



PLANTS PEOPLE  
POSSIBILITIES

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## Collections at the Royal Botanic Gardens, Kew

More than 1.35 million people pass through the gates of the Royal Botanic Gardens, Kew every year. They come to view the breathtaking displays of flowers and trees, take in exhibitions, admire the historic and cutting-edge architecture and participate in colourful, seasonal events. But behind the scenes, and largely hidden from view, the Royal Botanic Gardens, Kew is a leading powerhouse for botanical scientific research, plant conservation and cataloguing the botanical world – a role that is never more important in the UN's International Year of Biodiversity.

Almost every conservation project in the world that aims to protect plants and their habitats relies on the wealth of information that the Royal Botanic Gardens, Kew and its partner organisations have gathered over 250 years of study (the botanical organisation celebrated its 250<sup>th</sup> anniversary in 2009). These collections – which can be divided into living and genetic resource collections, preserved plant and fungal collections and documentary and visual reference collections – offer an opportunity to explore Royal Botanic Gardens, Kew's rich history and heritage and its present day role in championing plant conservation and the sustainable use of plants in the UK and around the world through the Breathing Planet Programme [www.kew.org/breathingplanet](http://www.kew.org/breathingplanet)

### The Herbarium

**The Herbarium collection** contains some eight million preserved plant and fungal specimens, representing 98 per cent of all the genera of the world. Tucked away from the public gaze, the Herbarium was founded in 1852 and is at the heart of all Royal Botanic Gardens, Kew does. It houses a maze of cabinets where specimens are meticulously filed in systematic order, according to the characteristics of their flowers, leaves, stems, fruit and roots. The Royal Botanic Gardens, Kew's plant taxonomists – botanists who specialise in identifying, naming and classifying plants – constantly keep the collection up to date by studying, naming and curating existing and incoming specimens and researching the relationships and classification of plants. The collection held in the Royal Botanic Gardens, Kew's Herbarium underpins much of the botanical work conducted around the world. It also houses specimens collected by some of Britain's most esteemed scientists and explorers such as Charles Darwin, Joseph Hooker, David Livingstone, John Hanning Speke, Richard Spruce, and Ernest 'Chinese' Wilson.

The vast majority of the specimens are plants stored in dried form, mounted on stiff paper. In addition to dried and pressed plants, the Herbarium also includes a fleshy flowers and fruits **Spirit collection** – 70,000 specimens, preserved in fluid and stored in glass. Bulky plant parts that cannot be easily pressed, such as palm fronds, are dried and stored in boxes.

Royal Botanic Gardens, Kew is also home to the world's largest and most comprehensive **collection of fungi** – over 1.2 million specimens including mushrooms, moulds and other microfungi.

Founded in 1879, Royal Botanic Gardens, Kew's mycological collection is one of the most important reference collections of fungi in the world and mycologists (fungi scientists) at Kew have carried out pioneering research on fungi for over a century.

From Antarctica to the tropics, more than 1 million fungi specimens from every part of the globe are represented in the collection – including mushrooms, moulds and other microfungi – and it continues to grow at a rate of three to four thousand specimens every year.

The collection is backed by an unrivalled mycological library containing classical works, modern texts, and specialist journals. It is one of the most complete reference collections of literature on fungi to be found anywhere.

Despite the importance of fungi in pharmaceuticals, agriculture, biotechnology, food and soil science, only an estimated 5 % of species have been described – estimates suggest that over 1.5 million species of fungi exist. Vital work is being done by the mycology team at Kew to shed new light on these unknown species.

This lack of understanding can hinder conservation and restoration projects, since the types of plants which grow in an area are often dependent on the fungi present in the soil. This is true of about 80% of all plants.

The Royal Botanic Gardens, Kew is committed to making its Herbarium collections more accessible to botanists and others around the world for use in their own research, particularly in biodiversity, conservation, sustainable development and systematics. To enable this, the Royal Botanic Gardens, Kew is building an electronic Herbarium catalogue of specimen images and information taken from their collection labels. In addition, the Royal Botanic Gardens, Kew is heavily involved in large digitization projects such as the African Plants Initiative (API) and the Latin American Plant Initiative (LAPI). These international collaborations will produce online databases for plants from Africa and Latin America respectively, making it possible to combine searches and access digitised material from collections held all over the world.

In 2010 a new wing of the Herbarium, Library, Art and Archives opens, creating an additional 40 years of specimen storage space (each year the collection of preserved plant specimens grows with 30,000 new additions). As well as housing hundreds of thousands of plant specimens, it will provide new, state of the art space for the Royal Botanic Gardens, Kew's Library, Art and Archives collection.

For more information

Herbarium collection see [www.kew.org/collections/herbcol.html](http://www.kew.org/collections/herbcol.html)

Electronic Herbarium catalogue see <http://apps.kew.org/herbcat/gotoHomePage.do>

The Spirit collection see [www.kew.org/collections/spiritcol.html](http://www.kew.org/collections/spiritcol.html)

The Mycological Collection <http://www.kew.org/about-kew/press-media/press-releases-kew/fungi-collection-reaches-1-million/index.htm>

Digitising collections see [www.kew.org/data/herb\\_digitisation.html](http://www.kew.org/data/herb_digitisation.html)

## Library, Art and Archives

**The collection of letters, books, maps, journals, botanical art and illustrations, manuscripts and photographs** is one of the premier and largest sources of botanical information in the world. They are working collections, used by Royal Botanic Gardens, Kew's staff and visiting scientists, historians and art historians for research. Increasingly the collections are also accessed by designers and artists seeking inspiration. Some items extend beyond Royal Botanic Gardens, Kew's 250 year history, with the oldest items in the Library

being printed herbals, or plant books, dating from the 15th century and the early years of printing.

The curators of the Library, Art and Archives are responsible for **one of the largest collections of botanical art**, both prints and original arts works in various media, in the world. The collection totals some 200,000 items. It ranges in date from the great masters of botanical illustration, such as GD Ehret, PJ Redouté and the Bauer brothers in the 18th century through to Walter Hood Fitch and Marianne North in the 19th century. A high proportion of the originals prepared for *Curtis's Botanical Magazine*, the longest running 200 year old botanical periodical, also feature; together with 20th-century contributors such as Lilian Snelling, Stella Ross-Craig, Mary Grierson and Margaret Stones. Present-day artists represented include Christabel King, Ann Farrer and Pandora Sellars.

A small fraction of these art works is on display in **The Shirley Sherwood Gallery**, which opened its doors to the public on 19 April 2008. The Shirley Sherwood Gallery marks the first time Royal Botanic Gardens, Kew has had a permanent space dedicated to exhibiting these precious, fragile art works in the right environmental conditions. The **Marianne North Gallery**, which is joined to The Shirley Sherwood Gallery by a linking gallery, is exclusively dedicated to the art of the intrepid, globe-trotting Victorian artist. The result of her epic journeys to far-flung corners of the world can be seen in the gallery named after her.

With the help of a £1,867,000 Heritage Lottery Fund grant, a restoration project is underway: building features have been repaired and environmental conditions have been improved. The renovated Gallery, hung with high quality facsimiles of the painting collection, reopened to the public in October 2009 as part of the organisation's 250<sup>th</sup> anniversary celebrations. The restoration project continues throughout 2010 with a team of conservators working behind the scenes restoring the painting collection. The Conserved Painting Collection will return to the Gallery in Autumn 2010. For more information visit [www.kew.org/mng](http://www.kew.org/mng)

The **Archives** contain the official records of the Royal Botanic Gardens, Kew, and the papers and correspondence of the many botanists who were sent on collecting expeditions on behalf of the Royal Botanic Gardens, Kew. They form a valuable resource on the history of the discovery, study, transfer and use of the world's plants and fungi. There is also a special section on the history and development of the Royal Botanic Gardens, Kew, called *Kewensia*. It includes books and news clippings about Kew and also holds a volume of poetry with the earliest published poem mentioning the Gardens.

The **Library's** main subject area is plant taxonomy, but it also contains material on specialised horticulture, horticultural history, and a collection of material on botanic gardens and garden history. There is also a collection of maps and travel literature relating to expeditions and regions of botanical importance.

For more information see <http://www.kew.org/library/about.html#colls>

### **Economic Botany Collection**

The Centre for Economic Botany, which curates plant artefacts from around the world in the Economic Botany Collection, is also part of the Herbarium, Library, Art and Archives. The Economic Botany Collection (EBC) is a rich collection of more than over 83,000 plant-based artefacts from around the world that illustrate the significant role plants have played in human culture and development. It is managed by Royal Botanic Gardens, Kew's *Sustainable Uses of Plants* group in the Jodrell Laboratory. Medicines, clothing, weapons, jewellery, paper and musical instruments are just some of the items that feature in the vast, chilled storage room that is home to the EBC. A selection of these is on display in Kew's *Plants and People* exhibition.

The collection was founded by Royal Botanic Gardens, Kew's first official director, Sir William Hooker, in 1847. The items in the EBC reflect the history of Royal Botanic Gardens, Kew and the fascinating role it has played in the history of Britain and world economics.

The ECB is a global treasure chest with one of the world's finest wood collections (32,000 samples from 12,000 species); bottles of the finest essential oils; original samples of materials at the beginning of their trials for commercial and industrial production; crude drug specimens such as *Cinchona* (quinine) barks used in the treatment of malaria; and all manner of plant-based curiosities. They have come from companies and long-closed museums; from diplomats such as Sir Harry Parkes who, based in Japan in the late nineteenth century, made renowned collections of surprising items such as delicate hair ornaments and water-proof coats fashioned from the bark of the paper mulberry tree; from explorers such as Richard Spruce who spent 15 years in the Amazon from 1849 and collected artefacts from local Indian tribes; from scientists such as Hooker himself and countless others, many of them famous names.

Contemporary, but perhaps fast disappearing objects from regions being researched by Royal Botanic Gardens, Kew's own botanists are still being added to the EBC today.

For more information see [www.kew.org/collections/ecbot/](http://www.kew.org/collections/ecbot/)

## Collections in the Jodrell Laboratory

### DNA Bank

A vast whirring freezer in the Jodrell Laboratory contains over 37,000 samples of plant DNA material, representing more than 32,500 species of vascular plants, almost 6,000 genera of plant species and almost all families, all stored at -80°C. The DNA Bank, already the world's largest store of genetic material from wild plant species, is growing all the time, with more than 4,500 samples added in 2008. In some ways a "hi-tech version of the Herbarium", DNA samples are sent all over the world to organisations that are involved in plant research and conservation.

For more information see [data.kew.org/dnabank/](http://data.kew.org/dnabank/)

### Anatomical Slide Collection

Royal Botanic Gardens, Kew also has an extensive reference collection of around 100,000 anatomical microscope slides of plant fragments including leaves, stems, roots and a large number of wood sections. The collection is used in forensic research to help identify plant material for organisations such as the police; as well as archaeologists, antique dealers, hospitals, vets, furniture restorers and HM Revenue and Customs.

In the UK, Kew is the Scientific Authority for Plants for Cites. This means it is the first port of call when customs officers seize plants or products made from plants and need to identify whether or not they are made from endangered materials such as ramin. Ramin is the common name given to a number of tropical hardwood tree species native to the peat swamp forests of South East Asia and the South Pacific, which are important carbon sinks. It is often made into pool cues, blinds and tool handles.

For more information see [www.kew.org/scihort/applanat.html](http://www.kew.org/scihort/applanat.html)

## Kew's Millennium Seed Bank

Kew's Millennium Seed Bank is the largest wild plant seed bank in the world. Based at Wakehurst Place, Kew's sister site in West Sussex, the Millennium Seed Bank is home to more than a billion seeds, each with the potential to become a plant. It contains seeds from

around 30,000 (10%) of the world's wild flowering plant species as an insurance policy against loss of these species in the wild. The aim is to conserve 25% by 2020 – one in four of the world's plants. The seeds are stored in an underground vault at  $-20^{\circ}\text{C}$ . To access the vault, visitors have to don a protective suit.

Kew's Millennium Seed Bank has the capacity to store up to half the world's wild flowering plant species and already holds 96% of the UK's flora. Species for collection and conservation are prioritised by the 123 organisations in the Millennium Seed Bank Partnership: all are endangered, rare or of potential economic value.

But the idea is not to lock these seeds away. Where species have gone extinct, or are on the brink of disappearing, Kew's stores are used to replenish wild populations. Seed from Kew's Millennium Seed Bank is currently being used in species re-introduction and habitat restoration programmes worldwide. Examples include the restoration of tall grass prairie in the USA; restoration and fire management of sand plain fynbos in South Africa; reintroduction of starfruit in the UK; and restoration of mined land in Australia and Madagascar.

Kew's Millennium Seed Bank also ensures that seeds are made available for research in areas such as combating desertification; identifying plants that can tolerate high salt content in soil; and seeking photosynthetically efficient crops and pharmaceutically active species. Scientists from around the world use the seed collection, including Royal Botanic Gardens, Kew scientists based at the Jodrell Laboratory within Kew Gardens. Examples of how seed from Kew's Millennium Seed Bank is currently being used in partner countries includes developing drought resistant forage plants for animals to graze in Egypt and culturing threatened medicinal plant species that are in danger of disappearing in Pakistan. Used in this way, seeds from Kew's Millennium Seed Bank will be vital tools if people are going to adapt to climate change.

For more information see [www.kew.org/msbp](http://www.kew.org/msbp)

## The Living Collection

Kew Gardens has the largest living plant collection in the world, with 30,000 different kinds of plants. The beauty of the Gardens, and its Grade 1 listed historic landscape, is the foundation of Kew's ability to attract the visiting public and educate them about the importance of the plant world. The collections include exotic carnivorous plants; rare orchids; over 14,000 trees, including the wollemi pine which is endangered in the wild in its native Australia; palms, including Royal Botanic Gardens, Kew's newest discovery from Madagascar, *Tahina spectabilis* – or the 'suicidal palm' – the seedlings of which are being cultivated behind the scenes in the Jodrell Glass Nursery; grasses, including bamboo, economically important cereals and a British native grass species, *Bromus interruptus*, extinct in the wild; delicate alpine plants; giant water lilies and a foul-smelling titan arum in the Princess of Wales Conservatory. The oldest glasshouse plant in the Gardens, a cycad, is found in the iconic Palm House. *Encephalartos altensteinii* was introduced from South Africa in 1775.

For more information see [www.kew.org/collections/plants.html](http://www.kew.org/collections/plants.html)

**Ends**

Contact the Royal Botanic Gardens, Kew press office on telephone +44 (0) 20 8332 5607 or e-mail [pr@kew.org](mailto:pr@kew.org)