Cataloguing the Plant Diversity of the Flora Malesiana Region

Daniel C. Thomas

Singapore
Botanic Gardens

Article

New Guinea has the world's richest island flora

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A list of authors and their affiliations appears at the end of the paper.

New Guinea is the world's largest tropical island and has fascinated naturalists for centuries[1,2]. Home to some of the best-preserved ecosystems on the planet[3] and to intact ecological gradients—from mangroves to tropical alpine grasslands—that are unmatched in the Asia-Pacific region[4,5], it is a globally recognized centre of biological and cultural diversity[6,7]. So far, however, there has been no attempt to critically catalogue the entire vascular plant diversity of New Guinea. Here we present the first, to our knowledge, expert-verified checklist of the vascular plants of mainland New Guinea and surrounding islands. Our publicly available checklist includes 13,634

Amazon plant diversity revealed by a taxonomically verified species list

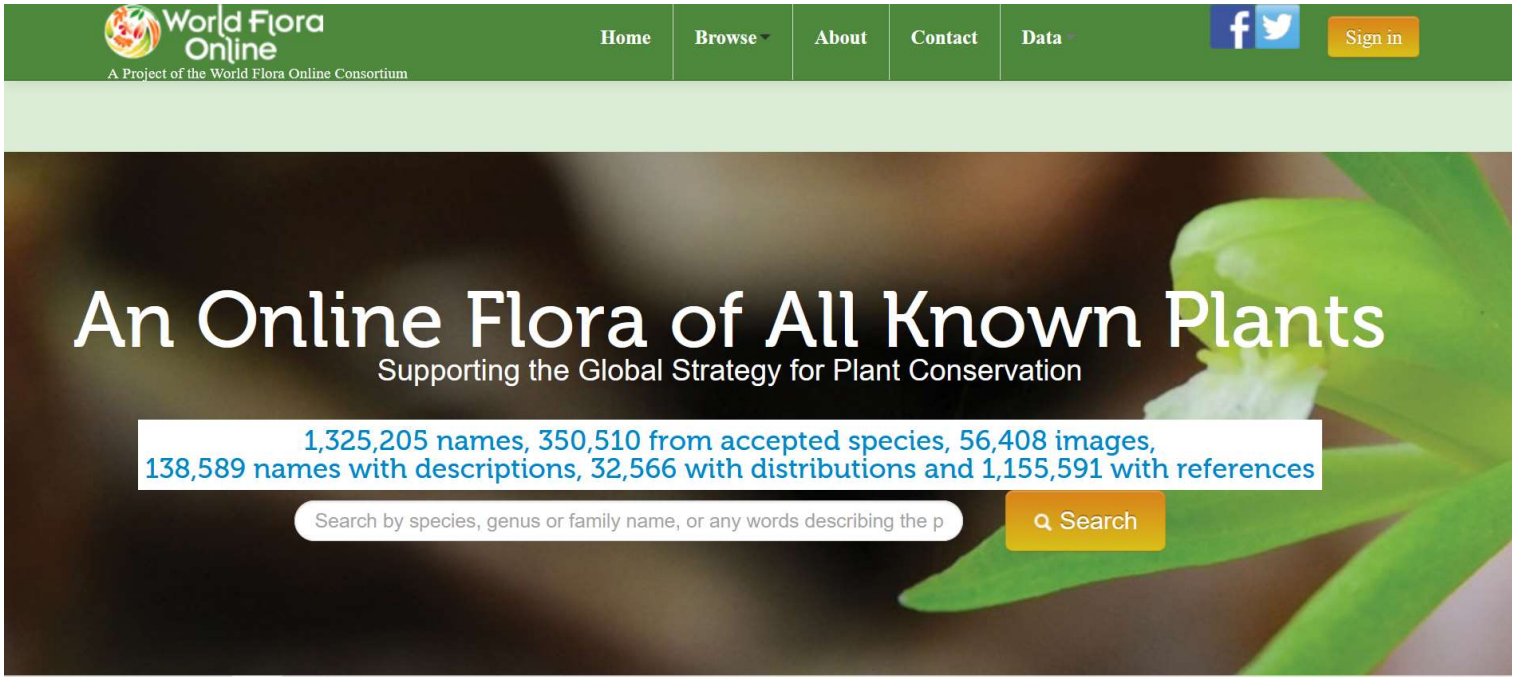
Domingos Cardoso[a,1,2], Tiina Särkinen[b,1], Sara Alexander[c], André M. Amorim[d], Volker Bittrich[e], Marcela Celis[f,g], Douglas C. Daly[h], Pedro Fiaschi[i], Vicki A. Funk[c], Leandro L. Giacomin[j], Renato Goldenberg[k], Gustavo Heiden[l], João Iganci[m], Carol L. Kelloff[c], Sandra Knapp[n], Haroldo Cavalcante de Lima[o], Anderson F. P. Machado[p], Rubens Manoel dos Santos[q], Renato Mello-Silva[r], Fabián A. Michelangeli[h], John Mitchell[h], Peter Moonlight[b], Pedro Luís Rodrigues de Moraes[s], Scott A. Mori[h], Teonildes Sacramento Nunes[p], Terry D. Pennington[t], José Rubens Pirani[r], Ghillean T. Prance[t], Luciano Paganucci de Queiroz[p], Alessandro Rapini[p], Ricarda Riina[u], Carlos Alberto Vargas Rincon[v], Nádia Roque[a], Gustavo Shimizu[w], Marcos Sobral[x], João Renato Stehmann[y], Warren D. Stevens[z], Charlotte M. Taylor[z], Marcelo Trovó[aa], Cássio van den Berg[p], Henk van der Werff[z], Pedro Lage Viana[bb], Charles E. Zartman[cc], and Rafaela Campostrini Forzza[o]

Expert-verified Checklists: Crucial Taxonomic Baseline Data

- Conservation Planning
- Red List Assessments
- Identification of new regional species records
- Identification of new species
- Accuracy of biogeographical studies, ecological studies …

Expert-verified Checklists: Crucial Taxonomic Baseline Data

- **Discrepancy between opportunistically compiled data and expert-verified data**



Expert-verified Checklists: Crucial Taxonomic Baseline Data

- **Discrepancy between opportunistically compiled data and expert-verified data**

Flora of New Guinea

15723 spp. (Joyce et al., 2020)

13634 spp. (Camara-Leret et al., 2020)

13073 spp. (POWO, 2021) > 1714 spp. were identified as synonyms or non-native species

Expert-verified Checklists: Crucial Taxonomic Baseline Data

- **Discrepancy between opportunistically compiled data and expert-verified data**

Orchids of New Guinea

3037 spp. (Joyce et al., 2020)

2859 spp. (Camara-Leret et al., 2020)

2806 spp. (POWO, 2021)

Expert-verified Checklists: Crucial Taxonomic Baseline Data

- **Discrepancy between opportunistically compiled data and expert-verified data**

Begoniaceae

1999 spp. (Begonia Resource Center, 2021)

1892 spp. (POWO, 2021)

1808 spp. (WFO, 2021)

Expert-verified Checklists: Crucial Taxonomic Baseline Data

- **Discrepancy between opportunistically compiled data and expert-verified data**
- **Sources of discrepancy**
  - Underlying data
  - Synonymy
  - Non-native species
  - Erroneous presence/absence data
  - Delay between publication and inclusion in database
  - Taxa in the ‘grey literature’

Expert-verified Checklists: Crucial Taxonomic Baseline Data

- **Substantial impact on downstream analyses**

Biodiversity hotspots house most undiscovered plant species

Lucas N. Joppa[a,b,c], David L. Roberts[b,c], Norman Myers[d,1], and Stuart L. Pimm[e]

[a]Microsoft Research, Cambridge CB3 0FB, United Kingdom; [b]Durrell Institute of Conservation and Ecology, School of Anthropology and
University of Kent, Canterbury CT2 7NR, United Kingdom; [c]Royal Botanic Gardens, Kew TW9 3AB, United Kingdom; [d]Green College, Oxf
Oxford OX2 6HG, United Kingdom; and [e]Nicholas School of the Environment, Duke University, Durham, NC 27708

Contributed by Norman Myers, June 10, 2011 (sent for review April 6, 2011)

For most organisms, the number of described species considerably underestimates how many exist. This is itself a problem and causes secondary complications given present high rates of species extinction. Known numbers of flowering plants form the basis of biodiversity "hotspots"—places where high levels of endemism and habitat loss coincide to produce high extinction rates. How different would conservation priorities be if the catalog were complete? Approximately 15% more species of flowering plant are likely still undiscovered. They are almost certainly rare, and depending on where they live, suffer high risks of extinction from habitat loss and global climate disruption. By using a model that incorporates taxonomic effort over time, regions predicted to contain large numbers of undiscovered species are already conservation priorities. Our results leave global conservation priorities more or less intact, but suggest considerably higher levels of species imperilment than previously acknowledged.

relative priorities change as taxonomists comple
Will new priorities become apparent? Are the mi
places where they are likely to be threatened, and
discover them before they become extinct?

Estimating Missing Species

The original hotspots of Myers et al. (6) were
number of vascular plants endemic to a region ar
regional habitat destruction. Currently, there are
~350,000 species of vascular plants, of which 96%
plants (14). Working with only flowering plants,
the vast majority of vascular plants, therefore
our analysis in regard to the original impleme
hotspots idea.

Estimates of the numbers of missing species encc
problems. First, taxonomists inadvertently give dif

Expert-verified Checklists: Crucial Taxonomic Baseline Data

- **Substantial impact on downstream analyses**
- **Joppa et al. (2011)**

  Relatively small number of undiscovered species in SE Asian biodiversity hotspots?

  Floras of some tropical biodiversity hotspots very well known (e.g. New Guinea, the Philippines, Sulawesi, Sumatra)?

Cataloguing the Plant Diversity of Malesia

Checklist of the vascular flora of the Sunda-Sahul Convergence Zone

Elizabeth M. Joyce[‡,§,|], Kevin R. Thiele[¶], Ferry J.W. Slik[#], Darren M. Crayn[‡,§,|]

‡ Australian Tropical Herbarium, James Cook University, Cairns, 4870, Australia
§ College of Science and Engineering, James Cook University, Cairns, 4870, Australia
| Centre for Tropical Environmental Sustainability Science, James Cook University, Cairns, 4870, Australia
¶ School of Biological Sciences, The University of Western Australia, Crawley, 6009, Australia
# Faculty of Science, Department of Environmental and Life Sciences, Universiti Brunei Darussalam, Gadong BE1410, Brunei

- **Crucial first step in cataloguing the Malesian plant diversity**

Next Steps

- **Implementation in dynamic, updatable framework**
- **Taxonomic specialist input**
- **Presentation of data online**

Flora Malesiana Checklist Project

Checklist of the vascular flora of the Sunda-Sahul Convergence Zone

Elizabeth M. Joyce[‡,§,|], Kevin R. Thiele[¶], Ferry J.W. Slik[#], Darren M. Crayn[‡,§,|]

‡ Australian Tropical Herbarium, James Cook University, Cairns, 4870, Australia
§ College of Science and Engineering, James Cook University, Cairns, 4870, Australia
| Centre for Tropical Environmental Sustainability Science, James Cook University, Cairns, 4870, Australia
¶ School of Biological Sciences, The University of Western Australia, Crawley, 6009, Australia
# Faculty of Science, Department of Environmental and Life Sciences, Universiti Brunei Darussalam, Gadong BE1410, Brunei

- **Steering Committee**

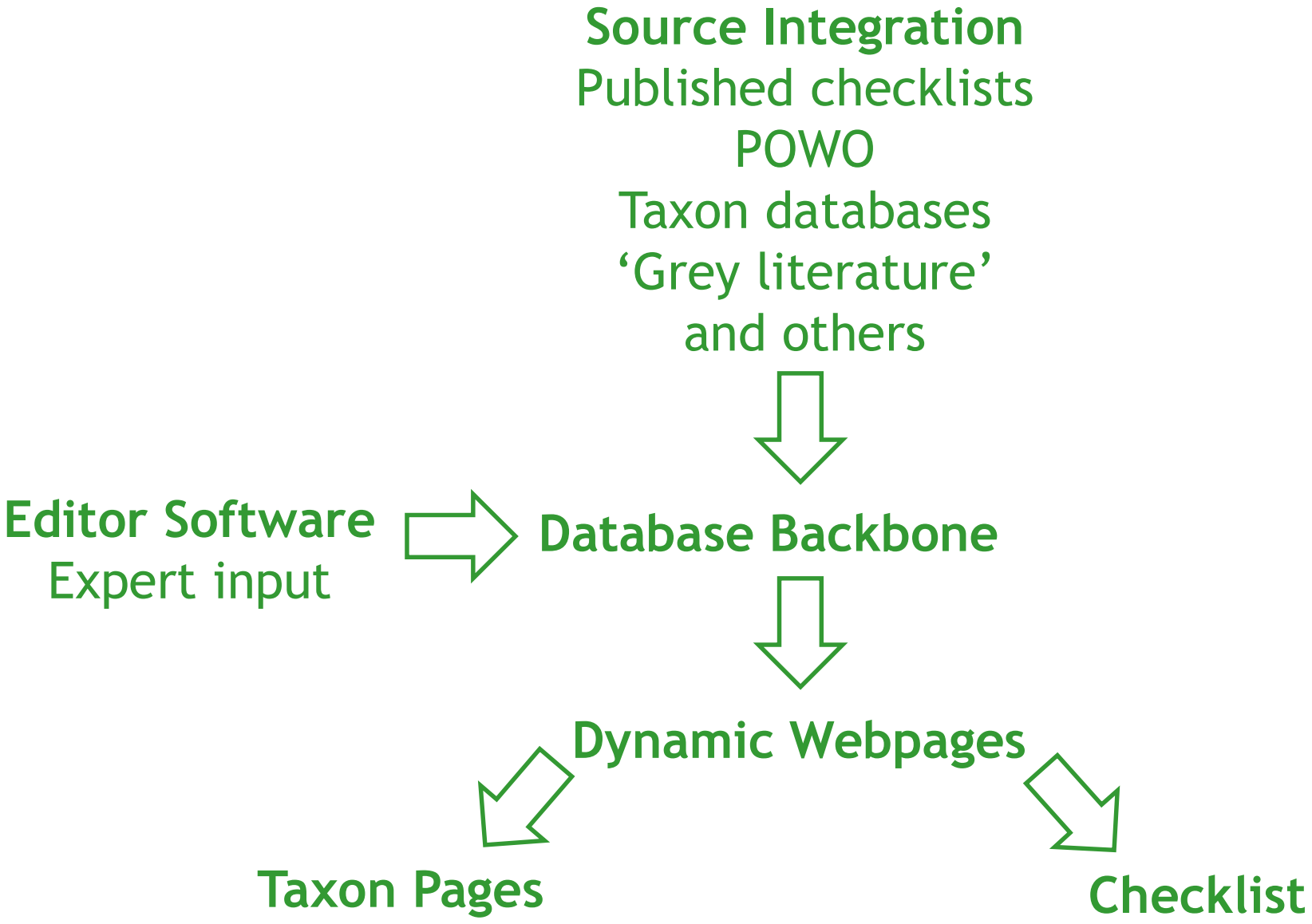
  Approach, development and implementation

  Time-delimited partial goals

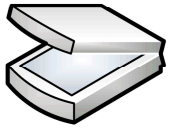
  Funding proposals

- **Institutional support from Singapore Botanic Gardens**

Flora Malesiana Checklist Project

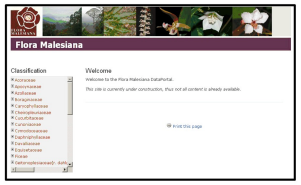


Printed Flora Malesiana volume (1)

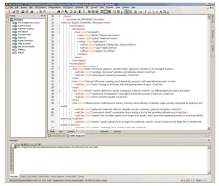


Scanning and OCR (2)

Hamann et al. 2014. D
semi-monographic lega
using FlorML. *Taxon*



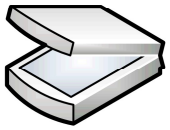
FM e-Flora (EDIT CDM-based) (8)



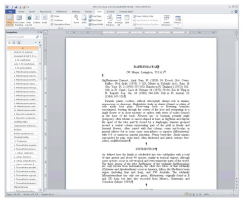
Final correction of XML (7)

```
[...]
<feature class="description">
   Perennial, monoecious herb [...]
   </feature>

<feature class="distribution">
   Indonesia: Sumatra, Java, Lesser
   Sunda Isles (Bali), Sulawesi [...]
   </feature>

<feature class="habitat">
   This species grows in the herb
   layer or on wet rock walls in
   lowland and upland primary
   rainforest [...]
   </feature>
[...]
```

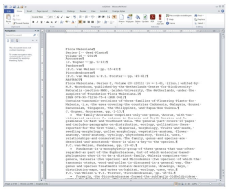
Printed Flora Malesiana volume (1)



Scanning and OCR (2)



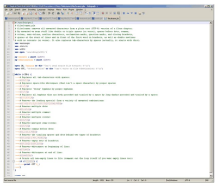
Digitalised text (3)



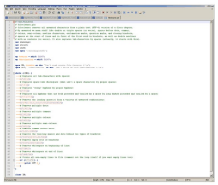
Clean-up (MS Word) (4)

e-FM Portal

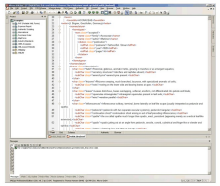
http://dev.e-taxonomy.eu/dataportal/flora-malesiana/



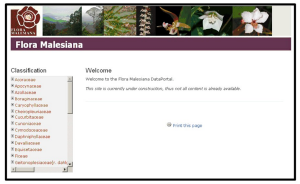
Clean-up scripts (5)



Mark-up scripts (6)

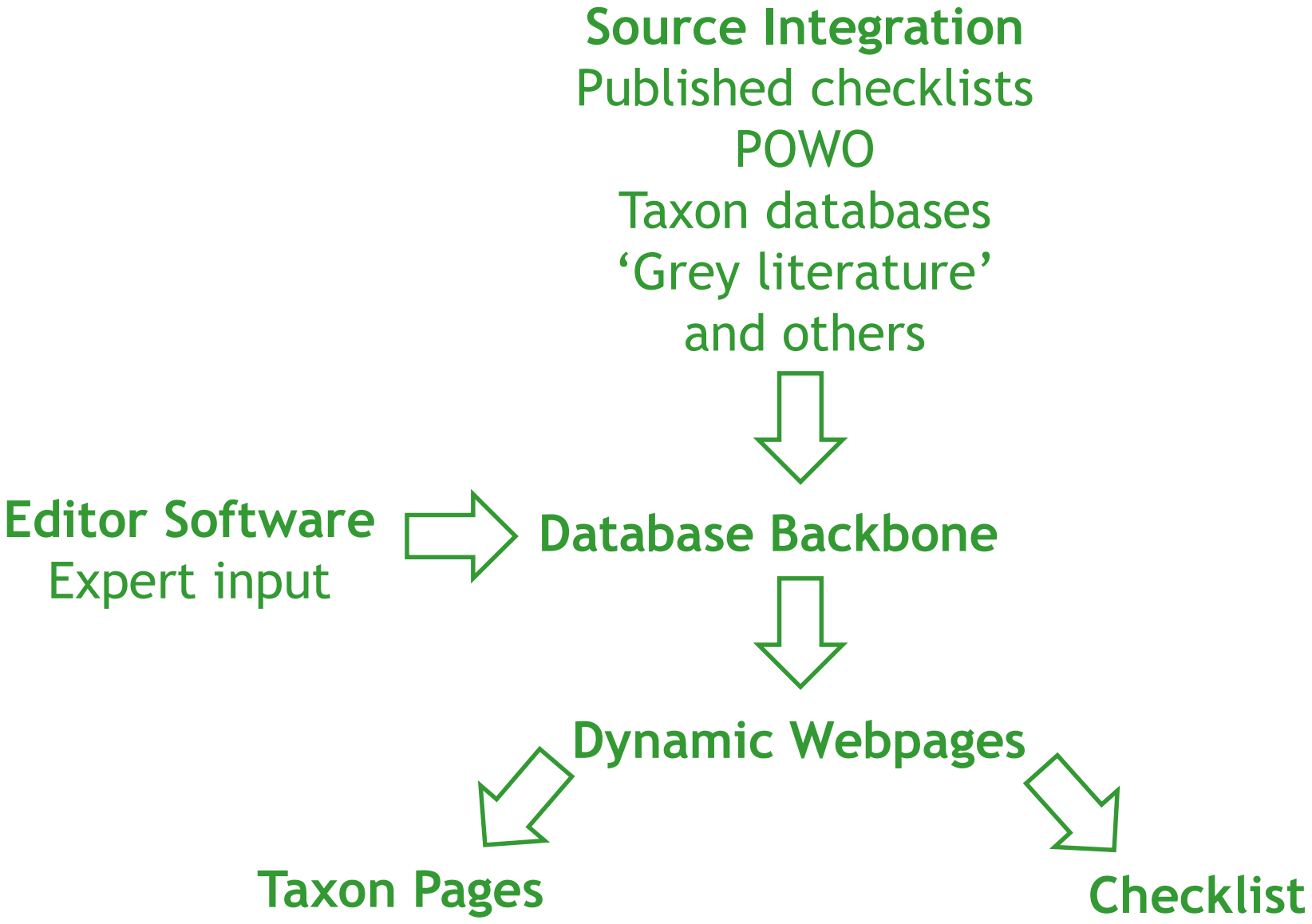


Final correction of XML (7)



FM e-Flora (EDIT CDM-based) (8)

Flora Malesiana Checklist Project



Flora Malesiana Checklist Project

- Source integration and name resolution
- Database backbone
- Dynamically generated websites
- Dynamic links to other data sources
- Expert review of contents & annotation system
- Framework for remote collaboration and data management

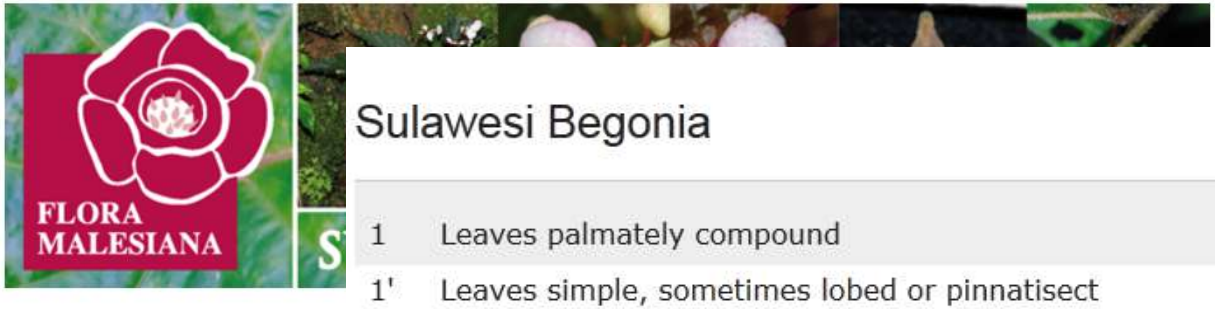
Flora Malesiana Checklist Project

- Feasibility?
- Duplication of work?
- Importance in the wider FM framework?

Database backbones + dynamically linked websites

BGBM, Berlin

http://wp5.e-taxonomy.eu/



Sulawesi Begonia

Search taxa

*nob

Misapplied names

Search

Advanced Search

Identification Key

Polytomous

Sulawesi Begonia

Classification

- Begoniaceae
  - Begonia
    - Begonia sect. Petermanni
      - B. bonthainensis
      - B. capituliformis
      - B. carnosa
      - B. celebica
      - B. chiasmogyna
      - B. comestibilis
      - B. cuneatifolia
      - B. didyma

1	Leaves palmately compound	2
1'	Leaves simple, sometimes lobed or pinnatisect	3
2	Robust plants up to c.100 cm in height; moderately to densely hairy on all above-ground vegetative parts; female inflorescence 2-flowered; pedicel of the fruits long (16-19 mm); wings of the fruits unequal with one wing much larger than the other two *Begonia insueta* D.C.Thomas & Ardi in Edinburgh J. Bot. 68(2): 230. 2011	
2'	Small, delicate plants, to c.40 cm in height; glabrous except for microscopic glandular hairs; female flowers solitary; pedicels of the fruits very short (c.1 mm); wings of the fruits subequal *Begonia rachmatii* Tebbitt in Edinburgh J. Bot. 61(2-3): 101. 2005	
3	Leaves pinnatisect to bipinnatisect *Begonia humilicaulis* Irmsch. in Bot. Jahrb. Syst. 50(4): 356. 1914	
3'	Leaves entire or when lobed then maximally halfway to the midrib	4
4	Leaves peltate (although a few leaves, especially the subtending leaves of the inflorescences, sometimes with basifixed laminas)	5
4'	Leaf laminas basifixed	7

*nob

☑ Misapplied names

Search

Advanced Search

Identification Key

Polytomous

Sulawesi Begoni

Classification

⊞ Begoniaceae

○ B. nobmanniae

Begonia Resources

Southeast Asian Begonia Database

User login

Begonia nobmanniae **D.C.Thomas & Ardi** in Edinburgh J. Bot. 68(2): 235. 2011, nom. valid

General | Synonymy | Images | Specimens

Back to search result

Content

Original Publication Link

Title	Nine new species of Begonia (Begoniaceae) from South and West Sulawesi, Indonesia
Authorteam	Thomas, D.C., Ardi, W.H. & Hughes, M.
Datepublished	2011
Volume	68(2)
In journal	Edinburgh Journal of Botany
Pages	225-255
Uri	http://dx.doi.org/10.1017/S0960428611000072

Perennial, monoecious herb, with erect stems, to c.25 cm tall, glabrous except for a sparse indumentum of microscopic, glandular trichomes, or sometimes exhibiting a sparse indumentum of multicellular, simple trichomes up to c.0.5 mm long on all above-ground vegetative parts. Stems branched; internodes c.2-7 cm long, reddish to brownish.

Leaves alternate; stipules caducous, 8-14 × 4-7 mm, ovate or oblong, with an abaxially prominent midrib that projects shortly at the apex; petioles c.2-4 cm long

*nob

Misapplied names

Search

Advanced Search

Identification Key

Polytomous

Sulawesi Begonia

Classification

Begoniaceae

B. nobmanniae

Begonia Resources

Southeast Asian Begonia Database

User login

Begonia

Bot. 68(2):

General

Back to search

Content

Original Publicat
Diagnosis
Description
Habitat
Conservation
Distribution
Etymology
Notes
Molecular Syste
Bibliography

Original F

http://dx.d

Diagnosis

Begoniae
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mm) diff
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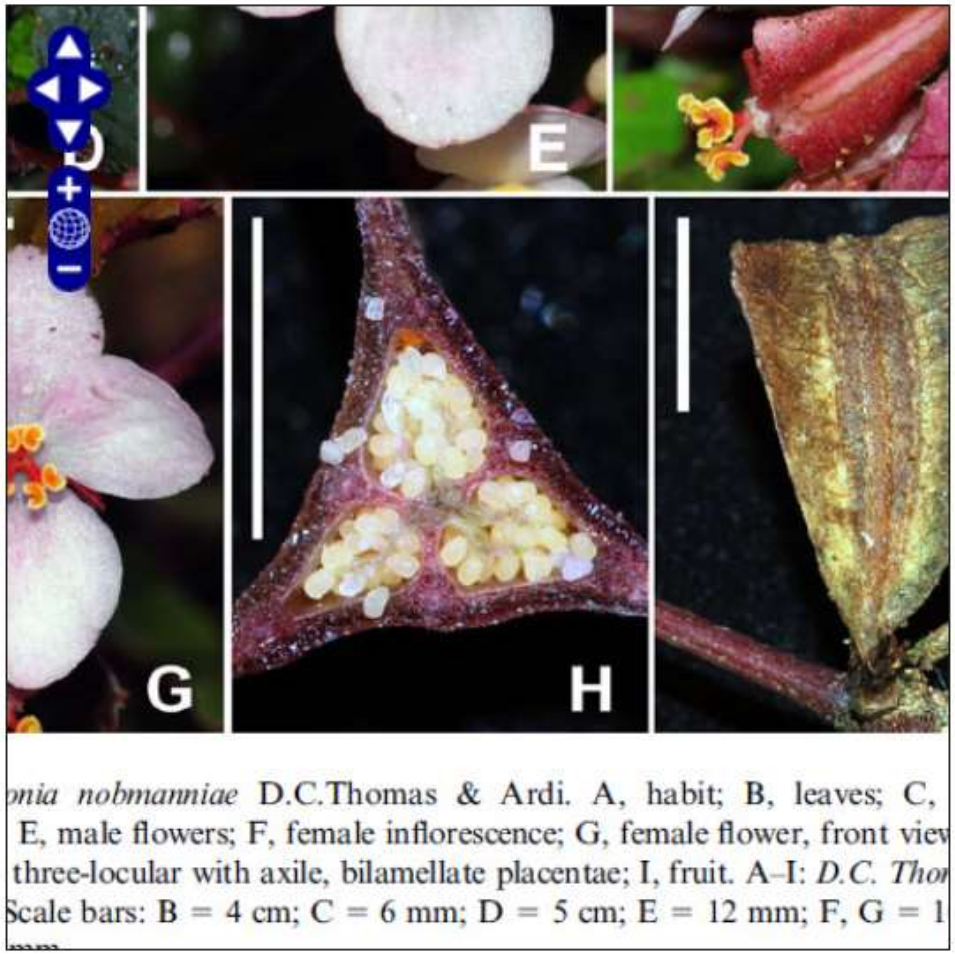
Descriptio

Perennial
sparse in
sparse in
above-gr
to brown

Leaves a

Photo plate (© Royal Botanic Garden Edinburgh/Edinburgh Journal of Botany)

Back to Images



onia nobmanniae D.C.Thomas & Ardi. A, habit; B, leaves; C, E, male flowers; F, female inflorescence; G, female flower, front view three-locular with axile, bilamellate placentae; I, fruit. A–I: *D.C. Thor* Scale bars: B = 4 cm; C = 6 mm; D = 5 cm; E = 12 mm; F, G = 1

Photo plate (© Royal Botanic Garden Edinburgh/Edinburgh Journal of Botany)

Search taxa

*reni

Misapplied names

Search

Advanced Search

Identification Key

Polytomous

Sulawesi Begonia

Classification

Begoniaceae

B. aptera

Begonia aptera **Blume**, Enum. Pl. Javae 1: 97. 1827

General | Synonymy | Images | Specimens

Back to search result

Begonia aptera Blume, Enum. Pl. Javae 1: 97. 1827

≡ *Diploclinium apterum* (Blume) Miq., Fl. Ned. Ind. 1(1): 691. 1856
Lectotype (designated by Hughes, M. 2008)[1]: Indonesia, Sulawesi: Sulawesi: Tondano, Anon. s.n. (L Herb. Lugd. Bat. 898194-39).

1. An annotated checklist of Southeast Asian Begonia. 2008

= *Begonia renifolia* Irmsch. in Bot. Jahrb. Syst. 50(4): 379. 1913
Holotype: Indonesia, Sulawesi: Sulawesi: Minahassa: Bojong, Wallich, N. 15188 (B).

= *Begonia cristata* Warb. ex L.B.Sm. & Wassh. in Phytologia 52(7): 442. 1983
– *Begonia cristata* Warb. ex Koord. in Nutuurw. Tijdschr. Ned.-Indie 63: 90. 1904, nom. nud.
Lectotype (designated by Smith, L.B. & Wasshausen, D.C. 1983)[2]: Indonesia, Sulawesi: Sulawesi: Minahassa: Tomohon, 4.1894, Sarasin, K.F. & Sarasin, P.B. 288 (K).

2. Smith, L.B. & Wasshausen, D.C., Notes on Begoniaceae in Phytologia 52. 1983

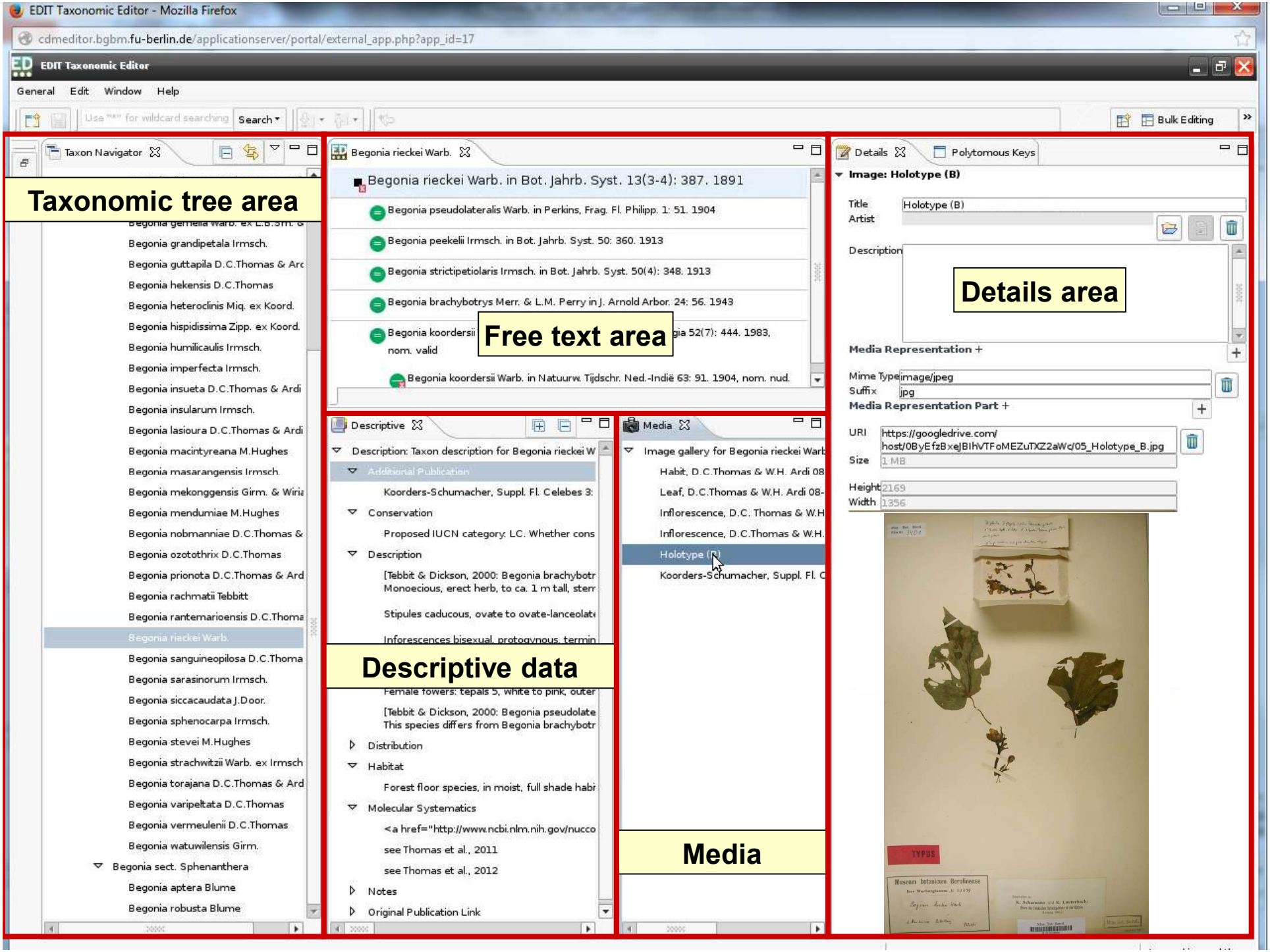
Distribution

Asia-Tropical: Maluku; New Guinea (Irian Jaya); Sulawesi.

Indonesia: Sulawesi, Maluku, and New Guinea.

Widespread on Sulawesi (all provinces), but apparently absent from Sulawesi Selatan south of the Latimojong mountains.

See specimen tab for map of point distribution data of georeferenced specimens.


EDIT Taxonomic Editor - Mozilla Firefox
cdmeditor.bgbm.fu-berlin.de/applicationserver/portal/external_app.php?app_id=17
EDIT Taxonomic Editor
General Edit Window Help
Search
Bulk Editing
Taxon Navigator
Taxonomic tree area
Begonia grandipetala Irmsch.
Begonia guttapila D.C.Thomas & Arc
Begonia hekensis D.C.Thomas
Begonia heteroclinis Miq. ex Koord.
Begonia hispidissima Zipp. ex Koord.
Begonia humilicaulis Irmsch.
Begonia imperfecta Irmsch.
Begonia insueta D.C.Thomas & Ardi
Begonia insularum Irmsch.
Begonia lasioura D.C.Thomas & Ardi
Begonia macintyreana M.Hughes
Begonia masarangensis Irmsch.
Begonia mekonggensis Girm. & Wiria
Begonia mendumiae M.Hughes
Begonia nobmanniae D.C.Thomas &
Begonia ozotothrix D.C.Thomas
Begonia prionota D.C.Thomas & Ard
Begonia rachmatii Tebbitt
Begonia rantemarioensis D.C.Thoma
Begonia riekei Warb.
Begonia sanguineopilosa D.C.Thoma
Begonia sarasinorum Irmsch.
Begonia siccacaudata J.Door.
Begonia sphenocarpa Irmsch.
Begonia stevei M.Hughes
Begonia strachwitzii Warb. ex Irmsch
Begonia torajana D.C.Thomas & Ard
Begonia varipeltata D.C.Thomas
Begonia vermeulenii D.C.Thomas
Begonia watuwilensis Girm.
Begonia sect. Sphenanthera
Begonia aptera Blume
Begonia robusta Blume
Begonia riekei Warb.
Begonia riekei Warb. in Bot. Jahrb. Syst. 13(3-4): 387. 1891
Begonia pseudolateralis Warb. in Perkins, Frag. Fl. Philipp. 1: 51. 1904
Begonia peekelii Irmsch. in Bot. Jahrb. Syst. 50: 360. 1913
Begonia strictipetiolaris Irmsch. in Bot. Jahrb. Syst. 50(4): 348. 1913
Begonia brachybotrys Merr. & L.M. Perry in J. Arnold Arbor. 24: 56. 1943
Begonia koordersii
nom. valid
Begonia koordersii Warb. in Natuurw. Tijdschr. Ned.-Indië 63: 91. 1904, nom. nud.
Free text area
Descriptive
Description: Taxon description for Begonia riekei W
Additional Publication
Koorders-Schumacher, Suppl. Fl. Celebes 3:
Conservation
Proposed IUCN category: LC. Whether cons
Description
[Tebbit & Dickson, 2000: Begonia brachybotr
Monoecious, erect herb, to ca. 1 m tall, sterr
Stipules caducous, ovate to ovate-lanceolat
Inflorescences bisexual, protogynous, termin
Female flowers: tepals 5, white to pink, outer
[Tebbit & Dickson, 2000: Begonia pseudolate
This species differs from Begonia brachybotr
Distribution
Habitat
Forest floor species, in moist, full shade habi
Molecular Systematics
<a href="http://www.ncbi.nlm.nih.gov/nucco
see Thomas et al., 2011
see Thomas et al., 2012
Notes
Original Publication Link
Descriptive data
Media
Image gallery for Begonia riekei Warb
Habit, D.C.Thomas & W.H. Ardi 08
Leaf, D.C.Thomas & W.H. Ardi 08-
Inflorescence, D.C. Thomas & W.H
Inflorescence, D.C.Thomas & W.H.
Holotype (B)
Koorders-Schumacher, Suppl. Fl. C
Media
Details
Polytomous Keys
Image: Holotype (B)
Title Holotype (B)
Artist
Description
Details area
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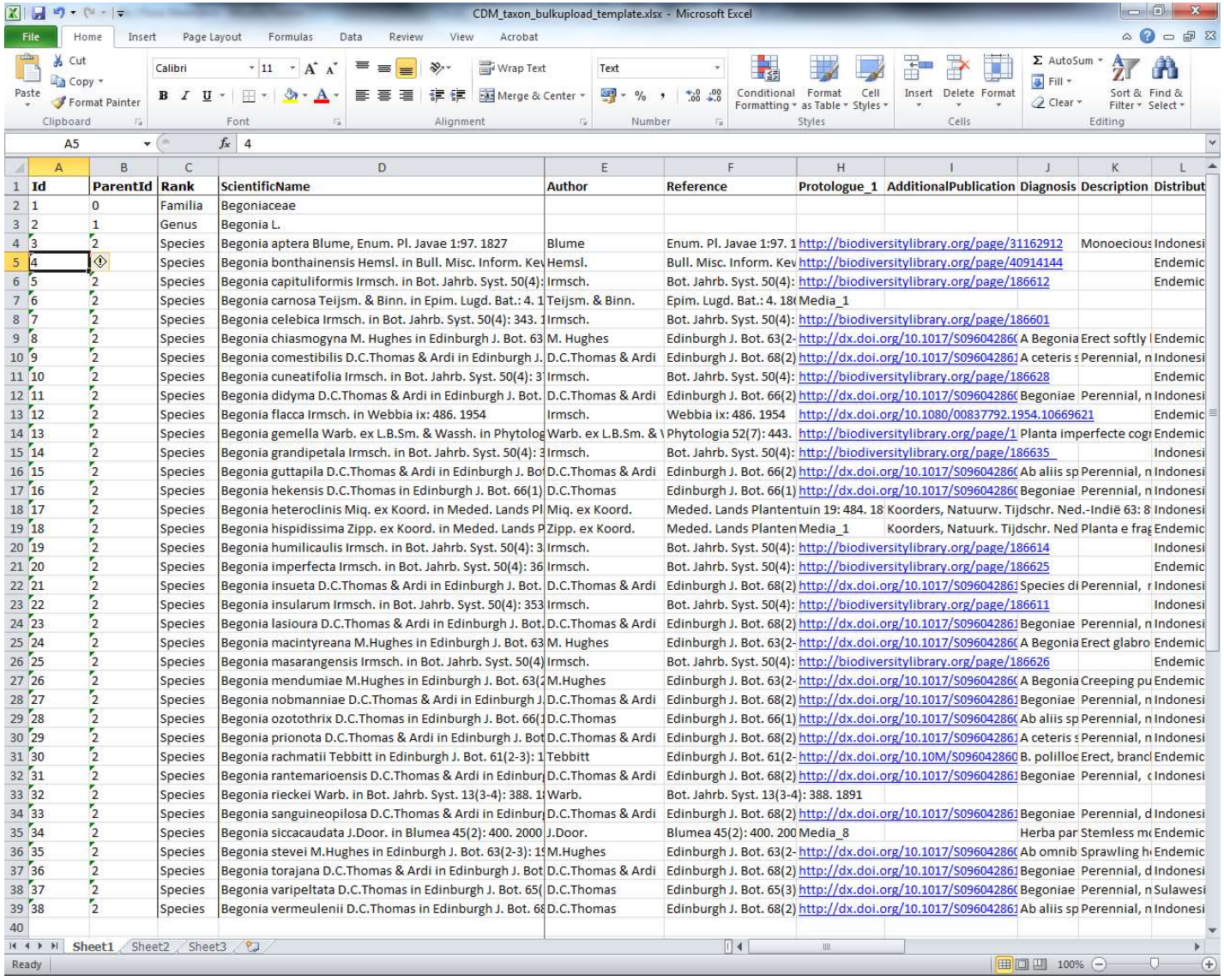
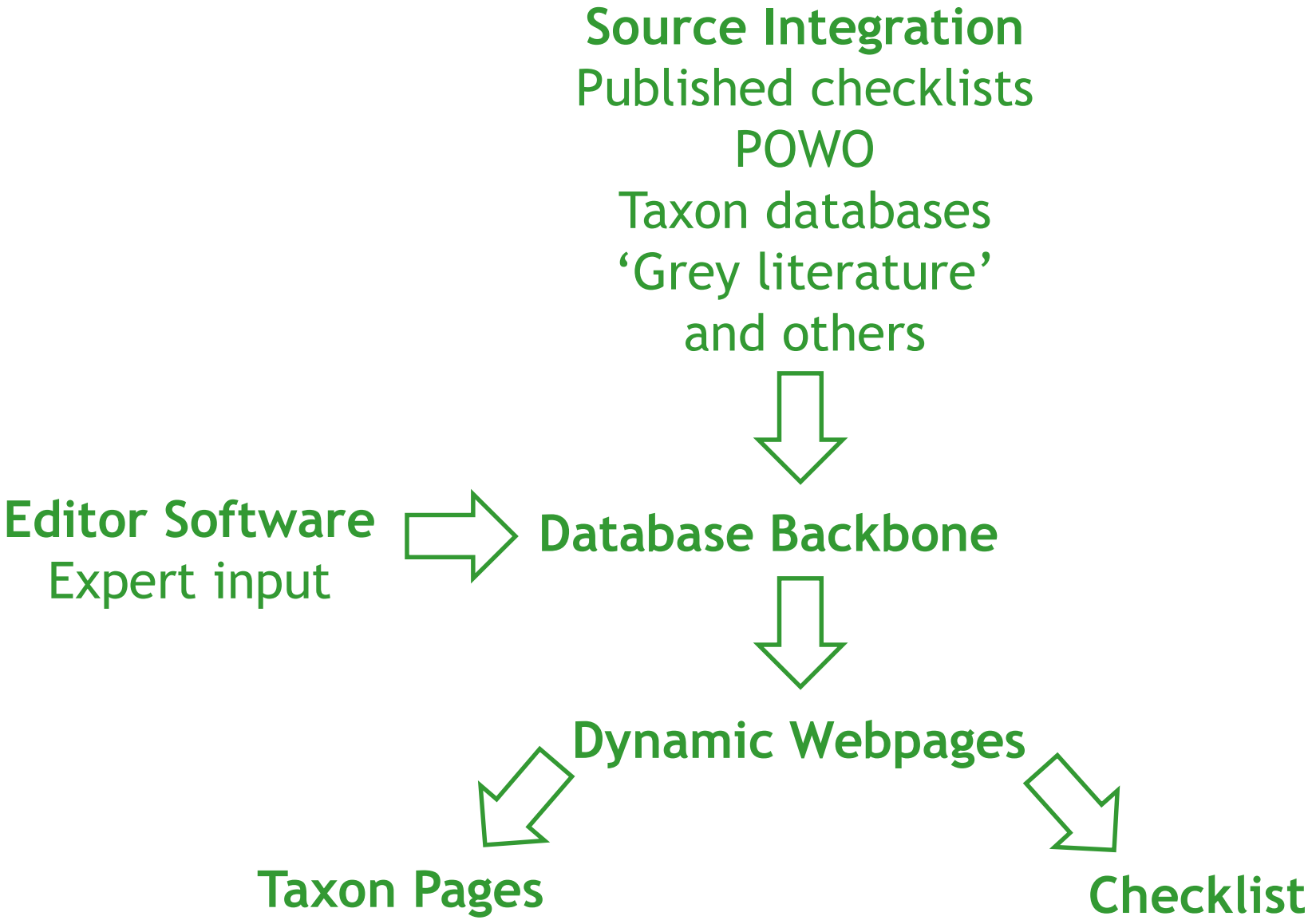
Mime Type image/jpeg
Suffix jpg
Media Representation Part +
URI https://googledrive.com/host/0ByEfzBxeJBIhVTFoMEZuTXZ2aWc/05_Holotype_B.jpg
Size 1 MB
Height 2169
Width 1356
TYPUS
Museum botanicum Berolinense



Id	ParentId	Rank	ScientificName	Author	Reference	Protologue_1	AdditionalPublication	Diagnosis	Description	Distribut
1	0	Familia	Begoniaceae							
2	1	Genus	Begonia L.							
3	2	Species	Begonia aptera Blume, Enum. Pl. Javae 1:97. 1827	Blume	Enum. Pl. Javae 1:97. 1	http://biodiversitylibrary.org/page/31162912			Monoecious	Indonesi
4	2	Species	Begonia bonthainensis Hemsl. in Bull. Misc. Inform. Kev	Hemsl.	Bull. Misc. Inform. Kev	http://biodiversitylibrary.org/page/40914144				Endemic
5	2	Species	Begonia capituliformis Irmsch. in Bot. Jahrb. Syst. 50(4):	Irmsch.	Bot. Jahrb. Syst. 50(4):	http://biodiversitylibrary.org/page/186612				Endemic
6	2	Species	Begonia carnosa Teijsm. & Binn. in Epim. Lugd. Bat.: 4. 1	Teijsm. & Binn.	Epim. Lugd. Bat.: 4. 18	Media_1				
7	2	Species	Begonia celebica Irmsch. in Bot. Jahrb. Syst. 50(4): 343. 1	Irmsch.	Bot. Jahrb. Syst. 50(4):	http://biodiversitylibrary.org/page/186601				
8	2	Species	Begonia chiasmogyna M. Hughes in Edinburgh J. Bot. 63	M. Hughes	Edinburgh J. Bot. 63(2-	http://dx.doi.org/10.1017/S096042860		A Begonia	Erect softly	Endemic
9	2	Species	Begonia comestibilis D.C.Thomas & Ardi in Edinburgh J.	D.C.Thomas & Ardi	Edinburgh J. Bot. 68(2)	http://dx.doi.org/10.1017/S096042861		A ceteris s	Perennial, n	Indonesi
10	2	Species	Begonia cuneatifolia Irmsch. in Bot. Jahrb. Syst. 50(4): 3	Irmsch.	Bot. Jahrb. Syst. 50(4):	http://biodiversitylibrary.org/page/186628				Endemic
11	2	Species	Begonia didyma D.C.Thomas & Ardi in Edinburgh J. Bot.	D.C.Thomas & Ardi	Edinburgh J. Bot. 66(2)	http://dx.doi.org/10.1017/S096042860		Begoniae	Perennial, n	Indonesi
12	2	Species	Begonia flacca Irmsch. in Webbia ix: 486. 1954	Irmsch.	Webbia ix: 486. 1954	http://dx.doi.org/10.1080/00837792.1954.10669621				Endemic
13	2	Species	Begonia gemella Warb. ex L.B.Sm. & Wassh. in Phytolog	Warb. ex L.B.Sm. & \	Phytologia 52(7): 443.	http://biodiversitylibrary.org/page/1		Planta imperfecte cog		Endemic
14	2	Species	Begonia grandipetala Irmsch. in Bot. Jahrb. Syst. 50(4): 3	Irmsch.	Bot. Jahrb. Syst. 50(4):	http://biodiversitylibrary.org/page/186635				Indonesi
15	2	Species	Begonia guttapila D.C.Thomas & Ardi in Edinburgh J. Bo	D.C.Thomas & Ardi	Edinburgh J. Bot. 66(2)	http://dx.doi.org/10.1017/S096042860		Ab aliis sp	Perennial, n	Indonesi
16	2	Species	Begonia hekensis D.C.Thomas in Edinburgh J. Bot. 66(1)	D.C.Thomas	Edinburgh J. Bot. 66(1)	http://dx.doi.org/10.1017/S096042860		Begoniae	Perennial, n	Indonesi
17	2	Species	Begonia heteroclinis Miq. ex Koord. in Meded. Lands Pl	Miq. ex Koord.	Meded. Lands Plantentuin 19: 484. 18		Koorders, Natuurw. Tijdschr. Ned.-Indië 63: 8			Indonesi
18	2	Species	Begonia hispidissima Zipp. ex Koord. in Meded. Lands P	Zipp. ex Koord.	Meded. Lands Planten	Media_1	Koorders, Natuurk. Tijdschr. Ned	Planta e frag		Endemic
19	2	Species	Begonia humilicaulis Irmsch. in Bot. Jahrb. Syst. 50(4): 3	Irmsch.	Bot. Jahrb. Syst. 50(4):	http://biodiversitylibrary.org/page/186614				Indonesi
20	2	Species	Begonia imperfecta Irmsch. in Bot. Jahrb. Syst. 50(4): 36	Irmsch.	Bot. Jahrb. Syst. 50(4):	http://biodiversitylibrary.org/page/186625				Endemic
21	2	Species	Begonia insueta D.C.Thomas & Ardi in Edinburgh J. Bot.	D.C.Thomas & Ardi	Edinburgh J. Bot. 68(2)	http://dx.doi.org/10.1017/S096042861		Species di	Perennial, r	Indonesi
22	2	Species	Begonia insularum Irmsch. in Bot. Jahrb. Syst. 50(4): 353	Irmsch.	Bot. Jahrb. Syst. 50(4):	http://biodiversitylibrary.org/page/186611				Indonesi
23	2	Species	Begonia lasioura D.C.Thomas & Ardi in Edinburgh J. Bot.	D.C.Thomas & Ardi	Edinburgh J. Bot. 68(2)	http://dx.doi.org/10.1017/S096042861		Begoniae	Perennial, n	Indonesi
24	2	Species	Begonia macintyreana M.Hughes in Edinburgh J. Bot. 63	M. Hughes	Edinburgh J. Bot. 63(2-	http://dx.doi.org/10.1017/S096042860		A Begonia	Erect glabro	Endemic
25	2	Species	Begonia masarangensis Irmsch. in Bot. Jahrb. Syst. 50(4)	Irmsch.	Bot. Jahrb. Syst. 50(4):	http://biodiversitylibrary.org/page/186626				Endemic
26	2	Species	Begonia mendumiae M.Hughes in Edinburgh J. Bot. 63(2	M.Hughes	Edinburgh J. Bot. 63(2-	http://dx.doi.org/10.1017/S096042860		A Begonia	Creeping pu	Endemic
27	2	Species	Begonia nobmanniae D.C.Thomas & Ardi in Edinburgh J	D.C.Thomas & Ardi	Edinburgh J. Bot. 68(2)	http://dx.doi.org/10.1017/S096042861		Begoniae	Perennial, n	Indonesi
28	2	Species	Begonia ozotothrix D.C.Thomas in Edinburgh J. Bot. 66(1	D.C.Thomas	Edinburgh J. Bot. 66(1)	http://dx.doi.org/10.1017/S096042860		Ab aliis sp	Perennial, n	Indonesi
29	2	Species	Begonia prionota D.C.Thomas & Ardi in Edinburgh J. Bot	D.C.Thomas & Ardi	Edinburgh J. Bot. 68(2)	http://dx.doi.org/10.1017/S096042861		A ceteris s	Perennial, n	Indonesi
30	2	Species	Begonia rachmatii Tebbitt in Edinburgh J. Bot. 61(2-3): 1	Tebbitt	Edinburgh J. Bot. 61(2-	http://dx.doi.org/10.10M/S096042860		B. polilloe	Erect, branc	Endemic
31	2	Species	Begonia rantemarioensis D.C.Thomas & Ardi in Edinbur	D.C.Thomas & Ardi	Edinburgh J. Bot. 68(2)	http://dx.doi.org/10.1017/S096042861		Begoniae	Perennial, c	Indonesi
32	2	Species	Begonia rieckei Warb. in Bot. Jahrb. Syst. 13(3-4): 388. 1	Warb.	Bot. Jahrb. Syst. 13(3-4): 388. 1891					
33	2	Species	Begonia sanguineopilosa D.C.Thomas & Ardi in Edinbur	D.C.Thomas & Ardi	Edinburgh J. Bot. 68(2)	http://dx.doi.org/10.1017/S096042861		Begoniae	Perennial, d	Indonesi
34	2	Species	Begonia siccacaudata J.Door. in Blumea 45(2): 400. 2000	J.Door.	Blumea 45(2): 400. 200	Media_8		Herba par	Stemless m	Endemic
35	2	Species	Begonia stevei M.Hughes in Edinburgh J. Bot. 63(2-3): 19	M.Hughes	Edinburgh J. Bot. 63(2-	http://dx.doi.org/10.1017/S096042860		Ab omnib	Sprawling h	Endemic
36	2	Species	Begonia torajana D.C.Thomas & Ardi in Edinburgh J. Bot	D.C.Thomas & Ardi	Edinburgh J. Bot. 68(2)	http://dx.doi.org/10.1017/S096042861		Begoniae	Perennial, d	Indonesi
37	2	Species	Begonia varipeltata D.C.Thomas in Edinburgh J. Bot. 65(	D.C.Thomas	Edinburgh J. Bot. 65(3)	http://dx.doi.org/10.1017/S096042860		Begoniae	Perennial, n	Sulawesi
38	2	Species	Begonia vermeulenii D.C.Thomas in Edinburgh J. Bot. 68	D.C.Thomas	Edinburgh J. Bot. 68(2)	http://dx.doi.org/10.1017/S096042861		Ab aliis sp	Perennial, n	Indonesi

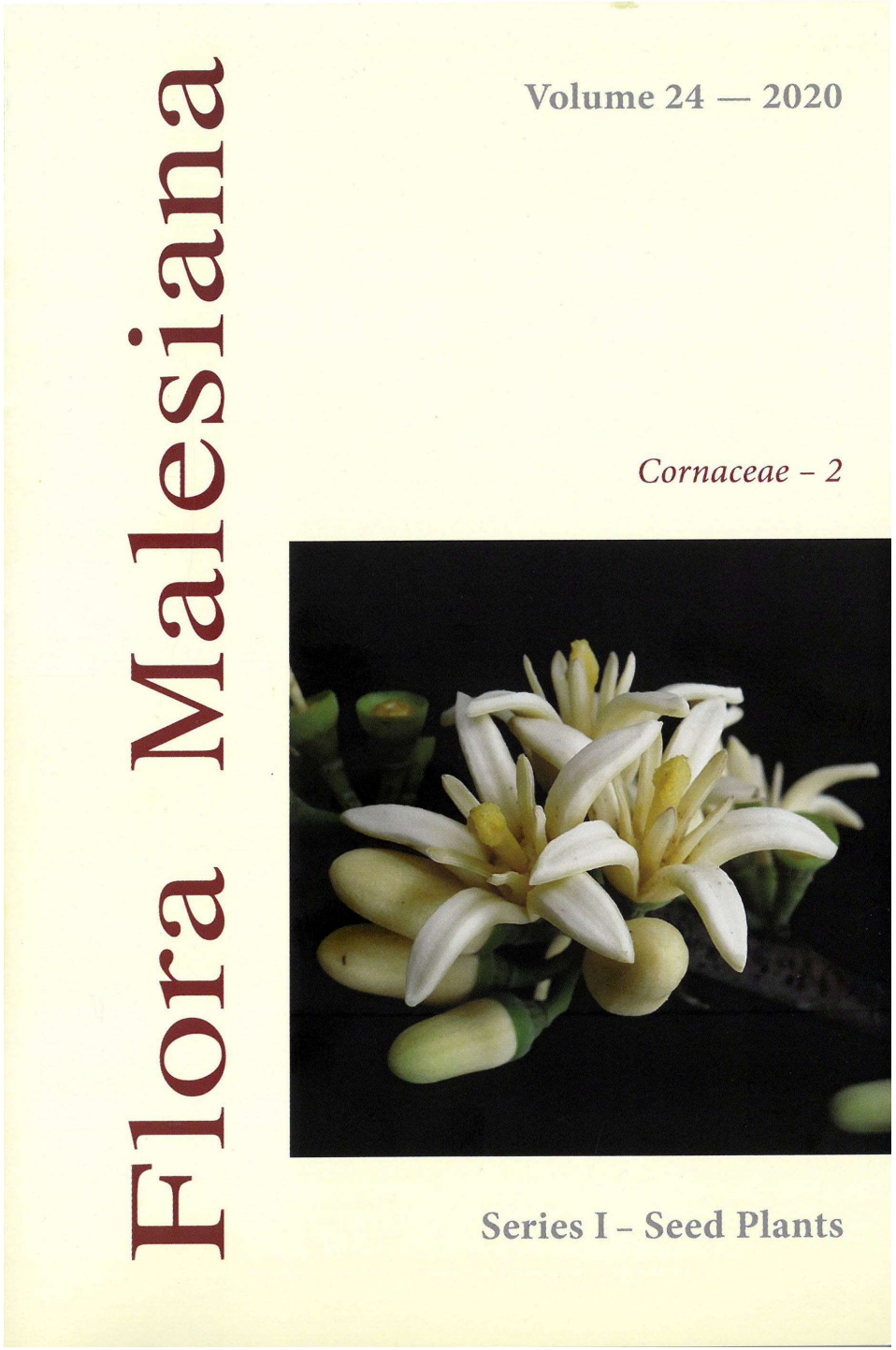
- **.csv files**

Flora Malesiana Checklist Project



Flora Malesiana Checklist Project

- Feasible? Absolutely!
- Duplication of work? Some, but…
- Importance in the wider FM framework?



Thank you very much for your attention

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