

Research strategy for Gothenburg Botanical Garden

Human-mediated global change poses serious threats to global biodiversity and the future sustainability of Earth's ecosystems. It also threatens human wellbeing since we are dependent on biodiversity for food, medicine, energy, clean air, water, security from natural disasters, recreation, and cultural inspiration (Kunming-Montreal Global Biodiversity Framework). Thus, the documentation and conservation of biodiversity, and the provision of information and services enabling its sustainable use, are core responsibilities of all agencies charged with its custodianship.

Botanic gardens are no exception. Through their role in (i) supporting and conducting biodiversity-linked research, (ii) promoting public biodiversity education and awareness, and (iii) facilitating both in situ and ex situ biodiversity conservation, botanical gardens have a critical role to play in the future wellbeing of Earth and all its inhabitants.

While Gothenburg Botanical Garden (GBG) has a long and distinguished history as a centre for basic botanical research, the era of anthropogenic global change necessitates a broader research agenda moving forward. **Our research mission is, therefore, to contribute to the discovery, conservation, appreciation, and sustainable use of plant diversity.**

Priority areas for research

Towards fulfilling the research mission, we identify four priority research areas which cumulatively address several of the United Nations Sustainable Development Goals.

1. Discovering, documenting, and understanding biodiversity

Taxonomy, the discovery, description, and classification of biological diversity, and systematics, the science which seeks to describe and understand patterns of diversity and diversification, are foundational to other biological subdisciplines, including conservation biology, because they provide accurate species names and identifications. At GBG, we conduct fundamental taxonomic and systematic research, using diverse technologies and data, and addressing questions relating to the delimitation and description of wild plant species, and the evolution of plant diversity.

Our taxonomic and systematic research focuses on selected diverse and important lineages, reflecting the taxonomic expertise and interests of our research staff, and our living collections. Taxa of current interest include Asteraceae, Colchicaceae, Iridaceae, Liliaceae, Primulaceae, Rubiaceae, and Selaginellaceae, while geographic focus areas include Madagascar, the Brazilian Atlantic rainforest, the South African Cape, the Middle East, Central and East Asia.

2. Conserving biodiversity for an uncertain future

Ex situ conservation of species outside of their natural habitats complements in situ conservation by providing security against extinction in the wild and serving as a source of material for re-establishment of populations following wild extinction. Its importance is enhanced in an era of

unprecedented global change. Via both their living collections and seed banks, botanical gardens represent important sites of ex situ conservation, and the GBG collection is an important ex situ conservation resource for many plants, particularly geophytes, cremnophytes, and tree species from a vast geographic range.

Current conservation research at GBG is focused towards identifying priority taxa for future ex situ conservation attention, as well as the development of appropriate storage and propagation/horticultural protocols. In this context, quantifying genetic diversity of wild populations is important, as well as research on conservation horticulture in line with BGCI priorities. Here, we focus on the wild flora of Europe, particularly that of Sweden and Västra Götaland, and regional edible and useful plant diversity.

3. Utilizing biodiversity for ecosystem function

Global change, including both climate change, pollution, and human land use, poses significant challenges for the health and functioning of ecosystems, and ecosystem services. By facilitating the propagation of plant species across a wide range of climatic and environmental contexts, botanical gardens and botanical garden networks provide a unique opportunity to test the reaction norms and adaptability of species to a diversity of environmental gradients.

At GBG, we are researching the abilities of diverse Eurasian tree species, and their component genotypes, to grow successfully under a warming climate, with a view to informing the selection of species and genotypes for use especially in future urban greening projects, but also silviculture and wild forest ecosystem rehabilitation. This research, always taking into account and preventing the potential risk of promoting invasive species and pests, makes extensive use of the arboretum placed in the Änggårdsbergens

Nature Reserve. Separately, we are also exploring the use of particular plants as a means to extract pollutants from soils (phytoremediation).

4. Public science engagement

Through pedagogical research, studies focusing on how to best raise awareness of biodiversity or fight plant blindness can be conducted as botanic gardens provide an array of opportunities for studies of teaching methods.

Another area of research at GBG, falling in the public science realm, is science history. Here, we focus mainly on the development of botanical research and practice in Swedish botanical gardens and institutions.

Delivering on our research goals

In terms of the Botanic Gardens Conservation International (BGCI) accreditation standards, active engagement in research and conservation is a core requirement for formal botanic garden accreditation. Research at GBG is premised both on the generation of high quality, high impact primary research, some of this exploiting the remarkable diversity housed in our collections, and on the development of productive research collaborations with researchers based at strategic partner organizations.

Research success is gauged on the basis of publications with GBG staff listed as authors or co-authors, student supervisions or co-supervisions, and successful receipt of external research funding by GBG staff.

Implementation of our research agenda thus involves four key aspects, as follows.

1. Maintenance and curation of living and seed collections to the highest international standards, as set out in the BGCI accreditation standards manual. *Inter alia*, this involves having a strategic plan

and collections policy, and ensuring that collections are curated and databased in a way that facilitates their use in research and public engagement.

2. The maintenance and further development of research facilities required to promote and support research at GBG. This includes the development of glasshouse and laboratory spaces for research, and the maintenance and further development of the botanical library.
3. Enabling and incentivizing staff engagement in primary research, which includes conducting personal research, supervising/co-supervising research students, writing research papers and research funding applications, and research results at meetings and conferences.
4. Establishing formal and informal research collaborations and material/information sharing agreements with strategic partner institutions, including University of Gothenburg (including the Herbarium GB), Swedish University of Agriculture (SLU), the Royal Botanic Gardens Kew, including the Millenium Seed Bank (MSB), and the Gothenburg Global Biodiversity Centre (GGBC). GBG also plays a central role in the European Botanic Gardens Consortium (EBGC), the Plant Collecting Collaborative (PCC). GBG researchers also work collaboratively with researchers at these and other institutions other partnerships in our geographical focus areas, e.g. The Middle East, Eastern Brazil and Central China and The Cape Province of South Africa.

Project Portfolio

A project portfolio with planned, ongoing and completed projects related to the Priority Areas for Research will be maintained internally, together with information on relevant grants and financing intentions.

Information om handlingen

Handlingstyp: Riktlinje

Gäller för: Göteborgs botaniska trädgård

Innehållsansvar: Mats Havström, (matha12), Enhetschef

Granskad av: Hanna Tornevall, (hanto16), Förvaltningschef

Godkänd av: Hanna Tornevall, (hanto16), Förvaltningschef

Dokument-ID: GBT7701-875628194-143

Version: 1.0

Giltig från: 2025-04-29

Giltig till: 2027-04-29