

# Botanic Gardens from A to Z

(526089; 2 – 4 credit points)

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[www.fmnh.helsinki.fi/opetus](http://www.fmnh.helsinki.fi/opetus)



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## General aims:

- To give a good overview of the work and role of botanic gardens so as to:
  - build a foundation for a possible future employment in BGs
  - give the students an understanding on how to make use of BG collections and services in their future studies, research, teaching and other work
  - contribute towards a general appreciation of the work BGs do



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## Specific aims:

- After completion of the course, students should be able to answer the following questions:
  - What is a botanic garden?
  - Which are the core fields of activity of BGs?
  - What constitutes an accession, i.e., the basic unit of a BG collection?
  - For which fields of research are BG collections particularly valuable?
  - Which are the specific benefits of BG collections in teaching and education of various target groups?
  - In which ways can and do BGs play a particular role in conservation?

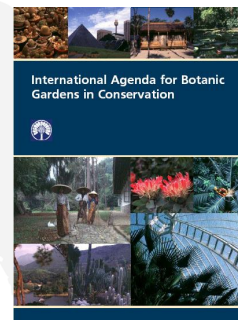


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## Definition

“Botanic gardens are institutions holding documented collections of living plants for the purposes of *scientific research, conservation, display and education.*”

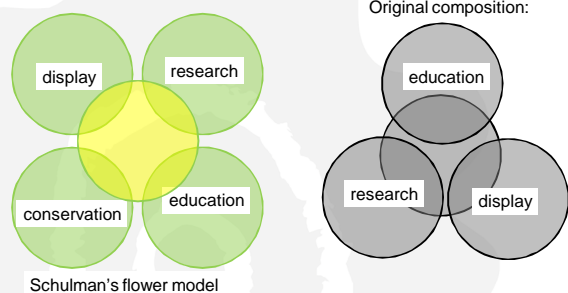


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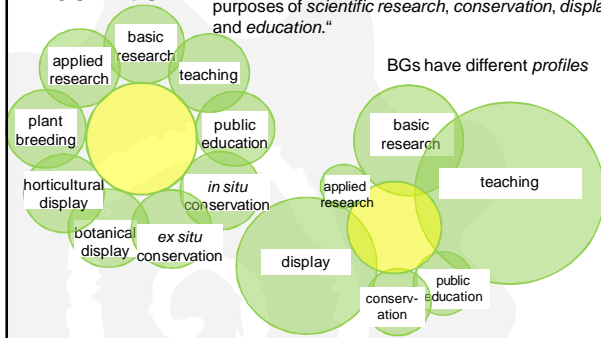


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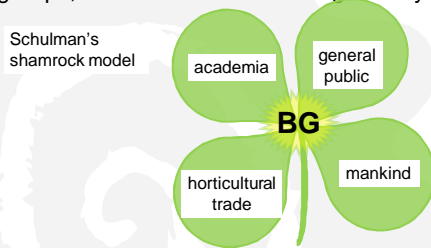


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## The nature of Botanic Gardens

- BGs always have been, are, and should remain multifaceted, and valuable for many interest groups, not least the surrounding society



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## ...the nature of Botanic Gardens

- BGs always have been, are, and should remain multifaceted, and valuable for many interest groups, not least the surrounding society
- There are many types of BGs:
  - 'classic' multipurpose BGs, university gardens, ornamental gardens, historical gardens, conservation gardens, natural or wild gardens, combined botanical and zoological gardens, agro-botanical / germplasm collections, alpine or mountain gardens, horticultural gardens, community gardens, children's gardens...
  - etc., etc.

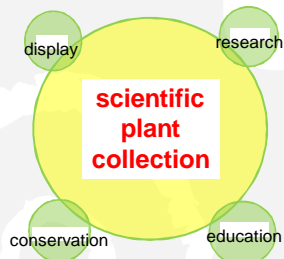


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## Principles of scientific collection curation

- a *documented* collection consists of *items* and *information* pertaining to those items
- there must be a system connecting the information to the items
  - registration code
  - register / database
- in a *scientifically documented* collection (=a scientific collection) the information is systematic, rigorous, and useful for research



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## ...principles of scientific curation

- scientific collection curation means that the collection is:
  - augmented,
  - arranged, and
  - maintained as a scientific collection following certain scientifically sound principles
- scientific collection curation ensures the collection is as valuable as possible for research



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## Accession vs. specimen

- a specimen is a *fixed sample of an individual*
  - proves definitely that "this kind of plant grew in place X at time Y"
  - can be used as a type, because doesn't change
- an accession is a *population sample*
  - proves that "a population containing some of these genes grew in place X at time Y" (may prove that "a population containing these kinds of genomes grew in place X at time Y", if collected as vegetative propagules)
  - not good as a type, because changes



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### ...accession vs. specimen

- curational challenges of an accession
  - after registration, a specimen can be filed once and for all
  - an accession typically goes through a number of stages – and then it dies
  - an accession requires continuous technical *and* scientific curation



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### ...accession vs. specimen

- the typical 'life cycle' of an accession



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### ...accession vs. specimen

- the first challenge is to keep the information
  - attached to the accession
  - up to date
- the second challenge is to keep the accession as the original population sample



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### Take-home message again:

“An accession in a BG collection is **a living population sample** and needs to be curated as such to retain its value“



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### Survey of education in botanic gardens

- 91% include education in their mission or vision
- 68% have a budget allocated specifically for education
- 71% of gardens have a dedicated education team, the numbers of hours they work is variable
- If no education team, most sites still carry out education work through their volunteers or horticultural department



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### Audiences targeted

1. School children aged 5- 11	85%
2. School children aged 11-16	85%
3. University students	81%
4. School children aged 16-18	78%
5. Families	74%
6. Tourists	66%
7. Community groups	63%
8. School children aged 0-5	58%
9. Professional educators	57%
10. Senior citizens	49%



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## Methods used in communication – garden education expertise

- Guided tours 92%
- Talks and lectures 78%
- Exhibitions 69%
- Interpretation panels 65%
- Leaflets 67%
- Workshops 63%



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## Conclusions

- Environmental education can help address environmental issues
- Botanic gardens have an enormous amount to offer for environmental education
- Botanic gardens worldwide currently run a wide range of environmental education programmes



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## Conclusions

- The way in which environmental education is taught is linked to ideology
- Botanic gardens run a wide range of education programmes
- Botanic gardens can help create a collaborative vision for a New Environmental Paradigm



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## How do BGs serve university-level teaching?

1. by providing material
  - living plants in the collections
  - plant material from collections to classrooms, labs, for theses, etc.
2. by acquiring material
  - seed exchange (this mostly for research, but possible also for teaching)
3. by providing facilities
  - seminar rooms, but also unique environments



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## ...how BGs serve teaching

4. by providing expertise
  - lecture series, practical courses
  - guest lectures, demos of collections
  - exams of independently studied entities
  - supervision of theses
5. by offering internships
  - university trainees
  - polytechnics apprenticeships



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## In summary: benefits of BGs in teaching

- living plants more informative than dead ones or pictures
- living plants are alive: physiology etc.
- reliably pre-identified material
- unique environment
- wide range of expertise (albeit often superficial)
- learning by doing
- **experiential learning!**



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## How do BGs support research?

1. by acting as research institutions
  - curators usually also are researchers
  - research posts, particularly in projects
  - joint projects with other institutions
2. by providing material
  - the living collections are used as research material
3. by acquiring material
  - seed exchange



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## ...how BGs support research

4. by providing facilities
  - research glasshouses
  - outdoor lots
  - labs
  - etc.



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## In summary: benefits of BGs for research

- documented collections
  - reliable identifications (relatively at least)
  - information on origin, wild-collected material
- living plants
  - DNA extraction easier
  - biochemical analyses possible
  - many studies require living plants
- global exchange network
- unique facilities (in city centres)



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## Conservation

- the GSPC; the most relevant targets are:
  - i, ii, iii (from topic a)
  - viii, ix (b)
  - xiv (d)
  - xvi (e)



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## Why the case of Kumpula?

- Many aspects can be generalised
- Arguments for opening
- Insight into the huge number of factors
- Perspective of the input needed



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## Things to prepare

- Collection
- Landscape planning & gardening
- Infrastructure in the garden
- Facilities/services
- Public education
- The surroundings
- Traffic to the garden
- Marketing, public relations
- Capacity building
- Opening event



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## National and international cooperation

- traditional cooperation
- International Association of Botanic Gardens IABG
- Botanic Gardens Conservation International BGCI
- Finnish network, other national networks
- Regional networks
- European Consortium of BGs



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## Reasons for cooperation between BGs

1. building of a diverse plant collection
  - not easy to get hold of so many plants → seed exchange
2. serving science, which in itself is global
3. similar functions → similar problems
4. multifaceted activities → hard to keep up with development alone
5. conservation of plants – a global issue



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## International Association of BGs - IABG

- “official” organisation of BGs
  - under IAPT (International Association of Plant Taxonomy)
  - representative of BGs in International Botanical Congress
  - BUT: almost dead!



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## Botanic Gardens Conservation International - BGCI

- originally a body within IUCN
- independent since ?
- a membership organisation
  - progressive membership fee
  - institutional but also individual members
- the largest plant conservation network in the world
- global; regional offices in US, Russia, China...



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## European Consortium of Botanic Gardens

- “the EU-Consortium”
  - EU-countries are members, Norway, Switzerland and Iceland observers
  - IABG and BGCI have representatives
  - founded as a consultative body for BGCI and IABG in 1994
  - BGCI provides secretariat
  - originally to plan European responses of BGs to the CBD and to further implementation of international agreements and strategies



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## Literature

- **The Darwin Technical Manual for Botanic Gardens.** BGCI, London. **pp. 3-10; 27-50; 88-99**
- **Action Plan for Botanic Gardens in the European Union.** **pp. 7-12; (31-)41-48**
- **International Agenda for Botanic Gardens in Conservation.** **pp. 0-14; 24-31; Annex 4, 5 and 6 (pp. 45-47)**
- **Global strategy for plant conservation.** **pp. 0-13**



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