The Bean Bag

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

Number 60 **December 2013**

FROM THE EDITOR

Lourdes Rico

The Bean Bag is a newsletter designed to promote communication among research scientists concerned with legume systematics. It started in 1974 as the initiative of Bob Gunn and Richard Cowan; the first printed issue was distributed in May 1975, so Bean Bag is nearly 40 years old. In 1978 Roger M. Polhill and Peter Raven made possible the first International Legume conference at Kew and then in 1982 the first Advances in Legume Systematics (ALS) volumes were published, fundamental references for any bean family researcher. To date 12 ALS have been produced to the benefit of us all. The year 2005 was an excellent one due to the appearance of Legumes of the World, an illustrated encyclopedia of all 727 legume genera recognised at that time from endemic monotypic genera to the largest angiosperm genus *Astragalus*. This year the Bean Bag issue 60 is a milestone issue with exciting news to communicate to all readers.

The aim of the Bean Bag has always been a yearly newsletter that keeps legume researchers informed about new titles and projects on the family. Nowadays electronic distribution makes circulation more efficient and economic.

To make the Bean Bag sustainable, potential new readers wishing to receive a copy should please send an email to the editor: L.Rico@kew.org and provide their full name and area(s) of interest. Contributions for the next issue are welcome; copies of past issues are available at:

http://www.kew.org/herbarium/legumes/beanbag.html

Please feel free to share the Bean Bag with people who might find it interesting for their research. If you change your e-mail address or wish to unsubscribe please send an e-mail to the editor.

N E W S

Astragalus - New book: a result of 40 years work



A taxonomic revision of the genus *Astragalus* L. (Leguminosae) in the Old World is now available; a joint effort of D. Podlech (München, Germany) & Sh. Zarre (Tehran, Iran) with collaboration of M. Ekici (Ankara), A.A. Maassoumi (Tehran, Iran) and A. Sytin (St. Petersburg, Russia).

This consists of 3 Volumes, with a total of 2439 pages (201 x 297 mm.), a taxonomic treatment with an identification key for the 136 *Astragalus* sections. Authors list 2398 accepted names, each with synonyms, descriptions, distribution maps and a list of specimens. A limited number of printed copies of the 3 volumes are on sale (€ 400 - plus postage, c. 6 kg) – there might still be some copies available! There is also a DVD with searchable pdfs (€100, - plus postage).

Order: verlag@nhm-wien.ac.at
 ISBN 978-3-902421-76-0

http://www.nhm-wien.ac.at/forschung/botanik/mitarbeiterinnen/ernst_vitek
http://www.nhm-wien.ac.at/forschung/botanik

Advance in Legumes Systematics 12 (ALS 12)

Lourdes Rico

The proceedings of the Sixth International Legume Conference (VI ILC) held 6-11 January 2013 at the University of Johannesburg (South Africa) are now published in the South African Journal of Botany Vol. 89: pages 1-300 (2013), including 33 articles; the full text (pdf) of the papers is available electronically at the journal website. Many congratulations to the editors who got this magnificent volume published in a less than a year since the Conference took place. To consult the proceedings on line (ALS 12) please visit:

www.elsevier.com/locate/sajb

Seed Collecting Guides for the Adapting Agriculture to Climate Change Project

Ruth Harker

The Adapting Agriculture to Climate Change project (cwrdiversity.org) has developed a new method of producing seed collecting guides using the visual reporting tool in BRAHMS (Botanical Research and Herbarium Management database Version 7.1).

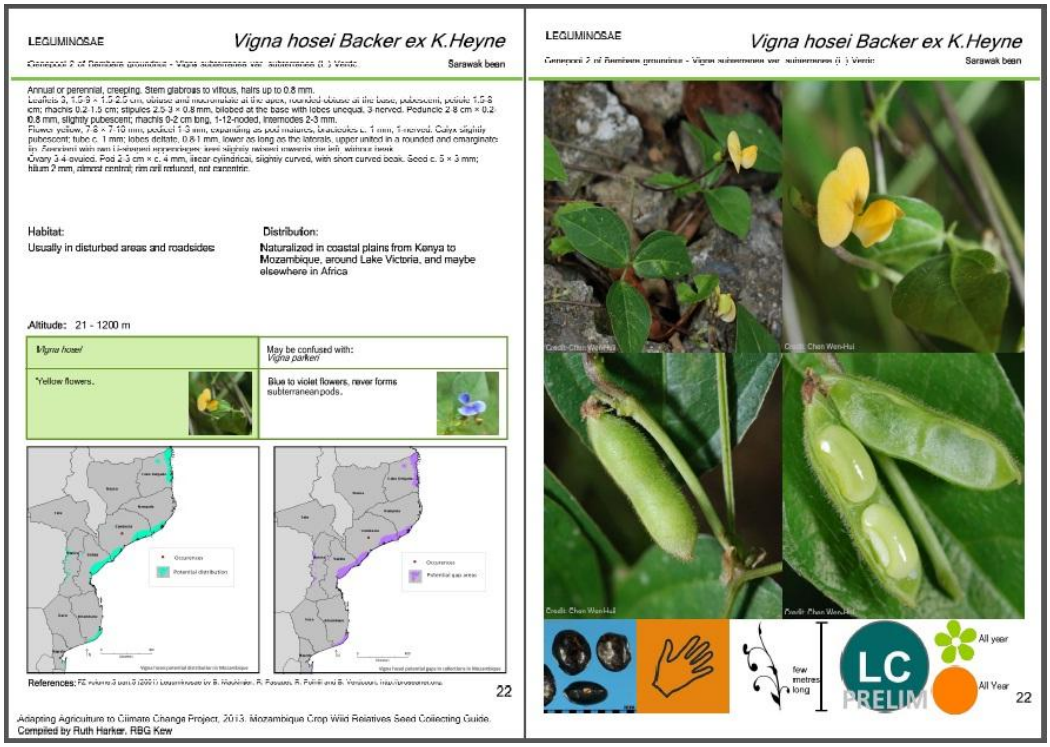
The visual reporting tool within BRAHMS can be used to design a template for the layout of the species profile pages which integrates botanical information, images and maps with graphics and labels. The visual report may also be used to specify the font, colour and size of

text as well as the layout. This tool has proved to be extremely useful and efficient in compiling collecting guides, as the species profiles which are produced do not need any additional editing and can be exported straight to a pdf.

The finished guides can be viewed as a pdf, and are also being produced in hardcopy for our partners to use in the field. The sheets in the hard copy guides are laminated and held in a ringbinder, to provide a hardwearing and durable resource to be used in the field.
Target species for the Adapting Agriculture to Climate Change project come from 29 different genepools, and include legumes, grasses and solanums.

Data provided for each target species includes a species description, habitat, distribution, phenology, conservation status, best collecting method, and how to distinguish the target species from others with which it may be easily confused. High quality images of the plant in the field and distribution maps are also included.

Example of the first hardcopy of the Mozambique collecting guide (it has just been printed).



Example of a species page

The resulting collecting guides will be used on seed collecting expeditions to provide collectors in the field with the key information they need for identification and collection of target species. This project is aiming to make and conserve over 6000 seed collections from crop wild relatives in over 20 countries. Each seed collecting guide will contain information for between 20 and 30 target species.
Any comments or questions, please contact Ruth Harker at r.harker@kew.org

Legumes of the World Online available from December 2013

Barbara MacKinder & Ruth Clark

In July 2005, the Royal Botanic Gardens, Kew published *Legumes of the World* (LoW), a book containing an encyclopaedic overview of the current knowledge of the 727 genera then recognised in the Leguminose (Fabaceae) family.

The content and images published in LoW are now accessible at www.kew.org/lowo as a web-based publication, *Legumes of the World On-Line* (LOWO), managed and updated initially by members of the legume research team at Kew (Barbara Mackinder, Ruth Clark and Gwilym Lewis and Lourdes Rico) with contributions from other international legume specialists. LOWO links to other Kew-based and external legume resources and the intention is to integrate with additional classes of legume data provided and curated by others.
LOWO currently contains information about the number of species, global distribution, ecology, habit and uses of each legume genus, as well as pointing to reliable references for further information and providing useful notes about taxonomy, including the etymology of the genus names.

Users can locate a genus by browsing either the traditional hierarchical classification (tribe by tribe as the published book was arranged) or a phylogenetic hierarchy which more closely reflects current thinking as to the evolutionary relationships in the family. Users can also search using scientific names (including synonyms) or common names, or search for any content through use of a simple free text search.

What are our plans?

New content is to be regularly added to the website gleaned largely from published scientific papers, new revisions, monographs and Flora treatments. For example, we already know that the number of legume genera has increased from the 727 recognised in LoW in 2005 to 751 accepted in mid-2013.

We are committed to making numerous additional authoritatively identified legume images widely available through LOWO. At Kew we have a major collection of images which could not be included in the Book. Currently only images for which explicit permission has been granted for use on the website are visible. Where images and artwork in LOWO are subject to copyright agreements we will be seeking permission from their owners to consent to their use for this purpose. We also plan to enhance geographical distribution data so that country lists of genera can be easily downloaded and provide active links to other sources of legume data.

How can you participate?

We would like to receive news of your new legume publications. Digital links to your publications, if they exist, are particularly welcome. This will allow us to keep the information on the website as up to date as possible.

We are particularly keen to receive legume images, especially digital photographs of flowers, fruits, habit and habitat if you are willing to give us permission to use your photos in LOWO (all images are appropriately acknowledged). Ideally images should link to a specimen lodged as a voucher in a recognised herbarium. Meta data accompanying an image should

include, where available, plant identification, country, collector of associated specimen, collector`s number and collection date. There is no restriction on how many images we can include on each genus page.

We are looking to increase the number of contributors who are willing to act as genus or tribe co-ordinators whom we can consult for authoritative input and feedback on taxonomy, phylogenetic position, data reliability and image availability. Please do get in touch.

Finally should you manage a digital resource containing information about Legumes and would like to explore possibilities for linkages and pointers between the two data sets then please do contact us at the email address below.

We are keen to receive feedback about LOWO and you can contact us at: lowo@kew.org
Follow us on twitter@LegumeGenera

International Legume Database on Nodulation (ILDON)

Janet Sprent & Peter Winfield

We would like to announce the availability of a new information service on Legume nodulation. Our ambition is to provide an on-line, easily searchable web publication that reflects modern taxonomy. An initial trial version was shown at the Legume conference in Johannesburg, but was put on hold until some of the taxonomic problems have been resolved. We will cite the latest authoritative information on nodulation, nodule processes from infection by rhizobia, to nodule morphology, anatomy and fine structure of host cells and bacteroids. ILDON will include links to and from the latest revised version of ILDIS and the newly released Legumes of the World On-Line (LOWO, www.kew.org/lowo.
The web publication will be built progressively, starting with the agronomically important tribe Fabeae (now including Trifolieae and Cicereae) and then proceed to the largely Southern Hemisphere tribes Brongniartieae, Crotalarieae, Hypocalypteae and Podalyrieae, which, as a group, encompass a different suite of nodule characters. ILDON is seeking sponsorship to develop and deliver a sustainable information resource. Steve Cannon of ARC, USDA says he thinks ILDON is a fantastic project and expects to be a user.
We also welcome feedback on our work. If you are interested in supporting ILDON, please contact one of the three current 'owners' Peter Winfield (peter.winfield@ildon.org) Janet Sprent (JISprent@btinternet.com) or Euan James (Euan.James@Hutton.ac.uk).

International Legume Database & Information Service (ILDIS)

Peter Winfield

A revised version of the ILDIS (International Legume Database & Information Service) Legume database, version 10.38, is available as a web publication at http://www.legumes-online.net. The database was last revised and published in November 2012.
The web includes all preferred names, synonymy and vernacular names for all legume species. The web also includes the geographic distribution by continent, country and area, habitats for African legumes, literature citations for descriptions, maps and illustrations and

notes. Simple descriptors, including life form and conservation status are also included. All information is referenced, where possible.
The publication is comprehensively indexed to facilitate simple searching by nomenclature and data type, including geographic distribution. The web can be accessed using any digital device with an internet connection and a browser.
The web publication was revised in January 2013 to include a comprehensive index to genera. For further information about this publication please contact Peter Windfield <peter.winfield@legumes-online.net>

OBITUARIES

Tom Corby (1913 - 2013)
Photograph courtesy of Susan Vincent

Tom Corby died on 6 January 2013, he made two very important contributions to legume biology. Readers of New Phytologist are most likely to know him from his work putting legume nodule morphology into a taxonomic framework. His best-known paper on this, Corby (Kirkia 13:53-123.1988), gave details of the morphology of nodules from many different legume genera, mostly from his own observations. This work was also the basis for his PhD thesis (University of Harare, Zimbabwe). Tom's other contribution was in the formulation of rhizobial inoculants, using local ingredients rather than peat as a carrier, for legumes including soybean, which was then being developed as a crop in Southern Rhodesia.

I saw Tom in November 2012 and, although physically frail, he was mentally as sharp as ever. He had a long discussion with us about experimental design and the statistical analysis of field data. I was also able to tell him of our planned interactive database on legume nodule characters (www.ILDON.org) which was launched at the 6th International Legume Conference in Johannesburg. Tom will be greatly missed by his friends, not only for his excellent science, but also for his great sense of humour and resolve.
Tom Corby full obituary (http://onlinelibrary.wiley.com/doi/10.1111/nph.12280/full)

Tom was an amazing man and I am very grateful to New Phytologist for enabling and helping me to publish his obituary

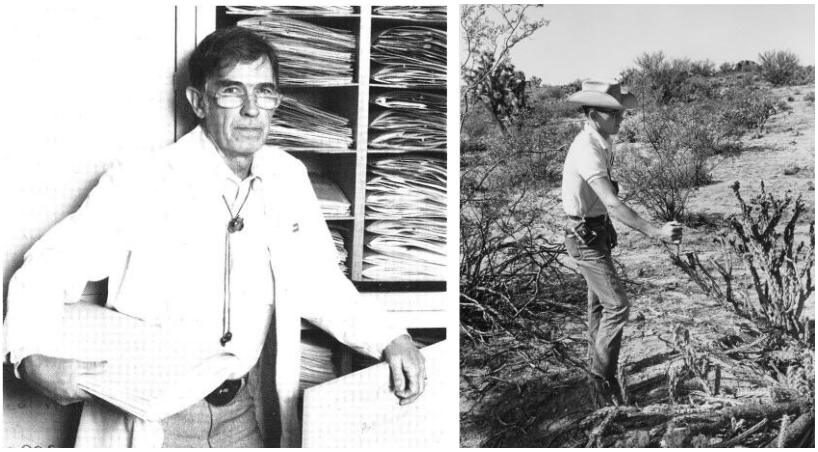
Janet Sprent

Frances K. Kupicha (1947-2013)

Well known authority on the genera *Vicia* and *Lathyrus*, Frances Kupicha died peacefully at home on 12th September, 2013. Amongst her Leguminosae work, her diligent PhD on the tribe Vicieae and the relationships of *Cicer* was published in 1977; she subsequently worked as a market gardener near Hastings (Parkwood) for the rest of her life. Despite the excellence of her work on the tribe Vicieae (=Fabeae) she never returned to work

as a professional taxonomist but her contributions were a cornerstones in Fabeae taxonomy. Her funeral took place at Den Church, at 12 noon on Friday 27th September 2013.

Lathyrus cicera L. and *L. aphaca* L. two of the species of the tribe Fabeae studied by Francis Kupicha. Photographs courtesy of Ali Shehadeh



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William Fred Mahler "Bill"
30 August 1930–2 July 2013

W.F. Mahler well known contributions on Leguminosae are within the genera *Psoralea*, *Dalea*, *Desmodium* and other Papilionoideae. In 1988, Mahler was the first recipient of the Harold Beaty Award from the Texas Organization of Endangered Species for his work with endangered plant species in Texas. The Native Plant Society of Texas again honored Mahler in 1995 with the Charles Leonard Weddle Memorial Award in recognition of a lifetime of service and devotion to Texas native plants. Mahler also served on the Board of Consultants

for the North Texas Poison Center, Parkland Hospital, Dallas, Texas. He assisted the Poison Center in identifying plants and mushrooms implicated mostly in human poisoning cases. In 1993, S.H. Sohmer assumed directorship of BRIT, and Bill served as Director Emeritus (1993–2013). After retiring, he returned with his loving wife to his childhood home of Iowa Park, Texas, where was a native and proud of his home town. There he kept his fingers in botany, attended many BRIT functions in Fort Worth (often with Iowa Park friends, introducing them to BRIT), and worked tirelessly on the genealogy of the Mahler family. The taxonomist in him never retired. On July 2, 2013, Bill retired to his final resting place adjacent to his father, mother, and brother in Highland Cemetery, Iowa Park, Texas.

http://brit.org/webfm_send/476

G L E A N I N G S

New legume projects

HYMENAEA

Msc. Rafael Barbosa Pinto, student at Universidade Estadual de Campinas, São Paulo, Brazil (UNICAMP), is currently working on a taxonomic revision and phylogenetic analysis of the genus *Hymenaea* L. under the supervision of Dra. Ana María G. de A. Tozzi (UNICAMP) and Dr. Vidal de Freitas Mansano (JBRJ).

NITROGEN FACTOR

Julie Ardley, Sofie de Meyer and Janet Sprent from the Plant Biology Department, University of Dundee (UK) are undertaking a project to study legume nodule processes in the W Australian **Mirbelioid** legumes: these are adapted to low nutrient soils.

MUCUNA

Dr. Tania Moura is currently on a one year post-doc research placement in the Herbarium of the Royal Botanic Gardens, Kew where she is preparing a monograph of the pantropical legume genus *Mucuna* in collaboration with Gwilym Lewis, Melanie Thomas, Helen Hopkins and Felix Forest. She also is collaborating on the project with Dr Frits Adema (Leiden), Professor Tadashi Kajita and Dr Mohammad Vatanparast (Chiba University, Japan), Dra Ana Tozzi (Universidade Estadual de Campinas, Brazil) and Dr Vidal de Freitas Mansano (Jardim Botanico do Rio de Janeiro, Brazil). There are approximately 105 accepted species of *Mucuna* recorded from the tropics and subtropics; many are narrow endemics. The monograph will include keys to species identification, descriptions, maps and illustrations. We are currently gathering field photographs of *Mucuna* for publication in the monograph. If you have any photographs of *Mucuna* that you would allow us to use, please send them to Tania Moura tmariamoura@gmail.com together with the metadata: photographer`s name (for acknowledgement and copy right purposes), country and location of photograph, species identification if known, and, if the image has links to an herbarium specimen, the collector(s), collector`s number and date of collection, as well as the name of at least one herbarium where a duplicate has been deposited. Tania will be happy to provide you with an up-to-date identification of any photographs; she will also identify herbarium vouchers in exchange for a duplicate specimen.

TRIBE CERCIDEAE

Liam Trethowan, ecology and environmental biology undergraduate student from Leeds University, U.K., is currently on a year's sandwich placement at Kew (his second year of a four year degree programme). Whilst at Kew he is working on the Legumes of the World Online (LOWO) project. The core of his work entails gathering information and images on the tribe Cercideae adding to that already placed within the LOWO website. In less than four months his work has lead to the location of several new combinations required in the *Bauhinia s.l.* clade and also the discovery of some interesting information on the anti-syphilitic properties of *Schnella glabra*. He plans to carry out a project on the *Schnella guianensis* complex.

PELTOGYNE

Phylogeny and phylogeographical analyses of the endangered species *Peltogyne mexicana*. Jeny Solange Sotuyo, Alfonso Delgado-Salinas (UNAM, México) and Gwilym Lewis (RBG, Kew).

Peltogyne Vogel ("purpleheart") is a neotropical genus comprising ca. 25 species centred in Amazonian Brazil, with 2 species in Central America, one extending to Mexico, and one S. American species reaching Trinidad (Mackinder, 2005). Several species are used for high quality timber in construction and for furniture, cabinet work, flooring, decorative veneers and musical instruments, as well as for the extraction of a dye, although two species are more widely used than others: *P. mexicana* and *P. purpurea*. *Peltogyne mexicana* Martínez is an allopatric species restricted to the state of Guerrero in Mexico. Populations are decreasing rapidly in areas where they were once abundant and the species is considered to be endangered. To date there exists no genetic study of the populations in Guerrero. First, we will reconstruct a robust phylogeny of *Peltogyne* to discover the sister species of *P. mexicana*. Then we will analyse the phylogeography of *P. mexicana* and its present day fragmented distribution. The genetic diversity and differentiation among populations will be analysed by Sanger sequencing (plastid and nuclear regions) and new generation sequencing (RADtags). The results of our research will be relevant to conservation efforts and ongoing sustainable management of the species.

NEW PUBLICATIONS

Andueza-Noh, R.H., Serrano-Serrano, M.L., Chacón-Sánchez, M.I., Sanchéz del Pino, I., Camacho-Pérez, L., Coello-Coello, J., Mijangos-Cortés, J., Debouck, D.G. & Martínez-Castillo, J. 2013. Multiple domestications of the Mesoamerican gene pool of Lima bean (*Phaseolus lunatus* L.): evidence from chloroplast DNA sequences. Genet. Resources & Crop Evol. 60 (3): 1069-1086.

Babineau, M., Gagnon, E., Bruneau, A. 2013. Phylogenetic utility of 19 low copy nuclear genes in closely related genera and species of caesalpinioid legumes. South African Journal of Botany 89: 94-105. http://www.sciencedirect.com/science/article/pii/S0254629913002974

Babineau, M . 2013. Systematique moleculaire et biogeographie de trois genres malgaches menaces d'extinction *Delonix, Colvillea*, et *Lemuropisum* (Caesalpinioideae: Leguminosae). Thesis (in french with english abstract):

https://papyrus.bib.umontreal.ca/xmlui/handle/1866/9958

Bandyopadhyay, S., Ghoshal, P.P. & Pathak, M.K. 2012. Fifty new combinations in *Phanera* Lour. (Leguminosae: Caesalpinioideae) from paleotropical region Bangladesh. J. Pl. Taxon. 19: 55–61.

Bandyopadhyay, S. 2012. Lectotypification of *Bauhinia phoenicea* Wight & Arn. (Leguminosae: Caesalpinioideae). Candollea 67(1): 41–43.

Bandyopadhyay, S. 2012. Lectotypification of *Bauhinia nervosa* (Leguminosae: Caesalpinioideae). J. Bot. Res. Inst. Texas 6: 109-111.

Bandyopadhyay, S. 2012. Typification of *Bauhinia ornata* (Leguminosae: Caesalpinioideae). Nelumbo 54: 263–264.

Bandyopadhyay, S. 2013. Two new varietal combinations in *Phanera* (Leguminosae: Caesalpinioideae). Edinburgh J. Bot. 70 : 363–365.

Bandyopadhyay, S. 2013. Second-step lectotypification of *Bauhinia khasiana* Baker (Leguminosae: Caesalpinioideae). Candollea 68: 99–103.

Bandyopadhyay, S. 2013. Lectotypification of *Phanera macrostachya* Benth. **(**Leguminosae: Caesalpinioideae**).** Edinburgh J. Bot. 70: 48- 490.

Banks, H., Forest, F. & Lewis, G.P. 2013. Palynological contribution to the systematics and taxonomy of *Bauhinia* s.l. (Leguminosae: Cercideae). South African Journal of Botany 89: 219–226

Beentje, H. J., Polhill, R.M., & Lewis, G.P. 2013. Bernard Verdcourt (1925–2011). Kew Bulletin 68 (4): 1-8.

Berbel, A., Ferrándiz, C., Hecht, V., Dalmais, M., Lund, O.,S., Sussmilch, F.C., Taylor, S.A., Bendahmane, A., Ellis, T.N.H., Beltrán, J.P., Weller J.L. & Madueño, F. 2012. VEGETATIVE1 is essential for development of the compound inflorescence in pea. Nature Communications 3: 797. DOI: 10.1038/ncomms1801

Bruneau, A., Doyle, J. J., Herendeen, P., Hughes, C.E., Kenicer, G., Lewis, G.P., Mackinder, B.A., Pennington, R.T., Sanderson, M.J., Wojciechowski, M.F., Boatwright, J.S., Brown, G., Cardoso, D., Crisp, M., Egan, A., Fortunato, R.H. & al. 2013. Legume phylogeny and classification in the 21st century: Progress, prospects and lessons for other species-rich clades. Taxon 62 (2): 217–248. ISSN: 0040-0262.

Cardoso, D., Pennington R.T., de Queiroz L.P., Boatwright J.S., van Wyk B.-E., Wojciechowski, M.F. & Lavin, M. 2013. Reconstructing the deep-branching relationships of the papilionoid legumes. South African Journal of Botany 89: 58–75.
Carneiro Capucho L. & Pádua Teixeira, S. 2013. Tapetal and parenchymatic anther tissues participate in polyad adhesive production in *Calliandra* brevipes (Leguminosae). South African Journal of Botany 89: 227–233.

Conterato, I.F., Schifino-Wittmann, M.T., Divanilde Guerra, D. & Dall'Agnol, M. 2013. Amphicarpy in *Trifolium argentinense*: morphological characterisation, seed production, reproductive behaviour and life strategy. Australian Journal of Botany 61: 119–127.

Cullen, J. & Lewis, G.P. 2013. 760. *Retama sphaerocarpa* (Leguminosae). Curtis`s Bot. Mag. 30(2): 95 – 100.

Devey, D.S., Forest, F., Rakotonasolo, F., Ma, P., Dentinger, B.T.M. & Buerki, S. 2013. A snapshot of extinction in action: The decline and imminent demise of the endemic *Eligmocarpus* Capuron (Caesalpinioideae, Leguminosae) serves as an example of the fragility of Madagascan ecosystems. South African Journal of Botany 89: 273–280.

de Queiroz, R.T., & Tozzi, A.G.P. 2013. A new species of *Tephrosia* (Leguminosae-Papilionoideae-Millettieae) from Misiones, Argentina. Phytotaxa 131: 41–44.

de Queiroz, R.T., Tozzi, A. & Lewis, G.P. 2013. Seed morphology: an addition to the taxonomy of *Tephrosia* (Leguminosae, Papilionoideae, Millettieae) from South America. Plant Systematics and Evolution 299: 459–470.

de Stefano, R.D., Rico Arce, M.D.L., Contreras, J.E.L., Can, L.L. & Ruiz, S.C. 2013. Re-establishment of *Pithecellobium subglobosum* in Colombia and Venezuela (Leguminosae, Mimosoideae, tribe Ingeae). Phytotaxa 138: 15-24

de Souza, E. R., Lewis, G.P., Forest, F., Schnadelbach, A.S., Van den berg C., & Queiroz L.P. 2013. Phylogeny of *Calliandra* (Leguminosae: Mimosoideae) based on nuclear and plastid molecular markers. Taxon 62: 1201-1220.

Dutra, V. F., Garcia, F. C. P. 2013. Three New Species of *Mimosa* (Leguminosae) from Minas Gerais, Brazil. Systematic Botany 38: 398-405.

Filardi, F. L. R., de Lima, H. C., Klitgård, B.B., Sartori, A.L.B. 2013. Taxonomy and nomenclature of the neotropical *Machaerium hirtum* complex (Leguminosae, Papilionoideae). Brittonia 65: 154-170.

Ferval, M., Legal, L., Gers, C., Winterton, P. & Bermúdez-Torres, K. 2013. Genomic fingerprinting versus nuclear gene sequences: A comparative approach for studying the *Lupinus montanus* (Fabaceae) species complex. South African Journal of Botany 89: 106-110.

Fortuna-Perez, A. P., de Silva, M. J., et al. 2013. Phylogeny and biogeography of the genus *Zornia* (Leguminosae, Papilionoideae, Dalbergieae).Taxon 64: 739-748.

Gagnon, E., Lewis, G.P., Sotuyo, S.J., Hughes, C.E. & Bruneau, A. 2013. A molecular phylogeny of *Caesalpinia* sensu lato: Increased sampling reveals new insights and more genera than expected. South African Journal of Botany 89: 111-127.

Gehlot, H.S. et al. 2013. An invasive *Mimosa* in India does not adopt the symbionts of its native relatives. Ann. Bot. 112: 179-196.

Gomes Ribeiro, P. 2012. Flora da Bahia: família Leguminosae, subfamilia Mimosoideae. Tribo Acacieae & Tribo Mimoseae-Parte I. MSc Thesis. Universidade Feira de Santana, Bahia, Brazil. 371 pages.

Iganci, J.R.V., Miotto, S.T.S., Souza-Chies, T.T., Särkinen, T.E., Simpson, B.B., Simon, M.F., Pennington, R.T. 2013. Diversification history of *Adesmia* ser. Psoraleoides (Leguminosae): Evolutionary processes and the colonization of the southern Brazilian highland grasslands. South African Journal of Botany 89: 257-264.

Kaljund, K., Leht, M. & Jaaska, V. 2013. Highly variable clonal diversity and spatial structure in populations of sickle medic. Biochemical Systematics and Ecology 47: 93-100.

Kite, G. C., Cardoso, D., Veitch, N.C., Lewis, G.P. 2013. Quinolizidine alkaloid status of *Acosmium* s.s., *Guianodendron* and *Leptolobium*, the segregate genera of *Acosmium* s.l. South African Journal of Botany 89: 176-180.

Kite, G. C., Veitch, N.C., Soto-Hernández, M., Lewis, G.P. 2013. Highly glycosylated flavonols at the genistoid boundary and the systematic position of *Dermatophyllum*. South African Journal of Botany 89: 181-187.

Klitgård, B.B., Forest, F., Booth, T.J., Saslis-Lagoudakis, C.H. 2013. A detailed investigation of the *Pterocarpus* clade (Leguminosae: Dalbergieae): *Etaballia* with radially symmetrical flowers is nested within the papilionoid- flowered *Pterocarpus*. South African Journal of Botany 89: 128-142.

Koenen, E.J.M., de Vos, J.M., Atchison, G.W., Simon, M.F., Schrire, B.D., de Souza, E.R., de Queiroz, L.P. & Hughes, C.E. 2013. Exploring the tempo of species diversification in legumes. South African Journal of Botany 89: 19-30.

Lammel, D. R., Cruz, L. M., Carrer, H., Cardoso, E.J.B.N. 2013. Diversity and symbiotic effectiveness of beta-rhizobia isolated from sub-tropical legumes of a Brazilian *Araucaria* Forest. World Journal of Microbiology and Biotechnology. DOI 10.1007/s11274-013-1400-7 Abstract: http://www.ncbi.nlm.nih.gov/pubmed/23861038

Lewis, G.P., Schrire B.D., Mackinder, B.A., Rico, L., Clark, R. 2013. A 2013 linear sequence of legume genera set in a phylogenetic context - A tool for collections management and taxon sampling. South African Journal of Botany 89: 76-84.

Lee, G-A., Crawford, G.W., Liu, L., Sasaki, Y., Chen, X. 2011. Archaeological Soybean (*Glycine max*) in East Asia: Does Size Matter? PLoS ONE 6(11): e26720. doi:10.1371/journal.pone.0026720

Lu, J.K. et al. 2013. Two-way transfer of nitrogen between *Dalbergia odorifera* and its hemiparasite host *Santalum album* is enhanced when the host is efficiently nodulated and fixing nitrogen. Tree Physiol. 33: 464-474

Luna, J., Morales, M. & R.H. Fortunato, 2012. *Mimosa diversipila* var. *subglabriseta* (Mimosoideae, Leguminosae), a new record for the flora of Paraguay. Bol. Soc. Arg. Bot. 47 (3-4): 457-460. ISSN: 1851-2372.

The Legume Phylogeny Working Group. 2013. Towards a new classification system for legumes: progress report from the 6th International Legume Conference. South African Journal of Botany 89: 3-9. http://dx.doi.org/10.1016/j.sajb.2013.07.022

The Legume Phylogeny Working Group. 2013. Legume phylogeny and classification in the 21st century: progress, prospects and lessons. Taxon 62: 217-248.

Mackinder, B. A. & J. J. Wieringa. 2013. *Annea* gen. nov. (Detarieae, Caesalpinioideae, Leguminosae): a home for two species long misplaced in *Hymenostegia* sensu lato. Phytotaxa 142: 1-14.

Mackinder, B. A. & J. J. Wieringa. 2013. *Hymenostegia viridiflora* (Detarieae, Caesalpinioideae, Leguminosae), a new tree species from Cameroon. Blumea 58: 13-17.

Mackinder, B.A., Saslis-Lagoudakis, C.H., Wieringa J.J., Devey, D., Forest, F. & Bruneau, A. 2013. The tropical African legume *Scorodophloeus* clade includes two undescribed *Hymenostegia* segregate genera and *Micklethwaitia*, a rare, monospecific genus from Mozambique. South African Journal of Botany 89: 156-163.

Manríquez-Torres, J.J, Torres-Valencia, J.M., Gómez-Hurtado, M.A., Motilva, V., García-Mauriño, S., Avila, J., Elena Talero, Cerda-García-Rojas, C.M. & Joseph-Nathan, P. 2011. Absolute Configuration of 7,8-seco-7,8-Oxacassane Diterpenoids from *Acacia schaffneri*. Journal of Natural Products 74: 1946-1951. dx.doi.org/10.1021/np200445y

Martínez Quesada, E. & Morales Pérez, R. 2013. *Acaciella angustissima* (Fabaceae, Mimosoideae), new for Cuba. Willdenowia 43: 139-141. ISSN 1868-6397 http://dx.doi.org/10.3372/wi.43.43116

Maseko, S.T., Dakora, F.D. 2013. Rhizosphere acid and alkaline phosphatase activity as a marker of P nutrition in nodulated *Cyclopia* and *Aspalathus* species in the Cape fynbos of South Africa. South African Journal of Botany 89: 289-295.

Marshall, A.R., Platts, P. J., Gereau, R.E., Kindeketa, W., Kang'ethe, S. & Marchant, R. 2012. The genus *Acacia* (Fabaceae) in East Africa: distribution, diversity and the protected area network. Plant Ecology and Evolution 145 (3): 289–301. http://dx.doi.org/10.5091/plecevo.2012.597

Meireles, J.E. & de Lima, H.C. 2013. A new species of *Poecilanthe* (Leguminosae, Papilionoideae, Brongniartieae) from Southeastern Brazil. Phytotaxa 116: 57-60.

Mikić, A., Ćupina, B., Mihailović, V., Krstić, Đ., Antanasović, S., Zorić, L., Đorđević, V., Perić, V. &, Srebrić, M. 2013. Intercropping white (*Lupinus albus*) and Andean (*Lupinus mutabilis*) lupins with other annual cool season legumes for forage production. South African Journal of Botany 89: 296-300.

Moura, T.M., Tozzi, A.M.G.A, Manzano, V.F. &. Lewis, G.P. 2013. Lectotypification of names of Neotropical species of *Mucuna* (Leguminosae: Papilionoideae: Phaseoleae). Taxon 62: 391-393.

Moura, T.M., Manzano, V.F., Gereau, R. & Tozzi, A.M.G.A. 2013 *Mucuna jarocha* (Leguminosae-Papilionoideae-Phaseoleae), a new species from Mexico. Phytotaxa 89 (1): 43-46.

Morales, M. & Fortunato, R.H. 2013. Contribuciones en el género *Mimosa* (Mimosoideae, Leguminosae) para la Flora del Paraguay. Candollea 68(1): 76-85. ISSN: 0373-2967**.**

Morales, M. & R.H. Fortunato, 2013. A new species of *Mimosa* (Mimosoideae, Leguminosae) from the inter-Andean dry valleys. Phytotaxa 114 (1): 33–41. ISSN**:** ISSN 1179-3155.

Morales, M., Wulff, A.F., Fortunato, R.H. & Poggio, L. 2013. Chromosome studies in southern species of *Mimosa* (Fabaceae, Mimosoideae) and their taxonomic and evolutionary inferences. Plant Syst Evol. [on line 15 pages w/n] DOI 10.1007/s00606-013-0920-9

Morales, M., Santos-Silva, J., & Ribas, O.S. 2013. A new species of *Mimosa* sect. *Mimosa* (Leguminosae, Mimosoideae) from Southern Brazil. Brittonia**,** 65: 148 - 153, 2013 ISSN**:** 0007-196X.

Nemoto, T. & Murata, J. 2013. A new record of *Desmodiastrum parviflorum* (Leguminosae) from Myanmar. Journal of Japanese Botany 88(1): 21-29.

Nores, M. J., Simpson, B. B., Hick, P., Anton, A. M. & Fortunato, R.H. 2012. The phylogenetic relationships of four monospecific caesalpinioids (Leguminosae) endemic to southern South America. Taxon 61(4): 790-802.

Ohashi, H. & Ohashi, K. 2013. The Second species of *Verdesmum* (*Leguminosae*: Tribe *Desmodieae*) found in China. J. Jpn. Bot. 88: 156-162.

Oliveira-Filho, Cardoso, D. Schrire, B.D., Lewis, G.P., Penington, R.T., Brummer, R. & Lavin, M. 2013. Stability structures tropical woody plant diversity more than seasonality: Insights into the ecology of high legume-succulent-plant biodiversity. South African Journal of Botany 89: 42-47.

Perez, A. J., Klitgård, B. B., Saslis-Lagoudakis, C.H. & Valencia, R. (2013). *Brownea jaramilloi* (Leguminosae: Caesalpinioideae), a new, over-looked species endemic to the Ecuadorian Amazon. Kew Bulletin 68: 157-162.

Porch, T.G., Beaver, J.S., Debouck, D.G., Jackson, S., Kelly, J.D. & Dempewolf, H. 2013. Use of wild relatives and closely related species to adapt common bean to climate change. Agronomy 3: 433-461.

Prenner G. 2013. Papilionoid inflorescences revisited (Leguminosae-Papilionoideae). Annals of Botany 112(8): 1567–1576.

Prenner, G. 2013. Flower development in *Abrus precatorius* (Leguminosae: Papilionoideae: Abreae) and a review of androecial characters in Papilionoideae. South African Journal of Botany 89: 210–218.

Raes, N., Saw, L.G., van Welzen, P.C. & Yahara, T. 2013. Legume diversity as indicator for botanical diversity on Sundaland, South East Asia. South African Journal of Botany 89: 265-272.

Robbiati, F.O., Lamarque, A., Anton, A.M. & Fortunato, R.H. 2013. Phenetic analysis of the complex *Senna fabrisii—S. trichosepala* (Leguminosae, Caesalpiniodeae, Aphyllae) based on morphological characters and seed protein electrophoretic profiles. Phytotaxa 145 (1): 1-14.

Santos-Silva, J., Tozzi, A.M.G.A., Simon, M.F., Urguiza, N.G. & Morales, M. 2013. Evolution of trichome morphology in *Mimosa* L. (Leguminosae-Mimosoideae). Phytotaxa 119: 1-20

Santos-Silva, J., Simon, M.F. & Tozzi, A.M.G.A. 2013. Pollen diversity and its phylogenetic implications in *Mimosa* ser. *Leiocarpae* Benth. (Leguminosae-Mimosoideae). Grana 52: 15 – 25.

Santos-Silva**,** J., Simon, M.F. & Tozzi, A.M.G.A. 2013. A new species of 'jurema' (*Mimosa* ser. *Leiocarpae*) from Bahia, Brazil. Systematic Botany 38: 127 - 131.

Schrire, B. D. 2013. *Indigastrum* and *Indigofera*. Plants of the Greater Cape Floristic Region. Vol. 2: The Extra Cape Flora. D. A. Snijman. Pretoria, South Africa, South African National Biodiversity Institute. Strelitzia 30: 386-389.

Schrire, B. D. 2013. A review of tribe Indigofereae (Leguminosae–Papilionoideae) in Southern Africa (including South Africa, Lesotho, Swaziland & Namibia; excluding Botswana). South African Journal of Botany 281-283.

Seigler, D.S., Ebinger, J.E. & Gomes Ribeiro, P. 2012. A previously unrecognized species of *Senegalia* (Fabaceae) from northeastern Brazil. J. Bot. Res. Inst. Texas 6(2): 397- 401.

Sheu, S-Y. et al. 2013. *Burkholderia diazotrophica* sp.nov. isolated from root nodules of *Mimosa* spp. IJSEM 63: 435-441

Singh, S.P., Terán, H., Schwartz, H.F., Otto, K., Debouck, D.G., Roca, & Lema, M. 2013. White mold-resistant, interspecific common bean breeding line VRW32 derived from *Phaseolus costaricensis*. J. Plant Registr. 7 (1): 95-99.

Sprent, J.I., Ardley, J.K., James, E.K. 2013. From North to South: a latitudinal look at nodulation processes. South African Journal of Botany 89: 31-41

Stepanova, A.V., Kotina, E.L., Tilney, P.M. & van Wyk, B.-E. 2013. Wood and bark anatomy of *Hypocalyptus* support its isolated taxonomic position in Leguminosae. South African Journal of Botany 89: 234-239.

Turner, B. L. 2011. Systematics of the *Rhynchosia senna* complex (Fabaceae). Lundellia 14: 27-31.

Turner, B. L. 2012. Taxonomic status of *Rhynchosia diversifolia* var. *prostrata* (Fabaceae). Lundellia 15: 22-25.

Turner, B.L. 2013. Taxonomy of the *Dalea phleoides* (Fabaceae) complex. Phytologia 95: 274-278.

Vatanparast, M., Klitgård B.B., Adema, F. A.C.B., Pennington, R.T., Yahara, T. & Kajita, T. 2013. First molecular phylogeny of the pantropical genus *Dalbergia*: implications for infrageneric circumscription and biogeography. South African Journal of Botany 89: 143-149.

van der Maesen, L.J.G. & Wieringa, J.J. 2013. Flora treatment of the Leguminosae–Papilionoideae of Gabon. South African Journal of Botany 89: 284-288.

Whinder, F., Clarke, K.L., Warwick, N.W.M. & Gasson, P.E. 2013. Structural diversity of the wood of temperate species of *Acacia* s.s. (Leguminosae: Mimosoideae**)**. Australian Journal of Botany 61: 291-301.

Wieringa, J. J., Mackinder, B.A. & van Proosdij, A.S.J. 2013. *Gabonius* gen. nov. (Leguminosae, Caesalpinioideae, Detarieae), a distant cousin of *Hymenostegia* endemic to Gabon. Phytotaxa 142: 15-24.

Wink, M. 2013. Evolution of secondary metabolites in legumes (Fabaceae). South African Journal of Botany 89: 164-175.

Wojciechowski, M.F. 2013. Towards a new classification of Leguminosae: Naming clades using non-Linnaean phylogenetic nomenclature. South African Journal of Botany 89: 85-93.

Yahara, T. et al. 2013. Global legume diversity assessment: Concepts, key indicators, and strategies. Taxon 62: 249-266.

Zimmerman, E., Prenner, G., Bruneau, A. 2013. Floral ontogeny in Dialiinae Caesalpinioideae: Cassieae), a study in organ loss and instability. South African Journal of Botany 89: 188–209.

Zimmerman E., Prenner G., Bruneau A. 2013. Floral morphology of *Apuleia leiocarpa* (Caesalpinioideae: Cassieae), an unusual andromonoecious legume. International Journal of Plant Sciences 174(2): 154–160.

Articles in press

Ohashi H. and Nemoto T. in press. A new system of *Lespedeza* (Leguminosae tribe Desmodieae). J. Jap. Bot.

Khodaverdi M., Movafeghi A., Dadpour M. R., Naghiloo S., Ranjbar M. and Prenner G. in press. Comparative study of floral development in *Onobrychis melanotrica*, *Hedysarum varium* and *Alhagi persarum* (Leguminosae: Papilionoideae: Hedysareae). Flora

To end the 60th issue of the Bean Bag I take the opportunity to wish all our readers a very enjoyable festive season and a fructiful and happy 2014…

… and season's Greetings from Southern India, land of sunshine and delicious curries. Send by the Director Dr T.H.Noel Ellis of CGIAR Research Program on Grain Legumes and Postdoctoral Fellow Dr Julie M.I. Hofer (Center of Excellence in Genomics) in Patancheru, Andhara Pradesh, India.