The Bean Bag

A newsletter to promote communication among research scientists concerned with the systematics of the Leguminosae/Fabaceae

Issue 63, Year 2016

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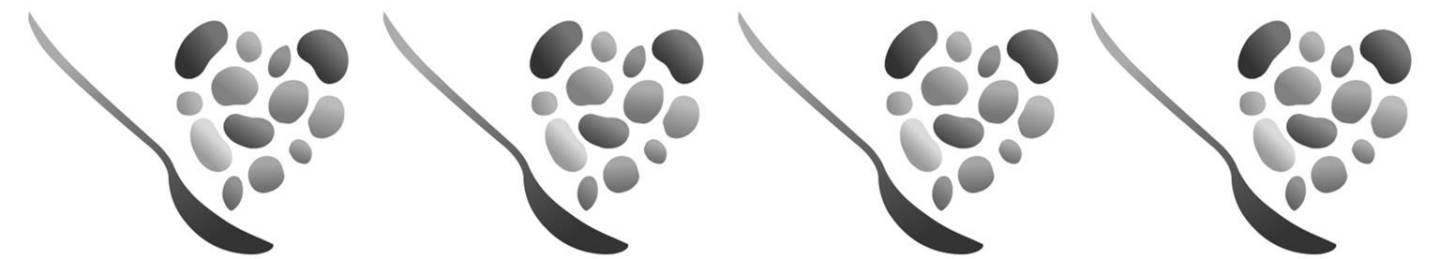


Letter from the Editor

Dear Bean Bag Fellow

Happy New Year!!

My deepest apologies for getting after delay this issue to you. But, as you will very soon see, this is an extra-large issue that needed some extra dedication.

It has been a year of many events in the legume world. Starting with the news that past Bean Bag issues are now available online in the BHL repository. Continuing with glimpses from the International Year of Pulses often extended to the entire family, and the looking forward into 2017 where the new legume submfamily classification will be published and a legume symposium is being organized at the International Botanical Congress in China! Then, some beautiful photographs of papilionoid flowers, the highlights from the world of publications on legumes, more special issues available and on the way, and new floristic books. Concluding, as always, with the traditional list of legume bibliography.

This is now the second year that the Bean Bag newsletter and important communications have been and still will be sent out through the new BB Google Group to which BB members have been added in 2015. As a reminder, this is the only purpose of the google group. For any correspondence about the BB, members are invited to email the editor at beanbag.kew@gmail.com.

Finally, I am very grateful to all contributors of this issue for sharing their news, insights, images and publication citations. Note that this newsletter will be made available for online download on the BB webpage along with the pdfs of all previous issues.

Thank you very much for your attention, and I wish you a Wonderful 2017!

Kind regards,

Brigitte Marazzi

The Bean Bag Newsletter in the Web
Webpage: www.kew.org/science-conservation/research-data/publications/bean-bag
Google Group: https://groups.google.com/forum/?hl=en#!forum/thebeanbag
Facebook: https://www.facebook.com/groups/1484192248560637/

REPORTS OF 2016 HAPPENINGS

BEAN BAG NOW AVAILABLE VIA BHL!

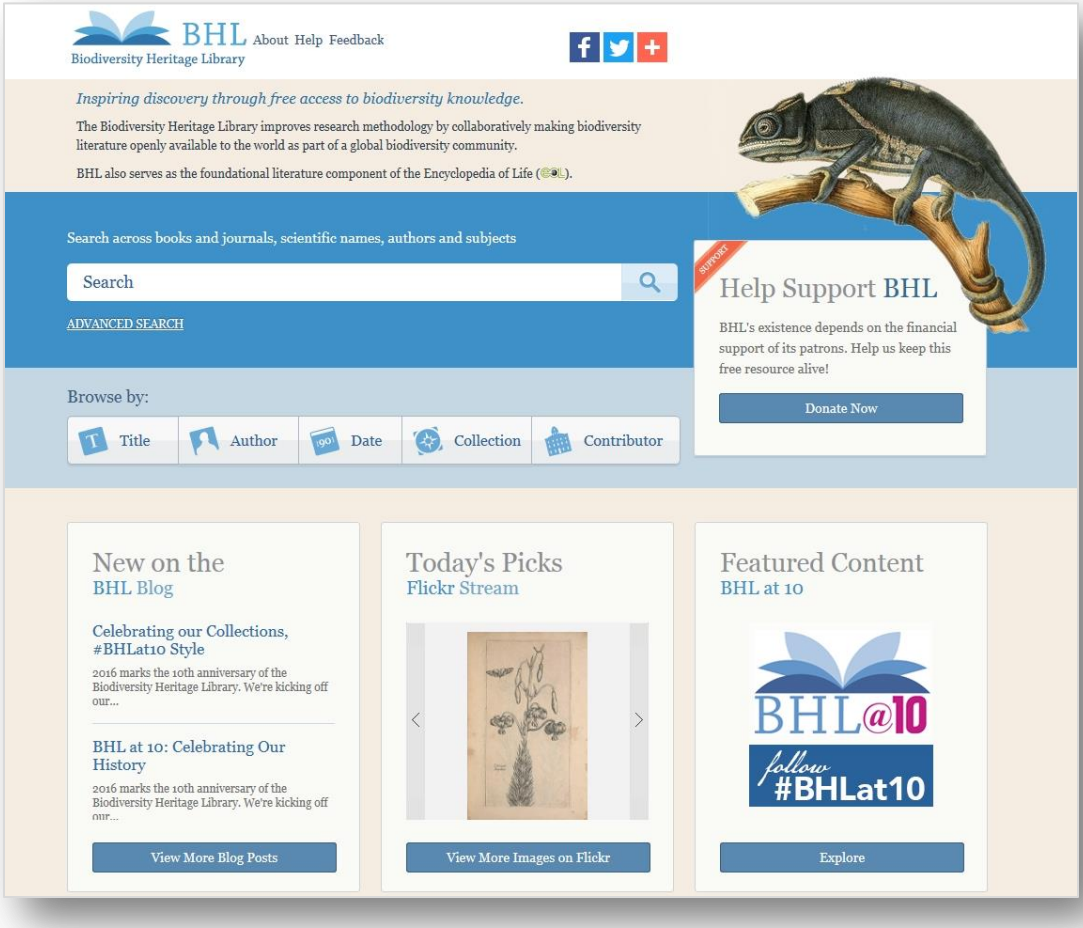
Communicated by David Iggulden
Electronic Resources Manager - Library, Art & Archives, Royal Botanic Gardens, Kew

The Bean Bag has now been made available on the Biodiversity Heritage Library (BHL) website. The title was contributed by the Royal Botanic Gardens, Kew (a founder member of BHL) and digitised by the Internet Archive staff at the Natural History Museum, London. Currently issues 1-54 are available to view or download via the site and the more recent issues will be added over the next two months. The issues can be viewed here: http://www.biodiversitylibrary.org/search?searchTerm=bean+bag#/titles

Please just be aware that due to a technical problem during ingest, there are currently separate records for each issue making it difficult to see initially the issue number each record relates to, however this will soon be corrected.

Additionally, please note that we chose not to contribute Directory issues to prevent members' contact details being published online through the site. However, in some cases where a small Directory was incorporated alongside editorial content in a standard issue, it was necessary to include these sections as otherwise editorial would have been cut unnecessarily. We thank members for their understanding and patience in relation to this issue.

Do take a look at the Bean Bag online in its new home and send any comments or feedback direct to: d.iggulden@kew.org



2016 INTERNATIONAL YEAR OF PULSES

Compiled by Brigitte Marazzi

"*The 68th UN General Assembly declared 2016 the International Year of Pulses (IYP) (A/RES/68/231). The Food and Agriculture Organization of the United Nations (FAO) has been nominated to facilitate the implementation of the Year in collaboration with Governments, relevant organizations, non-governmental organizations and all other relevant stakeholders. The IYP 2016 aims to heighten public awareness of the nutritional benefits of pulses as part of sustainable food production aimed towards food security and nutrition. The Year will create a unique opportunity to encourage connections throughout the food chain that would better utilize pulse-based proteins, further global production of pulses, better utilize crop rotations and address the challenges in the trade of pulses*."
(Source: www.fao.org/pulses-2016/en/)

The image below is a capture of the computer screen after a Google Image search of the words "the international year of pulses". It nicely shows the importance that this event had worldwide.

Some events and activities communicated by leguminologists from across the world.

The magazine Quatre Temps of the Friends of the Botanical Garden of Montréal published a special article on the Leguminosae by Anne Bruneau (University of Montréal).

Leguminologists after the mini-symposium organized on the 11 of September 2016 at the Botanical Garden of the Cantone Ticino on the Brissago Islands, Switzerland. The botanical garden also organized an exhibit on the legume family in the garden.

Invited speakers were (from right to left): Colin Hughes, Guy Atchison (University of Zurich), Brigitte Marazzi (Natural History Museum of Cantone Ticino), accompanied by PhD students Victoria Cabrera and Jens Ringelberg (University of Zurich).

International Year of Pulses t-shirt designed by the Slow Food movement in Italy.

2016 - International Year of the Legumes

botanical garden
University of Zurich

Institute of Systematic & Evolutionary Botany

Legume Diversity

The legume family (Leguminosae) is the third largest family of flowering plants with 750 genera & c. 19,500 species.

The c. 170 species of temperate legumes in Switzerland are mainly herbs.

Most legumes are woody shrubs, lianas and trees that grow in tropical dry forests, savannas and rain forests.

The flowers of legumes are so diverse that it is hard to imagine that they all belong to one plant family.

The unifying feature of the legume family is the fruit – a pod, or legume. This is modified extensively for animal, water, wind and mechanical dispersal of the seeds.

Nutritious seeds for a sustainable future

The UN General Assembly declared 2016 the International Year of the Pulses to raise awareness of the many benefits of legumes.

The legumes represent one of the most phenomenal examples of manipulation and utilization of a plant family by human cultures worldwide.

This has involved the domestication of a set of globally important food crops, such as soybeans, (*Glycine max), culinary beans (Phaseolus spp. & Vicia faba), groundnut (Arachis hypogaea),* lentil (*Lens culinaris), chickpea (Cicer arietinum)* and pea (*Pisum sativum).*

Legumes are an excellent source of protein and a healthy alternative to meat in the human diet. Some legume seeds contain mixes of amino acids that precisely match human nutritional needs. Legumes can help to drive the much-needed shift away from meat-based diets.

Eat more legumes, eat less meat and help to reduce CO_2 emissions from intensive livestock production, and mitigate global warming.

Nitrogen Fixation

Many legumes form symbiotic associations with nitrogen-fixing bacteria *Rhizobium* through formation of root nodules involving complex molecular signalling pathways between legumes and bacteria.

N_2 constitutes 80% of the atmosphere and a virtually unlimited supply of nitrogen, yet only a few plants including legumes, and no animals can assimilate N_2 in its free form.

Synthetic nitrogen fertilizers in agriculture have high economic, energy and environmental costs. Nitrogen fixation by legumes provides an important source of nitrogen in agriculture and natural ecosystems, boosting soil fertility and benefitting sustainable agricultural productivity.

Designed & compiled by Colin Hughes, legume researcher, Institute of Systematic & Evolutionary Botany

A LOOK INTO 2017

AND THE NEW LEGUMINOSAE SUBFAMILY CLASSIFICATION HAS COME TRUE!

Communicated by Anne Bruneau and Carole Sinou on behalf of the Legume Phylogeny Working Group

In a paper to be published in the February issue of *Taxon*, the Legume Phylogeny Working Group, a collective of 97 authors from 18 countries, has proposed a new subfamily classification of the Leguminosae.

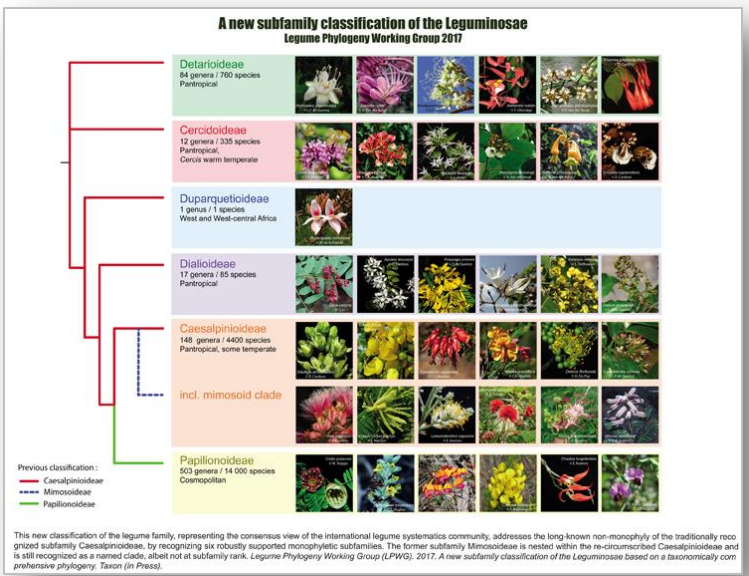
This new community-endorsed classification addresses the long known non-monophyly of the traditionally recognised subfamily Caesalpinioideae, by recognising six robustly supported monopyhyletic subfamilies: a recircumscribed Caesalpinioideae DC., Cercidoideae Legume Phylogeny Working Group, Detarioideae Burmeist., Dialioideae Legume Phylogeny Working Group, Duparquetioideae Legume Phylogeny Working Group, and Papilionoideae DC. The traditionally recognised subfamily Mimosoideae DC. is a distinct clade nested within the recircumscribed Caesalpinioideae and is referred to informally as the mimosoid clade pending forthcoming formal tribal and/or clade-based classifications of the new Ceasalpinioideae.

This new classification uses as its framework the most comprehensive phylogenetic analyses of legumes to date, based on plastid matK gene sequences, and including near-complete sampling of genera (698 of the currently recognised 765 genera) and c. 20% (3,696) of known species. The analysis presented improves upon previous studies that have used large phylogenies of the Leguminosae for addressing evolutionary questions, because it maximises generic sampling and provides a phylogenetic tree that is based on a fully curated set of sequences that are vouchered and taxonomically validated. The phylogenetic trees obtained and the underlying data are available to browse and download via Data Dryad (dx.doi.org/10.5061/dryad.61pd6) facilitating subsequent analyses that require evolutionary trees.

The paper provides a key for identification, an illustrated glossary of some legume features, descriptions with diagnostic characteristics for the new subfamilies, figures illustrating their floral and fruit diversity, and a list of genera by subfamily. This new classification of Leguminosae represents a consensus view of the international legume systematics community; it invokes both compromise and practicality of use.

The new classification is presented here in the schematic diagram illustrating the six new subfamilies of Leguminosae and their floral diversity.

See next page for a large-sized version adapted to the format of the BB newsletter



This new classification of the legume family, representing the consensus view of the international legume systematics community, addresses the long-known non-monophyly of the traditionally recognized subfamily Caesalpinioideae, by recognizing six robustly supported monophyletic subfamilies. The former subfamily Mimosoideae is nested within the re-circumscribed Caesalpinioideae and is still recognized as a named clade, albeit not at subfamily rank. *Legume Phylogeny Working Group (LPWG). 2017. A new subfamily classification of the Leguminosae based on a taxonomically comprehensive phylogeny. Taxon (In Press).*

A Look into 2017

A Morphological Ensemble

Communicated by Leonardo Borges on behalf of the Legume Phylogeny Working Group

The last edition of the Bean Bag included a briefing and a report about the Legume Morphology International Symposium and Workshop, held in November 2015 at Botucatu, Brazil.

This year, I am writing to communicate that one of the prospects of the meeting is on the go. Contributions from researchers that attended the meeting, and also from others, are going to come together in a special issue (or section) on Legume Morphology, to be published in the Botanical Journal of the Linnean Society. The deadline for submission ended together with 2016 and we are excited to see the full list of manuscripts sent to the journal! Papers will be published online as soon as they are accepted, but all contributions are going to be merged in a single edition, hopefully in 2017.

There is still a lot to know about legume morphology. Hopefully the contributions in the special issue will help us to add more shapes to the wide landscape of Leguminosae diversity.

The XIX International Botanical Congress: Symposium T259
Phylogenomics and Evolution of Legumes

Organizers:
Tingshuang Yi (Kunming Institute of Botany, CAS, China)
Manuel de la Estrella (Royal Botanic Gardens, Kew, UK)

The family Leguminosae (Fabaceae) is the third largest angiosperm family in terms of species richness with c. 770 genera and over 19,500 species. In ecological and economic terms the family is also one of the most important plant groups of the world and it has been recently the focus of numerous taxonomic, phylogenetic and evolutionary studies. The classical and long standing three subfamilies classification has been reviewed by the international Legume Phylogenetic Working Group, and a new system including a six subfamilies classification has been proposed. Additionally, increasing efforts on phylogenomics studies revealed multiple whole genome duplication within legumes that, along with the new NGS data available, is contributing to our understanding of the family phylogeny, diversification and evolution. This symposium will invite 6 leading botanists to introduce the most recent achievements in phylogenomics and evolution of legumes.

Congress webpage: www.ibc2017.cn

Legume Shots of the Year

Anthyllis montana taken earlier this year near Rehalp, Switzerland.

Photo courtesy of Colin Hughes.

Vicia sepium taken in late Spring this year in Zurich, Switzerland. An ant is visiting an extrafloral nectary ; do you see it?

Photo courtesy of Brigitte Marazzi

RARE PAPILIONOID LEGUMES

Contributed by Domingos Cardoso,
University of Salvador, Brazil.

Photographs courtesy of
Domingos Cardoso

The selected photos are all examples of rare papilionoids that have been the focus of my recent publications and future research.

From the top to the bottom:

The first two flowers are species from the "rediscovered" monospecific genera ***Petaladenium urceoliferum*** and ***Uleanthus erythrinoides***, respectively (reported in Cardoso et al.,2015; Neodiversity 8: 55-73).

Aldina kunhardtiana is also a rare species known from Western Amazonia in the Upper Rio Negro River (see Ramos et al., 2016, in the publication list below).

***Dioclea* sp. nov.** is only known from a highly diverse area of Atlantic Rain Forest in Espirito Santo (see Paganucci de Queiroz et al., 2015, MPE 90: 1-19).

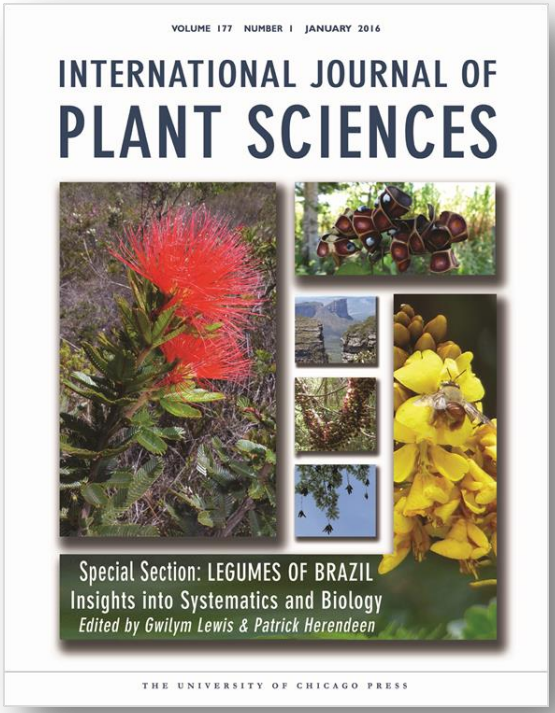
Harpalyce magnibracteata is a very rare species from a savanna in Bahia (published in São-Mateus et al., 2016). The phylogeny, biogeography, and floral evolution of the genus is also being investigated as part of Wallace São-Mateus' PhD thesis)

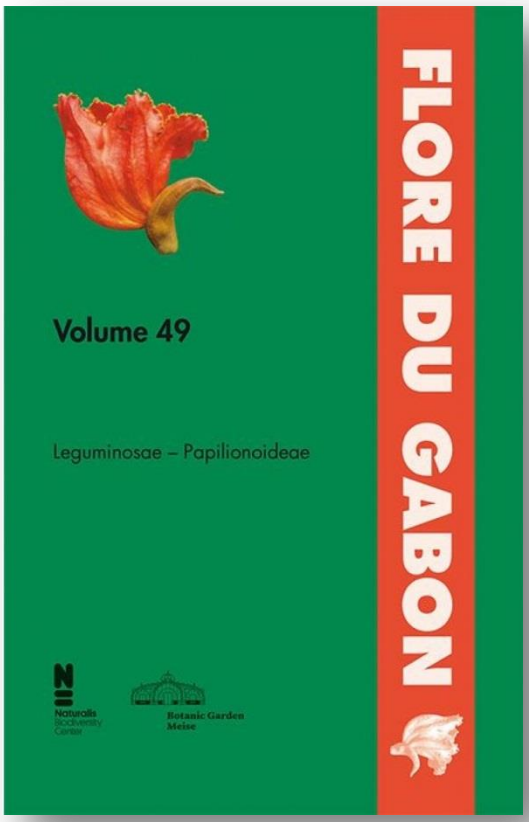
Legume Bibliography under the Spotlight

Symposium Issue on Leguminosae Highlighting Brazil's Important Role in Modern Legume Systematics and Biology

Published by the International Journal of Plant Sciences and edited by Gwilym Lewis and Patrick Herendeen this issue features six papers by Brazilian legume researchers and their collaborators.

An Introduction is available online: www.jstor.org/stable/10.1086/684170?origin=JSTOR-HTMLeTOCAlert





Flore du Gabon: Leguminosae - Papilionoideae

The authors Jos van der Maesen and Marc Sosef, with contributors Frits Adema, Aristide Adomou, Frans Breteler, Olivier Lachenaud, Rémy Pasquet and Jan Wieringa, are happy to announce the issue of vol. 49 of the Flore du Gabon, dealing with the Leguminosae-Papilionoideae of this botanical paradise in Central Africa. It contains 272 species in 62 genera, of which 19 are endemic. Fifteen species are new to science, of which 11 are endemics, and 2 new subspecies. The other two subfamilies, (Caesalpinioideae (Vol. 15) and Mimosoideae (Vol. 31)) were issued in 1968 and 1989 respectively with 158 and 45 species. The volume is published by Margraf Publishers, Weikersheim, Germany, and available on their webpage: shop2014.2margraf.de/index.php?id=234&L=12121121121212.1. The Flore du Gabon series is produced by Naturalis Biodiversity Center, Leiden, The Netherlands and Botanic Garden Meise, Belgium, in collaboration with the Herbier National du Gabon (IPHAMETRA – CENAREST), Libreville, Gabon and the Muséum national d'Histoire naturelle, Paris, France.

PAUBRASILIA ECHINATA (LAM.) E. GAGNON, H.C. LIMA & G.P. LEWIS, A NEW NAME FOR BRAZIL`S NATIONAL TREE

Communicated by Gwil Lewis, Royal Botanic Gardens, Kew
Photographs by Luciano Paganucci de Queiroz, University of Feira de Santana, Brazil

A new classification for all the taxa considered to belong to the pantropical Caesalpinia group, which now comprises 26 genera and 205 species was published online in the open access journal *Phytokeys* in October 2016 (Gagnon et al., 2016). The molecular analyses which underpin the 2016 publication clearly revealed three species which do not belong to any of the main groups highlighted in the study. These have been recognised as the new monospecific genera: *Hererolandia*, *Hultholia* and *Paubrasilia*, the latter a new name for the national tree of Brazil.

First scientifically described as *Caesalpinia echinata* by Lamark in 1785, Pau-brasil, as it is commonly known, is the tree which gave its name to the country Brasil (spelt Brazil in English). Historically used for the extraction of its red sap to dye luxury textiles, today it is the preferred wood for the manufacture of violin bows. In all molecular analyses, this iconic tree does not group with any other species. In fact, it sits alone on a long branch of the phylogenetic tree, an indication of early evolutionary divergence and isolation from other members of the Caesalpinia group. The species is also morphologically unique by possessing a combination of characters not seen in any other species of the 26 genera in the Caesalpinia group. *Paubrasilia* is native in eastern Brazil, from Rio Grande do Norte in the north to Rio de Janeiro in the south, growing in coastal cactus scrub, Mata Atlantica (Atlantic rain forest) and in tall restinga (coastal vegetation on well-drained, white sandy soil). The tree is highly endangered in its native habitat which has been reduced to less than eight percent of its original cover, but is widely cultivated as an ornamental street and park tree and sometimes in plantations.

Despite *Paubrasilia echinata* being listed on CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) prohibiting trading of the wood, the authors of the *Phytokeys* paper have witnessed, first-hand, continued illegal logging of Pau-brasil trees during recent field-work. It is hoped that the emblematic new genus name for Brazil`s national tree will draw added attention to its endangered status and highlight the fragile state of the fragmented forests of coastal Brazil.

Reference

Gagnon, E., Bruneau, A., Hughes, C.E., Queiroz, L.P.de & Lewis, G.P. (2016). A new generic system for the pantropical Caesalpinia group (Leguminosae). *PhytoKeys* 71: 1–160.

PUBLICATION NEWS FROM THE WORLD OF LEGUME SYSTEMATICS

Compiled by Leonardo Borges and Brigitte Marazzi

A list with this year's publication citations of studies on legume systematics is here provided. We thank authors who sent us their references. Please accept our apologies if any citation is missing. This collection of studies and the publications highlighted above provide an elegant insight into another vibrant year of research in Systematics and Biology of Leguminosae.

Adams, M., Turnbull T.L., Sprent J.I., Buchman N. 2016. Legumes are different:Leaf nitrogen, photosynthesis and water use efficiency. PNAS 113: 4018-4015.

Adema, F. et al. 2016. Notes on Malesian Fabaceae (Leguminosae-Papilionoideae) 17. The genus *Dalbergia*. Blumea 61: 186–206.

Aghaahmadi, M. et al. 2016. Typification of two species names of *Trigonella* sect. *Ellipticae* (Leguminosae-Papilionoideae) from Afghanistan. Phytotaxa 238(1): 97–100.

Amirahmadi, A. et al. 2016. The phylogeny and new classification of the genus *Onobrychis* (Fabaceae-Hedysareae): evidence from molecular data. Plant Systematics and Evolution 302(10): 1445–1456.

Atahuachi, M., van der Bent, M.L., Wood, J.R.I., Lewis, G.P. & Hughes, C.E. 2016. Bolivian *Mimosa* (Leguminosae, Mimosoideae): three new species and a species checklist. Phytotaxa 260 (3): 201 – 222.

Atchison, G.W., Nevado, B., Eastwood, R.J., Contreras Ortiz, N., Reynel, C., Madriñán, S., Filatov, D.A. and Hughes, C.E. (2016). Lost crops of the Incas: origins of domestication of the Andean pulse crop 'tarwi', *Lupinus mutabilis*. American Journal of Botany 103: 15921606. doi: 10.3732/ajb.1600171.

Banks, H & Rudall, P.J. 2016. Pollen structure and function in caesalpinioid legumes. American Journal of Botany 103(3): 423–436.

Barbosa, A.R., Machado, M.C., Lewis, G.P., Forest, F. & Queiroz, L.P.de (2016). Re-establishment of *Chamaecrista cultrifolia* (Leguminosae, Caesalpinioideae) based on morphological and molecular analyses. Phytotaxa 265(3): 183 – 203.

Barros, T.C. et al. 2016. Anther glands in Mimosoideae (Leguminosae) are emergences with a conserved meristematic origin. Flora 226: 1–9.

Bidarlord, M. et al. 2016. A new species of the genus *Astragalus* (Leguminosae) from Northwest Iran. Phytotaxa 252(4): 280–284.

Borges, L.M. & Antar, G.M. 2016. Four they are! Broadening the description of *Mimosa flabellifolia* (Leguminosae Mimosoideae), a rare species from the Brazilian Cerrado. Phytotaxa 243(2): 155–162.

Buzatti, R.S.O. et al. 2016. Transferability of microsatellite markers across six *Dalbergia* (Fabaceae) species and their characterization for *Dalbergia miscolobium*. Biochemical Systematics and Ecology 69: 161–165.

Camargo, R.A. & Tozzi, A.M.G.A. 2016. Taxonomic placement of *Millettia occidentalis* (Leguminosae, Papilionoideae), a rare liana from the Amazon Basin. Phytotaxa 261(1): 75–81.

Cândido, E.S. et al. 2016. A New Species of *Eriosema* (Leguminosae, Papilionoideae, Phaseoleae) from Mato Grosso do Sul, Brazil, with a Secretory Structure Novel to the Genus. Phytotaxa 263(2): 122–130.

Chaintreuil, C., Gully, D., Hervouet, C., Tittabutr, P., Randriambanona, H., Brown, S.C., Lewis, G.P., Bourge, M., Cartieaux, F., Boursot, M., Ramanankierana, H., D`Hont, A., Teaumroong, N., Giraud, E. & Arrighi, J.-F. 2016. The evolutionary dynamics of ancient and recent polyploidy in the African semiaquatic species of the legume genus *Aeschynomene*. New Phytologist. Published online 7 April 2016. DOI. 10.1111/nph13956.

Clark, R. 2016. A Taxonomic Revision of *Mezoneuron* (Leguminosae: Caesalpinioideae: Caesalpinieae). Phytotaxa 274(1): 1-72.

Cota, M.M.T. et al. 2016. *Chamaecrista petiolata* (Leguminosae, Caesalpinioideae), new species from Diamantina Plateau, Minas Gerais, Brazil. Phytotaxa 267(1): 70–76.

Coutinho, I.A.C. et al. 2016. A study of the morphoanatomical characters of the leaves of *Chamaecrista* (L.) Moench sect. *Apoucouita* (Leguminosae-Caesalpinioideae). Acta Botanica Brasilica 30(2): 205–221.

Dangi, R., Tamhankar, S., Choudhary, R.K. et al. 2016. Molecular phylogenetics and systematics of *Trigonella* L. (Fabaceae) based on nuclear ribosomal ITS and chloroplast trnL intron sequencesGenet Resour Crop Evol 63: 79. doi:10.1007/s10722-015-0236-4

Dhatchanamoorthy, N. et al. 2016. Rediscovery of *Crotalaria rigida* (Leguminosae)—Rare and endemic legume of Southern India, Tamil Nadu. Phytotxa 278(3): 297–300.

Duan, L. et al. 2016. A molecular phylogeny of Caraganeae (Leguminosae, Papilionoideae) reveals insights into new generic and infrageneric delimitations. PhytoKeys 70: 111–137.

Egan, A.N. et al. 2016. Parsing polyphyletic *Pueraria*: Delimiting distinct evolutionary lineages through phylogeny. Molecular Phylogenetics and Evolution 104: 44–59.

Falcão Jr., M.J.A. et al. 2016. A Taxonomic Revision of the genus *Dialium* (Leguminosae: Dialiinae) in the Neotropics. Phytotaxa 238(2): 123–142.

Felix-da-Silva, M.M. et al. 2016. Taxonomic studies in the *Macrolobium campestre* complex (Leguminosae). Phytotaxa 272(4): 257–266.

Flores, A.S. et al. 2016. Lectotypifications and taxonomic changes in Brazilian *Crotalaria* L. (Leguminosae). Phytotaxa 267(4): 267–300.

Gagnon, E., Bruneau, A., Hughes, C.E., de Queiroz, L.P. and Lewis, G.P. (2016). A new generic system for the pantropical Caesalpinia group (Leguminosae). Phytokeys 71: 1-160. doi: 10.3897/phytokeys.71.9203.

PUBLICATION NEWS FROM THE WORLD OF LEGUME SYSTEMATICS

(Cont.)

Gholami, A & Pandey, A.K. 2016. *Alysicarpus gautalensis* (Leguminosae: Desmodieae), a new species from Maharashtra, India. Phytotaxa 266(2): 141–145.

Gómez-Acevedo, S.L., Rico-Arce, MdL, Delgado-Salinas, A., Magallón, S. & Eguiarte-Fruns, L. 2015. Análisis molecular del género *Acacia* (Leguminosae, Mimosoideae), con énfasis en el grupo mirmecófilo. in V Conferencia Internacional de Leguminosas, VILC / Renée Fortunato (ed). Fundación CICCUS, Buenos Aires, Argentina Pp 201-223.

Greve, M., Lykke, A.M., Fagg, C.W., Gereau, R.E., Lewis, G.P., Marchant, R., Marshall, A.R., Ndayishimiye, J., Bogaert, J. & Svenning, J.-C. 2016. Realising the potential of herbarium records for conservation biology. South African J. Bot. 105: 317 – 323.

Hardion, L. et al. 2016. Geographical isolation caused the diversification of the Mediterranean thorny cushion-like *Astragalus* L. sect. *Tragacantha* DC. (Fabaceae). Molecular Phylogenetics and Evolution 97: 187–195.

Khandani, S. et al. 2016. Plant Systematics and Evolution. Biodiversitas 17(1): 162–171.

Kholina, A.B. et al. 2016. Phylogenetic relationships of the species of *Oxytropis* DC. subg. *Oxytropis* and *Phacoxytropis* (Fabaceae) from Asian Russia inferred from the nucleotide sequence analysis of the intergenic spacers of the chloroplast genome. Russian Journal of Genetics 52(8): 780-793.

Lam, H.K. et al. 2016. The single evolutionary origin of chlorinated auxin provides a phylogenetically informative trait in the Fabaceae. Plant Signaling and Behaviour 11(7) DOI: 10.1080/15592324.2016.1197467

Lewis, G. & Herendeen, P., eds. 2016. Special Section: Legumes of Brazil, insights into systematics and biology. Int. J. Plant Sci. 177 (1): 1 – 89.

Lewis, G. P. & Machado, R. P. 2016. *Caesalpinia* (pp. 24 – 25), *Guilandina* (pp. 28 –29) and *Poincianella* (pp. 31 – 32). In Wanderley, M.G.L. et al. (eds.) Flora Fanerogâmica do Estado de São Paulo. Instituto de Botânica, São Paulo, vol. 8, Caesalpinioideae pp. 22 – 83.

Lewis, G. P. 2016. New insights into the systematics and biology of Brazilian Leguminosae (Fabaceae). Int. J. Plant Sci. 177 (1): 1 – 2. DOI: 10.1086/684170.

Mansano, V.F. et al. 2016. *Swartzia hilaireana* (Leguminosae), an "old" new species from the state of Minas Gerais, Brazil. Phytotaxa 253(2): 156–160.

Marinho, C.R. et al. 2016. The uncommon cavitated secretory trichomes in *Bauhinia* s.s. (Fabaceae): the same roles in different organs. Botanical Journal of the Linnean Society 180(1): 104-122.

Morales, M. & Fortunato, R.H. 2016. A new xerophytic species of *Mimosa* (Mimosoideae, Leguminosae) from Madagascar. Phytotaxa 270(4): 277–285.

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