

# FABACEAE

Família chamada comumente de

# LEGUMINOSAS

# A. Engler (1909)

## ANGIOSPERMAE

### DICOTYLEDONEAE

#### ARCHICHLAMYDEAE

#### Rosales

- Rosaceae
- Leguminosae
- Cunoniaceae
- Crassulaceae
- Saxifragaceae
- Pittosporaceae
- Chrysobalanaceae
- Etc

**A. Cronquist (1968, 1983 e 1988)**

**Magnoliophyta (Angiospermae)**

**Magnoliopsida (Dicotyledoneae)**

**V. Rosidae**

**Fabales**

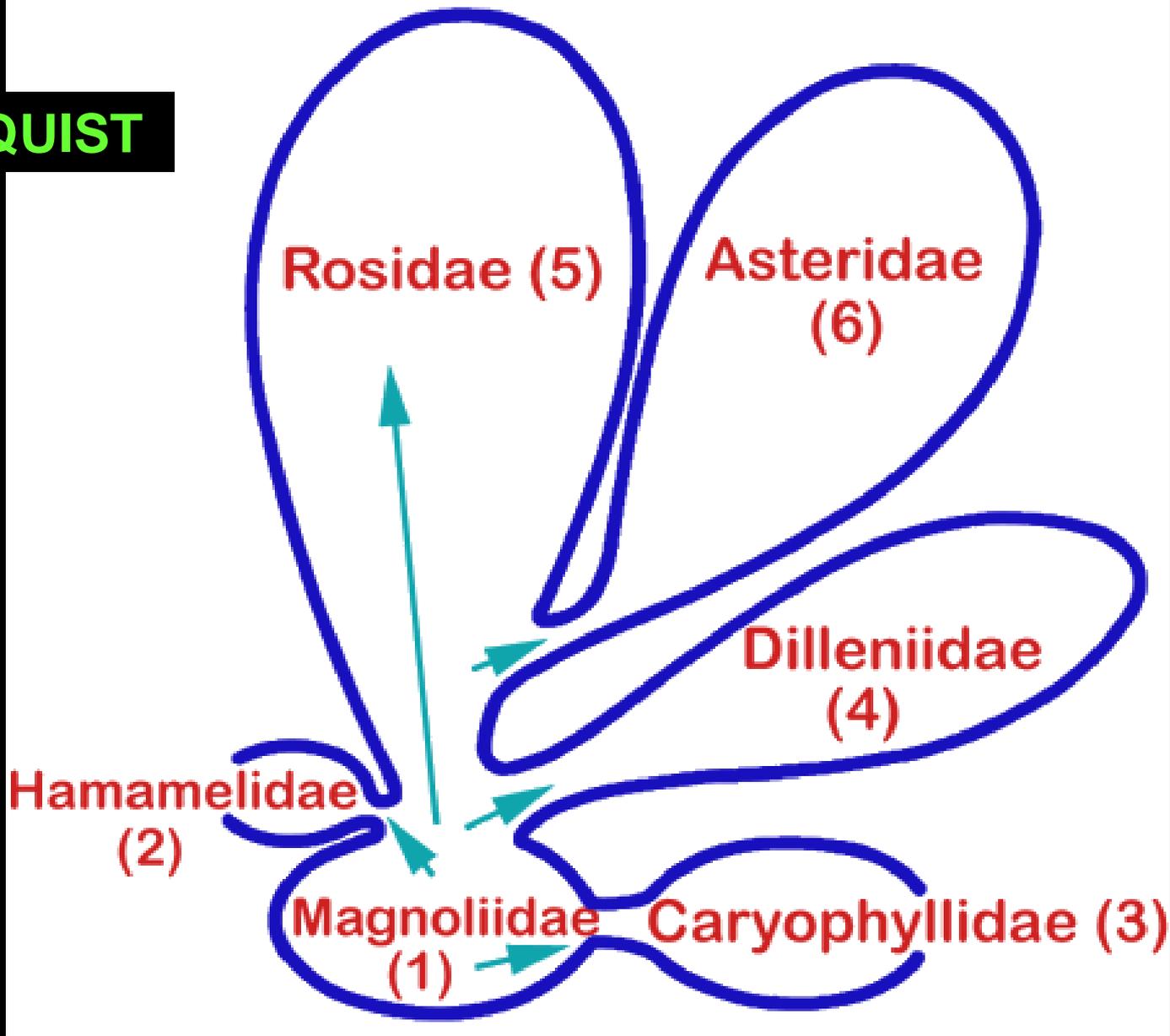
**-Mimosaceae**

**-Caesalpinaceae**

**-Fabaceae**

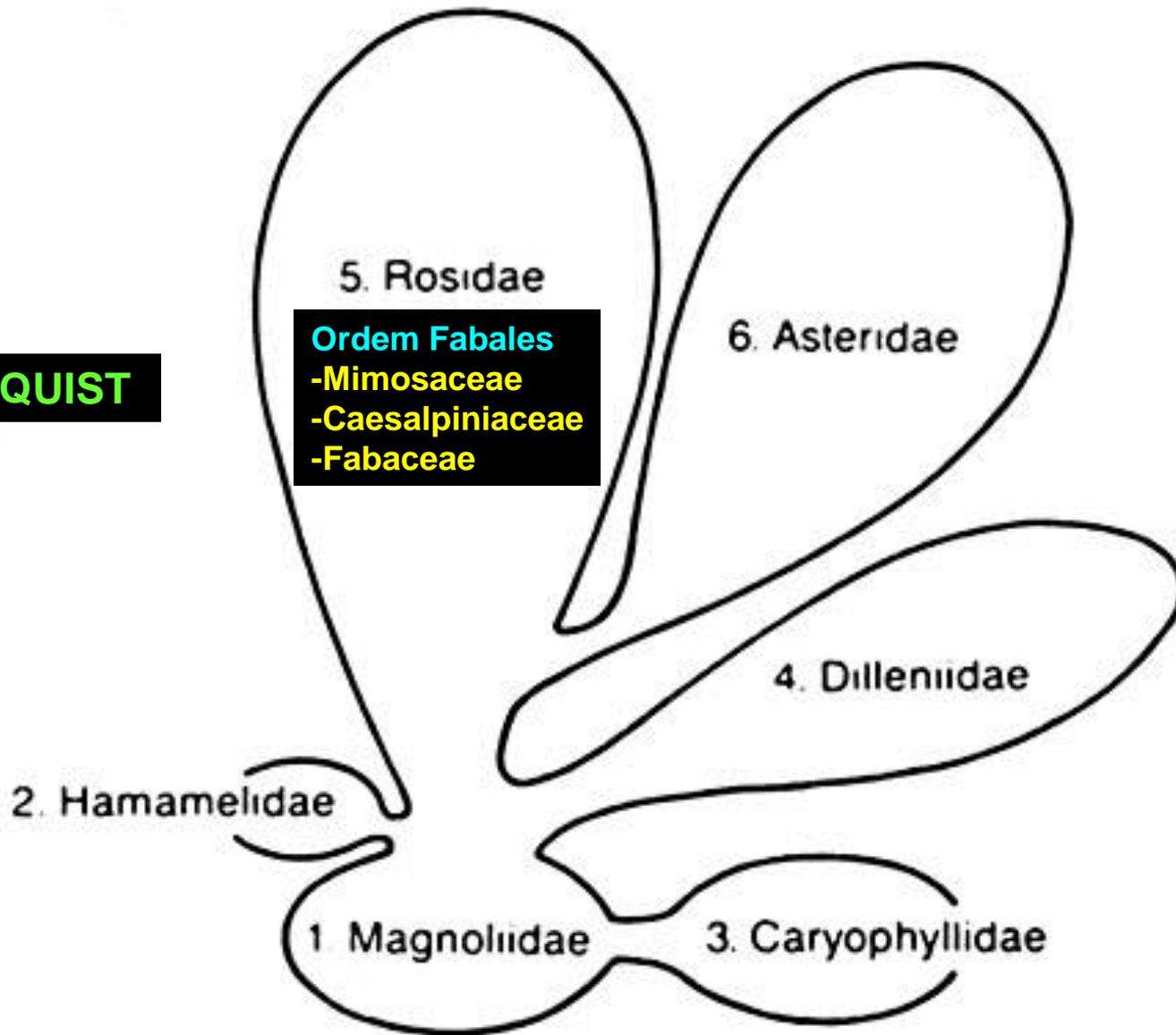
**Rosales (Demais Famílias)**

**CRONQUIST**



**MAGNOLIOPSIDA (Dicotyledoneae)**

**CRONQUIST**



**Magnoliopsida** (Dicotyledoneae)

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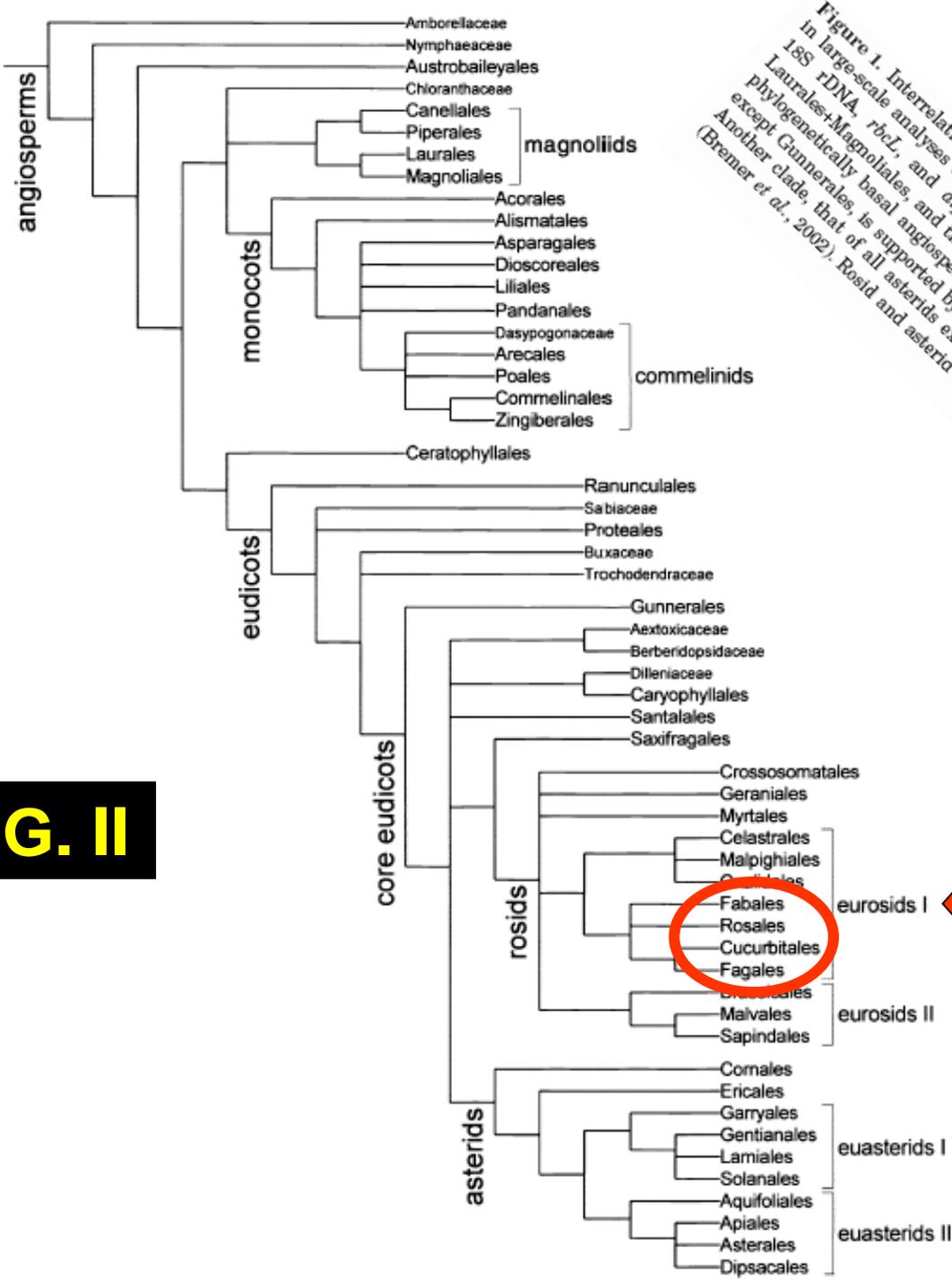
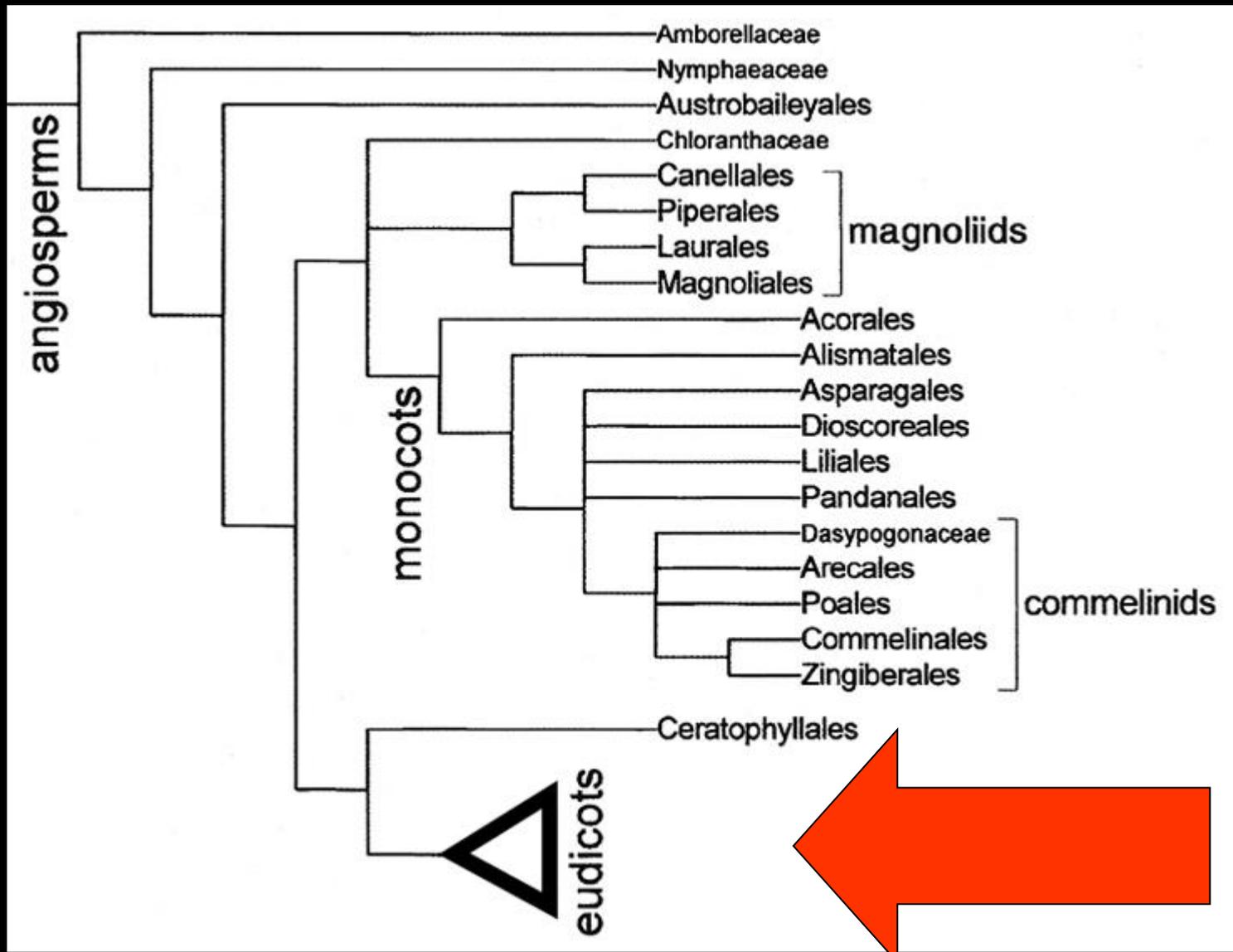


Figure 1. Interrelationships of the orders and some families supported by jackknife or bootstrap frequencies above 50% in large-scale analyses of angiosperms. All except five of the clades are supported by the Soltis *et al.* (2000) analysis of 18S rDNA, *rbcL*, and *atpB* sequences from a wide sample of angiosperms. Three clades, Canellales-Piperales, Laurales+Magnoliales, and these four orders together, are supported by analyses of several different gene sequences of phylogenetically basal angiosperms (Qiu *et al.*, 1999; Graham & Olmstead, 2000). One clade, that of all core eudicots except Gunnerales, is supported by analysis of *rbcL* sequences from a wide sample of eudicots (Savolainen *et al.*, 2000). Another clade, that of all asterids except Cornales, is supported by a six-marker analysis of a wide sample of asterids (Bremer *et al.*, 2002). Rosid and asterid families not classified to order are not shown.

# APG II



# APG II

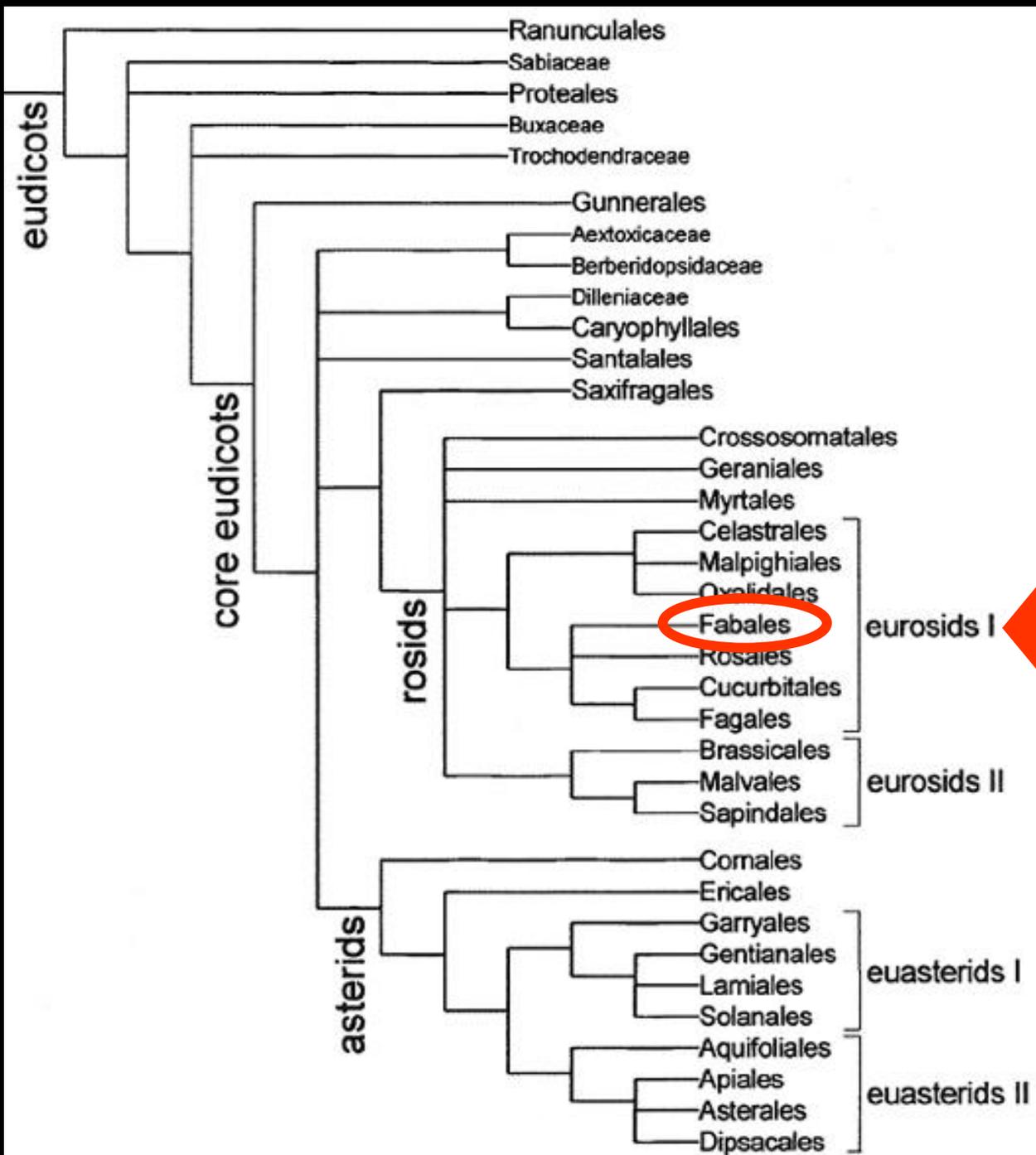
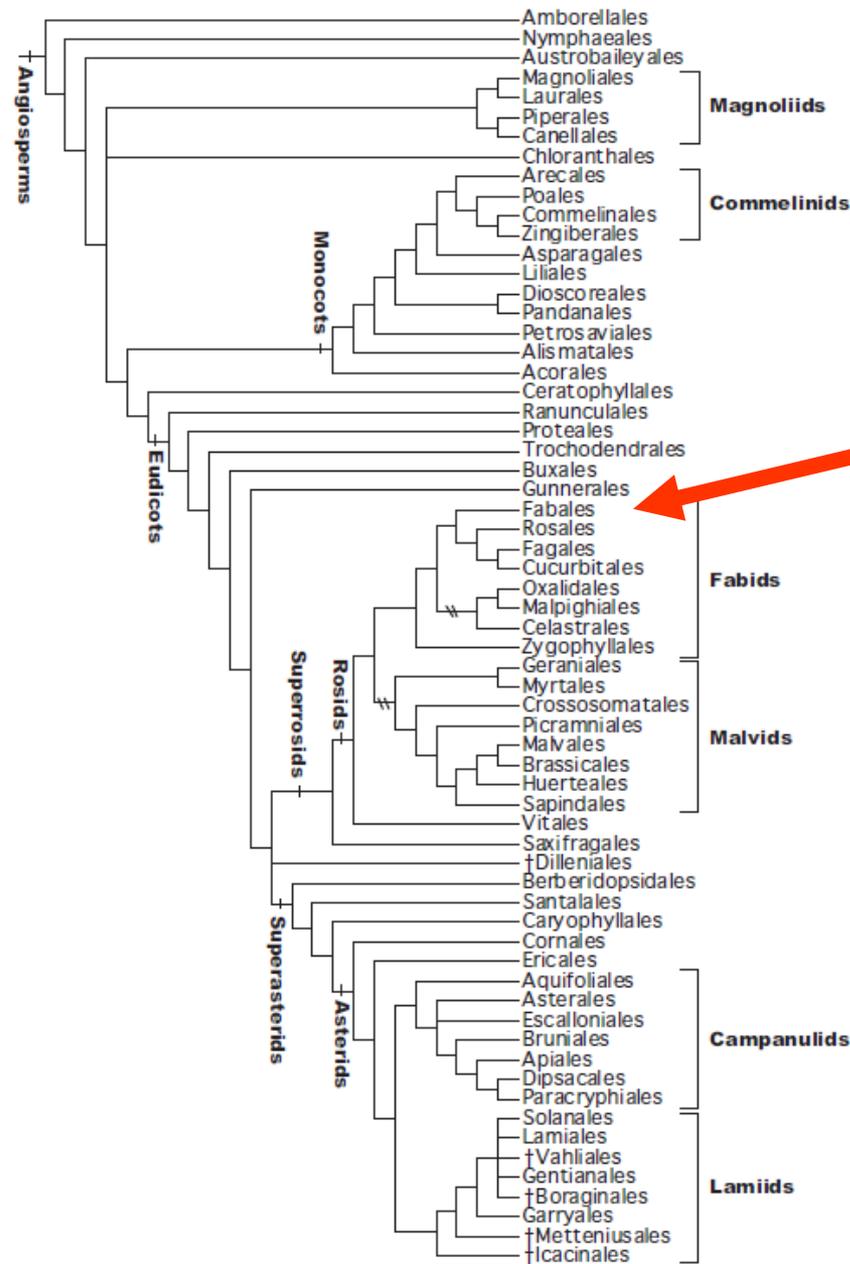


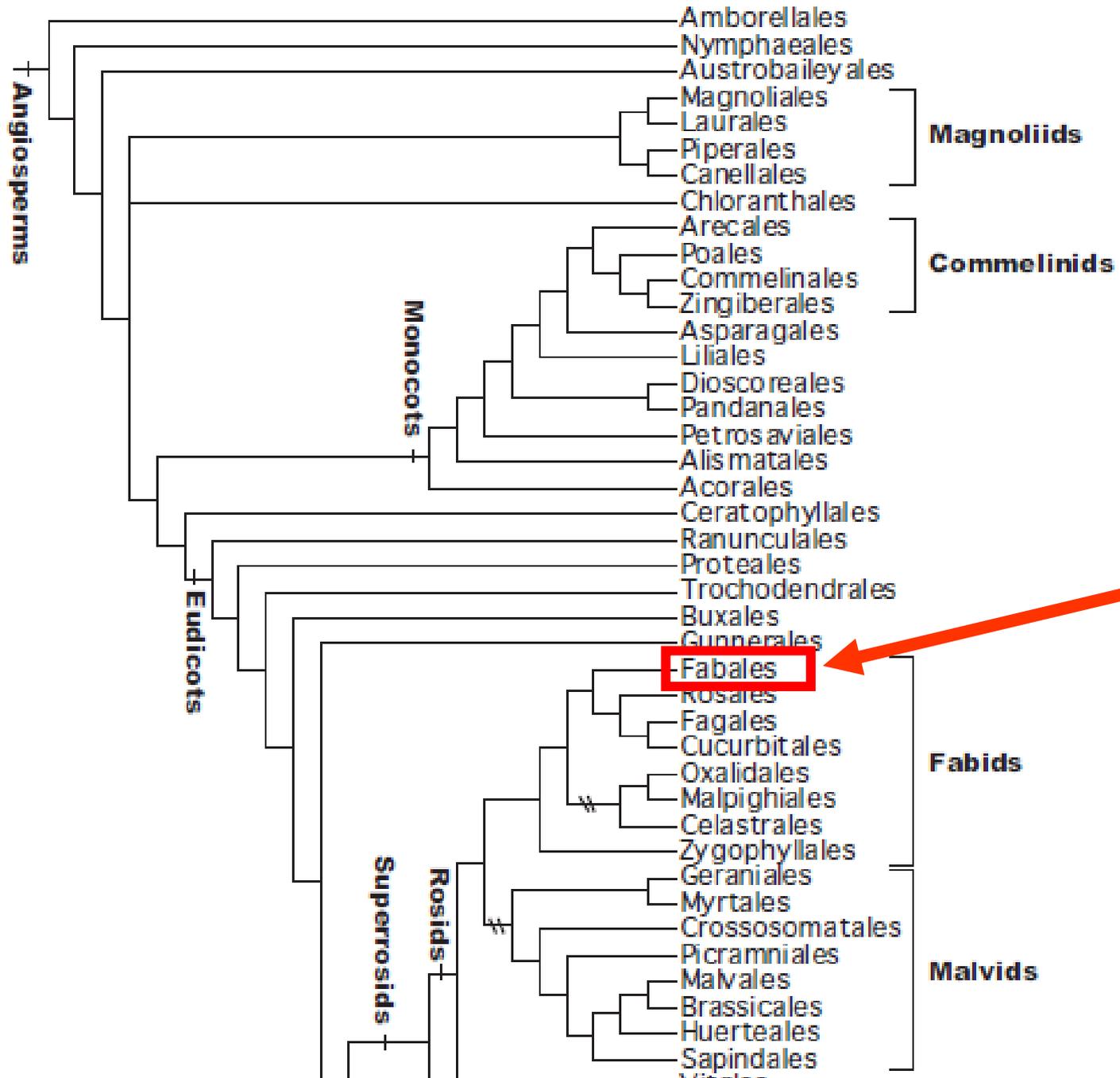


Figure 1. Interrelationships of the APG III orders and some families supported by jackknife/bootstrap

# APG IV (2016)



**Figure 1.** Interrelationships of the APG IV orders and some families supported by jackknife/bootstrap percentages >50 or Bayesian posterior probabilities >0.95 in large-scale analyses of angiosperms. See text for literature supporting these relationships. The alternative placements representing incongruence between nuclear/mitochondrial and plastid results for the Celastrales/Oxalidales/Malpighiales (COM) clade are indicated by slash marks (//). †Orders newly recognized in APG.



# APG IV (2016)

Fabales

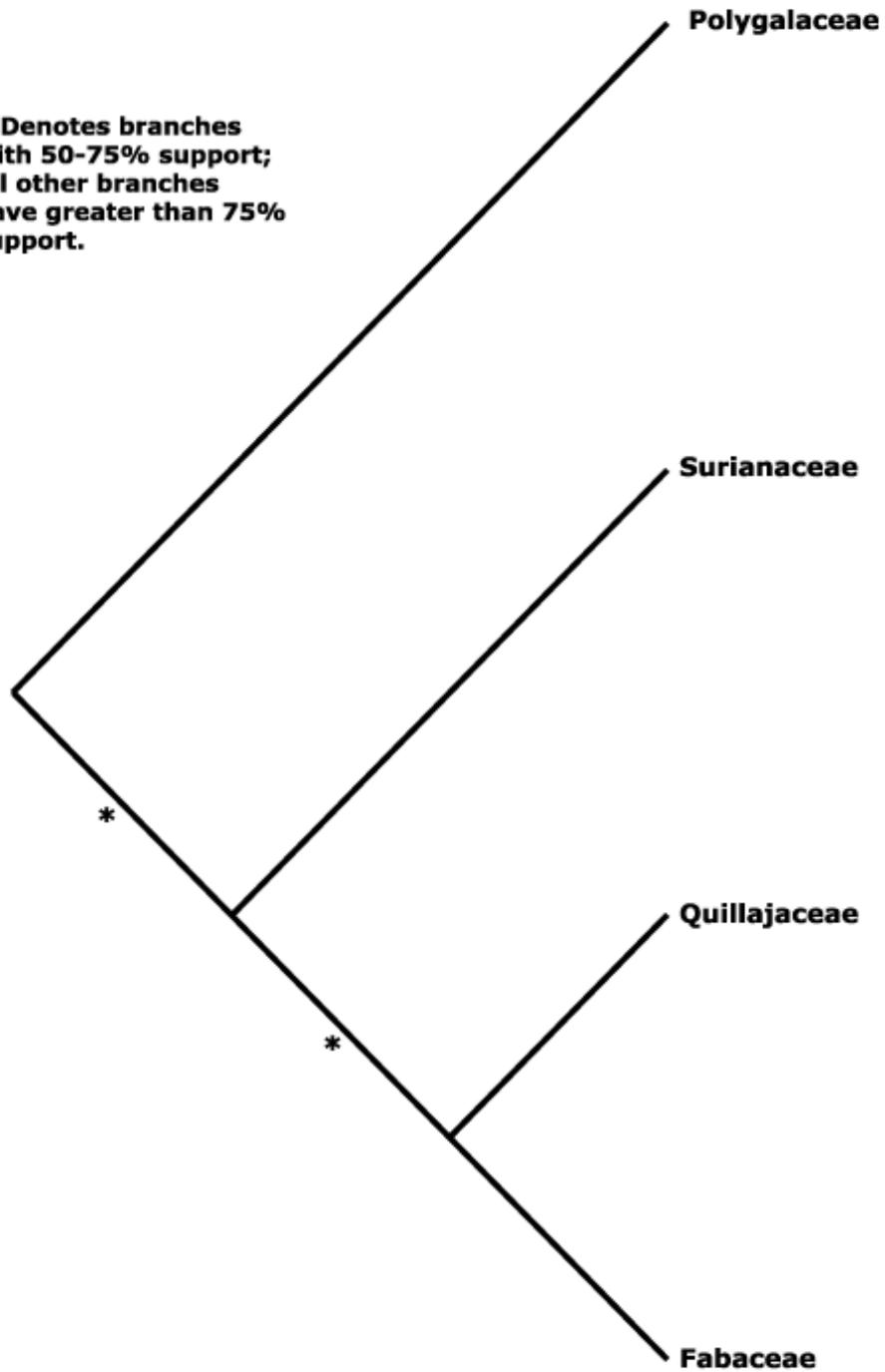
**Position de la famille dans les systèmes de classifications évolutives**

	<b>Engler</b>	<b>Cronquist</b>	<b>Thorne</b>	<b>Dahlgren</b>	<b>Takhtajan</b>	<b>APG II,III e IV</b>
<b>Super-classe</b> ?						<b>Tricolpées (Eudicots)</b>
<b>Classe</b>	<b>Dicotyledonae</b>	<b>Magnoliopsida</b>	<b>Magnoliopsida</b>	<b>Magnoliopsida</b>	<b>Magnoliopsida</b>	<b>Tricolpées évoluées</b>
<b>Sub-Classe</b>	<b>Archichlamydeae</b>	<b>Rosidae</b>	<b>Magnoliidae</b>	<b>Magnoliidae</b>	<b>Rosidae</b>	<b>Rosidae</b>
<b>Super-ordre</b>			<b>Rutanae</b>	<b>Rutanae</b>	<b>Fabanae</b>	<b>Eurosidae I</b>
<b>Ordem</b>	<b>Rosales</b>	<b>Fabales</b>	<b>Rutales</b>	<b>Fabales</b>	<b>Fabales</b>	<b>Fabales</b>
<b>Família</b>	<b>Leguminosae</b>	<b>Caesalpiniaceae, Mimosaceae e Fabaceae</b>	<b>Fabaceae</b>	<b>Fabaceae</b>	<b>Fabaceae</b>	<b>Fabaceae</b>
<b>Sub-família</b>	<b>-Mimosoideae -Caesalpinioideae -Faboideae ou Papilionoideae</b>					<b>-Cercideae -"Caesalpinioideae" -Mimosoideae -Faboideae (Papilionoideae)</b>

# ORDEM FABALES

- Fabaceae
- Polygalaceae
- Quillajaceae
- Surianaceae

**\* Denotes branches  
with 50-75% support;  
All other branches  
have greater than 75%  
support.**



# Polygalaceae (Cosmopolita–20 gêneros (7 nativos) e 1000spp)



*Diclidanthera pendulina*

# Polygalaceae (Cosmopolita–20 gêneros (7 nativos) e 1000spp)



*Polygala violacea*

*Photo by Matthew Merritt*

# Surianaceae



***Suriana maritima* – sp nativa – região litorânea**



Quillaja saponaria MOLINA  
©Thomas Schoepke  
www.plant-pictures.com

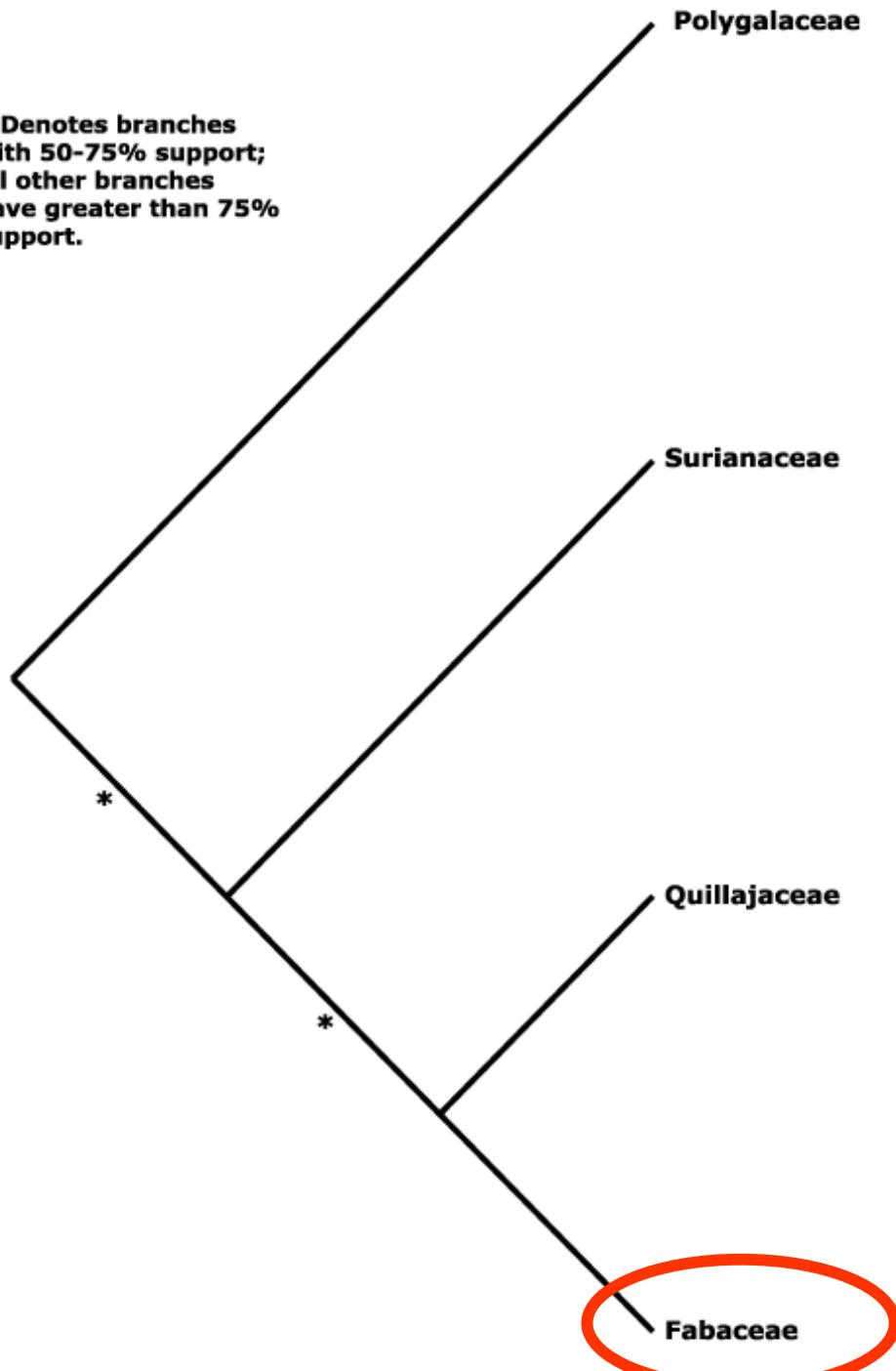
Quillaja saponaria MOLINA  
©Thomas Schoepke  
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# Quillajaceae

*Quillaja brasiliensis*  
região temperada do sul do Brasil

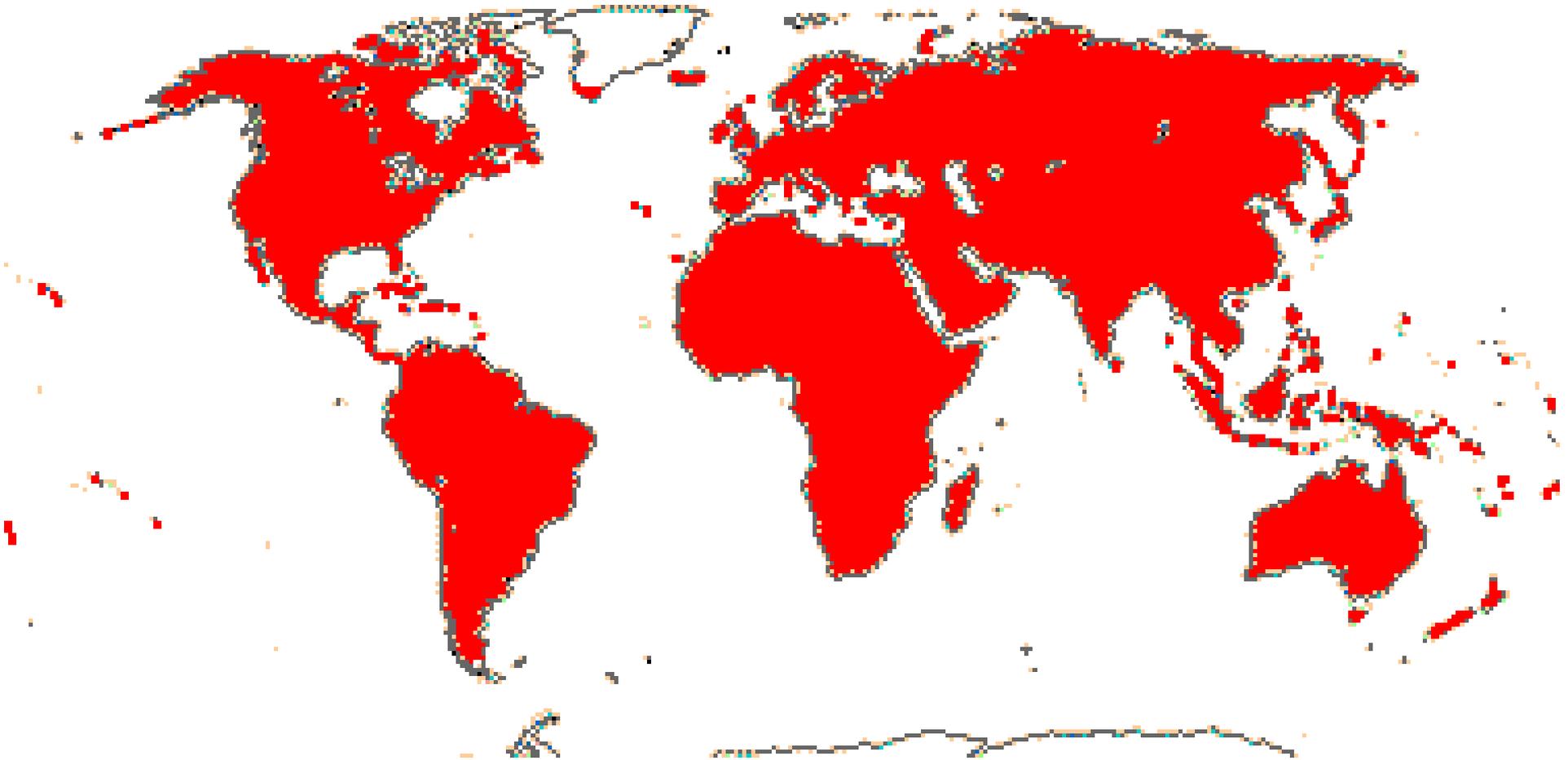


**\* Denotes branches  
with 50-75% support;  
All other branches  
have greater than 75%  
support.**



# Fabales: FABACEAE

- 650 gêneros, 19.000 espécies
- Distribuição cosmopolita



# Fabaceae

Sub Famílias ou Clados:

**1. Cercideae**

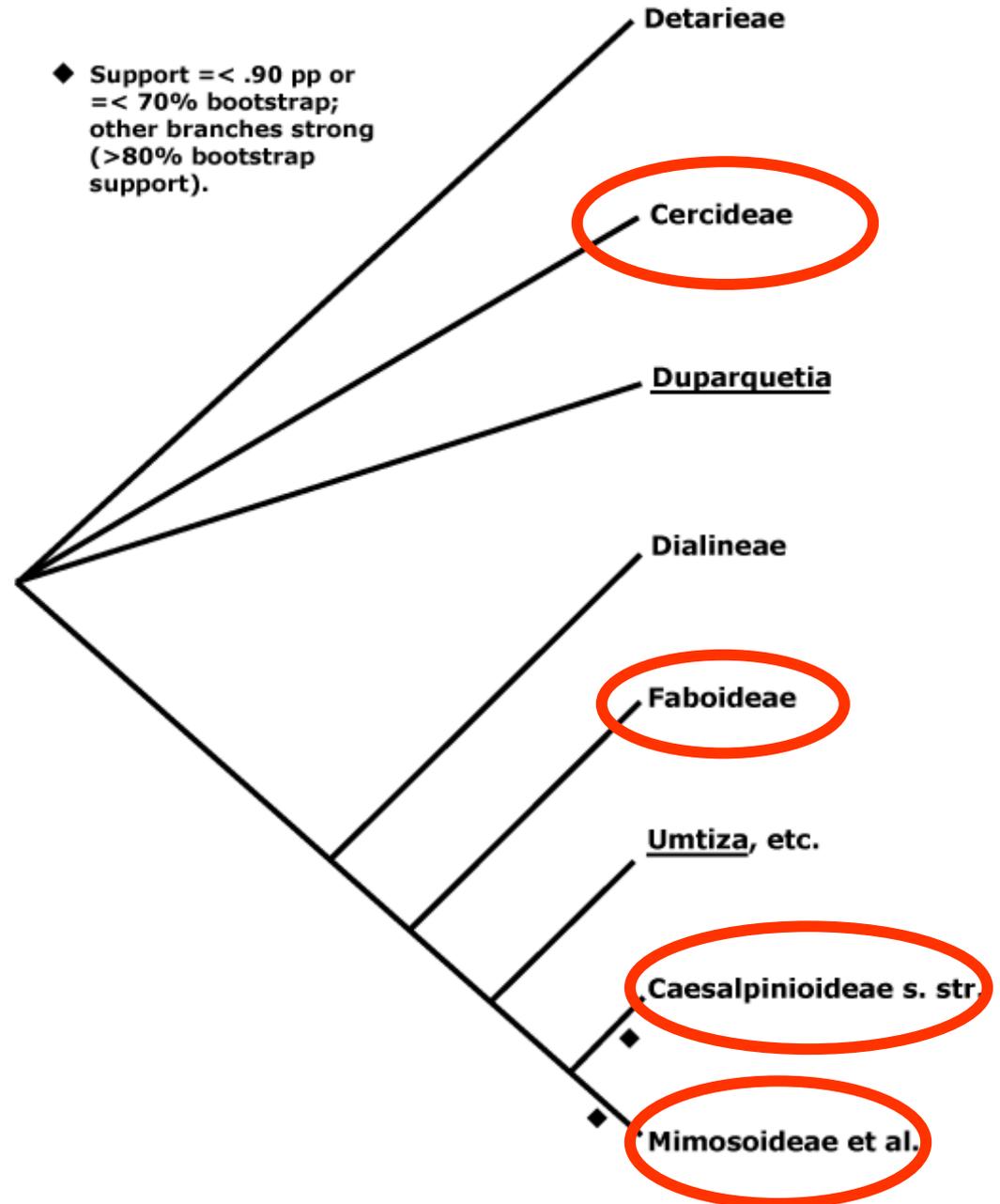
**2. "Caesalpinioideae"**

**3. Mimosoideae**

**4. Faboideae (Papilionoideae)**

# Fabaceae

## Sub Famílias ou Clados:



# Fabaceae (Leguminosae)

-Aproximadamente **650 gêneros** (200 Brasil) e **18.000 espécies** (1500 spp Brasil)

-Árvores, arbustos, lianas (trepadeiras) e ervas

-Folhas **alternas**, raro opostas, freqüentemente **compostas, com estípulas, com pulvino**

-Flor **monóclina** (bissexuadas), **actinomorfa ou zigomorfas, diclamídeas**, raro mono, perianto com pré-floração **valvar ou imbricado**, geralmente 5 - **pentâmera**

-Cálice **dialissépalo ou gamossépalo**, Corola **dialipétala ou gamopétala**, com **Pétalas** semelhantes ou distintas entre si

-O androceu geralmente **diplostêmone ou numerosos** e nesse caso **vistosos**, raro igual ou menor. Estames **livres ou unidos**. Anteras rimosas ou poricidas.

-O gineceu de **ovário súpero, unicarpelar**, raro mais (dialicarpelar), com **1 - muitos** óvulos no carpelo, placentação marginal. Disco nectarífero **presente**.

-**Fruto variado**, mas geralmente **Legume** (fruto seco deiscente, se abrindo pela região da sutura e da nervura principal das folha carpelar, mas também **Drupa** (carnoso, com endocarpo lenhoso), **Sâmara** (seco, indeiscente com asa), **Folículo** (=legume mas se abre apenas na sutura), **Lomento** (secção transversal do fruto, cada unidade com uma semente) e **Craspédio** (= lomento, mas deixando uma armação presa na planta)







*Platymiscium stipulare*  
Fabaceae  
©G. D. Carr



*Albizia julibrissin*



*Bauhinia* sp. – “pata-de-vaca”



*Caesalpinia pulcherrima*  
-barba de barata



*Clitoria ternatea*



*Leucaena leucocephala*  
-leucena





*Adenanathera pavonina*  
Fabaceae - Mimosoideae  
© G. D. Carr

**FRUTO LEGUME**

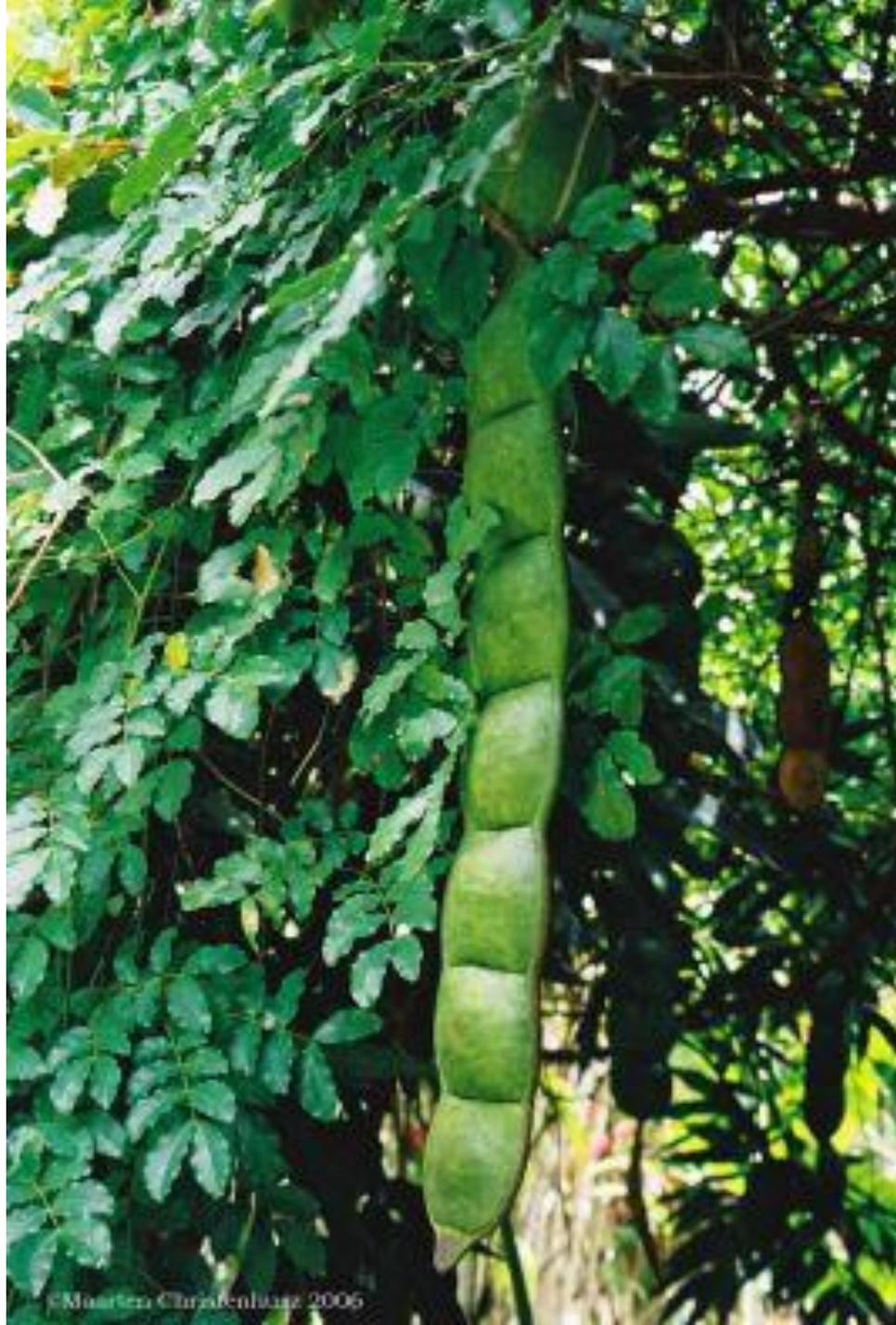


**FRUTO FOLÍCULO**

# FRUTO CRASPÉDIO



## Fruto Craspédio



**Convergência em Função: dispersão pelo vento  
– fruto Sâmara de *Tipuana tipu* e demais Sementes**



*Tipuana tipu*  
Fabaceae  
(winged fruit)



*Swietenia mahagoni*  
Meliaceae  
(winged seed)



*Acer* sp.  
Sapindaceae  
(Aceraceae)  
(winged mericarp)



*Serjania exarata*  
Sapindaceae  
(winged mericarp)

# Sub Família ou Clados

## 1. Cercideae

### Características da sub-família Cercideae

- folhas compostas, com dois folíolos geralmente fundidos, total ou parcialmente
- flores zigomorfas, diclamídeas, corola com pré-floração imbricada ascendente ou carenal, dialipétalas
- estames iso ou diplostêmones, geralmente livres e não vistosos
- demais características = Família Fabaceae



***Bauhinia herrarae***



*Bauhinia variegata*

Pré-floração e diagrama - Quadro

*Bauhinia variegata*  
Fabaceae  
© G. D. Carr





***Bauhinia forficata*** – sp nativas, estípulas transformadas em espinhos

*Cercis occidentalis*  
Fabaceae  
(Caesalpinioideae)  
© G. D. Carr



*Cercis canadensis* – sp exótica



# Sub Família

## 2. “Caesalpinioideae”

Características da sub-família “Caesalpinioideae”

- folhas compostas, bipinadas ou pinadas e nesse caso paripinadas
- flores zigomorfas, diclamídeas, corola com pré-floração imbricada ascendente ou carenal, dialipétalas
- estames diplostêmones, geralmente livres e não vistosos
- demais características = Família Fabaceae
- “aspas”- por ser um grupo destacadamente não monofilético, o que justificaria estar numa família separada.

*Caesalpinia pulcherrima*  
Fabaceae - Caesalpinioideae  
© G. D. Carr





*Cassia fistula*  
Fabaceae  
(Caesalpinioideae)  
Gordon Daida



*Delonix regia- flamboyant*

*Tamarindus indica*  
Fabaceae  
© G. D. Carr





*Hymenaea courbaril-jatobá*

*Chamaecrista nictitans*



*Hymenaea courbaril* – “jatobá”



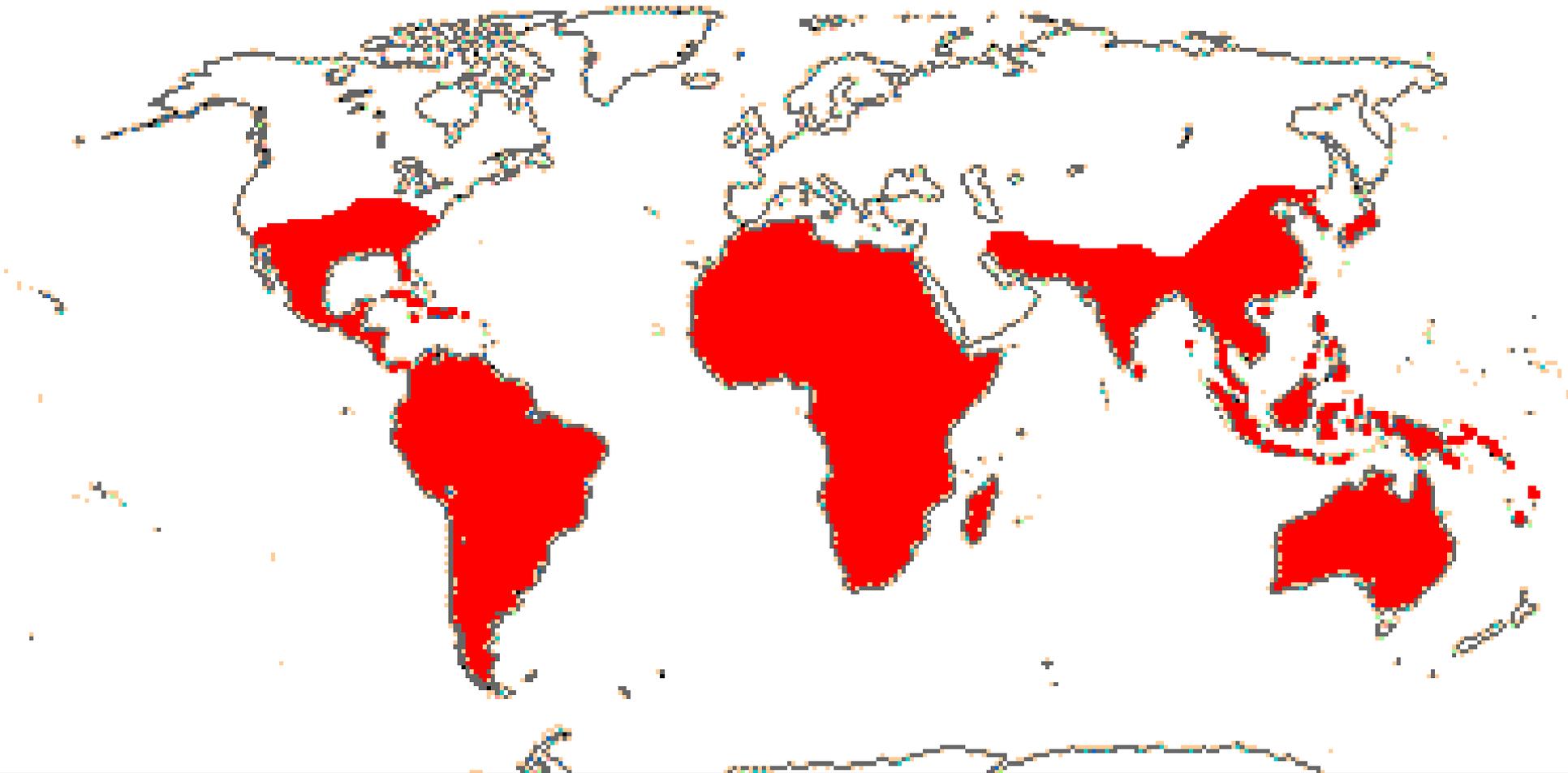
*Caesalpinia echinata* - "pau-brasil"

# Sub Família

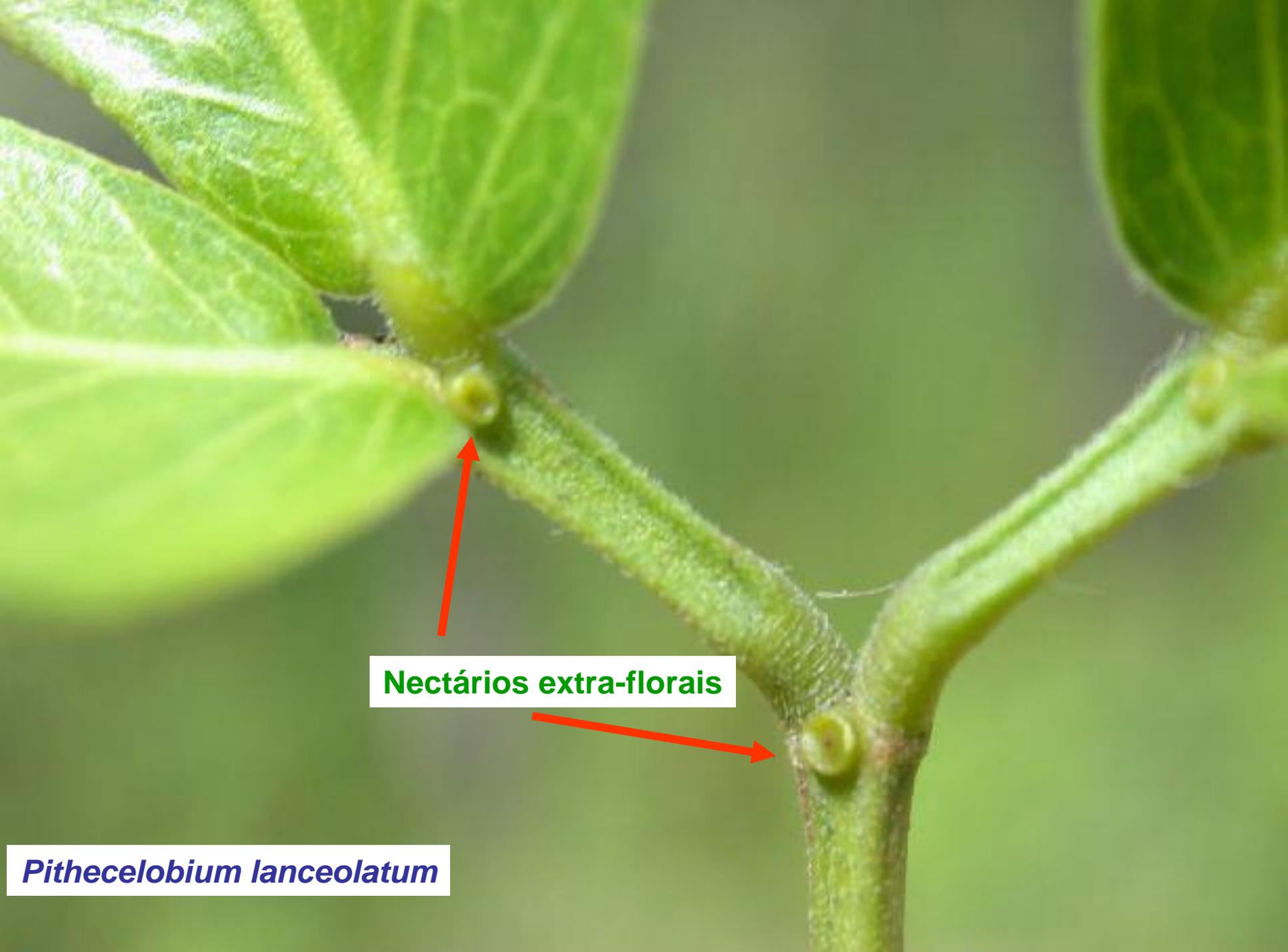
## 3. Mimosoideae

### Características da sub-família Mimosoideae

- folhas compostas, bipinadas, raro pinadas (Inga), geralmente com nectários extra-florais
- flores actinomorfas, diclamídeas, corola com pré-floração valvar, freqüentemente gamopétalas, às vezes dialipétalas
- estames polistêmones, às vezes diplostêmones ou isostêmones, livres ou comumente unidos pelo filete, geralmente vistosos (atração dos polinizadores)
- demais características = Família Fabaceae



**Fabaceae Sub-família Mimosoideae**



**Nectários extra-florais**

***Pithecelobium lanceolatum***

*Inga* sp.







*Albizia lebeck*  
Fabaceae (Mimosoideae)

© G. D. Carr



*Mimosa pudica*  
Fabaceae-Mimosoideae  
© G. D. Carr

*Leucaena leucocephala*  
Fabaceae - Mimosoideae  
© G. D. Carr

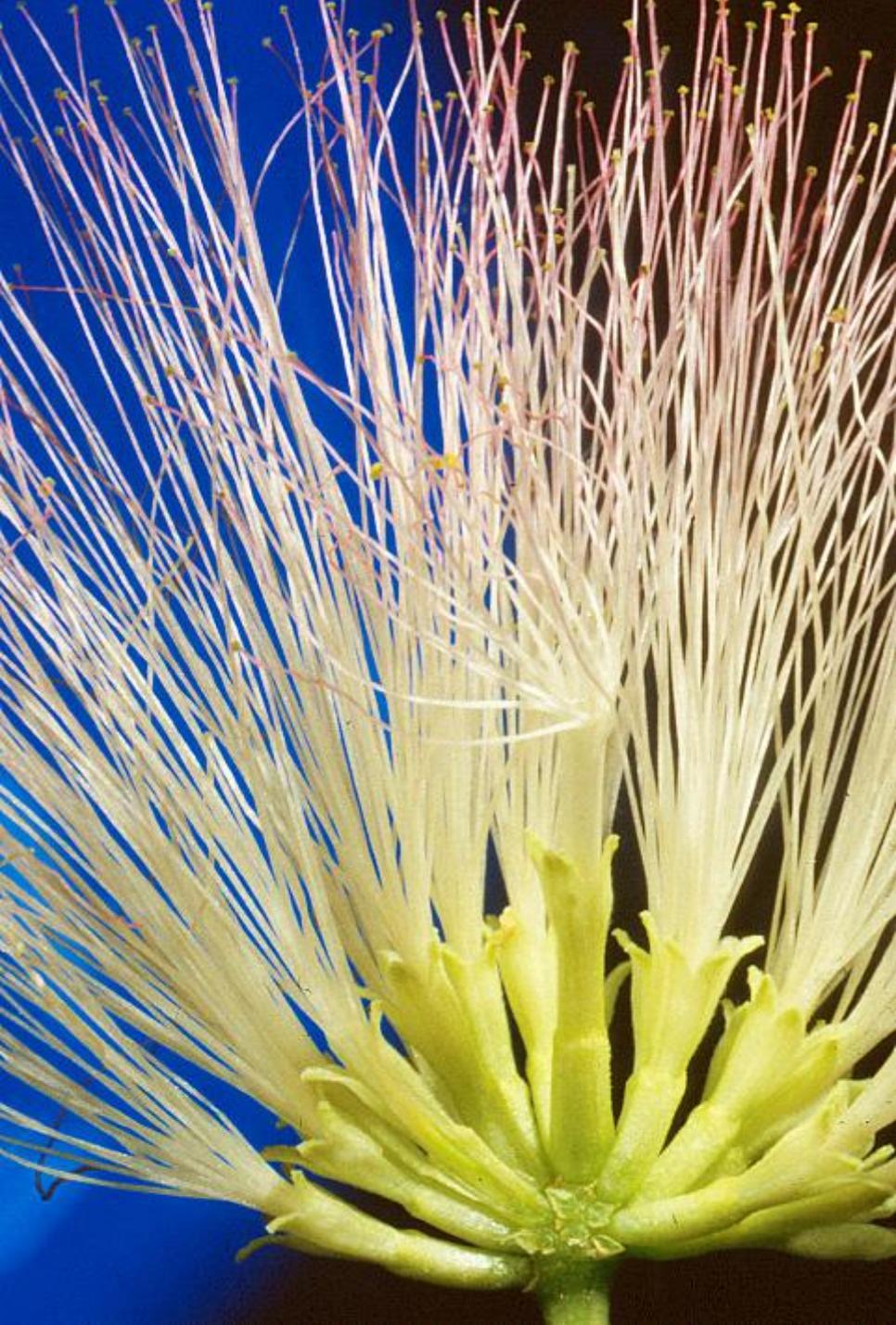


*Samanea saman*  
Fabaceae  
© G. D. Carr

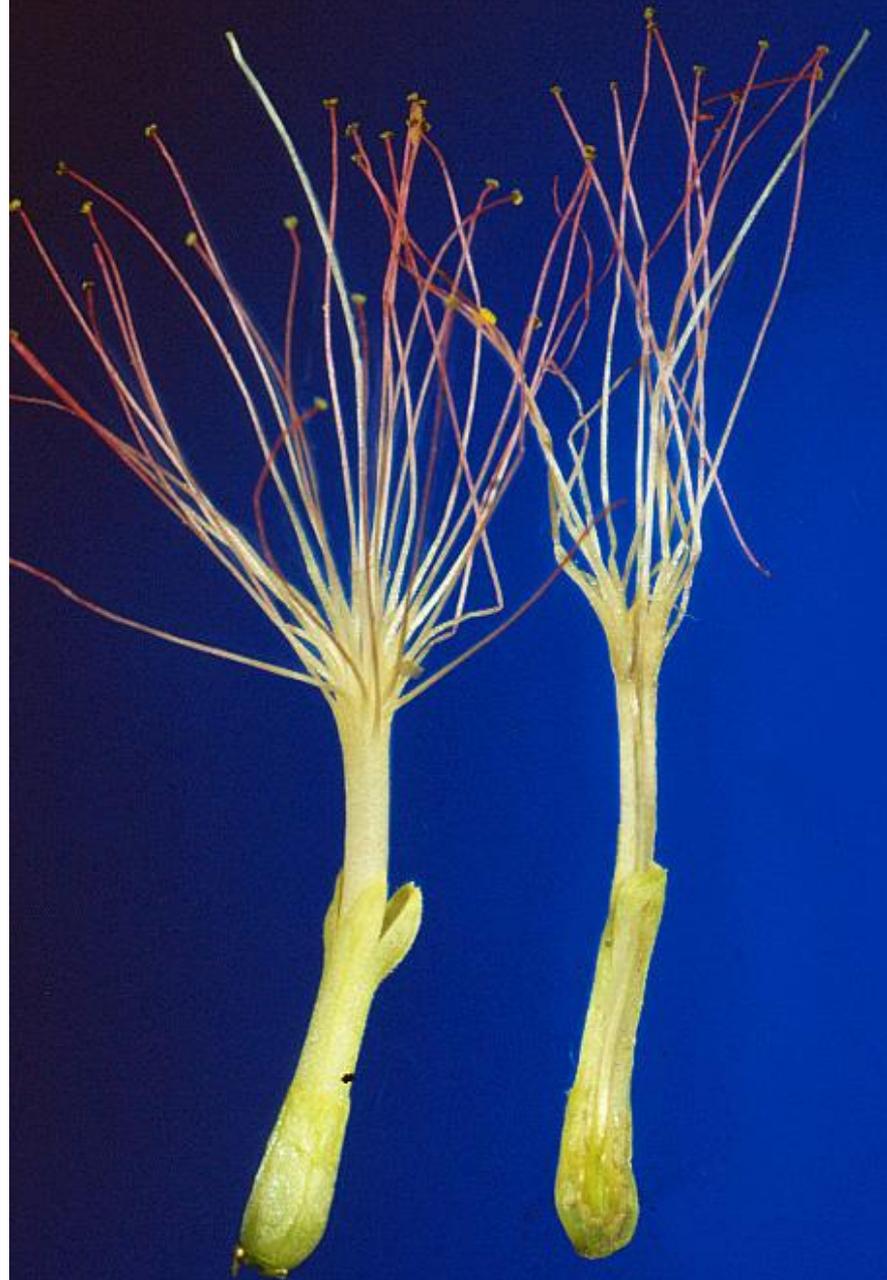




*Samanea saman*  
Fabaceae  
© G. D. Carr



*Albizia julibrissin*



*Calliandra calothyrsus*

Mimosaceae

© G. D. Carr





*Leucaena leucocephala*

Mimosaceae

© G. D. Carr



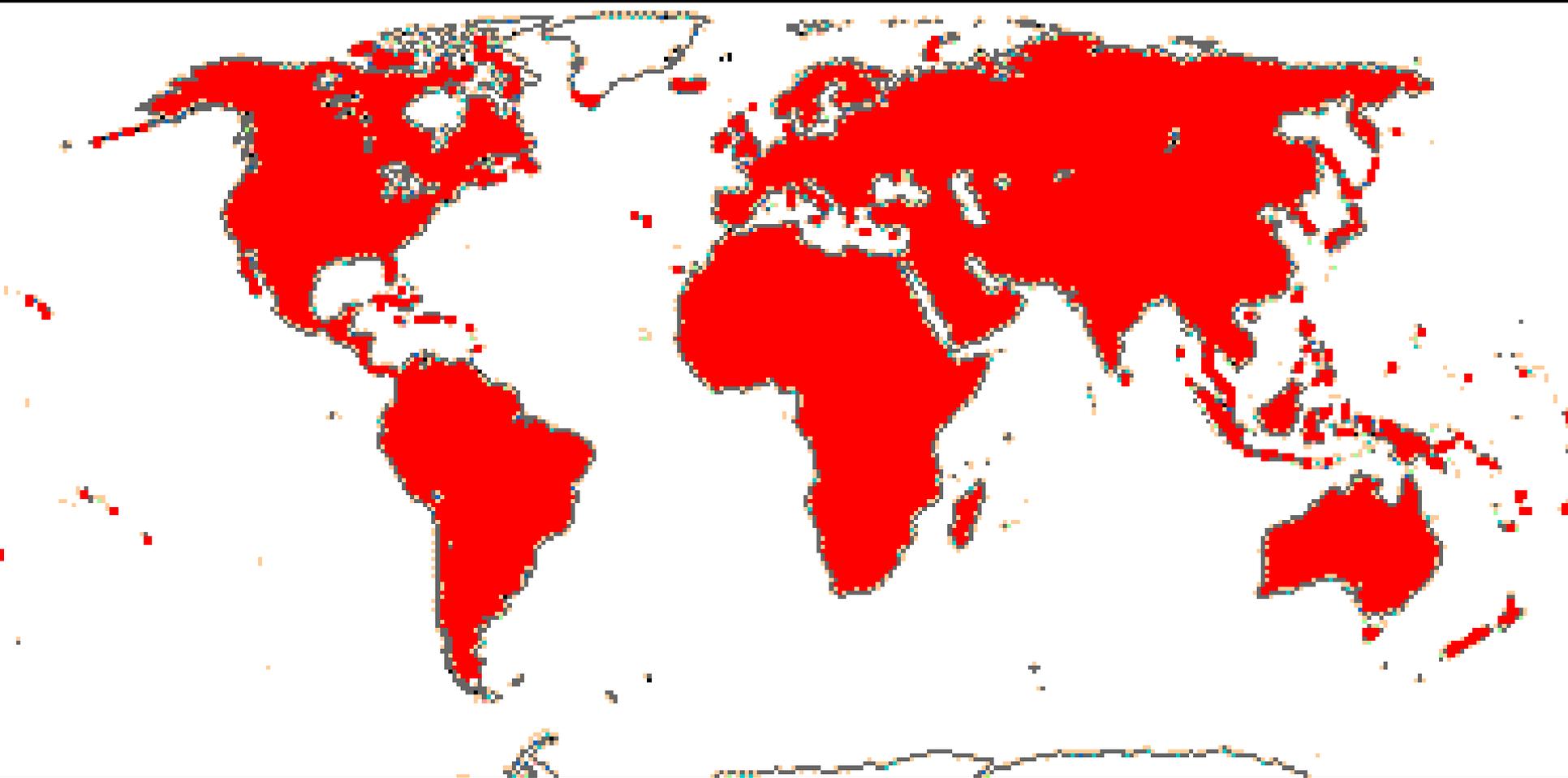
*Adenanathera pavonina*  
Fabaceae - Mimosoideae  
© G. D. Carr

# Sub Família

## 4. Faboideae ou Papilionoideae

Características da sub-família Faboideae ou Papilionoideae

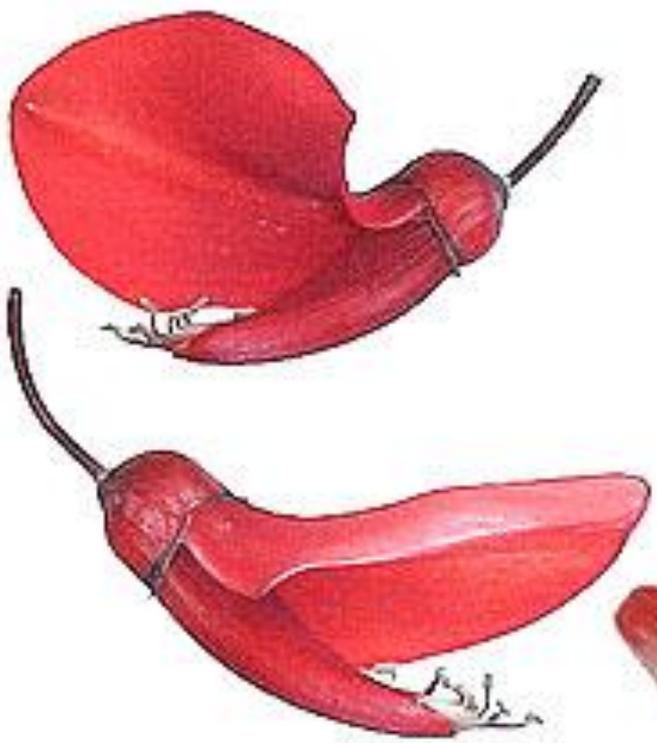
- folhas compostas, pinadas, imparipinadas, às vezes trifoliolada ou unifoliolada
- flores zigomorfas, diclamídeas, corola com pré-floração imbricada descendente ou vexilar, dialipétalas
- estames diplostêmones, geralmente diadelfos (nove unidos pelo filete e um livre, às vezes todos unidos pelo filete (monadelfos), não vistosos
- demais características = Família Fabaceae



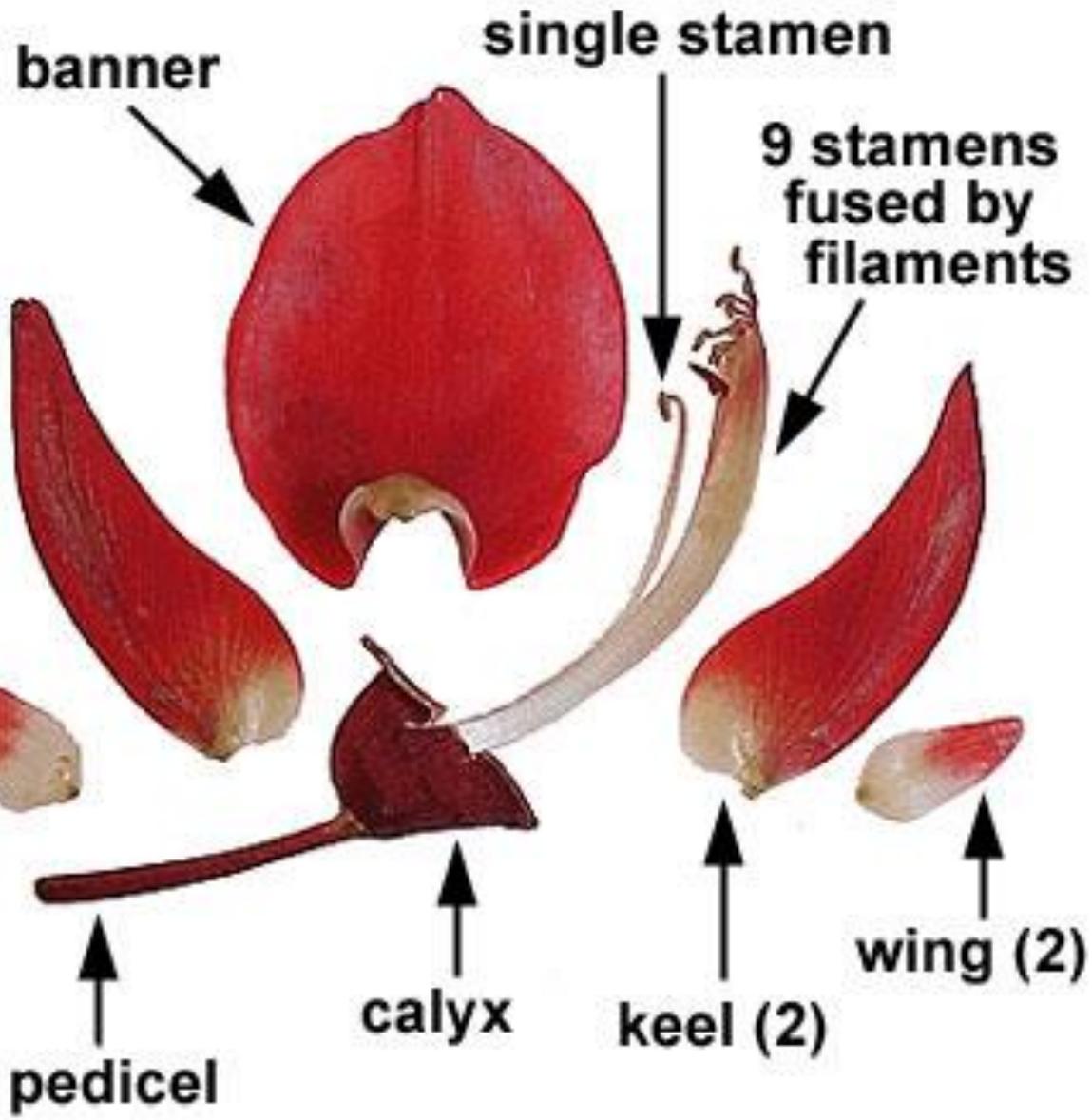
**Fabaceae Sub-família Faboideae ou Papilionoideae**



© W.P. Armstrong 2002



**papilionaceous blossoms of *Erythrina crista-galli***



**banner**  
**single stamen**  
**9 stamens fused by filaments**  
**pedicel**  
**calyx**  
**keel (2)**  
**wing (2)**



*Tipuana tipu*

Fabaceae

© G. D. Carr



*Pterocarpus indicus*  
Fabaceae  
Caesalpinioideae  
© G. D. Carr

*Crotalaria* sp.  
Fabaceae - Faboideae  
© G. D. Carr

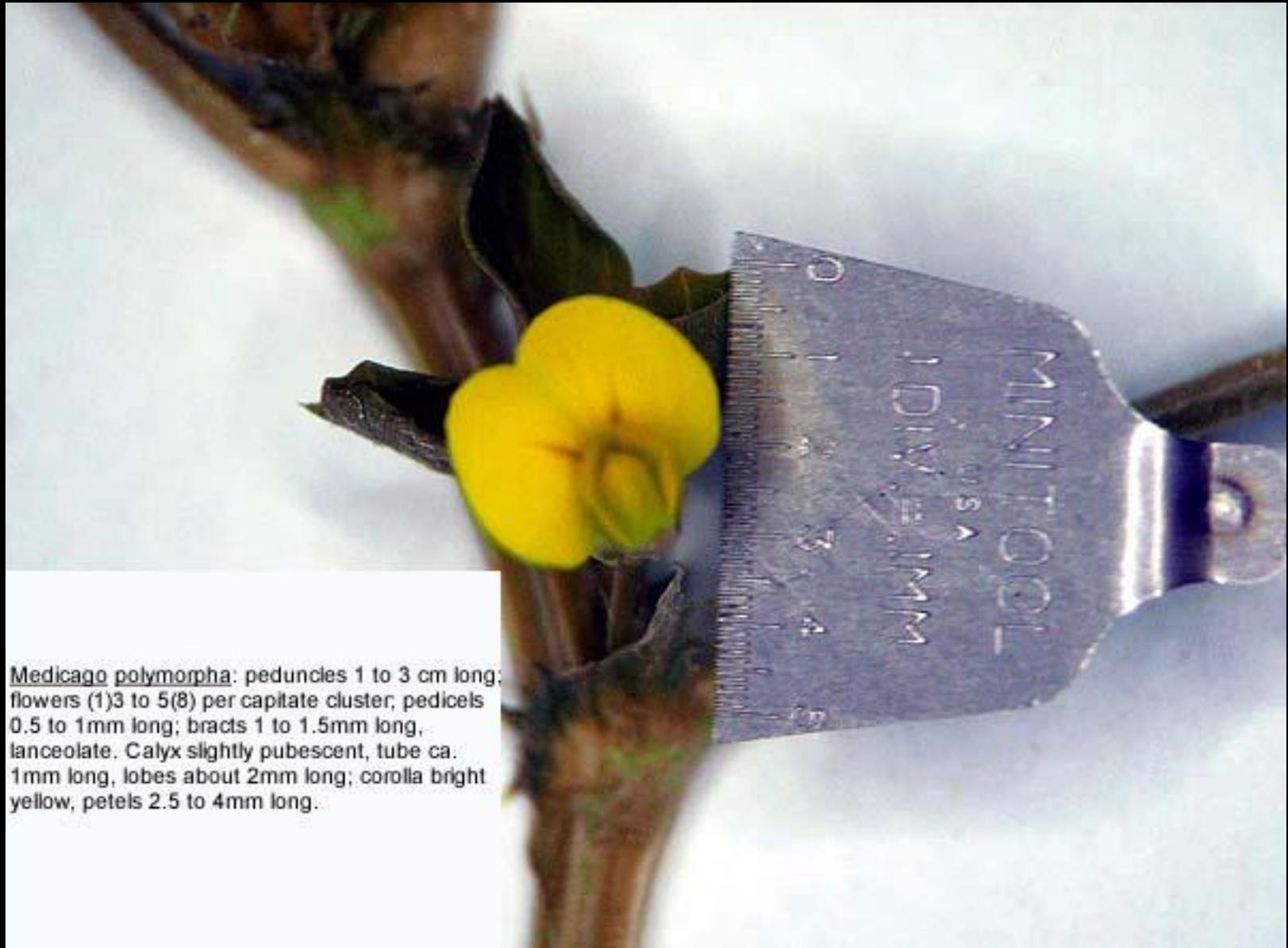




*Erythrina crista-galli*  
Fabaceae  
© G. D. Carr



*Erythrina*  
*crista-galli*  
Fabaceae  
© G. D. Carr



Medicago polymorpha: peduncles 1 to 3 cm long; flowers (1)3 to 5(8) per capitate cluster; pedicels 0.5 to 1mm long; bracts 1 to 1.5mm long, lanceolate. Calyx slightly pubescent, tube ca. 1mm long, lobes about 2mm long; corolla bright yellow, petals 2.5 to 4mm long.



*Mucuna bennettii*  
Fabaceae  
© G. D. Carr

# A new subfamily classification of the Leguminosae based on a taxonomically comprehensive phylogeny

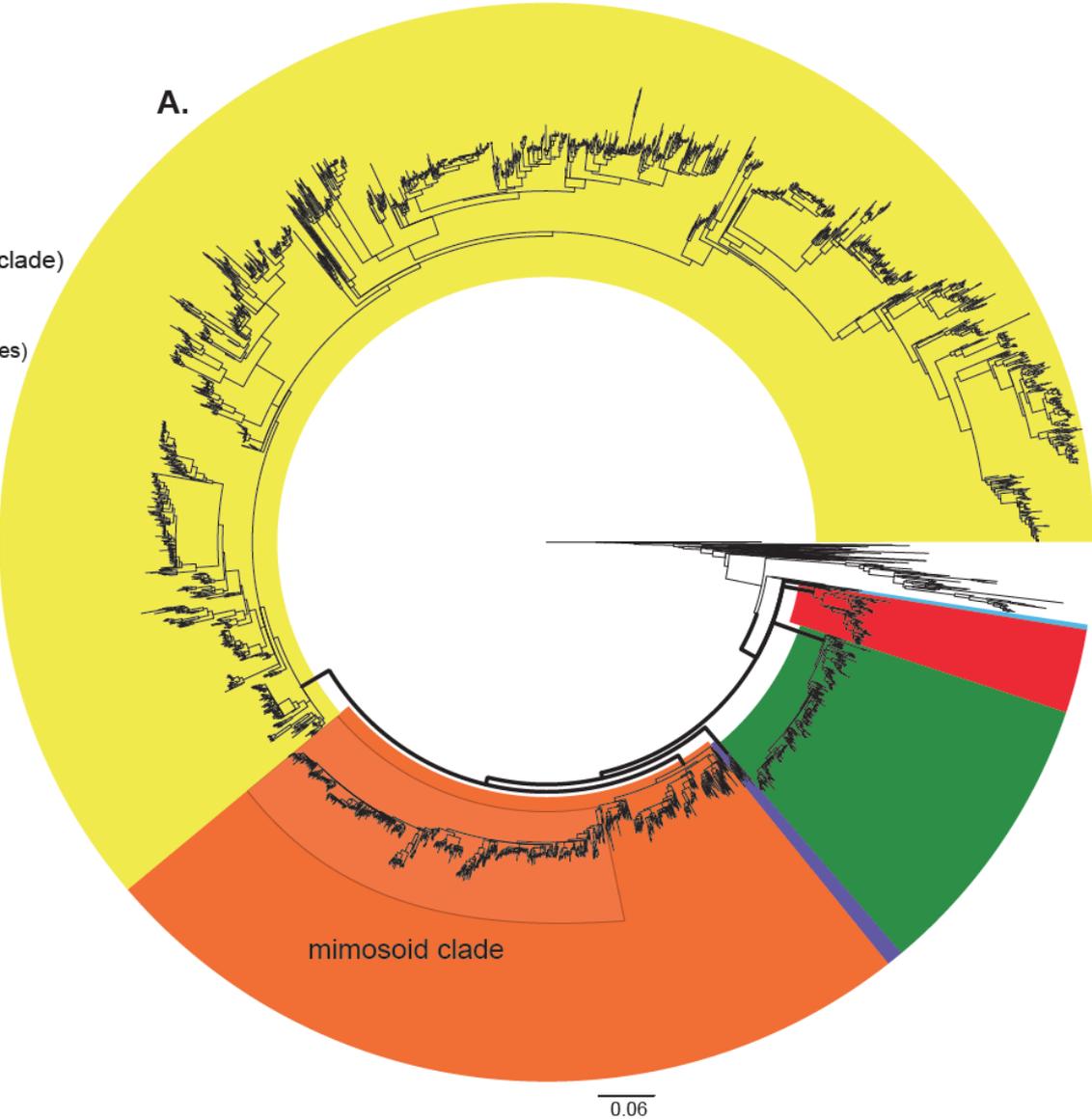
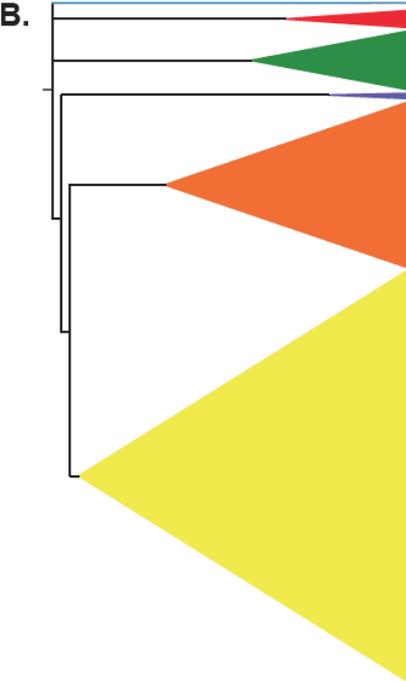
The Legume Phylogeny Working Group (LPWG)

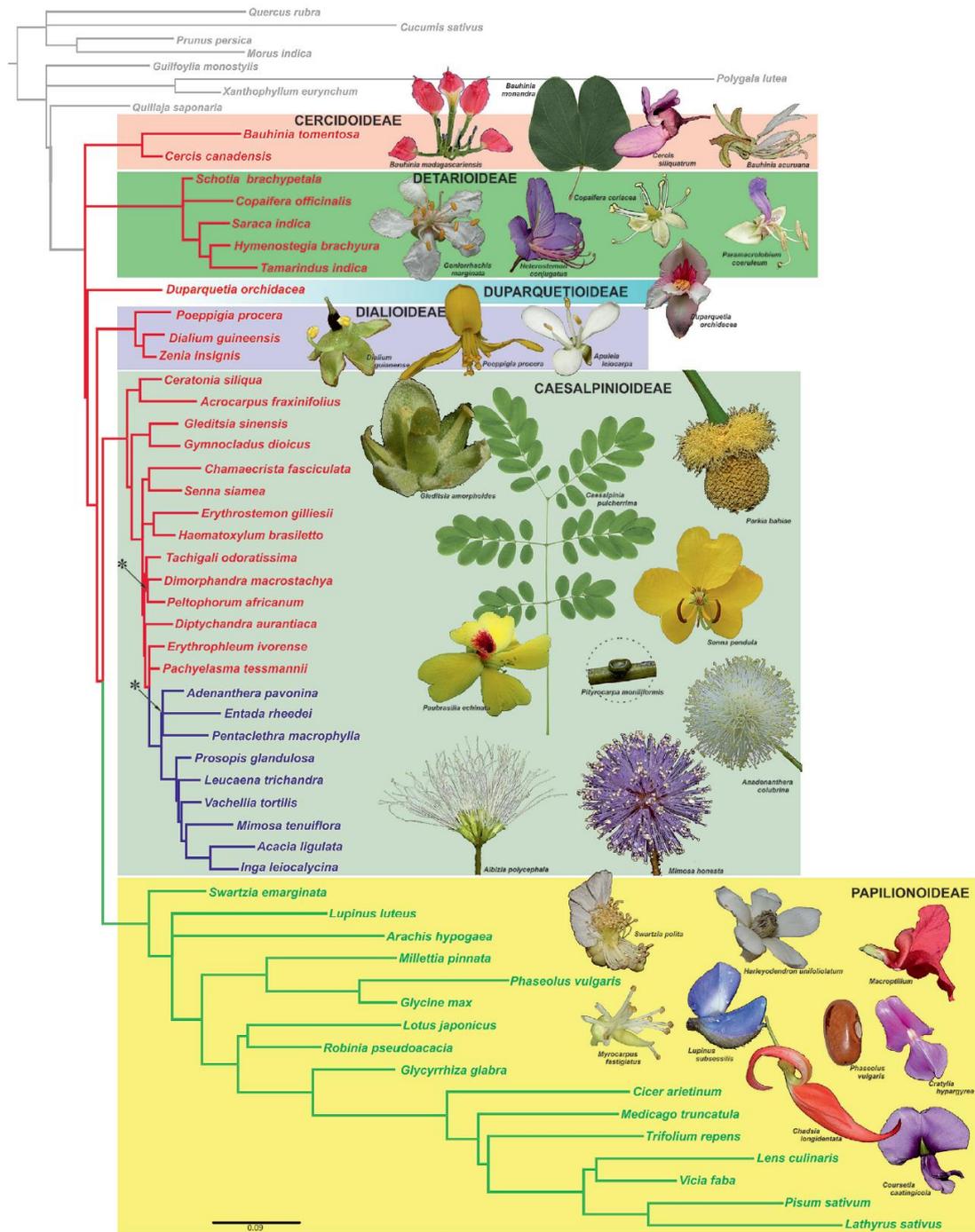
Recommended citation: LPWG (2017)

This paper is a product of the Legume Phylogeny Working Group, who discussed, debated and agreed on the classification of the Leguminosae presented here, and are listed in alphabetical order. The text, keys and descriptions were written and compiled by a subset of authors indicated by §. Newly generated *matK* sequences were provided by a subset of authors indicated by \*. All listed authors commented on and approved the final manuscript.

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- 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)
- Caesalpinioideae (incl. mimosoid clade)  
(146/148 genera, 937/ca. 4400 species)
- Papilionoideae  
(445/503 genera, 2316/ca. 14,000 species)





**Table 1.** Comparative morphology, chemistry and chromosome numbers of the six subfamilies of Leguminosae. The text in bold highlights characters and character states that are particularly valuable for identifying members of the subfamilies. See glossary in Appendix 2 and Figs. 12 & 13 for definitions and illustrations of technical terms.

	Cercidoideae	Detarioideae	Duparquetioideae	Dialioideae	Caesalpinioideae	Papilionoideae
Habit	Trees, shrubs or lianas, many with tendrils, mostly unarmed but frequently with prickles or infrastipular spines; branches rarely modified into cladodes	Usually unarmed trees, sometimes shrubs, rarely suffruticose	Unarmed scrambling liana	Unarmed trees or shrubs, rarely suffruticose	Trees, shrubs, lianas, suffruticose or functionally herbaceous, unarmed or commonly armed with prickles or spines	Usually unarmed trees, shrubs, lianas, <b>herbs, or twining vines with tendrils</b>
Specialised extrafloral nectaries	Mostly lacking	<b>Often present</b> on the underside, rarely on the margins of leaflets or on the leaf rachis	Lacking	Lacking	<b>Often present on the petiole and/or on the primary and secondary rachises, usually between pinnae or leaflet pairs</b> , sometimes on stipules or bracts	Lacking on petiole and leaf rachis; <b>occasionally present on stipules, stipels, bracts, or swollen and nectar-secreting peduncles or sepals</b>
Stipules	Lateral, free	<b>Intrapetiolar (i.e., somewhere between the petiole and the axillary bud) and then free, valvate and connected by chaffy hairs, or fused, either partly (only at base) or entirely</b> , rarely lateral and free	Lateral, free	Lateral, free or absent	Lateral, free or absent	Lateral, free or absent, <b>very rarely interpetiolar</b>
Leaves	<b>Unifoliolate or bifoliolate</b>	Usually <b>paripinnate</b> or bifoliolate, rarely unifoliolate	Imparipinnate	<b>Usually imparipinnate</b> , rarely paripinnate, 1-foliolate or palmately compound	Commonly <b>bi-pinnate</b> , otherwise pinnate, and then <b>mostly paripinnate</b> , rarely imparipinnate or bifoliolate, modified into phyllodes or lacking	<b>Mostly pari- or imparipinnate or palmately compound</b> , commonly unifoliolate, <b>trifoliolate</b> , rarely bifoliolate or tetrafoliolate

**Table 1.** Continued.

	Cercidoideae	Detarioideae	Duparquetioideae	Dialioideae	Caesalpinioideae	Papilionoideae
Leaflets and pinnae	Opposite (when bifoliolate); blade (when unifoliolate) entire or bilobed	Opposite or alternate; translucent glands sometimes present	Opposite; blade entire	Alternate, rarely opposite	Mostly opposite, rarely alternate	Opposite or alternate, sometimes modified into tendrils, rarely in phyllodes
Inflorescence	Raceme or pseudoraceme	Raceme or panicle	Terminal raceme	<b>Branched, thyrsoid inflorescences</b> , less commonly racemes with distichous flower arrangement, or flowers solitary	Globose, spikes, panicles, racemes or flowers in fascicles	Mostly racemes, pseudoracemes or panicles, less often cymes, spicate or capitate, or flowers solitary
Bracteoles	Large or minute	<b>Large</b> or small, frequently <b>petaloid</b> , <b>valvate</b> , <b>imbricate</b> or <b>partially fused</b> or <b>partly fused with the hypanthium</b> , <b>partially</b> or <b>completely enclosing the bud</b>	Small	Small or absent	Small or absent	Mostly small, rarely large, valvate, enveloping the bud
Flowers	Bisexual, rarely unisexual, slightly to strongly bilaterally symmetrical, <b>sometimes papilionate</b>	Bisexual or with both bisexual and male flowers, radially or slightly to strongly bilaterally symmetrical, but <b>never papilionate</b>	Bisexual, strongly bilaterally symmetrical, <b>never papilionate</b>	Bisexual, radially or slightly to strongly bilaterally symmetrical, <b>sometimes papilionate</b>	Usually bisexual, rarely unisexual, or bisexual flowers combined with unisexual and/or sterile flowers in heteromorphic inflorescences; radially, less frequently bilaterally symmetrical, <b>sometimes papilionate</b> or asymmetric	Bisexual, rarely unisexual, usually bilaterally symmetrical, <b>usually papilionate</b> , rarely asymmetrical, radially symmetrical or nearly so
Hypanthium	Present, greatly elongated to almost absent	Present, elongated to almost absent	Absent	Usually absent, rarely present, receptacle may be broad and flattened, bearing nectary-like bodies	Lacking or <b>cupular</b> , rarely tubular	Present or absent

Table 1. Continued.

	Cercidoideae	Detarioideae	Duparquetioideae	Dialioideae	Caesalpinioideae	Papilionoideae
Sepals	United in a spathaceous or 2–5-lobed calyx or sepals free	Commonly 5 or 4 (two adaxial sepals often fused), rarely some or all absent or more (–7)	<b>4, unequal, free, the abaxial and adaxial sepals cucullate and sepaloid, the laterals petaloid</b>	(3 or 4)–5–(6), free, equal to sub-equal	(3–)5–(6), free or fused, or sepal whorl lacking	(3–)5, united at least at the base, sometimes entire and splitting into irregular lobes or lobes dimorphic and some petaloid
Petals	5, rarely 2, 6 or absent, free, when present <b>imbricate, the adaxial petal innermost</b> and frequently differentiated	0–5(–7), free, when present <b>imbricate, the adaxial petal generally outermost</b> , all equal or the adaxial large and either the other 4 or only the abaxial ones smaller to rudimentary	5, free, <b>imbricate, the adaxial petal outermost</b> , adaxial and two lateral petals ovate, two abaxial petals strap-like, oblong, <b>all 5 petals with stalked glands along their margins</b>	5 or fewer (0, 1, 3, 4), rarely 6, free, <b>imbricate, the adaxial petal innermost</b> , all equal to sub-equal	(3–)5–(6), free or fused, or petal whorl lacking, <b>valvate or imbricate, then adaxial petal innermost</b>	Usually (0–)5(–6), rarely 1 (standard) petal and 4 absent, <b>imbricate, the adaxial petal outermost</b> , in radially symmetrical flowered species, corolla with 5 small or undifferentiated petals, less often only one (standard) petal is present or all petals absent
Stamens	Usually 10 (sometimes fewer) in two whorls of alternate length	Usually 10, sometimes 2–numerous	4	5 or fewer, rarely 6–10, uniform, rarely dimorphic	Diplostemonous or haplostemonous, sometimes reduced to 3, 4 or 5, frequently many (100+), sometimes heteromorphic, some or all sometimes modified or staminodial	Usually 10, rarely 9 or many
Stamen fusion	Filaments partly connate or free	Filaments partly connate or free	Filaments free	Filaments free	Filaments free or connate	<b>Filaments usually connate into a sheath or tube</b> , uppermost filament wholly or partly free, sometimes all filaments free
Anthers	Mostly uniform, dorsifixed, dehiscing via longitudinal slits or central pores; reduced stamens or staminodes sometimes present	Mostly uniform, dorsifixed or basifixed, dehiscing via longitudinal slits	Uniform, basifixed, with pointed appendages, dehiscing via short apical, poricidal slits; anthers post-genitally fused into a curving synandrium	Uniform, rarely dimorphic, basifixed, rarely dorsifixed, dehiscing via longitudinal slits, often reduced to short apical, poricidal slits; staminodes present or absent	Uniform or heteromorphic, basifixed or dorsifixed, often with a stipitate or sessile apical gland, dehiscing via longitudinal slits or apical or basal poricidal slits or pores	Uniform or dimorphic, basifixed or dorsifixed, dehiscing via longitudinal slits
Pollen	Monads, 3-colporate, 3–6-colpate, 3-porate, 3-pororate, 3–4-colporoidate or inaperturate, <b>rarely in tetrads</b>	Monads, mostly 3-colporate with a vast array of sculptures	Monads, <b>asymmetrical, one equatorial-encircling ectoaperture with two equatorial endoapertures</b>	Monads tricolporate, with punctate or finely reticulate, rarely striate sculpture patterns	Monads, tricolporate or <b>porate tetrads, bitetrads or polyads</b> , sculpture pattern never striate	Monads, mostly 3-colporate, 3-colpate or 3-porate
Gynoecium	1-carpellate, stipitate, stipe free or adnate to the wall of the hypanthium	1-carpellate, stipitate, stipe free or adnate to the wall of the hypanthium	1-carpellate, stipitate, stipe free	1-carpellate, sometimes 2-carpellate, stipitate or sessile, stipe free	Usually 1-carpellate, <b>rarely polycarpellate</b> , stipitate or sessile, stipe free	Usually 1-carpellate, rarely 2-carpellate, stipitate or sessile, stipe free

Table 1. Continued.

	Cercidoideae	Detarioideae	Duparquetioideae	Dialioideae	Caesalpinioideae	Papilionoideae
Ovules	Ovary 1–many-ovulate	Ovary 1–many-ovulate	Ovary 2–5-ovulate	Ovary frequently 2-ovulate, rarely 1–many-ovulate	Ovary 1–many-ovulate	Ovary 1–many-ovulate
Fruits	Dehiscent pods, often explosive with twisted valves, or indehiscent, then generally samaroid	Mostly woody, de- hiscent pods, some- times indehiscent and woody or thin valved samaroid, rarely filled with pulpy mesocarp or endocarp	Woody dehiscent pods, 4-angled, valves spirally coiled	<b>Commonly inde- hiscent drupaceous or samaroid</b> , rarely dehiscent or the dru- paceous fruit with indurating endocarp into one-seeded segments	Commonly thin- valved, 1–many- seeded pod, dehis- cent along one or both sutures, also often a lomentum, a craspedium, or thick and woody and then indehiscent or explosively dehiscent, often curved or spirally coiled	Dehiscent pods along one or both sutures, or indehis- cent, or lomentis, samaras or drupes
Seeds	With apical <b>cre- scent-shaped hilum</b> , rarely circular; lens inconspicuous, <b>lack- ing pleurograms, pseudopleuro- grams, wing or aril</b>	Often overgrown, sometimes hard and then <b>occasionally with pseudopleuro- grams</b> ; occasionally arillate	2–5, oblong to ovoid, the testa thick, <b>lacking pleurograms</b>	1–2, rarely more, <b>lacking pleurograms</b>	<b>Usually with an open or closed pleurogram on both faces</b> , sometimes with a fleshy aril or sarcotesta, some- times winged; hilum usually apical; lens usually inconspicuous	Usually with hard testa, rarely over- grown, sometimes with a fleshy aril or sarcotesta; com- plex hilar valve, elongate hilum and lens usually pres- ent, <b>pleurogram lacking</b>
Embryo	Straight, very rarely curved	Straight	Straight	Straight	Straight	Usually curved, rarely straight
Vestured pits in 2 <sup>o</sup> xylem	Lacking	Present	Lacking	Usually lacking, rarely present	Present	Present
Root modules	Absent	Absent	Absent	Absent	Variably present and indeterminate	Usually present, either indeterminate or determinate
Chromosome counts	2n = 14, 24, 26, 28 (42, 56)	2n mostly 24 (occa- sionally 16, 20, 22, 36, 68)	Unknown	2n = 28 (most gen- era not surveyed)	2n mostly 24, 26, 28 (but 14, 16, 52, 54, 56 also reported)	2n mostly 16, 18, 20, 22 (but 12, 14, 24, 26, 28, 30, 32, 38, 40, 48, 64, 84 also reported)
Chemistry	Coumarins and cyanogenic glu- cosides reported; non-protein amino acids common 5-hydroxy-L-tryp- tophan only reported to this subfamily)	Coumarins reported, frequently with terpenes (resins) and non-protein amino acids	Chemical character- istics unknown	Chemical character- istics unknown	Non-protein amino acids frequently reported; coumarins, cyanogenic gluco- sids, phenylethyl- amine, tryptamines, and β-carboline alkaloids also reported	Isoflavonoids, prenylated flavonoids, indol- izidine or quinol- izidine alkaloids reported. Non- protein amino acids widespread, some exclusively found in the subfamily (e.g., canavanine)



Brownea grandiceps

Sol da mata

**Table 2.** Genera of Leguminosae listed in alphabetical order within subfamilies. Recently synonymised genera are listed after the list of currently recognised genera in each subfamily. Genera that have not been sampled in the *matK* phylogenetic analysis are identified by \*. Genera of the mimosoid clade in Caesalpinioideae are underlined.

**CERCIDOIDEAE** (12 genera, ca. 335 species): *Adenolobus* (Harv. ex Benth. & Hook.f.) Torre & Hillc.; *Barklya* F.Muell.; *Bauhinia* L.; *Brenierea* Humbert; *Cercis* L.; *Gigasiphon* Drake; *Griffonia* Baill.; *Lysiphyllum* (Benth.) de Wit; *Phanera* Lour.; *Ptilostigma* Hochst.; *Schnella* Raddi; *Tylosema* (Schweinf.) Torre & Hillc.

**Recent synonym:** *Lasiobema* (Korth.) Miq. = *Phanera* Lour.

**DETARIOIDEAE** (84 genera, ca. 760 species): *Afzelia* Sm.; *Amherstia* Wall.; *Annea* Mackinder & Wieringa; *Anthonotha* P.Beauv.; *Aphanocalyx* Oliver; *Augouardia* Pellegr.; *Baikiaea* Benth.; *Barnebydendron* J.H.Kirkbr.; *Berlinia* Sol. ex Hook. f.; *Bikinia* Wieringa; \**Brachycylix* (Harms) R.S.Cowan; *Brachystegia* Benth.; *Brandzeia* Baill.; *Brodriguesia* R.S.Cowan; *Brownea* Jacq.; *Browneopsis* Huber; *Colophospermum* J.Kirk ex J.Léonard; *Copaifera* L.; *Crudia* Schreb.; *Cryptosepalum* Benth.; *Cynometra* L.; *Daniellia* Benn.; *Detarium* Juss.; *Dicymbe* Spruce ex Benth.; *Didelotia* Baill.; *Ecaddendron* D.A.Neill; *Elizabetha* Schomb. ex Benth.; *Endertia* Steenis & de Wit; *Englerodendron* Harms; *Eperua* Aubl.; *Eurypetalum* Harms; *Gabonius* Wieringa & Mackinder; *Gilbertiodendron* J.Léonard; *Gilletiodendron* Vermoesen; *Goniorrhoea* Taub.; *Gossweilerodendron* Harms; *Guibourtia* Benn.; *Hardwickia* Roxb.; *Heterostemon* Desf.; *Humboldtia* J.Vahl; *Hylodendron* Taub.; *Hymenaea* L.; *Hymenostegia* (Benth.) Harms; *Icuria* Wieringa; *Intsia* Thouars; *Isoberlinia* Craib & Stapf; *Isomacrolobium* Aubrév. & Pellegr.; *Jubbernardia* Pellegr.; *Kingiodendron* Harms; *Lebrunioidendron* J.Léonard; *Leonardoxa* Aubrév.; \**Leucostegane* Prain; *Librevillea* Hoyle; *Loesenera* Harms; *Lysidice* Hance; *Macrolobium* Schreb.; *Maniltoa* Scheff.; \**Michelsonia* Hauman; \**Micklethwaitia* G.P.Lewis & Schrire; *Microberlinia* A.Chev.; *Neoapaloxylon* Rauschert; *Neochevalierodendron* J.Léonard; *Normandioidendron* J.Léonard; *Odoniodendron* De Wild.; *Oxystigma* Harms; *Paloue* Aubl.; *Paloveopsis* R.S.Cowan; *Paramacrolobium* J.Léonard; *Peltogyne* Vogel; *Plagiosiphon* Harms; *Polystemonanthus* Harms; *Prioria* Griseb.; \**Pseudomacrolobium* Hauman; *Saraca* L.; *Schotia* Jacq.; *Scorodophloeus* Harms; *Sindora* Miq.; *Sindoropsis* J.Léonard; *Stemonocoleus* Harms; *Talbotiella* Baker f.; *Tamarindus* L.; *Tessmannia* Harms; *Tetraberlinia* (Harms) Hauman; *Zenkerella* Taub.

**Recent synonym:** *Pellegrinioidendron* J.Léonard = *Gilbertiodendron* J.Léonard

**DUPARQUETIOIDEAE** (1 genus, 1 species): *Duparquetia* Baill.

**DIALIOIDEAE** (17 genera, ca. 85 species): \**Androcalymma* Dwy.; *Apuleia* Mart.; *Baudouinia* Baill.; *Dialium monanthus* Benth.; *Eligmocarpus* Capuron; *Kalappia* Kosterm.; *Koompassia* Maingay ex Benth.; *Labichea* Gaud Gleason; *Mendoravia* Capuron; *Petalostylis* R.Br.; *Poeppigia* C.Presl; *Storckiella* Seem.; \**Uittienia* Steenis; *Zenia*

Apuleia leiocarpa

Garapa



CAESALPINIOIDEAE (148 genera, ca. 4400 species; includes genera of the mimosoid clade, which are underlined): Abarema Pittier; Acacia Mill.; Acaciella Britton & Rose; Acrocarpus Wight & Arn.; Adenanthura L.; Adenopodia C.Presl; Afrocalliandra E.R.Souza & L.P.Queroz; Alantsilodendron Villiers; Albizia Durazz.; Amblygonocarpus Harms; Anadenanthera Speg.; Arapatiella Rizzini & A.Mattos; Archidendron F.Muell.; Archidendropsis I.C.Nielsen; Arcoa Urb.; Arquita E.Gagnon, G.P.Lewis & C.E.Hughes; Aubrevillea Pellegr.; Balizia Barneby & J.W.Grimes; Balsamocarpus Clos; Batesia Spruce ex Benth. & Hook. f.; Biancaea Tod.; Blanchetiodendron Barneby & J.W.Grimes; Burkea Benth.; Bussea Harms; Caesalpinia L.; Calliandra Benth.; Calliandropsis H.M.Hern. & P.Guinet; Calpocalyx Harms; Campsiandra Benth.; Cassia L.; Cathormion Hassk.; Cedrelinga Ducke; Cenostigma Tul.; Ceratonia L.; Chamaecrista Moench; Chidlowia Hoyle; Chloroleucon (Benth.) Britton & Rose; Cojoba Britton & Rose; Colvillea Bojer ex Hook.; Conzattia Rose; Cordeauxia Hemsl.; Coulteria Kunt.; Cyclopodiscus Harms; Delonix Raf.; Denisophytum R.Vig.; Desmanthus Willd.; Dichrostachys (DC.) Wight & Arn.; Dimorphandra Schott; Dinizia Ducke; Diptychandra Tul.; Ebenopsis Britton & Rose; Elephantorrhiza Benth.; Entada Adans.; Enterolobium Mart.; Erythrophleum Aubl. ex R.Br.; Erythrostemon Klotzsch; Faidherbia A.Chev.; Falcataria (I.C.Nielsen) Barneby & J.W.Grimes; Fillaeopsis Harms; Gagnebina Neck. ex DC.; Gelrebia E.Gagnon & G.P.Lewis; Gleditsia L.; Guilandina L.; Gymnocladus Lam.; Haematoxylum L.; Havardia Small; Hererlandia E.Gagnon & G.P.Lewis; Hesperalbizia Barneby & J.W.Grimes; Hesperalbizia M.Sousa; Hoffmannseggia Cav.; Hultholia E.Gagnon & G.P.Lewis; Hydrochorea Barneby & J.W.Grimes; Indopiptadenia Brenan; Inga Mill.; Jacqueshuberia Ducke; Kanaloa Lorence & K.R.Wood; Lemurodendron Villiers; Lemuropisum H.Perric; Leucaena Benth.; Leucocoron Barneby & J.W.Grimes; Libidibia (DC.) Schtdl.; Lophocarpinia Burkart; Lysiloma Benth.; Macrosamanea Britton & Rose ex Britton & Killip; Mariosousa Seigler & Ebinger; Melanoxylon Schott; Mezoneuron Desf.; Microlobius C.Presl; Mimosa L.; Mimozyanthus Burkart; Moldenthera Schrad.; Mora Schomb. ex Benth.; Moullava Adans.; Neptunia Lour.; Newtonia Baill.; Pachyelasma Harms; Painteria Britton & Rose; Parapiptadenia Brenan; Paraschidendron I.C.Nielsen; Paraserianthes I.C.Nielsen; Parkia R.Br.; Parkinsonia L.; Paubrasilia E.Gagnon, H.C.Lima & G.P.Lewis; Peltophorum (Vogel) Benth.; Pentaclethra Benth.; Piptadenia Benth.; Piptadeniastrum Brenan; Piptadeniopsis Burkart; Pithecellobium Mart.; Pithecolobium (Benth.) Britton & Rose; Plathymenia Benth.; Pomaria Cav.; Prosopidastrum Burkart; Prosopis L.; Pseudopiptadenia Pauschert; Pseudoprosopis Harms; Pseudosamanea Harms; Pterogyne Tul.; Pterolobium R.Br. ex Wight & Arn.; Recordoxylon Ducke; Samanea (Benth.) Merr.; Sanjappa E.R.Souza & M.V.Krishnaraj; Schizolobium Vogel; Schleinitzia Warb. ex Nevling & Niezgod; Senegalia Raf.; Senna Mill.; Serianthes Benth.; Sphinga Barneby & J.W.Grimes; Stachyothyrsus Harms; Stenodrepanum Harms; Stryphnodendron Mart.; Stuhlmannia Taub.; Sympetalandra Stapf; Tachigali Aubl.; Tara Molina; Tetrapleura Benth.; Tetrapterocarpus Humbert; Thaillentadopsis Kosterm.; Umtiza Sim; Vachellia Wight & Arn.; Viguieranthus Villiers; Vouacapoua Aubl.; Wallaceodendron Koord.; Xerocladia Harv.; Xylia Benth.; Zapoteca H.M.Hern.; Zuccagnia Cav.; Zygia P.Browne.  
**Recent synonyms:** Guinetia L.Rico & M.Sousa = Calliandra Benth.; Marmaroxylon Killip = Zygia P.Browne; Poincianella Britton & Rose (in part, including type) = Erythrostemon Klotzsch and (in part) = Cenostigma Tul.; Stahlia Bello = Libidibia (DC.) Schtdl.



Samanea saman

Árvore da chuva



Dinizia excelsa

Angelim vermelho

**PAPILIONOIDEAE** (503 genera, ca. 14,000 species): *Abrus* Adans.; *Acmispon* Raf.; *Acosmium* Schott; *Adenocarpus* DC.; *Adenodolichos* Harms; *Adesmia* DC.; *Aenictophyton* A.T.Lee; *Aeschynomene* L.; *Afgekia* Craib; *Aganope* Miq.; *Airyantha* Brummitt; *Aischindlium* H.Ohashi; *Aldina* Endl.; *Alexa* Moq.; *Alhagi* Gagnebin; *Alistilus* N.E.Br.; *Almaleea* Crisp & P.H.Weston; *Alysicarpus* Desv.; *Amburana* Schwacke & Taub.; *Amicia* Kunth; *Ammodendron* Fisch. ex DC.; *Ammopiptanthus* S.H.Cheng; *Ammothamnus* Bunge; *Amorpha* L.; *Ampicarpaea* Elliott ex Nutt.; *Amphimas* Pierre ex Harms; *Amphiodon* Huber; *Amphithalea* Eckl. & Zeyh.; *Anagyris* L.; *Anarthrophyllum* Benth.; *Ancistrotropis* A.Delgado; *Anlira* Lam.; *Angylocalyx* Taub.; *Antheroporum* Gagnep.; *Anthyllis* L.; *\*Antopetitia* A.Rich.; *Aotus* Sm.; *Aphyllodium* (DC.) Gagnep.; *Apios* Fabr.; *Apoplanesia* C.Presl; *Apurimacia* Harms; *Arachis* L.; *Argyrocytismus* (Maire) Raynaud; *Argyrolobium* Eckl. & Zeyh.; *Arthroclianthus* Baill.; *Aspalathus* L.; *Astragalus* L.; *Ateleia* (Moç & Sessé ex DC.) Benth.; *Austrodolichos* Verdc.; *Austrosteenisia* R.Geesink; *Baphia* Afzel. & Lodd.; *Baphiastrum* Harms; *Baphiopsis* Benth. ex Baker; *Baptisia* Vent.; *\*Barbieria* DC.; *Behaimia* Griseb.; *Bionia* Mart. ex Benth.; *\*Biserula* L.; *Bituminaria* Heist. ex Fabr.; *Bobgunnia* J.H.Kirkbr. & Wiersema; *Bocoa* Aubl.; *Bolusafrax* Kuntze; *Bolusanthus* Harms; *Bolusia* Benth.; *Bossiaea* Vent.; *Bowditchia* Kunth; *Bowringia* Champagn. Benth.; *Brongniartia* Kunth; *Brya* P.Browne; *Bryaspis* P.A.Duvign.; *\*Burkilliodendron* Sastry; *Butea* Roxb. ex Willd.; *Cadia* Forssk.; *Cajanus* DC.; *Calicotome* Link; *Callerya* Endl.; *Callistachys* Vent.; *Calobota* Eckl. & Zeyh.; *Calophaca* Fisch. ex DC.; *Calopogonium* Desv.; *Calpurnia* E.Mey.; *Camoensia* Welw. ex Benth.; *Camptosema* Hook. & Arn.; *Campylotropis* Bunge; *Canavalia* DC.; *Canuotteouendron* R.S.Cowan; *Caragana* Fabr.; *Carmichaelia* R.Br.; *Carrissoa* Baker f.; *Cascaronia* Griseb.;

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# Fabaceae

Sub Famílias ou Clados:

2. "Fabaceae"

3. Papilionoideae

4. Faboideae (Papilionoideae)

# Chave de separação das quatro sub-famílias da Família Fabaceae:

1. FOLHAS COMPOSTAS BIPINADAS, COM NECTÁRIOS EXTRAFLORAIS, FLORES ACTINIMORFAS, COROLA VALVAR, ESTAMES NUMEROSOS (POLISTÊMONES) VISTOSOS.....**MIMOSOIDEAE**
- 1' FOLHAS DE OTRAS FORMAS, FLORES ZITÓFILAS, PÉTALAS IMBRICADAS, ESTAMES ÚNICO OU NÚMERO DUPLO ACROSTÉMONES.....**2**
2. FOLHAS COMPOSTAS PARIPINADAS OU TRIFOLIOLADAS, COROLA PREFLORAÇÃO ASCENDENTE OU VEXILAR, DIALIPÉTALA, ANDROCEU DIPLOSTÉMONES (9+1) OU MONADELFOS.....**OU PAPILIONOIDEAE**
- 2' FOLHAS COMPOSTAS PARIPINADAS OU BIFOLIOLADAS OU COMPOSTAS BIPINADAS SEM NECTÁRIOS EXTRAFLORAIS, COROLA PREFLORAÇÃO ASCENDENTE OU VEXILAR, DIALIPÉTALA, ANDROCEU DIPLOSTÉMONES, LIVRES..... **3**
3. FOLHAS BIFOLIOLADAS, COM FOLIOLOS FUNDIDOS.....**CERCIDEAE**
- 3' FOLHAS COMPOSTAS PINADAS PARIPINADAS OU BIFOLIOLADAS, MAS COM FOLIOLOS LIVRES.....**CAESALPINIOIDEAE**



***Glycine max* – Soja- Alimentação Animal**



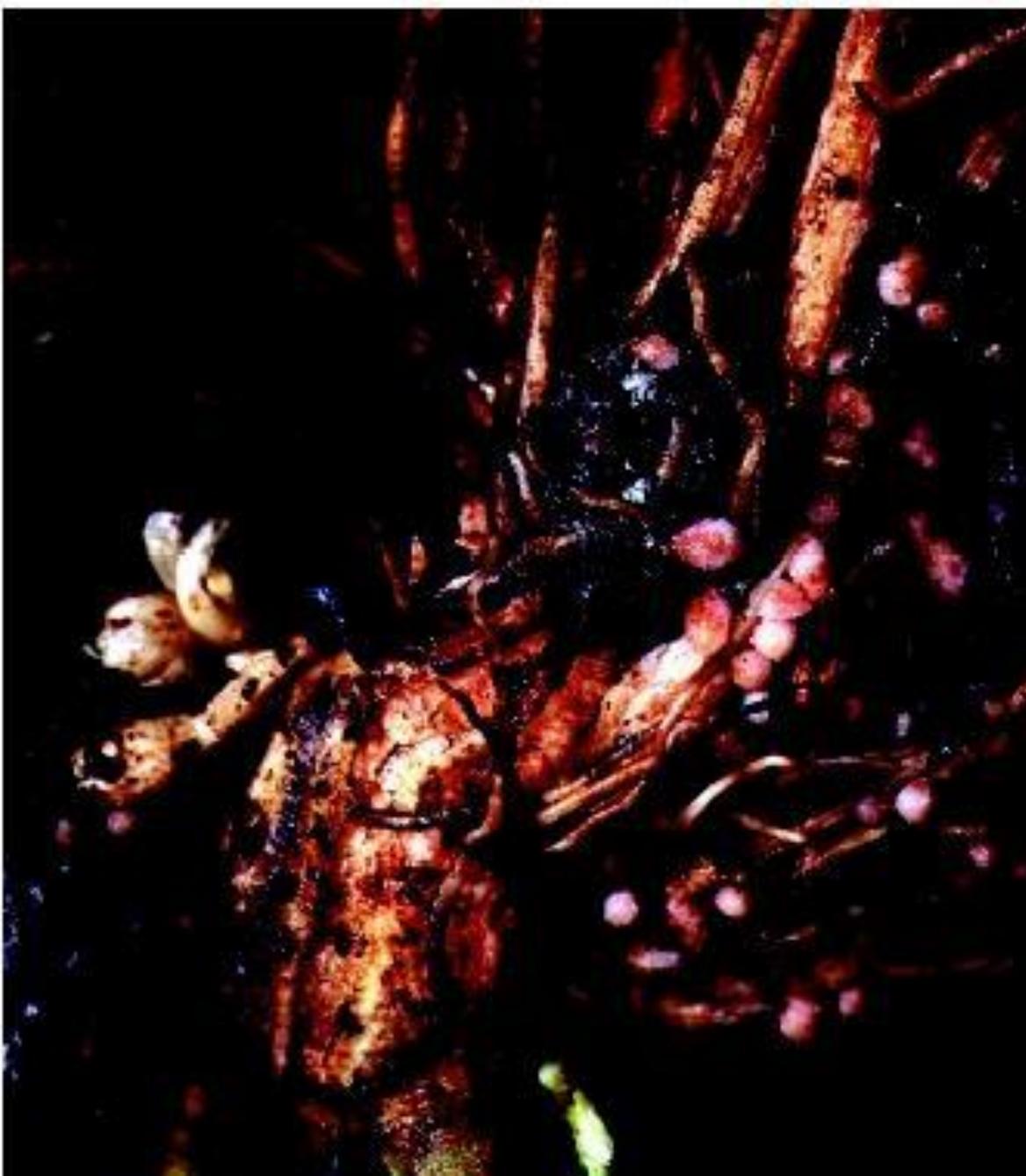
*Phaseolus vulgaris*- feijão  
Alimentação





*Crotalaria* sp.  
Fabaceae  
Gordon Daida

**Adubação Verde**



*Adubação Verde: Nódulos nas raízes- Rhizobium spp*

**Nódulos radiculares:** relação simbiótica entre a raiz e bactérias (*Rhizobium*) fixadoras de N<sub>2</sub> atmosférico.





***Lathyrus odoratus* –ervilha de cheiro- Ornamental**



**Ornamental**

*Tipuana tipu*  
Fabaceae  
© G. D. Carr

*Desmodium triflorum*  
Fabaceae  
© G. D. Carr



***Ornamental e Adubação Verde***

# Usos econômicos de Fabaceae

**Alimentação:** feijão, amendoim, soja, ervilha, tremoço, etc

**Madeira:** jatobá, cabreúva, cerejeira, sucupira, braúna, jacarandá da bahia, angelim, angicos, garapa, copaíba etc

**Adução verde:** em função da associação das leguminosas, em especial da sub-família Faboideae, com bactérias (*Rhizobium* spp) fixadoras de nitrogênio, como feijão guandú, feijão de porco, crotalária, desmodium, lab-lab etc

**Ornamentais:** tipuana, sibipiruna, ervilha de cheiro, esponjinha, sansão do campo (cerca viva) etc

## **FABACEAE – alguns exemplos de spp Nativas**

- *Amburana cearenses*- Cerejeira
- *Anadenanthera spp*- Angicos
- *Apuleia leiocarpa*- Garapa
- *Bowdichia virgilioides*- Sucupira
- *Caesalpinia echinata*- Pau brasil
- *Copaifera langsdorffi*- Copaiba, pau d'óleo
- *Dalbergia nigra*- Jararandá da Bahia
- *Holocalix balansae*- Alecrim de Campinas
- *Hymenolobium spp*- Angelim
- *Melanoxylon brauna*- Braúna
- *Myroxylum peruiferum, Myrocarpus frondosus*- Cabreúvas
- *Parkia pendula*- Visgueiro
- *Piptadenia gonoacantha*- Pau jacaré

## **Exóticas**

- *Phaseolus vulgaris*-Feijão, *Arachis hypogae*-Amendoim, *Glycine max*-Soja, etc
- *Aubus verdes*- *Crotalaria spp*-*Crotalarias*, *Cajanus cajan*-Feijão guandu, etc
- *Delonix regia*- Flamboyant
- *Leucaena leucocephala*- Leucena ETC!!!