ROOTS

BOTANIC GARDENS CONSERVATION INTERNATIONAL
EDUCATIONAL REVIEW

VOLUME 23, NUMBER 1
MAY 2026

CULTURAL HERITAGE IN BOTANIC GARDENS

BOTANIC GARDENS CONSERVATION INTERNATIONAL

ROOTS Volume 23 • Number 1

Editors:

Helen Miller
Head of Education and Vocational Training

Annelies Andringa-Davis
Education and Training Officer

Cover image: Celebrating Užgavėnės at Vytautas Magnus University Botanical Garden, Kaunas, Lithuania (Jonas Petronis)

Roots and *BGjournal* are published by **Botanic Gardens Conservation International (BGCI)**. Each publication is issued twice a year. Articles are contributed by BGCI members. Membership is open to all individuals, institutions, and organisations that support BGCI's aims.

BGCI is a membership organisation representing botanic gardens in more than 100 countries worldwide. We are an independent UK charity, established in 1987, that connects botanic gardens and conservation practitioners through a global network for plant conservation. Our mission is to mobilise botanic gardens and engage partners to secure plant diversity for the well-being of people and the planet. Our global office is based in London, United Kingdom, and we work through separately registered entities, and regional networks to achieve a truly global reach.

BGCI Global Office
Botanic Gardens Conservation International (BGCI)
Charity Reg. No. 1098834
Company (CLG) Reg. No. 04673175
199 Kew Rd., Richmond, Surrey, TW9 3BW
United Kingdom
+44 20 83325953 info@bgci.org www.bgci.org

BGCI Africa
Botanic Gardens Conservation International Africa Limited
Company (CLG) Reg. No. CLG-VXFAEQ
C/O IUCN ESARO
Mukoma Rd., off Magadi Rd.,
P.O. Box 68200 - 00200, Nairobi, Kenya
+254 725295632 africa@bgci.org

BGCI US
Botanic Gardens Conservation International U.S., Inc.
Non-profit organisation 501 (c)(3)
C/O The Huntington Botanical Garden
1151 Oxford Rd., San Marino, CA 91108
United States of America
jennifer@bgcius.org

BGCI Regional Networks
- African Botanic Gardens Network (ABGN)
- Central America and Caribbean Botanic Gardens (CCABG) Network
- European Botanic Gardens Consortium (EBGC)
- Red Sudamericana de Jardines Botánicos (RSAJB)
- Southeast Asia Botanic Gardens (SEABG) Network

Design: John Morgan, Seascape
john@seascapedesign.co.uk

FIRST WORD

ARTICLES

REGULARS

FIRST WORD

CULTURAL HERITAGE IN BOTANIC GARDENS

Helen Miller
Head of Education and Vocational Training

Back in 2019, BGCI was coordinating the big European funded project BigPicnic which aimed to facilitate conversations with a wide range of audiences about food security. 19 partners across 13 countries took part, with botanic gardens across Europe co-creating activities and facilitating conversations with minority and underrepresented audiences about the project's topic. One of the key findings of that project, was the importance of cultural heritage, that food is closely linked to individual and national identity, culture, tradition and memory and that this relationship shapes personal and collective identities. For our project, cultural heritage became the foundation of how we engaged with our audiences, and led to impactful, long-lasting connections, many of which are still going strong today. What BigPicnic highlighted was that cultural heritage is a powerful and necessary tool for us as organisations, that can enrich the way that we engage with our visitors, provide opportunities to engage new visitors and audiences, and can provide a sense of place and purpose in the work that we do and the stories we tell. Cultural heritage encompasses identity, belonging, and the rich diversity of stories that shape how people connect with plants and landscapes. It invites us to use cultural perspectives to deepen our narratives, promote intercultural dialogue, foster mutual respect, and amplify underrepresented voices.


BigPicnic policy brief 1:
Food and heritage
Recommendations

BigPicnic policy brief on food and heritage

In this issue we share stories of the way in which some of our BGCI member gardens have been embedding cultural heritage within their programmes and practice.

On page 4 read about how Birmingham Botanical Gardens (UK) has been integrating cultural heritage and plant humanities as they embark on an exciting new phase of the garden's development. On page 8, Royal Botanic Gardens Victoria (Australia) shares their commitment to embedding First Peoples perspectives through a Learning on Country approach.

At the Bauru Municipal Botanical Garden (Brazil) they have established a partnership with the Ekeruá village to create an ethnobotanical collection representing Indigenous knowledge, the first of its kind in the region, read more on page 12. On a similar theme, San Diego Botanic Garden (USA) share their experiences of working in partnership with local community partners to design, install, interpret and operate three key spaces in the garden - the Indigenous (Native American), Mexican, and Medicinal Gardens. Read about them on page 16.

On page 21 you can read about Vancouver Botanical Gardens Association (Canada) and their experiences of engaging communities through natural and cultural heritage, demonstrating how biocultural diversity and culturally responsive education programming is essential to meaningful place-based education.

At Vytautas Magnus University Botanical Garden (Lithuania), they hold an annual Užgavėnės festival, which is a unique celebration of Lithuania's cultural heritage, that welcomes the awakening of nature and the chance to start anew after a long winter. Hear more about the festival and why it's so important to the garden and their surrounding communities on page 25.

At Xishuangbanna Tropical Botanical Garden (China), they have been developing the Wild Edible Plants Notes programme, a youth learning programme that was created with local holders of Indigenous knowledge, who also served as mentors to the students. Read more on page 29.

And finally on page 33, the National Institute of Ecology (Korea) has been undertaking a study of ramie (mosi) in Hansan, showing how a heritage crop can form living heritage and a pedagogical infrastructure, integrating agriculture, climate literacy, and community stewardship.

As always, I hope you enjoying reading the selection of articles from BGCI members and are inspired to embed cultural heritage into your practices.

Author: Jen Ridding

DIVERSIFYING NARRATIVES AT BIRMINGHAM BOTANICAL GARDENS, 2023-2026

Birmingham, UK... a super-diverse, post-industrial city, deeply connected to Empire. Birmingham Botanical Gardens... a Victorian garden with a global plant collection which is reinventing itself for the 21st century. In our urban context, cultural heritage defines this reinvention.

Collaborating with diverse underrepresented communities, and partners, we are integrating cultural heritage and plant humanities to share new narratives, multiple knowledges, and diverse perspectives on plants, landscape, and heritage. Cultural heritage is transforming our programmes, interpretation, living collection, and our £19.4m capital restoration project.

This paper will share live action research from our unique context, alongside provocations for dialogue and exchange.

Birmingham Botanical Gardens (BBG) is one of the UK's most significant historic botanic gardens. Its grade II* (special interest) listed landscape designed in 1829, and global living collection of over 30,000 plants, form a unique and essential part of the city's green ecology, existing within Birmingham's post-industrial urban context. Located just one mile from the city centre, the Gardens welcome over 200,000 visitors a year, around 40% of whom are from global majority communities.

Above: Artist Saranjit Birdi led community drawing workshops to explore personal connections to plants (Charlie Gregson, Nottingham Trent University)

Visitors were invited to share their plant remedies at the Healing Scents sensory artwork event (Birmingham Botanical Gardens)

Birmingham Botanical Gardens are on a journey of transformation to rethink, reactivate and reposition the Gardens for the 21st century. Over the last four years we have worked with visitors, communities and stakeholders to create a road map for the future of the Gardens which includes delivery of a transformational £19.45m capital project *Growing our Green Heritage* to restore, redisplay and reinterpret the heritage and collection, and reposition the Gardens as a connected, responsive and valued civic institution in the city.

Informing this journey lies our central provocation- *what is the role of a 21st century urban botanic garden, located within the super diverse and youthful city of Birmingham, within the contexts of severe biodiversity loss, climate crisis and political uncertainty?*

It is within this context of transformation that we have introduced a practice of cultural heritage at Birmingham Botanical Gardens. This is new work for the Gardens. Prior to 2023 there was no recognised community engagement at the Gardens. Since 2023 we have built an engagement team, delivered pilot projects and implemented an engagement framework across the organisation.

Cultural heritage is central to who we are and what we do, defining not only our engagement programmes but our organisational values, behaviours and ethos. The cultural, social and political landscape in Birmingham is changing significantly and rapidly around us. For example, in 2025 Raise the Colours, a divisive UK grassroots campaign to display the Union Jack and St George's Cross flags in public places, began in a suburb of Birmingham just a few miles from the Gardens. As we opened our Gardens to diverse global communities, flags were being raised across the city. How does a botanic garden activate cultural heritage to respond to social and political shifts happening on its doorstep? In these politically uncertain times, this is a question for all of us working in botanic gardens across the world. For us, this context served to foreground and strengthen our commitment to cultural heritage practice. Sharing and activating the Gardens to foster intercultural dialogue, understanding and respect never felt so vital.

"This reminds me of my country, we have the same type of garden design but different flowers in it."
Community group participant

Healing Scents bespoke engagement station designed by Kaye Winwood, Jieling Xiao and Stephanie Singer (Birmingham Botanical Gardens)

We are at the beginning of a journey and this paper shares selected examples of the cultural heritage projects we are developing at Birmingham Botanical Gardens as an invitation for dialogue and exchange within the sector.

As a small charity, collaboration has been a key feature of our cultural heritage projects. We have found working with university partners particularly fruitful, giving us access to resources (people, financial and knowledge), and providing a critical framework for the work.

In 2023 - 2024 we delivered a cultural heritage project called *Planting Stories* in collaboration with Nottingham Trent University's (NTU) School of Arts and Humanities. Senior NTU Lecturers, Kat Massing and Charlie Gregson, secured £20,000 of Innovate UK funding for the project which aimed to explore the Gardens' living collection and heritage through the lens of colonial histories, migrations and global connections. Using practice-led research, the project deepened relationships with local stakeholders to ask what diversifying narratives meant to them and how they wanted to engage with this.

Creative and participatory engagement practice was central to the approach. A programme of free drop-in workshops led by queer and global majority artists in drawing, co-created poetry and collage gathered community responses from over 100 participants. Four global majority members of Birmingham's diverse allotment community took part in semi-structured interviews, sharing personal stories and lived experience of connecting with plants and landscapes. Stories included medicinal uses such as "rubbing nettles and onions on sore muscles" or "breaking a bit off monkey finger plant to put on warts", or food stories such as the memory of "drinking sugar cane juice as a child" and "brewing tea from leaves rather than buying overpriced teabags".

Three paid student interns from NTU's Museum & Heritage Development Masters supported the project. For one student intern, the banana plant evoked strong memories of home, leading to the creation of a film by NTU Animation students to reveal the fruit's cultural meanings and its relation to empire and human rights abuses.

NTU Student intern Madhavi Jayawardana in the Planting Stories exhibition (Charlie Gregson, Nottingham Trent University)

"The wisteria reminds me of being home in Iran, they are my favourite flowers."
Community group participant

Exchanging plant stories in the Mediterranean House (Birmingham Botanical Gardens)

Multiple voices were layered in a public project-lab exhibition, engaging over 25,000 visitors with cultural heritage discourse by showcasing the project's creative outputs alongside provocations and space for further visitor contributions. The exhibition was a pivotal public moment for Birmingham Botanical Gardens, positioning us as a research-led botanic garden, actively engaged in cultural heritage practice. *Planting Stories* introduced the Gardens to new cultural perspectives and diversified the narratives around our collection. It upskilled the staff team, built organisational confidence, informed the new interpretation strategy and paved the way for further Higher Education partnership projects.

In 2025 we collaborated with Jieling Xiao, Reader in Architecture and Sensory Environments at Birmingham City University, and artists Kaye Winwood and Stephanie Singer to commission a sensory participatory artwork called *Healing Scents*. Presented as part of the Being Human Festival, this free interactive experience invited visitors of all ages and demographics to think about plant properties, alternative remedies and their own cultural plant traditions. Participants were invited to create their own plant-based remedy rooted in their lived experience and knowledge. The artwork became a place for intercultural dialogue, discovery and exchange.

Since 2024 we have engaged in a programme of community listening. We have invited diverse community groups to experience the Gardens to share their responses, their lived experiences and their plant stories. Participants included adults experiencing homelessness, sanctuary seekers (refugees and asylum seekers) housed in temporary accommodation and people living with special educational needs. During tours of the Gardens participants shared culturally specific information about plants in the Garden. There were many powerful and moving exchanges including participants sharing photos of plants in gardens that were 'left behind' in Syria and Iran whilst standing next to examples of these plants growing in Birmingham soil. Participants identified different elements of a plant in their preferred languages, providing us with insight into indigenous and colloquial plant knowledges and vocabularies.

These sessions quickly revealed to us the collection's rich potential to inspire cultural exchange and dialogue, and foster connection and belonging. The learnings have informed our interpretation strategy, which will include diverse, contemporary and changing community voices throughout, and the future of our living collection which will be informed by community decisions on which plants to retain and add to our collection. We have designed a plant matrix auditing toolkit which not only scores plants according to their horticultural and scientific value, but also according to their cultural, social and emotional value. The Gardens team will use this toolkit alongside communities and stakeholders to determine the future of our global living collection.

Cultural heritage practice continues to inform our person-centred engagement approach. As we move forward, we are committed to a multiple expertise approach, championing diverse knowledges that co-exist equally alongside Western models of horticultural and scientific knowledge. We are not the experts. We are all experts together.

Community listening session exploring the stories and language of an oak tree (Birmingham Botanical Gardens)

We are committed to a multiple expertise approach, championing diverse knowledges that co-exist equally.

These sessions quickly revealed to us the collection's rich potential to inspire cultural exchange and dialogue, and foster connection and belonging.

AUTHOR

Jen Ridding
Head of Engagement & Learning
Birmingham Botanical Gardens,
Westbourne Road,
Edgbaston, Birmingham, UK
jen@birminghambotanicalgardens.org.uk

Authors: Sally Fierenzi and Janine (Jaffa) Richardson

LEARNING ON COUNTRY: EMBEDDING FIRST PEOPLES PERSPECTIVES IN BOTANIC GARDENS EDUCATION

This article outlines Royal Botanic Gardens Victoria's (RBGV) commitment to embedding First Peoples perspectives through a Learning on Country approach. It positions botanic gardens as cultural landscapes and emphasises place-based, relationship-led learning guided by Traditional Owners and Aboriginal communities. Through First Peoples-led programs, RBGV supports culturally safe education that recognises Aboriginal knowledge as living, relational and enduring, contributing to reconciliation and a deeper understanding of Country for learners and Communities.

Botanic gardens are often perceived as places of beauty, science, and recreation, spaces where people gather to enjoy curated landscapes and learn about plant life. Yet beneath these familiar roles lies a deeper responsibility. Botanic gardens are also cultural landscapes, shaped by thousands of years of knowledge, care, and connection to Country.

At Royal Botanic Gardens Victoria (RBGV), this understanding underpins a growing commitment to embed First Peoples perspectives across schools' education and community programming, more broadly. This work is grounded in relationships, respect and the recognition that meaningful learning must be led in partnership with Traditional Owners and Aboriginal communities. Our Gardens are striving to incorporate First Peoples perspectives through "Learning on Country." This approach moves beyond outdoor learning to centre Place, relationships, and First Peoples ways of knowing, being, thinking, and doing.

Above: Jaffa with children from Balee Koolin Bubup Bush Playgroup (Royal Botanic Gardens Victoria)

Embedding "Learning on Country" requires more than just individual programs, it demands ongoing institutional commitment.

Students connecting to Country at Marrung Mob Day at Cranbourne Gardens (Royal Botanic Gardens Victoria)

"Learning on Country" and learning in Place, invites a shift in how First Peoples knowledge is understood. Rather than treating Aboriginal culture as a subject to be studied, it recognises knowledge as relational, embedded in land, language, and culture. First Peoples knowledge systems are holistic and sophisticated, developed over tens of thousands of years and continuing to evolve. This aligns with Australian curriculum frameworks, which increasingly acknowledge the importance of Indigenous knowledge systems (ACARA, 2022) and informs how programs are designed and delivered at RBGV. Our Gardens are not purely green landscapes or scientific spaces; they are situated on Aboriginal land. Melbourne Gardens on Wurundjeri/Woiwurrung Country and Cranbourne Gardens on Bunurong/Boonwurrung Country. Recognising this means making the stories of Country visible, relevant, and present—not confined to the past.

A key principle guiding this work is that First Peoples knowledge remains the cultural and intellectual property of Aboriginal people. It is not owned or interpreted by institutions. RBGV does not position itself as the authority on Aboriginal knowledge; its role is to facilitate, support, and create space for First Peoples-led perspectives. This includes acknowledging Traditional Owners, supporting self-determination in program design, and ensuring those with cultural authority shape learning experiences. Moreover, relationships are central. Meaningful engagement with Traditional Owners and Aboriginal communities requires time, trust, transparency, and reciprocity. It also calls on institutions like RBGV to reflect on and decolonise their histories and practices through truth-telling and culturally safe ways of working, including recognising the ongoing impacts of colonisation and shifting decision-making toward First Peoples. This learning extends across the organisation, with staff engaged in ongoing professional learning led by Aboriginal staff.

Aboriginal staff are embedded across multiple divisions, including Learning, Visitor Experience, and Horticulture, strengthening a whole-of-organisation approach. This is supported by RBGV's Reconciliation Action Plan (RAP), which commits to advancing reconciliation through increased Aboriginal staffing, visibility, and more intentional engagement. Aboriginal Learning staff play a vital role in shaping culturally informed educational experiences. The organisation also prioritises culturally safe working environments by addressing cultural load and sharing responsibility for program delivery with non-Aboriginal colleagues, supporting both integrity and Sustainability.

Botanic gardens are also cultural landscapes, shaped by thousands of years of knowledge, care, and connection to Country. In practice, embedding First Peoples perspectives means designing programs from the outset with these perspectives in mind, rather than adding them as an afterthought.

Jaffa engaging with the community at NAIDOC (Royal Botanic Gardens Victoria)

Aboriginal Elders welcoming students to Cranbourne Gardens with a smoking ceremony (Royal Botanic Gardens Victoria)

In practice, embedding First Peoples perspectives means designing programs from the outset with these perspectives in mind, rather than adding them as an afterthought. While this has not always been the case, it remains an ongoing commitment. Programs increasingly incorporate storytelling, language, and cultural context, emphasising that cultural practices are living and evolving, reflecting the strength and continuity of the world's oldest living culture.

Across Melbourne and Cranbourne Gardens, the Learning and Participation team offers a range of cultural education programs from early childhood through to secondary years. Students explore topics such as plant use, tools, bush foods, and sustainable land practices. These programs are led by Aboriginal Learning team members, with non-Indigenous educators in supportive roles. Learning experiences are interactive and place-based, supporting curriculum links while prioritising respect for cultural knowledge. Strong demand reflects their growing value within schools. A powerful example of this work is Marrung Mob Day, an annual gathering at Cranbourne Gardens for First Peoples students from the local community. Coordinated with local schools, the event brings together hundreds of students, providing a culturally safe and empowering space to connect, learn, and celebrate culture within The Gardens.

Programs are led by Aboriginal Learning team members, with non-Indigenous educators in supportive roles.

Another important initiative is the Balee Koolin Bubup Bush Playgroup, an inclusive early years program that supports local Aboriginal and Torres Strait Islander children and their families, irrespective of their Aboriginal heritage. The title is derived from Boonwurrung language: Balee (Cherry Ballart, a plant that requires a parent plant to grow), Koolin (family), and Bubup (children), reflecting the program's emphasis on connection, care, and growth. Led by an Aboriginal Learning Officer and guided by a Boonwurrung Elder, the program fosters connection to culture and community through play-based learning on Country.

Beyond the Gardens, outreach programming extends this work into the community. The Community Engagement and Outreach team are building relationships with Traditional Owners and Aboriginal organisations to ensure offsite programs are grounded in local culture. One example is the Raising Rarity Schools conservation program, which engages schools in growing and studying locally threatened native plants.

Learning through First Peoples storytelling (Royal Botanic Gardens Victoria)

In partnership with Aboriginal educators and local government, the program is evolving to embed storytelling as a core element, driven by local Aboriginal students. These perspectives enrich scientific learning by highlighting cultural relationships with plants, including their uses, histories, and seasonal significance.

Embedding "Learning on Country" requires more than just individual programs, it demands ongoing institutional commitment. It involves valuing process as much as outcomes and adapting systems to support Indigenous ways of working (Shay *et al.*, 2023). These shifts help ensure engagement is genuine and respectful, and not tokenistic. For learners, the approach fosters a deeper understanding of Place and encourages reflection on how knowledge is shaped and shared. Students come to see that Australia's histories and knowledge systems are living, dynamic and enduring, and this contributes not only to educational outcomes but also to broader goals of reconciliation, respect and recognition, outlined in the Australian Curriculum (ACARA, 2022).

Ultimately, our approach to embedding First Peoples perspectives is about building relationships and connections, and a shared commitment to caring for Country. It challenges the traditional institutional approach and encourages the broader community to listen, learn, and act in ways that honour the knowledge and authority of First Peoples. At RBGV, this work continues to evolve, guided by the voices and leadership of Traditional Owners and Aboriginal communities, whose enduring connection to Country remains at its heart.

Sally Fierenzi – Learning Innovation Programs Officer
Sally Fierenzi is an experienced environmental educator and program leader at Royal Botanic Gardens Victoria, with over 25 years in sustainability and STEM education. For the past decade, she has designed programs that connect students and communities with nature, with a growing focus on community engagement and outreach education. With a background in science and education, Sally builds collaborative partnerships that bring science, learning, and community together. Her work inspires curiosity, strengthens connections to the natural world, and empowers people to contribute to a sustainable future.

Janine (Jaffa) Richardson – Aboriginal Learning Officer
Janine (Jaffa) Richardson is a proud Dja Dja Wurrung woman with a background in horticulture, bushland management, and children's services. She has worked at Royal Botanic Gardens Victoria Cranbourne for eleven years and currently holds the role of Aboriginal Learning Officer. Initially employed to facilitate the Balee Koolin Bubup Bush Playgroup under the cultural guidance of local Elder Aunty Fay Muir, Janine continues to teach local Boonwurrung language and culture to young Aboriginal children and their families in a bushland setting. She also delivers a range of school excursion programs, covering both Aboriginal perspectives and Australian plants, animals, and environments. Janine is deeply passionate about connecting children and the wider community to local culture and is committed to supporting greater understanding of First Peoples. She actively uses her role to help embed Aboriginal culture in meaningful and respectful ways.

Jaffa teaching students in The Gardens (Royal Botanic Gardens Victoria)

REFERENCES

Shay, M., Miller, J., Oliver, R. & Frawley, J. (2023). Indigenous education policy, practice and research: unravelling the tangled web. The Australian Educational Researcher. Available at: https://doi.org/10.1007/s13384-022-00581-w

Australian Curriculum, Assessment and Reporting Authority (ACARA) (2022). Aboriginal and Torres Strait Islander Histories and Cultures. Available at: https://www.australiancurriculum.edu.au

AUTHORS

Sally Fierenzi – Learning Innovation Programs Officer
Sally.Fierenzi@rbg.vic.gov.au

Janine (Jaffa) Richardson – Aboriginal Learning Officer

Royal Botanic Gardens Victoria, Australia

Authors: Vitória de Paula Pereira Cesar, David Henrique da Silva Pereira, Luiz Carlos de Almeida Neto, Vinícius Sementili Cardoso and Mateus Henrique Costa Vieira

CONSERVING BIOCULTURAL LEGACY THROUGH ETHNOBOTANICAL COLLECTIONS

Botanical gardens are essential for conserving plant biodiversity and valuing the traditional knowledge associated with plants, acting as important cultural agents. In 2023, the Bauru Municipal Botanical Garden (BMBG) established a partnership with the Ekeruá village to create an ethnobotanical collection representing Indigenous knowledge. Developed in collaboration with the BMBG technical staff and representatives of the Terena and Guarani Ñandeva peoples, the collection links plant species to ancestral practices, values, and uses. As the first initiative of its kind in the region, it offers an innovative educational experience, strengthens environmental education, and promotes the appreciation and dissemination of Indigenous culture.

Introduction

The loss of biocultural diversity has become a growing concern, particularly regarding traditional botanical knowledge. One major contributing factor is the disappearance of Indigenous languages, which may, in turn, take with them thousands of years of associated ancestral knowledge. According to Cámara-Leret and Bascompte (2021), each language has a unique terminology for describing a society's environment, and when that terminology disappears, part of that knowledge is lost. In other words, when Indigenous terminology is lost, it is as if pages from the index of the forest's library are being erased.

Above: Environmental educator presenting a plant from the collection to children during the Botanical Garden's holiday programme (Archive of the Bauru Botanical Garden)

In Brazil, the situation is no different, and the problem of this knowledge loss is even more pronounced due to the country's extraordinary biological and ethnocultural diversity. According to the most recent census conducted by the Instituto Brasileiro de Geografia e Estatística (IBGE, 2025), Brazil is home to 391 Indigenous ethnic groups and 295 Indigenous languages, a fact that in itself represents a rich cultural heritage accumulated over generations.

Bringing conservation together with traditional knowledge

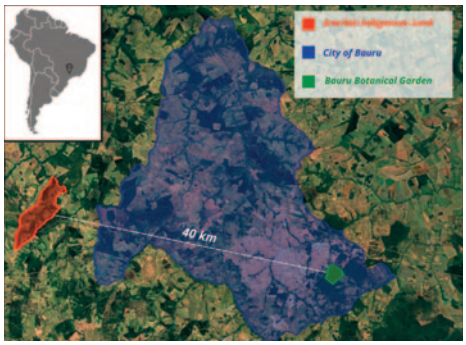
Botanical gardens have great potential to contribute to the conservation and dissemination of traditional plant-related knowledge, playing a fundamental role through ethnobotanical collections (Oliveira-Melo et *al*., 2019). These collections are biocultural repositories that highlight the relationships between human populations and plant species, emphasising their traditional uses (Salick et *al*., 2014). This initiative aligns with the Global Strategy for Plant Conservation (GSPC), adopted under the Convention on Biological Diversity (CBD), which seeks to reduce threats to biodiversity while encouraging the sustainable use of resources and the sharing of traditional knowledge held by Indigenous peoples and local communities, always with their consent (Global Partnership for Plant Conservation, 2025).

The influence of the Bauru Municipal Botanical Garden to its regional context

The Bauru Municipal Botanical Garden (BMBG) is located in the central region of the state of São Paulo, Brazil. From this location, the institution seeks to operate, through partnerships, with conservation and environmental education projects and actions within a radius of up to 100 kilometres. Within this area lies the Araribá Indigenous Land (AIL), in the municipality of Avaí, approximately 40 kilometres from the BMBG. According to the Fundação Nacional dos Povos Indígenas (FUNAI, 2020), the AIL has a population of more than 600 inhabitants, distributed across four villages and belonging to three Indigenous peoples: the Guarani Ñandeva, the Terena, and the Kaingang.

The BMBG serves the regional public, receiving approximately 75,000 visitors per year through both guided and independent visits.

Physical space of the collection, featuring a wooden structure that evokes two Indigenous headdresses facing one another (Archive of the Bauru Botanical Garden)



Map showing the location of the Araribá Indigenous Territory in relation to the Bauru Botanical Garden (Archive of the Bauru Botanical Garden)

Representatives from the Ekeruá Village with a display of Indigenous artefacts in the background (Fátima Sandrin)

Plants from the Collection				
Scientific Name	Family	Guarani Name	Terena Name	Utility
Aspidosperma polyneuron	Apocynaceae	wyraró	mayane karameva	Mortar manufacturing
Balfourodendron riedelianum	Rutaceae	ywyrá ratã	tikoti marfim	Bow and slingshot manufacturing
Bixa orellana	Bixaceae	urukú	nyé	Body painting
Bromelia balansae	Bromeliaceae	karagwata	vihehe	Food / Medicinal
Calophyllum brasiliense	Calophyllaceae	gwanandi	tikoti	Construction of canoes and dwellings
Cedrela fissilis	Meliaceae	wynary	karameva	Arrowheads and blowguns manufacturing
Centrolobium tomentosum	Fabaceae	arara yba	araribá	Manufacture of canoes, plates and utensils
Cupania vernalis	Sapindaceae	kuã-pu-açaba	okona ahara	Manufacturing of bows and tool handles
Gallesia integrifolia	Phytolaccaceae	wyraré	ticotima ayu	Medicinal
Genipa americana	Rubiaceae	ianypaba	nutiku	Medicinal / Body painting
Hymenaea courbaril	Fabaceae	ietá-yba	vama	Food
Imperata brasiliensis	Poaceae	tsapé	tokerehi	Used in construction for roofs and coverings, mixed with clay
Macropsychanthus grandiflorus	Fabaceae	kuru'ãin	uke bui	Production of necklaces and handicrafts
Myracrodruon urundeuva	Anacardiaceae	ywaytá kyiyi	metakiku teti	Arrowheads and blowguns manufacturing
Ormosia arborea	Fabaceae	wyrá tsapirã	uve vaxikita	Production of necklaces and handicrafts
Philodendron sp.	Araceae	mombépi	hepipi	Handicraft / Medicinal

List of plants present in the ethnobotanical collection, preserving their Indigenous nomenclature (Archive of the Bauru Botanical Garden)

"Environmental education and plant conservation go hand in hand with the preservation of Indigenous cultural heritage". ***Vitória de Paula Pereira Cesar, Bióloga do Jardim Botânico de Bauru***

Creating a new collection in collaboration with Ekeruá Village

The initial connection between the BMBG and Ekeruá Village (Indigenous Terena people) was facilitated by the Bauru Municipal Department of Culture, following a proposal from members of the Village to add labels to some of the trees at the BMBG in their native language. This interest emerged within the Village's Visitor Plan, called *houxovoti kalivono komohiti*, which means "children playing" in the Terena language and focuses on cultural exchange. This initiative was essential to the development of the partnership.

Following the initial contact, the BMBG staff introduced the concept of ethnobotanical collections to the village representatives and invited them to expand the original proposal. Collaborative actions were then initiated to establish a new collection at the Botanical Garden, integrating Indigenous knowledge into conservation and education activities. Subsequently, members of the Nimuendaju Village (Indigenous Guarani Ñandeva people) also contributed by providing information and linguistic consultancy.

The selection of plants for the collection prioritised native Brazilian species that were commonly used by members of the villages. To enrich the collection, Indigenous artefacts were kindly donated for display as part of the collection.

Educational use of the ethnobotanical collection

This initiative seeks to value and promote the historical relationship between Indigenous peoples and native flora, while raising visitors' awareness of the importance of conserving both biodiversity and cultural heritage. The inclusion of plant names in the Terena and Guarani languages on the identification signs, together with their traditional uses, reinforces the commitment to recognising the Indigenous communities that still inhabit the region and to contributing to the preservation of their customs and languages.

During guided visits, educators introduce the concept of ethnobotany and contextualise the use of plants in the daily life and culture of the Indigenous peoples. Topics addressed include biological, cultural and linguistic diversity, as well as the importance of the intergenerational transmission of knowledge. The aim is to encourage recognition of and respect for traditional peoples.

The educational resources (interpretive signs and Indigenous artefacts) present information on the distribution and current situation of Indigenous populations in Brazil, as well as the location of the AIL and the ethnic groups whose members participated in the development of this collection.

Examples of interpretive panels used in the ethnobotanical collection (Archive of the Bauru Botanical Garden)

REFERENCES

Cámara-Leret, R. & Bascompte, J. (2021). Language extinction triggers the loss of unique medicinal knowledge. Proceedings of the National Academy of Sciences, 118(24), e2103683118.

Fundação Nacional dos Povos Indígenas (FUNAI) (2020) Terras Indígenas: Dados geoespaciais e mapas [Indigenous lands: geospatial data and maps]. Available at: https://www.gov.br/funai/pt-br/atuacao/terras-indigenas/geoprocessamento-e-mapas.

Botanical Garden staff with the representative of Ekeruá Village (David) at a cultural event held in the village, where the partnership was presented (Archive of the Bauru Botanical Garden)

During guided visits, groups learn about the various ways in which plants are used by Indigenous peoples, including housing, construction, body painting, the manufacture of instruments and utensils, food, medicinal purposes, clothing production and handicrafts. These topics are explored through an interactive approach, encouraging visitor participation and curiosity. For members of the public who visit the BMBG independently, the space was designed to provide an accessible and self-guided experience, using clear and objective language.

The artefacts also help to enrich the learning experience, as they represent symbolic elements of Indigenous customs and traditions, while also highlighting the use of various plant species in their production.

The collection also includes audio content, accessed via QR codes, which provide a brief description of the space and its purpose.

Contributions and future directions

This collection represents a new achievement in environmental education for the BMBG, both as a non-formal educational space and for the region in which it is located. It is a line of work that broadens the traditional scope of the institution's botanical collections by incorporating traditional knowledge, as well as cultural and linguistic aspects of Indigenous peoples. In the regional context, the initiative also stands out for its pioneering character, as there are officially no botanical gardens in the region that maintain similar collections. In this sense, the experience gained by the BMBG in organising this collection is particularly significant, especially given the scarcity of initiatives with this approach in the region, considering Brazil's vast biocultural diversity and territorial scale.

We recognise that there is still room to improve the educational activities associated with the collection, in order to make better use of its engagement potential and further stimulate public interest, both during guided visits and independent visits.

As next steps, actions aimed at enhancing the visitor experience are currently being planned. Initially, QR codes will be added to the identification signs, linking to audio recordings of the pronunciation of species names in the Terena and Guarani languages, thereby expanding the interactive and sensory character of the collection. This new feature seeks to support efforts to recover and keep Indigenous languages alive, now also through sound.

We hope that our experience will serve as a source of inspiration for other botanical gardens and environmental education institutions in future projects. This work has also motivated us to envision possible new thematic spaces for the BMBG that may likewise integrate cultural heritage and biodiversity conservation.

REFERENCES CONTINUED

Global Partnership for Plant Conservation, (2025). The Global Strategy for Plant Conservation 2020–2030. Botanic Gardens Conservation International , London, UK.

Instituto Brasileiro de Geografia e Estatística-IBGE, (2025). Censo 2022: Brasil tem 391 etnias e 295 línguas indígenas. Available at: https://agenciadenoticias.ibge.gov.br/agencia-noticias/2012-agencia-de-noticias/noticias/44848-censo-2022-brasil-tem-391-etnias-e-295-linguas-indigenas.

Oliveira-Melo, P., Fonseca-Kruel, V., Lucas, F., Coelho-Ferreira, M. (2019). Ethnobotanical collections in Brazil considering the global strategy for plant conservation. Bol. Mus. Para. Emílio Goeldi. Cienc. Hum., 14(2), pp. 665-676.

Salick, J., Konchar, K., Nesbitt, M. (2014). Biocultural collections: needs, ethics and goals in Salick, J., Konchar, K., Nesbitt, M. (eds) Curating biocultural collections: a handbook. Richmond: Kew Publishing.

AUTHORS

Vitória de Paula Pereira Cesar
Bióloga do Jardim Botânico Municipal de Bauru
jbbauru@gmail.com

David Henrique da Silva Pereira
Professor e Gestor Cultural da Aldeia Ekeruá
davidsilva@prof.educacao.sp.gov.br

Luiz Carlos de Almeida Neto
Diretor do Jardim Botânico Municipal de Bauru
jbbauru@gmail.com

Vinícius Sementili Cardoso
Biólogo do Jardim Botânico Municipal de Bauru
jbbauru@gmail.com

Mateus Henrique Costa Vieira
Estudante de Biologia e Estagiário do Jardim Botânico Municipal de Bauru
jbbauru@gmail.com

Authors: Kekoa Cantwell, Lisa K. Cumper, Shasta Gaughen, Sophia Bejarano, Michelle Garcia, Brophy Joseph Toledo, Bryn E. Fragua, Roger Fragua, Angela McChesney, David Ehrlinger, Juan Solomon, Robert Kopfstein, Sergio Bautista, Venice Henson and C. Benjamin Naman

CELEBRATING CULTURAL BELONGING AND HERITAGE AT SAN DIEGO BOTANIC GARDEN

San Diego Botanic Garden celebrates cultural belonging and heritage near the US-Mexico border in a region that hosts vast biological and cultural diversity. Three of the spaces that were designed, installed, interpreted and operated in true partnership with local community partners are the Indigenous (Native American), Mexican, and Medicinal Gardens. Curated plant selections, a multilingual self-guided tour app, interpretive signage, and interactive programming engage and inform guests about diverse human connections with plants and the cultural humility with which the spaces were crafted. A sense of belonging and understanding is created through the intentional design and implementation throughout.

San Diego Botanic Garden designs spaces and programs that engage audiences in exploring human relationships with plants. This work is grounded in cultural humility and a commitment to amplifying voices of underrepresented communities. More than 30 themed gardens engage visitors with plants from various geographies, including California, the Mediterranean basin, Mexico, and South Africa, as well as plants of cultural significance such as those used for food, medicine, and other traditional practices. These gardens invite multisensory exploration through hearing, seeing, smelling, and, where appropriate, touching and tasting. Among the most popularly engaged spaces are the Local California Native American Garden, Mexican Garden, and Medicinal Garden. A community-engaged design approach integrates thoughtful plant selections, docent-led tours, multilingual interpretive signage, a GPS-enabled self-guided tour app, and dynamic programs that celebrate cultural diversity. Guests are encouraged to learn about culturally significant plants and their uses, and to form personal connections with them that enrich their appreciation of both biodiversity and cultural heritage.

Above: Participants in the February 2025 Gathering of Tribes and Conservation Organizations, including representatives from about 25 Indigenous Native American Nations, seven Indigenous-led organizations, and 25 conservation groups, academic institutions, and government agencies at the Local California Native American Garden (Native Plants and Native Peoples Trail) at San Diego Botanic Garden (San Diego Botanic Garden)

"Lahunt" Richard Bugbee, the late Luiseño tribal elder and ethnobotany instructor from Kumeyaay Community College, instructing local school children circa 2000 on the construction of "ewaa" traditional shelter structures taken in the Local California Native American Garden (Native Plants and Native Peoples Trail) (San Diego Botanic Garden)

The San Diego region is a biocultural hotspot among the 36 global biodiversity hotspots and is home to the most federally-recognized Indigenous Native American tribal nations of any US county, including the distinctive Cahuilla, Iipay ~ Tipay Kumeyaay (Diegueño), Kuupangaxwichem ("Cupeño"), and Payómkawichum ("Luiseño") peoples. San Diego is further shaped by diverse naturalized and immigrant populations, particularly communities of Mexican heritage due to the nearby Mexico-US border. Guests come to connect with plants important to their own cultural heritage or to learn about others. San Diego Botanic Garden builds and maintains reciprocal relationships with community partners, supporting ongoing collaborations and mutual knowledge exchanges to advance the organization's goal of creating, sharing, and applying plant wisdom in our world. The vast biological and cultural diversity here uniquely position San Diego Botanic Garden to foster intercultural dialogue that deepens understanding, builds mutual respect, and develops a sense of belonging for individual guests and entire communities.

San Diego Botanic Garden is entrusted by Indigenous partners to convey an allowed segment of their knowledge and culture through intentional ongoing partnerships grounded in trust, reciprocity, and shared stewardship.

A Sharing in Cultural and Medicinal Plant Knowledge public educational program with Indigenous knowledge holders, traditional medicine practitioners, and plant scientists leading classes, discussions, and hands-on herb blending workshops to raise awareness of the importance of medicinal plant biodiversity (San Diego Botanic Garden)

The garden strives to innovate replicable models that other organizations can adapt and implement while creating vital place–based experiences with their own native flora, Indigenous cultures, and local communities.

People using the GPS-enabled self-guided tour mobile app to learn about medicinal plants throughout the Garden with curated information that is delivered both audibly and visually in English and Spanish (San Diego Botanic Garden)

San Diego Botanic Garden is entrusted by Indigenous partners to convey an allowed segment of their knowledge and culture through intentional ongoing partnerships grounded in trust, reciprocity, and shared stewardship. The Garden acknowledges and honors the foundational roles and monumental contributions of "Lahunt" Jane Dumas, the late chairwoman and tribal elder of Jamul Indian Village of California (A Kumeyaay Nation), and "Lahunt" Richard Bugbee, the late Luiseño tribal elder and ethnobotany instructor from Kumeyaay Community College, who philosophically guided the organization down a path of meaningful sustained partnerships with Indigenous communities. With initial funding from the Donald C. and Elizabeth M. Dickinson Family Foundation, the Local California Native American Garden (colloquially the Native Plants and Native Peoples Trail) officially opened in 2000. This space was designed, installed, interpreted and continually operated since the late 1990s with local Indigenous community partners, especially Jamul Indian Village of California. Interpretive signage here relays a clear message from Indigenous people: "This is who we are, and we are still here". Plant labels include Kumeyaay names and selected ethnobotanical uses that Indigenous partners have chosen to share publicly. This garden highlights rich native biodiversity, including manzanitas, oaks, toyon, and yerba santa, while emphasizing the deep relationships between people, plants, and place. Jane, Richard, and other Indigenous people have led intergenerational and cross-cultural events and programs for over 25 years here to share their distinguished perspectives and understandings of the natural world with community members and guests.

Garden staff, volunteers, and local community members of Mexican heritage, including secondary school students, created the Mexican Garden in the early 2000s with funding from the US Institute of Museum and Library Services. This Garden demonstrates the rich biodiversity of Mexico, including agaves, peppers, and new world cycads, and has fun design elements to help connect guests with Mexican culture and create an atmosphere of belonging. This garden was installed and officially opened in 2005 by pre-existing Fruit and Herb Gardens to celebrate the botanical and cultural heritage shared through foods, especially in Mexican tradition. Guests here learn about the origins of foods and spices that are often unspecified when sold as groceries. One well-known plant in this garden is hoja santa (*Piper auritum*), which is used in traditional Mexican cooking and holiday festivities such as Las Posadas and Christmas. Since it officially opened in 2005, the Garden has regularly hosted cultural events that reflect Mexican traditions, creating opportunities for pluralistic community celebrations alongside cross-cultural learning.

In the Mexican Garden, ballerina and mariachi topiaries near a tile fountain are crowd favorite sights that connect guests with cherished aspects of Mexican culture through plants (San Diego Botanic Garden)

REFERENCES

Anderson, K. (2013). Tending the wild: Native American knowledge and the management of California's natural resources. University of California Press.

Barbour, M., Keeler-Wolf, T. & Schoenherr, A.A. (eds) (2007). Terrestrial vegetation of California. 3rd edn. Berkeley: University of California Press.

Beauchamp, R.M. (1986). A flora of San Diego County, California. Chatsworth, CA: Sweetwater River Press.

Carrasco, M., Cibrián-Jaramillo, A., Bonta, M., Englehardt, J. and Hart, T.C. (2022). Under the shade of Thipaak: the ethnoecology of cycads in Mesoamerica and the Caribbean. Gainesville: University Press of Florida.

Carrico, R.L. (2008). Strangers in a stolen land: Indians of San Diego County from prehistory to the new deal. El Cajon, CA: Sunbelt Publications.

Clarke, C.B. (1977). Edible and useful plants of California. University of California Press.

Eargle, D.H. (1992). California Indian Country: The land & the people. San Francisco: Trees Company Press.

Largo, D., McCarthy, D.F. & Roper, M. (2009). Medicinal plants used by Native American tribes in southern California. Banning, CA: Malki-Ballena Press.

Lightfoot, K.G. and Parrish, O. (2009). California Indians and their environment: an introduction. Berkeley: University of California Press.

Miskwish, M.C. (2007). Kumeyaay: A history textbook: a curriculum for Kumeyaay history classes. Sycuan Reservation: Sycuan Press.

Nabhan, G.P. (2009). Where our food comes from: retracing Nikolay Vavilov's quest to end famine. Washington, DC: Island Press.

Since conventions and laws regarding biodiversity exchange can limit the community's ability to access some plants from Mexican cultural heritage, the Garden provides guests with the opportunity to experience them responsibly while learning about the importance of ethical sourcing and international conservation efforts.

The creation of the Medicinal Garden was enabled in the early 2020s by the establishment of San Diego Botanic Garden's Medicinal Plants Research Consortium, which brought together representatives from academia, industry, non-governmental non-profits, and Native American Tribal government agencies to partner in conservation, education, and scientific inquiry. Funding for this development came primarily from the local Conrad Prebys Foundation. Practitioners of traditional medicine here and across the world, including Indigenous knowledge holders, contributed to the intentionality of expanding the living plant collection and designing the Medicinal Garden and educational programs to engage and inform guests. Interpretive signs, plants, and programming here celebrate the cultural diversity of traditional knowledge and the history of medicinal plant use from time immemorial through present, including but not limited to Ayurveda, Native American cultural practices, and Traditional Chinese Medicine. Since many medicinal plants are at risk from overharvesting globally, the importance of biodiversity conservation taught here includes both its ecologically intrinsic value and its relevance to human health and wellbeing. The Medicinal Garden also serves as a learning space for students and researchers at local colleges and universities, supporting hands-on education and the formation of new relationships between people and plants.

Ethnobotany students from California State University San Marcos learn about the past, present and future connections between traditional medicinal knowledge and modern scientific advancements (San Diego Botanic Garden)

The San Diego Botanic Garden Medicinal Plants Research Consortium, including representatives from academia, industry, non-governmental non-profits, and Native American Tribal government agencies, meets in 2022 to plan for the new Medicinal Garden, expanded medicinal plant collection, educational programming, and scientific research studies

REFERENCES CONTINUED

Peirce, A. (1999). The American Pharmaceutical Association practical guide to natural medicines. New York: Morrow.

Simmonds, M.S.J., Howes, M.-J. and Irving, J. (2017). The gardener's companion to medicinal plants: an a-z of healing plants and home remedies. London: Frances

U.S. Census Bureau (2025). Quickfacts: San Diego County, California. Available at: www.census.gov/quickfacts/fact/table/sandiegocountycalifornia/PST045224. (Accessed: 10 April 2026).

Van Wyk, B.-E. and Wink, M. (2017). Medicinal plants of the world: an illustrated scientific guide to important medicinal plants and their uses. 2nd edn. Wallingford: CABI.

Wilken-Robertson, M. (2018). Kumeyaay ethnobotany: shared heritage of the Californias. San Diego: Sunbelt Publications.

AUTHORS

Kekoa Cantwell
Tribal Climate Resilience Specialist
San Diego Botanic Garden
kcantwell@sdbgarden.org

Lisa K. Cumper
Tribal Historic Preservation Officer
Jamul Indian Village of California
lcumper@jiv-nsn.gov

Shasta Gaughen
Executive Director of Pala Environmental Department
Pala Band of Mission Indians
sgaughen@palatribe.com

Sophia Bejarano
Environmental Coordinator
Viejas Band of Kumeyaay Indians
sbejarano@viejas-nsn.gov

By bridging Indigenous knowledge systems with contemporary research methods in biochemistry, botany, and pharmacognosy, the Medicinal Garden affirms the value of multiple ways of knowing and encourages holistic understandings of plant science.

Curated living plant collections, thoughtfully designed thematic areas with interpretive signage, and interactive programs at San Diego Botanic Garden offer authentic ways for guests to engage with their own cultural heritage and others, fostering belonging, dialogue, and meaningful knowledge exchange. As part of the American Public Gardens Association, Botanic Gardens Conservation International, and other invaluable conservation networks, San Diego Botanic Garden strives to innovate replicable models that other organizations can adapt and implement while creating vital place-based experiences with their own native flora, Indigenous cultures, and local communities. The design, installation, and operation of the Local California Native American, Mexican, and Medicinal Gardens in true partnerships with cultural humility demonstrate a successful approach to elevating underrepresented voices and strengthening communities. These approaches align with broader regional educational efforts, including community college programs that integrate ethnobotany and place-based learning, further improving connections between academic institutions, cultural knowledge holders, and public gardens. Learners begin to understand that biodiversity and cultural diversity are deeply interconnected, and that ongoing Indigenous ecological practices such as tending, burning, and harvesting are part of long-standing sustainable systems of reciprocal relationships between people and plants. San Diego Botanic Garden is honored to connect and inform many communities and organizations to advance plant conservation, ethical knowledge exchanges, and true sustainability.

The 2024 San Diego Botanic Garden Medicinal Plants Research Symposium, hosted in the Dickinson Family Education Conservatory, celebrates many ways of knowing and studying plants including traditional culture, modern biochemical research, and especially highlighting Indigenous knowledge sovereignty (San Diego Botanic Garden)

AUTHORS CONTINUED

Michelle Garcia,
Professor of Kumeyaay Science
Cuyamaca Community College
michelle.garcia@gcccd.edu

Brophy Joseph Toledo
Cultural Advisor
Flower Hill Institute
toledo@flowerhill.institute

Bryn E. Fragua
Director of Agriculture
Flower Hill Institute
bfragua@flowerhill.institute

Roger Fragua
Executive Director
Flower Hill Institute
rfragua@flowerhill.institute

Angela McChesney
Graphic Designer
& Digital Media Specialist
San Diego Botanic Garden
amcchesney@sdbgarden.org

David Ehrlinger
Volunteer
San Diego Botanic Garden
ehrlingd@sbcglobal.net

Juan Solomon
Director of Horticulture
San Diego Botanic Garden
jsolomon@sdbgarden.org

Robert Kopfstein
Volunteer
San Diego Botanic Garden
rwkopfstein@gmail.com

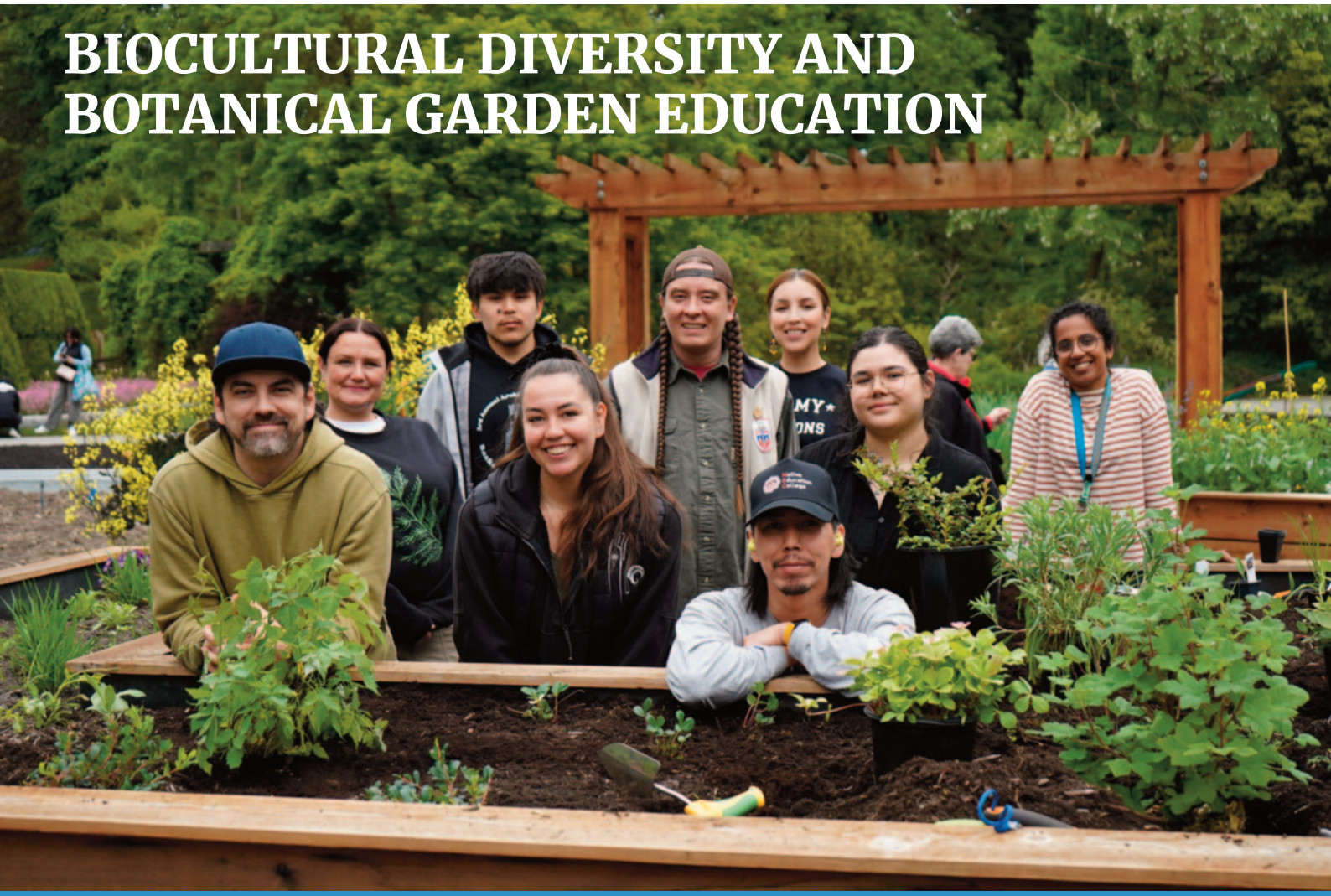
Sergio Bautista
Director of Facilities
San Diego Botanic Garden
sbautista@sdbgarden.org

Venice Henson
Director of Marketing
& Communications
San Diego Botanic Garden
vhenson@sdbgarden.org

C. Benjamin Naman*
Director of Cultural and Medicinal Plants Research
San Diego Botanic Garden,
bnaman@sdbgarden.org
* Corresponding author

Authors: Chantal Martin, Poh Tan and Rachelle Packwood

BIOCULTURAL DIVERSITY AND BOTANICAL GARDEN EDUCATION



Biocultural diversity is integrated throughout the educational programming offered by the Vancouver Botanical Gardens Association in both VanDusen Botanical Garden and Bloedel Conservatory. This article illustrates how cultural heritage is incorporated as living practice linking biodiversity with belonging, responsibility, and shared human–plant relationships. Experiences of engaging communities through natural and cultural heritage are highlighted, demonstrating how biocultural diversity and culturally responsive education programming is essential to meaningful place-based education. Additionally, insights are shared on being mindful of mainstream norms in education and instead amplifying Indigenous voices through relationship, protocol, and reciprocal practice.

Botanical gardens are often understood as places of beauty, conservation, science, and education. They are all of these things, but they are also cultural spaces. Plants are connected to language, migration, ceremony, food, medicine, work, and belonging. Research in botanic garden and environmental education has increasingly emphasized the importance of linking biological diversity with cultural diversity, and helping the public understand why those connections matter (Dunn, 2017; Sanders, Ryken & Stewart, 2018). For us at the Vancouver Botanical Gardens Association (VBGA), this means that natural heritage and cultural heritage cannot be separated. A plant is never only a specimen; it also carries memory, relationships, and story.

Above: Indigenous Land Stewardship students planting a legacy bed in VanDusen Botanical Garden's Garden Lab (Tina Chin)

A plant is never only a specimen; it also carries memory, relationships, and story.

Hula and storytelling with Dr. Poh Tan at Bloedel Conservatory (Tina Chin)

VBGA educators prepare an Onam Sadhya with plant food (Poh Tan)

VanDusen Botanical Garden and Bloedel Conservatory are situated on the unceded traditional and ancestral territories of the Sḵwx̱wú7mesh Úxwumixw (Squamish Nation), xʷməθkʷəy̓əm (Musqueam), and səlilwətaɬ (Tsleil-Waututh) Nations. Working on this land reminds us that place-based learning is not only about ecology. It is also about history, responsibility, language, and the ongoing presence and stewardship of the Peoples of the Land. This educational perspective is supported by scholarship that calls for greater attention to the tensions and possibilities between Indigenous and Western knowledges in environmental education (Kapyrka & Dockstator, 2012), and asks educators to think carefully about approaches to environmental learning concerning land and place (Tuck et al, 2014).

Working on this land reminds us that place-based learning is not only about ecology. It is also about history, responsibility, language, and the ongoing presence and stewardship of the Peoples of the Land.

Beyond just scientific plant facts, VBGA educators also want to know what relationships exist with land and place, what stories are being told, who gets to tell them, and how students can learn about plants through both science and their own experiences. Research on biocultural diversity in British Columbia elucidates its significance, demonstrating that place, ecology, and culture are intricately connected in how communities perceive and manage their environments (Zandvliet et al., 2023). Previous VBGA research has examined this through narratives of plants related to the emotional, ecological, and cultural experiences of educators and students (Albuquerque et al., 2022).

For us, cultural heritage in the garden can be understood as living practice. A visitor may know a plant's Latin name or through Cantonese, Dakelh, Bahasa Melayu, hən̓q̓əmin̓əm̓, or another language carried through family and community. Through language and naming, a plant can shift from unfamiliar to familiar, from display to food, medicine, home, or ceremony. Research on urban and place-responsive pedagogies suggests that naming, identity, and lived experience matter deeply in how children and adults come to know the more-than-human world (Somerville & Hickey, 2017). In a diverse urban setting, visitors may also recognize plants through diasporic memory before they recognize them through botany. A banana blossom, hibiscus, or medicinal herb can connect continents, generations, and identities. It becomes understood that biodiversity is part of daily life and part of the journeys that people and plants have taken together.

VBGA Natural & Cultural Heritage Coordinator Rachelle Packwood gifts a medicine bag to a member of the Coastal Wolf Pack (Tina and Aidan Chin)

Through language and naming, a plant can shift from unfamiliar to familiar, from display to food, medicine, home, or ceremony.

At the VBGA, teaching is not merely about imparting knowledge. Teaching at VBGA is about instilling wonder, connections, and empathy. Martin (2023), an author writing from the viewpoint of the botanical garden educator, explains that educator stories shared in the garden can inspire a lifelong appreciation for plants. In our case, when learners meet plants by using memory, narrative, and connection, the garden transforms into a place that creates a sense of awareness and belonging. This ties well with reflective science education, where not only do learners gain knowledge, but they also reflect upon their relationships and epistemologies (Tan, 2021).

Our audience engagement has grown from creating opportunities for recognition, participation, and dialogue with biocultural diversity. This includes inviting Indigenous speakers, artists, storytellers, and knowledge keepers into large public events and teacher series, and creating space for ceremony, healing walks, and family days for local Nations and Urban Indigenous community groups. It also includes making available literature by local Nation authors and illustrators through our library, offering free education for members of local Nations, hiring Indigenous students, and supporting Indigenous-led research groups in the garden. These examples are all meaningful parts of building cultural safety and trust that successful education depends on.

Our work is strengthened by relational leadership and cultural accountability. An Indigenous educator on our team works closely with cultural protocol and community relationship-building, helping us engage Elders, knowledge keepers, and community members with greater care, mutual respect, and reciprocity. One of our most important lessons is this: Before there is engagement, there must be learning. Non-Indigenous institutions cannot simply insert Indigenous perspectives into programming and call that inclusion. Trusting relationship-based work requires time, a respect of protocol, and asks educators to listen, return, revise, and sometimes step back. It asks us to learn with Indigenous Peoples rather than only about Indigenous Peoples. Recent work on relational science emphasizes values such as humility, integrity, reciprocity, and respect in research and engagement with Indigenous communities (David-Chavez *et al.*, 2024). This resonates strongly with our own efforts to work in a good way.

A traditional welcoming to the land by the Coastal Wolf Pack at VanDusen Botanical Garden (Tina Chin and Aidan Chin)

Quarterly medicine wheel celebrations at VanDusen Botanical Garden facilitated by All My Relations Teachings (Tina Chin)

REFERENCES

Albuquerque, M., Kwok, J., Martin, C., Moran, H., Runtukahu, G., Tan, P. & Zandvliet, D. (2022). Reverence for nature: A biocultural journey in botanical gardens, Langscape Magazine, 11.

David-Chavez, D.M., Gavin, M.C., Ortiz, N., Valdez, S. & Carroll, S.R. (2024). A values-centered relational science model: supporting Indigenous rights and reconciliation in research. Ecology and Society, 29(2). doi: 10.5751/ES-14768-290211.

Dunn, C.P. (2017). Biological and cultural diversity in the context of botanic garden conservation strategies. Plant Diversity, 39(6), pp. 396–401. doi: 10.1016/j.pld.2017.10.003.

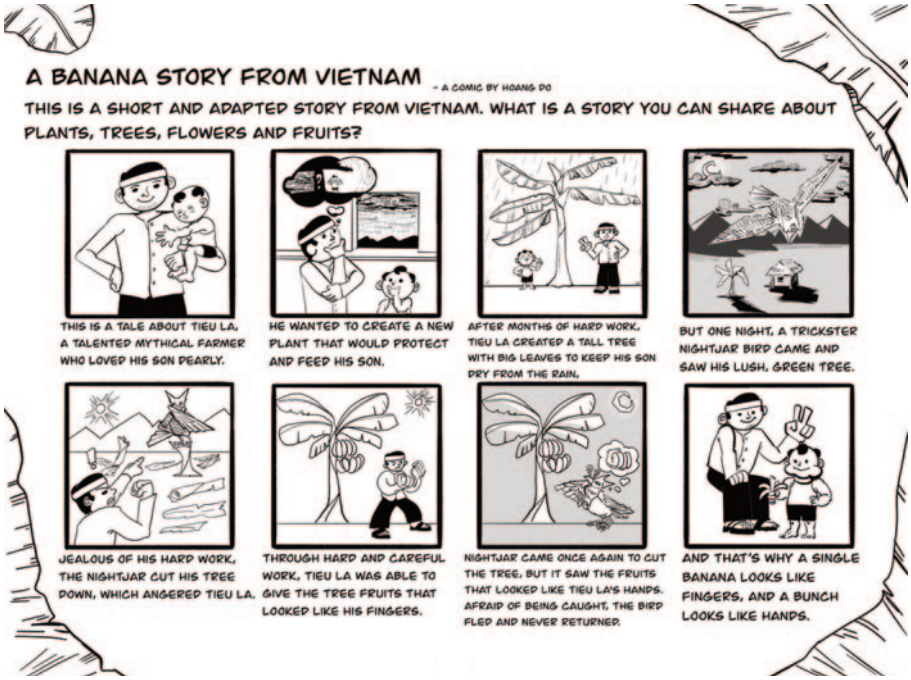
Kapyrka, J. & Dockstator, M. (2012). Indigenous knowledges and western knowledges in environmental education: Acknowledging the tensions for the benefits of a "two-worlds" approach. Canadian Journal of Environmental Education, 17, pp. 97–112.

Martin, C. (2023). Fostering a lifelong love of plants: Educator stories from a botanical garden. SFU Educational Review, 15(1). doi: 10.21810/sfuer.v15i1.6183.

Sanders, D.L., Ryken, A.E. & Stewart, K. (2018). Navigating nature, culture and education in contemporary botanic gardens. Environmental Education Research, 24(8), pp. 1077–1084. doi: 10.1080/13504622.2018.1477122.

Somerville, M. & Hickey, S. (2017). Between Indigenous and non-Indigenous: urban/nature/child pedagogies. Environmental Education Research, 23(10), pp. 1427–1439. doi: 10.1080/13504622.2017.1325451.

Tan, P. (2024). Extending scientific literacy through Indigenous Hawaiian epistemology: Navigating scientific seas with hula. PhD thesis. Simon Fraser University.



A Banana Story from Vietnam- a comic by Hoang Do (Emily Carr University Alumni)

We have also learned that biocultural diversity extends beyond local Nations alone. The garden and conservatory hold plants from many climatic and cultural worlds. VanDusen is rooted in a temperate rainforest, while Bloedel Conservatory houses species more often associated with tropical regions. Caring for plants from around the world brings a responsibility to interpret them in culturally responsive ways. A recorded reflection on the role of bananas in an Onam Sadhya meal, stories about how bananas are prepared in Venezuela, a student's illustrated retelling of a traditional banana origin story from Vietnam, or hula and hibiscus teachings that connect Hawaii, Malaysia, and Benin all show learners that plants live in culture as much as in collections. This broader biocultural approach aligns with ongoing efforts in botanical gardens to engage nature, culture, and education together rather than as separate domains (Sanders et al, 2018).

Digital tools have contributed to our ability to responsibly share global plant and culture relationships. Tan & Zandvliet (2024) have pointed out how botanical virtual field trips could enable a form of learning where storytelling, curriculum, and place intersect via digital media to promote inclusive and enhanced learning experiences in communities. In our case, technology enables students, teachers, and parents to familiarize themselves with plants prior to their arrival, reflect upon concepts learned after leaving the garden, and explore stories that may not have been as impactful by signage or tours alone.

Other gardens can use this approach, understanding that the starting point is a commitment to relationship, humility, and responsiveness to place. Gardens can begin by asking whose land they are on, who holds knowledge that should guide the work, and what structures are needed for reciprocity rather than extraction. They can create multiple entry points for audiences through language, family memory, foodways, art, ceremony, and scientific inquiry. They can support staff learning through cultural safety training and Indigenous-created resources. They can invite community members to shape interpretation rather than simply contribute to it. And they can use digital tools thoughtfully to widen access while keeping place and relationship at the centre.

For us, the larger lesson is clear: Cultural heritage in gardens is not an added layer placed on top of environmental education, it is one of the ways environmental education becomes meaningful. When gardens make space for biocultural diversity, they can become places where biodiversity, identity, belonging, and public learning meet. That work is strongest when it is grounded in protocol, receptivity, and a willingness to be changed by the relationships that make it possible.

REFERENCES CONTINUED

Tan, P.C. (2021). Waves of reflection: Becoming reflective science educator. *Alberta Science Education Journal*, 47(1), pp. 50–58.

Tan, P. & Zandvliet, D. (2024). Accessible and enriched community-engaged learning: a botanical virtual classroom field trip, New Perspectives in Science Education Conference Proceedings. Filodiritto Editore.

Tuck, E., McKenzie, M. & McCoy, K. (2014). Land education: Indigenous, post-colonial, and decolonizing perspectives on place and environmental education research. Environmental Education Research, 20(1), pp. 1–23. doi: 10.1080/13504622.2013.877708.

Zandvliet, D., Leddy, S., Inver, C., Elderton, V., Townrow, B. & York, L. (2023). Approaches to bio-cultural diversity in British Columbia. Sustainability, 15(8), 6422. doi: 10.3390/su15086422.

AUTHORS

Dr. Poh Tan, PhD
Senior Education Research Lead
Vancouver Botanical Gardens Association (VBGA)
ptan@vandusen.org

Chantal Martin
Director of Education & Research
Vancouver Botanical Gardens Association (VBGA)
cmartin@vandusen.org

Rachelle Packwood
Natural and Cultural Heritage Coordinator, Vancouver Botanical Gardens Association (VBGA)
Member of Tseshaht First Nation
rpackwood@vandusen.org

The Vancouver Botanical Gardens Association, a charitable non-profit, are joint operating partners of VanDusen Botanical Garden and Bloedel Conservatory with the Vancouver Board of Parks and Recreation.

Author: Indrė Sekevičienė

CELEBRATION OF UŽGAVĖNĖS: CULTURAL HERITAGE COMES ALIVE AT THE BOTANICAL GARDEN

Vytautas Magnus University (VMU) Botanical Garden in Kaunas, Lithuania, brings its visitors together not only for plant-blooming festivals and rich outdoor and greenhouse collections, but also for unique celebrations of Lithuania's cultural heritage. One of them is Užgavėnės. This festival is closely related to the awakening of nature and its life as well as starting anew after a long winter.

46 days before Easter, participants of Užgavėnės dress up as goats, witches, herons, devils, and other characters who loudly shoo the winter away from the yard. After a symbolic fight, the symbol of winter, is burned down in a large bonfire. Aromas of pancakes and other fatty dishes fill the air as dishes prepared in the garden are served to the arriving guests by the local community.

The traditions of Užgavėnės date as far back as the pagan times. They were born in rural areas. As more and more of their residents have moved to urban spaces, the festival's traditions have been gradually disappearing and shifting, replaced by new holidays and customs dictated by the Western world. VMU Botanical Garden, established at the heart of Lithuania's second-largest city, is a great place to nurture traditions and ensure continuity.

Celebrations of Užgavėnės here help introduce younger generations to the deep-seated traditions of the festival and to demonstrate that upholding these traditions can be a lot of fun.

Above: Every year, Užgavėnės not only attracts regular visitors but also draws in guests from other cities (Jonas Petronis)

At the VMU Botanical Garden, Užgavėnės has been celebrated for decades and welcomes over a thousand costumed revellers every year.

VMU Botanical Garden welcomes over a thousand costumed revellers every year (Jonas Petronis)

Modern ethnologists encourage viewing Užgavėnės not only as heritage but also as a phenomenon shaped by social, political, and economic forces. It is an invitation to reflect on what our traditions say about us today.

Promoting harmonious coexistence of nature and humans

Botanical gardens are significant spaces for biodiversity conservation, education, and recreation, playing a crucial role in public engagement. As part of the urban green infrastructure, botanical gardens can contribute to the harmonious coexistence of humanity and nature (Wen et al, 2026). These spaces also host cultural and seasonal events, such as exhibitions, concerts, and public celebrations, which enhance their accessibility and social value (Bulut, 2024).

At the VMU Botanical Garden, Užgavėnės has been celebrated for decades and welcomes over a thousand costumed revellers every year. Various educational events and guided tours take place here, folk music is performed, dances are held, and symbolic ceremonies are enacted. The local community cannot imagine the VMU Botanical Garden without the Užgavėnės celebration, every year, this festival not only attracts regular visitors but also draws in guests from other cities. Foreign visitors of Lithuania see it as an exotic festival, they attend it with great interest and discover the customs of our country.

Botanical gardens are very closely connected to and follow the cycles of nature, making this festival highly symbolic and relevant. Lithuania lies in a climate zone with four distinct seasons, so the arrival of spring is a crucial moment, driving winter away promises a new beginning and transformation in the garden.

Celebrations of Užgavėnės here help introduce younger generations to the deep-seated traditions of the festival and to demonstrate that upholding these traditions can be a lot of fun

Užgavėnės is also known as the Day of the Meat-Eater, a celebration of bidding farewell to winter and awakening nature.

Foods symbolizing the sun and light

Užgavėnės is also known as the Day of the Meat-Eater, a celebration of bidding farewell to winter and awakening nature. It always takes place on a Tuesday, 46 days before Easter. Before the Christianization of Lithuania, this festival, which was called Ragutis Day was celebrated around the spring equinox (which falls between March 19th and 21st). After the country's baptism in 1387, the festival's date and name were aligned with the Church calendar, but many of the customs remained.

As traditions evolved, they underwent not only functional but also structural and conceptual changes. With the decline of ritual practices, the spatial and temporal dimensions of customs lost their original meaning, even though they played an important role in the structural chains of ritual communication (Vaicekauskas, 2005).

Over time, the festival has preserved many of its superstitions and traditions, its participants are greeted with rich, fatty food and various rituals (sprinkling with water, horse racing, riding, swinging, singing of special songs, wearing animal masks, etc.) to encourage a good harvest and ensure prosperity for the year.

As Morė burns, people shout loudly, "Winter, winter, run out of the yard!" (Jonas Petronis)

Speaking of food, one of the most beloved dishes is pancakes (usually made from flour). Their round, golden shape symbolizes the Sun and inner light; moreover, in the past, a circle was seen as a space inaccessible to evil spirits. For this reason, they are a crucial part of the celebration. In general, people try to eat a lot of rich and hearty food during Užgavėnės, reflecting what they hope to have in the coming year too. It is believed that if you eat too much during the festival, you will be strong all year. The day after it marks the beginning of the Lenten fast (Ash Wednesday).

Magical rituals during the celebration

Užgavėnės is an exceptional day, and its weather is believed to be prophetic. If there is no rain during the festival, then the entire spring will have no rain. If it is sunny, then the crops will thrive, and if it is snowing lightly, then flax will grow as well. Fertility of the land on Užgavėnės is encouraged through various magical rituals. That's why during the celebration you will always see staged weddings in which a woman dresses as the groom and a large man dresses as the bride. This comical union symbolizes the desired fertility of nature.

Užgavėnės brings together people wearing masks and various costumes. Popular characters include witches, the Grim Reaper, devils, goats, bears, roosters, and cranes. According to ethnologists, in the tradition of the festival, crooked-nosed, toothless masks typically represented the face of an old person. Wooden masks were often enhanced with additional materials - sheepskin eyebrows and moustaches, linen hair, and flax or horsehair beards. Simpler masks were made from bark or old sheepskin. A reveller's costume consisted of more than just a mask. Anthropomorphic characters wore sheepskin coats turned inside out. Other types of men's and women's clothing were incorporated as well, jackets, skirts, and scarves. Outer garments were tied with ropes or belts; less frequently, with towels or straw belts. In the making of masks depicting animals, apart from sheepskin coats turned inside out, various everyday objects were used; shirts, sheets, sieves, benches, spinning tools and other items. Animal snouts or bird beaks were carved from wood, woven from straw, or fashioned from cloth (Vaicekauskas, 2012). Over time, costumes have become simpler, and participants often look for easier solutions. Sometimes, instead of masks, they paint moustaches, beards, and cheeks with charcoal, soot, beetroot, or other colouring materials.

REFERENCES

Wen, X., Entwisle, T.J. & Ren, H. (2026). Botanical gardens can play an important role in the harmonious coexistence of humanity and nature in cities. Biological Diversity, pp1–3. Available at: https://doi.org/10.1002/bod2.70019.

Buluet, M.B.B. (2024). Examining recreational activities in UNESCO-listed botanical gardens: Kew, Singapore, and Padova. Directorate National Botanical Garden of Turkiye. Available at: https://doi.org/10.56494/dnbgt.2024.20.

Vaicekauskas, A. (2005). Lietuvių žiemos šventės: Bendruomenės kalendorinio ciklo apeigos XIX a. pab. - XX a. pr. Kaunas: VDU leidykla, 192 p. Available at: https://www.lituanistika.lt/content/217

Vaicekauskas, A. (2012). Lietuviškos Užgavėnės: tradicija ar paveldas? Šiaurės Atėnai. Available at: https://www.satenai.lt/2012/02/17/lietuviskos-uzgavenes-tradicija-ar-paveldas/

The celebration ends with the fight between Lašininis, symbolizing winter, and Kanapinis, who symbolizes spring

The celebration ends with the fight between Lašininis, a person symbolizing winter, and Kanapinis, who symbolizes spring (a battle between winter and spring). Kanapinis and Lašininis push and wrestle until Kanapinis eventually wins. All of this represents the struggle between winter which is reluctant to yield and the eagerly awaited spring. The final highlight of the festival is the burning of a large cloth effigy called Morė. This ceremony symbolizes the expulsion of evil and the departure of the previous winter. According to ethnologists, etymological data and comparative material show that Morė is the most archaic name of this figure. It is a negative character associated with death (Vaicekauskas, 2005). As Morė burns, people shout loudly, "Winter, winter, run out of the yard!".

Modern ethnologists encourage viewing Užgavėnės not only as heritage but also as a phenomenon shaped by social, political, and economic forces. It is an invitation to reflect on what our traditions say about us today. Ethnologists claim that disguising oneself can be interpreted as communal psychotherapy, a way to experience being someone else and understand something that is not a part of your life. It helps release fears and unlock creative energy.

An invitation to discover the wonders of nature

Užgavėnės is one of the traditional celebrations held at the VMU Botanical Garden. In addition, every year thousands of visitors attend the largest botanical midsummer event, Night of Scents and the international Fascination of Plants Day, held each May. Furthermore, the garden organises various scientific events, seminars, conferences, an international dahlia exhibition, educational programmes, children's camps, blooming weeks, plant and craft fairs, and exhibitions of tropical butterflies and artists' works. The garden brings together the local community and visitors from Kaunas and across Lithuania for a warm and engaging encounter with the magical and enchanting world of nature.

The Užgavėnės celebration, held in the heart of the city, brings cultural heritage to life. The Botanical Garden is undoubtedly one of the most suitable places to nurture traditions, ensure their continuity, unite communities, and introduce Lithuania's visitors to the country's rather exotic celebrations.

The burning of a large cloth effigy called Morė symbolizes the expulsion of evil and the departure of winter (Jonas Petronis)

A staged comical wedding that symbolizes the desired fertility of nature

The Botanical Garden is one of the most suitable places to introduce Lithuania's visitors to the country's rather exotic celebrations.

AUTHOR

Indrė Sekevičienė
Vytautas Magnus University (VMU) Botanical Garden
indre.sekeviciene@vdu.lt

Authors: Yixin Wang, Dujuan Zhang, Jinli Zhao and Yongping Yang

YOUTH LEARNING THROUGH WILD EDIBLE PLANT HERITAGE IN XISHUANGBANNA, CHINA

At Xishuangbanna Tropical Botanical Garden (XTBG) in China, we developed and implemented a four-week programme for local college students called Wild Edible Plants Notes. Educational materials were created through interviews with local holders of indigenous knowledge, who also served as mentors. They guided students in field investigations and practical learning within the botanical garden, a Dai village, and a local market. Students explored edible plants knowledge and sustainable food perspectives, then produced short videos to share what they had learned. This programme highlights the role of botanical gardens in connecting youth, communities, and culinary heritage.

Background

In Xishuangbanna, Yunnan, dense tropical rainforest supports rich plant diversity, alongside the culinary culture traditions and ecological wisdom of Indigenous ethnic groups such as the Dai and Hani. Among these traditions, wild edible plants are widely utilised for their distinctive flavours, health benefits and cultural meanings, with over 200 species consumed daily (Xu et al., 2002). However, rapid modernisation is threatening the transmission of the indigenous knowledge and dietary practices associated with these plants (Ghorbani et al., 2012; Reyes-García et *al*., 2013).

Above: Students preparing traditional Dai dishes (Ying Liu)

Food is more than nutrition; it is a living carrier of culture. Every meal can be a starting point for youth to identify with their heritage.

Students independently exploring the wild vegetable garden (Yuhao Zhao)

Against this backdrop, Xishuangbanna Tropical Botanical Garden (XTBG) launched the "*Wild Edible Plants Notes*" programme to help safeguard and pass on Indigenous culinary heritage. Targeting the goal "Let's become cool foodies and vloggers", the four-week programme recruited 28 local college students and aimed to rebuild young people's connection with local edible plants through informal education.

The education perspective

The programme's curriculum integrates Place-Based Education (PBE) and Social Cognitive Theory (SCT) to construct a multidimensional learning framework. Firstly, PBE shaped the broader learning environment. We moved beyond the physical boundaries of the botanical garden and extended learning into a Dai village and traditional local markets. These local sites transformed abstract knowledge into lived experiences within specific geographical and cultural contexts. Students encountered wild edible plants not only as botanical specimens, but also as part of everyday food practices, memory and community life. Secondly, SCT informed the internal learning process. Students did not acquire knowledge in isolation, but through dynamic interactions between the individual, society, and the environment (Bandura, 1999; Schunk & DiBenedetto, 2020). Through observing local mentors, conducting in-depth village interviews, and collaborating with peers, students internalised Indigenous knowledge through authentic social interactions. Furthermore, the programme incorporated scaffolded tasks and hands-on culinary practices to provide direct mastery experiences, aiming to cultivate students' practical skills and gradually build their self-efficacy. In this way, the programme positioned culinary heritage as a dynamic pathway for youth to learn about biocultural diversity and sustainable diets.

Educational tool: Example of Sustainable Diet Cards (Ying Liu)

Inviting community elders and residents to teach is not just an educational approach—it is a profound empowerment of marginalized botanical traditions.

Students conducting in-depth interviews with local villagers (Ying Liu)

Local community mentors: A Dai elder teaching students traditional culinary techniques (Ying Liu)

Youth engagement strategies

1. Amplifying marginalised voices to build a local mentor network
Prior to the programme, our team engaged deeply with Indigenous knowledge holders in local Dai villages. We systematically collected knowledge and cultural narratives about edible plants to form the core curriculum, ensuring it was firmly rooted in local practices. During the programme, we invited elders and residents with rich knowledge of wild edible plants to serve as mentors, empowering them to reclaim cultural authority. Instead of learning from textbooks, students were immersed in the bustling atmosphere of authentic villages and vibrant wild vegetable gardens. There, mentors explained the cultural significance of these plants, taught traditional cooking techniques such as Bao Shao (leaf-wrapped roasting), and shared family stories of coexistence with nature. This authentic immersion and the vivid sharing of living memories captivated the youth, effectively dissolving their cultural unfamiliarity.

2. Introducing youth role models to transform identities from "learners" to "creators"
To connect traditional culinary culture with contemporary youth life, we invited Yu Shisan, a Dai content creator who actively promotes local food culture on short-video platforms. As a youth role model, she shared how to use digital media to record and reinterpret traditional wisdom. Her participation lowered the barrier to youth engagement and encouraged students to see cultural heritage as something they could actively express, reinterpret, and share. Building on this inspiration, we established the culminating task of collaboratively creating short videos. By empowering students with the identity of "cultural disseminators", we enabled them to deepen and articulate their knowledge through video planning, filming, and editing, successfully awakening their sense of responsibility to protect culinary cultural heritage.

3. Developing cognitive tools to provide learning scaffolds
We developed visualised and gamified tools, such as a "Wild Edible Plants Monthly Calendar" and "Sustainable Diet Cards". These tools linked edible plants with seasonality, healthy living, helping students understand the practical value of cultural heritage and making the learning process more accessible and engaging.

Programme evaluation

Follow-up interviews three months later revealed that the "Wild Edible Plants Notes" programme not only improved students' botanical knowledge and understanding of sustainable diets but also strengthened their sense of identity with Xishuangbanna's culinary culture. Notably, this sense of identity generated a cultural spillover effect; approximately over 20% of the participants (n=6) transferred this investigative interest to their own hometowns, documenting and sharing local edible plant knowledge as active protectors of their culinary heritage. This suggests that youth learning through edible plant heritage can foster both personal cultural identity and broader community-based heritage protection.

Students working in groups to prepare dishes using local Xishuangbanna ingredients (Ran Chen)

Student output: Screenshot from an educational short video about Ciwujia (*Eleutherococcus senticosus*) collaboratively created by students ('Chihuo' Group)

REFERENCES

Bandura, A. (1999). Social Cognitive Theory: An agentic perspective. Asian Journal of Social Psychology, 2, pp:21-41. Available at: https://doi.org/10.1111/1467-839X.00024

Dunn, C. P. (2017). Biological and cultural diversity in the context of botanic garden conservation strategies. Plant Diversity 39(6), pp. 396–401.

Ghorbani, A., Langenberger, G. & Sauerborn, J. (2012). A comparison of the wild food plant use knowledge of ethnic minorities in Naban River Watershed National Nature Reserve, Yunnan, SW China., Journal of Ethnobiology and Ethnomedicine, 8(1).

Implications for future practice

This programme offers several ideas that other botanic gardens could adapt.

1. Break physical boundaries to experience living heritage. Rooted in the principles of Place-Based Education (PBE), educational settings should extend from botanical gardens to surrounding farmlands and villages. Guiding audiences into everyday spaces allows them to intuitively grasp the deep-rooted connections between people and plants, truly experiencing the vitality of living cultural heritage.
2. Engage local community mentors. Botanic garden education should not be limited to in-house experts. Reaching out to surrounding communities and inviting Indigenous people or community elders to directly participate in teaching is a profound sign of respect for marginalised botanical cultural traditions.
3. Empower youth with digital media. To engage modern audiences, youth should be encouraged to use familiar tools (e.g., short-video platforms, social media) to record traditions. This not only sparks enthusiasm but also carves out a new space for cultural heritage to survive in the digital age.
4. Design cognitive scaffolds for accessible learning. Transforming abstract cultural concepts into tangible formats is crucial. Developing visual and gamified tools helps bridge the gap between traditional wisdom and youth's everyday lives, making the learning process highly engaging and practical.

Conclusion

We believe that food is not merely a source of nutrition, but a carrier of Indigenous knowledge and culture. Botanic gardens are not only centres for plant research and conservation, but also crucial hubs for recording Indigenous knowledge and protecting biocultural diversity (Dunn, 2017; Hsu et al., 2024). The "Wild Edible Plants Notes" programme demonstrates that when botanic gardens integrate cultural heritage perspectives into education and adopt engagement strategies tailored to youth, they can inject new vitality into the protection of cultural diversity. For these young participants, every meal could become a starting point for understanding nature, identifying with culture, and practising more sustainable ways of living.

We would also like to thank all the students who participated in the programme, as well as the teachers and colleagues who supported its implementation.

Educational tool: Xishuangbanna Wild Edible Plants Monthly Calendar (Ying Liu)

REFERENCES CONTINUED

Hsu, P., Chao, C. & Tung, G. (2024). Co-producing an ethnobotanical garden to support the conservation of indigenous crop diversity. Journal of Zoological and Botanical Gardens, 5(2), pp. 211–225.

Reyes-García, V., Guèze, M., Luz, A. C., Paneque-Gálvez, J., Macía, M. J., Orta-Martínez, M. & Rubio-Campillo, X. (2013). Evidence of traditional knowledge loss among a contemporary indigenous society. Evolution and Human Behavior, 34(4), pp. 249–257.

Schunk, D. H. & DiBenedetto, M. K. (2020). Motivation and social cognitive theory. Contemporary Educational Psychology, 60, Article ID:101832.

Xu, Y., Liu, H. & Tao, G. (2002). Characteristics and development suggestions of wild vegetable resources in Xishuangbanna. Guihaia, 22(3), pp. 220-224.

By breaking the physical boundaries of the garden, we allow students to experience the true vitality of living cultural heritage in everyday spaces.

AUTHORS

Yixin Wang
wangyixin@xtbg.ac.cn
Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, Mengla, China
University of Chinese Academy of Sciences, Beijing, China

Dujuan Zhang
zhangdujuan@xtbg.ac.cn

Jinli Zhao
zhaojinli@xtbg.ac.cn
corresponding authors

Yongping Yang
yangyp@xtbg.ac.cn
corresponding authors

Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, Mengla, China

Author: Yoojin Kim

Above: Ramie cultivation fields in Seocheon County (2024), illustrating the ecological landscape that sustains the region's textile heritage based on *Boehmeria nivea* (Seocheon-gun)

PLANT TO PLATFORM: RAMIE AND TEN YEARS OF ECOLOGICAL COLLABORATION

This study examines how ramie (mosi) in Hansan, Korea, has evolved from a traditional textile crop into a focus of plant-centred education. Tracing collaboration between Seocheon County and the National Institute of Ecology since 2015, we explore how festival programming shifted from product display to participatory ecological learning. Pandemic disruption highlighted the importance of embodied transmission, while post-2022 recovery expanded biodiversity education and regional partnerships. The study shows how a heritage crop can form living heritage and a pedagogical infrastructure, integrating agriculture, climate literacy, and community stewardship within a regional socio-ecological framework.

Ramie harvesting in Seocheon County (2024). The first stage in the plant-to-textile process (Seocheon-gun)

From plant to living heritage

Ramie has long been used for cloth, food, tea, and crafts. In Korea, known as *mosi* (모시), it has been woven into everyday life.

What begins as a stalk in the soil ends as fabric on the loom. Harvesting marks the first material shift from plant to fibre, embedded in seasonal rhythms sustaining the HansanMosi Agricultural System (No. 18). Hansan, now part of (Seocheon County), in *GyuhapChongseo* (1818), was noted for ramie cultivation. Warm summers, humid sea breezes, and fertile soils contribute to the exceptional quality of Hansanmosi. The tradition encompasses cultivation, fibre extraction, the stripping, drying, refining, and joining of fibres by hand before weaving on a loom, all rooted in labour-intensive generational knowledge. Ramie production supports the local economy, and women's livelihoods. Mosi (fine ramie) weaving in the Hansan Region is on the UNESCO Representative List of the Intangible Cultural Heritage of Humanity (00453). Its importance lies in continued practice, not designation alone.

What begins as a stalk in the soil ends as fabric on the loom.

Among the most prominent bearers of this tradition is Bang Yeon-ok (b. 1942), whose work embodies intergenerational transmission of plant-based textile knowledge. Today, transmission extends into a broader institutional and community framework, including HansanMosi Hall, HansanMosi Craft Village, Year-round Cultural Tourism Interpreter and the annual HansanMosi Cultural Festival (*HANSANMOSI The Tradition of Millennium*). Through this structure, mosi forms part of everyday life.

Bang Yeon-ok, a holder of National Intangible Cultural Heritage No. 14 (certified by the Korea Heritage Service), weaves ramie fibre on a traditional wooden loom at the HansanMosi Hall, illustrating the transmission of plant-based textile knowledge (Seocheon-gun)

When physical transmission stops, cultural vulnerability becomes visible.

Visitors participating in a mini ramie weaving activity during the 2025 HansanMosi Cultural Festival (Seocheon-gun)

In Hansan's long history, the festival, established in 1989, and its partnership with the National Institute of Ecology (NIE), initiated in 2015, mark a pivotal turning point in the context of ramie.

From cancellation to educational collaboration

The collaboration between Seocheon and NIE began in disruption. A modest joint promotional booth was interrupted by the 2015 MERS outbreak, which led to sudden cancellation of the HansanMosi Cultural Festival. The booth was realised the following year.

Since 2016, NIE has participated annually in the event. In its early phase, ecology and heritage coexisted but remained largely separate. Over time, repeated collaboration reframed the festival beyond its regional origins. Early cooperation was modest, but laid the groundwork for later educational expansion.

Parallel paths: Ecology and heritage

Since 2015, festival organisers have enhanced cultural programming to broaden public engagement. Night-time lighting and performances extended festivities into the evening, while the large-scale *Jeosanpaleup Gilssamnori* traditional weaving performance reinforced the value of the UNESCO-recognised heritage. A Hansan tavern serving *Sogokju* rice wine, themed events such as the "Mosi Party," and increasingly professional fashion shows further established the festival as a major regional cultural event.

During these years, ecology and heritage largely coexisted in parallel. Mosi tradition foregrounded through demonstrations and performances, while NIE focused on biodiversity awareness within designated exhibition spaces.

Visitors moved between cultural displays and ecological information. However, links between ramie cultivation, fibre production, and broader environmental systems were seldom articulated as a unified learning narrative. Collaboration remained more institutional than conceptual.

However, repeated cooperation fostered trust between Seocheon and NIE. Attendance at HansanMosi Hall steadily increased, before peaking in 2019. Although ecology and heritage had not yet formed a shared pedagogical framework, the foundations for deeper integration were prepared.

Hands-on learning activities demonstrating taemosi, as part of field-based learning during an EcoLink programme (2025) (Ecolink Institute)

Educational booth operated by the National Institute of Ecology at HansanMosi Cultural Festival (2025), representing the institutional integration of plant-based learning within a cultural heritage festival (National Institute of Ecology, Ju Jung-ho)

Demonstration of the preparation of *taemosi*, the process of transforming ramie plants into fibres suitable for spinning, at HansanMosi Hall during the festival (Seocheon-gun)

Fibre preparation demonstration at the HansanMosi School (2025) (Seocheon-gun)

Embodied transmission pause

The pandemic marked a second interruption in the festival's trajectory. In 2020, the festival was cancelled due to COVID-19, and visitor numbers declined sharply. Limited online programming resumed the following year. However, the embodied dimension of mosi transmission, including touching fibre, observing plant material, and learning through shared spaces was suspended.

Ramie-making depends on physical engagement. Fibre must be stripped by hand, weaving requires proximity, and botanical knowledge is transmitted through demonstration and repetition. The pause highlighted how deeply the tradition relied on material contact and intergenerational presence. When physical transmission stops, cultural vulnerability becomes visible.

In 2021, the festival adopted an online "Ontact" format. Programmes streamed through official channels, including HansanMosi TV, sustained visibility and economic circulation but not the tactile and communal dimensions of plant-based learning. The disruption clarified the limits of digital substitution and the importance of embodied pedagogy. Transmission paused, but conditions for transformation remained.

Recovery and re-engagement in plant-based learning

The 2022 and 2023 editions marked operational recovery and signalled the reactivation of plant-based learning. On-site programming restored sensory and intergenerational engagement.

By 2023, the festival increasingly engaged families and schools through expanded programming and hands-on activities, including miniature loom weaving, mosi food experiences, HansanMosi School workshops, and the Mosi Playzone. Transmission resumed through display and renewed physical gathering.

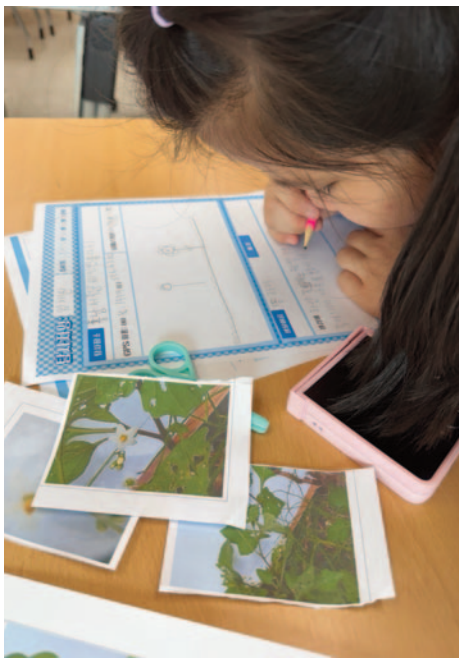
During this period, NIE expanded its role beyond promotion. Experience-based activities introduced biodiversity awareness within the context of ramie cultivation, aligning environmental education with the festival's intergenerational audience.

From festival to regional learning

Between 2024 and 2025, collaboration evolved from programme demonstrations into a broader plant-centred framework. Ramie was presented as fibre and a living species within an agricultural system. As officer Beak notes, environmental collaboration strengthened educational quality and attracted a wider audience. NIE extended its role beyond programming into operational practice, introducing reusable tableware systems and reducing single-use waste, integrating sustainability into festival governance.

The ramie field itself became a classroom.

Plants are not only biological resources; they are cultural archives.



Students producing illustrated species catalogues and registering observations through the citizen-science platform *Naturing* after a biodiversity survey (2025) (Ecolink Institute)

Participants are observing and recording ramie during a bioblitz session (2025) guided by instructors dispatched from the NIE. This session facilitates embodied transmission by linking traditional ramie cultivation with ecological literacy through direct field documentation and hands-on experience (Ecolink Institute)

In 2025, the Ecolink Institute launched a school-oriented programme, Seocheon HansanMosi Traditional Agriculture Experience Education. Through field-based activities including taemosi fibre preparation, ramie field bioblitz surveys, and traditional food workshops, the programme integrated ecological literacy with agricultural heritage. Students produced illustrated species catalogues and registered observations through the citizen-science platform Naturing.

According to Ecolink's Jang Mi Wha, the aim was not only to transmit knowledge but to cultivate stewardship. Biodiversity was presented not abstractly, but as embedded within traditional agricultural practice. The ramie field itself became a classroom.

From local practice to educational model

Plants are not only biological resources; they are cultural archives. Ramie became cloth, festival, and culture. It has evolved into an educational platform linking agriculture, local communities, institutions, and municipal governance.

Seocheon County has bolstered the transmission of mosi culture by engaging local personnel and enterprises. Professionally trained Cultural Tourism Interpreters such as Choi Seo-ki, provide visitors with in-depth insights. Meanwhile, local non-profits like Ecolink and artisans in the HansanMosi Craft Village extend learning through year-round programmes. Educational initiatives such as the annual *HansanMosi School*, operated by the Seocheon Cultural Centre, further extend this approach, by offering hands-on learning in ramie cultivation, fibre preparation, and weaving. Beyond weaving, adults, families, and school children participate in activities in HansanMosi Craft Village, including ramie tea tasting, making small craft items such as brooms from taemosi fibre, preparing ramie rice cakes, and trying on traditional ramie clothing at the visitor centre.

As officer Beak Jongseok from Seocheon-gun said, over the last decade, the festival's trajectory has shifted from presenting finished textiles toward participatory, ecology-oriented experiences. The event now immerses visitors with the ecological processes underlying ramie production. Ramie is no longer framed solely as traditional cloth, but as 'an environmentally friendly natural fibre that can substitute plastic', bridging craft knowledge to climate-responsive education and regional sustainability. In this sense, ramie functions both as heritage and a living agro-cultural system that integrates cultivation, craft, institutions, and ecological literacy.

Challenges remain, including staff rotation and financial stability. Yet since 2015, tradition has been reframed ecologically. This case shows how a heritage crop can function as both living heritage and pedagogical infrastructure, anchoring a regional network of agriculture, education, and community enterprise.

REFERENCES

Ham, S.H. (2013). Interpretation: making a difference on purpose. Golden, CO: Fulcrum Publishing.

Kolb, D.A. (1984). Experiential learning: experience as the source of learning and development. Englewood Cliffs, NJ: Prentice Hall.

Smith, L. (2006). Uses of heritage. London: Routledge.

UNESCO (n.d.). Weaving of mosi (fine ramie) in the Hansan Region (00453). Representative list of the intangible cultural heritage of humanity. Available at: https://ich.unesco.org/en/RL/weaving-of-mosi-fine-ramie-in-the-hansan-region-00453 (Accessed: 21 February 2026).

Korea Rural Heritage Foundation (n.d.). SeocheonHansanMosi Agriculture (No. 18). Nationally important agricultural heritage systems. Available at: https://erahs.krha.co.kr/en/heritage/system (Accessed: 21 February 2026).

Wibeck, V. (2014). Enhancing learning, communication and public engagement about climate change. Environmental Education Research, 20(3), pp. 387–411.

AUTHOR

Yoojin Kim
Manager
Dept. of Global Plant Ecology
National Institute of Ecology
Republic of Korea
+82-41-950-5951
yoojinkim@nie.re.kr

RESOURCES

Decolonizing botanical gardens – Kelsey Leonard

Article published in Qualitative Researcch Journal 24 in 2024.

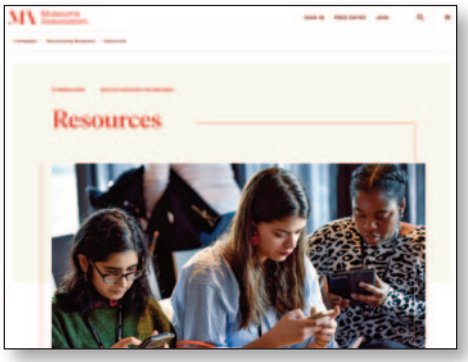
This article untangles the influence of Linda Tuhiwai Smith's Decolonizing Methodologies on botanical gardens, particularly in the context of commemorating 25 years since its publication. By examining the intersections between decolonial theory and botanical practices, the article seeks to elucidate the ways in which Smith's work has informed and inspired efforts to decolonize botanical research, conservation and education.

https://www.emerald.com/qrj/article/24/5/536/1235094

Decolonising museums campaign resources - Museums Association

The Museums Association have collected a range of resources to support and inspire decolonial practice. This page provides a range of blogs, articles, case studies, keynotes and more.

https://www.museumsassociation.org/campaigns/decolonising-museums/resources/



Webinar "Nature and cultural heritage: How to conserve these sources of inspiration of the Linnean Society."

Heritage is our legacy from the past, what we live with today, and what we pass on to future generations. Our cultural and natural heritage are both irreplaceable sources of life and inspiration according to UNESCO. However, culture and nature are often seen as separate and conservation of one can conflict with conservation of the other. Heather Viles, professor of Biogoemorphology and Heritage Conservation works at the University of Oxford and shows in this webinar the benefits of improving the link between nature and cultural heritage. Closing the gap between nature and culture can make valued places more resilient to climate change, support biodiversity, improve public understanding of environmental issues, and enhance human wellbeing.

https://www.youtube.com/watch?v=6BjlXDpdkUE

Living heritage in the UK hub

This site celebrates living heritage, as part of the UK's commitment to the 2003 UNESCO Convention for the Safeguarding of Intangible Cultural Heritage, and includes resources, guidance and case studies.

https://livingheritage.unesco.org.uk/

BOTANIC GARDENS CONSERVATION INTERNATIONAL

Descanso House, 199 Kew Road,
Richmond, Surrey, TW9 3BW, U.K.
Tel: +44 (0)20 8332 5953
E-mail: info@bgci.org
Internet: www.bgci.org
https://twitter.com/bgci

ROOTS Volume 23 • Number 1 • April 2026 ISSN 0965-2574

CONTRIBUTE TO THE NEXT ISSUE OF ROOTS

The next issue of Roots will focus on mental health and wellbeing. It is well documented that spending time in nature can have a positive impact on individual health and wellbeing, offering access to green spaces and delivering programmes that provide health and wellbeing benefits is an area in which botanic gardens and arboreta are playing an increasingly important role. Do you have a project or programme of activities that you would like to share? Have you been delivering therapeutic horticulture programmes, forest bathing, green prescribing, wellbeing walks, etc. Have you designed activities that are focusing on specific audiences that suffer from isolation or mental health challenges, how is your garden ensuring that it supports the wellbeing needs of the local communities around them?

We are currently looking for a variety of articles on this important topic.

To contribute, please send a 100 word abstract to **annelies.andringa-davis@bgci.org** by July 15 2026.

INTERNATIONAL DAY OF EDUCATION

As part of the closing statement of the 11th International Congress on Education in Botanic Gardens which took place in South Korea in June 2025, an International Day of Botanic Gardens Education was launched. This day, which has been designated as 12 June each year, will serve as a global call for solidarity in addressing the climate and biodiversity crises, and as a symbol of our shared commitment to overcoming these urgent challenges. The hosts of 11ICEBG (Korea National Arboretum) and BGCI have been working on a package of support and communication materials for gardens that wish to take part.

Find out more: **https://www.bgci.org/our-work/addressing-global-challenges/public-engagement-education/**

DECLARATION OF INTENT ON CLIMATE ACTION EDUCATION

The Declaration of Intent on Climate Action Education for Botanic Gardens and Arboreta outlines the commitment that our network makes to address climate change challenges and identifies seven key goals where botanic garden and arboreta education can have the most impact.

This Declaration covers the period 2026-2030 and invites botanic gardens and arboreta to sign up to the Declaration, agreeing to contribute to at least one of the seven goals.

Find out more and sign up:
https://www.bgci.org/our-work/projects-and-case-studies/dec-of-intent-on-climate-action/