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World Gesneriad Research Conference 2010: An Overview

John R. Clark*

National Tropical Botanical Garden (PTBG), 3530 Papalina Road, Kalaheo, HI 97641, Rancho Santa Ana Botanic Garden (RSA), 1500 North College Avenue, Claremont, CA 91711, Marie Selby Botanical Gardens (SEL), 811 South Palm Avenue, Sarasota, FL 34236. Email: jclark@ntbg.org

Jeanne Katzenstein

The Gesneriad Society, Inc., 4252 Moss Oak Place, Sarasota, FL 34231.

Bruce K. Holst

Marie Selby Botanical Gardens (SEL), 811 South Palm Avenue, Sarasota, FL 34236.

Introduction

The World Gesneriad Research Conference 2010 (WGRC 2010) was an international meeting designed to bring together the world's Gesneriaceae researchers, students, and lay enthusiasts. The conference was held 13–15 October 2010 (with a gesneriad exhibition 15–17 October) at the Marie Selby Botanical Gardens in Sarasota, FL, USA. The specific objectives of the conference were to promote the understanding and knowledge of the plant family Gesneriaceae, provide opportunities for new researchers and students of the family to enter into working groups, formalize international collaborations, explore opportunities to create a web-based Gesneriaceae coalition, and summarize the current state of knowledge on Gesneriaceae phylogenetics. WGRC 2010 was also designed to increase public awareness of gesneriads through conservation-based lectures/discussions and through a public exhibition of rare and lesser-known gesneriads from around the world. The key note address was delivered by Prof. Anton Weber, distinguished Gesneriaceae researcher and faculty emeritus of the University of Vienna, Austria.

As part of the conference, the Hans Wiehler Student Travel Award was established to fund student attendance of WGRC 2010. This award honored Dr. Hans Wiehler, founding researcher of Selby's gesneriad program, and his impressive career as a gesneriad taxonomist and mentor to students (both formally and informally). Multiple awards were given on a competitive basis to qualified students and beginning researchers.

Outcomes

WGRC 2010 was attended by over 70 scientists and enthusiasts, arriving from as far away as South America, Europe, and Asia, and many parts of North America. Thirty-four participants made oral presentations that covered topics including phylogenetics and taxonomy, biogeography, floristics, development and reproduction, and education and conservation (see WGRC 2010 Abstracts, these proceedings). Additionally, 11 posters were presented at the conference.

Dr. Douglas E. Soltis, Distinguished Professor, University of Florida, opened the conference with an overview of flowering plant phylogenetics. He framed the conference by demonstrating current knowledge on the placement of Gesneriaceae in the Lamiales, as well as by illustrating the efficacy of supertree methods and large datasets in reconstructing phylogenies (see Soltis et al. 2011). Dr. Anton Weber, Professor Emeritus, University of Vienna, followed and presented talks on the history of research in Gesneriaceae as well as he and his coauthor's efforts to revise the taxonomy of the family, the first effort since B.L. Burtt and Hans Wiehler's 1995 treatment (Burtt & Wiehler 1995). In total, 34 talks were presented, covering aspects of Neotropical and Paleotropical gesneriad research.

Ten talks presented at the conference were accepted for publication in these proceedings. They cover the breadth of topics presented during the conference, including the work of Weber. Other studies published here include a review of molecular research in the family, major new studies in the taxonomy and systematics of *Codonanthe, Codonanthopsis, Columnea,* and *Cyrtandra,* a review and checklist of Cuban gesneriads, and a review with novel observations of splash seed dispersal in Gesneriaceae.

Student participation was another major success of WGRC 2010. We were able to award partial support to eight students. These included Laura Clavijo, Cassandra L. Coleman, and Marcela Mora, (all University of Alabama), Kuan-Ting Hsin, Hao-Chun Hsu, (both National Taiwan University), Abdulrokhman Kartonegoro (Indonesian Institutes of Sciences), Jeremy Keene (Ohio

* Corresponding author.

University) and Carmen Puglisi (Royal Botanic Garden Edinburgh). Each student presented either an oral presentation or poster or both at WGRC 2010 (see List of Abstracts, these proceedings).

Work continues toward the goal of providing a comprehensive phylogeny (see Möller & J.L. Clark, these proceedings). Regional and generic focus is proving to be the direction most researchers are going in supporting this effort (see in these proceedings Chautems and Perret, J.L. Clark et al., J.R. Clark et al., and Smith et al.). These efforts serve to advance our understanding in particular groups and it is expected will lead to completion of a comprehensive phylogeny in the foreseeable future.

Less has been achieved to create a web-based resource to unify the study of gesneriads. However, at least one international project within the Gesneriaceae has taken hold as a result of WGRC 2010, that of a multinational effort to complete a taxonomic and phylogenetic revision of *Cyrtandra*, the largest gesneriad genus (see both Atkins et al. and J.R. Clark et al. these proceedings).

Recommended citation for these proceedings:

The proceedings

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A New Formal Classification of Gesneriaceae

Anton Weber*

Department of Structural and Functional Botany, Faculty of Biodiversity, University of Vienna, A-1030 Vienna, Austria. Email: anton.weber@univie.ac.at

John L. Clark

Department of Biological Sciences, The University of Alabama, Tuscaloosa, AL 35487, USA.

Michael Möller

Royal Botanic Garden Edinburgh, Edinburgh EH3 5LR, Scotland, U.K.

Abstract. A new formal classification of Gesneriaceae is proposed. It is the first detailed and overall classification of the family that is essentially based on molecular phylogenetic studies. Three subfamilies are recognized: Sanangoideae (monospecific with *Sanango racemosum*), Gesnerioideae and Didymocarpoideae. As to recent molecular data, *Sanango*/Sanangoideae (New World) is sister to Gesnerioideae + Didymocarpoideae. Its inclusion in the Gesneriaceae amends the traditional concept of the family and makes the family distinctly older. Subfam. Gesnerioideae (New World, if not stated otherwise with the tribes) is subdivided into five tribes: Titanotricheae (monospecific, East Asia), Napeantheae (monogeneric), Beslerieae (with two subtribes: Besleriinae and Anetanthinae), Coronanthereae (with three subtribes: Coronantherinae, Mitrariinae and Negriinae; southern hemisphere), and Gesnerieae [with five subtribes: Gesneriinae, Gloxiniinae, Columneinae (=the traditional Episcieae), Sphaerorrhizinae (=the traditional Sphaerorhizeae, monogeneric), and Ligeriinae (=the traditional Sinningieae)]. In the Didymocarpoideae (almost exclusively Old World, especially E and SE Asia/Malesia) two tribes are recognized: Epithemateae [with four small, but morphologically and genetically very distinctive subtribes: Loxotidinae (monogeneric with *Rhynchoglossum*), Monophyllaeinae, Loxoniinae and Epithematinae (monogeneric)] and Trichosporeae (the earliest name at tribal rank for the "Didymocarpoid Gesneriaceae"). The last is subdivided into ten subtribes: Jerdoniinae (monospecific), Corallodiscinae (monogeneric), Tetraphyllinae (monogeneric), Leptoboeinae, Ramondinae (Europe), Litostigminae (monogeneric), Streptocarpinae (Africa and Madagascar), Didissandrinae, Loxocarpinae and Didymocarpinae. Didymocarpinae is the largest subtribe (ca. 30 genera and >1600 species) and still requires intensive study. It includes the most speciose genera such as *Cyrtandra*, *Aeschynanthus*, *Agalmyla*, *Didymocarpus*, *Henckelia*, *Codonoboea*, *Oreocharis* and *Primulina* and the types of the traditional tribes Didymocarpeae, Trichosporeae and Cyrtandreae.

Key words: Gesneriaceae, classification, traditional classifications, molecular systematics

Introduction

The incorporation of molecular methods into plant systematics over the last two decades has dramatically changed our understanding of the phylogenetic diversification of angiosperms. Not unexpectedly, this applies also to the family Gesneriaceae. The last classification, based on morphological (and with respect to the Neotropical Gesneriaceae also cytological) characters was that of Burtt and Wiehler (1995). This was followed by the treatment of the family in Kubitzki's "Families and genera of vascular plants" by Weber (2004a). In the latter work, allowance was made for the molecular data then available (partly unpublished and published later by Möller et al. 2009). This resulted in an abandonment of the traditional tribes hitherto recognized in the Old World Gesneriaceae. For a provisional subdivision of the "Didymocarpoid Gesneriaceae," informal group names (e.g., "Basal Asiatic genera") were used instead of formal names.

* Corresponding author.

Since Weber's (2004a) treatment, many more molecular studies have been published (reviewed in Möller & Clark, 2013). In the New World Gesneriaceae a new tribe has been erected (Roalson et al. 2005b), and in the Old World Gesneriaceae a much more detailed picture of the informal groups previously recognized emerged through the work of M. Möller and his collaborators (e.g., Möller et al. 2009, 2011a; Weber et al. 2011a). This paper is the first to propose a comprehensive classification of the entire family based on molecular phylogenetic studies and to formalize a rank-based system from published phylogenies.

Do We Need Formal Rank-Based Classifications?

The answer is: not necessarily. Formal classifications with ranks indicated by name endings are simply a well-established custom. The modern language of our discipline consists of precise and easily comprehensible communication via phylograms