

■ CARYOPHYLLALES 2015 IN BERLIN AND THE GLOBAL CARYOPHYLLALES INITIATIVE

The *Caryophyllales 2015* conference was held at the Botanic Garden and Botanical Museum Berlin, 13–18 September 2015. The conference aimed at fomenting and expanding the international Caryophyllales network, bringing together researchers from all over the world and initiating new collaborations. More than 80 colleagues from 18 countries participated in the conference. During the first three days current research was presented in talks in eleven sessions ranging from phylogeny, adaptive evolution, morphology, classifications, to floristic diversity and conservation (see <http://caryophyllales.org/caryophyllales2015> for details). The following two days were dedicated to workshops introducing biodiversity informatics tools (the EDIT Platform for Cybertaxonomy, the JACQ herbarium management system and Xper² for creating botanical descriptions and identification keys) and working group meetings discussing ongoing work in selected plant groups (Sileneae Network, Cactaceae, Nyctaginaceae).

In the past decades, scientific meetings focussing on Caryophyllales were organised at irregular intervals. During the XIIth International Botanical Congress in Leningrad in 1975 the symposium “Evolution of centrospermous families” was held. A new circumscription of the order was discussed and broadly agreed upon (Mabry & Behnke, 1976). In July 1992, some 30 specialists from different fields (plant morphology to organic chemistry) gathered in Heidelberg, Germany, for a symposium—organized by H.-D. Behnke and C. Mabry—on the “Evolution and systematics of the Caryophyllales” (Behnke & Mabry, 1994). Almost 20 years later, in September 2012, the symposium “Caryophyllales – New insights into the phylogeny, systematics and morphological evolution of the order” was organized

by A. Sukhorukov and colleagues at the Lomonosov State University Moscow, Russia.

The recent conference in Berlin marked the starting point for a series of more regular Caryophyllales meetings. Colleagues from the Instituto de Biología, Universidad Nacional Autónoma de México (UNAM) offered to host the next Caryophyllales conference in 2018.

The Caryophyllales Network.— This international network of specialists was initiated in 2011 as an institutional partnership consisting of the Botanic Garden and Botanical Museum Berlin (including herbarium B), the Universidad Nacional Autónoma de México’s Instituto de Biología (including herbarium MEXU) and the Instituto de Botánica Darwinion in Argentina (including herbarium SI). All three institutions are committed to contribute their existing expertise in Caryophyllales research into a larger initiative (see Borsch & al., 2015, for more details).

Caryophyllales are a research focus at the BGBM and the institutional commitment includes a position for scientific coordination. The biodiversity informatics side of the activities will be supported by the BGBM team handling the EDIT Platform for Cybertaxonomy.

The network plays a key role in the research activities within the initiative for a “Global synthesis of species diversity in the angiosperm order Caryophyllales” (Borsch & al., 2015). Benefits of a networked and informatics-supported approach towards building a modern monographic synthesis are obvious. Baseline information on species will be built up and open access in a single resource provided for easiness and efficiency. Access to character data (sequences, morphology, etc.) linked to specimens (requirement) and names will facilitate research. Tools are provided for the publication of regional or global treatments to support the interface of regional Flora writing and global taxonomic synthesis. In this way, the initiative will contribute to saving work time, and to improving quality and consistence.



Participants of the international *Caryophyllales 2015* conference in Berlin. Photograph by Wolf-Henning Kusber.

A permanent repository for data of individual researchers is provided, so that data become sustainable, discoverable, and visible. This approach also allows the identification of knowledge gaps, which will allow the oriented formation of human resources at different scholarly levels. Last but not least the Network provides an umbrella for individual, bottom-up and content-driven project applications and will improve conditions to show relevance of projects and enhance visibility of researchers and publications.

Caryophyllales represent around 6% of global flowering plant diversity. The Caryophyllales Network received a mandate to organise the respective contribution to the “World Flora Online” initiative (WFO, <http://worldfloraonline.org/>) in the context of the Global Strategy for Plant Conservation of the Convention on Biological Diversity. We posit that it is essential to promote taxonomic research to pursue this very ambitious aim and reach a result that is meaningful in the context of conservation.

Generic checklist of Caryophyllales. — As a first result of collaborative efforts of the network, a taxonomic backbone at the family and genus levels was published just in time for the *Caryophyllales 2015* conference. It reflects the current state of knowledge and accepts 39 families and 749 genera for the order (Hernández-Ledesma & al., 2015; also available online at <http://caryophyllales.org>). The checklist includes all currently accepted genus names in Caryophyllales, as well as nomenclatural references, type names and synonymy. Additionally, notes indicate how extensively the respective genera have been studied in a phylogenetic context. This synopsis represents a first step towards the aim of creating a global synthesis of the species diversity in the angiosperm order Caryophyllales integrating the work of numerous specialists around the world.

Outlook. — We intend to gradually expand the generic backbone to cover the species-level and eventually full species (and infraspecific) information. To that end, we will incorporate expert-evaluated species-level catalogues. An editorial workflow has to be developed that allows maximum participation, and further standards have to be set with regard to the dynamic development of the published information. We will work on selected genera/clades where teams exist to provide basic data (character data linked to specimens, trees and taxonomic concepts) and make the results available to encourage further research. Minimum requirements for character data such as genomic markers will be developed in order to foster comparability (positive experiences by *Silene* researchers). In addition, during *Caryophyllales 2015* it was decided to set up a “who is who in Caryophyllales” as well as a bibliography for the order.

Currently, the Caryophyllales network constitutes more than 100 individual scientists. We aim to expand the network to include further institutions with Caryophyllales on their research agenda. Individuals or institutions wishing to participate in and contribute to the network are invited to contact us.

Acknowledgements

The Caryophyllales network thanks the German Research Foundation (DFG) and the Center for International Cooperation (CIC) at the Freie Universität Berlin for their support of *Caryophyllales 2015*.

Literature cited

- Behnke, H.-D. & Mabry, T. J. (eds.) 1994. *Caryophyllales: Evolution and systematics*. Springer: Berlin.
<http://dx.doi.org/10.1007/978-3-642-78220-6>
- Borsch, Th., Hernández-Ledesma, P., Berendsohn, W.G., Flores-Olvera, H., Ochoterena, H., Zuloaga, F.O., Mering, S. von & Kilian, N. 2015. An integrative and dynamic approach for monographing species-rich plant groups – Building the global synthesis of the angiosperm order Caryophyllales. *Perspect. Pl. Ecol. Evol. Syst.* 17: 284–300. <http://dx.doi.org/10.1016/j.ppees.2015.05.003>
- Hernández-Ledesma, P., Berendsohn, W.G., Borsch, Th., Mering, S. von, Akhani, H., Arias, S., Castañeda-Noa, I., Egli, U., Eriksson, R., Flores-Olvera, H., Fuentes-Bazán, S., Kadereit, G., Klak, C., Korotkova, N., Nyffeler, R., Ocampo, G., Ochoterena, H., Oxelman, B., Rabeler, R.K., Sanchez, A., Schlumpberger, B.O. & Uotila, P. 2015. A taxonomic backbone for the global synthesis of species diversity in the angiosperm order Caryophyllales. *Willdenowia* 45: 281–383.
<http://dx.doi.org/10.3372/wi.45.45301>
- Mabry, T.J. & Behnke, H.-D. (eds.) 1976. Evolution of centrosperous families: A symposium held in July 1975 during the XIIth International Botanical Congress, Leningrad. *Pl. Syst. Evol.* 126: 1–106.

Salvador Arias,¹ Walter G. Berendsohn,^{2,3} Thomas Borsch,^{2,3} Hilda Flores-Olvera,⁴ Helga Ochoterena,⁴ Sabine von Mering² & Fernando O. Zuloaga⁵

- 1 *Jardín Botánico, Instituto de Biología, Universidad Nacional Autónoma de México (UNAM), Apartado Postal 70-614, C.P. 04510 México, D.F., México*
- 2 *Botanic Garden and Botanical Museum Berlin, Dahlem Centre of Plant Sciences, Freie Universität Berlin, Königin-Luise Str. 6–8, 14195 Berlin, Germany*
- 3 *Berlin-Brandenburg Institute of Advanced Biodiversity Research (BBIB), Altensteinstr. 6, 14195 Berlin, Germany*
- 4 *Departamento de Botánica, Instituto de Biología, Universidad Nacional Autónoma de México (UNAM), Apartado Postal 70-233, C.P. 04510 México, D.F., México*
- 5 *Instituto de Botánica Darwinion, Casilla de Correo 22, San Isidro, 1642, Argentina*

Address for correspondence: caryophyllales@bgbm.org