The World of Palms – Rediscovering Diversity

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An exhibition at the Botanic Garden and Botanical Museum Berlin-Dahlem in collaboration with the Royal Botanic Gardens, Kew, will run from 20 May 2011 through 26 February 2012. It provides a full introduction to palms.

Apart from palm enthusiasts, most people have no eye for the amazing richness and diversity of the palm family. For them, palms are mere symbols and iconic plants of the modern paradise, representing travel and leisure in tropical surroundings. Marketing experts, travel agencies, producers of soft drinks and other goods have long ago discovered how to use this persuading image most profitably. The iconic power of palms is so forceful that it may often detain people from paying attention and looking more closely at the diversity of palms.

The Botanical Museum Berlin-Dahlem encourages its visitors to look behind this image and (re)discover the diversity of the Principes, i.e. "sovereigns" of the plant kingdom, as this plant family was previously known. As one of the very few public museums in the world dedicated to plant taxonomy and plant diversity, we decided not to focus on a specific palm genus and its use, but to offer instead an overview of the entire "world of palms" with its approximately 2,400 species among 183 genera. Palms have been systematically collected, described, classified, investigated and displayed in conservatories and museum collections for more than two centuries. Although more than 150 years have passed since Carl Friedrich Philipp von Martius published the first attempt to classify the family of palms on a global scale in his *Historia Naturalis Palmarum* (1823–1853), working with palms still yields remarkable results and new species continue to be discovered every year. On the other hand, the use of palms by humans dates back to ancient times. Human colonization of the islands in the Pacific would not have been possible without them. Today, palm products are indispensable for our daily lives.

With only about 250 square meters of special exhibition space to fill, the biggest challenge for the Berlin exhibition team was to pick out the most relevant points in this huge and multifaceted topic. The advice of Bill Baker, head of palm research at the Royal Botanic Gardens Kew and his colleagues, was invaluable for this undertaking. On the one hand, we had to offer our visitors a comprehensible survey of the family with a limited number of stories, images and objects, while on the other hand, the stories we selected and the objects we focused on had to be reasonably attractive and emotionally appealing. Due to a close cooperation with RBG Kew we were able to include in our exhibition valuable specimens from the Palm Herbarium and rare artifacts from the Economic Botany collection at Kew.

The exhibit is divided into five chapters, each of which is marked by a specific sign: diversity, life histories, diversity of use, desire and palm islands. Apart from bilingual exhibition plates

1. View of the World of Palms exhibition at the Botanical Museum Berlin-Dahlem.

in German and English, the visitor's path is lined with numerous objects in showcases as well as hands-on interactive installations.

Diversity: A polo stick made of rattan catches the eye upon entering (Fig. 1). This deviation from the common tree form casually opens an eye for the diversity of stems and architecture. In contrast, the display of a sun hat made of *Hyphaene thebaica* fibers at first glimpse seems to comply with the popular belief that palms are mostly found in desert oases. However, the neighboring biogeography map explains that palms reach their highest levels of diversity in evergreen rain forests. A DNA-based "tree of life" together with genuine palm fossils from the Berlin Natural History Museum offer insights into the basic features of palm evolution, and interested visitors can obtain more in-depth information on specific palm species leafing through the website www.palmweb.org.

Some of the most striking features in palms are the numerous records they hold, one of the most spectacular being the largest leaf in the plant kingdom. In order to show its huge dimensions of over 25 meters, we display a model of the Botanical Museum Berlin-Dahlem together with a stylized in-scale leaf of *Raphia regalis*.

As leaves are the main distinguishing character of palms, they also feature at the very center of the exhibition. A rotary disc and selected specimens from the famous Berlin Palm Herbarium illustrate the distribution of major leaf forms and splitting types across the subfamilies of palms and encourage visitors to deal with this, what P.B Tomlinson called the "most complex determinate organ built by plants."

Life histories: In this chapter, visitors learn more about the reproductive strategies of palms, notably the hapaxanthic life history. Multiple wet and dry specimens, on display in a large cabinet showcase, illustrate the striking diversity of form and shape in fruits and flowers. Due to its sheer size, one of the most prominent objects had to remain on display in the entrance hall of the Botanical Museum. With an age over 300 years, the trunk of a female *Chamaerops humilis* was one of the chief figures in the famous *experimentum berolinense* conducted by Johann Gottlieb

2. "Shop" filled with 101 contemporary commercial products, Botanical Museum Berlin-Dahlem.

Gleditsch in 1749 in order to prove for the first time experimentally and convincingly, that plants reproduce sexually.

Diversity of use: Apart from their underground organs, virtually all parts of palms are used in one way or another. An array

of selected specimens and objects, including wax, resin, paper, oils and sugars as well as adornments and basketry convey that both the diversity of useful palms and the uses themselves can be very surprising (Figs. 2 & 3). The three economically most important palms *Elaeis guineensis*, *Cocos nucifera* and *Phoenix dactylifera* receive special attention in the exhibit. Archaeological objects from Berlin collections together with a 3-D reconstruction of the famous Oasis garden of Jericho at the time of King Herod the Great stress the importance of the date palm since antiquity. Nowadays, the continuing boom of oil palm monoculture causing massive destruction of tropical forests constitutes the downside of our society's continuously mounting consumption of palm oil. Visitors can browse our "shop" filled with 101 contemporary industrial products (Fig. 2) and see for themselves, that palm products, and especially oil and fat, are indispensable not only for the food industry but also for the manufacture of fuels, detergents and cosmetics. Children aged 5 years and above can learn even more about palm products in a special "shopping game."

Desire: The introduction of palms in Europe has been fueled decisively by our yearning for the tropics. European knowledge about palm diversity was at first slow to develop. In 1753 Linnaeus was familiar with only eight different palm species. However, the spectrum of well-known palm species broadened dramatically due to the colonial expansions of Great Britain, France, Spain and the Netherlands. In 1821 the first fully glazed greenhouses specially designed for the needs of tall palm trees were constructed simultaneously in Hackney near London and in the Royal Botanic Garden in Schöneberg near Berlin. There is hardly another plant family as connected to the development of modern greenhouses. Iron-and-glass construction reached a technical and aesthetic highpoint in 1848 with the completion of the palm house at the Royal Botanic Gardens, Kew. The great glass palaces that were built in the second half of the nineteenth century in European capitals such as the Berlin "Flora" already used an evergreen tropical backdrop for commercial purposes, not unlike contemporary indoor amusement parks.

Palm islands: Islands with, in many cases endemic, palm populations do not only activate common stereotypes, but indeed offer perfect settings for palm research, as we present

3. Another view of the World of Palms exhibition at the Botanical Museum Berlin-Dahlem.

4. The World of Palms exhibition book.

in four examples. The survival of the extremely endangered *Lodoicea maldivica* with its spectacular seeds, fruits and inflorescences is a main issue on the Seychelles archipelago. Collecting and comprehending the outstanding palm diversity in Cuba is a research focus of our institution. Studies on Lord Howe Island have shown that investigating speciation in *Howea* can help understanding processes of sympatric speciation that are of interest beyond the palm family. The extinction of *Paschalococos disperta* on Easter Island caused by man stresses the importance of palms in island ecosystems.

The exhibition offers just a first glimpse of the "World of palms", aiming to inspire an even closer look at this almost inexhaustible field. It will be on display in Berlin until the end of February 2012: the panels and selected items will then be available for loan. A bilingual catalogue (Fig. 4) edited by H. W. Lack & W. J. Baker, *Die Welt der Palmen/The World of Palms*, Berlin 2011 (ISBN 978-3-921800-69-0) is available for sale (m.sonntag@bgbm.org). Further information on the loan of the exhibition can be obtained by contacting Kathrin Grotz at the Botanical Museum Berlin-Dahlem (++49 +30 838 50165; k.grotz@bgbm.org).