się około 250 gatunków, a w Polsce około 50 gatunków roślin warzywnych.

Warzywa są niejednorodną morfologicznie i genetycznie grupą roślin, o zróżnicowanym znaczeniu fizjologicznym i ekonomicznym. W naszym kraju klasyfikacja warzyw opiera się w głównej mierze na rodzaju części jadalnych, przynależności systematycznej i okresie uprawy. Według tego podziału wyodrębnia się następujące grupy warzyw: cebulowe, kapustne, korzeniowe, liściowe, strączkowe, dyniowate,

psiankowate, rzepowate, wieloletnie i różne. Do warzyw zalicza się także niektóre rośliny przyprawowe i grzyby uprawne.

Warzywa przede wszystkim pełnią ważną funkcję w żywieniu człowieka. Są bogatym źródłem witamin, składników mineralnych i substancji bioaktywnych oraz błonnika, który wspomaga procesy trawienia. Równocześnie warzywa są niskokaloryczne oraz zawierają małe ilości cukrów prostych. W najnowszej Piramidzie Zdrowego Żywienia i Aktywności Fizycznej opracowanej przez Instytut Żywności i Żywienia warzywa wraz z owocami zajmują najważniejszą pozycję wśród grup produktów spożywczych. Światowa Organizacja Zdrowia zaleca spożycie co najmniej 400 g warzyw dziennie, najlepiej różnorodnych i jak najmniej przetworzonych.

Zdrowotne korzyści płynące ze spożywania warzyw znane są od dawna. Wśród najistotniejszych znajduje się między innymi zmniejszenie ryzyka wielu przewlekłych chorób cywilizacyjnych. Niektóre gatunki warzyw wykorzystywane są przez przemysł farmaceutyczny do produkcji leków i suplementów diety. Badania dowiodły, że spożywanie warzyw wiąże się również z poprawą samopoczucia i zadowolenia z życia oraz zwiększeniem kreatywności. Warzywa doskonale nadają się do stymulacji zmysłów. Dzięki temu świetnie sprawdzają się w hortiterapii.

Warzywa dostarczają także wrażeń estetycznych. Wiele z nich urodą nie ustępuje roślinom ozdobnym. Walorem dekoracyjnym większości warzyw są liście, ale mogą one też mieć interesujące kwiaty i owoce.

Niepelnosprawni – pełno(s)prawni odbiorcy kultury

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Słowa kluczowe: muzeum, edukacja muzealna, edukacja społeczna, niepełnosprawność, krajobraz kulturowy, krajobraz turystyczny.

W ciągu kilku ostatnich lat, w Polsce, obserwuje się wzrost ilości inicjatyw czyniących kulturę dostępną dla wszystkich. Likwidacja barier architektonicznych oraz rozwiązania uwzględniające potrzeby i możliwości osób z różnego typu dysfunkcjami sensorycznymi ułatwiają

dostęp do sztuki i szeroko pojętej kultury osobom z niepełnosprawnością ruchową, a także osobom niewidomym, niedowidzącym, głuchymi niedosłyszającym. Uczestnictwo w wydarzeniach kulturalnych osób z różnego typu niepełnosprawnościami często jest ich naturalną drogą socjalizacji i rozwoju. Kultura z czasem staje się płaszczyzną dającą im pewne poczucie autonomii. Instytucje kulturalne, wychodząc z ofertą naprzeciw osobom z dysfunkcjami stają się miejscem do zaspokajania ich potrzeb, rozwijania się i doskonalenia umiejętności życia w społeczeństwie. Jak wiadomo, bowiem, kultura w życiu człowieka pełni wiele funkcji m.in. poznawczą, hedonistyczną, kreacyjną czy rehabilitacyjną. W życiu osób z niepełnosprawnościami aktywne uczestnictwo w kulturze prowadzi bardzo często do wzbogacenia wszelakich doświadczeń m.in. poznawczych i uczuciowo-estetycznych. Kultura wpływa także na kształtowanie się zainteresowań człowieka, a tym samym na jego postawy, jak również jest jednym ze skuteczniejszych sposobów jego społecznego usamodzielniania. Uczestnictwo w kulturze, w szerokim jej rozumieniu przejawia się bezpośrednio w działalności kulturalnej, w postaci czynnego udziału w różnorodnych, celowo zorganizowanych zajęciach, warsztatach, wykładach, spacerach etc. Dla osób z dysfunkcjami uczestnictwo w ofercie kulturalnej, ma charakter szczególny, bowiem bardzo często zawiera w sobie silny element rewalidacyjny.

I właśnie o tych wszystkich aspektach będę chciała opowiedzieć w swoim wystąpieniu, wskazując na działania edukacyjne podejmowane już od wielu lat w Muzeum Pierwszych Piastów na Lednicy, znajdującym się, co nie jest bez znaczenia, na terenie wyjątkowej przestrzeni Lednickiego Parku Krajobrazowego.

Poster session

Be close to forest

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Keywords: forest, botanical garden, educational path.

Forest Botanical Garden 'Marszewo' is one of the youngest botanical gardens in Poland, established in 2010 according to the decision of the General Director for Environmental Protection in Poland. It is founded and maintained by the Gdańsk Forest District - a part of Polish State Forests. The garden is also a member of the Council of Botanical Gardens in Poland.

Marszewo garden covers the area of ca. 50 ha located in the suburbs of the Gdynia. Within the area the central part (5 ha) are taken by botanical collections and buildings, while the rest are forests - mainly beech and oak-hornbeam forests. There are 29 botanical collections, focused on plants typical for Pomerania region. They are mostly varied forest species, but also such collections as: orchard of old fruit trees, geographically alien species, flower meadow or collection of medical and edible plants.

Forest Botanical Garden 'Marszewo' is also main educational centre in Gdańsk Forest District. The varied, free of charge outdoor and indoor activities are provided by experiences educators (foresters and botanist) for organized groups of different age. Education is focused on: biodiversity of forests, sustainable development and cultural heritage. It is also willingly visited by individual visitors, especially by families, during Sunday events – workshops and classes carried out by varied specialists (i.a. zoologists, ornithologists, botanists and foresters).

Forest Botanical Garden 'Marszewo' tries to adopt its infrastructure to visitors with varied needs. A good example of such actions is educational path called 'Path of Roots', established with the financial support of EU funding. The route climbs up to the top of one of the forested hill within the garden. Thanks to gentle slope and hardened surface is suitable way for parents with small children in strollers but also for persons with limited

mobility. It allows everyone to take a walk through the forest and feel close to nature.

Educational values of the garden collection of medicinal plants in Poznań

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Keywords: medicinal plants, cultivation, herbal medicine, Plewiska n. Poznań.

The Garden of Medicinal Plants at the Institute of Natural Fibers and Medicinal Plants in Plewiska (near Poznań) was founded by Wacław Strażewicz in 1946. It was situated on the area of 3 hectares.

Currently the Garden possesses the rich collection of medicinal plant comprising at present about 1200 taxa. The area is divided in two parts, in which one is open for public. This part consists of plant taxonomy division (399 species), which serves mainly for didactic purposes, and willingly visited second division of trees and shrubs (about 200 species), where among them are the protected by law monuments of the nature.

The second part of the Garden consists of division of experimental cultivation (500 species) and very small division of greenhouse plants. Visits to this part of the garden collection is possible for organized groups only.

Because of the special nature of the garden of medicinal plants, this place has rather different activity from other botanical gardens and this collection is used mainly for scientific research, but also for dissemination of the knowledge about medicinal plants.

The scientific investigations are focused mainly on the content of active compounds in plants and are also devoted to agrotechnical conditions for cultivation of herbs.

Similar topics are realized during specialist trainings which are held on the following levels: schoolchildren – in the form of biology lessons concerning the life cycles and activity of plants, university students of

Pharmacy and Horticulture are acquainted with medicinal plants and their therapeutical features, as well as, with conditions of herb cultivation, farmers and collectors groups of herbs are acquainted with new medicinal plants and their cultivation possibilities.

The staff of the garden also participates in the organization of the practical trainings on herbal medicine. Completing these courses gives their participants the rights to keep the stores of medical herbs.

Public interest on cultivation of medicinal plants and phytotherapy is still growing, so educational activity of our Garden is always adjusted to the needs and expectations of our visitors.

M.M. Gryshko National Botanic Garden of the NAS of Ukraine: educational and conservational missions

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Keywords: plant collections, educational activity, glasshouse exhibitions.

Founded in 1935, M.M. Gryshko Botanic Garden (NBG) is one of the top Botanic research institutions and Botanic Gardens in Ukraine. The principal policy of NBG is maintenance and study of indigenous plant species and those outside their natural habitats, assessment of their conservation status and potential economic use as well as the development of conservational and environmental educational programs. The Garden's collections comprise more than 15 thousand species and cultivars including outstanding collections of woody and shrubby temperate plants, annual and perennial ornamentals, medicinal plants as well as the unique collections of tropical plants.

NBG provides a wide range of educational activities, including educational courses, exhibitions, workshops, guided tours, art exhibitions, performances, , lectures in botany, horticulture and conservation biology.

The various kinds of activities are developed through contact with social authorities, secondary and high schools, scientific institutions, artists, religious communities, volunteers.

The outdoor displays (Alpine Garden, Year Seasons' Garden, Rosarium) as well as glasshouse exhibitions (Orchidarium, Arid and semi-

arid vegetations, Aquatic and semi-aquatic plants, Tropical and subtropical fruit plants) highlight the diversity of plants and their uniqueness and how plants can be used by peoples, educating them for sustainable living.

During the last years after the glasshouse exhibitions were open for public the audience of our visitors was very diversified. Presenting our display glasshouses, we try to reach as many people as possible through communication with various types of recipients having different educational background, such as scientists, horticulturists, teachers and general public. These issues are likely to become increasingly important due to climate change and irreversible loss of natural habitats of plants.

For a charitable purpose we focus our efforts on special groups, such as older peoples, invalids, disabled children, the persons with low income.

Didactic models in polysensory teaching on the example of succulents

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Keywords: nature education, didactic models, succulents, shoot modification, sensors, Poznań.

Nature education for children with disabilities requires the use of didactic methods that involve many human senses since it enhances the effectiveness of teaching. Meeting sensory needs consists in stimulating various senses. In order to achieve this, natural specimens or artificial plants can be used. The didactic process can be conducted in classrooms dedicated to nature education, but other didactic offers for non-school institutions can be taken into consideration as well, as likewise botanical gardens, which have rich collections of living specimens – plant species of all climate zones on Earth.

A good example of such an offer is the workshop on shoot modification on the example of succulents. This is a group of plants able to survive long periods of drought due to their ability to store water, when it is available, in their parenchyma found in leaves, stems and roots. The

succulents use the water very economically and this is why the surface of leaves and shoots got reduced and the epidermis is covered with a thick cuticle or hairs. Organs with water-storage tissue are thick and fleshy, often cylindrical or spherical. This has resulted in great morphological diversity of succulents, embracing many various forms from compact (single- or multi-structured) to branchy, from columnar and cylindrical to spherical, from erect and scandent to prostrate or pendulous, all of them with various surface structure at the same time. To illustrate the topic, safe living specimens should be selected, and dangerous ones can be substituted with analogous artificial plants. It will result in releasing various sensory experiences on all levels of sensory communication, especially connected with the sight, touch and smell.

In nature education of visually impaired or blind persons, meeting sensory needs consists in directed involvement of the touch communication channel mainly. In this case, the succulents are excellent objects to be explored by the touch due to the variety of stimuli being provided.

MUSE, a garden for everyone

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Keywords: *for everyone*, vegetable garden, museum, wheelchair, raised beds, Trento, Italy.

In 2013 MUSE (Trento Science Museum, Italy) moved into a new building designed by renowned architect Renzo Piano, enjoying a tenfold increase in size and visitor figures. In grounds since 2015, a special display on agrobiodiversity was developed to include vegetable gardens in raised beds, an orchard and a vineyard. The display highlights landraces, local cultivars, neglected and underutilised crops, cornfield flowers and native species.

Since its inception, MUSE and the gardens were conceived as places *for everyone*. A careful planning and an inclusive design granted maximum accessibility both in the infrastructure and in the public events also aimed at disabled, disadvantaged and socially deprived people that would not normally visit cultural institutions.

An open and accessible garden and museum should cater for audiences whose real needs are not always known in advance, e.g. mothers with pushchair, elderly people that need frequent rests, easily distracted people, hearing and visually impaired people.

Accessibility in botanic gardens and museum is not only physical, not only related to barriers, but also related to perception and cultural sensitivity that is often overlooked. A wider audience approach requires a detailed analysis of many target groups to enable all of them to experience culture fully, on their own in comfort and safety.

Tandem guided tours is a good example where an educator and a disabled person guide visitors on an equal level, each with his/her specific expertise, with a strong focus on interpersonal relations. In this way, the tour leads visitors to discover science in a memorable and entertaining way, in a garden that is not only designed for everyone, but also explained and lived by everyone.

A special multiple raised bed in the garden was developed with many different smaller beds at different levels, positions and heights to allow everyone to have a comfortable experience, including wheelchairs that get close taking advantage of special hollow niches for the wheelchair. In the design stage, disabled people associations (*HandiCREA* and *Prodigio*) were specifically involved to get their feedback include it in the display that was built by *Progetto 92*, a social coop working to support socially deprived people.

Advancing University of Ibadan Botanical Gardens

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Keywords: conservation, plant diversity, serene environment, floriculture, arboretum, landscaping.

The University of Ibadan Botanical Gardens established in 1948 was mainly for Botanical Teaching and Research. Alongside was conservation of plant diversity by raising plant seedlings and promoting planting of trees. As protected green area, the Gardens serve to promote biodiversity and recreation. There are the arboretum, ornamental, nursery,

rock, rose and the water and bog Garden sections among others. Detailed description of what each section entailed shall be expatiated.

In recent times, additional changes have been effected e.g. people use the Botanical Gardens for social engagements, retreats and excursions. In the light of the expanding scope of services being rendered to the public, the children section was introduced so as to encourage them imbibe the culture of conserving plants. Lately also was the introduction of the medicinal Garden which affords people the opportunity to learn about plant uses. Some of the commonly used medicinal plants shall be discussed. Many of the social activities take place in the open field. In order to provide more facilities for recreation in the Gardens, six gazebos and a small hall were built. General services rendered by the Gardens include: space for retreats, wedding and other social engagements; landscaping and horticultural promotion; supply of seedlings and ornamentals; exciting Picnics at the Gazebos; bouquet and wreath making; educational visits; field experience on medicinal plants etc and a mini hall for seminars. How Garden visitations have enhanced ideas, innovations and great development will be discussed.

Medicinal plants in an academic botanical garden – on the interface between gardening and medicine

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Keywords: Asian medicinal plants, traditional herbal medicine.

The Botanical Garden of Medicinal Plants is a relatively small area (ca. 3 hectares) located in the campus of Wrocław Medical University. As one of the few academic gardens specializing in medicinal plants, it focuses on providing teaching and outreach resources for the faculty and researchers. The direct access to the diverse collection of rare or exotic living plants facilitates the dissemination of unique ethnopharmacological knowledge not only to the regular students and academic researchers but

also to all interested visitors and other stakeholders. It is also important in the Garden's activity to provide insight into the science behind each plant in the collection. Bringing these messages to the general public is a task that is fulfilled by providing lectures and workshops during Science Festivals, excursions, conferences, and other events. At the same time, the Garden staff strives for extending the participation of students in research and gaining practical skills in cultivation, identification, harvesting, and processing of medicinal herbs. In the Garden, special classes and electives take place that deepen the expertise of future pharmacists and practitioners that are among the few specialists who are obliged to provide the society with information about this important area of healthcare.

The Garden's specialty has been for years in the area of traditional Asian phytotherapy, the topic that attracts interest of many healthcare professionals and amateurs. The Traditional Chinese Herb collection of more than 200 well acclimated species is unique in the region and is also a base for developing educational programs for schoolchildren and students of subjects other than pharmacy.

Educational activities in the Botanical Garden in Zagreb – attracting different visitor groups

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Keywords: education, workshop, exhibition, evolution, plant kingdom, Zagreb.

The oldest university botanical garden in Croatia, the Botanical Garden of the Faculty of Science at the University of Zagreb, this year celebrates 130 years of continuous work. It has always had an important role in university teaching, scientific research and professional work in the field of botany, as well as, in education of the public about the importance of joint actions with the aim of protecting and preserving the wealth and diversity of the national flora.

Year after year, the Garden has been increasing the number of organized educational and dissemination activities intended for different groups of visitors. The oldest activity is a professional guided tour through

the Garden that is adapted for children, adults and tourist groups. With the restoration of the *Exhibition pavilion* in 2007, the Garden acquired a representative venue for exhibition and education, intended for various workshops, lectures and exhibitions. These events are exceptionally well attended, e.g. 15,417 visitors in only five months visited the “Lost Worlds of Archaic Gardens” with more than 9,900 foreign tourists. The exhibition presents the evolution of the Plant Kingdom on our planet. The Garden curators and gardeners organise and offer numerous educational and creative workshops on the topics of botany for schoolchildren and the public. Each year in May the Garden takes part in the national event called *The week of Croatian Botanical Gardens and Arboreta* featuring numerous free events for the public, such as thematic professionally guided tours of the Garden, creative workshops on the topic of botany, stage performances, storytelling, concerts, specialised and popular lectures etc. Because most of the children, growing up in urban areas, do not have the opportunity to cultivate plants, the *Children’s Flower and Vegetable Garden* was opened in 2013. The children from the nearby primary school and kindergarten use this fenced area to grow vegetables and flowers in an organic manner. A small fragrant garden with fragrant plant collection to enjoy aromas, colours and shapes is under construction. Facilities for disabled persons in wheelchairs, such as an elevator and adapted toilettes, will give the Garden an opportunity to organise different events for disabled persons.

Sugar plants in environmental education

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Keywords: sugar plants, environmental education, curriculum-based program, Tallinn.

In 2015, the Garden of Senses was opened in the Tallinn Botanic Garden (TBG). Among 350 species and varieties of aromatic plants, herbs, oil crops, fibre plants, edible and medicinal plants, as well as, those intended to provide tactile and audial experience, there are also plants which generate sweet chemical compounds.

Sweet compounds can be concentrated in a variety of plant organs, including stems, leaves, fruit, seeds and roots. The culm of sugarcane

(*Saccharum officinarum*), world's primary source of sugar, contains sweet juice, whose sweetness is provided by sucrose. Refined cane sugar is not a good dietary choice. The plant kingdom is so rich and versatile that there are numerous natural alternatives to sugarcane.

A natural sweetener boasting a long-standing tradition is maple syrup derived from the trunk of sugar maple (*Acer saccharum*). Main source of palm sugar is the sap harvested from the peduncle of sugar palm (*Arenga pinnata*), coconut palm (*Cocos nucifera*) and other palms. High-fructose agave syrup is mainly made from the inflorescence juice of agave of Salm (*Agave salmiana*) and blue agave (*Agave tequilana*). Sweet leaves can be found in candyleaf (*Stevia rebaudiana*) and Aztec sweet herb (*Lippia dulcis*) though. The fascinating natural sweeteners are the fruits of monk fruit (*Siraitia grosvenorii*) used for making sweet extract and yacon (*Smallanthus sonchifolius*) whose storage roots are used for making both sugar and syrup.

The TBG has conducted numerous guided tours and lectures featuring sweet plants. Natural sweeteners have also been displayed at the TBG's educational exhibitions, for example, "Smells, tastes, colours", "Fascinating edible plants" and "Plants in food and beverages". Young naturalists have been studying sugar plants in the educational group Nature Child in TBG. In 2018, the TBG also displayed sugar plants at the exhibition "All about sugar" in the Estonian Health Care Museum.

The TBG is currently working on the development of a new curriculum-based nature education program which will cover such topics as edible plants, health and sustainable development. One of the event goals focuses in providing information about natural alternatives to refined cane sugar. The first demonstration event was held in the TBG on 24 May 2019.

Inclusive education in the Botanical Garden of the University of Latvia

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Keywords: inclusive education, Plant Conservation Day, disabled people, Riga, Latvia.

The Botanical Garden of the University of Latvia (BGUL) has experience of not partitioning the offer to disabled people and the rest of the community. The most striking example is Plant Conservation Day (PCD), May 18. The event is dedicated to increase the public awareness on the plants, world's flora and its importance to people and the planet. BGUL has been celebrating PCD for 10 years. The average number of visitors to the event is around 1.000 people. The main audience are pupils, as well as, families and the general public. However, people, mainly school children with special needs also visit PCD. It is a great opportunity for them to communicate with the researchers and students of natural sciences, representatives of nature protection institutions and non-governmental organizations. All activities take place in the open fields of BGUL where improvised laboratories, guided tours and thematic trails are offered. Visitors can be acquainted with the topics related to plants in different levels: cell biology, anatomy, botany, ecology etc. The other plant-related areas are also represented – zoology, chemistry, paleontology, geography, nature protection, horticulture etc. The most compelling for visitors with special needs are improvised laboratories where events happen in a relaxed atmosphere and the specialists can talk directly, answer to the questions, explain the topics, allow to touch, to see, to observe, to try. It is a great opportunity for the professor and for the disable person to meet and investigate each other's interests on the base of the plants. The observations lead to the conclusion that people with special needs fit in equally and are able to enjoy educational activities that are not tailored specifically for them.

Ścieżka zmysłów w Ogrodzie Botanicznym Uniwersytetu Marii Curie-Skłodowskiej w Lublinie

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Słowa kluczowe: ścieżka zmysłów, ogród sensoryczny.

W Ogrodzie Botanicznym UMCS w Lublinie na powierzchni 21,25 ha zgromadzonych jest około 6,7 tys. taksonów. Każdego roku Ogród odwiedza około 65 tys. gości, wśród których coraz większy procent stanowią osoby niepełnosprawne.

W 2016 roku na terenie Ogródu Botanicznego została utworzona ścieżka zmysłów dla osób niewidomych i niedowidzących, zwana również ogrodem sensorycznym. Projekt został zrealizowany przy współpracy z Biurem Miejskiego Architekta Zieleni Urzędu Miasta Lublin oraz dofinansowany ze środków Wojewódzkiego Funduszu Ochrony Środowiska i Gospodarki Wodnej w Lublinie.

Zgromadzono w nim rośliny oddziałujące na zmysły człowieka, a jego teren przystosowano do swobodnego i samodzielnego poruszania się przez osoby z niepełnosprawnością ruchową, osoby starsze oraz z różnymi dysfunkcjami wzroku.

Rabaty z roślinami wyniesiono poprzez murki oporowe tak, aby były dostępne dla odwiedzających na wózkach inwalidzkich oraz osób niewidomych i niedowidzących. Murki okalające rabaty służą również do siedzenia pełniąc funkcję ławek. Ważnym elementem ścieżki zmysłów jest „ziołowa altana”, w której w wiszących skrzyniach zgromadzono zioła o intensywnym zapachu. Każda z roślin ścieżki opatrzona jest tabliczką z nazwą i opisem w języku Braille’a.

Do ekspozycji wybrano gatunki silnie pachnące, np. *Ocimum basilicum* L., *Pelargonium graveolens* L'Hér., *Lavandula angustifolia* Mill., o ciekawej fakturze, np. *Stachys byzantina* K.Koch i kształcie liści, np. *Sedum spectabile* Boreau lub kwiatów, np. *Echinacea purpurea* (L.) Moench, które łatwo zidentyfikować dotykiem. Wśród roślin pobudzających zmysł słuchu są np. *Phaseolus coccineus* L., *Physalis alkekengi* L. Ścieżka pełni głównie funkcję edukacyjną, ale jest również

miejszem odbywania zajęć dydaktycznych (ziołowa altana) i wypoczynku gości Ogrodu.

Ścieżka zmysłów jest jednym z elementów służących hortiterapii w Ogrodzie Botanicznym UMCS. Ten rodzaj terapii rozwija się w ostatnich latach bardzo dynamicznie. Wynikające z niego korzyści mają nieoceniony wpływ na poprawę zdrowia fizycznego oraz rozwoju emocjonalnego i umysłowego człowieka, dlatego swoimi działaniami staramy się wpisać w ten ważny i potrzebny proces.

Assessment of Estonian hospital gardens

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Keywords: environment, green room.

Garden environment have huge role on people's mental balance, physical and emotional health during recovery process. Garden is environmental communication room in many levels. Garden green room system around hospitals is assessable. The goal is to find Estonian green room features by landscape characteristics (Berggre-Barring, Grahn, 1995) and how they are created by well-know design techniques and views/therapeutic views (Tyson, 1998). Landscape characteristics are describable in one culture room (country). The term "room" is used to convey a sense that each green area consists of a set of distinct spaces that are separated from each other. Rooms can be generally described using a specific name to which a set of characteristics is attached. In current study Saare-, Pärnu-, Viljandi-, Tartu- and Jõgeva county 40 hospital gardens were studied in year 2017. Landscape characteristics assessed by attributes Serene, Wild, and Rich in species, Space, the Common, The Pleasure garden, Festive, Culture. Views were divided to open, half open and closed views. Therapeutic views appointed as Floating footbath, traceable view, screen/gate, distance view, perspective view, vignette. Design techniques were the Golden section, composition, rhythm, proportionality, scalability, symmetry, contrast, etc. Based on evaluation table all attributes were evaluated by existence / non-existence. Statistically correlations were made in SPSS 2.0. Correlation coefficient 0.5-0.7 is moderately strong correlation (Hinkle, Wiersma and Jurs, 2003). Results describe Estonian

hospital garden rooms very culture based. In design technique ‘the Golden section’ is correlated with open views ($r=0.598$, $p<0.01$) and closed views ($r=0.561$, $p<0.01$). The Golden section correlates with design technique Rhythm ($r=0.572$, $p<0.01$). Therapeutic view Floating foot bath and half open views are in correlation ($r=0.542$, $p<0.01$). Landscape characteristic the Culture correlates with design technique Composition ($r=0.581$, $p<0.01$). The Golden section is in correlation with the landscape characteristic the Common ($r=0.525$, $p<0.01$) and Festive ($r=0.538$, $p<0.01$). Landscape characteristic the Pleasure garden and Rich in Species are correlated ($r=0.587$, $p<0.01$). It shows which type green rooms are found in hospital gardens in Estonia.

Nature preservation and biodiversity conservation knowledge and attitude among 14-18-year-old children in Silesia region

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Keywords: nature protection forms, good practice, invasive species,
questionnaire, Upper Silesia.

Public knowledge about nature conservation is crucial for environmental protection. Using surveys, this study examines aspects of the knowledge about forms of nature conservation (including local forms), legal restrictions, obligations and benefits of landform conservation. Also the knowledge of good practices and attitude of participants of the survey were analyzed. A questionnaire was administered to primary schools and high school students within highly-urbanized agglomeration region and low-urbanized mountain region in Upper Silesia.

The results show that the students had moderate knowledge about the natural local heritage, although the local protected areas are commonly visited by them. There was a correlation between students’ knowledge about local environment and attitudes toward nature protection. Survey showed also the lack of knowledge about some of good practices, for

example reduction of invasive species spreading and shows the educational directions for local botanic gardens.

Botanic Garden in Kielce (Geopark Kielce) – a place friendly to people with disabilities

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Keywords: disability, accessibility, workshops, hortitherapy, thrive, botanical garden, Kielce.

The Botanic Garden in Kielce is one of the newest botanical gardens in Poland, and probably in Europe too. It has been built since 2009 and is partially available from July 13th, 2018. The garden will be fully opened in the spring of 2020. The main task of the garden is to present the local flora and to provide a green place for rest and recreation for Kielce residents. From the beginning, it was very important to adapt all technological solutions for a wide range of recipients. All elements of technical and touristic infrastructure have various facilities for people with physical disabilities, for example:

- numerous paths without stairs and thresholds lead to particular places, unless they are necessary (e.g. too big slopes);
- width of all paths not less than 120 cm with hardened surface (granite cube and mineral surface in type of Hanse Grand);
- presence of many wooden boxes performing the function of increased flowerbeds;
- presence of four rain protecting sheds;
- flower arrangements with sensory features.

In the Botanic Garden in Kielce a hortitherapeutic garden was also created in spring of 2019. It is a place to conduct active hortitherapy workshops. Target groups are people with various physical and mental dysfunctions, as well as, older people. All of technical infrastructure elements (paths, boxes, tables, benches) are made with accordance to the Thrive and Sensory Trust guidelines and according to elaboration *Inclusive*

Landscape Design. Supplementary Planning Document. London Borough of Islington, January 2010.

Botanic Garden in Kielce is a friendly place for the blind people. The information terminal was set up at the entrance to get them closer to the garden. The terminal has a typhlographic layer and an audio module with a short description of the plant collections.

Osoby ze specjalnymi potrzebami w zabytkowej przestrzeni Palmiarni Poznańskiej

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Słowa kluczowe: palmiarnia poznańska, przestrzeń, projektowanie uniwersalne, dostępność, zmysły.

Palmiarnia Poznańska jest obiektem zabytkowym, który powstał w 1911 roku. Dostosowanie tak nietypowej przestrzeni dla osób ze specjalnymi potrzebami jest ciągłym wyzwaniem. Potencjałem Palmiarni Poznańskiej są zróżnicowane warunki klimatyczne, jakie panują w poszczególnych pawilonach. Zmienna temperatura i wysoka wilgotność powietrza oraz dźwięki szumiącej wody czy odgłosy zwierząt, pozwalają na doświadczanie tego miejsca wszystkimi zmysłami. Jednak jest wiele nowych rozwiązań, które po wprowadzeniu mogłyby ułatwić zwiedzanie poznańskiej Palmiarni osobom niepełnosprawnym. Jednym z działań zrealizowanych z myślą o tego typu osobach jest zamontowanie windy przyschodowej umożliwiającej dotarcie do akwarium.

Kolejnym tego typu ułatwieniem jest umieszczenie w Parku Wilsona przed Palmiarnią miniatur Parku oraz Palmiarni odlanych z mosiądzu, które umożliwią osobom niewidomym zapoznanie się z infrastrukturą budynku i przestrzenią, w której się znajdują. Tego typu odlewy mogłyby stanąć również we wnętrzu Palmiarni umożliwiając poznawanie budowy roślin (np. wiktorii królewskiej), czy zwierząt (np. żółwia matamata lub papug). Następnym przedsięwzięciem, które mogłoby uczynić poznańską Palmiarnię obiektem bardziej dostępnym dla osób ze specjalnymi potrzebami byłoby położenie płyt prowadzących po całej Palmiarni dla osób poruszających się o lasce.

Dużym ułatwieniem jest również multimedialny przewodnik, który opowiada zwiedzającym o najciekawszych okazach w danym miejscu Palmiarni i wskazuje obiekty szczególnie warte uwagi, jednak z technicznego punktu widzenia jest to problematyczne rozwiązanie.

Ogród emocjonalny

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Słowa klucze: edukacja, przedszkole, seniorzy, migranci, emocje.

Rośliny łączą różne grupy ludzi. Ogród botaniczny to miejsce nie tylko dla szkół, rodzin czy badaczy, ale także dla szeregu różnych grup odkrywających przyrodę na sposób właściwy tylko im. Inaczej bowiem odbiera świat pięcioletni przedszkolak, inaczej kilkudziesięcioletnia emerytka, a jeszcze inaczej migrantka z Białorusi. Wszyscy mają jednak niepowtarzalną okazję zbliżenia się do roślin i otaczającej przyrody, odwiedzając Ogród Botaniczny Uniwersytetu Warszawskiego.

Wychodząc naprzeciw ww. różnorodnym potrzebom zwiedzających, opracowaliśmy projekt „Na grządce”, skierowany do przedszkolaków. Dzieci samodzielnie opiekowały się ogródkiem warzywnym, wykonując podstawowe prace ogrodnicze i odkrywając cykl życiowy roślin – od nasiona do dorosłej rośliny. Dowiedziały się skąd biorą się na naszych stołach warzywa. Budowanie emocjonalnej więzi zaczynało się już od samego początku – wyboru grządki, roślin, siewie – a kończyło na wspólnym posiłku jedzonym w kuchni plenerowej, sporządzonym z warzyw pochodzących z ogródka.

Z okazji dnia seniora, osobom dojrzałym zaproponowaliśmy warsztaty botaniczno-kulinarne, dzięki którym również oni mogli odkrywać nowe smaki i roślinne historie. Wspólne gotowanie i jedzenie, przebywanie z rówieśnikami, rozmowy przy wspólnym stole dawały niepowtarzalną okazję do dzielenia się swoimi emocjami.

Organizując Noc Muzeów w 2018 roku, nawiązaliśmy współpracę z Kuchnią Konfliktu – organizacją pozarządową, w której krzyżują się drogi migrantów z różnych stron świata. W oparciu o ich osobiste historie, doświadczenia i emocje stworzyliśmy materiały, tj.: książeczki

z przepisami, tablice edukacyjne, pocztówki. Wysłuchaliśmy wyjątkowych historii dotyczących roślin jadalnych – roślin, za którymi tęsknią, mieszkając w Polsce.

Obserwujemy, że bazując na emocjach, jesteśmy w stanie w niezwykle prosty i efektywny sposób dotrzeć do wszelkich grup odwiedzających nasz Ogród.

The Garden of Scents on Jardim Botânico da Ajuda

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Keywords: Ethnobotanic, Aromatic plants, Mediterranean flavours.

In the restoration of 1997 at the Jardim Botânico da Ajuda (JBA) it was converted a vacant land that was an old kitchen garden in a collection of wild plants used by the man, the Garden of Aromatic Plants. Its architecture was designed in order to provide accessibility to all visitors, especially those who have physical disabilities (motor or visual). The garden was built with flowerbeds overtaken about 0.9 meters in relation to the soil, so that the plants can be touched and smelled easier, having been labelled also in Braille. It was conceived as a sensory garden to stimulate the five senses. This is one of the preferred places by seniors who found there the herbs of the flavors and from the infusions for all diseases. During the school visits many games are done there: What kind of plant is this? How is it flavor? What smell have it? And in special days, gymkhanas are done with multifunctional teams who have to know the name of the plant that it is always in pizza, or what is the Betadine plant (*Chelidonium majus*), or what plant is that from the infusion you have taken before? In this way information is exchanged, valuing and expanding knowledge about the useful properties of plant species. With a multidisciplinary approach, visits are conducted by linking people, be they adults or children, to the plant environment, and, in the end, design strategies for the conservation of biological and cultural diversity.

Evaluation of aromatic plants for use in vertical gardening

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Keywords: vertical gardening systems, aromatic plants, phytomodule, Minsk, Belarus.

In the urban environment with its constant shortage of horizontal surfaces, the systems of vertical gardening allow us to involve in planting greenery and ornamental plants the areas which were not previously used for these purposes. In this regard, the modern technologies of vertical gardening can be very promising. The use of modular systems of vertical gardening can have aesthetic, environmental, economic, and educational purposes. Choosing a sustainable variety of plants for planting in vertical gardening systems is an important scientific task, since there are still very limited data on the topic.

Vertical gardening systems can be effectively used to create sensory gardens. The advantage of this systems type is the possibility of placing the plants at the height that is most convenient for visitors. Long-term cultivation of a number of aromatic plants in such systems is possible. This allows us to create large scale landscaping, which have a pronounced human-directed effect. The use of vertical gardening systems for creating aromatic gardens is especially promising in rooms and greenhouses with the year-round access. For last five years we have been carrying out an assessment of various aromatic plants for cultivation in phytomodules of rare watering, to be grown in open and closed ground. *Plectranthus amboinicus* and *Elettaria cardamomum* are considered the most promising for premises as the most stable when grown in phytomodules, providing the maximum decorative effect and containing a large amount of essential oils in the aerial mass.

Exhibitions for all senses - Innovative educational methods and the issue of accessibility of botanical gardens to the general public including visitors with special needs

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Keywords: senses, exhibition, special needs, nature, botany.

Prague Botanical Garden (PBG) has long been addressing the issue of accessibility of the garden to visitors with special needs (since 1996). At present, PBG has a comprehensive system of services and educational activities for visitors with special needs. This includes: 1. Discreet navigational and information system (the outdoor expositions of PBG); 2. Regular staff training for work with visitors with special needs (Certification of the Czech Red Cross); 3. Interactive educational activities focused on perception by all senses (Exhibitions for all senses, Scent Trail, Haptic collection of natural items).

More than twenty years of experience with the organization of exhibitions for all senses resulted in the formulation of generally valid principles for their realization. Since 1996 until now, 23 exhibitions for all senses have been held. The method of perception of nature by all senses is enriching, entertaining, and in the long run it reinforces gained knowledge. For visitors there is not only a professionally trained guide, but also a professionally prepared audio guide. The exhibition is designed for the general public and brings visitors many insights and new experiences, regardless of their potential disability. We cooperate with specialized institutions working with clients with special needs and with other professional and cultural institutions.

Garden of Senses: a new fascinating exposition in Tallinn Botanic Garden

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Keywords: Garden of Senses, useful plants, disabled people, Tallinn, Estonia.

The Garden of Senses, established in Tallinn Botanic Garden in 2015, mainly contains useful plants. The target group primarily comprises the people with disabilities, but other visitors who would like to study plants are welcomed too. This is where one can have an opportunity to experience and contact with medicinal plants, aromatic plants, cereals, oil crops, fibre plants, vegetables and spices. The Garden of Senses also features fruit trees and berry bushes. For display the lattice side walls of pergolas for climbing plants with edible fruits and clematis cultivars bred in Estonia were installed. The Garden of Senses is an excellent place for studying new and fascinating edible plants, learn more about medicinal plants or just stop for a rest to enjoy the plants with all your senses. The Garden of Senses has received a number of awards in Estonia.

Workshops

1. The Garden of Scents. Learning through scents and smells

Helen Ekvall

Gothenburg Botanical Garden, Sweden

Klára Lorencová

Prague Botanical Garden, Czech Republic

Learning about the world of plants using the sense of smell. Learning through our nose is a simple but also a fun way of how to obtain knowledge and remember it. Some visitors with special needs rely highly on their sense of smell, this can help them to learn and understand valuable information about plants.

In this workshop, we'll focus on smell. We'll use plants, their parts or products to find out more about them. We'll play a short „fragrant game” and we will show you how to prepare it by yourselves for your own students. Some other examples of good practice in botanical garden's education connecting to aromatic plants will also be displayed.

2. Let nature speak for itself

Kennert Danielsson

Gothenburg Botanical Garden, Sweden

Signs should not be an obstacle in our meeting with the natural world. However, this is often the case when we inform too much or inform in a way that hinders nature from speaking for itself. During this workshop we will take a closer look at accessible texts that help nature talk for itself. Prepare to actively participate outdoors!

3. Fruit madness

Karen Otto

Gothenburg Botanical Garden, Sweden

Mateusz Sowelo

Botanical Garden of the Adam Mickiewicz University, Poland

The workshop consists of 3 parts. The participants are blindfolded and sit around 4-person tables. The person conducting the workshop puts exotic fruits on the table. The participants' task is to recognize the fruits by means of their senses other than sight. First, they try to recognize the fruit by its shape, then by the scent and finally by the taste. During the second

part of the workshop, the participants get a convex world map and try to find the place of origin of the given fruit. At the end of the workshop participants prepare a fruit salad together and taste it.

4. Hello! Hello! This is Bird Radio from the Poznan Grove Station!

Anikó Gál-Bélteki

Hungarian Association of Arboreta and
Botanic Gardens

Natalia Hałas

Botanical Garden of the Adam Mickiewicz
University, Poland

The world of birds is not only of colors, it is primarily a world of sounds. A world rich with meanings. Birds express their emotions through sounds, they warn of danger, inform „this territory is occupied” and „that’s my mate! stay away!”. Finally, sounds constitute also information for us. What does the Bird Radio broadcast and what is the daily schedule? Let’s find out during the workshop. We will try to identify small fledged singers and the ones who start the broadcast. We’ll get to know the secrets of birds’ communication and the methods of emitting sounds. We also prepared some sound riddles (it’s going to be surprising). At the end we will have a walk around the Garden to put the knowledge from the workshop into the practice.

5. She was weaving garlands and throwing them into rippling water...

Joanna Markiewicz

Botanical Garden of the Adam Mickiewicz
University, Poland

Kinga Sikorska

Botanical Garden of the Adam Mickiewicz
University, Poland

Making garlands is a Slavic tradition connected with Midsummer’s Night (June 23/24). Maidens used to prepare garlands of herbs, which, as believed, had magic powers. Then, they put flaming torches into their garlands and let them go downstream, where bachelors were waiting. If a bachelor managed to catch a garland, it was taken as a good sign for the so established couple.

The workshop consists of 2 parts. During the first, blindfolded participants try to recognize herbs using their sense of smell and touch. Only herbs formerly connected with celebrations of the Midsummer’s Night will be selected for this activity. During the second part of the

workshop, the participants try to weave garlands, which afterwards may ornament their heads.

6. Never Alone: The Secrets of Symbiosis. The exhibition for all senses.

Alicja Kolasieńska	Botanical Garden of the Adam Mickiewicz University, Poland
Eva Novozámská	Prague Botanical Garden, Czech Republic
Amálie Balaščíková	Prague Botanical Garden, Czech Republic

Its theme is the symbiosis of plants and various other organisms. The exhibits can be touched, heard, smelled and sometimes even tasted. Come and try the smell of *Rafflesia*, make a home for a bat in a pitcher of a carnivore plant or find out how to fertilize a rice paddy.

The exhibition is a result of cooperation of an international team coming from 4 botanical gardens within the project Erasmus+ „Botanical Garden: COME IN! VSTUPTE! KOM IN! WEJDŹ! GYERE BE!“. It was prepared under the guidance of a team of the Prague Botanical Garden, which can boast 22-year-experience in organizing unique exhibitions that present various aspects of nature to a wide public, particularly visitors with special needs.

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