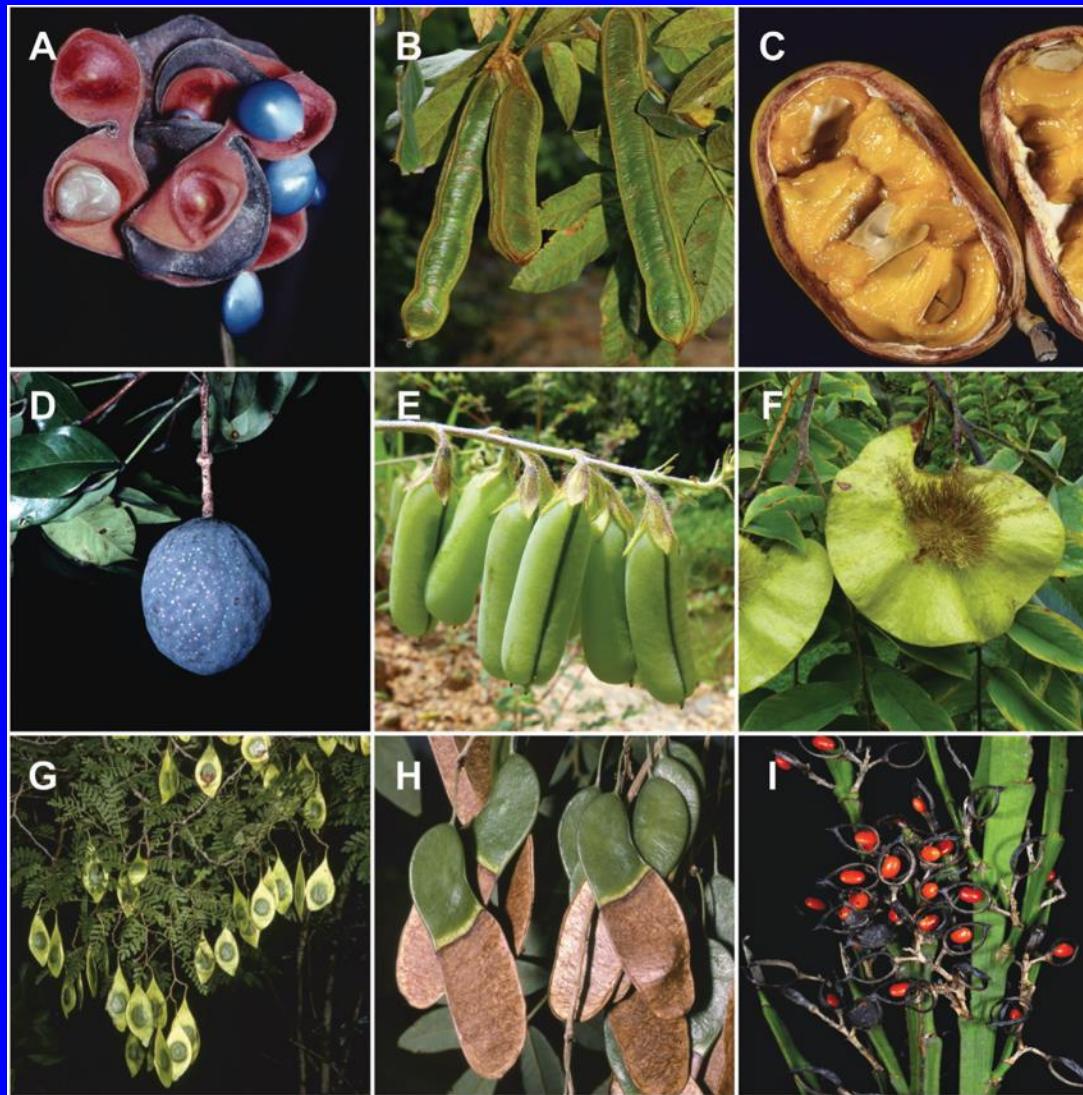


Phylogeny & morphology of arborescent Leguminosae



Paul Goetghebeur, Botanical Garden Ghent University

Introduction

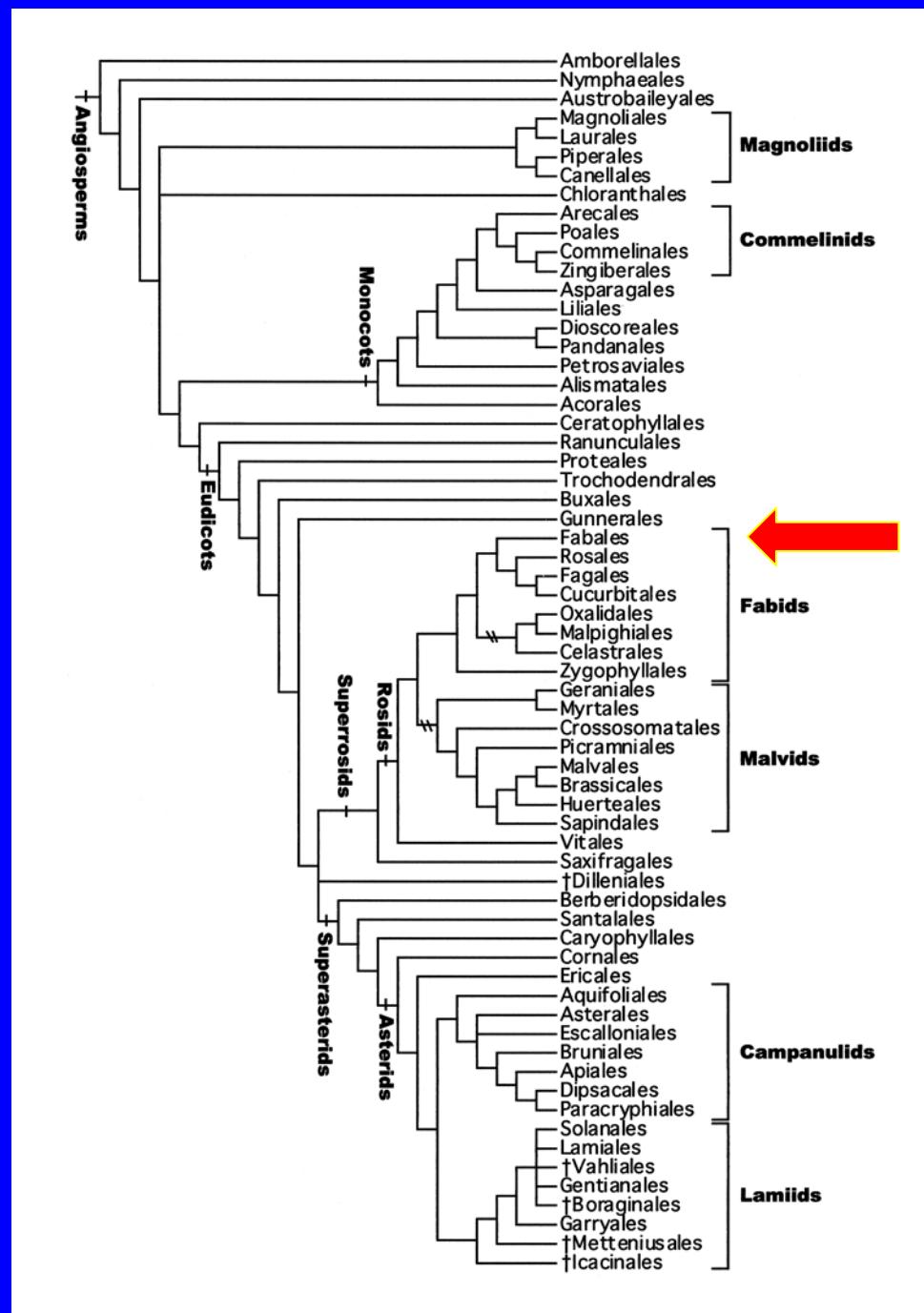
APG IV (2016) (Angiosperm Phylogeny Group)

Eudicots

Rosids

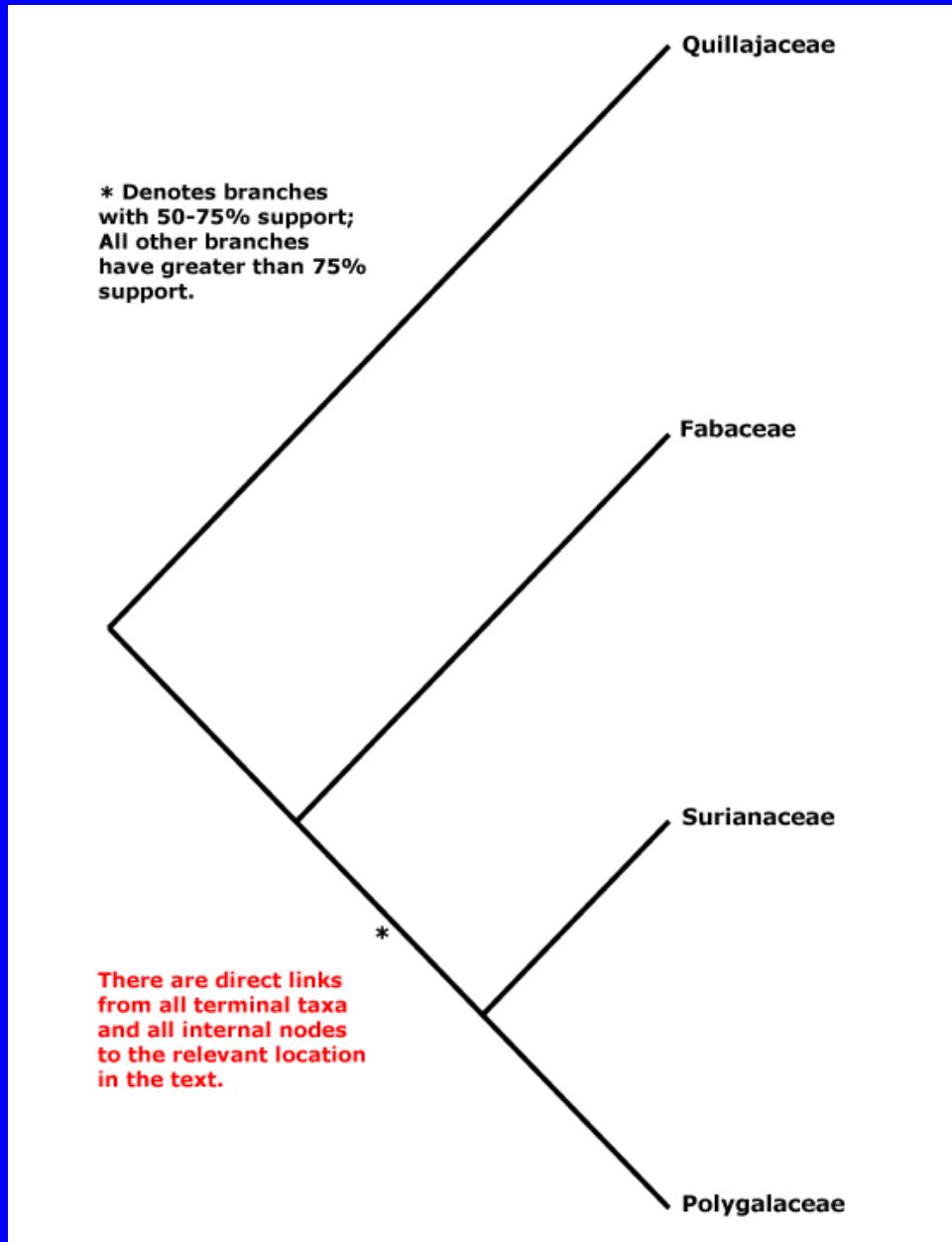
Fabids

Fabales



Fabales

(Stevens 2001 onwards)



*Quillaja
saponaria*



*Quillaja
saponaria*

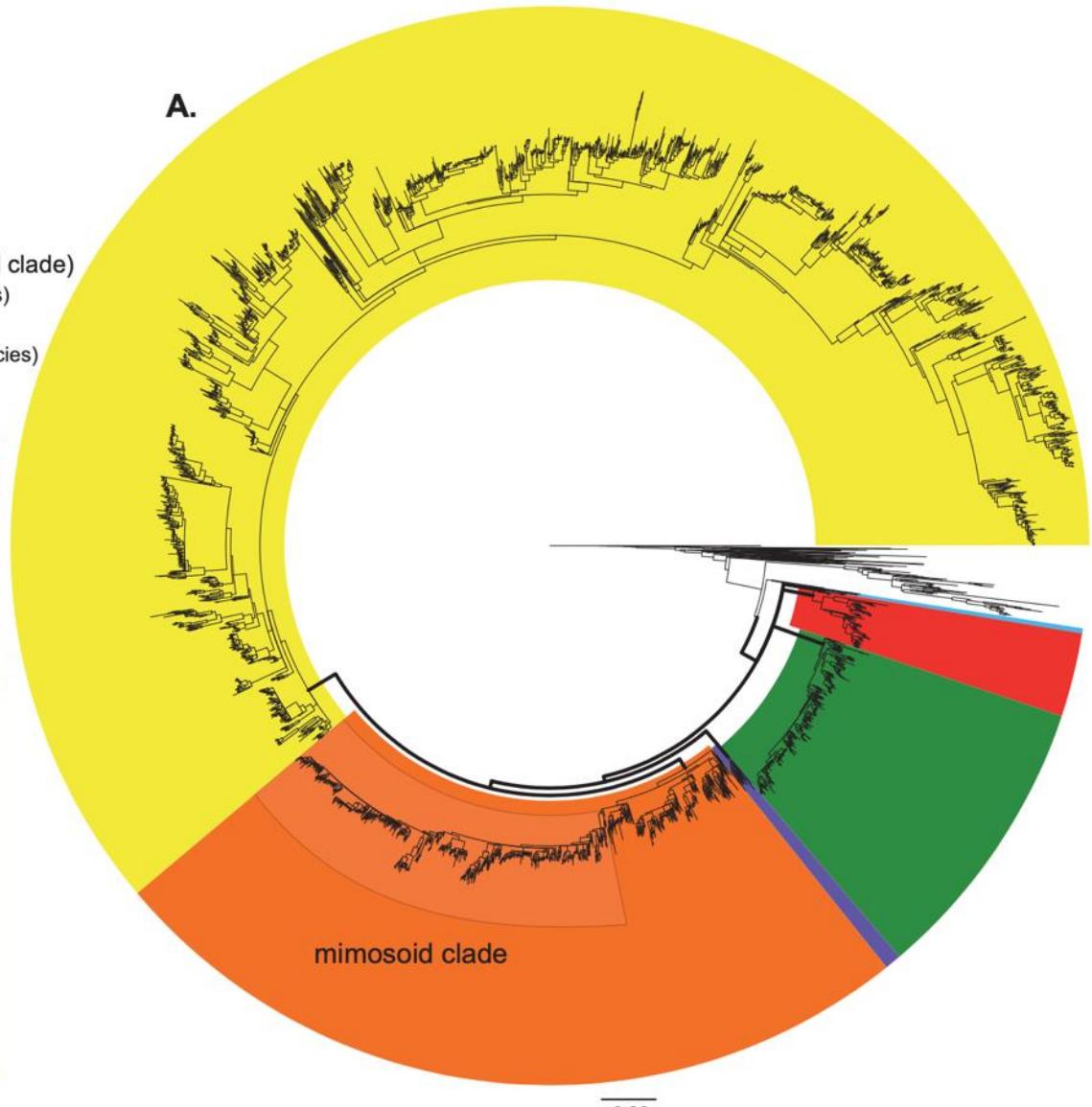
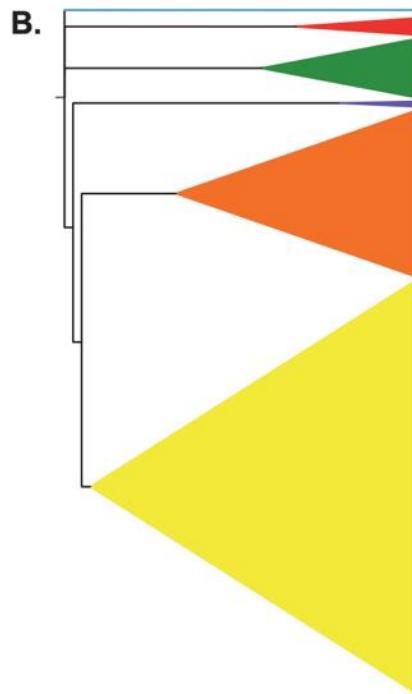


Quillaja lanceolata



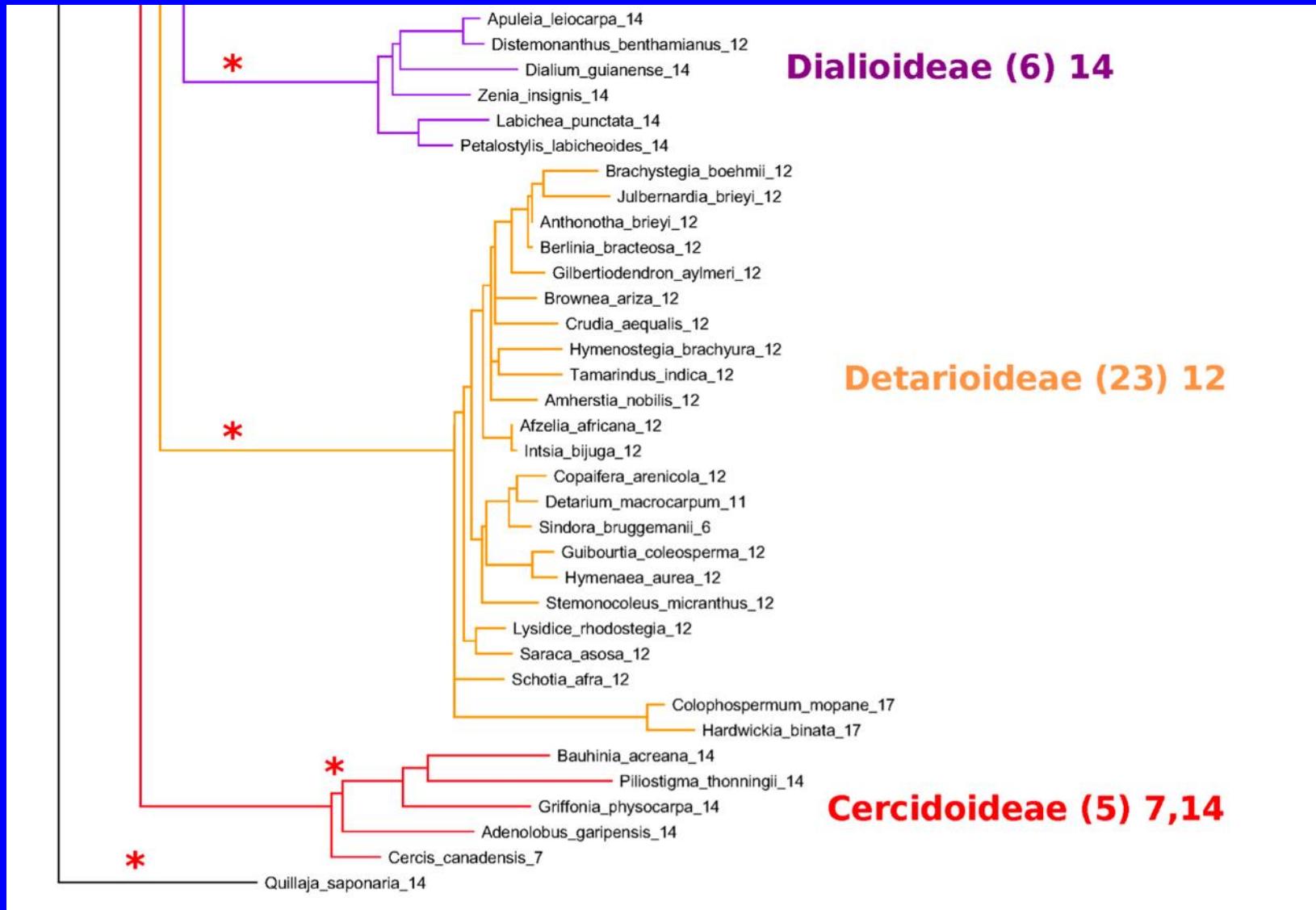
LPWG 2017, Phylogeny of the Fabaceae

- Duparquetioideae
(1/1 genus, 1/1 species)
- Cercidoideae
(12/12 genera, 96/ca. 335 species)
- Detarioideae
(79/84 genera, 327/ca. 760 species)
- Dialioideae
(15/17 genera, 19/ca. 85 species)
- Caesalpinoideae (incl. mimosoid clade)
(146/148 genera, 937/ca. 4400 species)
- Papilioideae
(445/503 genera, 2316/ca. 14,000 species)



Cercis

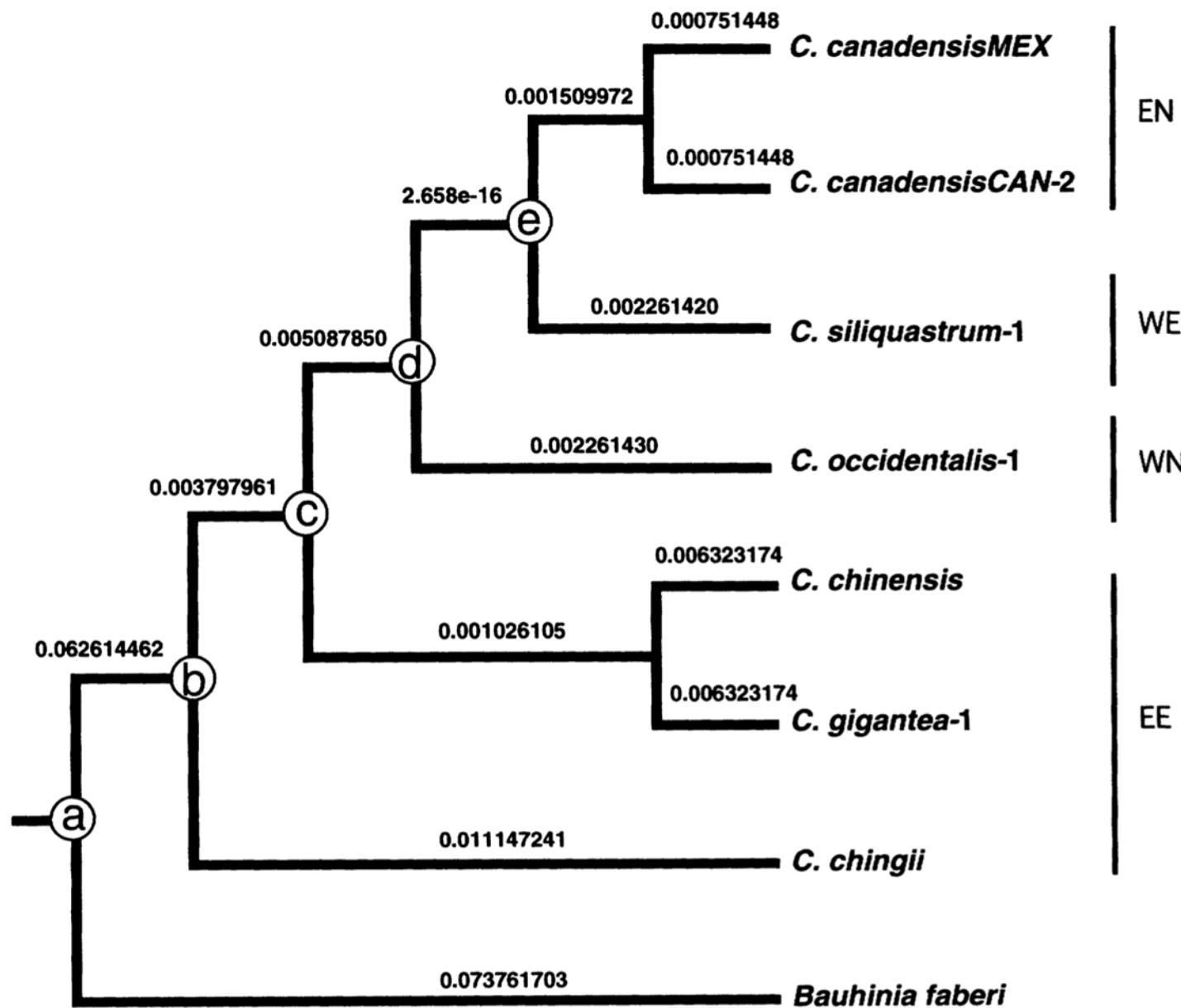
Stai et al. 2019, Cercis, a non-polyploid genomic relic



Stai et al. 2019, Cercis, a non-polyploid genomic relic



Davis et al. 2002, Phylogeny and biogeography of Cercis



Rembert Dodoens 1616, Stirpium historia: arbor Iudee

De Arbore Iudee.

Arbor Iudee.

C A P . X X V I I I .

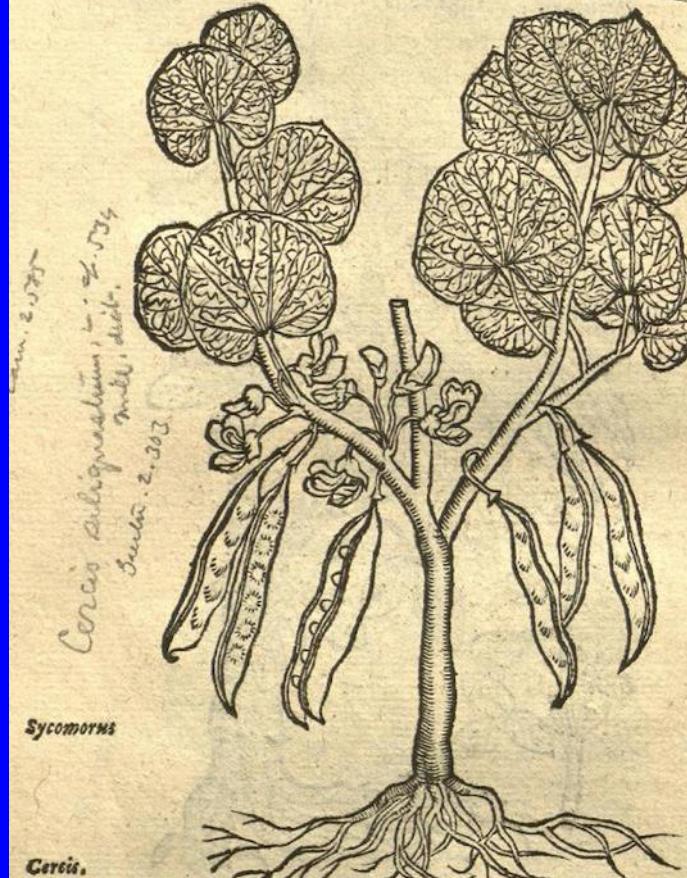
INTE R frutices numeranda venit & Arbor Iudee dicta , non nisi cultura arbore-scens;qua accedente, haud difficulter arbo-ris asturgit modo : è caudice lignoso ramu-los nonnullos promit , corticibus è purpura uigranticibus ; à quibus flores in breuibus pediculis exeunt forma Ochri , sed colore eleganti purpureo rubentes, quand oque& cādidi, ramulorum cortice & vnā albican-te: folia rotunda sunt, Asari ferè similia, sed molliora,tenuiora, dilutiusque virentia : si-liquæ succedunt floribus digitum longæ ac latæ, planæ, tenues, compressæ , in quibus semen planum durumque veluti Lentis.

In nonnullis Hispaniæ prouinciis in se-pibus ac dumis reperitur : Italiae quoque montes , ac Narbonensis Galliæ agri hoc non destituuntur frutice.

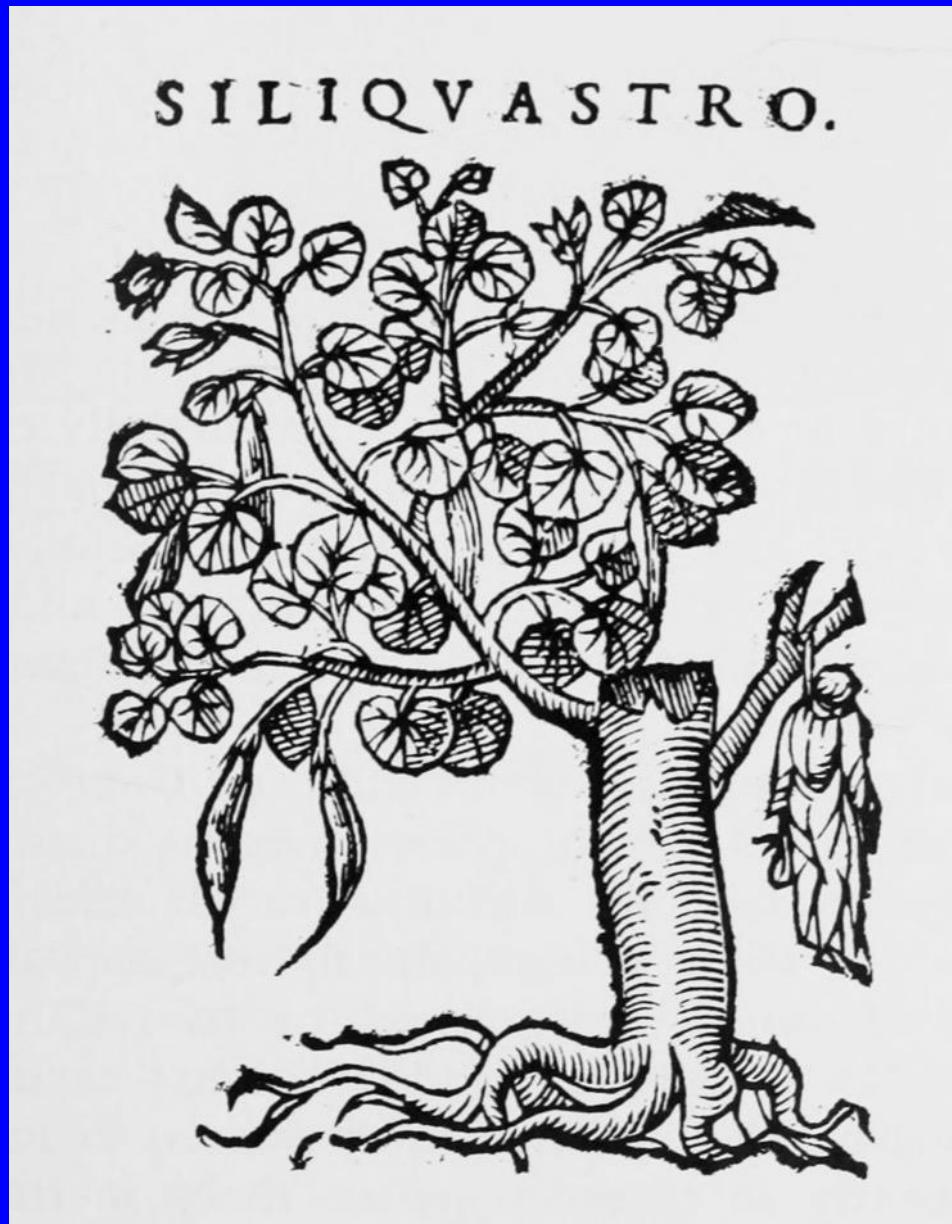
Flores primo tempore erumpunt,& prius quam folia, siliquas æstas maturat.

Vulgò Arboris Iudee nomen inuenit. Sunt qui Sycomoron appellauerint, quod videlicet è crassioribus ramulis flores ac si-liquæ dependeant : sed legitima Sycomo-rus fructu Ficum refert, & folia habet qua-lia Morus arbor, vnde illi nomen. Ab aliis *nepris* creditur esse, de qua his verbis The-o-phrastus : Cercis fructum in siliqua facit. Quæ adeò pauca sunt verba , vt ex his nihil certi haberí queat : plures etenim in siliqua fructum ferentes frutices sunt. Galli *Guañier*, quasi vaginulam, appellant. Hispano-rum plerique *Algorouo loco*, id est, siliquam siluestrem aut fatuam : alij *Arbol d'amor*, propter elegantiam.

Mastio-
lus notatur Incomptæ autem & incognitæ huius fruticis vires sunt & facultates : nam quodd Mat-thiolus hanc Acaciam (additis præter veritatem spinis) faciat, figmentum est.



Castor Durante 1636, Herbario Nuovo



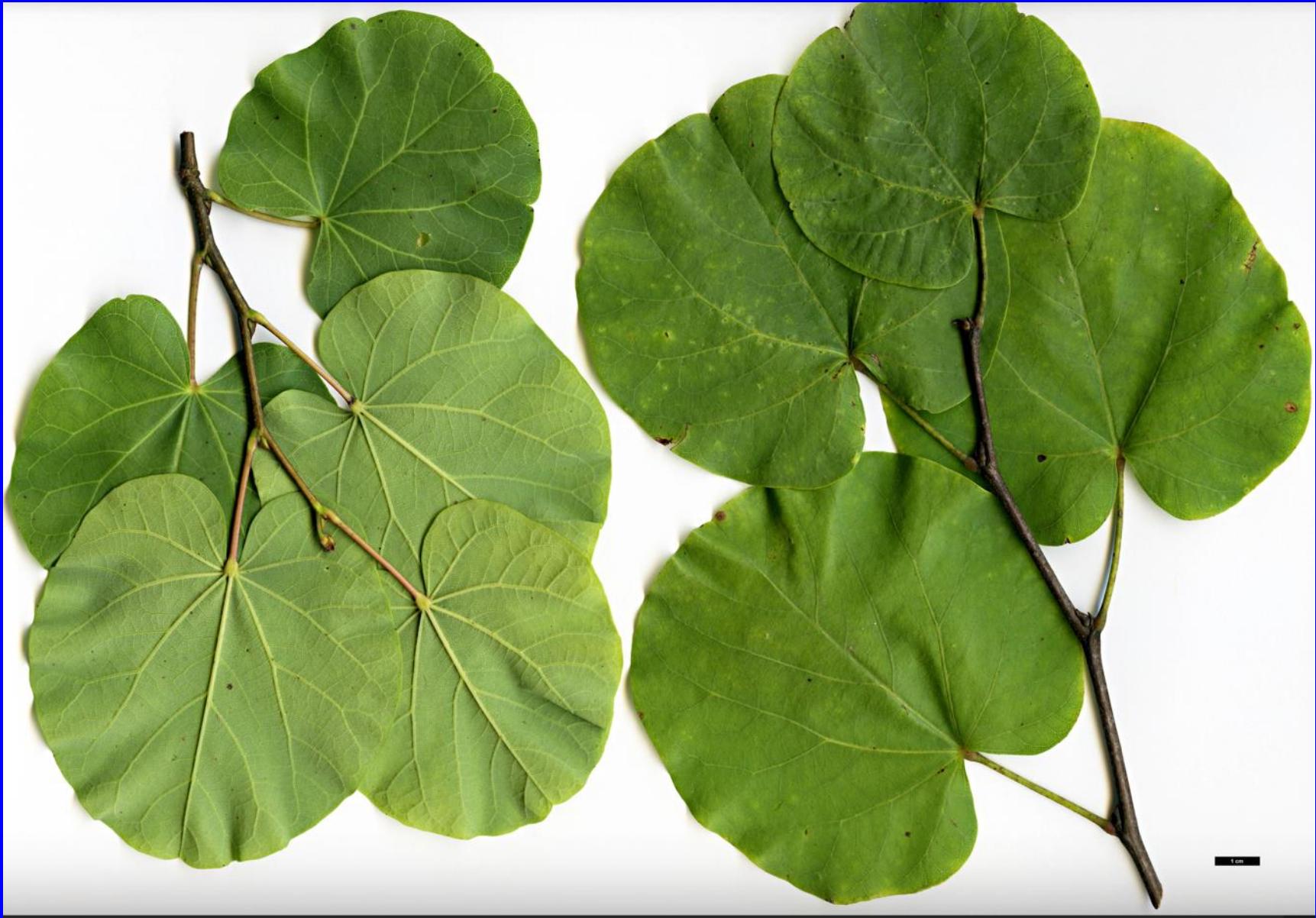
judáicus,a,um, – genoemd naar *Juda* (Hebr. = ge-prezen, geloofd), vierden zoon van den aartsvader Jakob bij zijn eerste vrouw Lea (Genésis XXIX, 35), stamvader van den naar hem genoemden stam Israels (Vgl. Genésis XLIX, 8–12 en 28), welke bij de scheuring in 975 v. Chr. trouw bleef aan het wettig vorstenhuis (Vgl. I Koningen XII, 20: „niemand en volgde het huys Davids dan de „stam Juda alleen“). – Na den terugkeer uit de Babylonische ballingschap (536 v. Chr.) werd de naam Juda een verzamelnaam voor de teruggekeerde joden (Vgl. D. Jude) en zoo beteekent judaicus: joodsch.

Cercis L., – Lat. translcr. van den ouden Gr. plantennaam *kerkis*. Kerkis beteekent ook de stang of slag, welke bij een ouderwetschen handweefstoel (, als o.a. nog bij de dorpsbevolking der Preanger Regentschappen in gebruik is,) gebezigd wordt om de inslagdraden te doen aaneensluiten, voorts de schietspoel, waarom de inslagdraad gewonden is. Verondersteld wordt, dat de plant zoo genoemd werd om uittedrukken, dat haar peul op zulk een slag of spoel gelijkt.

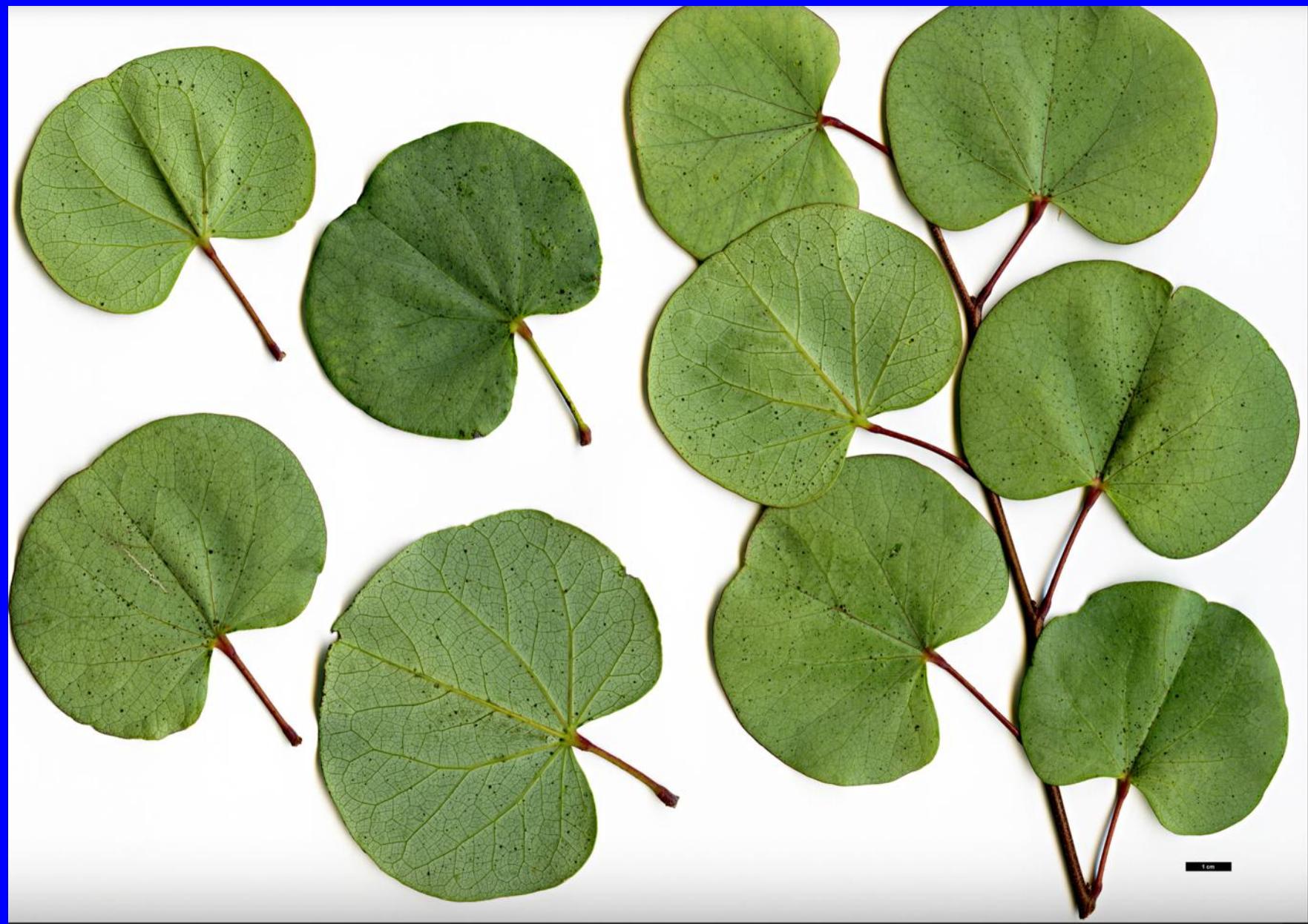
siliquástrum, – oude, Lat. plantennaam, van Lat. *siliqua*, peul: peuldragende boom.

Cercis siliquastrum





Fabaceae_Cercis_siliquastrum_BGBERN2006-988_JDL022356_19OCT2018_01.jpg

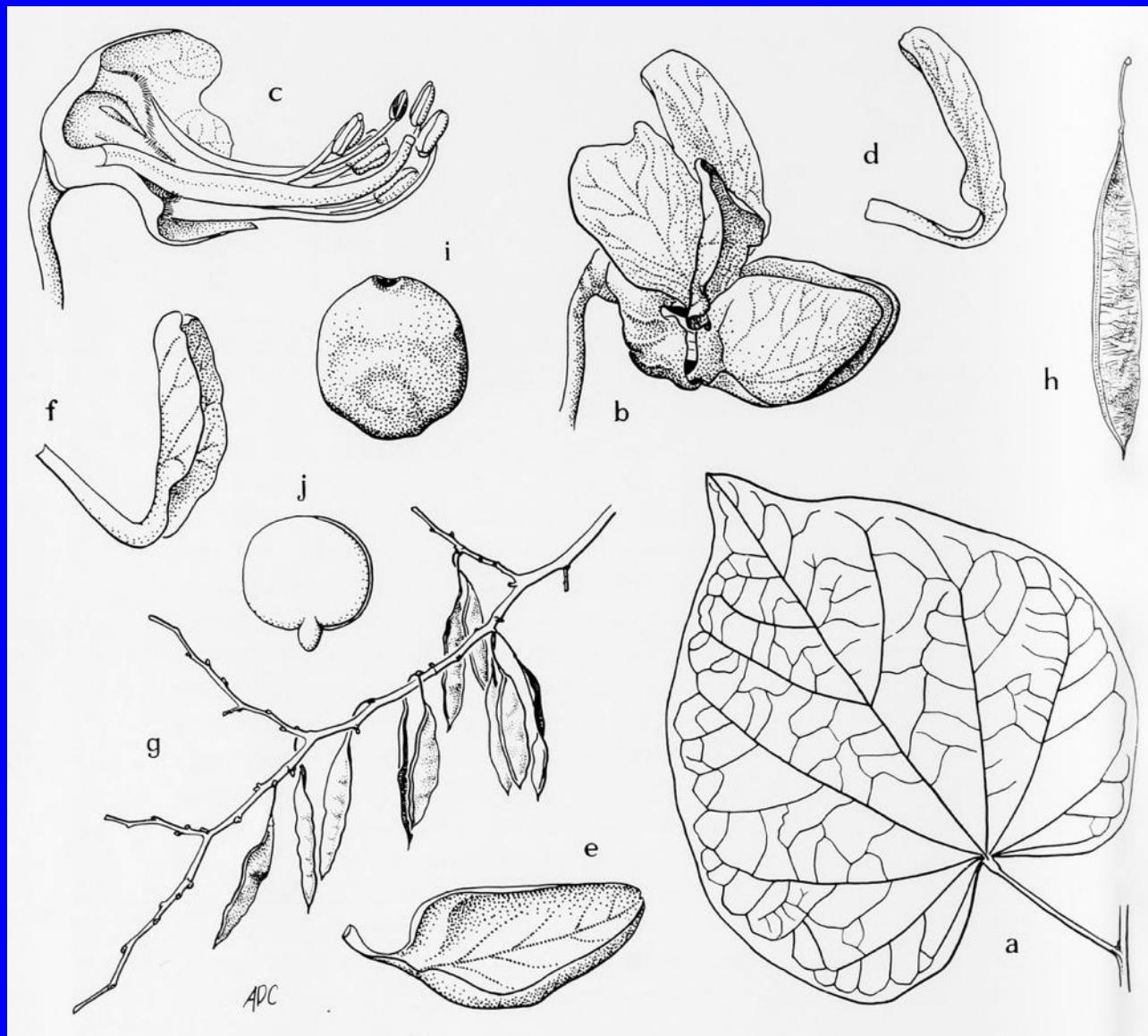


Fabaceae_Cercis_griffithii_RAFLEN0000_JDL022085_28AUG2018_01.jpg



Fabaceae_Cercis_canadensis_var. canadensis_AHLE00006783_JDL021879_21JUL2018_01.jpg

Generic Flora of the southeastern US, Cercis canadensis





Fabaceae_Cercis_racemosa_TPAR4745_JDL025247_20SEP2022_01.jpg



Fabaceae_Cercis_chinensis_AHLE00003845_JDL021169_15AUG2017_01.jpg



6. *Cercis glabra*

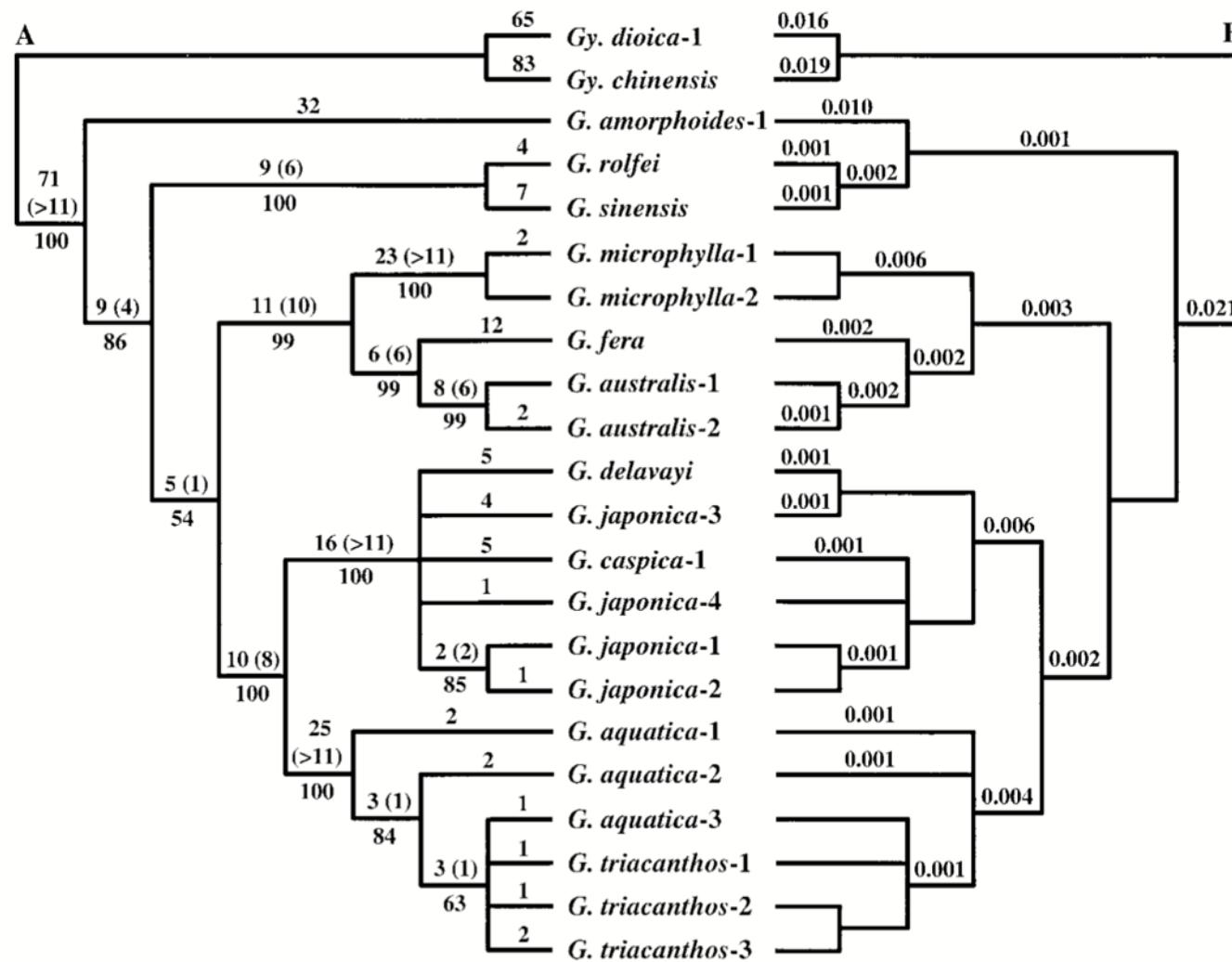
7. *Cercis griffithii*

Fabaceae *Cercis gigantea* AHLE00003317 JDL023979 17SEP2020_01.jpg

8. *Cercis foetida*

Gleditsia

Schnabel et al. 2003, Phylogenetic relationships in *Gleditsia*



Gleditsia sinensis

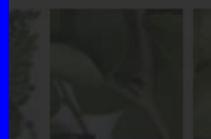


Gleditsia sinensis



R S

ditsia aquati
ditsia caspic
ditsia japoni
ditsia macra
ditsia sinensi



ditsia triacan



Fabaceae_Gleditsia_sinensis_HWH92321_JDL023161_11SEP2019_01.jpg

Gleditsia japonica



Gleditsia japonica





4. *Gleditsia macracantha*

5. Fabaceae_Gleditsia_japonica_MAINZ195006490_DL025126_29AUG2022_01.jpg



Fabaceae_Gleditsia_japonica_MAINZ195006490_JDL025126_29AUG2022_07.jpg

Gleditsia aquatica





Fabaceae_Gleditsia_aquatica_HWH02313_JDL023160_11SEP2019_06.jpg



Fabaceae_Gleditsia_aquatica_HWH02313_DL023160_11SEP2019_08.jpg

*Gleditsia
caspica*





Fabaceae_Gleditsia_caspica_KUVANI0000-BVP-Greece_WLD_JDL021739_23JUN2018_05.jpg



Fabaceae_Gleditsia_caspica_KUVANI0000-BVP-Greece_WLD_JDL021739_23JUN2018_04.jpg



Fabaceae_Gleditsia_caspica_KUVANI0000-BVP-Greece_WLD_JDL021739_23JUN2018_08.jpg

Gleditsia triacanthos

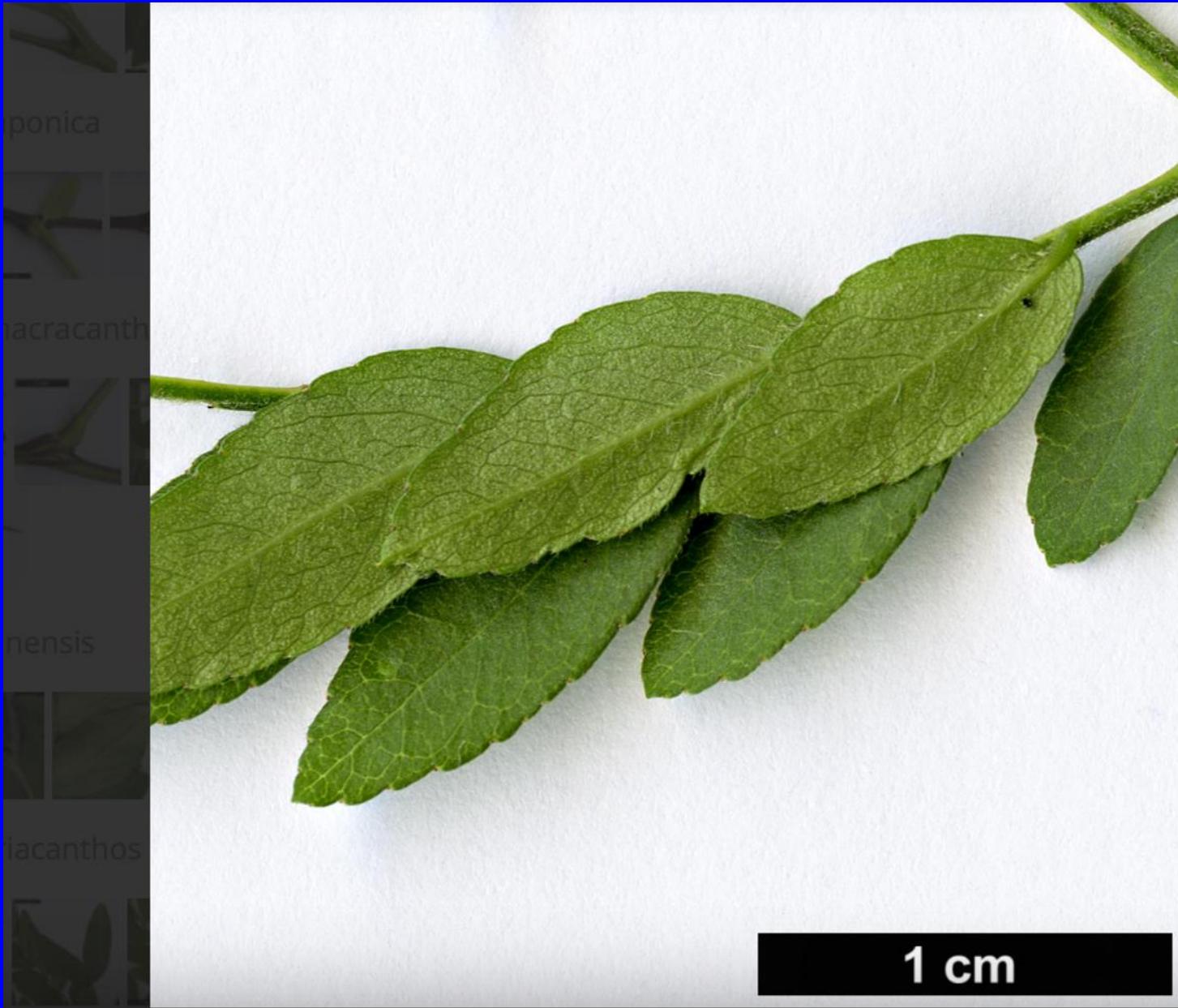


Gleditsia triacanthos





Fabaceae_Gleditsia_triacanthos_HWH12339-KC-Illinois_WLD_JDL023162_11SEP2019_01.jpg

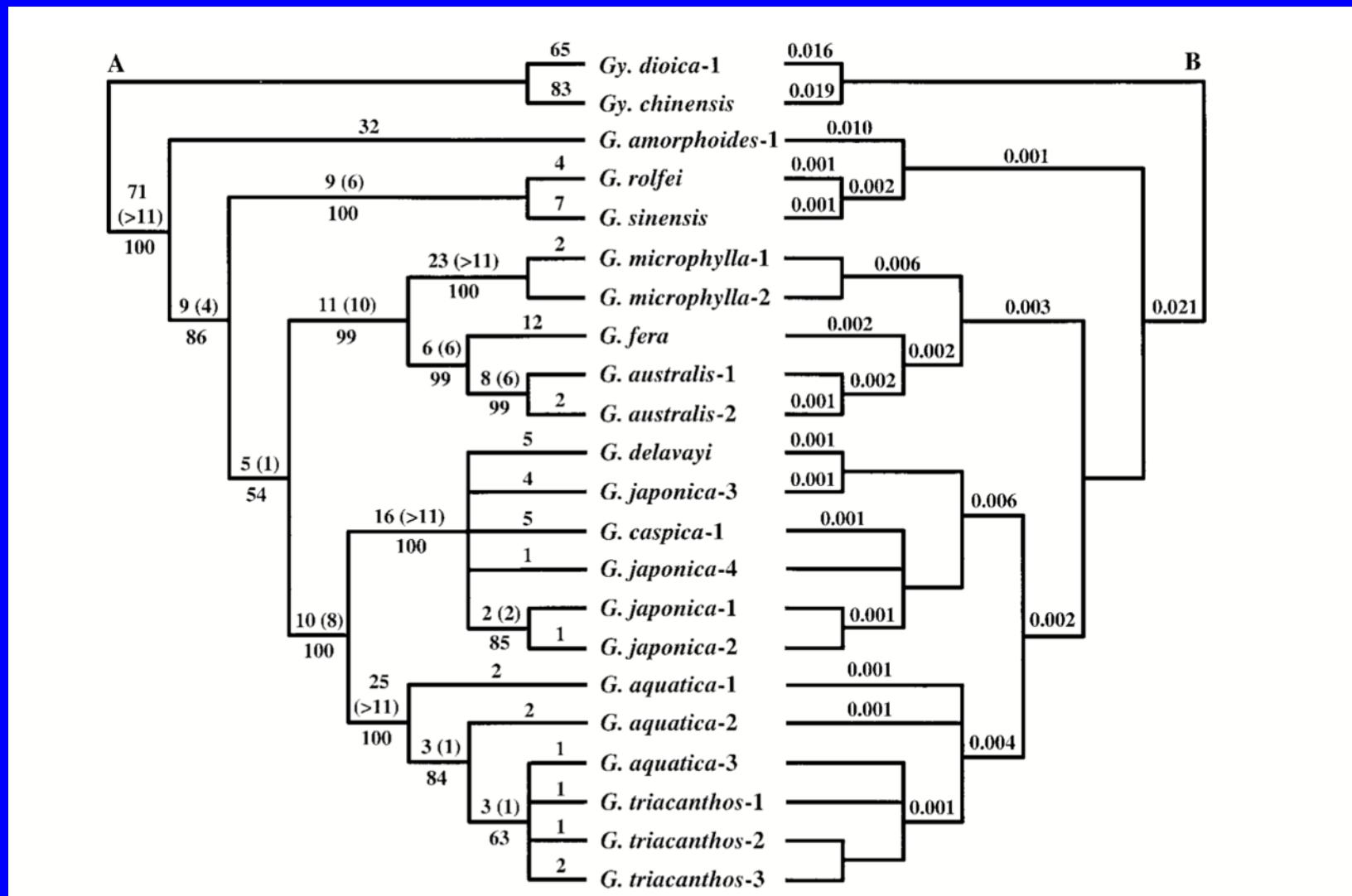


1 cm

Fabaceae_Gleditsia_triacanthos_HWH12339-KC-Illinois_WLD_JDL023162_11SEP2019_06.jpg

Gymnocladus

Schnabel et al. 2003, Phylogenetic relationships in *Gleditsia*



*Gymnocladus
dioicus*



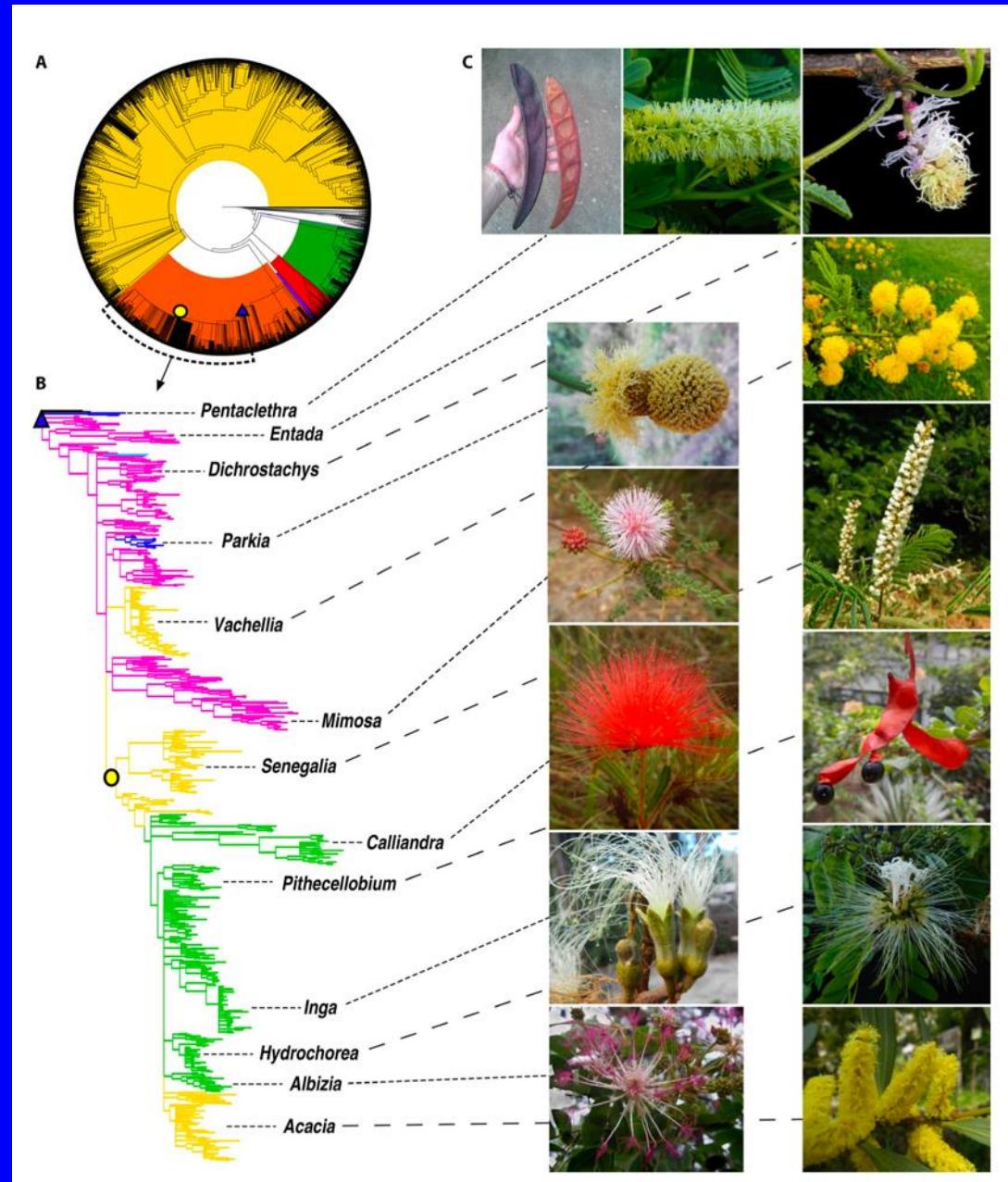
Gymnocladus dioicus



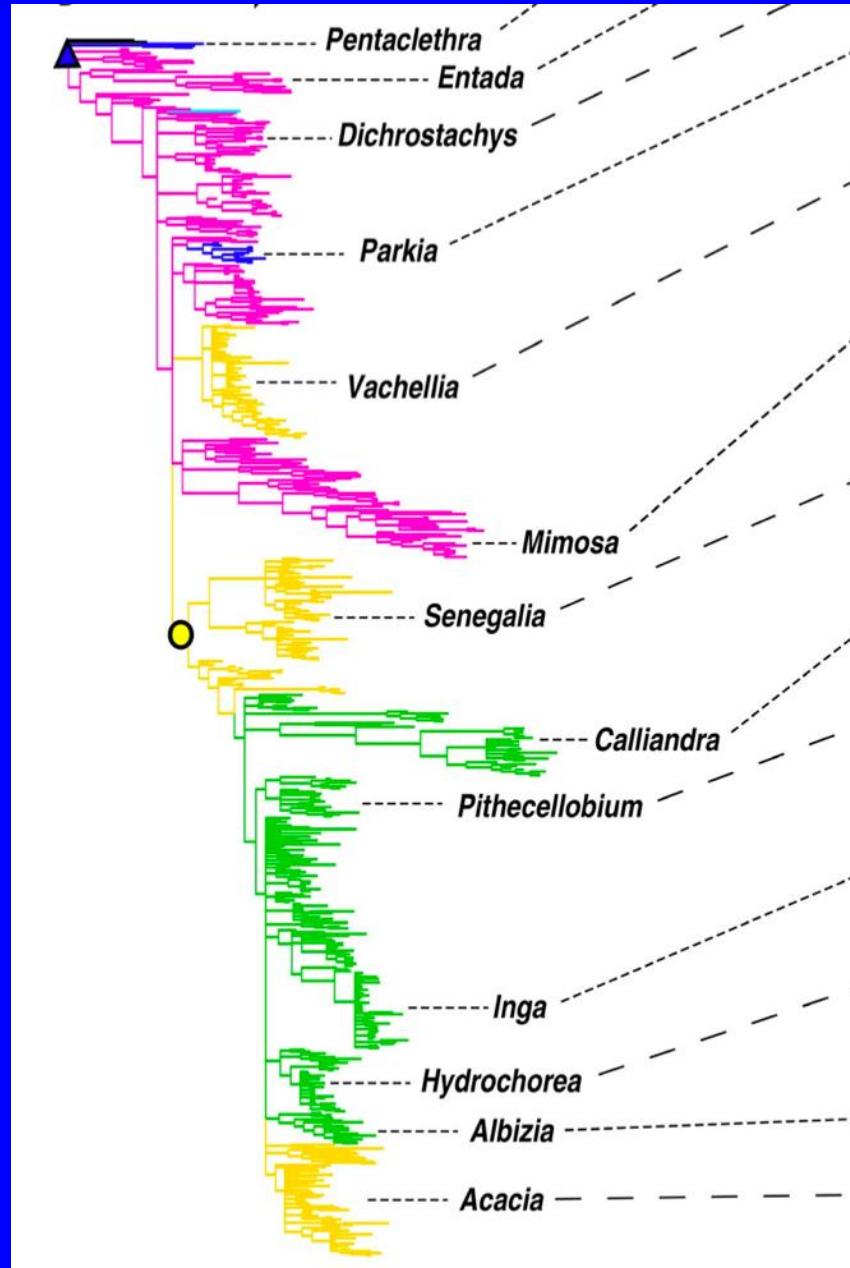


Fabaceae_Gymnocladus_dioica_KUVANI0000_DL020931_24JUN2017_01.jpg

Acacia



Koenen et al. 2020, Evolutionary relationships in mimosoid legumes



Acacia dealbata

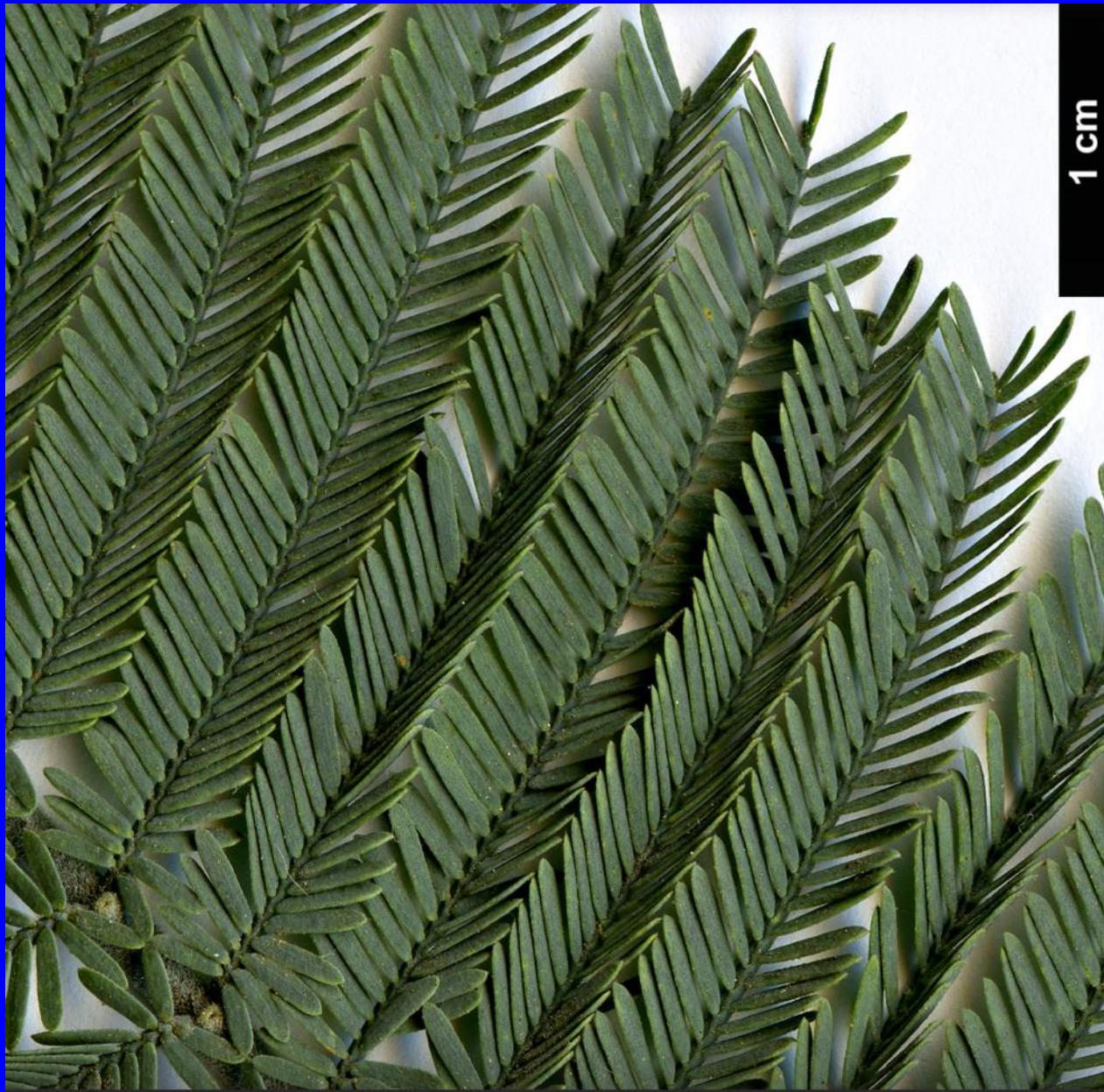




22. *Acacia farnesiana*

23. *Acacia farnesiana*

Fabaceae_Acacia_dealbata_BGBONN146-9-1990_JDL022589_29APR2019_01.jpg



Acacia dealbata

Fabaceae_Acacia_dealbata_BGBONN146-9-1990_JDL022589_29APR2019_03.jpg

Acacia pravissima



Acacia pravissima





Fabaceae_Acacia_pravissima_TPAR0000_JDL022214_24SEP2018_01.jpg



Fabaceae_Acacia_pravissima_TPAR0000_JDL022214_24SEP2018_03.jpg

Senegalia

Senegalia senegal



Vachellia

Vachellia karroo



Vachellia karroo



Vachellia karroo



*Vachellia
karroo*

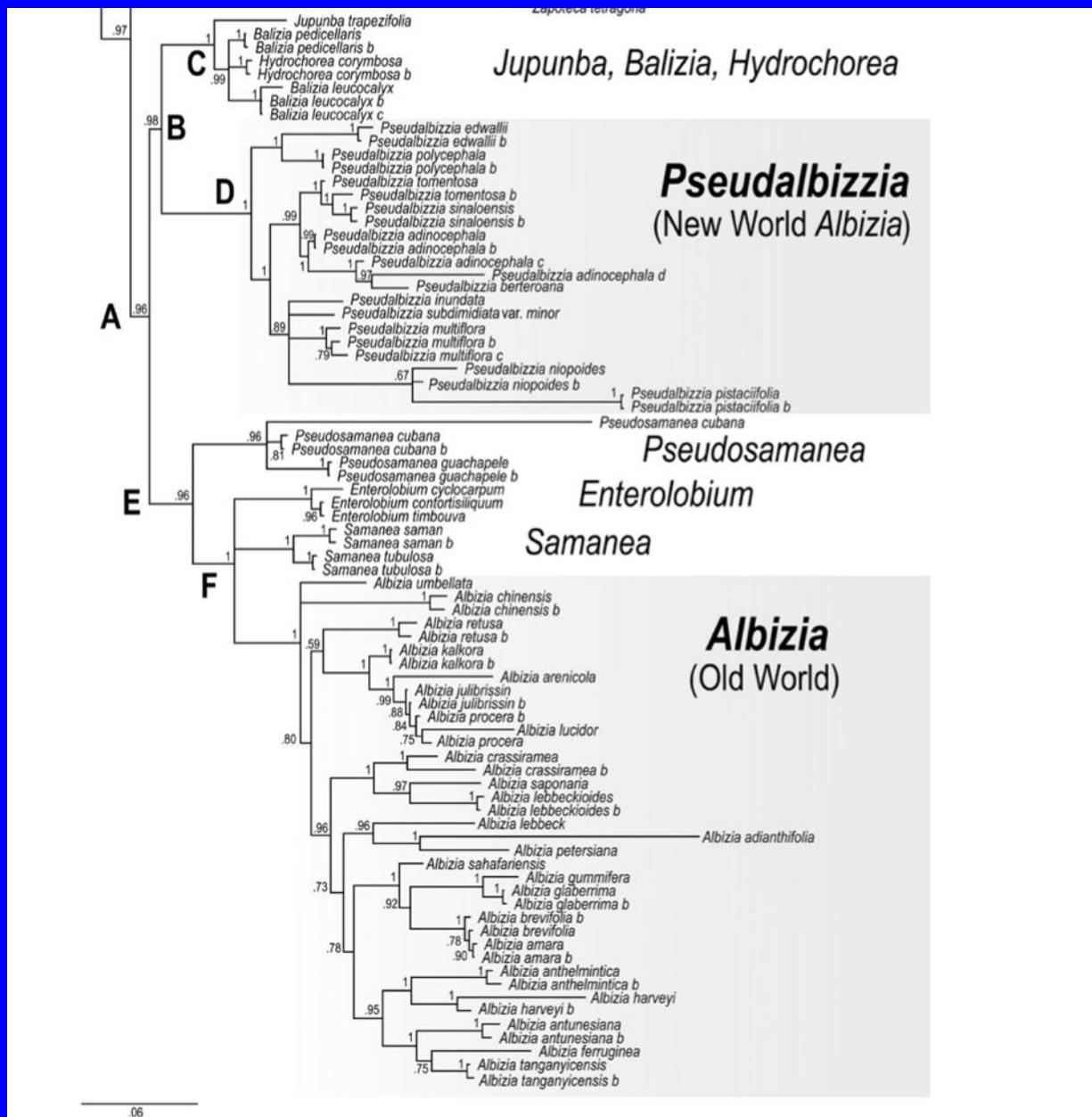




35. *Acacia longifolia*

36. Fabaceae_Acacia_karroo_HBUG19004667-U_JDL024213_31MAY2021_01.jpg

Albizia



Albizia julibrissin





Fabaceae_Albizia_julibrissin_AHLE00004254_JDL021072_10JUL2017_01.jpg



Fabaceae_Albizia_julibrissin_AHLE00004254_JDL021072_10JUL2017_02.jpg

1 cm

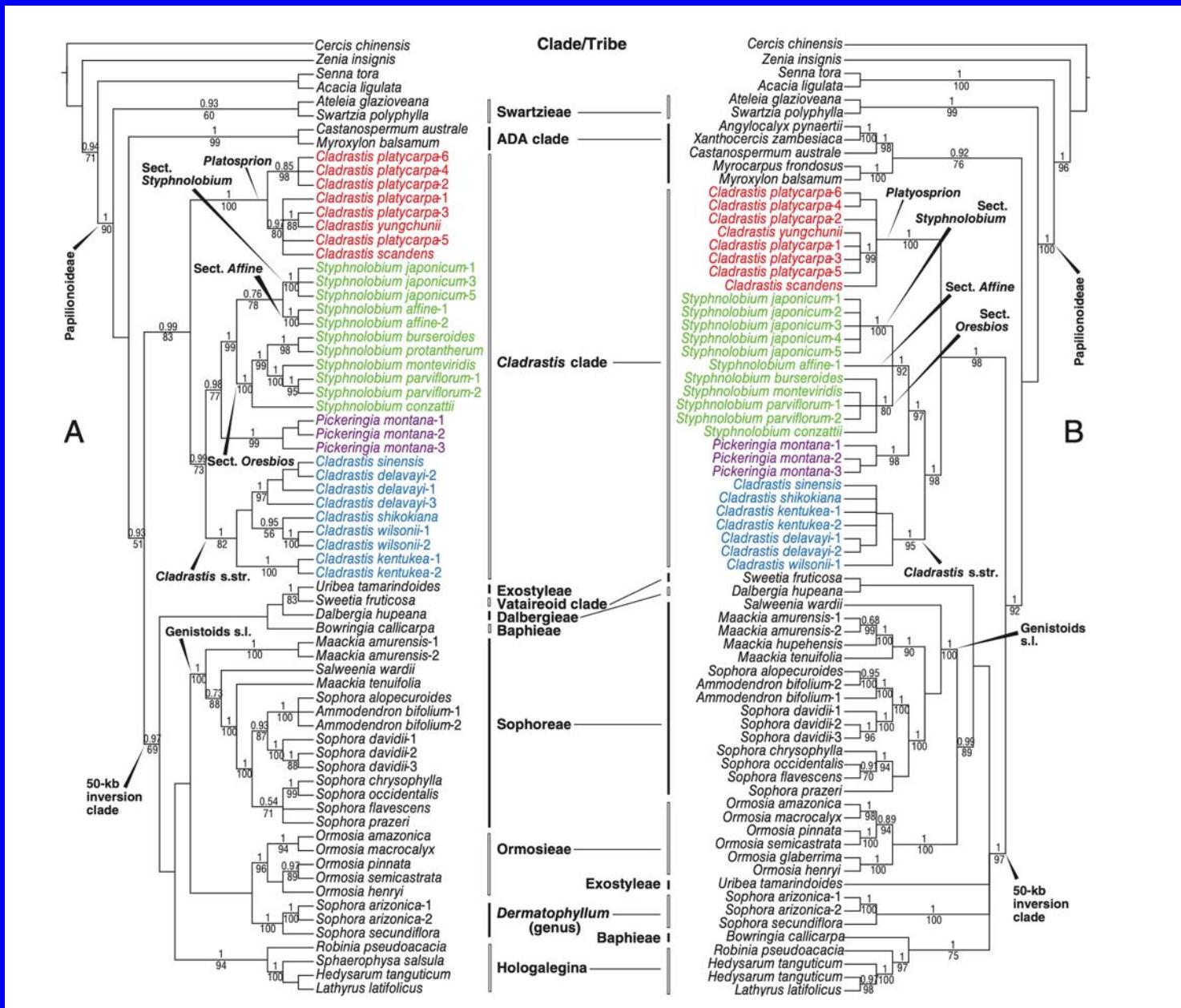


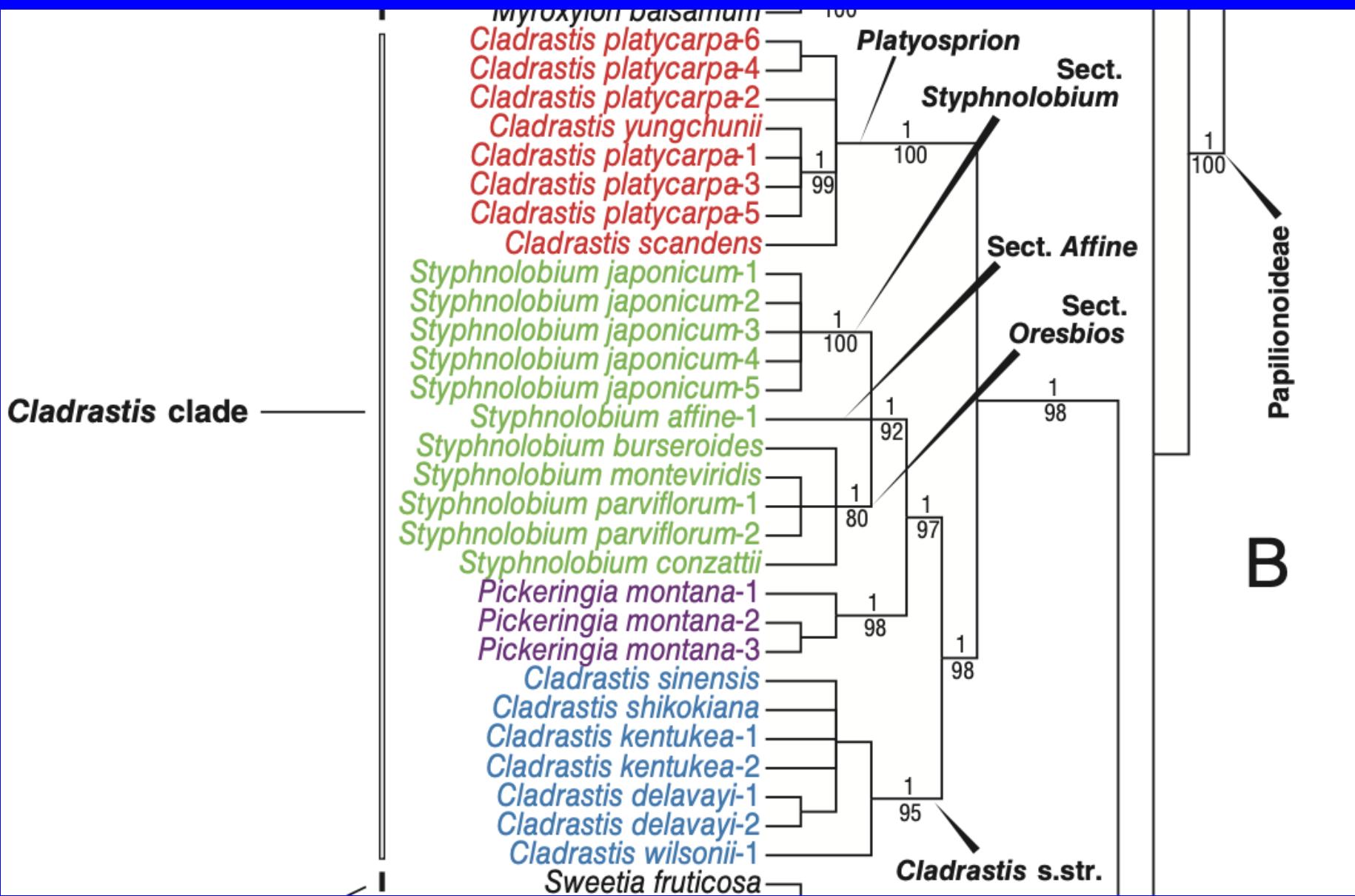
Fabaceae_Albizia_julibrissin_AHLE00004254_DL021072_10JUL2017_10.jpg

Cladrastis

Platyosprion

Styphnolobium





Cladrastis kentukea





Fabaceae_Cladrastis_kentukea_WBIRT050465-JesamineCounty-USA_WLD_JDL021084_25JUL2017_08.jpg

1.
2.



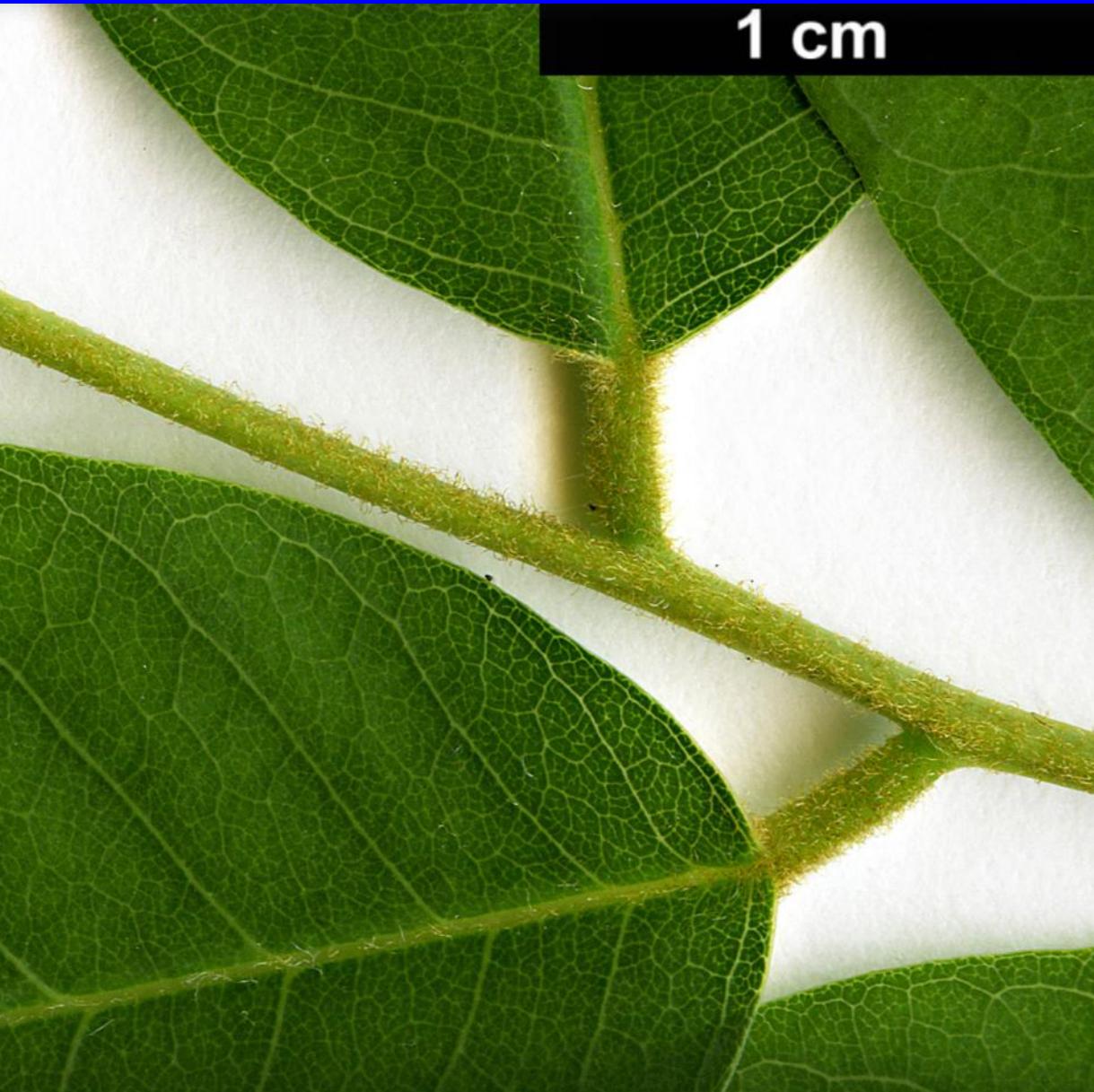
Fabaceae_Cladrastis_kentukea_WBIRT050465-JesamineCounty-USA_WLD_JDL021084_25JUL2017_06.jpg

Cladrastis delavayi





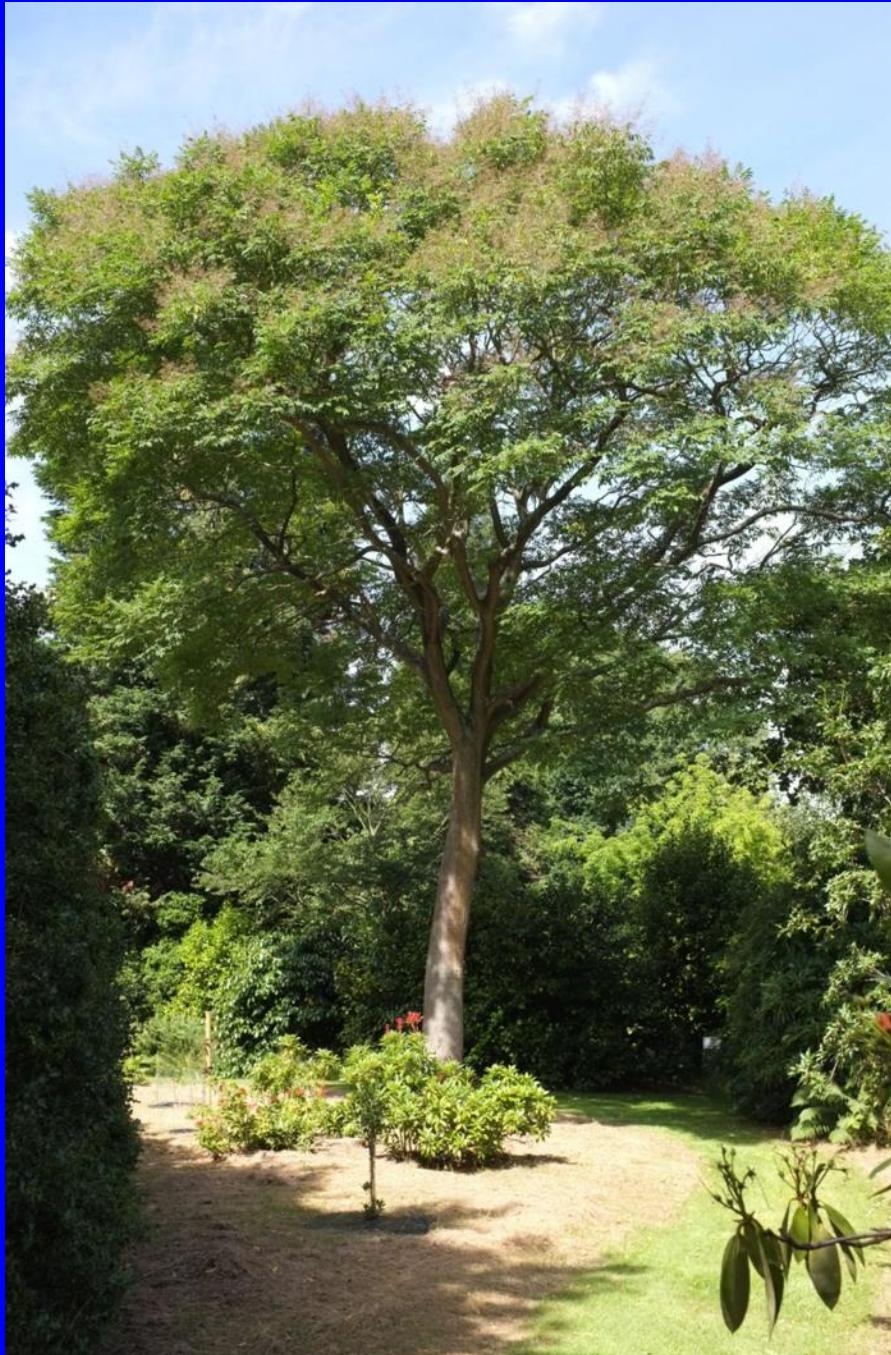
Fabaceae_Cladrastis_sinensis_WBIRT0600038_JDL021110_25JUL2017_01.jpg



1 cm

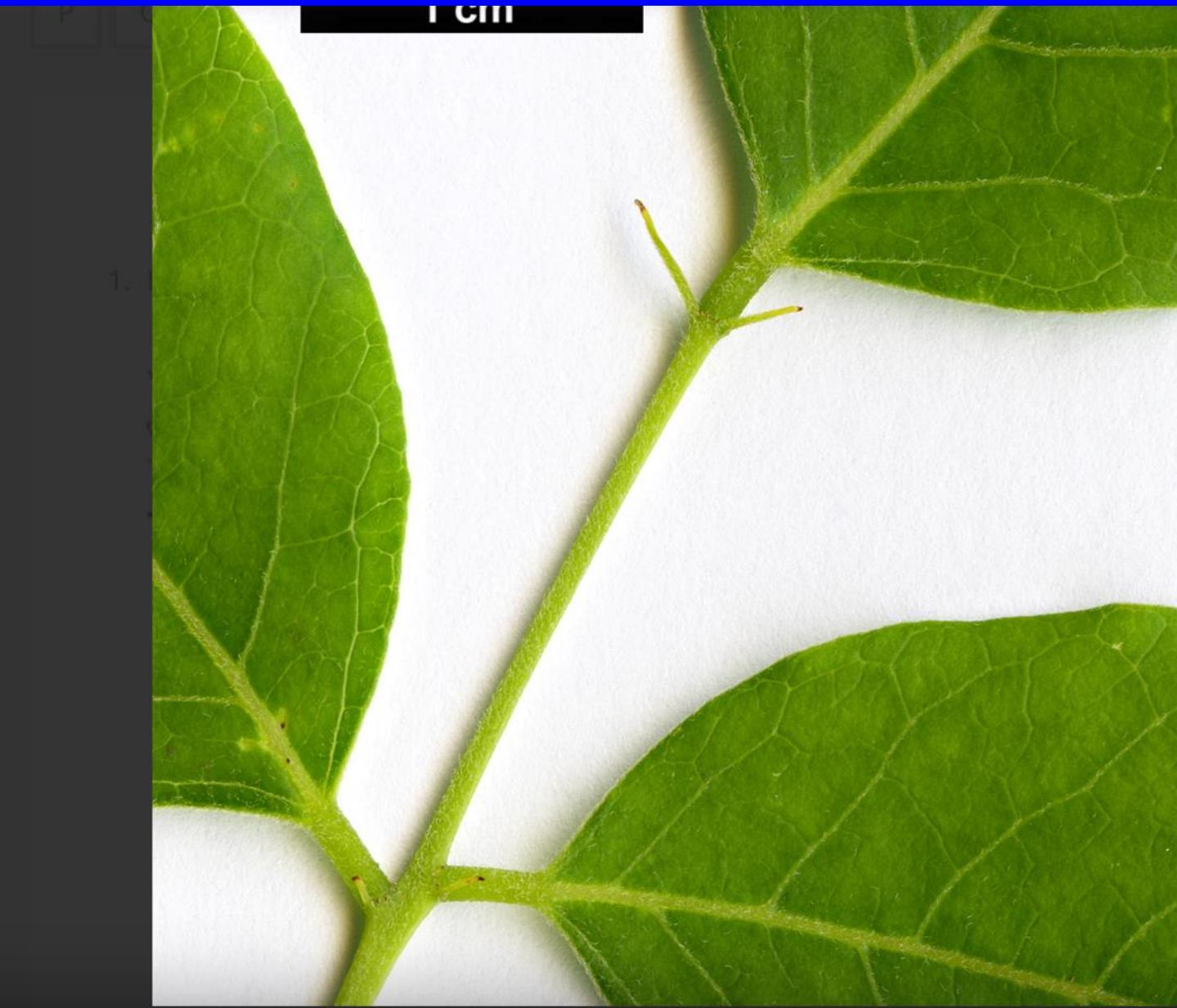
Fabaceae_Cladrastis_sinensis_WBIRT0600038_JDL021110_25JUL2017_05.jpg

*Platysprion
platycarpum*





Fabaceae_Platyosprion_platycarpum_HWH18086-Cladrastis_platycarpa_JDL023573_16JUN2020_01.jpg



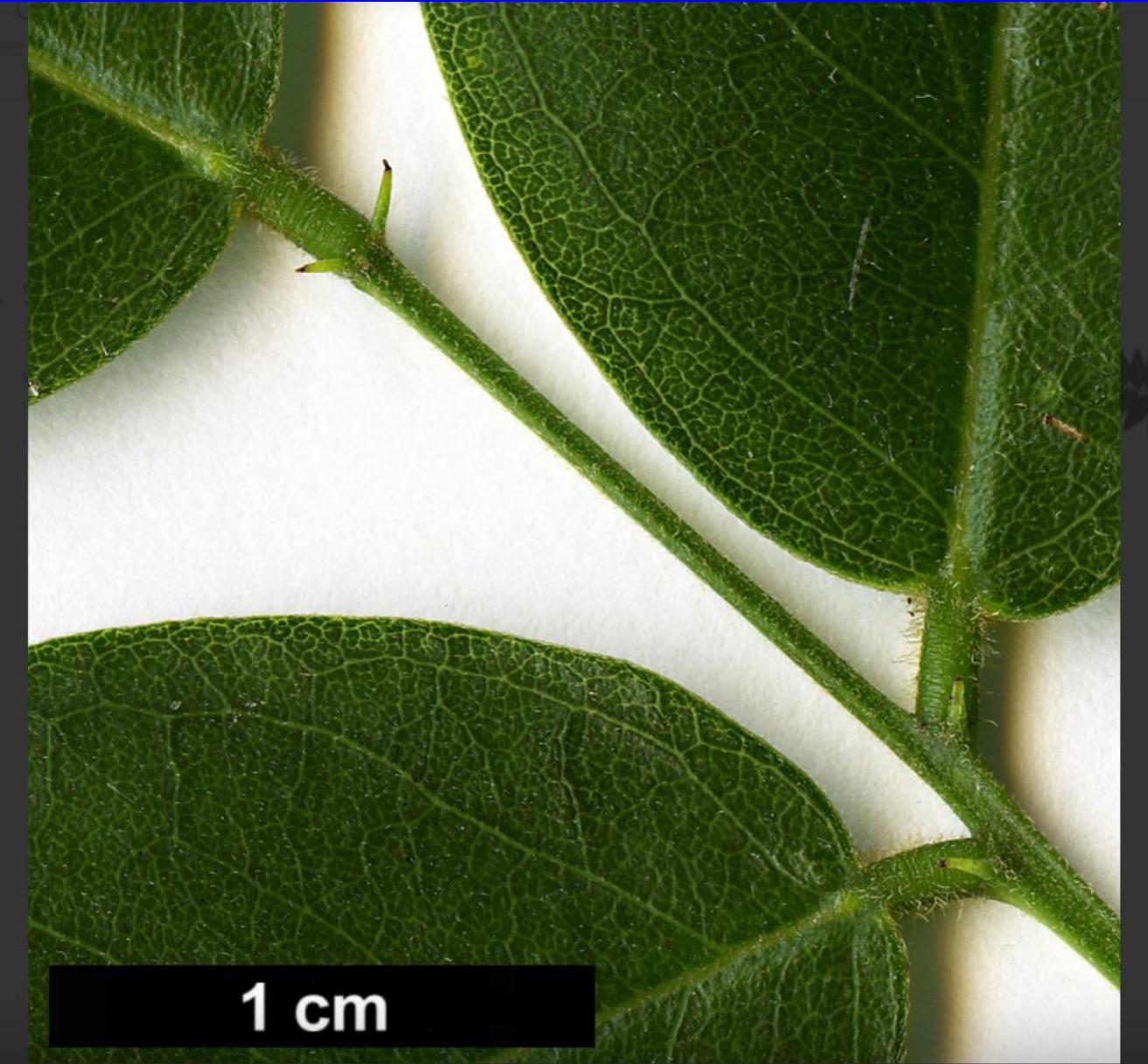
Fabaceae_Plattyosprion_platycarpum_HWH18086-Cladrastis_platycarpa_JDL023573_16JUN2020_05.jpg

*Styphnolobium
japonicum*





Fabaceae_*Styphnolobium japonicum*_AHLE00005860_JDL020990_04JUL2017_01.jpg

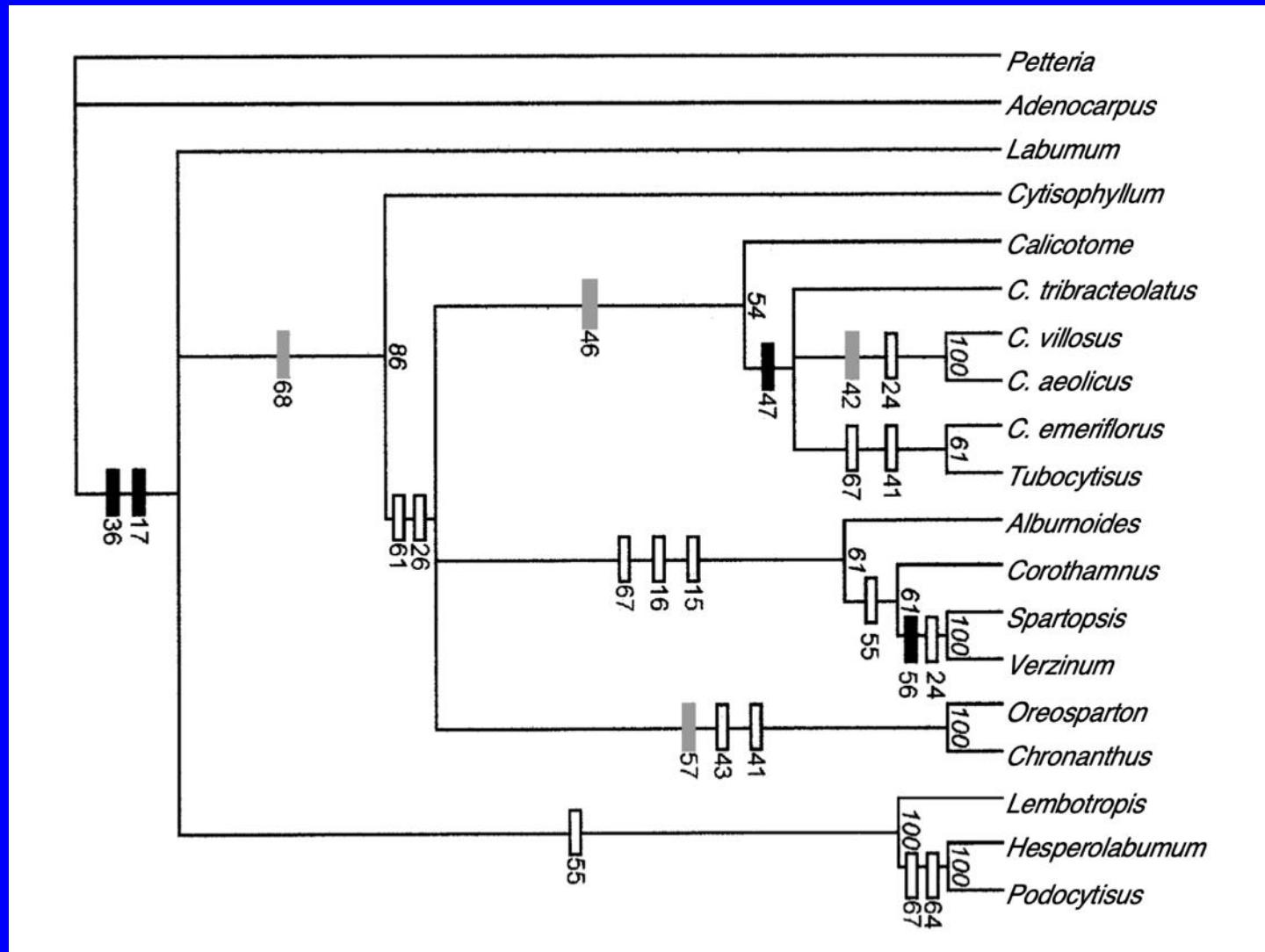


1 cm

Fabaceae_ *Styphnolobium japonicum* _AHLE00005860_JDL020990_04JUL2017_08.jpg

Laburnum

Cristofolini & Conte 2002, Phylogenetic patterns in *Cytisus*

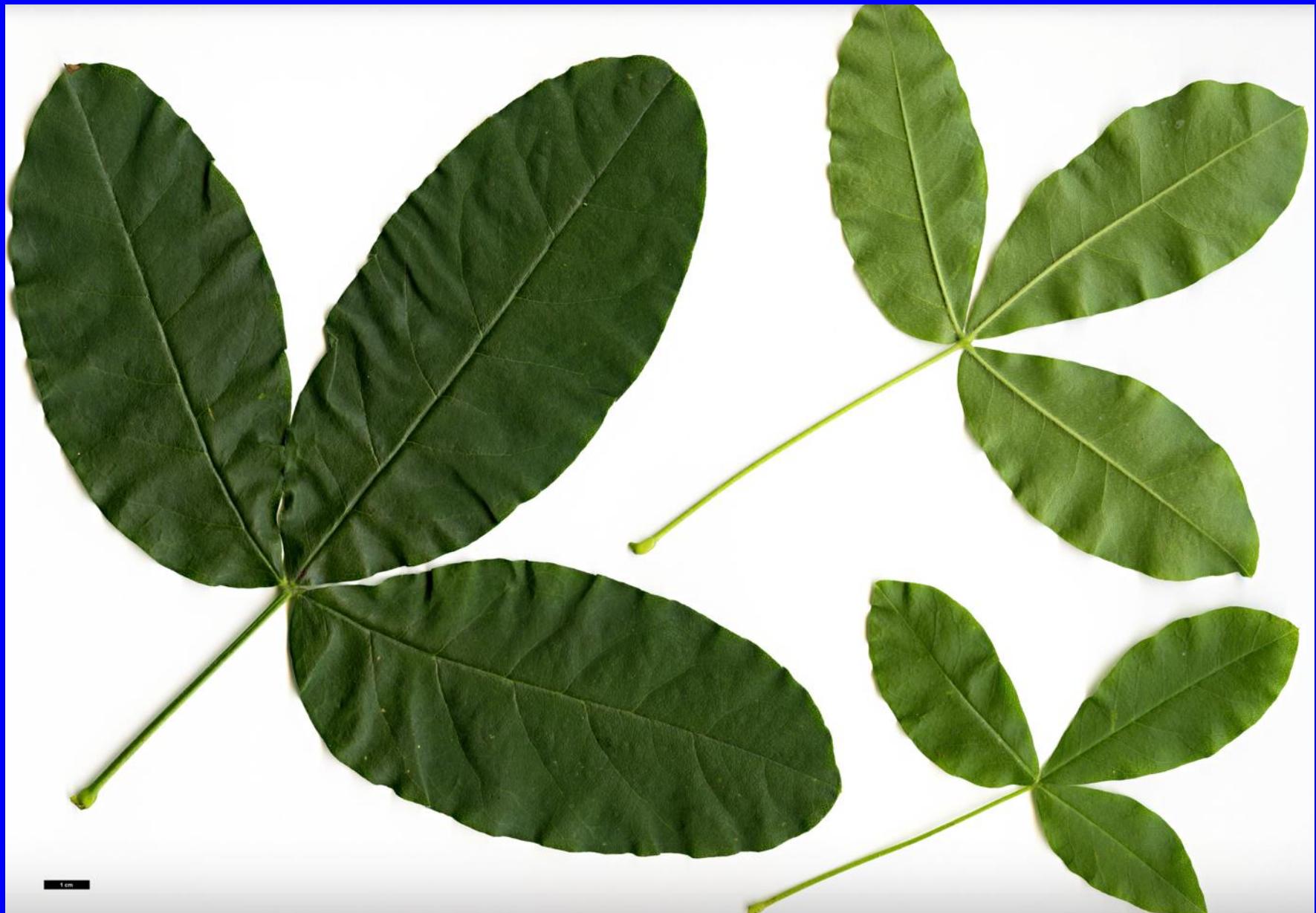


*Laburnum
alpinum*



*Laburnum
anagyroides*





Fabaceae_Laburnum_alpinum_JBFRIB20020502-La Dôle-VD-Switzerland_WLD_JDL021820_02JUL2018_10.jpg



Fabaceae_Laburnum_alpinum_JBFRI20020502-La Dôle-VD-Switzerland_WLD_JDL021820_02JUL2018_10.jpg



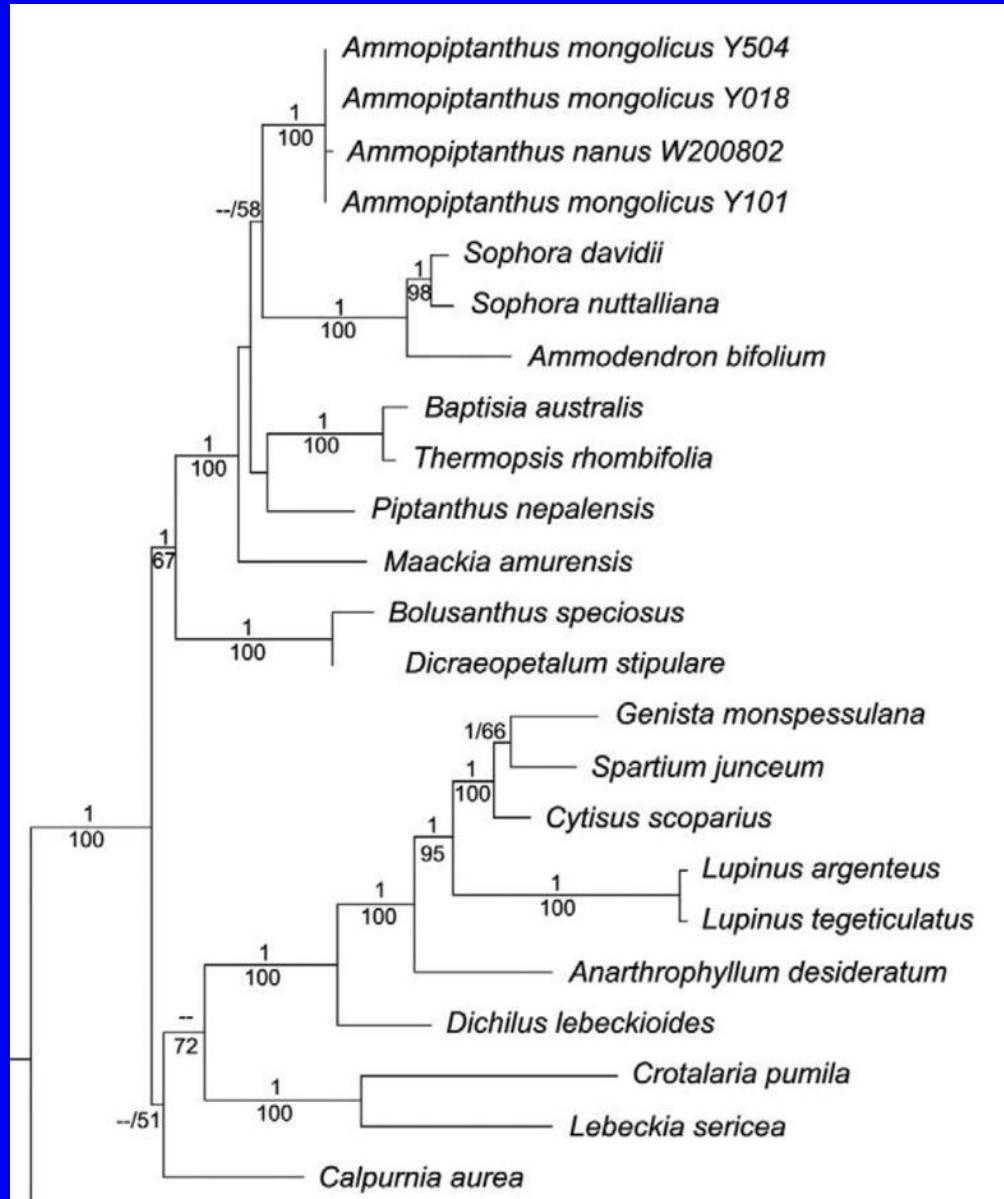
Fabaceae_Laburnum_anagyroides_HBUG19831334_WLD_JDL020897_16JUN2017_07.jpg



Fabaceae_Laburnum_anagyroides_HBUG19831334_WLD_JDL020897_16JUN2017_06.jpg

Maackia

Xie & Yang 2012, Miocene origin of the evergreen shrub *Ammopiptanthus*



*Maackia
amurensis*





Fabaceae_Maackia_amurensis_AHLE00007606_JDL021068_10JUL2017_01.jpg

*Maackia
hupehensis*



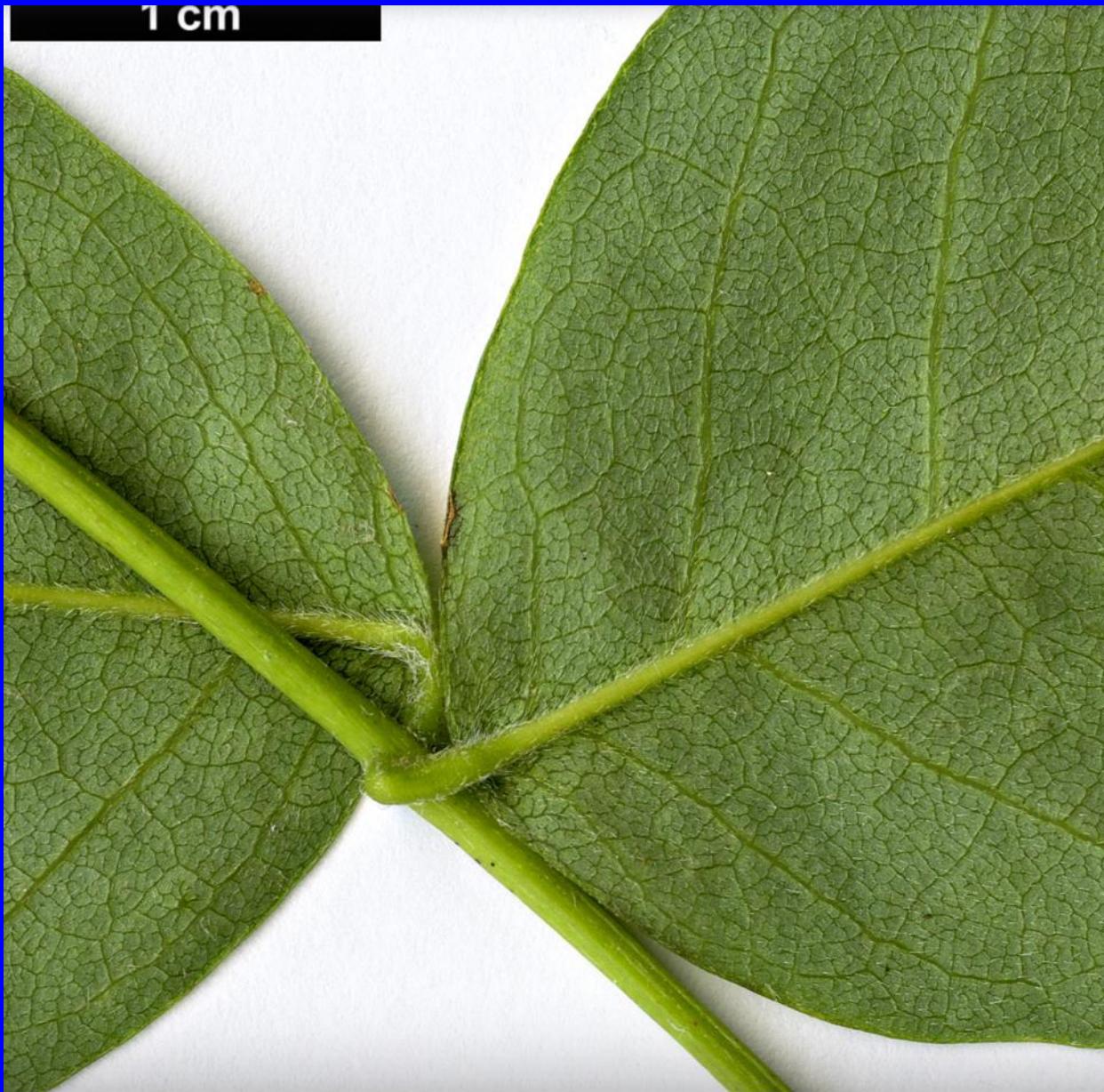
*Maackia
hupehensis*





Fabaceae_Maackia_hupehensis_TPAR3806_JDL023242_24SEP2019_01.jpg

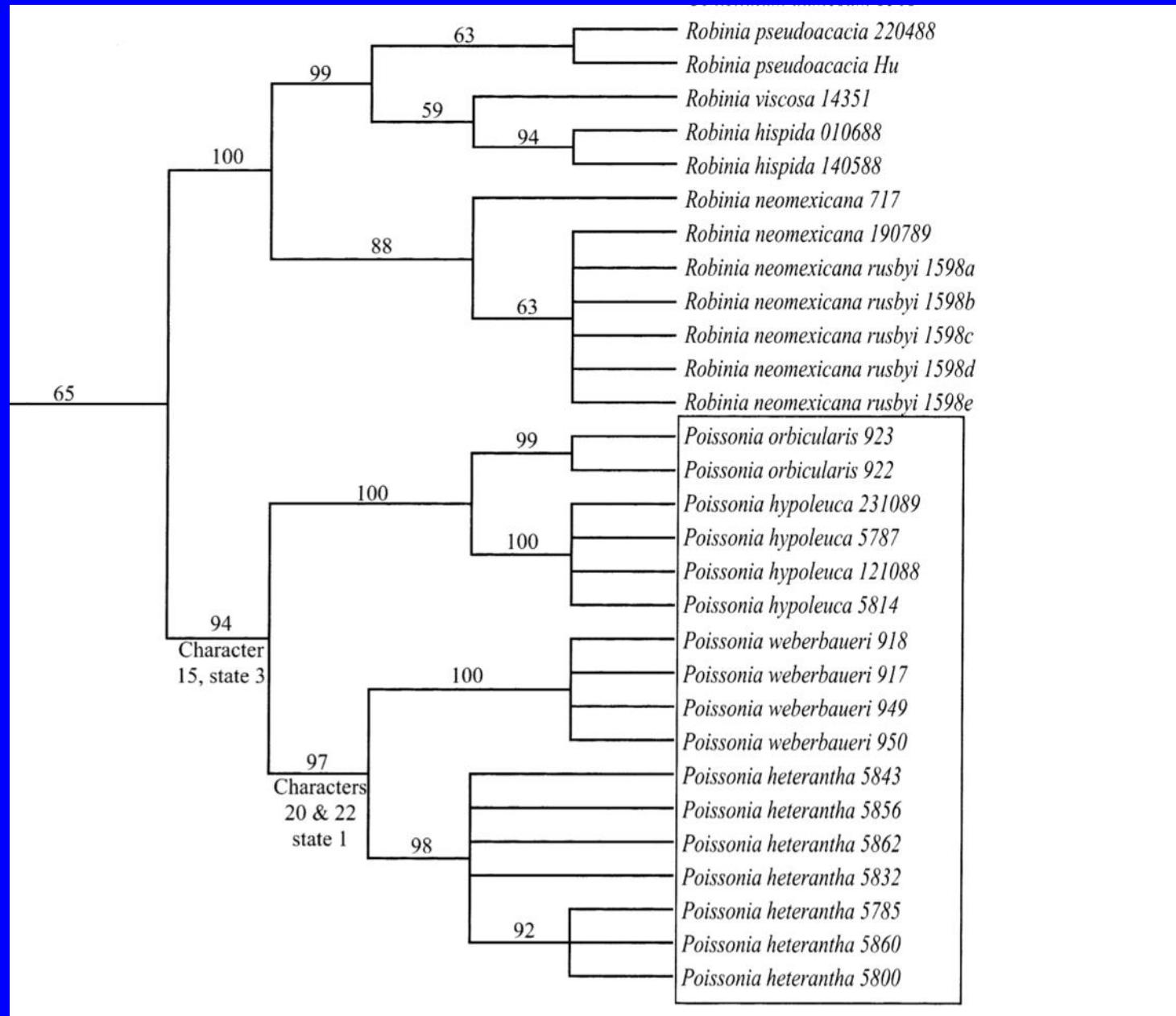
1 cm



Fabaceae_Maackia_hupehensis_TPAR3806_JDL023242_24SEP2019_03.jpg

Robinia

Lavin et al. 2003, Phylogeny of robinioid legumes revisited



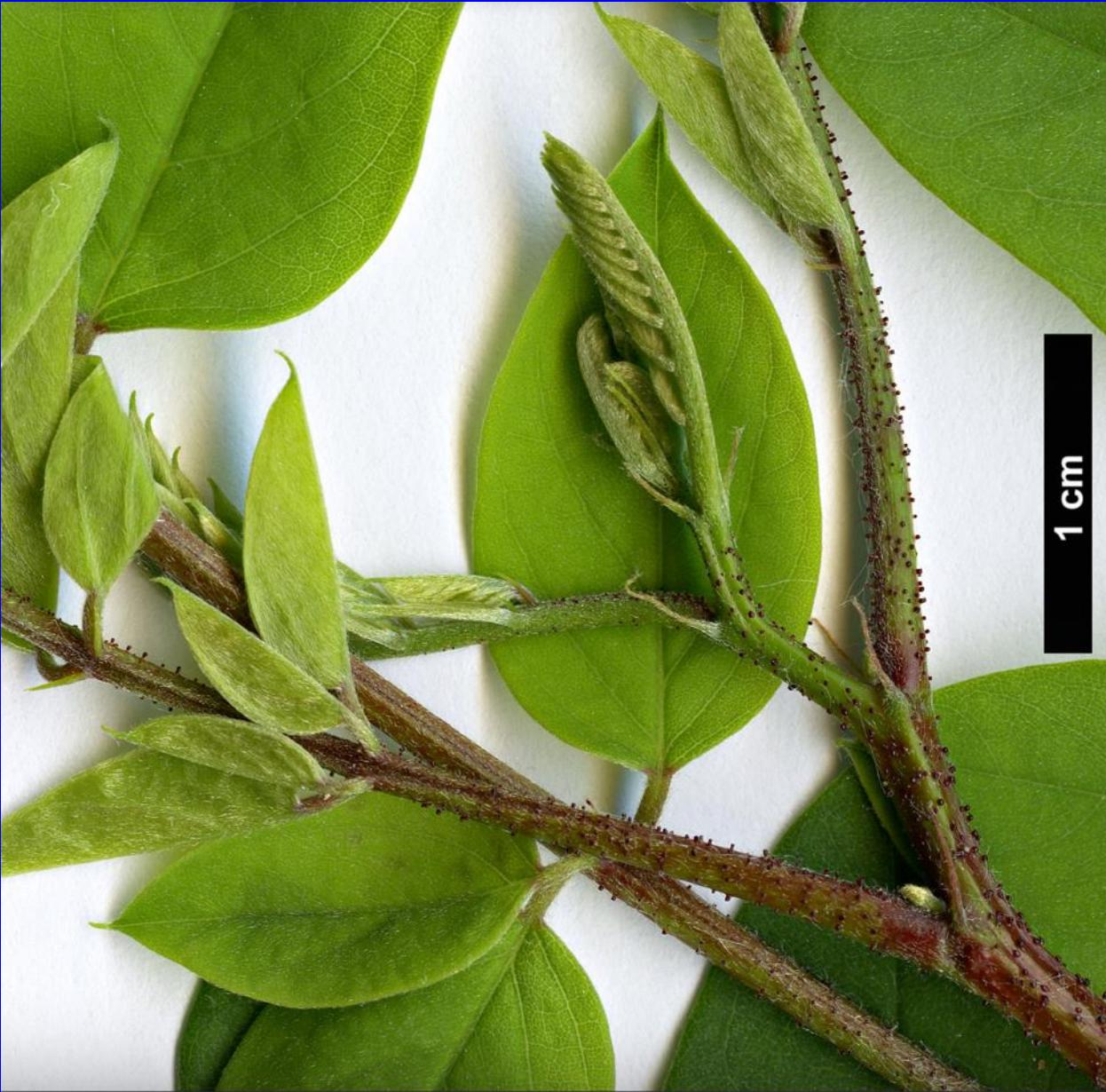


Fabaceae_Robinia_hispida_KUVANI0000_JDL021738_23JUN2018_01.jpg

1 cm



Fabaceae_Robinia_hispida_KUVANI0000_JDL021738_23JUN2018_08.jpg

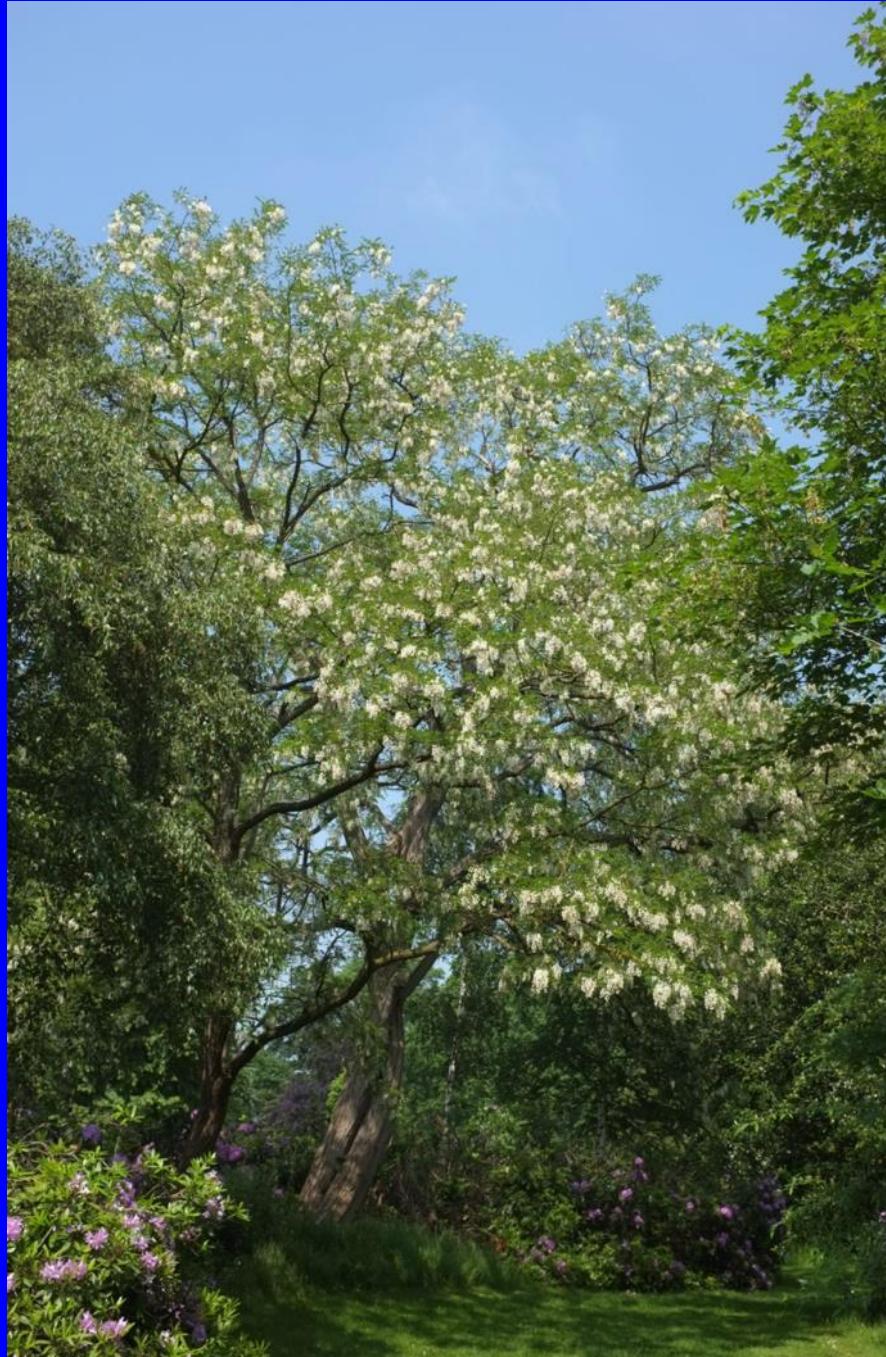


Fabaceae_Robinia_viscosa_KUVANI0000_JDL022750_08JUN2019_02.jpg



Fabaceae_Robinia_viscosa_KUVANI0000_JDL022750_08JUN2019_03.jpg

*Robinia
pseudoacacia*



*Robinia
pseudoacacia*





Fabaceae_Robinia_pseudoacacia_AHLE0000_JDL021160_11AUG2017_01.jpg



Fabaceae_Robinia_pseudoacacia_AHLE0000_JDL021160_11AUG2017_02.jpg

*Robinia
neomexicana*



Robinia neomexicana



*Robinia
neomexicana*



Summary

1. <i>Cercis</i>	Cercidoideae
2. <i>Gleditsia</i>	Caesalpinoideae
3. <i>Gymnocladus</i>	Caesalpinoideae
4. <i>Acacia</i>	Caesalpinoideae, mimosoid clade
5. <i>Albizia</i>	Caesalpinoideae, mimosoid clade
6. <i>Cladrastis</i>	Faboideae - Cladastideae
7. <i>Platysprion</i>	Faboideae - Cladastideae
8. <i>Styphnolobium</i>	Faboideae – Cladastideae
9. <i>Laburnum</i>	Faboideae – Cytiseae
10. <i>Maackia</i>	Faboideae – Sophoreae
11. <i>Robinia</i>	Faboideae - Robinieae

Thanks to...

Kenneth Bauters & Dirk De Meyere
Jan De Langhe (scans)
All of you, members of the BDB

Trees and Shrubs Online (images)

Victor Jara
Mercedes Sosa
Atahualpa Yupanqui
William Byrd