# International Legume Conference « Legume Systematics for Next Generation » Wrap-Up Session

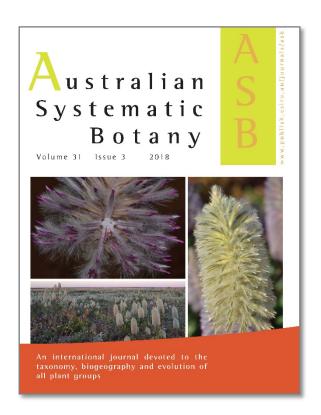
Sendai, Japan 28 August – 2 September 2018



#### Important Achievements at ILC7

- Generic delimitations are being clarified
- New species are being collected
- Incredible sampling of legumes across the world tropics (plot data, etc.)
- Integration of phylogenies with ecological, geographic
   & morphological data
- In the phylogenomics and genomics symposia we saw an unprecedented accumulation of molecular sequence data for adressing phylogenetic, evolutionary and ecological questions from the family to the population level
- Strong engagement and vibrant international collaboration

#### Next Advances in Legume Systematics



# Australian Systematic Botany

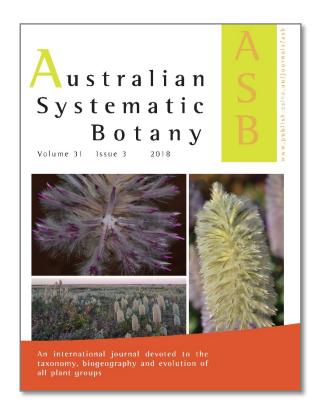
An international journal devoted to the systematics, taxonomy, and related aspects of biogeography and evolution of all algae, fungi and plants, including fossils.

6 issues/year | Print + Online | Impact Factor: 1.6 | #AusSysBot | View Citations, Altmetrics and Dimensions

publish.csiro.au/sb



#### Advances in Legume Systematics 13



# Papers due: 15 December 2018

Editors: Tadashi Kajita,Colin Hughes, Ashley Egan& Daniel Murphy

Questions:

colin.hughes@systbot.uzh.ch

and

Daniel.Murphy@rbg.vic.gov.au



### Opportunities and Responsabilities

- Responsibilities to deliver top-notch scientific data, knowledge and information to the wider world beyond (legume) systematics
- Opportunities to raise funds for research
- We could seek support for larger international collaborative funding initiatives
- There is tremendous scope to obtain support for legume-community initiatives to address the challenges and tasks that come with working on a large, prominent, and centrally important plant family

## Challenges & Tasks for the Legume Systematics Community

- A complete generic-level phylogeny as the basis for a new tribal and/or phylogenetic classification
- Maintaining and updating Legumes of the World
- A complete species-level phylogeny a much more challenging but ultimately very exciting possibility for understanding the evolution of legume diversity
- An updated and dynamic species checklist
- A trait database morphology & functional traits
- A geographical distribution database (specimen occurrence data)
- The integration of these into an information system for the future – nomenclature, geography, images, DNA data, traits...
- Close involvement in forthcoming legume genome sequencing initiatives

# Supporting the next generation of legume systematics community

- Fostering the next generation of legume systematists
- The legume community has been highly collaborative, coherent and very active over the last 40 years since the first ILC in 1978, as evidenced by the series of 7 successful ILCs, ILDIS, the Advances in Legume Systematics series
- That activity can be maintained by making sure some of the talented young people who have presented their work at this conference obtain stable positions in key institutions
- We must continue to share data, samples, methods, etc.
- We must continue to collaborate internationally

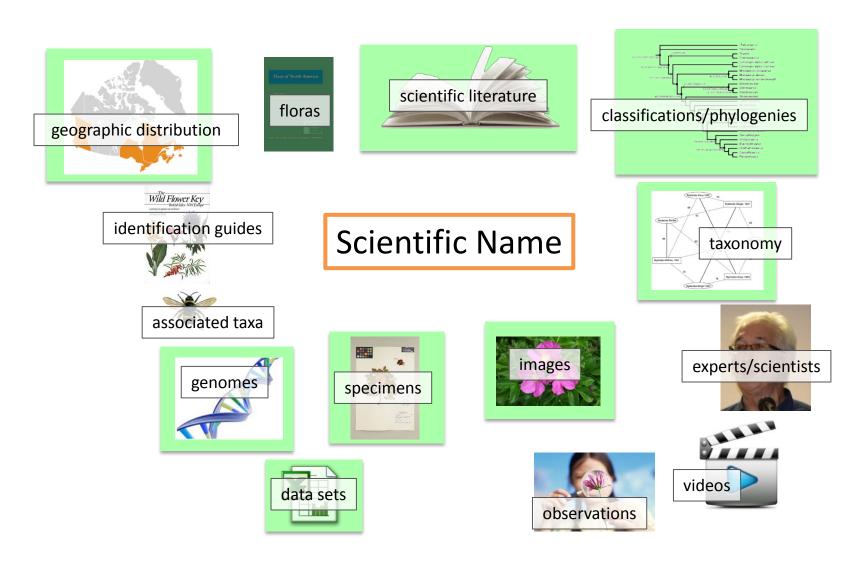
# Towards a Legume Systematics Portal

Workshop on Big Biodiversity Data organised by

Yasuhiro Kubota (University of the Ryukyus)

&

Félix Forest (Royal Botanic Gardens, Kew)



The scientific name is central to a portal. Numerous data sets can be attached to the name. Some data sets are easily accessible, others will require more work.

#### What do we want in this portal?

- An up-to-date taxonomy and species list is central to a taxonomic portal
  - Dynamic (can be changed easily)
  - Can be easily contributed to
- Can be developed based on existing lists
  - ILDIS
  - Tropicos
  - Scientific Literature
  - PlantList / Plants of the World Online (POWO) the list is 95% complete for legume species
- Species occurrence data curated and shared, using DarwinCore fields
- Ecological and environmental map layers
- Morphological and trait data initiatives discussed and underway by Leo Borges
- Phylogenies initiative proposed by Joe Miller
- Images
- .... What else?

#### Outcome of workshop

- Provisional Working Group: Yasuhiro Kubota, Stephen Boatwright, Leonardo Borges, Bente Klitgaard, Daniel Murphy, Jer-Ming Hu, Anne Bruneau, Patrick Herendeen, Ashley Egan, Rong Zhang
- A possible opinion paper for ALS 13 on how to develop a platform – LPWG style paper on interest and importance of a legume systematics portal
- Should we focus on particular clades to initiate the portal?
- Working Group Meeting?
- Others interested? Please contact: anne.bruneau@umontreal.ca

The LPWG has been successful in its proposal for a new classification of the legumes, endorsed by the legume community and now more widely accepted

#### What should be the next LPWG goals?

- A robust generic backbone phylogeny
- Tribal classifications for major clades (Caesalpinioideae, Papilionoideae???)
- Better sampled species level phylogenies
- Ultimate goal is a complete species level phylogeny

#### OpenTree of Life

Joe Miller

http://www.biodiversityintelligence.com/

- Supertree approach using:
  - Comprehensive taxonomy
  - Curated & published phylogenies
- Over 2.3 million taxa in the tree
- All input phylogenies are peer-reviewed and published

opentreeoflife.org

#### OpenTree of the Fabaceae

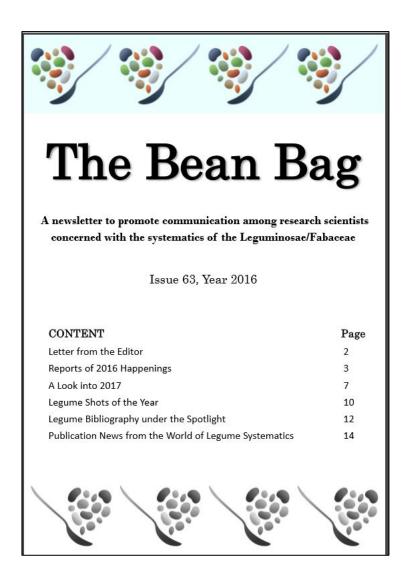
- Currently 23,410 tips in the tree
- Mostly based on taxonomy
- Almost no structure
- Goal:
  - Make the best supertree of the legumes using this platform
  - Use LPWG tree as backbone
  - -Genus/species level trees are critical

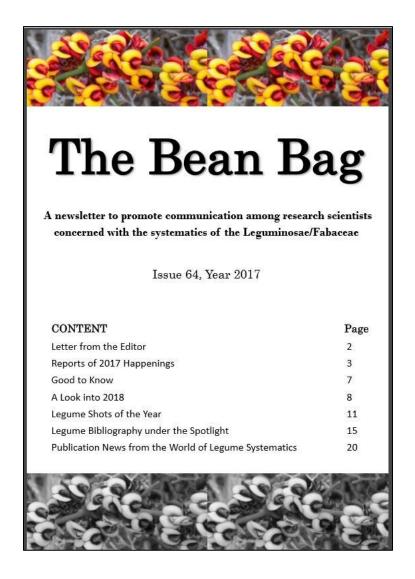
### Why of interest?

- A visualization of the Leguminosae phylogeny (see PhyloLink)
- Link GBIF spatial data to the tree
- Integrate trait data on the phylogeny
- Overlay phylogeny on environmental data layers
- Use subtrees in other analyses

#### How?

- Upload and curate legume phylogenies from Treebase and other sources
- In progress, need input on phylogenies that can be added to OpenTree
- If interested in participating or sending trees:
  - https://www.biodiversityintelligence.com/fabaceaeopentree
  - joe@acaciamulga.net
  - Joe Miller





beanbag.kew@gmail.com

Editor: Brigitte Marazzi

Bean Bag Google Group

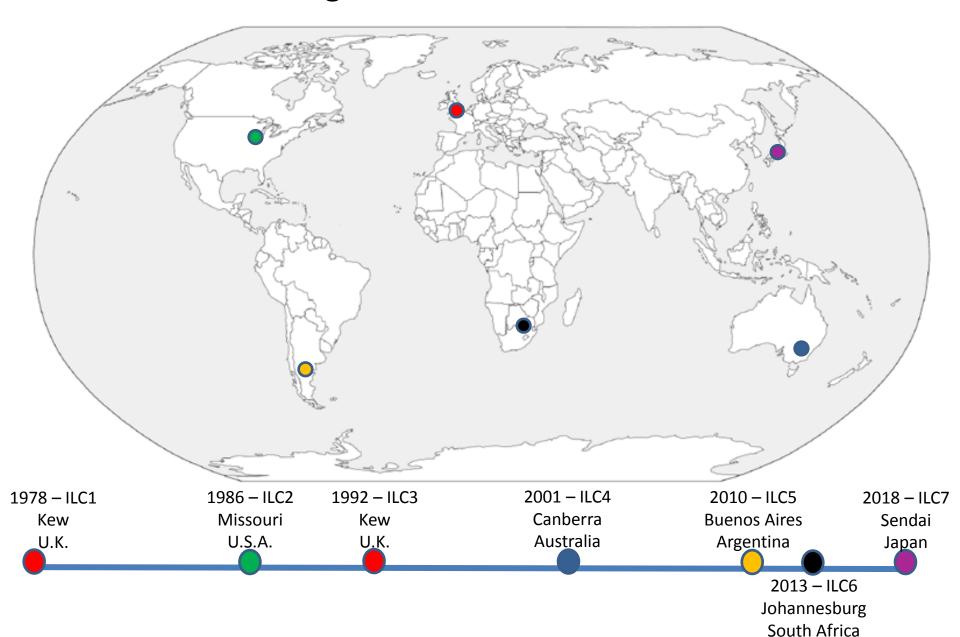
Annual legume systematics newsletter. Send contributions to Brigitte Marazzi.



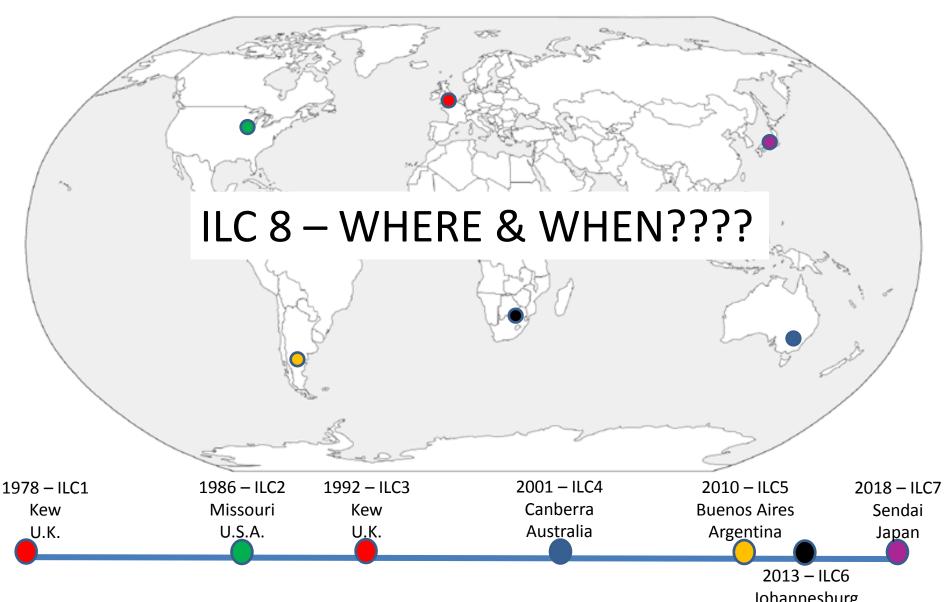
http://iclgg2019.com/



#### International Legume Conferences – 1978 to 2018



#### International Legume Conferences – 1978 to 2018



Johannesburg
South Africa

#### International Legume Conference ILC8



Italo Cotta Coutinho and other colleagues have proposed to host the next ILC in Brazil in 2022. This suggestion was fully endorsed by the ILC7 participants.

## Thank you!





## Thank you!

- The legume community wishes to pass on an immense thank you to the organisers of the 7th International Legume Conference, particularly Tadashi Kajita, Firouzeh Javadi & Yoshihisa Suyama
- We thank them for the punctuality and fabulous organisation during the week
- For an interesting and fantastic conference dinner
- For their patience and smiles with all the language challenges
- For their amazing hospitality, Japanese kindness and friendship