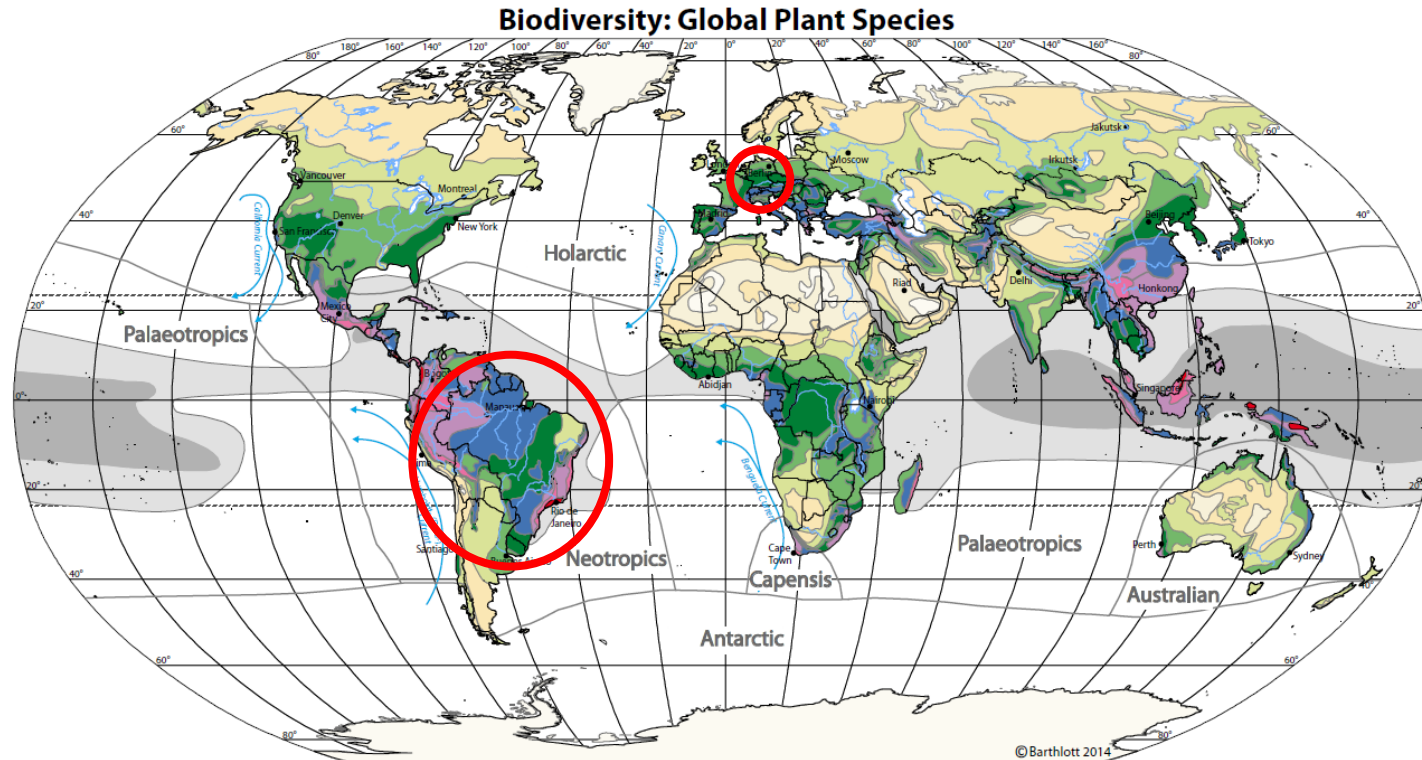


A Heritage of Biodiversity at Heidelberg Botanic Garden: Werner Rauh's Collections from Brazil

1. Biodiversity: worldwide and in Brazil
2. Biodiversity in Heidelberg
3. „Plant hunter“ Werner Rauh (1913–2000)
as example
4. The „Werner Rauh Heritage Project“

1. Biodiversity: worldwide ...



Robinson projection
Standard parallels: 38° N and 38° S

■ > 27° C Sea surface temp.

■ > 29° C Sea surface temp.

↪ Cold ocean currents

Diversity zones (DZ), number of vascular plant species per 10,000 km²

- DZ 1 (<100)
- DZ 2 (100 - 200)
- DZ 3 (200 - 500)
- DZ 4 (500 - 1000)
- DZ 5 (1000 - 1500)
- DZ 6 (1500 - 2000)
- DZ 7 (2000 - 3000)
- DZ 8 (3000 - 4000)
- DZ 9 (4000 - 5000)
- DZ 10 (> 5000)

W. Barthlott, M.D. Rafiqpoor, & J. Mutke 2014
modified after W. Barthlott, G. Kier, H. Kref, W. Küper, M.D. Rafiqpoor, & J. Mutke 2005 and W. Barthlott, W. Lauer, & A. Placke 1996
Nees Institute for Biodiversity of Plants
University of Bonn

... and in Brazil



Simpósio Brasil-Alemanha
Deutsch-Brasilianisches Symposium

Desenvolvimento Sustentável
Nachhaltige Entwicklung

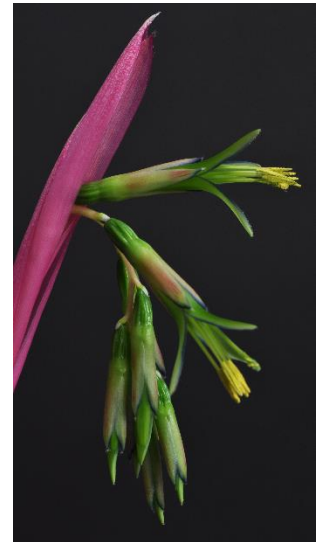
Heidelberg | 04 -10 de outubro de 2015 | 04.-10. Oktober 2015

2. Biodiversity in Heidelberg

- BG Heidelberg: living collections with more than 10,000 taxa collected from the 1950s onwards
- Herbarium HEID: 350,000 specimens (14,000 preserved in alcohol)
- Orchids, Bromeliads, Xerophytes (Succulents and Cacti)
- Madagascar, Southern Africa, Southern and Central America

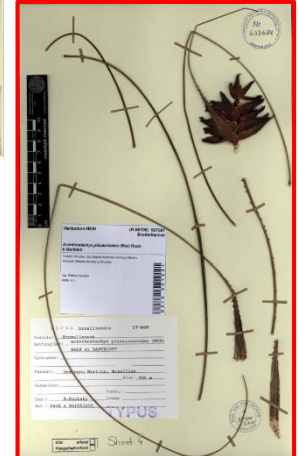
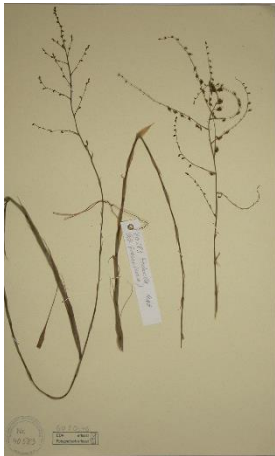


- Brazil: 700 living accessions cultivated in Heidelberg



All images: Botanic Garden and Herbarium HEID

- Brazil: thousands of specimens in herbarium HEID



among them more than 70 Holotypes

All images: Botanic Garden and Herbarium HEID

3. „Plant hunter“ Werner Rauh (1913–2000)

- 1932–1938 studies: Botany, Zoology, Chemistry and Geology at Leipzig, Innsbruck and Halle (Saale)



- 1939–2000 in Heidelberg, 1960–1982 Professor and Director of the «Institut für Systematische Botanik und Pflanzengeographie» and the Botanic Garden

Photographs: Archiv BG Halle (1), Archiv BG Heidelberg (2 & 3)

- 1938 to 1994

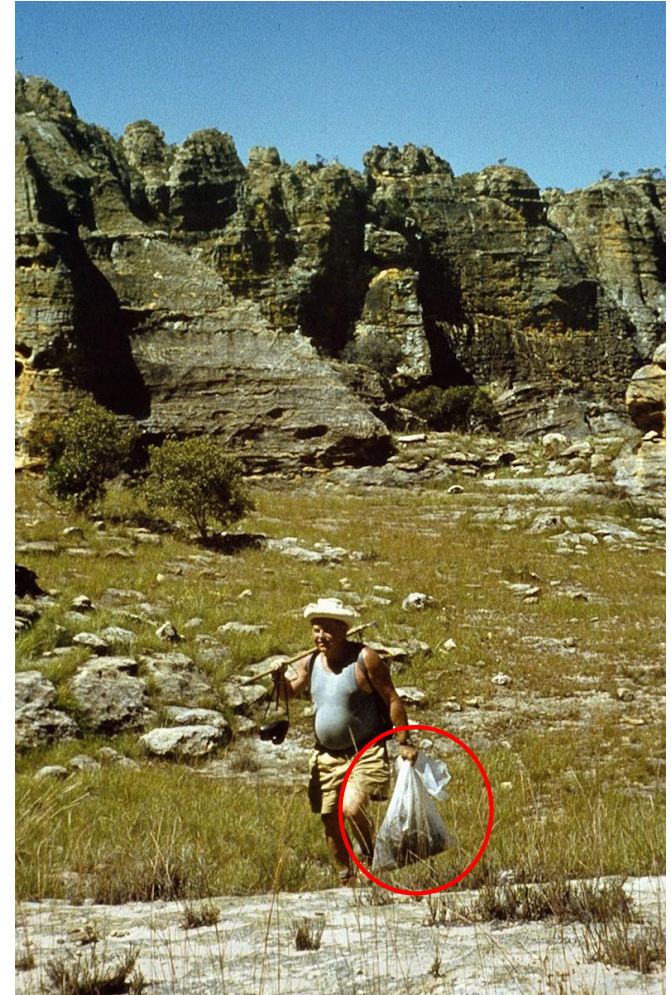


more than 60 Expeditions in at least 44 countries

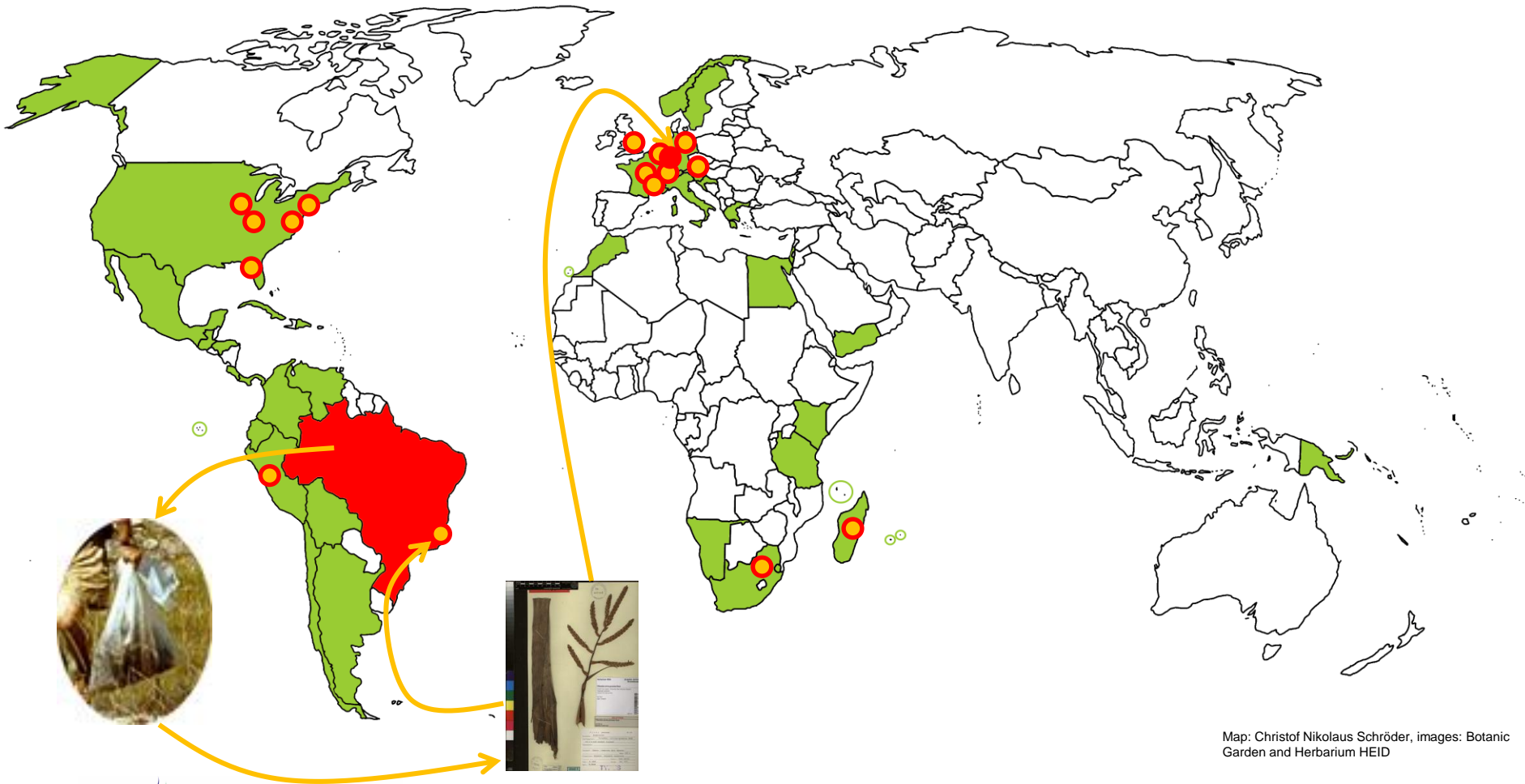
Map: Christof Nikolaus Schröder & Peter Sack



- 43,000 living and “dead” plants
 - Bromeliaceae (~7,000)
 - Orchidaceae (~1,600)
 - Cactaceae (~1,500)
 - Euphorbiaceae (~1,100)
 - succulent plants from Madagascar (~1.500).

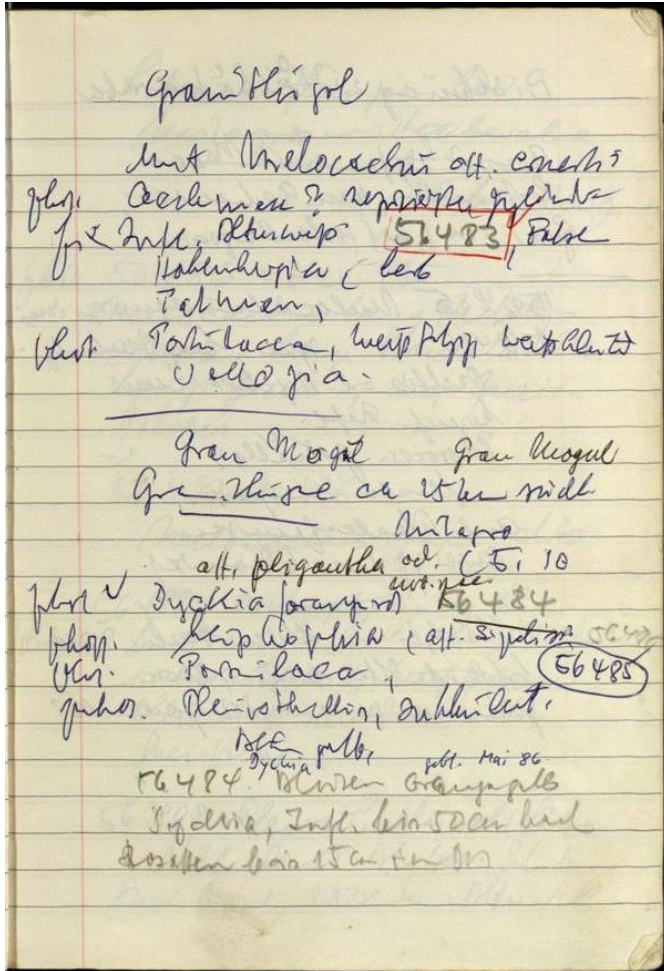


Photography: Botanic Garden
and Herbarium HEID



Map: Christof Nikolaus Schröder, images: Botanic Garden and Herbarium HEID

- 177 field books & field diaries with about 18,000 hand-written pages
- More than 200 maps used for the expeditions



All images: Botanic Garden and Herbarium HEID

4. The „Werner Rauh Heritage Project“ (since 2009)

- relational database
- 10,000 page scans
- more than 33,000 datasets with original Rauh numbers
- additional 27,000 accessions brought or sent to the Botanic Garden Heidelberg by others
- 5,775 entries with taxon data (2,474 taxa)
- 623 type collections
- 1,610 images



THE WERNER RAUH HERITAGE PROJECT

Home
Database
Fieldbooks & Diaries
Documents & Publications
References
History of the Project
Scriptorium
Acknowledgements
Further Information

Search for...

Plant Name

Types only

Fieldnumber

exact

version of data

Now Online:

33,328 entries with fieldnumber
= Real Rauh-Numbers

29,380 Pseudo-Rauh-Numbers

62,708 Numbers total

5,775 entries with Taxon data

2,687 entries with location data

623 type-collections

3,043 Garden accessions

7,723 Herbarium specimens

RUPRECHT-KARLS-UNIVERSITÄT HEIDELBERG



Home COS Biodiversity and Plant Systematics • Home Botanical Gardens Heidelberg

The Werner Rauh Heritage Project

Prof. Werner Rauh (1913–2000) studied Botany, Zoology, Chemistry and Geology at Leipzig, Innsbruck and Halle (Saale). In 1956 he was appointed as associate Professor of Botany at Heidelberg University. In 1960 he became full Professor and Director of the newly established «Institut für Systematische Botanik und Pflanzengeographie», until 2010 Heidelberg Institute for Plant Science (HIP), now part of Centre for Organismal Studies (COS Heidelberg). He held this position until he retired in 1981 and beyond that until 1982.

During his time as director and in his retirement until 1994, he made more than 36 expeditions, mainly to South- and Central-America, as well as to the south of Africa and particularly to Madagascar. From these journeys, he took innumerable plants to the Botanical Gardens Heidelberg, especially succulents, bromeliads and orchids, which are a valuable part of today's living collection and of the Herbarium (HEID). During his expeditions he scribed more than 90 booklets with detailed information not only about the plants collected, but on vegetation and geology of the regions he visited. A total of 8,776 hand written pages with more than 32,000 entries, hardly accessible for research, were scanned in 2008 and 2009 and are now being processed within «The Werner Rauh Heritage Project».

The heart of the project is a relational database to store the heterogenous information found in the field books, as well as to link it to a clear taxonomy and to the garden's database. A number of powerful tools are being developed to enable researchers to search the database for information like collected taxa by name, Rauh's field numbers and the place of collection etc. The central parts of the database are a look-up table with the itineraries of Werner Rauh's journeys (geographical points to be found in his field books, with the taxa collected or observed) and another table with the taxa entries (all taxa with a field number noted in the field books). Tables with synonyms and basionyms and protologue data are included as well as links to other taxonomic databases, e.g. IPNI and TROPICOS.

Reference

Marcus A. Koch, Christof Nikolaus Schröder, Markus Kiefer & Peter Sack (2013): A treasure trove of plant biodiversity from the 20th century: the Werner Rauh Heritage Project at Heidelberg Botanical Garden and Herbarium.
In: Plant Systematics and Evolution, November 2013, Vol. 299, Issue 9, pp. 1793–1800. [online]

«The Werner Rauh Heritage Project» is funded by **Klaus Tschira Stiftung gGmbH**

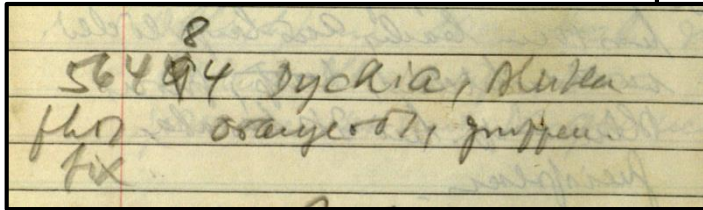
Klaus Tschira Stiftung
Gemeinnützige GmbH





Rauh 56484
Dyckia granmogulensis
***Dyckia granmogulensis* [= Basionym]**

how to



Collector(s): Werner Rauh
 URCI*: 816505648400 • WRHP-Entry: 26928 • **Typus!**
 cf. [Entry 26916](#)
 Basionym(s): ***Dyckia granmogulensis* RAUH**
 (Bromeliaceae) — WRHP-Taxon 1518
 Collected as: **«*Dyckia*, Blüten orangerot, Gruppen (*Dyckia*, flowers orange-red, groups)»**
 Name(s) of accession: ***Dyckia granmogulensis***
 Collected part: photography/photographies, specimen in alcohol
 Gathering date: **1981-09-26**
 Location (Entry): **Brazil (BR), Região Sudeste, Estado Minas Gerais, Município Grão Mogol, inhabited place Grão Mogol**
 Estimated precision of locality data: ±5 km
 Location (Itinerary): **«Gran Mogul»**
 Location(s) comment (Itinerary): **Brazil (BR), Região Sudeste, Estado Minas Gerais, Município Grão Mogol, inhabited place Grão Mogol**
 Estimated precision of locality data: ±2 km
 Location comment (Itinerary): Übernachtung {overnight stay}
 Fieldbook page: Location is concluded from different page of the same fieldbook: HEIDRAUHFDB065_038
 BG accessions: **HEIDRAUHFDB065_041**
 BG Heidelberg 130019
 Herbarium specimen: **HEID 602161 ! [HT]** **HEID 602163 ! [HT]**
HEID 602162 ! [HT] **HEID 602164 ! [HT]**
 ! = original specimen verified
 Entry comment: In the protologue of *Dyckia granmogulensis* Rauh published "5.10.1981" as gathering date. That cannot be correct. Rauh definitely was at Grão Mogol on 26/27. September 1981. On 5. October he travelled from Vitória da Conquista to Itaberaba. [CNS 2012-06-29]
 References: Schütz (2011)
 Versieux & Wendt (2006)
 Taxon set by Christof Nikolaus Schröder (CNS) according to Protologue and database of Botanical Gardens and Herbarium Heidelberg (HEID).



Coordinates rounded to 0.1°.
Exact coordinates are available on demand with proof of scientific interest.

Search for No. **Rauh**
 search exact

Example dataset:
Type collection of

Dyckia granmogulensis
Rauh 56484

collected 1981-09-21
near Grão Mogol
(Estd. Minas Gerais)

- 3,043 garden accessions, in BG Heidelberg and other Botanical Gardens (e.g. Berlin, Torino, Utrecht, Zurich).
- Herbarium specimens are housed around the world, many of them in Herbarium Bradeanum Rio de Janeiro, others e.g. in B, DPU, HUH, K, M, MO, MPU, NY, P, PRE, SEL, TAN, USM, W, ZSS.
- ‘Virtual Rauh Herbarium’ has been built up and filled with 7,723 datasets

scriptorium.cos.uni-heidelberg.de

- Acknowledgements

- Funding from Klaus Tschira Foundation gGmbH and Mellon foundation to M.A. Koch
- Heidelberg Academy of Sciences and Humanities
- Wilhelm Barthlott (Nees-Institut Bonn)
- Markus Kiefer, Andreas Franzke, Peter Sack, Barbara Sandler, Uwe Wagenfeld (COS / BG Heidelberg)
- Missouri Botanical Garden



- **Thank you for your attention!**

Photography: Botanic Garden and Herbarium HEID