



PLANTS PEOPLE  
POSSIBILITIES

**Press information: August 2010**

## **Herbarium, Library, Art and Archives**

The Herbarium at the Royal Botanic Gardens, Kew contains some eight million preserved plant and fungal specimens, representing 98% of all known genera (1). Each year the collection grows with over 35,000 new additions.

In autumn 2010, a new extension is being launched as part of the Royal Botanic Gardens, Kew's celebrations to mark the United Nation's International Year of Biodiversity. As well as housing hundreds of thousands of plant specimens, it will provide a new, state-of-the-art space for the Royal Botanic Gardens, Kew's outstanding Library, Art and Archives Collection.

Kew will mark the opening of the new wing by announcing the results of the Sampled Red List Index (SRLI) for Plants – a global analysis of extinction risk for the world's plants. Up until now the plant and conservation world had a good idea about the extent of threat to plants, but had not produced a scientifically rigorous evidence based study to confirm this to the wider world. The SRLI for Plants does just that and will help ensure conservation of plants, and the animals that rely on them for their survival, is targeted and affected.

The threat of climate change, combined with concerns about biodiversity loss, over-exploitation and invasive species, is predicted to accelerate the loss of plants to a level unparalleled in human history. It is predicted that a temperature rise of 2-3°C could put up to half the world's plant species at risk of extinction (2). The Royal Botanic Gardens, Kew is committed to using its scientific research to help communities worldwide mitigate and adapt to climate change.

Many specimens from the Herbarium collection are available online and accessible to researchers across the globe. Correct identification and understanding of plants lies at the foundation of all biodiversity conservation work, and will form an important part of our struggle with climate change.

The Herbarium, Library, Art and Archives is based in a much extended 18<sup>th</sup> century Grade II listed building on Kew Green. This was originally named Hunter House and was occupied by the King of Hanover until his death in 1851. Following its foundation in 1853, the Herbarium collections held at Kew Gardens grew with the amalgamation of private collections, including the personal herbaria of some of Britain's most celebrated scientists and explorers. Sir William Hooker, George Bentham, Charles Darwin, Joseph Hooker, David Livingstone, John Hanning Speke, Richard Spruce and Ernest 'Chinese' Wilson are just a few of the famous names whose collections can be studied in the Herbarium.

### **The Herbarium**

The Herbarium contains over 350,000 type specimens – the original specimens on which new species descriptions have been based. These specimens, some dating back to the 18<sup>th</sup> century, are the ultimate reference point for a species, fixing a plant name for all time. They are invaluable to researchers and they represent a major and irreplaceable international asset. Type specimens are vouchers for plant names, so they are the essential reference point for a name that botanists consult in seeking to apply names correctly.

Dried and pressed plants (or parts of large plants) attached to a sheet of archival paper with a label attached in the bottom right hand corner to indicate origin, collector, number and identity. Additional information, such as local uses, is often included in the label information.

The specimens are filed in systematic order, according to characteristics of their flowers, leaves, stems, fruit and roots. The Royal Botanic Gardens, Kew is moving towards arranging its collection according to their affinities as revealed by DNA analysis combined with classical morphological studies, which groups plants into families according to form and structure, and then these are subdivided into genus and species.

Some dried specimens are stored in boxes such as palm fronds or large fruits. These are plant parts that are too large or awkwardly shaped to be pressed and mounted, such as palm fronds or large fruits.

The Herbarium also holds a **spirit collection**, preserved in liquid, containing plants that cannot be pressed, preserved in liquid. Fleshy fruits and intricate flowers, such as orchids, are preserved using a mixture of methylated spirit (to stop mould and fungus from attacking the sample), formaldehyde (which fixes the plants as they are), glycerol (to prevent the specimen going brittle) and water. The Royal Botanic Gardens, Kew spirit collection is probably the largest botanical spirit collection in the world. The preserved collection has been built up over 150 years and it is now one of the world's most comprehensive. It is actively used as a reference for the accurate identification of plants, scientific studies including plant biochemistry, DNA sequencing and surveys of plant diversity to assist conservation, together with studies of plant uses including use by local people for medicinal and nutritional purposes.

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. It is estimated that only 10% of the world's fungi have been named. Kew mycologists have pioneered research into tropical and equatorial fungi from the Amazon to Australia.

More than 100 people work in the Herbarium, including expert plant taxonomists, digital map experts and scanning technicians. In addition to staff who specialise in particular plant families (such as Legumes, Palms, Coffees or Grasses) there are five regional teams that study the floras of dry Africa, wet Africa, South America, temperate regions and South-east Asia.

The Royal Botanic Gardens, Kew has started **digitising and barcoding** its Herbarium specimens and 171,000 specimen images are already accessible online to researchers around the world. Each record includes information about where and when a plant was collected together with its present name and any past variations.

Geographic information from satellites is being combined with specimen data to analyse plant life in new ways. These digital maps are generated by a dedicated team, the **Geographic Information Systems (GIS) Unit**. GIS enables botanists to cross-reference information such as altitude and soil type to see where they are most likely to find species, and can inform conservationists and politicians to determine which areas are in most need of a protected status.

For more information visit;

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

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

The Spirit collection [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>

## **Library, Art and Archives**

The Library, Art and Archives collections includes over 150,000 books and a comparable number of pamphlets on plant taxonomy and systematics, horticulture, plant ecology and conservation, and the work of botanic gardens and herbaria. There are also 4,000 periodical titles, over 200,000 botanical illustrations and seven million sheets of archive material.

The illustrations collections range from the great masters of botanical illustration of the 18<sup>th</sup> Century, such as G.D. Ehret, P.J. Redouté and the Bauer brothers, through to Walter Hood Fitch in the 19<sup>th</sup> century. A high proportion of the early originals prepared for Curtis's Botanical Magazine, together with the work of 20<sup>th</sup> and 21<sup>st</sup> Century contributors are included in the collection.

The Archives contain the official records of the Royal Botanic Gardens, Kew, and the papers of many botanists, gardeners and other individuals. One of the largest sections of the archives collections is the Directors' Correspondence. This collection comprises the scientific correspondence received by senior staff from 1841 to 1928, and Sir William Hooker's pre-1841 correspondence, which he brought with him to Kew Gardens. For more information visit [www.kew.org/library/about.html#colls](http://www.kew.org/library/about.html#colls)

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 collection (83,000 items) illustrates the extent of human use of plants around the world. The huge variety of objects ranges from artefacts made from plants, to raw plant materials, including a large collection of wood samples. Uses range from food, medicine and utensils, to social activities and clothing. While the majority of these objects were acquired during the 19th and early 20th centuries, the collection continues to grow today. For more information [www.kew.org/collections/ecbot/index.html](http://www.kew.org/collections/ecbot/index.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)**

**Notes to editors**

(1) A genus is a taxonomic category consisting of a group of plant species with similar characteristics

(2) Plants and Climate Change: Which future? BGCI 2008-10-21