The year 2014 was a truly historical year for the Botanic Garden Meise. On January 1st 2014 the National Botanic Garden of Belgium became an agency of the Flemish Community. This completed the transfer from the federal authority to Flanders that had been agreed in 2001, as part of the Fifth State Reform. The transfer signifies that Flanders finally acquired full responsibility of this world-renowned scientific organisation.

Botanic Garden Meise is home to a collection of more than 18,000 kinds of plants distributed over glasshouses, gardens and arboreta in its 92 hectares domain. This valuable living collection represents one of the most diverse groups of plants located in a single garden in the entire world.

The Garden’s scientific patrimony, its collection of living plants, valuable herbarium and important library, remains the property of the Belgian Federal State, but is loaned to the Flemish Community for an indefinite duration. This important point avoids the collection being divided and dispersed among the different Belgian communities.

In March a new Board of Directors was installed, all dedicated to restoring the former glory of the institute. With their combination of expertise and skills I am sure we can offer our collections, employees, and visitors a welcoming green home on the outskirts of Brussels. We are not alone to achieve our ambitious goals. We are also supported by the Scientific Council composed of university representatives from the Flemish Community and French Community, scientific specialists and foreign experts. Therefore, the Board is assured of obtaining the best possible scientific advice to support their decision making process.

Botanic Garden Meise also acquired a new CEO, Steven Dessein. His experience and expertise reassures us that we have an excellent manager for one of the most important botanic gardens in Europe. Thus, our institute stays committed to performing scientific research of the highest quality, providing first class educational outreach and aims to become one of Flanders most appreciated tourist destinations.

Such dreams only become true if you can count on highly experienced staff supplemented with a dedicated group of volunteers. All of these people demonstrate their commitment to the Garden daily so that together with you, and with all of our visitors, Botanic Garden Meise will continue to shine as a world renowned home for scientific discovery, education, conservation and tourism.

Dr. Jurgen Tack
Chairman of the Board of Directors
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The Botanic Garden Meise is the only scientific institute in Belgium which is focused on botanical taxonomy. The description of new species and developing an understanding of the role these new species play in ecosystems is of critical importance to our mission. In 2014, a large number of scientific activities were realised. In total 99 new taxa were discovered: along with many new sorts of plants, fungi and algae. There was even a new family and order of lichens described! Expeditions to Thailand and Mozambique have also led to the discovery of new species that will be published in the coming years. The Botanic Garden also lives up to its commitment to contribute to the global documentation of plant diversity: In collaboration with Naturalis Biodiversity Center in Leiden (NL) we are now responsible for the publication of ‘Flora of Gabon’, and new volumes of the ‘Flora of Central Africa’ are published in swift succession.

At the same time, our team of dedicated scientists have also focused their efforts to conserve plant genetic diversity. For example, there is currently a study which seeks to determine the effects of climate change on the sub-montane species which occur in Belgium. Our expertise is also being shared with other organisations, for example in the establishment of an education center in the Virunga national park, Democratic Republic of the Congo.

In 2014, the Botanic Garden received more than 126,000 visitors an all time record and in comparison with the numbers for 2000, more than double. The fine weather surely played its part but the many initiatives which were set in motion to enhance visitor experience have doubtlessly begun to have their intended effect. In 2014, visitors could enjoy two new tropical rainforest greenhouses and end October the stunning orchid exposition Flori Mundi. These new initiatives, along with the invigoration of existing plant collections, such as the rhododendron collection, are aimed at enhancing the national and international reputation of the Botanic Garden as a place to visit when in Brussels.

In 2014, urgent renovation works were finally started. The façade of the most iconic building of the Botanic Garden, the Balat greenhouse, was restored. In consultation with the Board of Directors and the Agency for Facility Management a master plan was worked out for the Botanic Garden covering a period of 12 years. Several urgent interventions were already carried out in 2014.

Looking back at 2014, we were saddened by the sudden loss of our dear colleague Gert Ausloos, head of Public Awareness at the Botanic Garden. His vision was ambitious and focused on the future, he worked with great commitment and enthusiasm. His ideas will still live on and will inspire those working in the Botanic Garden for many years to come.

Last, but not least, the numerous achievements of the Botanic Garden in 2014 have only been possible because of the high level of professional commitment of our staff, volunteers and park guides. Working together with the Scientific Council and the Board of Directors, we will build on past successes towards a bright future for the Botanic Garden Meise.

Dr. Steven Dessein
CEO
At present the total number of plant species on our planet remains unknown. Many are yet to be discovered, especially in the tropics and in certain groups like fungi and algae. This represents a serious scientific deficit, since species are the fundamental building blocks of ecosystems and knowing them is essential to our understanding of how our living planet works.

Discovering, describing, naming and classifying species is at the core of our scientific research. Our taxonomists combine classic methods, such as morphology, histology and anatomy with modern techniques including scanning electron microscopy, digital imaging and DNA barcoding. The result aims to be a globally accepted, stable and scientific ordering of all life forms in a system that reflects their evolutionary origin. The taxonomic data and identification tools, such as floras, developed by our specialists are crucial for many other fields of research and for commercial purposes.
Exploring the world’s most endangered ecosystems and discovering new species is part of the exciting work conducted by our researchers. In 2014, our scientists excelled by describing 99 new taxa composed of 54 diatoms, 15 lichens, three fungi, three ferns, and 24 flowering plants previously unknown to science.

Traditional taxonomic studies are now supported by DNA-based taxonomy, which can reveal unexpected links between species and provide evidence for defining new higher-level taxa. In 2014, taxonomic studies conducted in Botanic Garden Meise supported by molecular findings resulted in the description of ten new lichen genera, a new family (Lecanographaceae Ertz, Tehler, G.Thor & Frisch) and unusually, a new order (Lichenostigmatales Ertz, Diederich & Lawrey).

Important on-going work at the Garden is the study of thousands of specimens collected during the three-month long Congo River Expedition in 2010. In 2014, these specimens revealed eight additional new lichen species keeping our taxonomists busy. Little by little, these scientific discoveries improve our knowledge about the tremendous biodiversity present in the riverine forests of the Democratic Republic of the Congo. To complete a busy year for our lichen team, the endemic Trapelia antarctica Ertz, Aptroot, G.Thor & Ovstedal, was discovered growing on a granite ridge near the Belgian Princess Elisabeth Research Station. This lichen is one of the very few living organisms able to survive the extreme climatic conditions experienced on this continent.

The Sub-Antarctic region is a hotspot for diatom diversity, which are of particular interest for biogeographic studies. Among the numerous new freshwater diatoms collected and described from this area during 2014, Halamphora ausloosiana Van de Vijver & Kopalová is worth a mention, as it was dedicated in honor of our late colleague Dr Gert Ausloos (see obituary).

The Rubiaceae, or coffee-family, is one of the most diverse plant families worldwide and has always been a particular specialism of our researchers. In 2014, eight new Ixora species were described from Madagascar in international scientific journals. Collecting in African mountains often yields new discoveries. The recently discovered Rubiaceae, Sabicea bullata Zemagho, O.Lachenaud & Sonké, was found to be locally abundant but endemic to the Western Cameroon Highlands.

New species are occasionally discovered among herbarium vouchers. Taxonomists looking at preserved specimens of Begonia clypeifolia discovered two additional Begonia species and two subspecies of this genus. These hidden discoveries were an important because they are endangered in Equatorial Guinea, Gabon and the Democratic Republic of the Congo. African novelties from the genera Combretum and Cyperus were also first published in 2014. All publications of new taxa are a prerequisite to the preparation of regional Floras. Our scientists have had an exceptional year of discovery.

**Myxomycetes in the Democratic Republic of the Congo**

Myxomycetes or plasmodial slime molds are a fascinating group of giant amoebae. Their life cycle comprises a mobile amoebic stage that slides over substrate feeding on bacteria. In order to reproduce, it transforms into static fruiting bodies containing spores. Myxomycetes can grow in all terrestrial ecosystems on decaying wood and plant litter. Some are cosmopolitan, while others are associated with specific habitats, for example on the bark of living trees or near snowbanks in (sub) alpine regions.

Myxomycetes are relatively well studied in the temperate zones of the northern hemisphere. Over the last three decades efforts have been focused on surveys in tropical regions. A checklist of African myxomycetes published in Mycotaxon in 2009 (and based on literature data) reports only nine species from the Democratic Republic of the Congo. Although a total of 21 species from this country are treated in two volumes of the "Flore Illustrée des Champignons d’Afrique Centrale" published in the early eighties by Botanic Garden Meise. In 2014, work started to publish a volume on myxomycetes in the series "Fungus Flora of Tropical Africa" published by the Botanic Garden.

The herbarium of Botanic Garden Meise holds 1,094 myxomycete specimens from Africa, of which 407 (84 species) are from the DRC. Most of the Congolese specimens were collected in the provinces of Katanga, Nord-Kivu and Sud-Kivu during the period 1980-1990. During the ‘Boyekoli Ebale Congo 2010’ expedition an additional 159 field specimens (50 species) were collected.

The visited region, located west and north-west of Kisangani, is an unexplored area with regard to myxomycetes. Different habitats were explored in 2010, from woodland clearings to primary lowland rainforest. The substrates that yielded more than 60 % field collections were dead stumps, stems and trunks of various plants, including oil palms which were often covered by large colonies of myxomycete fruiting bodies. Leaf litter on the forest floor also proved to be a productive substrate to sample and provided interesting species.

In 2013, a field survey was undertaken in the framework of the COBIMFO (Congo Basin Integrated Monitoring for Forest Carbon Mitigation and Biodiversity) project, in the Man and Biosphere Reserve at Yangambi. This recent survey generated 305 records representing 100 species, with the most important substrate leaf litter where 55 % of all specimens were collected.

The surveys of the Boyekoli Ebale Congo 2010 expedition and the COBIMFO project in 2013 added 45 species to the checklist of the DRC giving this country 129 species. This figure matches the numbers in Madagascar, which means these two countries are the second most diverse countries in Africa for plasmodial slime molds, just behind Tanzania with 133 species. Despite this, 49 % of African countries are reputed to have less than 20 species per country, although the conditions in many of them being ideal for myxomycetes. This disparity demonstrates that they should be properly inventoried, a role that Botanic Garden Meise can lead on by organising field surveys and by capacity building local specialists.

"The herbarium of Botanic Garden Meise holds 1,094 myxomycete specimens from Africa"
Improved tools to predict the global diversity of soil-dwelling fungi

Predicting fungal diversity would ideally be based on identifying mycelia. Since the latter cannot be identified using morphological features, researchers have used fruiting structures, known as sporophores, to determine fungal diversity. In many countries checklists and other biodiversity data has been used to calculate a ‘plant-to-fungus ratio’. In general, depending on location, this ratio ranges from one plant species for every four to six fungal species. This ratio is based on a number of excellent, local surveys and has been used to base the estimate for the global diversity of soil-dwelling fungi to around 1.5 million species. Basing this analysis on sporophores is problematic because they often occur briefly and unpredictably. As a consequence, researchers have looked for better ways to estimate diversity.

DNA meta-barcoding techniques and annotated sequence databases have provided new tools for researchers to measure diversity. One of the Garden’s mycologists joined an Estonian-based team of 35 researchers willing to discuss and reconsider previous attempts at estimating fungal diversity. Over the next two years the team collected soil samples in 365 natural ecosystems worldwide. Botanic Garden Meise targeted its sampling in several Miombo forests in the Democratic Republic of the Congo.

The results of the team’s project demonstrated that plant species richness was not the best determinate of fungal diversity. Climatic factors (mean annual precipitation, seasonality), followed by edaphic (soil calcium, phosphorus, pH), spatial patterning (distance from the equator) and fire periodicity, were all better predictors of soil fungal richness and community composition at the global scale.

It was found that the richness of all fungal functional groups (e.g. saprotrophs, symbionts and parasites) are unrelated to plant diversity, with the exception of ectomycorrhizal symbionts. This suggests that changes to soil properties caused by plants, do not influence the diversity of soil fungi.

The Team discovered that geographically the plant-to-fungi ratio was not constant, soil-fungal diversity increased towards the poles, endemicity was strongest in tropical regions and declined exponentially towards the poles. Many taxonomic groups were represented in distant continents suggesting that distribution of fungi is more efficient at long-distance dispersal than macro-organisms.

This research fundamentally changed the general view on global fungal diversity patterns indicating the plant-to-fungus ratio method overestimated ground-dwelling fungal richness by a factor of 1.5 - 2.5.

The collaborative study can be found in L. Tedersoo et al., Global diversity and geography of soil fungi. Science 346, 1256688 (2014). DOI: 10.1126/science.1256688
DNA-analyses reveal high Boletales diversity in Northern Thailand and Yunnan (China)

Boletales are a group of fungi with a global distribution. The majority form symbiotic (ectomycorrhizal) associations with trees. Most of the species known have been described from temperate regions, with little research carried out on tropical boletes. However, tropical Boletales are very diverse, and they regularly challenged the taxonomic classification mainly based on temperate taxa.

Southeast Asia encompasses three of the 25 most important biodiversity hotspots in the world. Northern Thailand and Yunnan, in particular, shelter high biodiversity because they are located at the confluence of temperate and tropical areas. Their landscape is formed, mainly, by mountainous areas, which creates a mosaic of diverse forest habitats.

Since 2010, a Botanic Garden Meise researcher has collected Boletales in Northern Thailand and Yunnan. In 2014, DNA analyses revealed the existence of over 230 Boletales species in the areas investigated. Many of the species detected were new to science. For example, in Northern Thailand, five new species were discovered from the genus Sutorius, a recently published genus with just two described species (one from the Americas and Japan, the other from Australia). Further, phylogenetic analyses revealed the existence of several genera new to science. Studies on Boletales diversity in Southeast Asia has contributed to a greater understanding of the evolution and systematics of this group and suggests that there are many more taxa waiting to be discovered. Statistical analyses suggest that 300 species are likely to occur in Northern Thailand alone, making this area a potential hot spot for Bolete diversity.
The Chimanimani Mountains straddle the border between Zimbabwe and Mozambique. They form an isolated range rising in the east from the Mozambique coastal plain to the highest point at Mount Binga at 2436 m. The mountains largely consist of quartzite sandstones that weather into nutrient-poor soils. This combined with isolation means that the area is represented by a high percentage of endemic and near-endemic flora. This is especially true on montane grassland plateaus, slopes and bogs.

Historically most of the botanical research and collecting has been done from the Zimbabwean side of the mountains which is protected by a National Park. This side, however, only contains about 20% of the total area of the mountainside and in addition, very little data has been collected from the area in the last 50 years. Information from the extensive and unprotected Mozambican side has been very fragmented and is largely incomplete. However, it is known that many rare and endemic species occur here, but have never been officially recorded.

Recently artisanal gold mining has posed a significant threat to parts of the unprotected Mozambican mountainside. In April and October 2014, two expeditions were organised by the Royal Botanic Gardens Kew, MICAIA (a local NGO based in Chimoio), Botanic Garden Meise, National Herbarium of Zimbabwe and the National Herbarium of Maputo.

The purpose of these expeditions was four fold to:

• develop an up-to-date inventory of the rare and endemic plant species, their threat status and distribution, particularly on the Mozambican side of the mountains,
• discover and record specific areas of high botanical or ecological importance,
• assess the threats and possible long-term impacts of artisanal gold mining on botanical biodiversity, especially on rare and endemic species,
• record and photograph the flora and upload it to the website: www.mozambiqueflora.com.

Over a period of four weeks a total of 380 plant specimens were collected. Whenever possible duplicates were collected for all four participating herbaria (K, BR, SRGH, LMA). In most cases, silica-gel samples for DNA analyses were also gathered. In this period, over 70% of the target species were collected, many of them recorded for the first time in Mozambique. In addition, 65 specimens of corticolous and saxicolous lichens were also collected for further investigation by Botanic Garden Meise.

The identification and confirmation of plant collections have almost been completed and all records and images of the first expedition are freely available online

• http://www.mozambiqueflora.com/speciesdata/outing-display.php?outing_id=32,
• https://www.flickr.com/photos/zimbart/sets/72157644203545549/,
• https://www.flickr.com/photos/62615101@N02/sets/72157644547376913/

Among the preliminary results were five to six species that are thought to be new to science. Results of the second expedition and of the lichen collections are still being processed. The final results and findings of the two expeditions will eventually be published in an extensive report. This report will be a follow-up to the original publications by Goodier & Phipps (Kirkia 1: 44-66, 1960) and Wild (Kirkia 4: 125-157, 1963).
A new Flora at Meise

With an estimated 7,000 plant species, the central African country of Gabon harbours the most species-rich lowland rainforest of Africa. The multivolume *Flore du Gabon* offers essential tools to identify these plants and as such is crucial to a wide audience, such as researchers, conservationists, or interested amateurs. It also provides basic information for the strong conservation program in the country, with 13 National Parks and 11% of its surface protected. The *Flore du Gabon* series was initiated by the *Muséum national d’Histoire Naturelle* in Paris back in 1960, and taken over by the National Herbarium of the Netherlands – Wageningen branch in 2005. But, with the recent relocation of the latter to Leiden to join the Naturalis Biodiversity Center, and its Editor-in-Chief, Marc Sosef, coming to Meise to revitalize the *Flore d’Afrique centrale*, its future became uncertain. However, in 2014 we signed an agreement with Naturalis to jointly continue the *Flore du Gabon*, and to try and finish it in five years. With that, we have strengthened our position as center of expertise on the flora of the Central African region, and provide significant support to the conservation of, research on, and sustainable use of Gabon’s exceptionally rich botanical diversity!

European Journal of Taxonomy publishes its 100th issue

On October 24th, 2014, the editorial team of *European Journal of Taxonomy* was proud to publish its 100th issue of the journal, a beautifully illustrated monograph on African millipedes written by Henrik Enghoff, which describes 20 new species.

*European Journal of Taxonomy* (EJT) is a peer-reviewed international journal on descriptive taxonomy. Its content is fully electronic and available by means of ‘open access’ through the internet (www.europeanjournaloftaxonomy.eu) without financial, legal, or technical barriers. EJT is the only taxonomic journal that collectively covers zoology, mycology and plant-related sciences, including fossils.

The journal was launched in September 2011 and has since published around 3,500 pages in which over 400 new species, genera and higher taxa have been described. The journal is unique in its field as it follows the Diamond Model of open access publishing in that all content is free to read and free to publish. The financial costs of the online journal are met by the natural history institutions that make up the EJT consortium. This consortium is composed of the museums of Paris (France), Copenhagen (Denmark), Brussels and Tervuren (Belgium), London (UK) and Botanic Garden Meise (Belgium).
Re-newed production
Flore d’Afrique centrale

In 2013, the Botanic Garden recruited a new editor to intensify the production of the Flora of Central Africa series. This multi-volume work will eventually include over 10,000 species occurring in the Democratic Republic of the Congo, Rwanda and Burundi and thus provide a crucial tool for plant identification, research and conservation in that region.

During 2014, the new Editor set up a strong international network of collaborators. Over 40 specialists joined and expressed their willingness to contribute their knowledge to this endeavour. Amongst them are seven botanists from the region. These include those who already have great experience as well as promising young plant scientists. An important goal of our Botanic Garden is to increase education and training activities in Central Africa to assist young botanists and increase the regional capacity in plant science.

The Flore d’Afrique centrale series had a highly successful year in 2014 increasing its coverage by five family treatments (Caricaceae, Colchicaceae, Ericaceae, Flagellariaceae and Restionaceae) with several other manuscripts processed. This represents a flavour of our concerted efforts to complete the monumental work of Flore d’Afrique centrale within 15 years.

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Extinct grass found growing wild in botanic garden domain at Meise

During the assessment of the spontaneous flora in our Garden we found an unknown grass of the Festuca ovina (Sheep fescue) complex. It was sent to specialists abroad, who identified it as Festuca valesiaca, much to our surprise. The occurrence of F. valesiaca in the Garden is restricted to warm, dry microclimates provided by the rather steep, south-facing slope at the foot of a large beech tree.

F. valesiaca is a fine-leaved grass that grows from Central-Europe eastwards to NW China. Its European populations are considered rare or endangered. Officially Belgium lies outside its range, despite recordings of this species in ‘calamine’ (metalliferous) areas in the southeast part of the country. However, the identity of these recordings have been repeatedly questioned by scientists because species from the F. ovina complex are notoriously difficult to discern. However, by using plants from the herbarium at Meise we could confirm the identity of the calamine Festuca as F. valesiaca. Specimens were collected in Southeast Belgium a few times prior to 1860 and after that it appears to have become extinct.

So how did this species end up growing in a naturalised area in our Garden? We formed two possible hypotheses. This grass forms a small colony of about a dozen plants growing in one area under an old beech tree. It occurs there with another rare, fine-leaved fescue Festuca brevipila, which is believed to have been introduced accidentally from wild-gathered seeds destined for the ‘wood lawns’ as part of the formation of our 19th century English landscaped garden. Seeds were probably collected in Southern Germany, where a restricted population of F. valesiaca also naturally occurs. Therefore, the first hypothesis is that both species of fescue were introduced at the same time and are thus termed ‘wood lawn neophytes’. If true, this would mean that both grasses have survived in our Garden for around 150 years. By looking at the natural distributions of all ‘wood lawn neophytes’ found in the Garden we are able to pinpoint the probable locality where the grass seeds were originally collected.

The alternative hypothesis for the presence of F. valesiaca is that it is an escape from the living collections, because this species has also been cultivated for 25 years in the outdoor collections. Despite this, there appears to be greater evidence to support our first hypothesis.
Safeguarding plant life

It is estimated that up to one third of plant species are currently threatened or face extinction in the wild, mainly due to habitat fragmentation and destruction, combined with climate change. Every plant has a crucial role in a healthy functioning ecosystem. Some may hold unknown treasures such as molecules with helpful medicinal properties. Therefore, the safeguarding of plant species is essential.

Our research contributes to the development of tools for in situ conservation in valuable natural sites both nationally and internationally. Off-site or ex situ conservation is equally important. We collect plant material from the wild for preservation and propagation in our living collections, and in the collections of partner botanic gardens. Our seed bank holds the seeds of many rare and endangered species, thus safeguarding critical genetic variation. In combining our expertise and collections we are able to assist with the reintroduction of species in natural habitats both now and into the future.
Plant reproductive traits may influence species susceptibility to decline

Habitat destruction, eutrophication and fragmentation are generally considered the main factors behind population decline and extinction. Plant extinction is a complex phenomenon, for which we do not always recognise the early warning signs. It is therefore essential to look at possible plant-related factors that might bias a species vulnerability. If certain plant-related traits could be correlated with species imperilment then a critical new assessment would be available to conservationists to help them predict species susceptibility to local or global extinction.

Plant-related factors may include a range of characteristics, such as reproductive-related traits. These may include species with limited dispersal capacity, low seed production or those lacking residual seed banks. Scientists at Botanic Garden Meise explored whether reproductive-related traits determined population decline. Ten reproductive traits were compared against species trend (an index showing any decrease or increase in their frequency) in two geographically distinct data sets, compiled from subsets of the Belgian flora (1,055 species) and the British flora (1,136 species). Of the ten traits considered, the type of reproduction (seed or vegetative) and the pollination mechanism (insect or wind) showed the strongest association. We found a relationship between species trend (increase or decrease) and the type of reproduction as well as the pollination mechanism. These patterns were significant in both regions but the magnitude and the direction of the relationship was different in Belgian and in British datasets. In Britain wind-pollinated species are doing much better than insect-pollinated species, whereas the Belgian dataset showed that self-pollinators are doing much better than insect-pollinated species.

Species imperilment was also associated with traits relating to flower type, but again, results differed depending on the flora in question. Analysis of the Belgian flora showed no direct link between flower shape and the tendency of a species to decline, whereas plants from the British flora with tubular-shaped flowers were more threatened than those that had a more open flower formation. This pattern may be related to a decline of pollinating insects specialised in deep corollas such as butterflies. Our analysis also highlighted that species from the Belgian flora capable of self-pollination were less inclined to be vulnerable to extinction than those requiring cross pollination. This may also be due to a scarcity of pollinating insects.

We also demonstrated that species in the Belgian flora reproducing (mostly) vegetatively are at greater risk to population decline than those reproducing from seed. This may be explained by the fact that plants undergoing vegetative reproduction produce identical clones of themselves that may be less able to adapt to changing conditions.

The study highlighted the importance of not only correlating different plant traits with population decline, but also the significance of comparing two distinct geographic regions. This latter point demonstrated for the first time that the results are context-dependent. This indicates that reliably identifying species most prone to extinction, solely based on reproductive traits, is problematic.
Spruces fall under the spotlight, as the Botanic Garden hosts Belgian Dendrology Society

The annual study day of the Belgian Dendrology Society was held at Botanic Garden Meise on 7th September, 2014 on the topic of *Picea* or spruce.

In preparation for this day, all spruces in collection were located, measured and mapped by geo-referencing. The identification of each accession was verified. The collection totalled 66 accessions comprised of 43 taxa. The living plant collections’ database LIVCOL had 105 separate nomenclature records for *Picea* which were checked and updated. All accepted taxa were given a common name in both Dutch and French and all plant labels renewed. Data was shared with the Belgian Champion Trees’ database (Beltrees), which revealed a number of specimens as Champions. Our individual of *Picea asperata* had the largest girth (148 cm) of any tree of that type in Belgium, likewise *P. meyeri* (135 cm) and *P. smithiana* (36 cm) were also the largest recorded in Belgium.

As organisers of the *Picea* day we planned a preliminary day visit to the Pinetum of C. Anthoine at Jamioulx. A renowned collection of conifers with probably the best assortment in the country with over 1700 different species and cultivars. On that day delegates had the opportunity to refresh their knowledge of *Picea*, a generally little-known and unpopular genus, by trying to find, then identify different taxa.

On the following day, 46 members of the Society reconvened at our Garden. During the morning delegates were rewarded with interesting lectures by Prof. P. Goetghebeur (phylogeny & morphology), Ph. de Spoelberch (spruces from around in the world), J. De Langhe (identification key) & M. Herman (wood technology). During the breaks delegates had the opportunity to look at a rich collection of spruce cones loaned by Arboretum Wespelaar and the wood samples of W. Wessels.

The afternoon was dedicated to a visit to the *Picea* collection with a field workshop on how to recognise the different species in collection using vegetative characteristics from the key developed by J. De Langhe. The identification process specifically focused on the needles (discolourous or concolourous, directed forward or sideward, rhombic-quadrangular of flattened, pungent or not), shoots (pubescent or glabrous, yellow, ivory or brown) and buds (resinous or not). We discussed other field characteristics and topics of interest including the taxon’s natural distribution, their threats in nature, hardiness, cultivation and horticultural attributes.

Most of our spruces are concentrated in the Coniferetum, planted over the past four decades. Others (i.e. Norway spruce) were planted as part of the landscape at the beginning of the 20th century. A third group dates to just after World War II. These formed the green-belt around the buildings with another group planted on an abandoned nursery in the early 1960s.

Besides the species mentioned we consider the following taxa worthwhile of wider cultivation, *P. abies* ‘Acrocona’ with its terminal reddish cones, *P. orientalis* with its tiny, dark-green needles and *P. torano* with beautiful cones.
**Botanic Garden Meise contributes to impact study for mining project and inventory of a Ramsar site in Gabon**

Gabon has the best-preserved forests in Africa. In a country about half the size of France, c.80% of its land surface is covered in forest. Botanic Garden Meise is taking an increasing interest in the study of its flora, and recently became co-editor of the *Flore du Gabon* series. In 2013-2014, Olivier Lachenaud, researcher at the Garden, visited the country twice for a total of six weeks as part of the collecting expeditions organised by the Missouri Botanical Garden, USA. These expeditions were part of two major projects, both conducted in partnership with the National Herbarium of Gabon and the IRD (Institut de Recherche pour le Développement in Montpellier, France).

The first project's aim was to conduct an environmental impact study of a potential mining site in Mabounié where the company Er- amet are prospecting. This area has deposits of rare earth elements, in particular niobium, an essential metal used by the electronics industry. The site in question covers 20,000 hectares of forested, hilly terrain that had not previously been studied. Our task was to document its flora and identify which species are in need of particular conservation effort. Around 30 species of concern were identified, of which five are new species and apparently endemic to the area. Many of these species are found growing along forest streams, which are vulnerable to mining activities due to changes in sedimentation. Several areas were chosen to assess the changing impacts mining has on this habitat. In addition, cuttings from the most critical species were taken for propagation aided by a partnership with the expert gardener Jean-Philippe Biteau (Director of Jardi-Gab, Libreville).

The second project, responding to a request by WWF-Gabon and the Ministry of Water and Forests (Ministère des Eaux et Forêts), was a preliminary botanical inventory of the Bas-Ogooué Ramsar site. This extensive watershed was classified in 2009 as a wetland of international importance under the Ramsar Convention. The area covers 862,000 hectares with an amazing diversity of habitats, including floating grasslands, savannas, *terra firma* forests and various types of flooded forest. Yet its flora is poorly known. We visited five sites in the area and found at least three new species that are apparently endemic to the region. Other exciting discoveries included *Macaranga letestui* and *Strombosia fleuryana*, taxa that had not been seen in the wild since 1908 and 1912 respectively, and found to be locally common.

The trips to Gabon have taught us much about the flora of this country, and provide us with a mere glimpse of the wonders that remain hidden in these tropical forests.
The rapidly changing climate is currently one of the biggest threats to biodiversity on a global scale. Studies have shown that climate change may cause 10 – 30% of European plant species to become extinct by the end of the 21st century. At Botanic Garden Meise we examine how different plant species respond to climate change. The results of this research will enable us to take appropriate conservation measures and identify the species potentially most vulnerable and target their seed collection for conservation in our seed bank. A study, financed with a ‘Belspo Back-to-Belgium’ grant, has enabled us to examine different aspects of climate change on a number of indigenous plant species.

We selected *Meum athamanticum* as one of our study species. This sub-montane species is restricted in Belgium to the highest elevations and potentially vulnerable to climate warming. This species is unable to migrate upwards when the climate becomes warmer (as predicted by most models) whereas a northward migration is hampered by habitat fragmentation.

To simulate climate warming and to study its effects on *Meum athamanticum*, we placed open-top chambers around different individuals in the Hautes Fagnes region. The open-top chambers comprise small roofless greenhouses made of plexi-glass that increase the average environmental temperature within the chamber by 1 °C. By comparing the plants in the open-top chambers with control plants we can quantify the consequences increased temperature on flowering phenology, growth and germination of *Meum athamanticum*.

Plant species distributed across a large area are usually composed of populations adapted to local climate conditions. We sampled fruits and collected seeds of 35 *Gentiana pneumonanthe* populations across Europe to study how these populations are adapted to local climate. We aim to grow 3,000 plants from these different populations at Botanic Garden Meise, which will allow us to see how plants adapted to climate and provide an opportunity to test whether the different populations are sufficiently genetically diverse to evolve rapidly in a changing environment.

During the past two decades the average annual temperature in Belgium has risen by 0.4 °C per decade with precipitation remaining fairly constant. We are not only able to predict how plants will be affected by climate change, the seed bank of the Botanic Garden Meise also provides an excellent opportunity to test whether plants have already evolved to recent climate change.

We are using seeds of five annual species that have been stored in the seed bank of the Botanic Garden for 25 years to study whether the observed temperature increase has already affected flowering phenology, germination timing and leaf traits. This is done by growing plants from the stored seeds together with plants grown from “new” seeds collected 25 years later at exactly the same location.
Understanding ecosystems

In a world increasingly under environmental pressure, plants, ecosystems and the services they provide need to be maintained to keep the planet healthy. Amongst other things they mitigate the effects of greenhouse gases, play an important role in the global water cycle, and help combat desertification.

The work of our researchers helps us understand how ecosystems function, and how they can be described and monitored. They also investigate invasive species that influence native species. Throughout the world, in Africa as in Belgium, humankind is fully dependent on healthy ecosystems.
Reconstructing historical and recent climate changes in East Africa based on diatoms

Extreme climate events, such as catastrophic droughts and heavy flooding, have recently affected several regions in East Africa and have had a severe impact on the well-being of local populations and their socio-economic systems. In the region of Lake Challa, a crater lake located on the foot of Mount Kilimanjaro, the El Niño Southern Oscillation (ENSO) has a strong influence on the regional weather regime with heavier rains and flooding during El Niño years and intense and prolonged droughts during La Niña years. Based on thin-section analyses of an annual laminated sediment core of Lake Challa, Wolff et al. (2011) reported a tight link between inter-annual rainfall variability and the thickness of laminations (annual small-scale sedimentation of fine layers) also known as varves: thicker varves correspond to drier and windier conditions, whereas thinner varves correspond to wet years with less wind. The thickness of the varves is mainly determined by variation in the abundance of diatoms, unicellular algae characterised by their silica skeleton. Windy conditions mix the water column and stimulate algae growth and reproduction due to the upwelling of deeper nutrient-rich water.

As part of the project PAMEXEA (PAtterns and Mechanisms of EXtreme weather in East Africa) funded by the Belgian Science Policy, we are studying at high resolution changes in species composition of the diatom communities preserved in the sediment layers of Lake Challa, in order to retrieve more detailed information on changes in seasonality and the occurrence of climate extremes over the past 500 years. For this purpose nearly every varve was subsampled and permanent diatom slides made and analysed. To support the interpretation of the sediment analysis, the actual phytoplankton of Lake Challa was analysed based on a one-year monthly sampling. Moreover, sediment trap samples were sampled monthly and investigated since December 2006. Consequently, changes in phytoplankton composition can be followed up over a longer monitoring period up to 10 years or even more. Linking the survey of the recent phytoplankton and historical information on annual rainfall variations and ENSO events to the observed changes in the fossil diatom assemblages, will produce a more detailed perspective on the impact of increased inter-annual rainfall variability and wind conditions in East Africa due to anthropogenic climate change. The goal of the PAMEXEA project is to provide developing countries and their policy makers with basic guidance for sustainable agricultural economy and appropriate water-resource management in a future that will be characterized by climate change, growing demographic pressure, and natural scarce water resources.

Sampling of the sediment core of Lake Challa on a yearly resolution.
Aliens in Antarctica

One of the most pristine environments on earth, the Antarctic Region, is being threatened by foreign plants and animals that are unwittingly being introduced to the White Continent in the luggage and clothes of visitors. Every year, 33,000 tourists and 7,000 scientists visit Antarctica, many of them carrying plant seeds and spores picked up from other countries they visited prior to their Antarctica trip. Invasive alien species are among the primary causes of biodiversity change worldwide. Changing climates are making it easier for these species to establish, become invasive, and ultimately disturb and destroy the naturally occurring Antarctic ecosystems.

The Botanic Garden Meise participated in the international project ‘Aliens in Antarctica’. The idea behind this project was to assess the environmental risks to Antarctica, by finding out which seeds are being introduced, where they came from and where they are most likely to establish. Researchers from more than 10 countries checked 850 tourists and scientific team members who visited Antarctica during the first season of the International Polar Year (2007) and asked questions about their previous travel. The sampling process included the fine-combing and vacuuming of camera bags, outer clothing, shoes and backpacks to pry out accidentally hidden seeds.

The results were published in 2012 and 2014. On average, ten seeds per person were found, with scientists tending to carry more seeds than tourists. Using photographs in seed atlases and online databases, it was possible to identify most of the 2,600 seeds. The results indicated that half of the collected seeds and spores originated from other cold regions across the world and were known to have invaded cold-climate regions such as the Arctic and sub-Antarctic.

Fieldwork in the Atlantic Rainforest of Brazil: the New World brings new research opportunities

Our institute has a long tradition in studying African plant biodiversity, however, the New World flora is also well represented in our collections with the renowned von Martius Herbarium as a notable example. Inspired by past expeditions of famous naturalists, we embarked on a voyage to the New World ourselves and we travelled to Bahia in Brazil. Our expedition party included two staff members from Botanic Garden Meise, one of KU Leuven and another from the Naturalis Biodiversity Center, Leiden.

Our focus was on the Atlantic Rainforest, a biodiversity hotspot covering a vast area along the coast of Brazil. Sadly little of the original forest remains, despite this, it remains one of the richest biologically diverse ecosystems on earth with especially high numbers of endemic species. These endemics provide a great opportunity to study the origin and evolution of the Atlantic Rainforest. Based on the research interests of the people participating, we primarily focused on collecting Rubiaceae and Lauraceae species and on mycorheterotrophic plants (plants that receive all or part of their food from parasitism upon fungi rather than from photosynthesis). By studying the endemics of these three different groups and by calculating when they originated, it will be possible to calculate the age of the Atlantic Rainforest.
Everywhere on the planet specific plant and fungi species have provided local populations with food, energy, materials for housing and tools, fibres for clothing and medicines. In many parts of the world plants remain the primary elements in fighting hunger, disease and extreme poverty. Plants also often figure in cultural expressions and religion. Nowadays, cultural plant knowledge is being lost and with it the vital connections we have with plants and fungi.

Our researchers record how plants and fungi are used so that this knowledge can be shared and distributed. Our scientists’ ability to identify plants, even from tiny or ancient remains, contributes to fields as diverse as forensic investigation and archaeology, thus constantly identifying and establishing links between plants and people.
Capacity building and landscape development in post-conflict Democratic Republic of the Congo

Establishing close links with institutions involved in in situ conservation is a new venture for Botanic Garden Meise in the Democratic Republic of the Congo.

Virunga National Park, run by the ICCN (Institut Congolais pour la Conservation de la Nature), is a UNESCO World Heritage Site located in eastern DRC. It covers 7,800 square kilometres and is Africa’s oldest national park and one of the most biologically diverse protected areas on the continent. In 2013, after years of insecurity, the park launched a post-conflict program bringing electrical power to rural and remote areas as a catalyst for job creation and poverty reduction. The purpose of the program is to offer sustainable energy alternatives in order to decrease pressure on the natural resources. In 2015, the Virunga Foundation will complete the construction of a 14 megawatts hydroelectric plant in the region of Rutshuru, in North Kivu. The Matebe plant will have an immediate positive impact in terms of development of this region, but needs to be harmonised with the natural landscape. The ICCN and the Virunga Foundation asked the Botanic Garden to assist in providing botanical research, landscaping and environmental education in the area.

The first objective of the project was to integrate the hydroelectric plant into the existing landscape. In order to make this happen plant nurseries were set up to cultivate indigenous plants that will eventually transform the site into an education and tourist centre.

The project focuses on actions that involve local people, particularly youth, in the conservation and development of natural areas as historical and cultural heritage. This is a very interesting and difficult challenge as the Virunga Foundation and Botanic Garden Meise work in a post conflict zone where most people survive in refugee camps.

The second objective of the project for our Garden was to promote environmental education in schools, civil society and the media in North Kivu, in particular to highlight the role of the Park in preserving one of the richest regions for biodiversity in Africa.

It is anticipated that actions improving the livelihoods of these rural communities around the borders of the protected area will reduce the pressures within the Park and this will amplify the efforts of ICCN to safeguard the conservation of biodiversity.

Re-opening of the Lisowski Arboretum at Kisangani

Since February 2012, Botanic Garden Meise has partnered with the University of Kisangani and REFORCO (Congo Forestry Research) program to strengthen the curriculum of the Forest Master’s Programme in the field of ex situ conservation and to recover and improve the Faculty of Sciences’ green spaces. The latter included the rehabilitation of the Lisowski Botanical Garden.

Professor Stanislaw Lisowski, professor of systematic botany and plant sociology at the University of Kisangani, established the garden in 1975 to provide students and teachers with botanical reference material for their studies. In its original structure the area of the garden (7,800 m²) was divided into plots hosting representative plants from the Kisangani region. Today the area has grown into an arboretum at the heart of the campus.

In order to rehabilitate the arboretum and enhance its educational, environmental and recreational roles, major removal of rubbish and maintenance work needed to be done. The site was then fenced to protect it from inappropriate use and the area enhanced by positioning benches for visitors. The trees were labelled and, for the most important species, descriptive panels placed to aid identification.

The CEO of Botanic Garden Meise, the faculty dean and the most important representatives of Kisangani opened the rehabilitated arboretum on the 14th of June, 2014.

Lisowski Arboretum now offers a unique opportunity for students and visitors to appreciate the most representative species of the tropical forest surrounding Kisangani. This is essential for research, conservation and the effective protection of the natural and cultural heritage of the region.
The Garden is home to 18,000 different kinds of plant, set within 92 hectares of historical domain. It is a beautiful, diverse, green space and a source of enjoyment, wonder and inspiration tempting about 100,000 visitors per year.

Using a broad spectrum of plant displays, museum artefacts, webpages, science communication tools, events, informal learning, awareness instruments and experience-based educational activities, the Garden has the potential to change people’s understanding of the importance of plants for human well-being and to emphasise the vital importance of plant conservation.

Building on this understanding, the Garden can stimulate people of all ages, backgrounds and abilities to act in a sustainable and responsible way.
A tropical rainforest voyage

Over the past decade many displays in the public glasshouses of the Plant Palace have undergone metamorphosis. Plants have progressed from being displayed in large pots along bare earthen paths to luxurious planted gardens with hard landscaped walkways. The displays now have a greater focus on educational themes that support the role of our Garden. In April 2014, two additional landscaped glasshouses opened displaying aspects from the world of tropical rainforests. This development signifies that eight of the thirteen interconnected glasshouses of the Plant Palace have been renovated to a high standard.

The rich tropical displays, totalling 600 species were opened with a fanfare of Pygmy songs and the splendour of Amazon tribal face paintings. The first of the two new tropical glasshouses is situated next to the cool, damp Evolution House. As you pass from the Evolution House a much warmer, humid environment grabs the attention of visitors. A small, corrugated roofed shack welcomes you into a tropical garden full of edible, medicinal and ethnobotanical plants from the wet tropics. Those adventurous-minded visitors are welcome to cross the wobbly suspension bridge across a body of water.

The next, (much lower) glasshouse displays dense secondary forest vegetation reminiscent along roads, water courses and tropical forest clearings. Here, giant herbaceous plants like spiral ginger and bananas display their large and beautiful flowers, while fast growing trees with stilt roots and spines block your view to the rest of the display. Many travel stories mention these impenetrable and dangerous forests, but do not worry, at Meise we have excluded the snakes. One corner of the house displays a range of fascinating myrmecochorous plants, species that have co-evolved with ants in a mutualistic way. This relationship gives protection for the ant colony and a source of plant food via ant frass.

The journey is temporarily halted in time as we await the next phase of tropical redevelopment in the Plant Palace. Eventually, by the end of 2017, the tropical forest will completely fill all five houses of the northern wing of the Plant Palace. After passing through the ethnobotanical and secondary forest displays previously mentioned, visitors will continue their voyage into primary rainforest, past palm trees, through treetops clothed with cascading epiphytes and finally visit the forests of Central Africa, an area of the world where the Botanic Garden focuses much of its scientific research.

Those adventurous-minded visitors are welcome to cross the wobbly suspension bridge across a body of water.

Photo Lies Engelen.

“ The displays now have a greater focus on educational themes ”

Pygmy songs during the opening weekend.
Flori Mundi: The orchid show

On the 25th of October 2014, a lavish festival opened with over 10,000 orchids, bromeliads and other tropical delights on display. After months of preparation by the Gardens’ staff and volunteers the grass and red carpets were finally rolled out and spotlights switched on. This was going to be the biggest event of the year.

Cutting the ribbon at a nocturnal gala signified the beginning of the month-long tropical festival. Young and old savoured a luxurious flowering spectacle through tropical and sub-tropical glasshouses of the Plant Palace. A large pyramid of Cymbidium orchids in the Spring House was the first eye-catching display followed by our graceful female statue dressed in a magnificent gown of Cyclamen. The enchanting trail continued along living ‘paintings’, flower arrangements and beneath cascades of Vanda orchids, decorative arches and a chandelier arranged with mesmerising bromeliads. Interspersed among the displays, in glass cabinets, were flowering examples from our own living collections that included orchids and bromeliads. In addition to the living plants, large photographs of elegant flowers from our living collection were displayed as masterpieces.

Beyond any doubt, the pièce de résistance of Flori Mundi was the large sphere, above the Victoria House pond, decorated with mini Phalaenopsis. This arrangement appeared to float just above the water’s surface and was encircled by water lilies and drifting candles. The tour around the Plant Palace concluded with an opportunity for the public to embrace and have their picture taken beneath an arbor festooned with white and yellow blooms. On departing the Plant Palace there was opportunity to board an electric train that carried passengers on a sightseeing tour along Bouchout Castle and the park, which was bursting with the tints of autumn.

During the five-week period, the festival attracted over 27,000 visitors. As the flowers in the festival faded plans were already being drawn up for the 2015 display to beguile the public once more.
The creation of Flori Mundi: the orchid show with Meise volunteers

Flori Mundi was the name given to the magnificent display of orchids that graced the Plant Palace in 2014. This successful festival would not have been possible without the dedication of our faithful team of volunteers, including a group of 15 young people helping in partnership with the Brussels’ Platform for Citizen Service.

A huge effort goes on behind the scenes to create and maintain a wonderful array of colour and interest for the public. Prior to the orchids’ arrival, our volunteers set up a range of display areas used to show the orchids to their best effect. On arrival, the orchids were carefully unpacked and sorted into species, colour and floral combinations. One team began preparing 2,800 mini Phalanopsis orchids for display. This involved drilling holes in their pots, running a cable tie through the holes and removing loose substrate from around the plant. These were attached to a large sphere and crossbeam positioned above the pond in the Victoria House. This was one of the most flamboyant displays of the festival. After more than a week of painstaking work the globe was festooned with beautiful flowering orchids.

Another team artistically arranged Vanda orchids, Guzmanias, Bromeliads and Tillandsias into bows and other ornaments distributed in the tropical glasshouses. Some of these flower compositions were entirely created by our passionate volunteers. The total amount of voluntary help received over this short period was the equivalent to more than six months of fulltime work. We, and all those who witnessed the event, extend our gratitude to our volunteers for this joyful and professional collaboration amongst the wealth of magnificent flowers that made up Flori Mundi.
Record number of Rhododendrons planted in 2014 to enhance the Garden’s visitor appeal

After the expansion of our magnolia collection in 2013, we continued enhancing the attractiveness of our outdoor collections in 2014 by focusing on *Rhododendron*. Rhododendrons capture the imagination of visitors and brighten up the garden with their exquisite flowers in all colours of the rainbow from early March to June.

The initial collection was laid out between 1984-1987 in the centre of the Botanic Garden, an area now named ‘Rhododendron Wood’ or ‘Woodland Garden’. The initial selection of 480 species and cultivars was based on hardiness, light requirements, lime tolerance, flowering display, colour, leaf form and availability in commerce or by exchange with other botanic gardens.

By the end of 1987 the collection included 140 plants. Additional plantings in 1988 made the genus the largest outdoor collection with 119 species and 191 cultivars and hybrids.

A decline in resources to manage the collection and the occurrence of diseases (honey fungus, Phytophthora root rot) and pests (e.g. Rhododendron leaf hopper) resulted in a gradual decline of the collection. Action was needed and with a renewed enthusiasm from staff and collaborators and additional financing a recovery program was deployed in 2014. The Rhododendron Wood was enhanced by 193 plants significantly bolstering this part of the collection to 500 plants comprised of 341 taxa and 386 accessions. Rhododendrons planted in other areas swelled this genera’s representation to 485 taxa (comprised of 145 botanical and 340 horticultural taxa) and 670 accessions.

Expansion has focused on groups of evergreen, large-leaved hybrids (93 specimens), Williamsianum (8) and Yakushimanum (11) hybrids and the azalea hybrid groups of Ghent (51), Knap Hill (17), Mollis (8).

Rhododendrons in bloom can be a big draw for visitors, consequently accessibility has been increased in the Rhododendron Wood by the reconstruction of footpaths, while information has been enhanced with new labels and maps based on the geolocation of our plants. Without the dedicated work, expertise and perseverance of staff, gardeners and volunteers this enhancement of the collection would have been unachievable.


It is anticipated that, in time, Rhododendron Wood will become one of the many botanical highlights of the Garden and the region.
Bronze model increases the Garden’s accessibility for the partially sighted and blind

The most iconic building of the Botanic Garden is the Bouchout Castle. The oldest parts of this building date back to the 12th century. In the last century, the Castle was home to the Empress Carlota of Mexico (widow of Archduke Maximilian of Austria), until she died in 1927. While the castle is a beauty to behold for the sighted visitor it was not possible to easily convey this to those who are blind or partially sighted.

Therefore, to celebrate the 180th anniversary of the tactile writing system Braille in 2009, it was decided to seek funds to develop a bronze architectural model of the Castle. It took over four years to find the finances, commission the bronze and for the castle to be made. With much gratitude, The Rotary Club Meise – Bouchout funded the commission, which was installed in the Castle by the technical service of the community of Meise.

On the 27th of September 2014, the bronze architectural model was officially inaugurated. The tactile nature of the model means the castle can now be appreciated by all. It has become a popular feature on special tours developed for the visually impaired and blind. This tour already allows people to experience a three-dimensional model of the Plant Palace, touch Braille maps representing the vegetation types of the world and experience a planted zone that captivates the sense of touch and smell. These developments mean our Garden is becoming increasingly accessible to more members of the community.

Primary school children explore the rainforest

In 2014 we developed a workshop for children aged between 6 and 12 to help them discover how animals and humans depend on the rich botanical diversity of the rainforest for food and shelter, and how people utilise tropical plant products in their daily lives. The newly opened rainforest glasshouse was the ideal setting for primary school children to explore these issues in an exciting and creative way in the context of formal education.

In addition to the topics included above, the workshop introduced children to subjects on the sustainable use of rainforest resources, with the startling question: ‘Does the hamburger plant exist?’ This interesting question led the children to discover soya beans, oil palms and to explore vegetarianism and the idea that we all have choices in our lives to ensure our impact on rainforests is achieved in a more sustainable way.

The workshop was attended by several Dutch-, English- and German-speaking schools who actively and enthusiastically engaged in discussions on sustainability. Both children and teachers appreciated the workshop’s active and creative approach as part of their themed week on these topics that fuelled future discussions at school. This workshop has now become so successful that it has become a permanent offer to schools from the Botanic Garden.
Bringing our heritage to life

During its long history the Garden has constantly been collecting and creating a wide range of botanical collections, living plants, books, artefacts, instruments but also buildings, glasshouses and landscapes. Many of these elements still play an active role in our current work; books and archives are consulted by researchers, historic glasshouses protect plant collections and buildings and landscapes are visited and enjoyed by our visitors.

This extensive patrimony requires constant specialised care and upkeep and is an irreplaceable source to develop innovative approaches to better fulfill the mission of the Garden in a changing world.
DNA barcoding for identifying rainforest taxa in the DRC

Before the rise of the molecular era two decades ago, tropical rainforest trees could only be identified using morphological traits such as size and shape of leaves, flowers and fruits. Even though morphological keys sometimes provide a helpful tool, often the help of a specialist is needed to identify trees when no fruits or flowers were available. Nowadays, the molecular technique of DNA barcoding provides a complementary tool for the identification of species. DNA barcoding uses a short genetic sequence in an organism’s DNA to identify it as a particular species. As a result, even the tiniest leaf fragment can be used to delimit different species. For plants, the most effective barcode regions are the matK and rbcL genes. Using the barcoding technique, we were able to provide species names to a large number of tropical rainforest trees in the region of Yangambi (Democratic Republic of the Congo). Many of these trees could not be determined with traditional identification methods because no fruits or flowers were present at the time of collection. The use of modern molecular methods provided valuable insights into the enormous biodiversity of African rainforests. For this study, a total of 7835 African trees could be correctly identified demonstrating that DNA barcoding is an extremely useful accompaniment to the botanical knowledge of taxonomists.

“The use of modern molecular methods provided valuable insights into the enormous biodiversity”
Herbarium specimens reveal historic exchange networks of British and Irish botanists

Scientific use of social networks such as Facebook and Twitter is now common place, but such networks are not a new invention. In the mid-19th century, as a result of the expansion of the rail network, the cost of postage dramatically reduced. Botanists took advantage of these developments to establish societies to exchange herbarium specimens. Two such societies were, the Botanical Exchange Club of the British Isles and the Watson Botanical Exchange Club. These societies were the scientific social networks of their time. Botanists, both professional and amateur, took advantage of these networks to study botany internationally.

Collecting herbarium specimens was a popular hobby in the 19th and early 20th century. It was seen as a wholesome scientific pursuit that women and the clergy could engage in. Their legacy is the hundreds of thousands of herbarium specimens in hundreds of herbaria across the world. The exchange of these specimens has helped spread botanical knowledge widely, but it is difficult to reconstruct the network and recognise the contribution of the individuals within the network.

Working in collaboration with the Herbarium@home project in the United Kingdom and Ireland we have managed to partially reconstruct the network of 19th and early 20th century botanists. Herbarium@home is a website where anyone can contribute to documenting herbarium specimens and has already documented almost 150,000 specimens from 19 different herbaria. One of the important results, in addition to liberating botanical data, was the evaluation of the role women had in this historic network. It appears that women had a vital role in collecting herbarium specimens in contrast to their contribution to botanical literature at the time.

Over the period studied women’s membership of the Botanical Exchange Club of the British Isles and the Watson Botanical Exchange Club increased from 10% to 20% in the early 20th century. These percentages are much higher than other scientific societies of the time, some of which prevented women from joining.

The Bouchout Declaration: Promoting open access to biodiversity information

In 2014, the Garden hosted the final event of the pro-iBiosphere project. This project aimed at making progress towards the global acquisition, dissemination and integration of biodiversity knowledge. The project foresees a future where this knowledge is not restricted to the few people with access to a specialist library, but is freely available to all digitally. To promote this ideal the project launched the Bouchout Declaration, named after Bouchout Castle at the heart of the Botanic Garden (www.bouchoutdeclaration.org). The declaration promotes free and open access to biodiversity information, but also encourages adequate attribution of the creators of this knowledge. So far 90 institutions, including some of the biggest museums and herbaria in the world, have signed the declaration. Although the pro-iBiosphere project has now finished we hope that the Bouchout Declaration will continue its legacy by promoting open access to biodiversity data to all.

BOUCHOUT DECLARATION

Various versions of the Bouchout Declaration logo can be downloaded here http://www.bouchoutdeclaration.org/downloads/

The attendees at the pro-iBiosphere final event held in Bouchout Castle in June 2014 where the Bouchout Declaration was launched to promote open access to biodiversity information.

An example of a botanical exchange network from herbarium specimens collected between 1878 and 1888. Each circle represents a person and its size represents the number of specimens they exchanged. The lines represent the connections between people determined from their names on herbarium specimens.
Research on historical lacquer: sampling resins from the Cabinet of Botanical Curiosities

Botanic Garden Meise holds a vast array of diverse collections that can be utilised for a wide range of purposes. In 2014, we were contacted by the Royal Institute for Cultural Heritage who requested our assistance to identify the ingredients of old lacquer recipes. Resins were extensively used as constituents to lacquer because when dissolved in non-aqueous solvents they dry and form a protective, sometimes pigmented coating. From the 16th century, furniture and other objects were coated with ‘European’ lacquers since the export of Asian lacquer-tree resin (especially *Toxicodendron vernici-fluum*) was strictly prohibited.

Our Botanic Garden was happy to help with the Royal Institute’s request, which gave an opportunity for focused research on the Cabinet of Botanical Curiosities. This collection contains a surprising diversity of mostly vegetable objects (about 15,000) in flasks and boxes which are complementary to the herbarium. The oldest specimens belong to the ‘Product and Seed Collection’ of the famous ‘Herbarium Martii’, purchased by the Garden when it became the State Botanic Garden in 1870.

The investigation into the ingredients of lacquer began with an initial selection of 150 specimens. From these 50 samples (mostly resins) were shortlisted as ingredients of old lacquer recipes, although not all exudates were of straight plant origin. Many copal resins were sampled. These included: East African or Zanzibar copal, esteemed among the principal commercial copals to be the toughest, West African, Sierra Leonean or Congolese copals once the universal resin of varnish makers, American copal, and the valuable Australian kauri copal. Other plant resins of the selection have imaginative names like mastic, gamboge, sandarac, fossil amber, and dragon’s blood. Shellac was an odd-one-out because this product is derived from lac insects, which feed on a variety of trees and use the resinous secretion of the host plant to protect their larvae. One more secret of nature’s factory revealed.

Conducting this research emphasised the importance of the original label’s information, as this provided evidence to match the original ingredients with the corresponding plant taxon.

Identifying lacquer ingredients using the Cabinet of Botanical Curiosities, old manuscripts from von Martius and information from the library demonstrated the importance of having a range of varied collections at Botanic Garden Meise. Hence, for the first time, manuscripts and library data contributed to the value of the Cabinet of Botanical Curiosities even before the specimens were databased.
Photographs speak louder than words, a statement that was certainly true when we rediscovered a collection of c.2,000 glass plate negatives at our Botanic Garden. These images had remained untouched for decades. The glass negatives date to a period between 1880 and 1930 and are considered a real treasure. Many of the images comprise of views buildings, gardens, greenhouses, living plants and herbarium specimens from the collections located at our Garden’s former site in Brussels of this large haul only 20 plates are attributed, those taken by Belgian photographers Leon Gois and Felix Lambert.

In addition to this first batch of glass plate negatives, we also discovered two additional batches of negatives. One of these included c.200 of vegetation in Belgium taken by Jean Massart (1865-1923), probably as a consequence of the large photographic campaign between 1904 and 1911. Some of these images have previously appeared in publications including the notable Aspects de la végétation en Belgique. The final batch of glass plate negatives represented 160 plates depicting nature and daily life from the colonial time in Congo, Sierra Leone and Guinea. These date from the expeditions that the pharmacist and collector Albert-Louis Sapin (1869-1914) undertook between 1902 and 1914.

Knowing that these images had great value we began a conservation project. Glass plate negatives were cleaned and placed into non-acid paper envelopes and scanned. All images were then data-based with a full description added, this included annotations from their old boxes, information contained on the slides themselves and any other associated information, e.g. handwritten notes.

We appreciated that these images deserved publication because they represented an entire segment of history spanning the turn of the last two centuries. This is not only valuable for our institute but also for those interested the history of Brussels, architecture, botanic gardens, Africa under settlement, the evolution of landscape in Belgium and the history of photography in our country. As a consequence, some of the images have been used to illustrate a very interesting book about the history of our botanic garden. All images will be published on Botanic Garden Meise’s online library catalogue bringing these important images to a wide audience.
History in the Botanic Garden, a joyful and reliable tool

The Botanic Garden is a gold mine of historical sources of information, such as archives, old periodicals, pictures etc. It is therefore no surprise that, in the past, collaborators of the institute contributed information about the history of botany.

This tradition continues today, with the Botanic Garden playing an evident role in national and international aspects on the history of science. In 2014, an innovative publication on the history of Darwinism in Belgium and another, on the history of tensions between professional and self-made botanists within the Royal Botanical Society, were published.

Presentations about the history of our Botanic Garden, and the history of the Royal Botanical Society (at the Arboretum Gaston Al-lard in France and International Conference of the European Society for the History of Science in Lisbon) were given, as well as a lecture on early ecological concerns in Belgium (during the 19th century) presented at the Université libre de Bruxelles (ULB). All these events helped assert the Botanic Garden’s reputation for historical skill.

The Garden has a representative Historian-Archivist on the committee that represents Belgium in the ‘International Union of the History and Philosophy of Science’. He also collaborates with the academic research unit ‘Mondes moderns et contemporains’ at the ULB, where he is also a scientific collaborator. He has also evaluated a Master’s Thesis on the history of mycology at the Université catholique de Louvain.

A source of fascination for the layperson and the scientist, pure research on the history of science and epistemology creates an understanding about human activity (including science). In order to achieve this, more than 15 presentations have been given on the history of the institution, on 19th century plant hunters and the history of ecological concerns among other topics.

The Botanic Garden has been involved in a number of high-profile events during 2014, these have included: Viva Brasil! Belgians in Brazil (BELvue Museum, Brussels, 12/6-31/8), the Year of Flora (Brussels, March 2014-March 2015), and Brussels, capital of Flora (Halles Saint Géry, Brussels, December 2014-February 2015).

Our Historian-Archivist has been asked to collaborate with the exhibition: ‘Orchidées, cacao et colibris, Explorateurs et chasseurs de plantes luxembourgeois en Amérique latine’, to be held in the Natural History Museum in Luxembourg. Our historical expertise on plant collectors, botany and horticulture was also highlighted in a long article on horticulture in Brussels during the 19th century in Hommes et Plantes, the periodical of the Conservatoire des Collections Végétales Spécialisées (France). While an account of the history of the Botanic Garden’s collection of succulent plants was promoted in the magazine de les Amis du Jardin exotique de Monaco.

All these activities led to an increase in the number of requests for historical data from the Library of Botanic Garden Meise. These came from a range of sources from academics, researchers, and students, but also from non-professionals inspired by our historical outreach. This information has benefitted the subjects of humanities and botany. This was illustrated at the end of the year through extensive archive beachcombing that was meant to document the samples of the former Forestry Museum.

Extensive appeal was made to the collections and the expertise of Botanic Garden Meise for the project ‘Year of Flora’. Its success is reflected in the wide media attention for this project both on TV, radio as in magazines.
On a weekly basis around 25,000 herbarium specimens are taken from the shelves to be frozen in, a great teamwork!

Conserving these specimens is no straightforward task. One of the biggest problems is insects. Herbaria worldwide have a constant battle to reduce insects from destroying their collections and need to take urgent action when outbreaks occur, such as the Drugstore beetle (Stegobium panicum), which is extremely hard to eradicate.

The most efficient way to maintain a herbarium is to provide an atmosphere with constant low humidity and temperature. Unfortunately, this is not an option for our Garden in our present building. It is therefore important to practice good husbandry to reduce pests in the collection.

After reviewing several techniques freezing was selected as the best method to kill insects. In autumn 2013, a large freezing room (ca. 60 m²) was installed in the herbarium building. This is used to freeze specimens for a period of a week, which was sufficient to kill insects. Each week, herbarium material from 12 cupboards were frozen.

This method is very labour-intensive (in excess of one full-time member of staff). It involves the removal of specimens from cupboards, placing them into the freezer and then after two weeks reversing this process. While empty the cupboards are treated with a long-lasting insecticide with low human toxicity. The procedure for freezing the entire collection will take two years. Once complete, the process will begin once more. This work has a major impact on herbarium management and, sometimes, the availability of herbarium material for research. The weekly freezing cycles also uses considerable energy, but considered a small price in order to safeguard our historical, cultural and scientific treasures. By the end of 2014, c.60% of our vascular plant specimens had received the freezing treatment. The results to date demonstrate that this process is very effective because after eight months the treated specimens remain pest free.

With 86 endemic species (and 19 sub-specific taxa), the genus Crotalaria (Fabaceae) has more endemic taxa than any other in Central Africa. Here shown, from left to right, are C. germainii, C. andromedifolia, and C. minutissima.

The endemics of Central Africa

Endemic taxa are those that naturally occur in a given area and nowhere else. Though a subjective concept, all known living creatures are endemic to Earth, this term is most commonly used to refer to organisms occurring only in a specific continent, region, country, or locality. Endemic plants are of particular interest to botanists and are often prioritised in conservation programs because their narrow distribution can make them particularly vulnerable to habitat loss and environmental change.

The Botanic Garden has been developing a list of endemic vascular plant species (and sub-specific taxa) of Central Africa since the end of 2011, covering all endemic flowering plants, cycads, ferns and allies occurring only in the Democratic Republic of the Congo, Rwanda, Burundi, and eventually neighbouring countries (the Republic of the Congo, Central African Republic, Sudan, Uganda, Tanzania, Zambia, and Angola including Cabinda). This information will help to establish a Red List for Central Africa, highlighting taxa of most concern.

Compiling the list is not a straightforward matter, but a dynamic process. Taxonomists redefine taxa as new information comes to light, while additional fieldwork can modify a taxon’s distribution pattern. During the middle of 2014, a significant milestone was reached with all specimens of taxa endemic to the selected area having been databased: more than 30,000 specimens, among which 22,000 firstly recorded for this project. In total these specimens represented more than 2,800 taxa. This data is already providing us with the identity of biological groups and the location of geographical regions particularly rich in endemics (namely for the last, the Rift Valley in the East and Katanga in the South).

Publication of the list of endemic plants of Central Africa (as defined above) is expected in 2015.
Our Garden is an ever-changing organisation with about 180 members of staff, 70 volunteers and 20 guides. The domain, which covers 92 hectares, houses about 50 buildings where people work, meet and preserve plant collections. One of the challenges will be to prepare our Garden for transition. Indeed, it is absolutely essential that the Garden becomes less dependent on fossil fuels and reduces its environmental impact. Numerous responses will have to be developed on all levels of the Garden.
In Memoriam Gert Ausloos

We mourn the tragic departure of our friend and colleague Dr Gert Ausloos, Head of Education (SEED) and member of the Management and Scientific Boards at Botanic Garden Meise who died suddenly on Sunday, March 2nd, 2014 at the age of 47.

Gert Rene Jos Ausloos was born in Tienen on February 24th in 1967. He grew up in the rural village of Oplinter where he became fascinated by nature. In his final year at the O.L.V. College of Tienen, he was selected for the converted ‘Jacques Kets Award’ presented to young individuals demonstrating a love for nature.

Inspired, Gert continued his studies in the natural sciences and in 1985 started his degree in biology at the University of Leuven, which he achieved with Great Distinction. His thesis ‘wound-induced signal transfer in *Lycopersicon*’ encouraged him in the direction of plant physiology. He went on to conduct research in the lab of Prof. J.C Vendrig focusing on the function of proteinase inhibitors in the defence system and floral biology of Solanaceae, which gained him the degree of Doctor of Biology (Botany) with the Highest Distinction in 1996.

During his doctoral research he passed on his enthusiasm and love of botany to countless biology students while assisting exercises in microscopy and during excursions to the National Botanic Garden of Belgium. These wonderfully elaborated excursions and the Gert’s work on the permanent scientific and educational plant museum in the Ghent Hortus Michel Thiery caught the attention of the management of the Garden, because when our Botanic Garden decided to invest more into education Gert was selected as best candidate.

He entered our Garden’s service on January 20, 1997. Gert established the educational service from point zero and expanded it to a team of dedicated staff that, besides the pure education, also delivered communication, tourist reception, special events, graphic design and the volunteer service. Over 17 years Gert gave his heart to the Garden and achieved wonderful public exhibits about the lesser-known history of the rose, on botanic illustrator Albert Cleuter, orchids, ikebana, bonsai, aquarium plants and many others too numerous to mention. He was the enthusiastic leader of the renovation of the Plant Palace and always a welcome guest at international meetings of botanic gardens and the force behind guide training under the umbrella of the Belgian Network of Botanic Gardens (VBTA), which he organised on four occasions.

Gert loved to convince people that plants are dynamic organisms that play an essential role in our daily lives. The shock that reverberated through the Botanic Garden at his sudden passing will long remain, but his legacy to the world of botany and on all those he encountered will never diminish.
Awards for researchers of the Botanic Garden Meise

Fabienne Van Rossum, researcher at the Botanic Garden Meise has been recognised for her outstanding work on the Belgian flora and vegetation by being awarded the Royal Belgian Botanical Society’s coveted ‘François Crépin Award’. Named after the renowned Belgian botanist and former director of our institution this award is presented for exceptional achievements. Dr Van Rossum received her award for studies on pollination patterns within fragmented plant populations and demonstrated that restoration of pollen dispersal is a key factor for ensuring the long-term persistence of fragmented taxa. The establishment of biological corridors also reduces spatial isolation between plant populations by providing nesting opportunities for pollinating insects.

Emiel Van Rompaey was a famous amateur botanist and founder of the I.F.B.L. (Institute for the floristics of Belgium and Luxemburg), an association of benevolent individuals interested in floristics. In his honour (every second year) botanical studies on the Belgian and Luxemburg floras are selected for the coveted ‘Emiel Van Rompaey Award’. In 2014, this award was presented to three researchers at Botanic Garden Meise. Arthur Vanderweyen and André Fraiture received the award for creating a checklist of Belgian smut fungi (Ustilaginales) comprising 88 species, 18 of which were previously unrecorded in Belgium. Smut fungi are important pathogens responsible for plant diseases and economic loss in yields, namely on grains. Meanwhile, Dries Van den Broeck received his award for a survey of epiphytic lichens and their lichenicolous fungi in the Brussels Capital Region. The results of the survey showed that the greatest influence on species richness and distribution was tree girth and air pollution. Lichens are reliable bio-indicators and useful for monitoring urban air pollution. Dr Van den Broeck also found 146 species, about 65% of the recorded epiphytic lichen flora in Flanders. Botanic Garden Meise is proud to see so many distinguished researchers receiving recognition in 2014.
The first gathering of volunteers and guides from the VBTA network

Botanic Garden Meise was host to the first ever gathering of volunteers and guides of the Association of Botanical Gardens and Arboreta in Belgium (VBTA) in 2014.

The meeting was represented by enthusiastic participants from the arboretums of Kalmthout, Hof ter Saksen, Robert Lenoir, Wespelaar and the botanic gardens of Antwerp, Gent, Leuven and Meise.

The day began with a presentation about the types of voluntary work conducted at our Garden. This was followed by the group undertaking an ‘ice-breaking’ exercise sharing some of their earliest memories about plants. Participants were then taken on a guided tour around the Garden and paid a visit to the impressive Flori Mundi flower show. Throughout the tour the Botanic Garden’s volunteers and guides proudly explained and demonstrated the important work that they have been involved in. This included: mounting herbarium specimens, planting ground cover plants in the Fruticetum collection, geo-locating and collecting data of over 2,600 trees, and helping on a ‘Plants in our daily life’ workshop for school children.

The final reception produced enthusiastic discussions and networking between the different gardens. A fascinating meeting of active plant lovers that should boost the skills and experiences of the volunteers and guides of the network.

The Balat glasshouse, a national treasure, restored

In 1854, the royal architect of King Leopold II, Alphonse Balat, constructed a small house to grow the giant water lily, *Victoria amazonica* that was recently discovered in tropical America. The house was initially constructed in Brussels Zoo in Leopold Park only to be moved twice, to the Garden’s former home in the centre of Brussels and then, in 1941, to Botanic Garden Meise. It is arguably one of the most important glasshouses in Belgium.

Due to a lack of funding the house had not received specialist care for thirty years. This meant that the Balat glasshouse was in a very bad state. The framework of the glasshouse needed urgent restoration. The main damage was metalwork to oxidation resulting from flaking and fissured paint. Silicone paste and mastic, used to fix the glass, was weathered and crumbling at various locations. This was about to change in 2014.

A specialised firm, with high respect for ancient techniques, performed the restoration under the supervision of the Technical Service and the Garden’s Landscape Architect (who wrote tendering specifications, issued a public tender and monitored the project).

The restoration procedure involved the removal of glass and sandblasting the metal framework. Once done, the framework was painted with three different layers of paint and sash bars covered with a new layer of special white mastic. The mastic was comprised of a specific mix of linseed oil and chalk that helped preserve the flexibility of the material. The result turned the glasshouse from a sorry state to a beautiful piece of art situated within the Garden’s Herbetum, worthy of being called one of the most important glasshouses in Belgium.
**Varied work gives visitors new experiences and safeguards collections**

The technical service of our garden normally operates behind the scenes to make sure the Garden is a pleasant, safe and suitable environment for visitors, staff and plants. As in previous years, 2014 was a busy year with a wide range of projects undertaken and completed.

Our Garden is fortunate to have a historic castle on its grounds. The roof of the castle offers a wonderful panorama. Previously, this vantage point was not accessible to visitors because it was unsafe. The technical service set about changing this by removing slippery duckboards, replacing them with concrete floor tiles, and installing a safety gate. Visitors now have a magnificent vantage point to view our historic landscape.

The castle requires special care to maintain it. In 2014, its external woodwork was painted, and 96 windows and 16 doors repaired. The Bouchout Castle is now a dazzling sight in the middle of the Garden grasping the attention of both visitors and staff.

Ensuring the public are able to comfortably reach the site is also important. Pathways around the tree and shrub collection, known as the Fruticetum, have been poorly drained for many years with surface water appearing after rainfall. This often inhibited visitors exploring the wonders of this collection. We installed a new drainage system to remove surface water benefiting both visitors and the plants that grow there.

The Plant Palace is one of our most frequented destinations for visitors. Our service developed the necessary infrastructure to achieve the future expansion of the Rainforest biome to other glasshouses. This work included installing drainage canals, pathways and plant beds.

Another important feature of the Garden is the orangery. The orangery forms part of the north-facing wall of the walled garden, yet until 2014, it was not possible to view the walled garden from the interior of the orangery. This all changed when a new large doorway was installed allowing people to view the wonderful perspective of the inner garden from the comfort of the restaurant.

The herbarium building is a very important depository for millions of preserved plant specimens used in research. It is therefore vital to insure these specimens are protected. The flat roof needed urgent renovation to prevent leaks entering the interior of the building. In collaboration with a building contractor, chimneys removed, the roof was sealed and then covered with a layer of isolation to the depth of 10cm. This work is expected to reduce the energy cost of heating this building by about 10% per year.
Facts
and figures
Financial Result (K€)

The available budget for 2014 was 12,064 K€ of which 11,535 K€ was used for the financial year in question.

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisitions</td>
<td>12,064</td>
</tr>
<tr>
<td>Expenses</td>
<td>11,535</td>
</tr>
<tr>
<td>Budgetary year balance</td>
<td>529</td>
</tr>
</tbody>
</table>

Breakdown of financial income

Financial income consisted of 10,776 K€ from the Flemish Government and 1,288 K€ in total from self generated income. This internal income came mostly from external projects, consultancy work and ticket sales. In comparison with the two previous years, self generated income has risen further. This is mainly due to an increase in income arising from ticket sales. Income from projects fell due the ending of the digitalisation project for the Mellon Foundation for which the Botanic Garden received approximately 200 K€ per year.

Self generated income

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lease</td>
<td>73,455</td>
</tr>
<tr>
<td>Entrance fee</td>
<td>412,532</td>
</tr>
<tr>
<td>Garden shop</td>
<td>129,044</td>
</tr>
<tr>
<td>Staff canteen</td>
<td>45,901</td>
</tr>
<tr>
<td>Projects &amp; consultancy</td>
<td>601,854</td>
</tr>
<tr>
<td>Orangery concession</td>
<td>11,800</td>
</tr>
<tr>
<td>Insurance</td>
<td>13,770</td>
</tr>
<tr>
<td>Total</td>
<td>1,288,356</td>
</tr>
</tbody>
</table>

Expenditure

Salary costs accounted for a little over 70% of the total budget in 2014. In 2014, several important maintenance activities were realised thanks to extra funding for investment and renovation. Energy costs accounted for 5% of the budget. For our plant collections, research activities and public outreach there was, respectively, 449 K€, 310 K€ and 239 K€ available.

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary</td>
<td>8,264</td>
</tr>
<tr>
<td>Collections</td>
<td>449</td>
</tr>
<tr>
<td>Research</td>
<td>310</td>
</tr>
<tr>
<td>Public outreach</td>
<td>239</td>
</tr>
<tr>
<td>Overheads</td>
<td>808</td>
</tr>
<tr>
<td>Improvements &amp; repairs</td>
<td>700</td>
</tr>
<tr>
<td>Energy costs</td>
<td>556</td>
</tr>
<tr>
<td>ICT</td>
<td>209</td>
</tr>
<tr>
<td>Total</td>
<td>11,535</td>
</tr>
</tbody>
</table>
The number of personnel (including temporary staff) rose slightly and was back to the level recorded for 2012. There was a considerable increase in the number of statutory staff members.

<table>
<thead>
<tr>
<th>Year</th>
<th>Statutory scientists</th>
<th>Statutory non-scientists</th>
<th>Contractual scientists</th>
<th>Contractual non-scientists</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>17</td>
<td>71</td>
<td>15</td>
<td>85</td>
<td>188</td>
</tr>
<tr>
<td>2011</td>
<td>16</td>
<td>66</td>
<td>18</td>
<td>79</td>
<td>179</td>
</tr>
<tr>
<td>2012</td>
<td>14</td>
<td>85</td>
<td>16</td>
<td>70</td>
<td>185</td>
</tr>
<tr>
<td>2013</td>
<td>13</td>
<td>81</td>
<td>18</td>
<td>69</td>
<td>181</td>
</tr>
<tr>
<td>2014</td>
<td>21</td>
<td>92</td>
<td>13</td>
<td>61</td>
<td>187</td>
</tr>
</tbody>
</table>

Breakdown of staff according to the source of income (situation as of 1 January 2014)

The salaries of Botanic Garden staff were funded by income arising from the Flemish Community (129 staff members accounting for 69% of the total), from own resources (27 staff members making up 14% of the total), and from income coming from the French Community (31 staff members, accounting for 17% of the staff total).

<table>
<thead>
<tr>
<th>Source</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flemish Community</td>
<td>129</td>
</tr>
<tr>
<td>French Community</td>
<td>31</td>
</tr>
<tr>
<td>Own income</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>187</td>
</tr>
</tbody>
</table>

Breakdown of staff according to Community funding and function (situation as of 1 January 2014)

34 staff members (8% of total) are scientists, of which a third is financed by the French Community.

The French Community also pays for 19 staff members (10% of total) that are engaged in other activities in the Botanic Garden.

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientists French Community</td>
<td>12</td>
</tr>
<tr>
<td>Scientists Flemish Community</td>
<td>22</td>
</tr>
<tr>
<td>Non scientists French Community</td>
<td>19</td>
</tr>
<tr>
<td>Non scientists Flemish Community</td>
<td>134</td>
</tr>
</tbody>
</table>
Breakdown of staff by age

Almost two thirds of staff is younger than 50 and 10% is older than 60. The staff of the French Community is in general younger that the staff of the Flemish Community with one third between 35 and 44. Approximately 40% of staff is female, but the distribution between the various services is very variable, for example most of our gardeners are men.
Trainees and work place experience

The Botanic Garden offers many places for trainees and persons seeking work place experience. Our goal is to make them better prepared to take up their place in the labour market.

Volunteers

The list of volunteers was updated by removing those persons that were inactive over a long period of time. As a result, the number of volunteers has grown less strongly in 2014. During the preparations for Flori Mundi, we were able to benefit from the extra help of 25 young people from Brussels from the ‘Platform for the service of citizens’ (Plateforme pour le Service citoyen). The latter are not included in the statistics. The conversion of the number of volunteers to fulltime equivalents is based on the norm of the Flemish Government (1,520 hours/year).

Interns and placements with disability

<table>
<thead>
<tr>
<th>Total</th>
<th>Paid</th>
<th>Unpaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Interns and placements with migration background

<table>
<thead>
<tr>
<th>Total</th>
<th>Paid</th>
<th>Unpaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>0</td>
<td>11</td>
</tr>
</tbody>
</table>

Visitors

The number of visits increased by almost 40% in 2014. In comparison with 2000, the year when visitor numbers were, for the first time systematically registered, the number of visits has more than doubled. The good weather was an important factor but not the only one. The public opening of two new rainforest greenhouses in April and the fabulous orchid show Flori Mundi in November attracted many extra visitors.

Number of interns and placements

<table>
<thead>
<tr>
<th>Total</th>
<th>Paid</th>
<th>Unpaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>1</td>
<td>31</td>
</tr>
</tbody>
</table>

Number of interns and placements with disability

<table>
<thead>
<tr>
<th>Total</th>
<th>Paid</th>
<th>Unpaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Number of interns and placements with migration background

<table>
<thead>
<tr>
<th>Total</th>
<th>Paid</th>
<th>Unpaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>0</td>
<td>11</td>
</tr>
</tbody>
</table>

Total number of visits

<table>
<thead>
<tr>
<th>Number of visits</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>94,218</td>
<td>110,909</td>
<td>88,612</td>
<td>91,171</td>
<td>126,486</td>
<td></td>
</tr>
</tbody>
</table>
Breakdown of the number of visits (free / discount / normal tariff)

The increase in the number of visits was the strongest for paying visitors (full or reduced tariff).

<table>
<thead>
<tr>
<th>Year</th>
<th>Free</th>
<th>Reduced</th>
<th>Full</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>25,988</td>
<td>48,973</td>
<td>19,257</td>
</tr>
<tr>
<td>2011</td>
<td>36,602</td>
<td>46,820</td>
<td>27,487</td>
</tr>
<tr>
<td>2012</td>
<td>30,913</td>
<td>38,215</td>
<td>19,484</td>
</tr>
<tr>
<td>2013</td>
<td>31,368</td>
<td>38,992</td>
<td>20,811</td>
</tr>
<tr>
<td>2014</td>
<td>39,312</td>
<td>57,676</td>
<td>29,498</td>
</tr>
</tbody>
</table>

Year card subscriptions

There was a noteworthy increase in the number of persons subscribing to a yearly access card (+22%). This increase was spread across the different types of subscriptions on offer.

<table>
<thead>
<tr>
<th>Year</th>
<th>Individual</th>
<th>Gold</th>
<th>Gold 1+3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>1,253</td>
<td>106</td>
<td>329</td>
<td>1,688</td>
</tr>
<tr>
<td>2011</td>
<td>1,382</td>
<td>99</td>
<td>353</td>
<td>1,834</td>
</tr>
<tr>
<td>2012</td>
<td>1,113</td>
<td>100</td>
<td>384</td>
<td>1,597</td>
</tr>
<tr>
<td>2013</td>
<td>1,443</td>
<td>94</td>
<td>411</td>
<td>1,948</td>
</tr>
<tr>
<td>2014</td>
<td>1,756</td>
<td>112</td>
<td>514</td>
<td>2,385</td>
</tr>
</tbody>
</table>

Participation in organised educative visits

The number of school visits fell slightly. This was mainly due to a reduced number of free school visits.

<table>
<thead>
<tr>
<th>Year</th>
<th>Free visit</th>
<th>Guided visit</th>
<th>BAMA-module</th>
<th>School workshop</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>2,034</td>
<td>1,276</td>
<td>187</td>
<td>913</td>
<td>4,410</td>
</tr>
<tr>
<td>2011</td>
<td>3,060</td>
<td>1,368</td>
<td>201</td>
<td>584</td>
<td>5,213</td>
</tr>
<tr>
<td>2012</td>
<td>2,771</td>
<td>1,091</td>
<td>551</td>
<td>1,763</td>
<td>6,176</td>
</tr>
<tr>
<td>2013</td>
<td>3,523</td>
<td>989</td>
<td>713</td>
<td>1,127</td>
<td>6,361</td>
</tr>
<tr>
<td>2014</td>
<td>2,467</td>
<td>1,156</td>
<td>671</td>
<td>1,917</td>
<td>6,211</td>
</tr>
</tbody>
</table>

Visitors to the garden shop

In total, almost 6,250 visitors made a purchase in the garden shop. The average amount spent per customer was circa 20 EUR. Typical Botanic Garden products, such as Botanic Garden honey and Botanic Garden coffee remained, also this year, very popular.

<table>
<thead>
<tr>
<th>Year</th>
<th>Visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>5,958</td>
</tr>
<tr>
<td>2011</td>
<td>6,655</td>
</tr>
<tr>
<td>2012</td>
<td>4,729</td>
</tr>
<tr>
<td>2013</td>
<td>5,189</td>
</tr>
<tr>
<td>2014</td>
<td>6,244</td>
</tr>
</tbody>
</table>
The Botanic garden in the news and social networks

The Botanic Garden issued 24 press announcements in 2014 (12 in Dutch and 12 in French). At this moment 3,270 persons have a subscription with the digital newsletter Musa which is published every season in Dutch and French. On the facebook page of the Botanic Garden, 78 messages in French and Dutch were posted.

In 2014, the website of the Botanic garden was consulted by 766,838 visitors from 306,834 different computers from 134 countries. The most visitors came from Belgium, Germany, France and the Netherlands. In total 9,817,900 pages of our site viewed and 22,982,176 opened.

The number of subscribers to Dumortiera, a digital periodical for floristry, further increased to 1,050.

Collections

Living collections

The living collections are made up of all specimens which are available either as living plans and/or seeds. It is made up of 33,056 specimens from 18,638 different taxa. 95% belongs to the Federal government scientific patrimony, 5% is the property of the Flemish community.

Living plant collections

Currently, the living plant collections are made up of 26,259 accessions. They represent 343 families, 3,034 genera, 17,524 taxa and 12,961 species. They are spread over the greenhouses (57%) and open park land (43%). The best represented plant families the glasshouses are the Cactaceae (2,506 accessions), Orchidaceae (1,696), Euphorbiaceae (1,284), Liliaceae (949), Rubiaceae (575), Crassulaceae (513), Araceae (464) and Agavaceae (393).

In the open park collections, the best represented plant families are Ericaceae (807 accessions), Rosaceae (752), Liliaceae (481), Asteraceae (468) and Malaceae (431).
Trends in the acquisition of living plant material

In comparison with 2013, a very strong increase was recorded in 2014 (52%). This increase was mostly due to the acquisition of a large number of Rhododendron cultivars for the open park collections and the many new succulents, principally Euphorbia species in the greenhouses.

<table>
<thead>
<tr>
<th>Year</th>
<th>Cultivated</th>
<th>Wild origin</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>614</td>
<td>881</td>
<td>1,495</td>
</tr>
<tr>
<td>2011</td>
<td>1,021</td>
<td>863</td>
<td>1,884</td>
</tr>
<tr>
<td>2012</td>
<td>1,631</td>
<td>528</td>
<td>2,159</td>
</tr>
<tr>
<td>2013</td>
<td>710</td>
<td>404</td>
<td>1,114</td>
</tr>
<tr>
<td>2014</td>
<td>1,233</td>
<td>465</td>
<td>1,698</td>
</tr>
</tbody>
</table>

Trends in the number of searches in LIVCOL

LIVCOL is an in-house databank that is used for the daily management of the living plant collections and supporting scientific documentation. This database is partially accessible to the general public via the internet site of the Botanic garden. In 2014, a relatively strong increase in the number of searches was recorded (5,838).

<table>
<thead>
<tr>
<th>Year</th>
<th>Queries Livcol</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>2,664</td>
</tr>
<tr>
<td>2011</td>
<td>3,633</td>
</tr>
<tr>
<td>2012</td>
<td>3,734</td>
</tr>
<tr>
<td>2013</td>
<td>3,962</td>
</tr>
<tr>
<td>2014</td>
<td>5,838</td>
</tr>
</tbody>
</table>

Confiscation of CITES listed plants

In 2014, the Belgian customs authorities carried out ten confiscations under the international legislation of CITES. The seized plant specimens were housed in the Botanic Garden. The number of confiscations reflect a falling trend since 2010. The ten confiscations were made up of 43 introductions and 102 specimens.

<table>
<thead>
<tr>
<th>Year</th>
<th>CITES accessions</th>
<th>Number of individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>278</td>
<td>2,205</td>
</tr>
<tr>
<td>2011</td>
<td>69</td>
<td>105</td>
</tr>
<tr>
<td>2012</td>
<td>86</td>
<td>240</td>
</tr>
<tr>
<td>2013</td>
<td>122</td>
<td>1,152</td>
</tr>
<tr>
<td>2014</td>
<td>43</td>
<td>102</td>
</tr>
</tbody>
</table>
Sharing of living plant material

The number of plant specimens sent out varies strongly from year to year. In 2014, a total of 1,830 specimens were sent out; 75% of this total were seeds.

Mounting of herbarium specimens

The mounting of herbarium specimens is an important and meticulous time consuming activity that facilitates the long term storage of plant material. The number of mounted specimens increased in 2014 to more than 35,000. This was principally thanks to an extra full time member of staff (via redeployment of an existing member of staff) and an increased number of volunteers.

Long term storage of seeds

The seed bank is a very important ex situ conservation tool to support in situ conservation projects. It facilitates, over a long period of time (more than 100 years), the conservation of a very broad range of genetic diversity in a very limited area. At this moment, the seed bank of the Botanic garden conserve some 906 introductions of Belgian species collected from wild seeds and seed from 803 copper plants from Katanga. The seed collection of wild beans and bean-like plants remains the most important world-class collection with 2,152 introductions.
Entry of collections into a databank

Data about herbarium specimens contain valuable information over the distribution, ecology and utilisation of plants. Thanks to the encoding of this information in a databank, this information is made available to an extended population of interested users.

In comparison with 2013, there was a reduction in the encoding of specimens, but in comparison with previous years, the total number of encoded specimens has increased. This is explained by the fact that in 2013, within the context of the inventory of the federal scientific patrimony, ‘rapid databasing’ was used, for which less details were provided. In 2014 a large number of specimens were encoded in the framework of the activity ‘Flora of Central Africa’.

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT</td>
<td>21,935</td>
<td>18,159</td>
<td>17,487</td>
<td>49,341</td>
<td>18,289</td>
</tr>
<tr>
<td>SP</td>
<td>23,447</td>
<td>21,880</td>
<td>30,324</td>
<td>26,105</td>
<td>32,748</td>
</tr>
<tr>
<td>Total</td>
<td>45,382</td>
<td>40,039</td>
<td>47,811</td>
<td>75,446</td>
<td>51,037</td>
</tr>
</tbody>
</table>

Loans and exchange programs

The exchange of herbarium specimens between herbaria is essential to make botanical research possible.

Specimens can be offered to another herbarium on the basis of a temporary agreement, as a loan, on a permanent basis as a gift, or as part of an exchange programme. What is clear is that the number of exchanges, both incoming and outgoing, have sharply fallen in 2014. This is explained by a sharp decline in exchanges from Wageningen following a previous effort to receive all relevant material prior to the transfer of the Wageningen’s herbarium to Leiden in 2014. The transfer of the Botanic Garden to the Flemish Community has also meant the legalistic transfer of some of its herbarium collections. These include: the collections of Van Heurck (AWH, circa 250,000 specimens), Imler (5,154 specimens), Brulants (1,686 specimens) and Antonissen (793 specimens). Approximately 6.5% of the herbarium collection belongs to the Flemish Community.

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incoming exchange</td>
<td>3,249</td>
<td>11,261</td>
<td>7,892</td>
<td>15,536</td>
<td>853</td>
</tr>
<tr>
<td>Incoming gift</td>
<td>9,668</td>
<td>2,463</td>
<td>8,591</td>
<td>3,918</td>
<td>7,141</td>
</tr>
<tr>
<td>Incoming loan</td>
<td>595</td>
<td>539</td>
<td>2,391</td>
<td>678</td>
<td>1,394</td>
</tr>
<tr>
<td>Outgoing exchange</td>
<td>1,426</td>
<td>2,897</td>
<td>1,655</td>
<td>1,991</td>
<td>459</td>
</tr>
<tr>
<td>Outgoing gift</td>
<td>177</td>
<td>221</td>
<td>175</td>
<td>128</td>
<td>116</td>
</tr>
<tr>
<td>Outgoing loan</td>
<td>2,012</td>
<td>3,114</td>
<td>1,701</td>
<td>2,366</td>
<td>2,430</td>
</tr>
</tbody>
</table>
### Acquisition to the library

The number of acquisitions to the library remained stable in 2014. Approximately one third of the acquisitions belonged to the Flemish Community. Approximately two thirds were added from Federal Patrimony, these were books ordered at the end of 2013 with funding from the Federal budget, but were only delivered in 2014 and books from the research library which were not centrally recorded. A small number of books are the property of the Royal Belgian Botanical Society, whose library is accommodated in the Botanic Garden.

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monographs</td>
<td>3,124</td>
<td>1,244</td>
<td>1,035</td>
<td>926</td>
<td>965</td>
</tr>
<tr>
<td>Periodical fascicles</td>
<td>3,000</td>
<td>3,025</td>
<td>2,733</td>
<td>2,500</td>
<td>2,500</td>
</tr>
</tbody>
</table>

### Databank of the library

The number of records in the database grew steadily. The complete catalogue, available online, contains more than 125,000 records.

### Monographs

<table>
<thead>
<tr>
<th>Year</th>
<th>Flemish</th>
<th>Federal</th>
<th>Royal Botanical Society of Belgium</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>315</td>
<td>615</td>
<td>35</td>
</tr>
</tbody>
</table>

### Figures

- Articles: 48,516, 48,834, 49,030, 49,150, 49,404
- Series: 4,475, 4,596, 4,695, 4,789, 4,828
- Correspondance: 7,300, 7,443, 7,444, 7,444
- Monographs: 47,500, 48,796, 49,969, 50,743, 51,268
- Valuables: 3,383, 3,385, 3,386, 3,421, 3,461
- Serials: 8,352, 8,742, 8,979, 9,117, 9,168
- Iconographic material: 0, 500, 560, 1,554, 2,185
External library access

The library is accessible to the public. However, the number of visits has fallen sharply. This trend is expected to continue considering that many botanical publications are available online. The Botanic Garden actively participates in various digitalisation projects. The number of inter-library loans recorded a strong increase.

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>External visitors</td>
<td>494</td>
<td>504</td>
<td>457</td>
<td>440</td>
<td>342</td>
</tr>
<tr>
<td>Loans between libraries</td>
<td>58</td>
<td>49</td>
<td>61</td>
<td>58</td>
<td>95</td>
</tr>
</tbody>
</table>

Research

Number of publications

The number of scientific publications by research staff increased strongly, especially the number of publications with impact factor. The relationship between publications with impact factor and without impact factor reached their highest level and is now 64%. It is the intention to let this rise further, without losing sight of more local, but often very important research.

<table>
<thead>
<tr>
<th>Year</th>
<th>Manuscripts and book chapters</th>
<th>Abstracts of posters or presentations</th>
<th>Other publications (reports, book reviews,...)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>64</td>
<td>61</td>
<td>5</td>
<td>130</td>
</tr>
<tr>
<td>2011</td>
<td>114</td>
<td>26</td>
<td>18</td>
<td>158</td>
</tr>
<tr>
<td>2012</td>
<td>83</td>
<td>72</td>
<td>14</td>
<td>169</td>
</tr>
<tr>
<td>2013</td>
<td>116</td>
<td>50</td>
<td>26</td>
<td>192</td>
</tr>
<tr>
<td>2014</td>
<td>131</td>
<td>100</td>
<td>14</td>
<td>245</td>
</tr>
</tbody>
</table>
The average impact factor of the manuscripts by staff members of the Botanic Garden declined further to 2.04. The reason for this decline is due to more publications which appeared in periodicals with an impact factor. Due to the purpose of the research, these periodicals often have a relatively low impact factor. It remains a goal to combine fundamental with more applied research.
Publications

Peer-reviewed publications with impact factor authored or co-authored by staff of the Garden


• Sanín D. (2014) Serpocaulon obscurinervium (Polypodiaceae), a new fern species from Colombia and Ecuador. Plant Ecology and Evolution 147: 127–133. (IF 2013 = 0.96)


Verloove F. (2014) Scirpus hattorianus (Cyperaceae), newly reported for Europe, naturalized in France. Willdenowia 44: 51-55. (IF 2013 = 0.307)


Wetzel C.E., Van de Vijver B., Kopalova K., Hoffmann L., Pfister I. & Ector L. (2014) Type analysis of the South American diatom Achnanthes haynaldii (Bacillariophyta) and description of Planothidium amphibium sp. nov., from aerial and aquatic environments in Oregon (USA). Plant Ecology and Evolution 147: 439-454. (IF 2013 = 0.96)


Van De Vijver B. (2014) Analysis of the type material of Navicula brachysira Brebisson with the description of Brachysira sandrae, a new raphid diatom (Bacillariophyceae) from Iles Kerguelen (TAAP, sub-Antarctica, southern Indian Ocean). Phytotaxa 184: 139-147. (IF 2013 = 1.376)

Peer-reviewed publications without impact factor authored or co-authored by staff of the Garden

The Garden’s team

Staff Flemish Community

- Asselman Sabrina
- Ausloos Gert
- Baert Wim
- Ballings Petra
- Behwa Baguma
- Bellanger Sven
- Bellefroid Elke
- Bockstael Patrick
- Bogaerts Ann
- Borremans Paul
- Brouwers Erwin
- Cammaerts Thomas
- Cassaer Ronny
- Clarysse Katrien
- Claus Liliane
- Cnop Rony
- Coqueryt Christine
- Cremers Stijn
- Dardenne Christel
- De Backer Rita
- De Block Petra
- De Bondt Hendrik
- De Bondt Leen
- De Buysers William
- De Coster An
- De Groote Anne
- de Haan Myriam
- de Jonge Gerrit
- De Kesel André
- De Medts Steve
- De Meeter Ivo
- De Meeter Niko
- De Meyer Frank
- De Meyere Dirk
- De Pauw Kevin
- De Smedt Sofie
- Decock Marleen
- Dehertogh Davy
- Delcoigne Daphne
- Deraet Nancy
- Derammelaere Stijn
- Dercqke Marleen
- Dessein Steven
- D’Hondt Frank
- Engledow Henry
- Es Koen
- Esseleens Hans
- Faicz Samuel
- Franck Pieter
- Gheys Rudy
- Ghijs Dimitri
- Groom Quentin
- Hanssens Francis
- Heyvaert Karin
- Heyvaert Louisa
- Hoste Ivan
- Houdmont Karel
- Huyberechts Sonja
- Janssens Steven
- Janssens Marina
- Kaissoumi Abdennadi
- Kleber Jutta
- Kosolosky Chris
- Laenen Luc
- Lanata Francesca
- Lanckmans Peter
- Lanin Lieve
- Lanin Peter
- Lanin Myriam
- Lachenal Olivier
- Le Pajolec Sarah
- Leyman Viviane
- Lips Jimmy
- Looverie Marleen
- Maerten Christophe
- Mato Kelenda Bibiche
- Mertens Micheline
- Mombaerts Marijke
- Mote Salvador
- Peeters Kathy
- Peeters Marc
- Postma Susan
- Puttenaers Myriam
- Reusens Dirk
- Reynders Marc
- Robberechts Jean
- Ronse Anne
- Ryken Els
- Saëys Wim
- Schaillée David
- Scheers Elke
- Schoemaker Erika
- Schoevaerts Johan
- Schuurman Riet
- Sosef Marc
- Speliers Wim
- Steppe Eric
- Stoffelen Piet
- Sweerts Danny
- Tavernier Wim
- Taylor Jonathan
- Thelemans Tom
- Tilley Maarten
- Tytens Liliane
- Van Bael Nand
- Van Caekenberghe Frank
- Van Campenhout Geert
- Van Damme Vivek Seppe
- Van De Kerkhove Omer
- Van De Perre Frederic
- Van de Vijver Bart
- Van De Vyver Anne
- Van Den Borre Jeroen
- Van Den Broeck Mia
- Van den Broeck Andreas
- Van Den Hoornel Jean
- Van Den Troost Gery
- Van Der Beeten Iris
- Van Der Jeugd Michael
- Van Der Plassche Thierry
- Van Eckhoudt Jozef
- Van Eckhoudt Lucienne
- Van Gijsenheem Jeanine
- Van Grimbergen Dieter
- Van Hamme Lucienne
- Van Herp Marc
- Van Hoeve Manon
- Van Humbeeck Linda
- Van Humbeeck Jozef
- Van Opstal Jan
- Van Ossel Anja
- Van Paeschen Bénédicte
- Van Renterghem Koen
- Van Wal Rita
- Van Wambacq Paul
- Vandeven Philip
- Vanderstraeten Dirk
- Vanwinghe Petra
- Vekens Odette
- Verdict Nathalie
- Verdict Jozef
- Verdonek Carina
- Verissimo Nuno
- Verlinden Kevin
- Verlinden Willy
- Verloove Filip
- Vermeersen Berend
- Vermeesen Jochen
- Versael François
- Versael Ilse
- Verschueren Alice
- Vleminckx Sabine
- Vleminckx Kevin
- Vloerbergen Jospeh
- Willems Stefaan
- Würtzen Barend
- Zerard Carine

Staff French Community

- Beau Natacha
- Charavel Valérie
- Deguée Jérôme
- Denis Alain
- Diage Denis
- Dubroca Yael
- Ertz Damien
- Etienne Christophe
- Fabri Régine
- Fernandez Antonio
- Fraiture André
- Galluccio Michele
- Gerstmanns Cyrille
- Godefroid Sandrine
- Hanquart Nicole
- Hidvégi Franck
- Jospin Xavier
- Lahaye Chantal
- Lekeux Hubert
- Magotteaux Denis
- Mandy Guillaume
- Orban Philippe
- Raspé Olivier
- Reubrech Guy
- Rombout Patrick
- Salmon Géraud
- Stuer Benoit
- Telka Dominique
- Van Onacker Jean
- Van Rossum Fabienne
- Vanderboght Thierry

- Jospin Xavier
- Lahaye Chantal
- Lekeux Hubert
- Magotteaux Denis
- Mandy Guillaume
- Orban Philippe
- Raspé Olivier
- Reubrech Guy
- Rombout Patrick
- Salmon Géraud
- Stuer Benoit
- Telka Dominique
- Van Onacker Jean
- Van Rossum Fabienne
- Vanderboght Thierry
Volunteers

- Adams An
- Aerts Lutgarde
- Bailly Francine
- Bastin Dominique
- Baumers Maarten
- Belmans Lucie
- Berckx Anna-Maria
- Bockstael Annie
- Boyker Victor
- Buelens Luc
- Cammaerts Lisette
- Cappelleman Ingrid
- Chashanovski Zvi
- Claes Philippe
- Claessens Alfons
- Coen Marie-Laure
- Connrot Claire
- Corluy Karl
- Cuvy Bruno
- De Beer Dirk
- de Borman Sandrine
- de Coninck Hans
- De Cuyper Jozef
- De Hondt Eugeen
- De Meuter Pascale
- De Praetere Claude Anne
- De Ronghé Rose-Marie
- De Smet Françoise
- De Wit Daniël
- Dehaes Maria
- Delière Sandra
- Devolder Christiane
- Doutrleopont Hugues
- Dubois Martine
- Dumont Anne-Marie
- Durant Daniël
- Edmunds Clive
- Erpelding Nathalie
- Exsteen Walter
- Fabré Lisette
- Fourmanois Frédéric
- Ghysens Godelieve
- Gonçalves Bianca
- Goossens Flor
- Horions Christiane
- Houben Guido
- Huriaux Thierry
- Jacobs Ludo
- Jessen Georgeette
- Kozloski Elisabeth
- Lecomte Josiane
- Lepage Pierre
- Lokadi Valère
- Lucas Mireille
- Mager Gertrude
- Maton Bernard
- Meerburg Andreas
- Mertens Jan
- Mignolet Vinciane
- Minost Claire
- Moesen Piet
- Morel Maxence
- Peeters Henrica
- Putman Didier
- Puttemans Barbara
- Ramia Malik
- Ray Anne
- Rombauts Luc
- Salazar Renaldo
- Sanin Robayo David
- Sasson Diana
- Scheers Patricia
- Schibea Maria
- Schotte Marleen
- Semeria Claudia
- Shutt Richard
- Speckaert Claudine
- Sterckx Marie-Louise
- Strack Van Schijndel Maarten
- Swyncoep Muriel
- Tavernier Paul
- Thielemans Lea
- Traïbi Malika
- Valckx Jan
- Valles Maria
- Van Asch Solange
- Van Bueren Gerda
- Van Camp Karel
- Van Capellen Gisèle
- Van Conkelberge Luc
- Van De Casteele Geertrui
- Van den Broeck Martine
- Van der Straeten Elza
- Van Kerckhoven Leo
- Van Lier René
- Van Rossum Maria
- Vandelloo Rita
- Vanden Bavière Cécile
- Verdickt Hilde
- Verellen Lucie
- Verelst Tim
- Verlinden Hugo
- Verswyvel Myriam
- Vivignis Patrick
- Wagemans Emiel
- Wagemans Philip
- Wens Monique
- Wursten Barend

Guides

- Bailly Francine
- Benit Danielle
- De Cock Marianne
- De Cuyper Jef
- Delière Sandra
- Geernaert Inge
- Kozloski Elisabeth
- Mortelmans Bieke
- Proost Alida
- Silverans Michel
- Steensels Steven
- Talloen Paul
- Tavernier Patrick
- Van Acoleyen Roger
- Van de Vijver Martine
- Van den Broeck Martine
- van Lidth Bénédicte
- Van de Wijde Vida
- Vanderherten Frank
- Verbist Brigitte
- Verschuuren Frans
- Wayembergh Lisiane
- Wymeers Miet

Honorary research associates

- Billiet Frieda
- Champluvier Dominique
- Compère Pierre
- Geerinck Daniel
- Jongkind Carel
- Malaisse François
- Pauwels Luc
- Rameloo Jan
- Robrecht Elmar
- Sanin David
- Sharp Cathy
- Sonke Bonaventure
- Sotiaux André
- Steierraere Herman
- Vanderweyden Arthur
- Vanhecke Leo
- Verstraete Brecht
- Vrijdaghs Alexander

Trainees

- Moortgat Niels
- Van Hove Siemen
- Loeckx Yentl
- Bauman David
- Conte Mariama
- Pinseel Eveline
- Embrechts Sander
- Gyssens Paola
- Cauwelier Daan
- Gertrude Leanne
- Romburghe Kevin
- Borms Jorden
- Van Hamersveld Muriel
- Tilley Amber
- Hamiti Noura
- Bzayar Ayoub
- Vismoya Petra
- Colquelle Claire
- Bataillard Nina
- Zemagho Mbouzang Lise
- Lisoko Anaclét
- Van Herp Michiel
- Moysens Michiel
- Vadhanarat Sanhiti
- Havyarimana Georges
- Milenge Kamalebo Héritier
- Ingelbos Benjamin
- Lolai Dorian
- Temple Sophie
- Van Cauwelaert Ellen
- Yian Claver
- Tiebackx Matthew
Building a sustainable future through discovery, research and conservation of plants.

**Botanic Garden Meise**

**A portrait**

**A Garden with a long history...**
Older than Belgium, the earliest roots of Botanic Garden Meise can be traced to 1796, meaning that we have been working with plants for over two centuries. The Garden comprises 92 ha and includes many historical buildings, including a castle that dates back to the 12th century.

**With unique collections...**
The Garden has a large herbarium housing about 4 million specimens and containing the largest Rosa herbarium of the world and important historical collections from Brazil and Central Africa. It also has a botanical library holding over 200,000 volumes, comprising publications from the 15th century to modern day.

**With the mission to conserve plants...**
The Garden holds a collection of about 18,000 different kinds of living plants, among which several are threatened, such as the Laurent cycad (*Encephalartos laurentianus*). The Garden also houses an internationally recognised seed bank including inter alia the seeds of numerous wild bean species.

**To study plants and fungi...**
Activities of our scientists to inventory and study plant, fungal and algal diversity span the globe; from Antarctica to the rainforests of Congo. The scientific work focuses on the correct and scientific identification of plant species. What are the characteristics of a species? How many species are there? How do we distinguish one species from another? Without answers to these questions no economic activity based on plants or plant derived product could function. Knowing the correct scientific name of a species is the key that unlocks all information on this species. Correctly identifying a species helps us to recognise poisonous species from related medicinal ones. It helps us to establish if a plant species is threatened by extinction and in need of protection.

**To teach about plant diversity...**
On a yearly basis approximately 100,000 people visit the Garden. Most of our visitors come to explore the glasshouses and the gardens, but, of course, there is more. Our scientists fully realise the importance of sharing their knowledge, passion and enthusiasm with the public. Botanic Garden Meise has developed a range of tools to spread knowledge about plants and to raise public awareness about plant conservation. Our website www.botanicgarden.be offers an overview of current activities in the Garden.

**Our mission**

Building a sustainable future through discovery, research and conservation of plants.

**Our values**

The six guiding values of the Garden, necessary to keep us growing and flourishing.

**One team, one mission**
The staff of the Botanic Garden are team players. We combine our talents to realise our goals; through a process of consultation we are all responsible for its success.

**Respect for diversity**
We should be respectful and considerate to everyone with whom we come into contact. We appreciate their individuality and diversity. Our colleagues deserve respectful cooperation and professionalism.

**Delivering a professional service**
In performing our tasks and developing new ideas we always have the needs and expectations of our internal and external customers in mind.

**An eye for sustainability**
As professionals in environmental sciences, we have a responsibility for being role models in creating a healthy environment for people and plants.

**Open communication**
We should communicate openly and honestly in our daily work and decision making. Sharing useful information serves the common good. Problems should be shared and solutions sought together with discretion where necessary.

**Strive for excellence**
Our objectives are achieved to a high standard in an efficient and honest manner. We are always open to constructive criticism and we should critically evaluate our work and dare to make adjustments where necessary.
This report is also available in Dutch and French and can be downloaded from our website www.botanicgarden.be

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