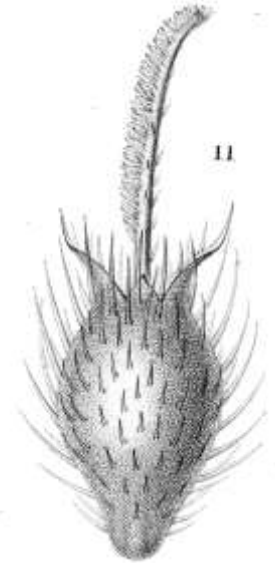
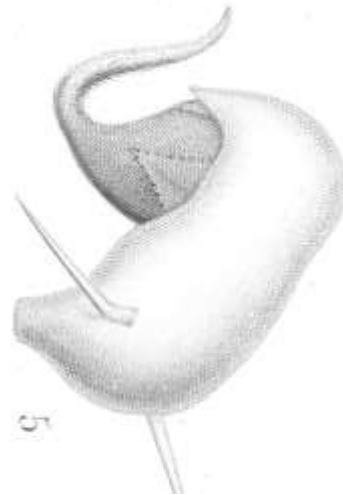
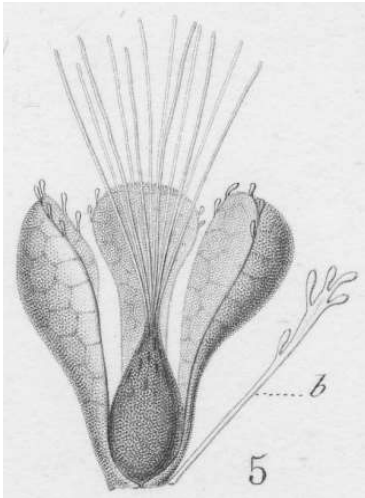


Urticaceae: ca 50 genera and 2,000 species of tiny flowered weeds

Alex Monro, Zeng-Yuan Wu, Melanie Thomas, Yu-Hsin Tseng, Ib Friis, Sven Buerki



Summary

- Morphological tour of the family
- Current phylogeny & implications for classification
- Directions to explore:
 - drivers female flower / inflorescence
 - drivers of ecological partitioning
 - drivers of species-richness
 - colonisation of karsts











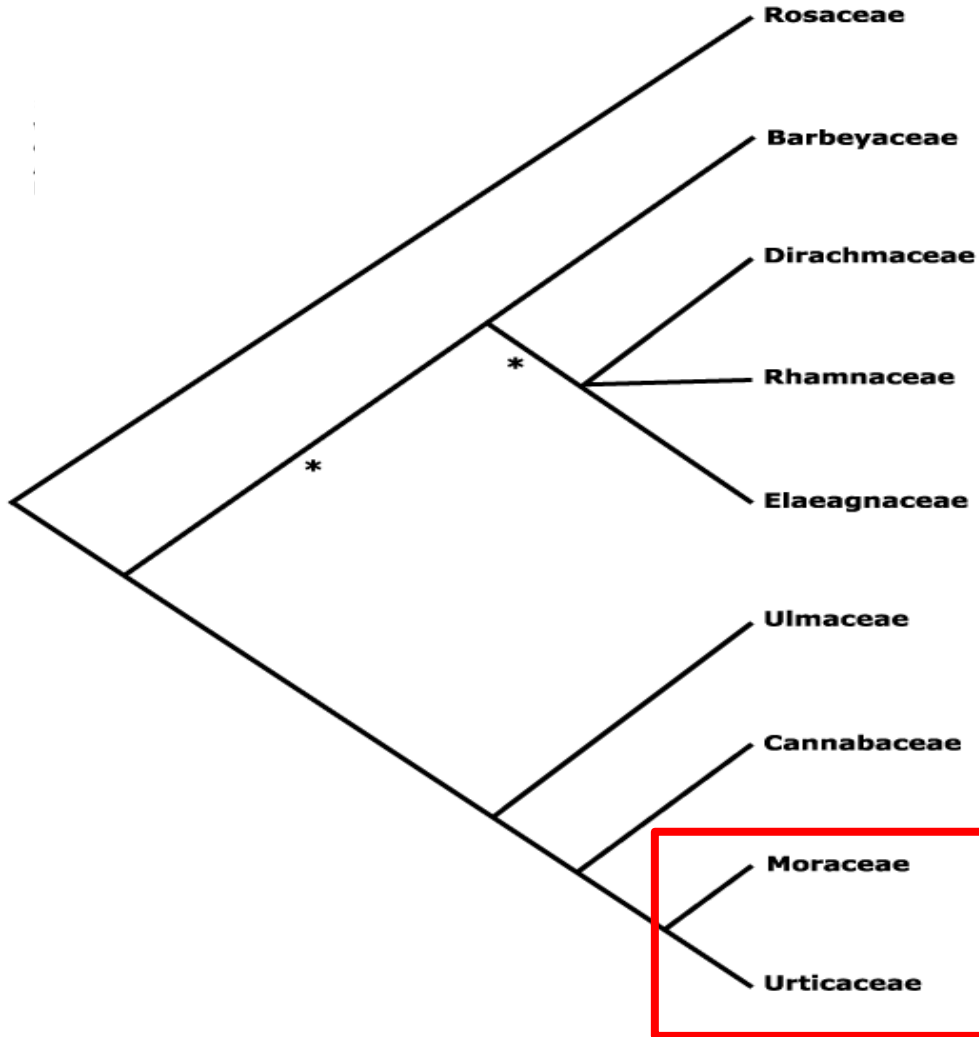


(73)76-94(104) my

Unplaced Taxa

Stevens, P. F. (2001 onwards). Angiosperm Phylogeny Website. Version 12, July 2012 [and more or less continuously updated since]. will do. <http://www.mobot.org/MOBOT/research/APweb/>

Stevens, P. F. (2001 onwards). Angiosperm Phylogeny Website. Version 12, July 2012 [and more or less continuously updated since]." will do.
<http://www.mobot.org/MOBOT/research/APweb/>



Stamens incurved in bud, latex system, no synapomorphies for Urticaceae or Moraceae



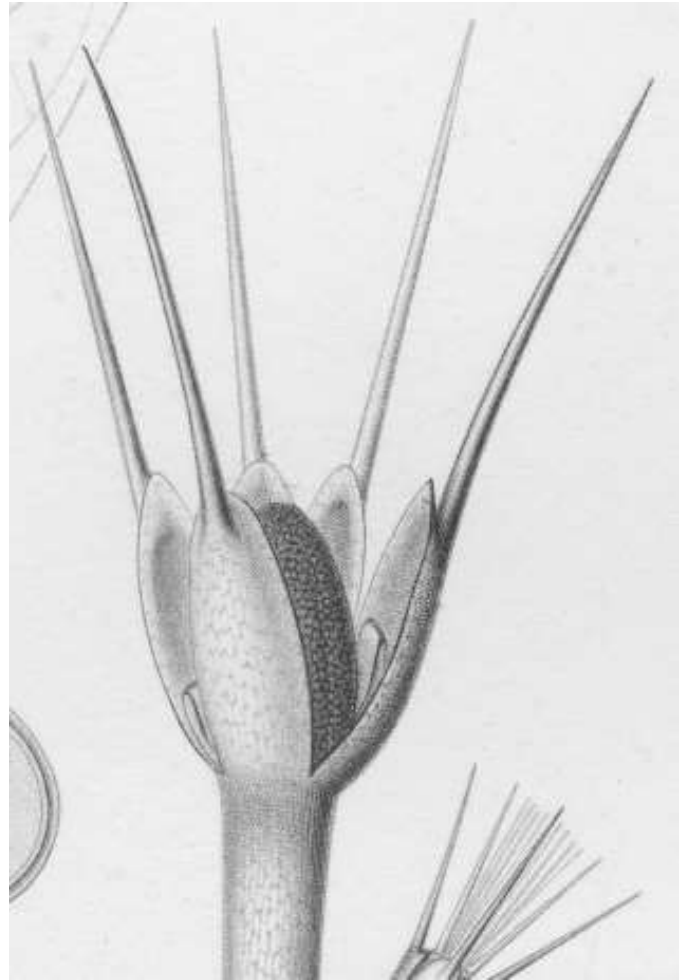


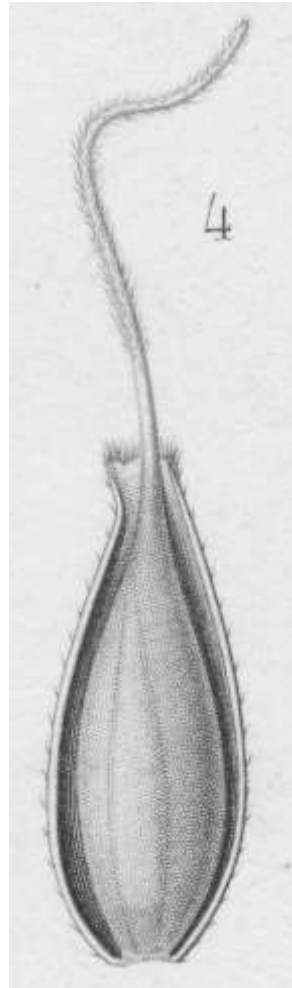
Cecropia obtusifolia

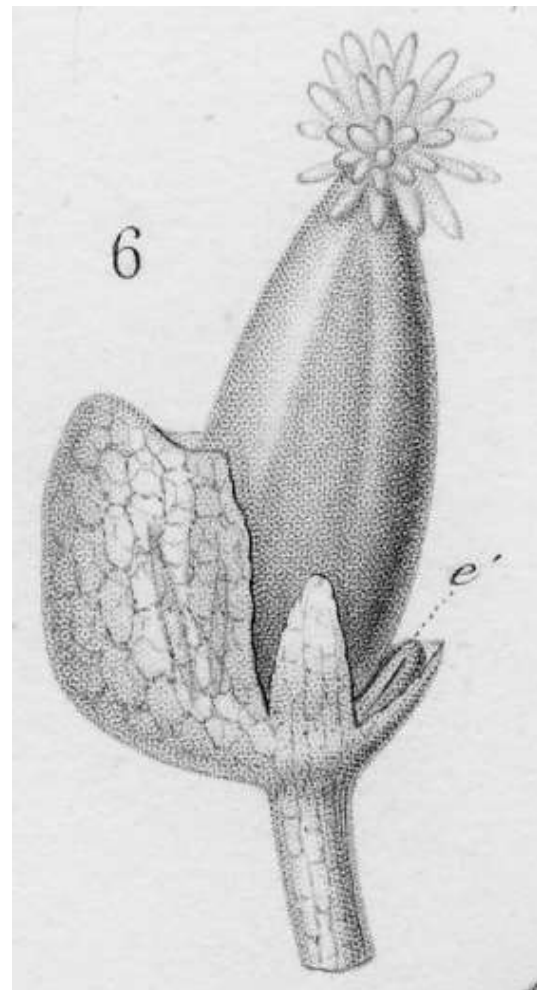


Urtica australis









Variation in inflorescence form





Pilea microphylla



Myriocarpa longipes

Myrianthus holstii



Poikilospermum suaveolens

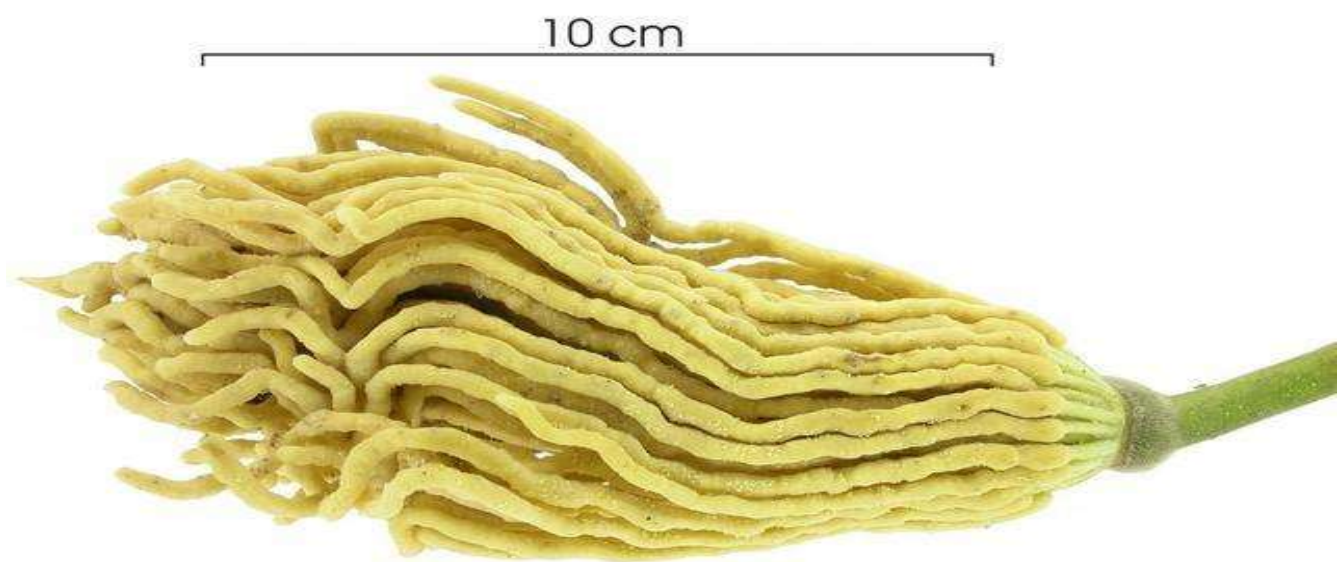




Elatostema sp.

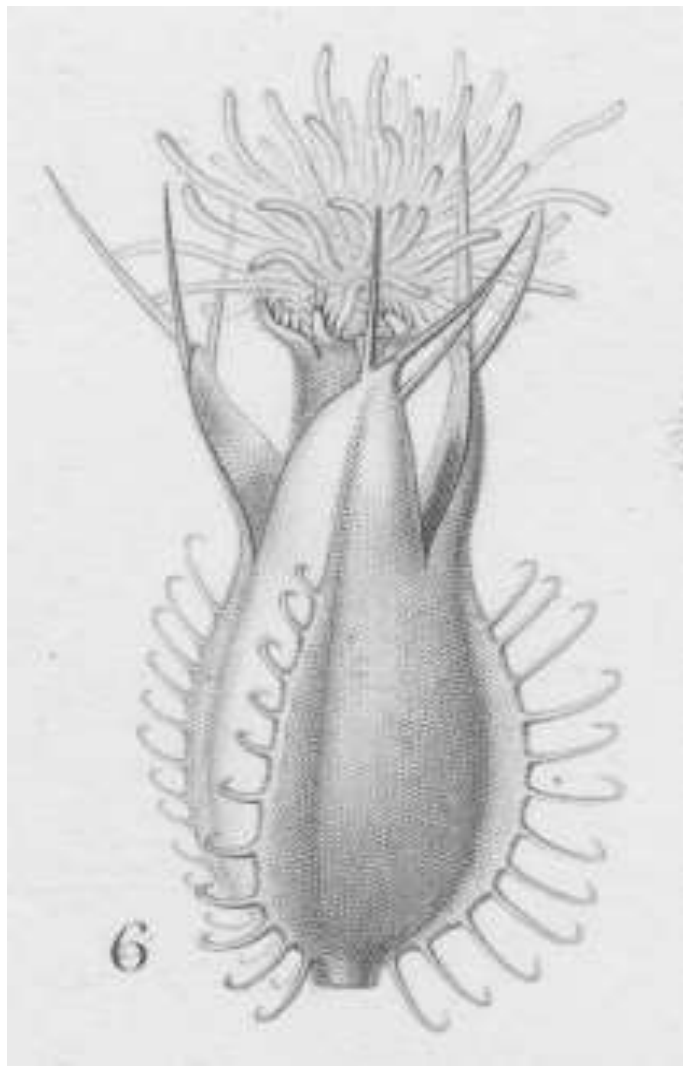






Cecropia obtusifolia

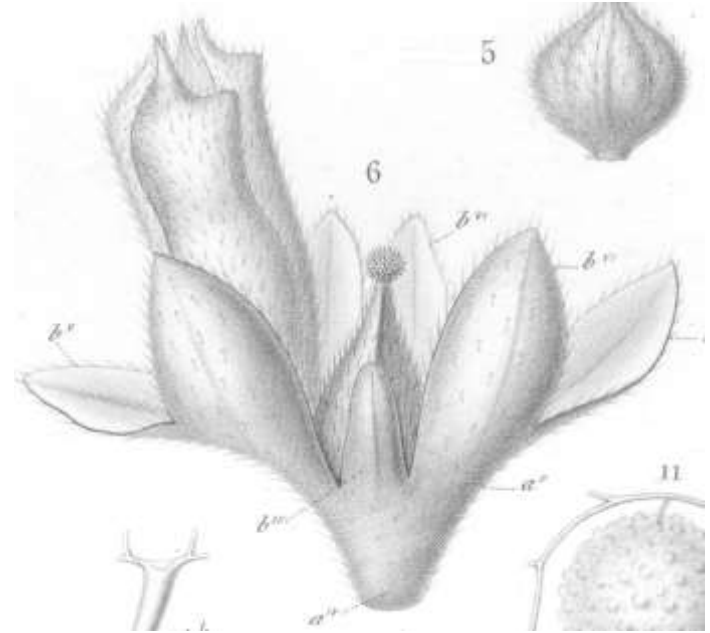
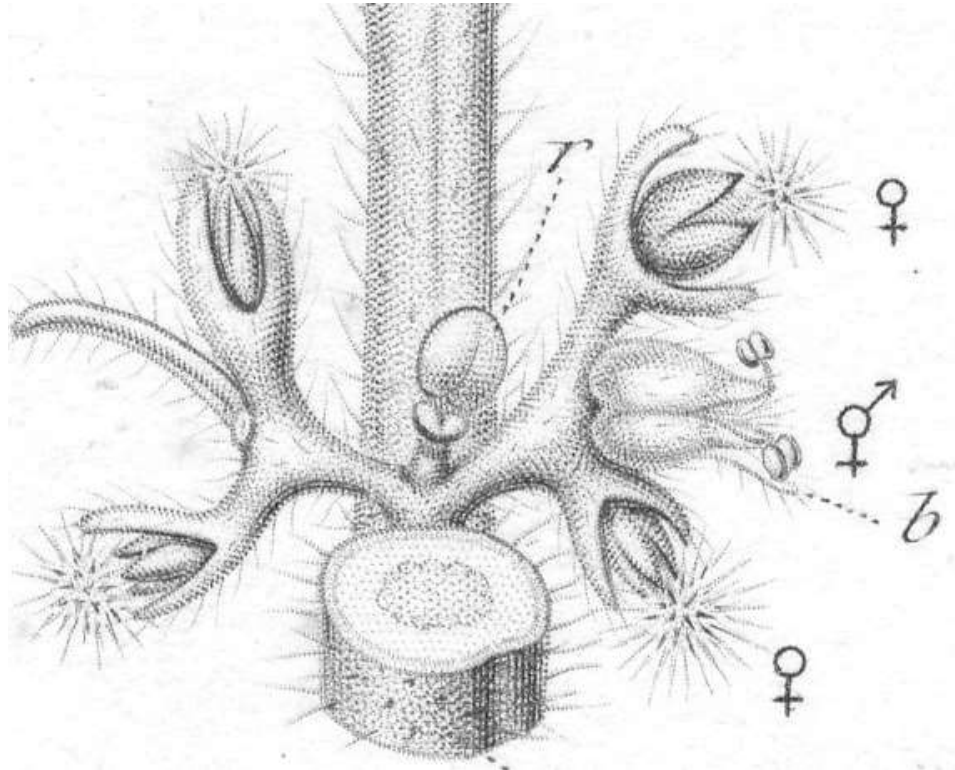
Soleirolia soleirolia

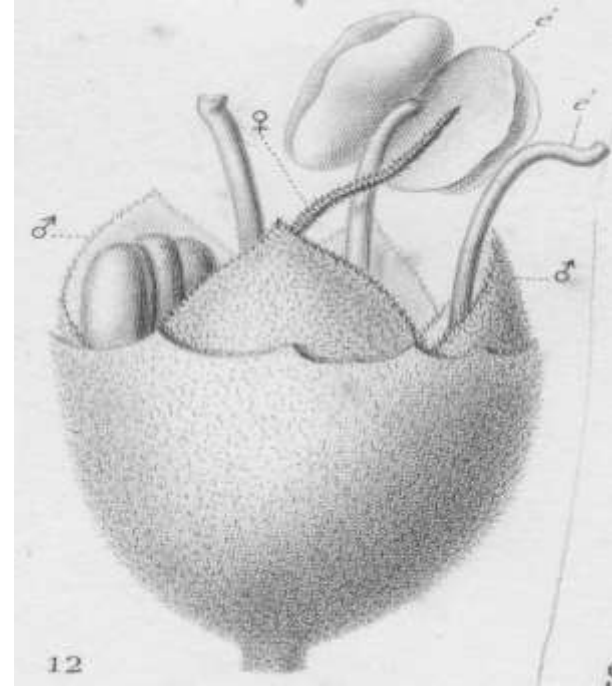
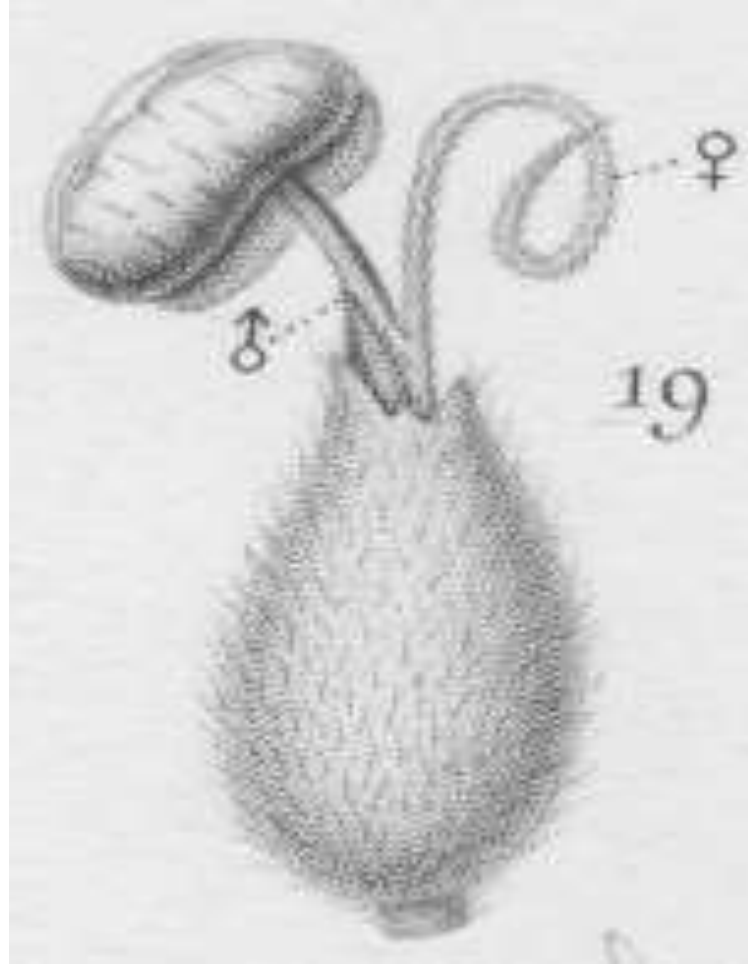
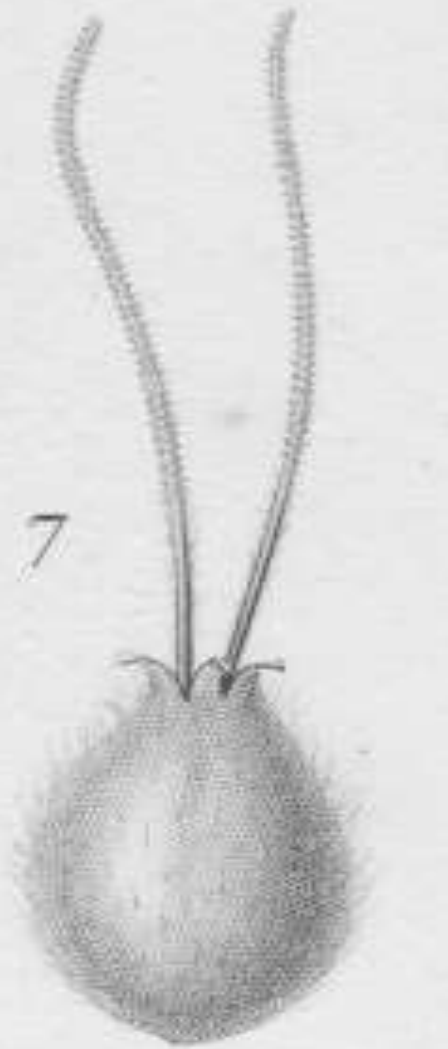




Parietaria judaica

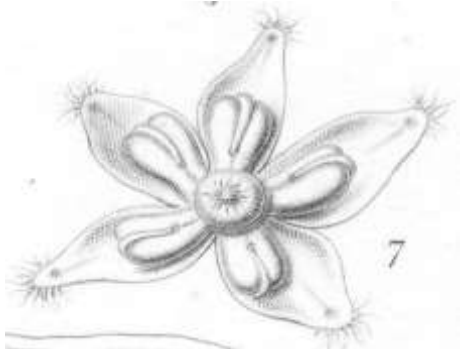
Parietaria debilis



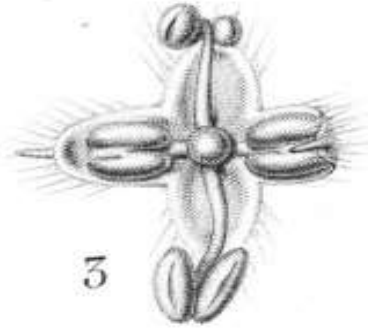


Droguetia iners

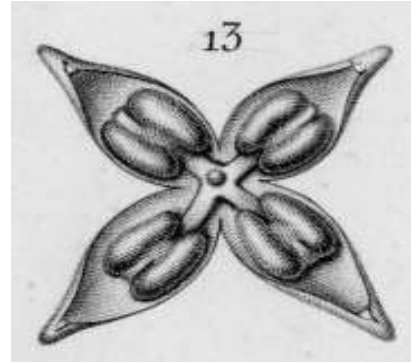
Variation in male flower form



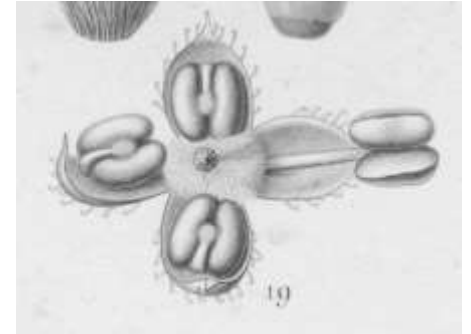
Achudemia japonica



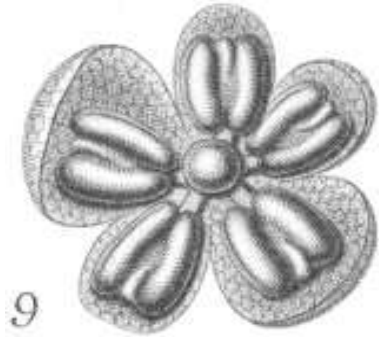
Elatostema sp.



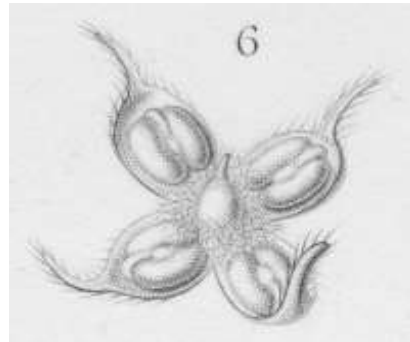
Pilea sp.



Urera sp.



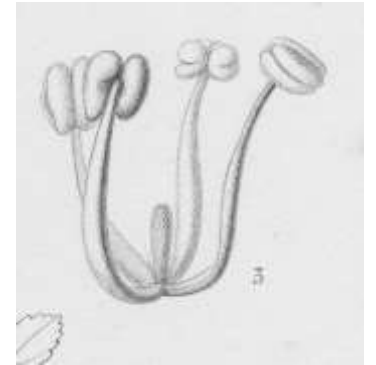
Procris cephalida



Gesnouinia arborea



Australina sp.



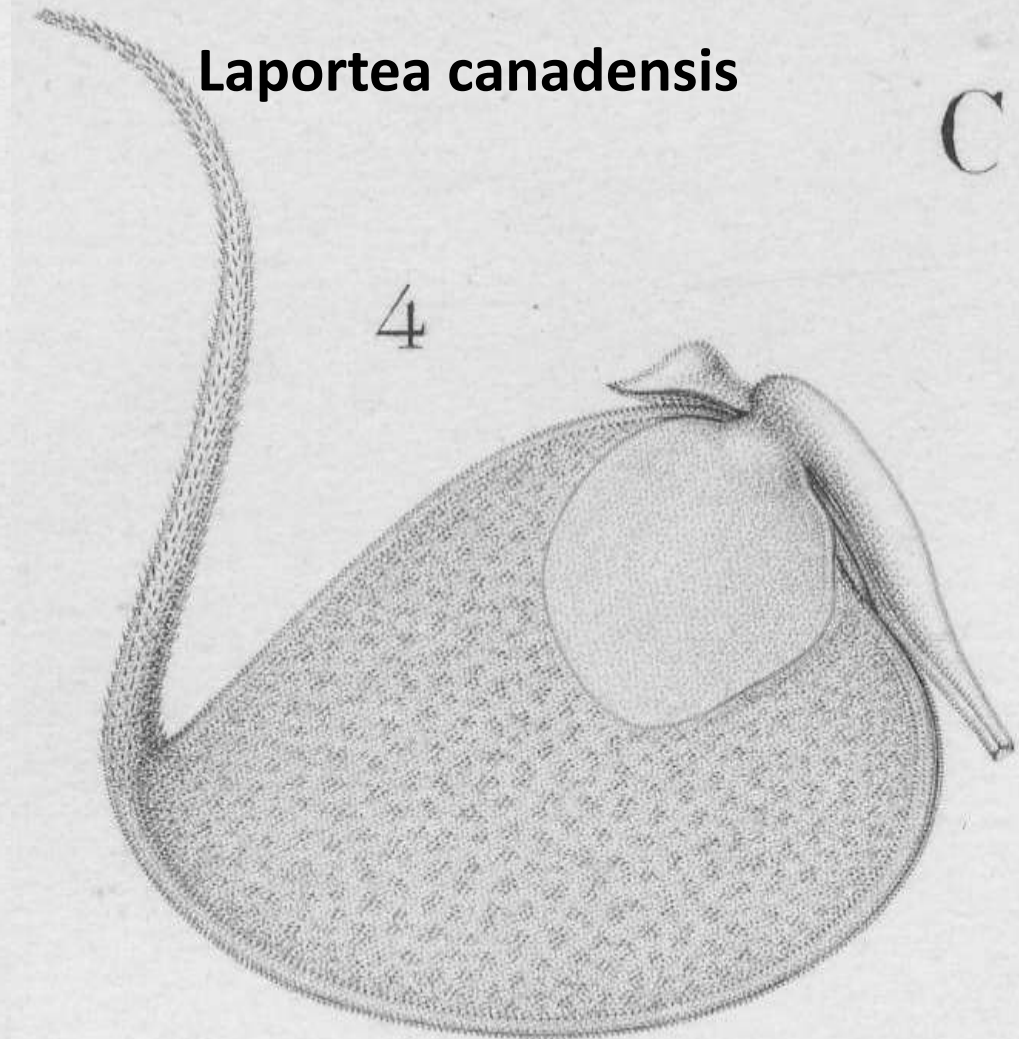
Chamabaina sp.

Laportea canadensis

C



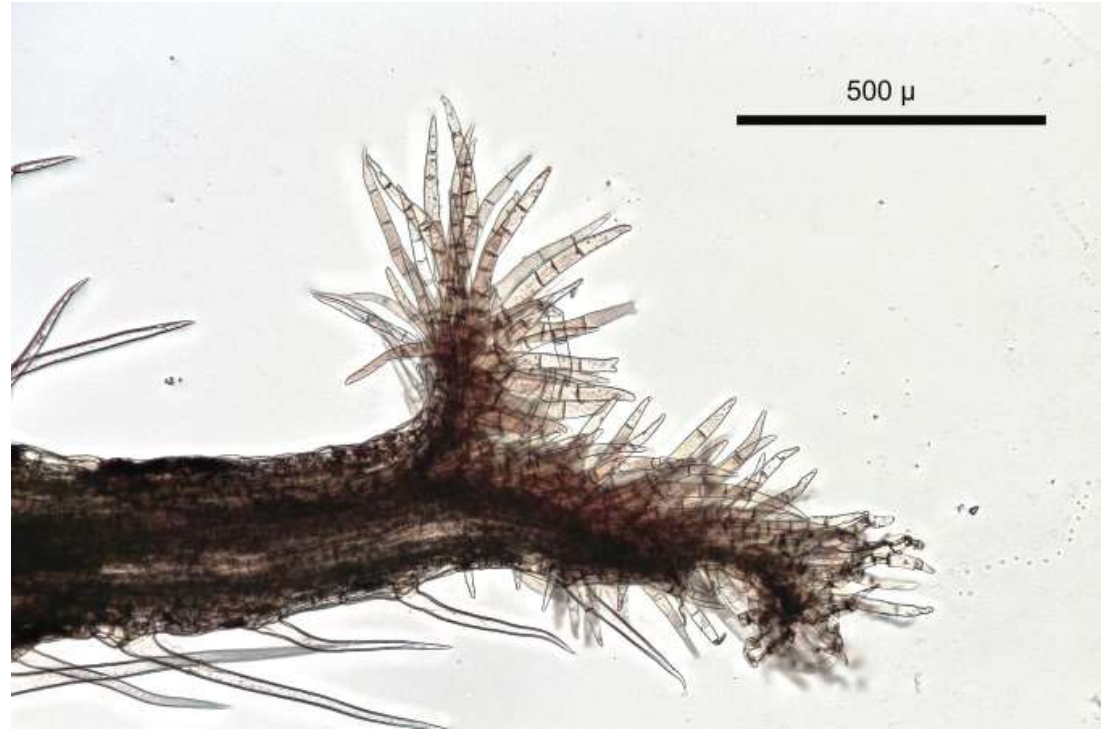
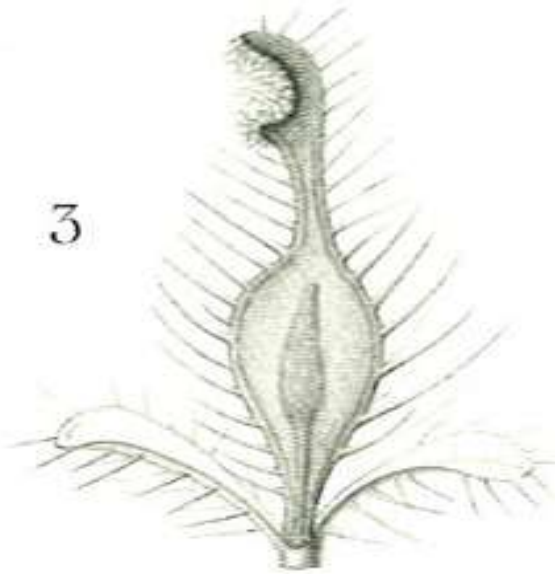
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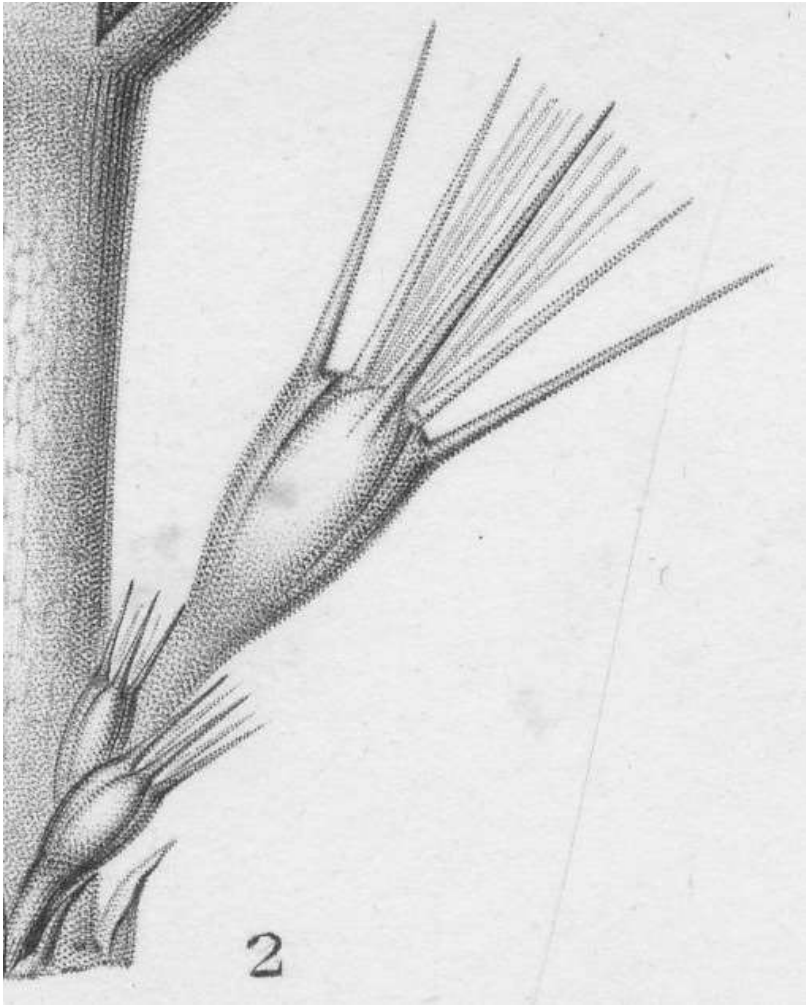
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Myriocarpa longipes

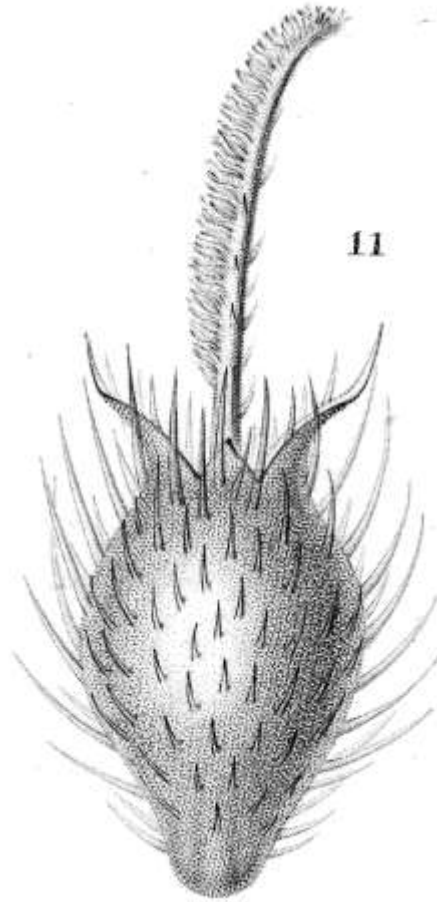
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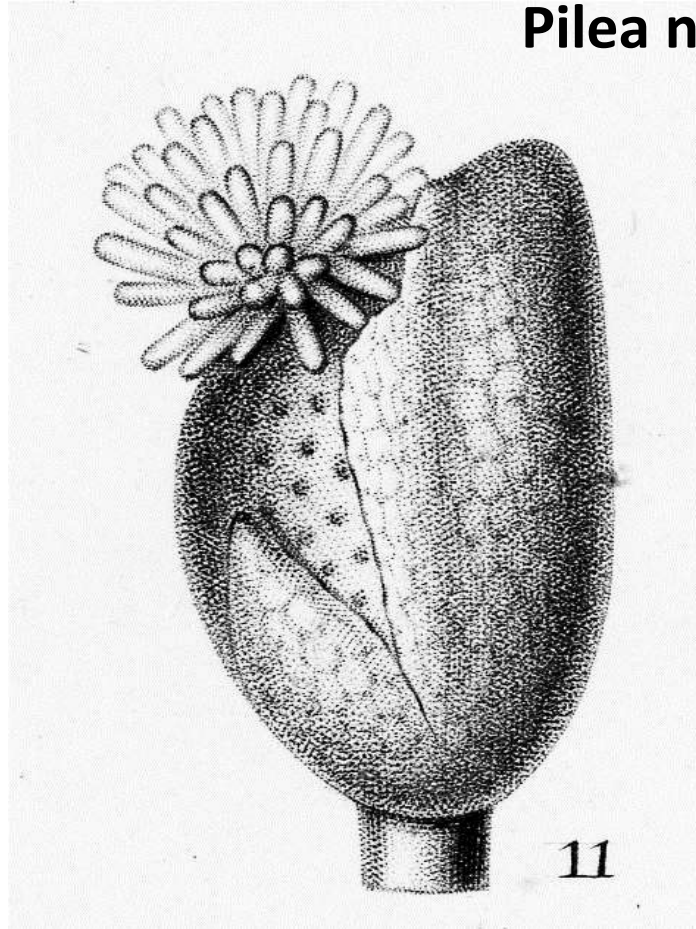
Pellionia elatsetmoides



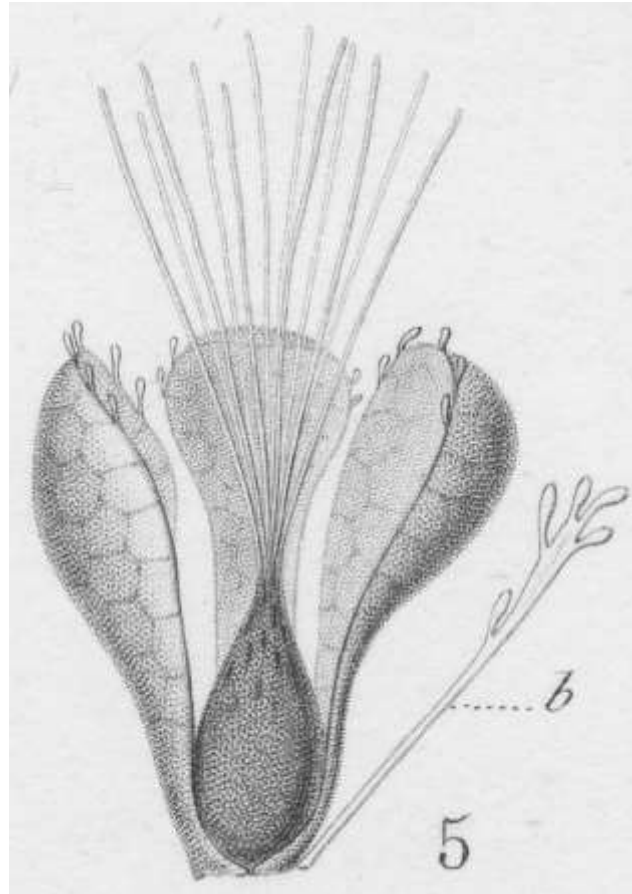
Boehmeria nivea



Pilea nutans



Procris cephalida



Cecropia obtusifolia





Procris wightii

Oreocnide sp.



Gyrotaenia myriocarpa



Urera simplex







Myrianthus holstii



Elatostema sp

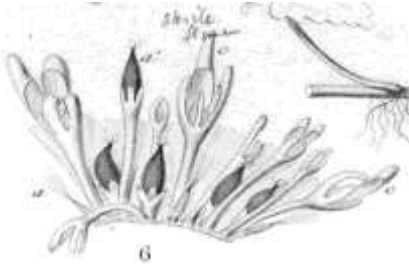
Weddell 1856; Friis 1993



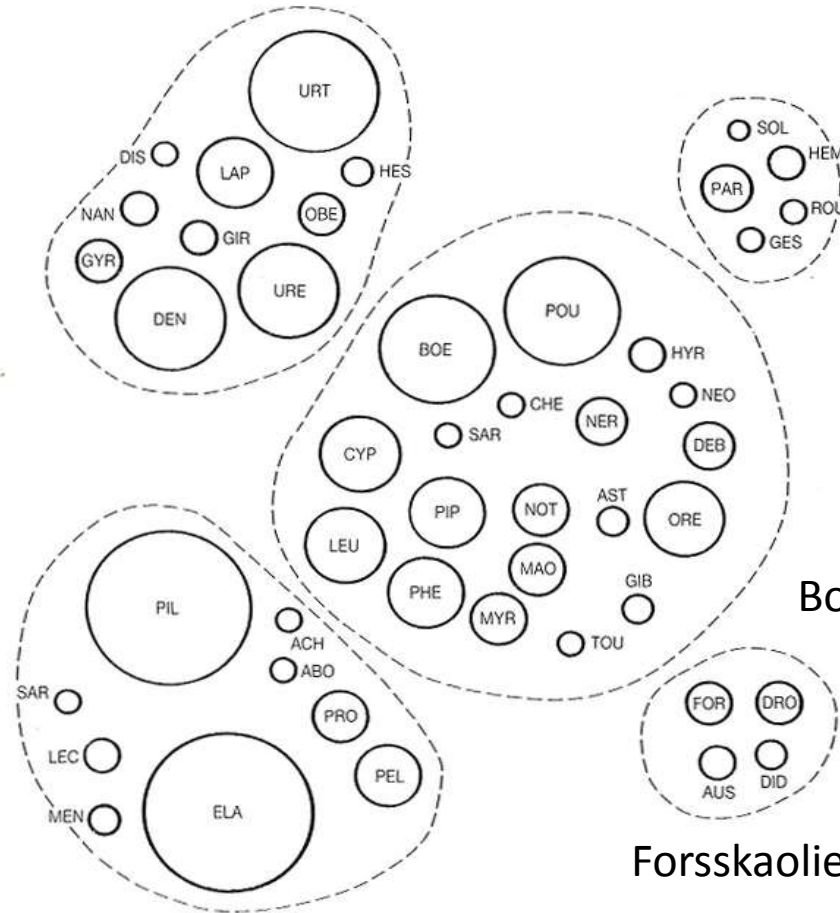
Urticeae



Parietarieae



Elatostemeae



Boehmerieae



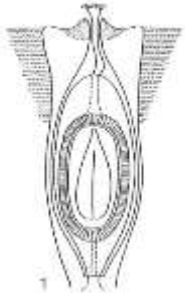
Forsskaolieae



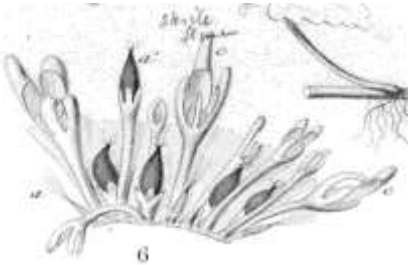
Weddell 1856; Friis 1993



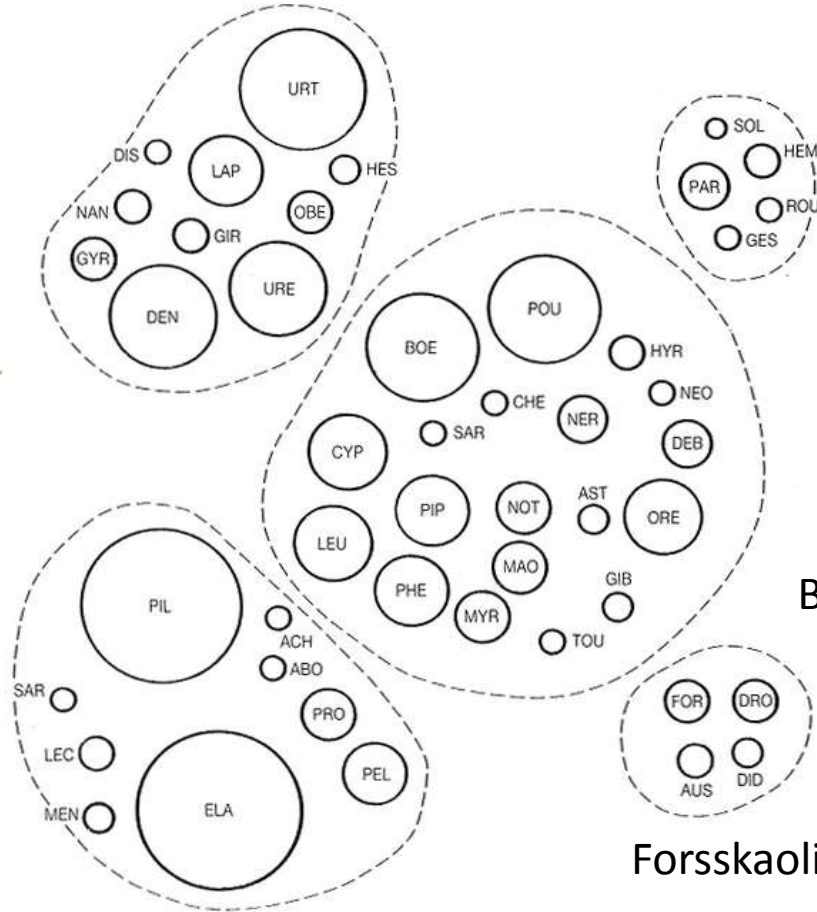
Urticeae



Cecropiaceae?



Elatostemeae



Parietarieae

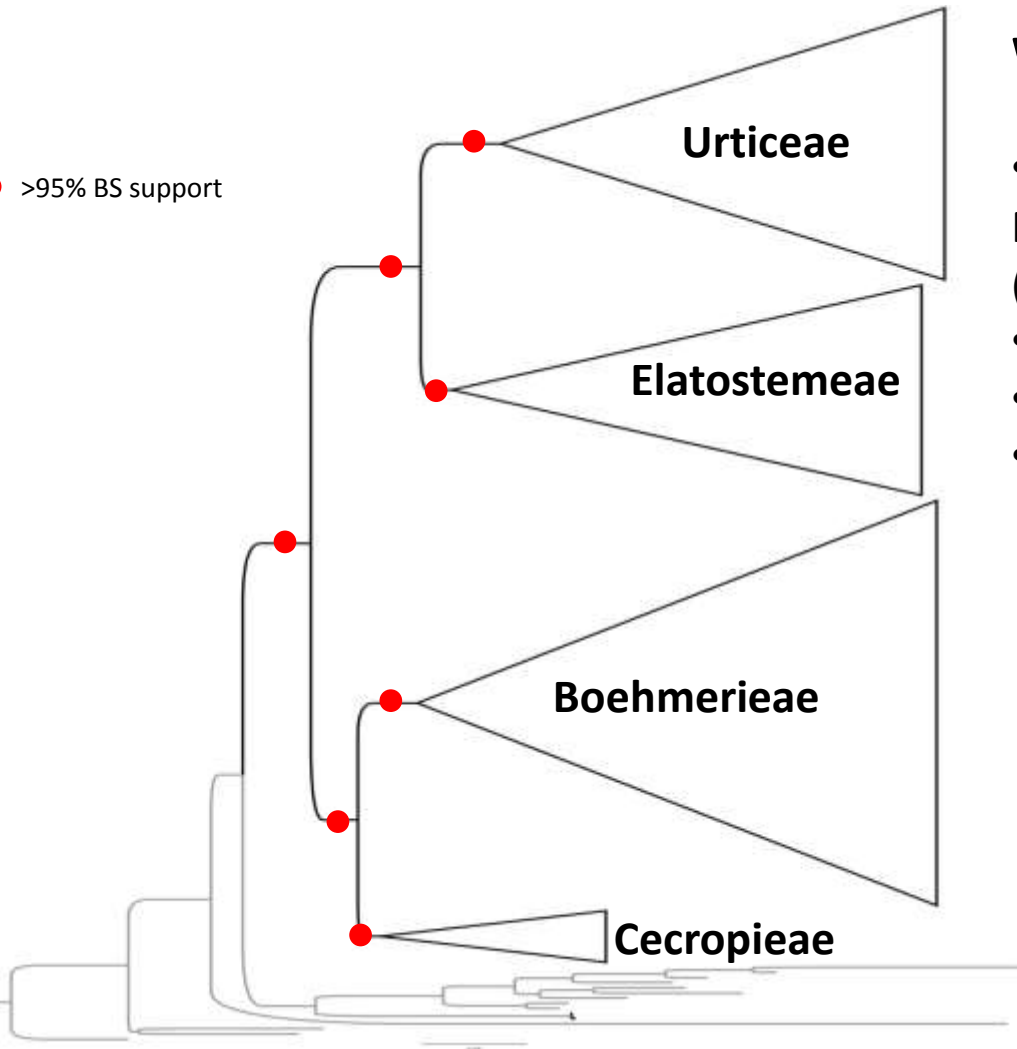


Boehmerieae



Forsskaolieae

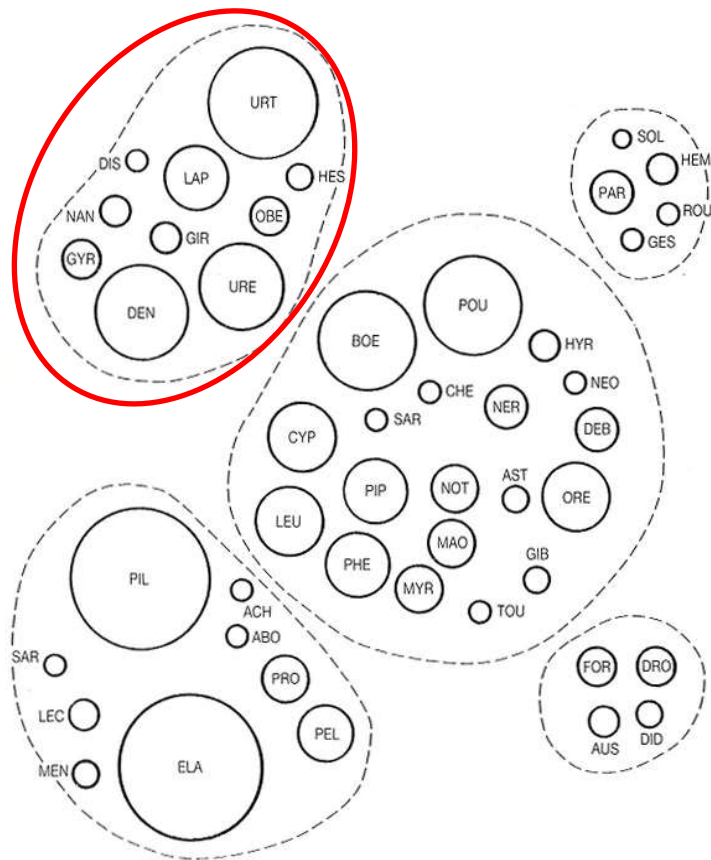
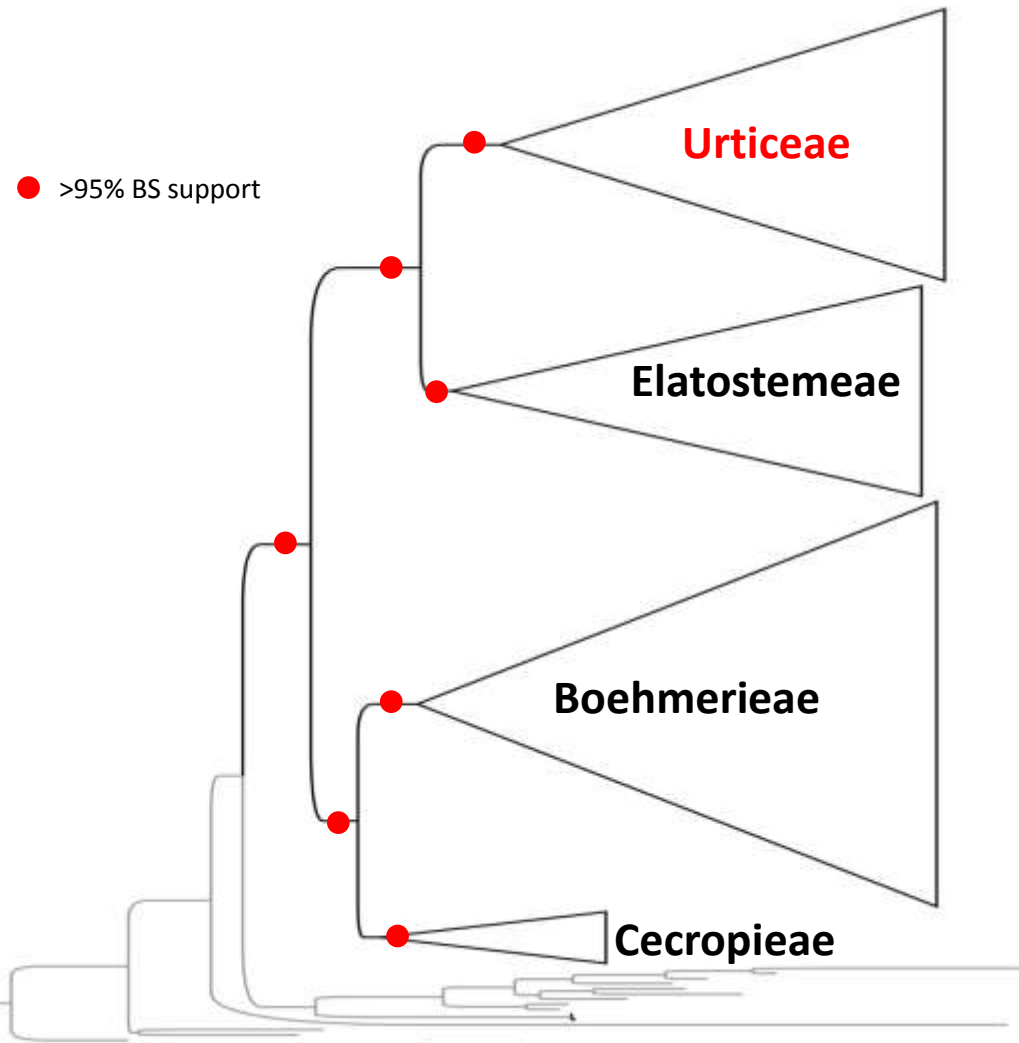
● >95% BS support



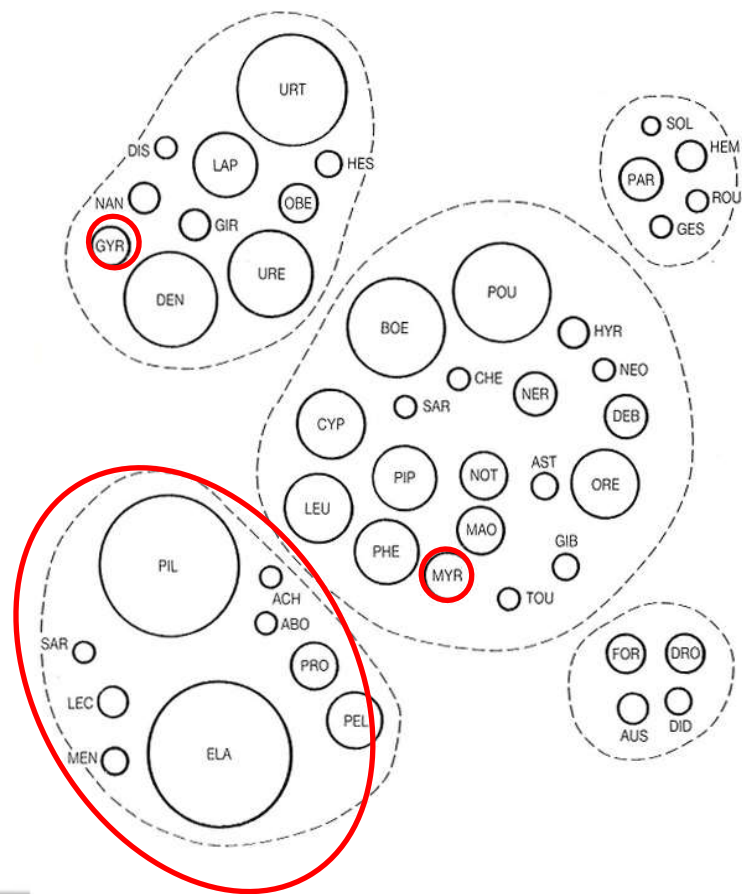
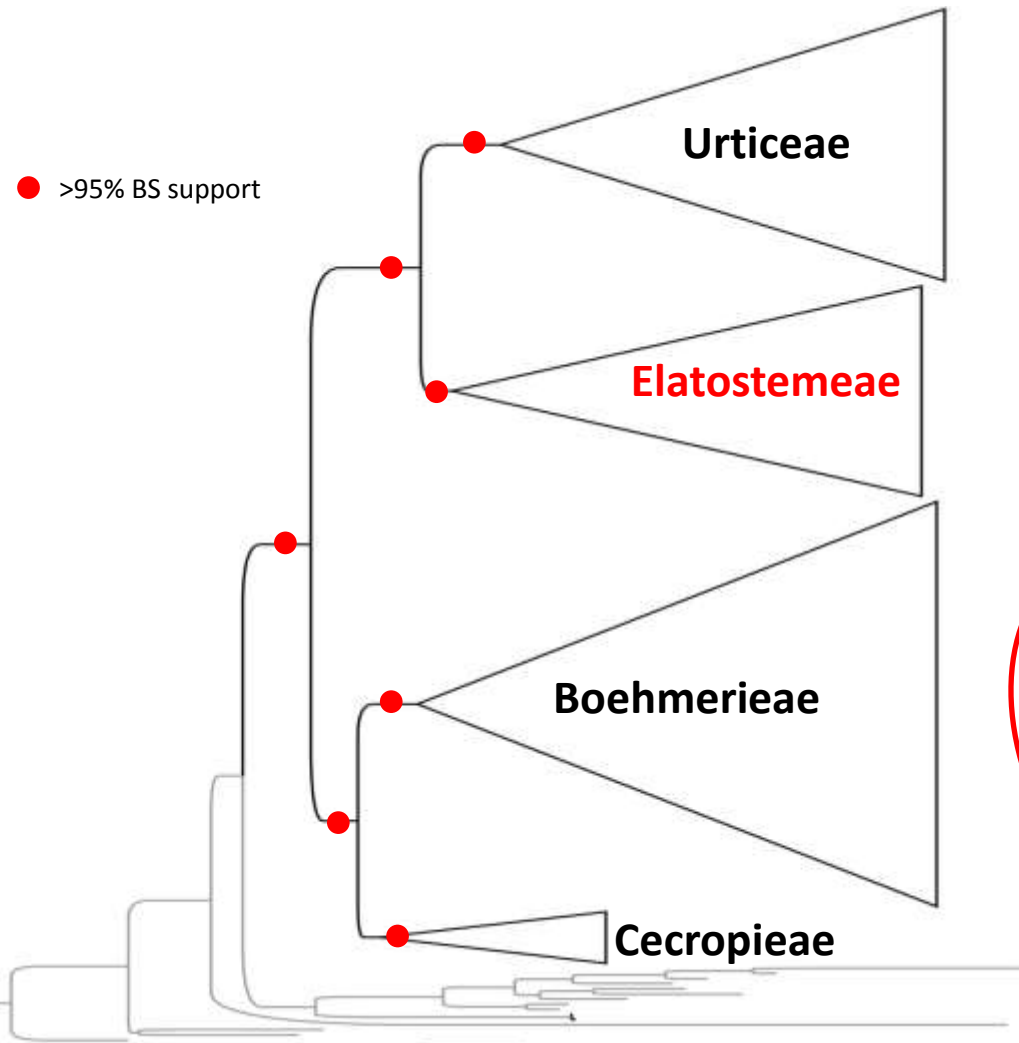
Work in progress

- This follows on from *Wu et al.* Molecular Phylogenetics and Evolution 69 (2013)
- 235 accessions from 49/50 genera
- Eight regions from 3 genomes: cp, nr, n
- RAxML analysis

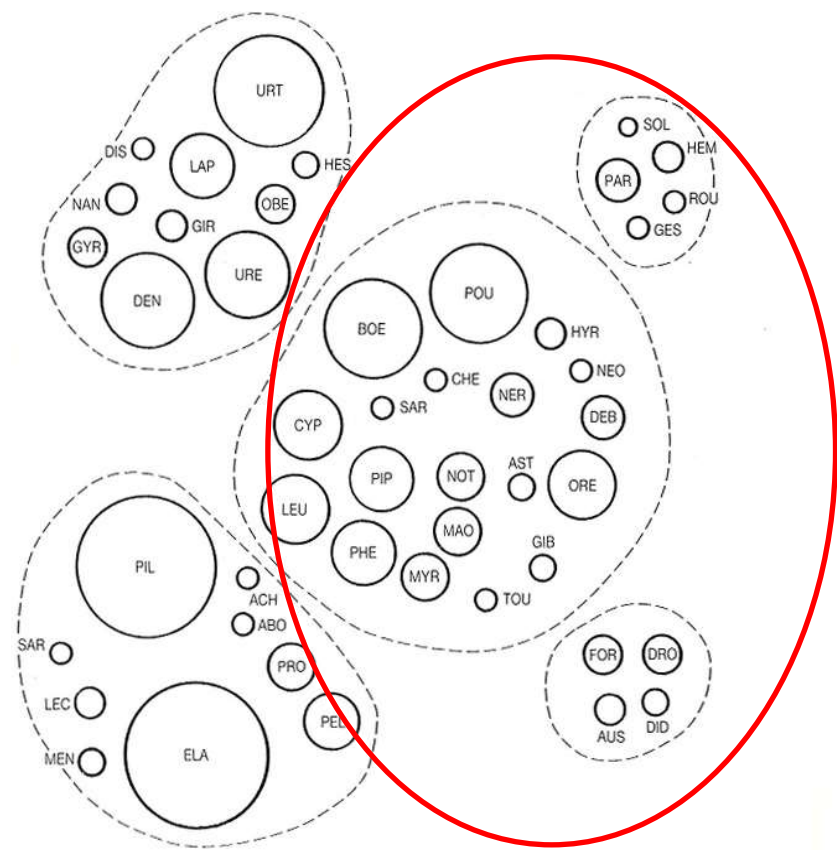
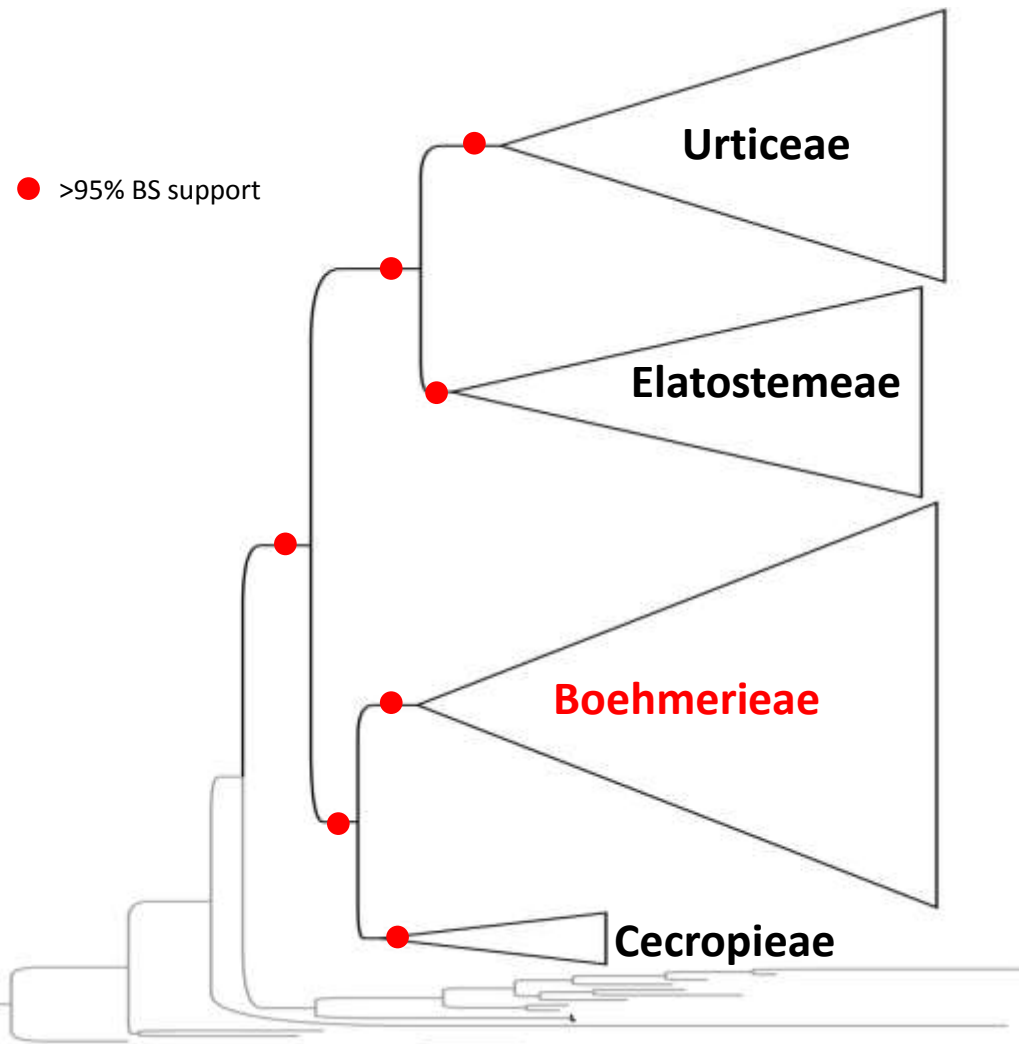
● >95% BS support



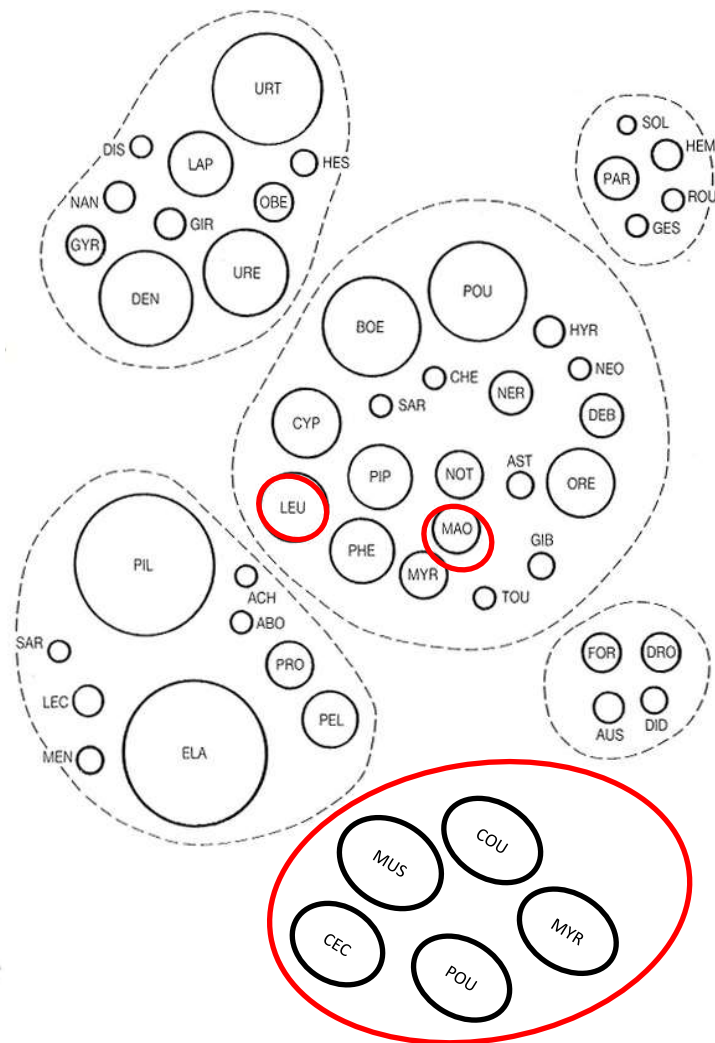
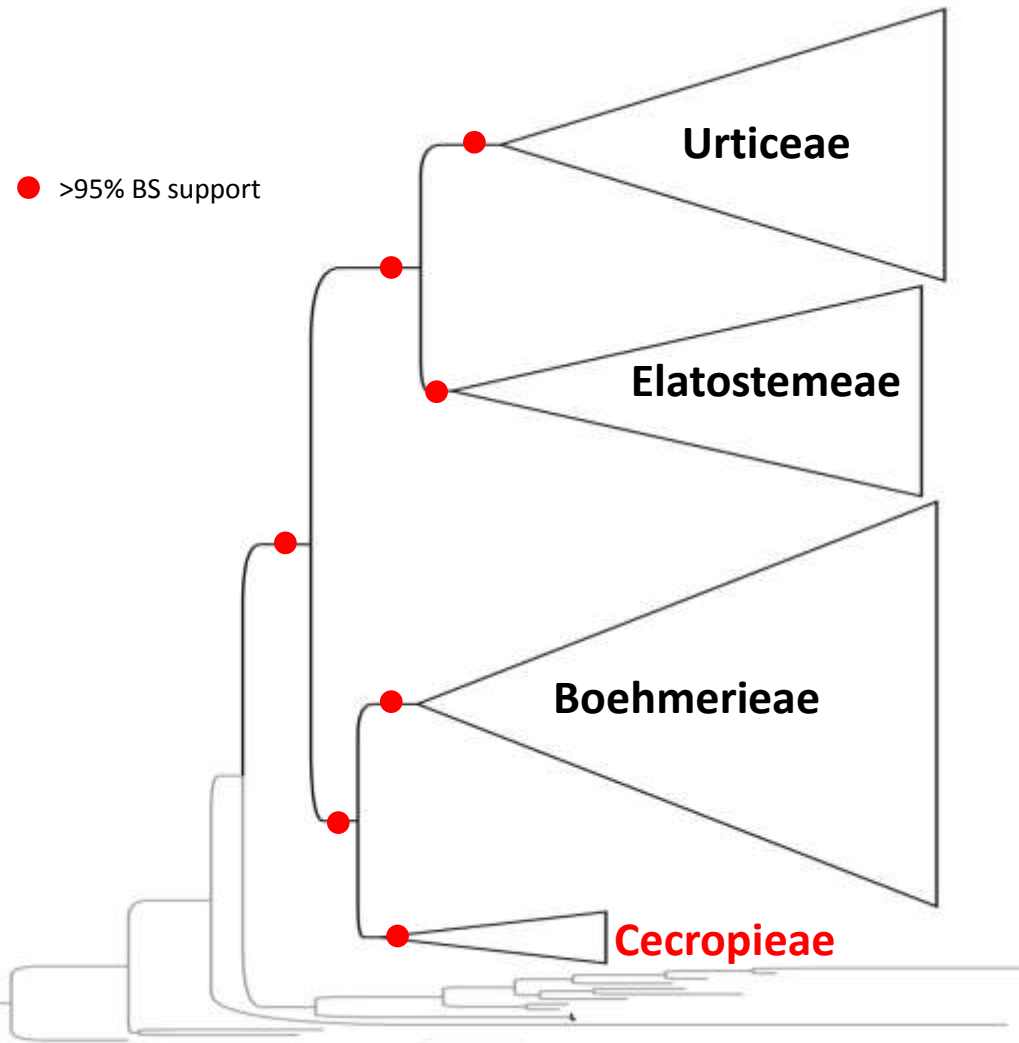
● >95% BS support



● >95% BS support

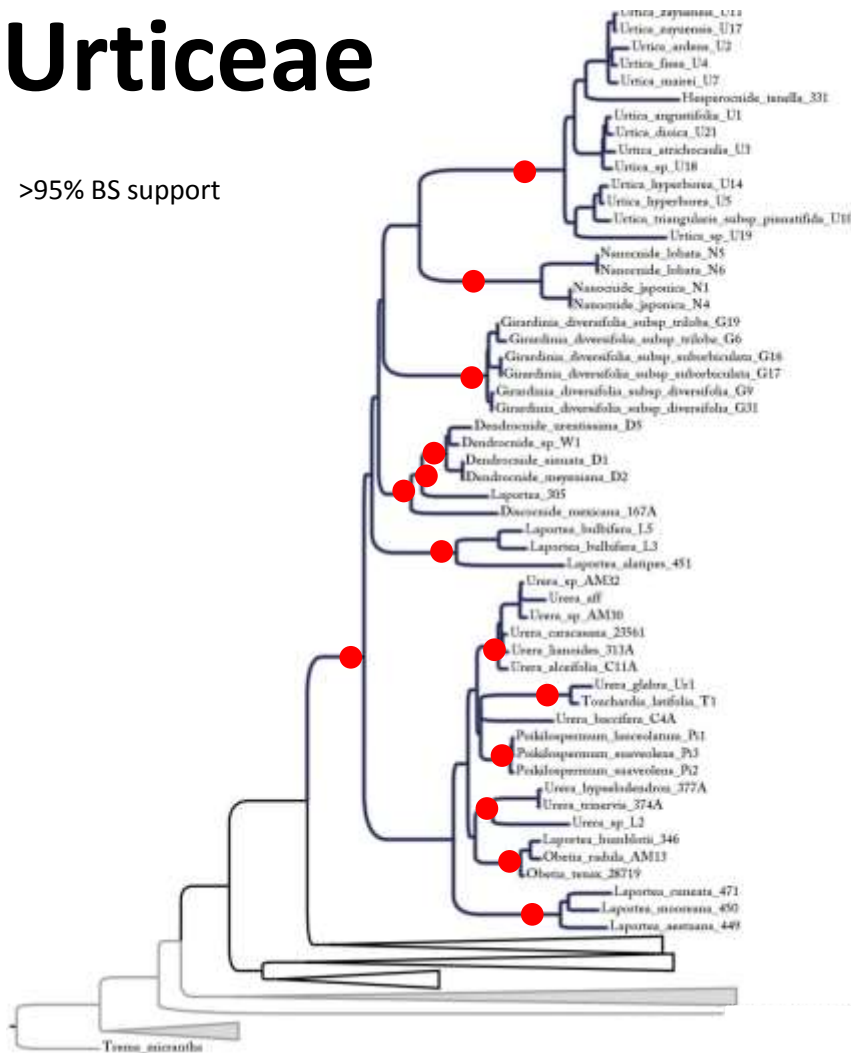


● >95% BS support



Urticeae

● >95% BS support



Urtica

Nanocnide

Girardinia

Dendrocnide

Discocnide

Laportea I

Urea LA

Urea Pacific

Poikilospermum

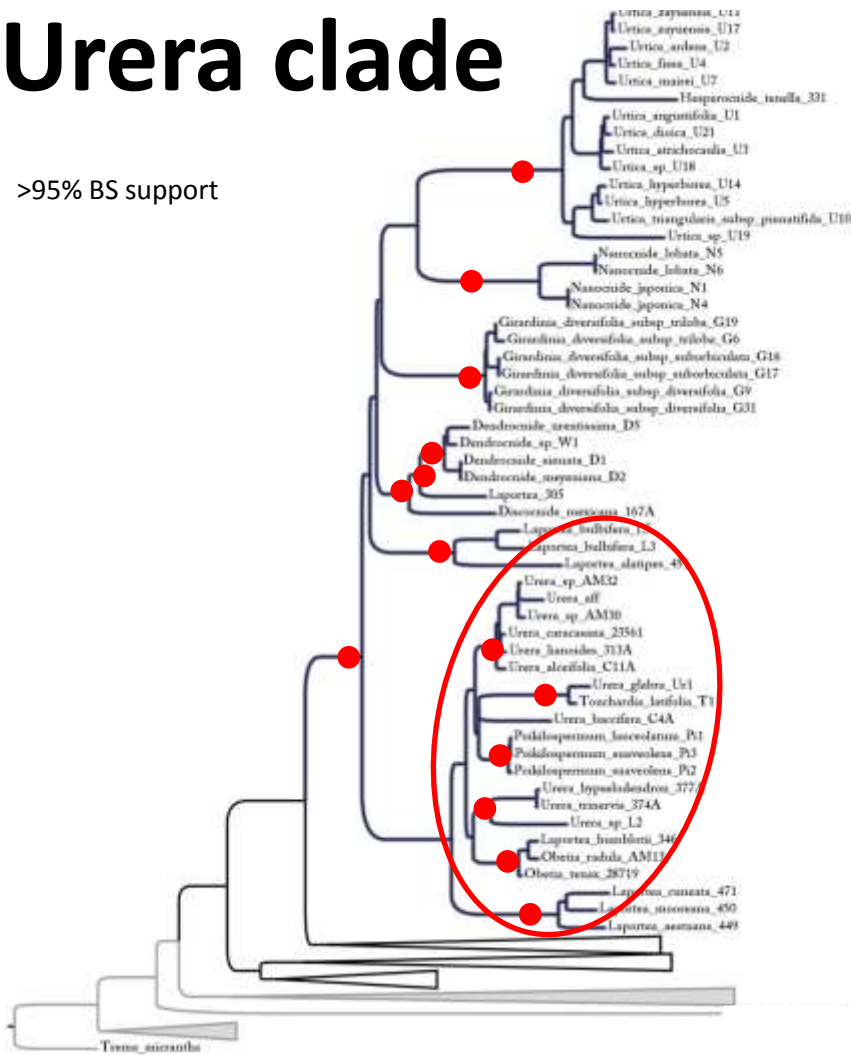
Urea Africa

Laportea II

Laportea III

Urera clade

● >95% BS support



Urera LA

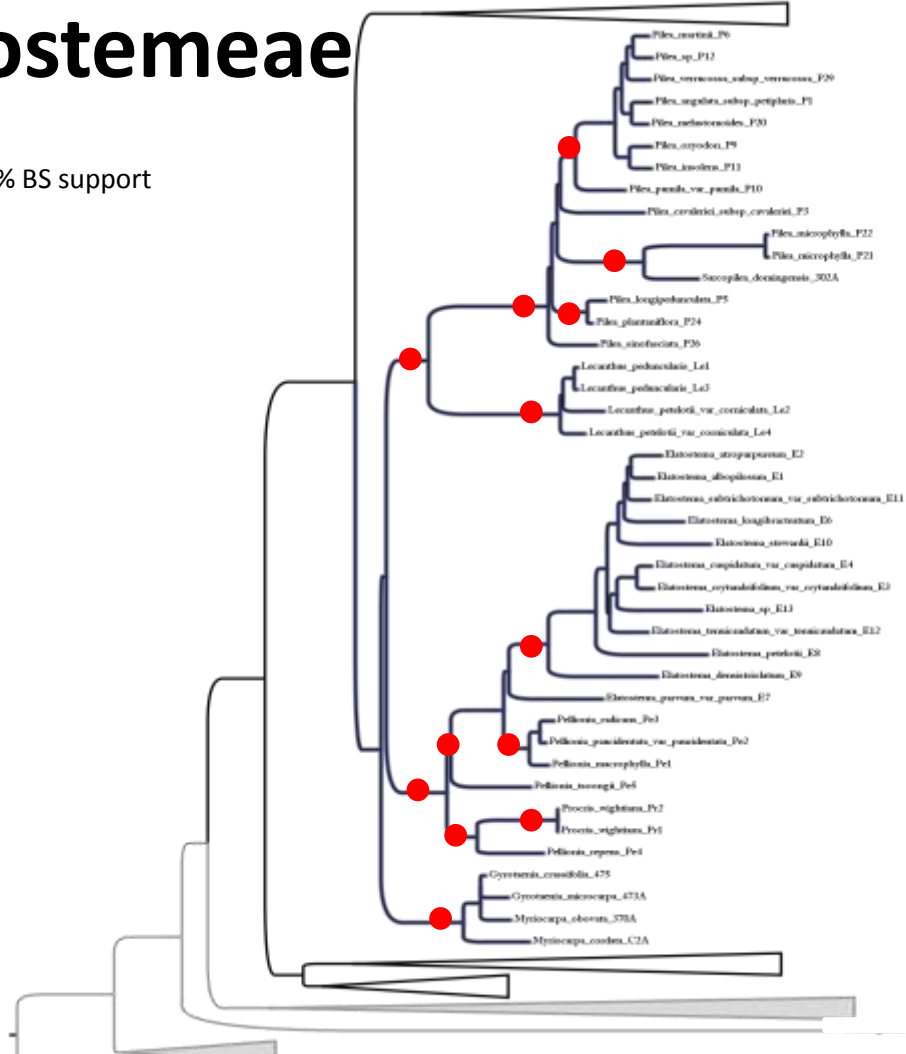
Urera Pacific

Poikilospermum

Urera Africa

Elatostemeae

● >95% BS support



Pilea

Lecanthus

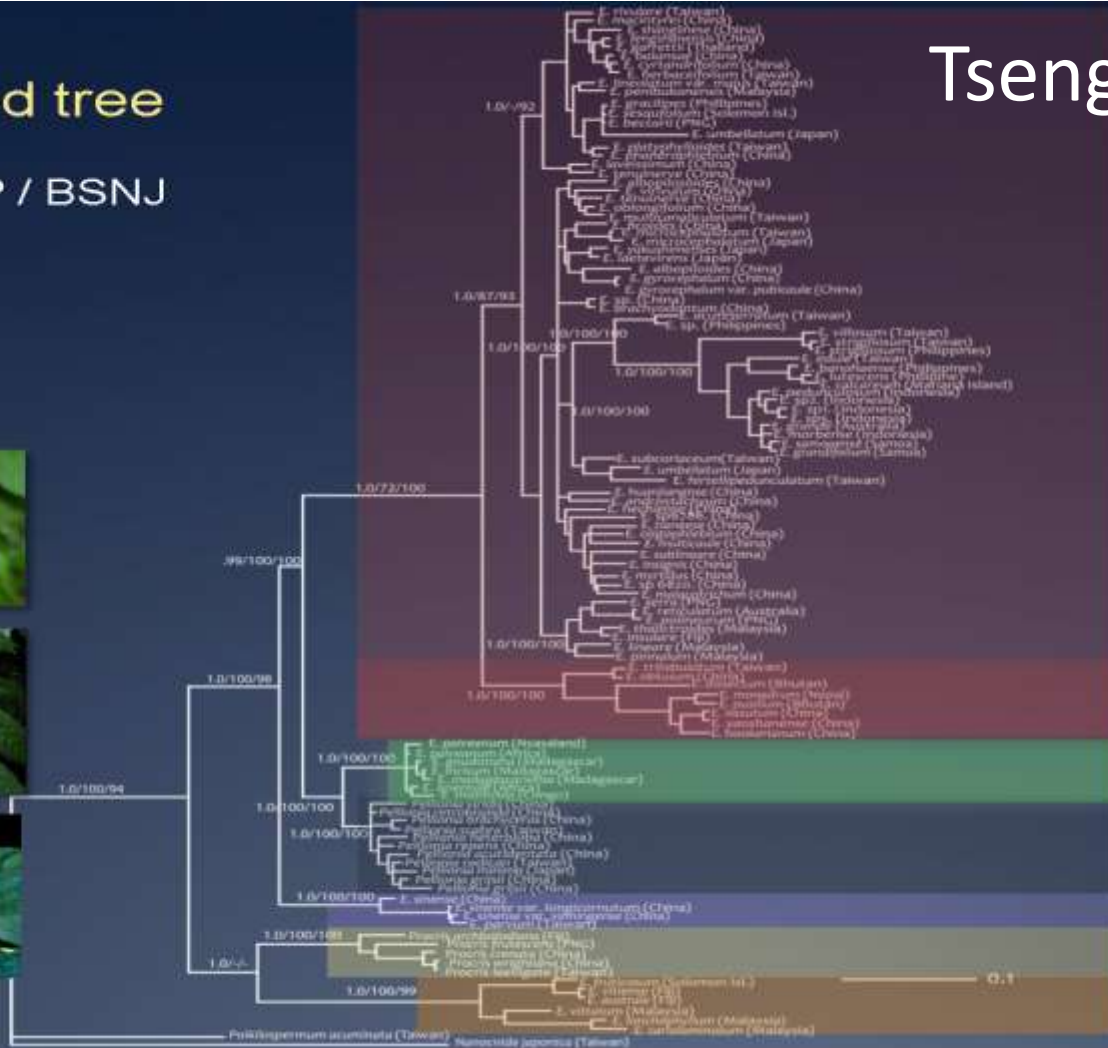
Elatostema / Pellionia / Procris clade

Myriocarpa / Gyrotaenia

Combined tree

BI tree

BI / BSMP / BSNJ



Elatostema

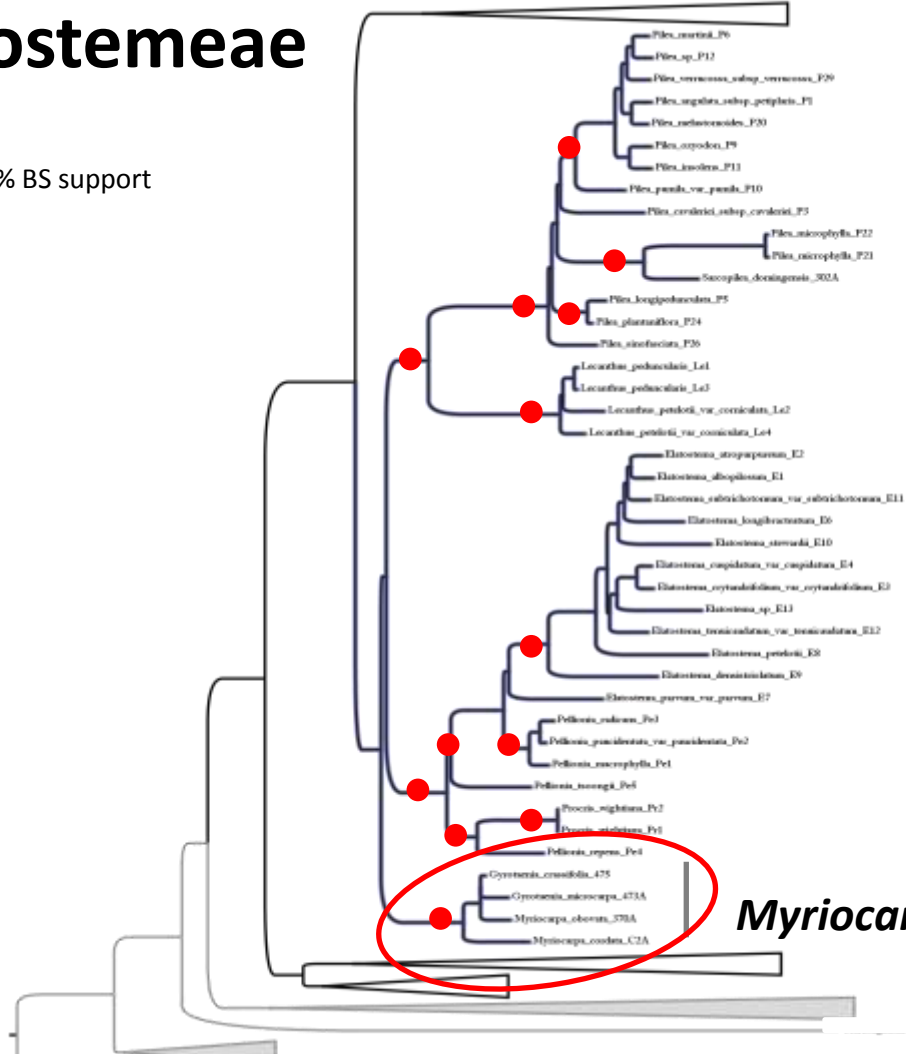
African
Pellionia

Nanophyll
Procris

Elatostematoides

Elatostemeae

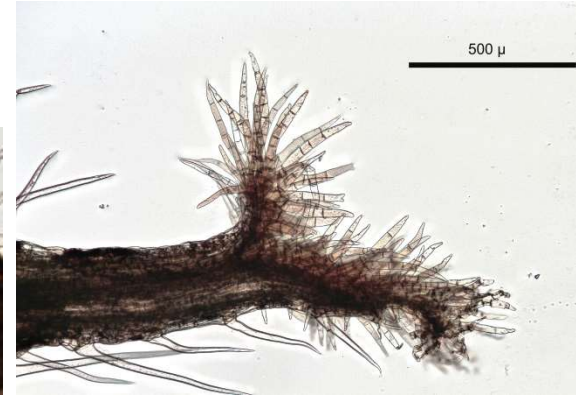
● >95% BS support



Myriocarpa / Gyrotaenia



Gyrotaenia myriocarpa



Myriocarpa obovata

Boehmerieae

Boehmeria

Cypholophus

Boehmeria glomerulifera

Debregeasia

Sarcochlamys *Archiboehmeria*

Boehmeria nivea group

Astrothalamus

Pouzolzia (*Rousselia*, *Hemistylus*, *Neodistemon*)

Gonostegia

Pipturus (Nothocnide)

Neraudia

Pouzolzia sanguinea group

Chamabaina

Phenax

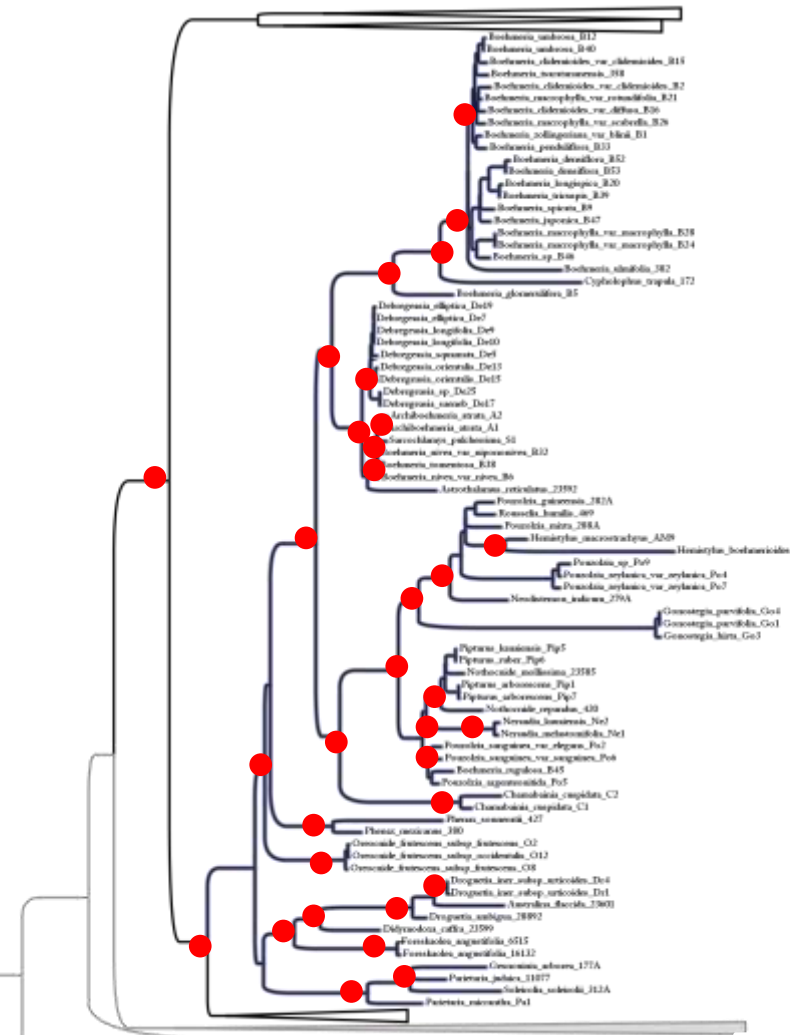
Oreocnide

Australina (*Droguetia*)

Didymodoxa

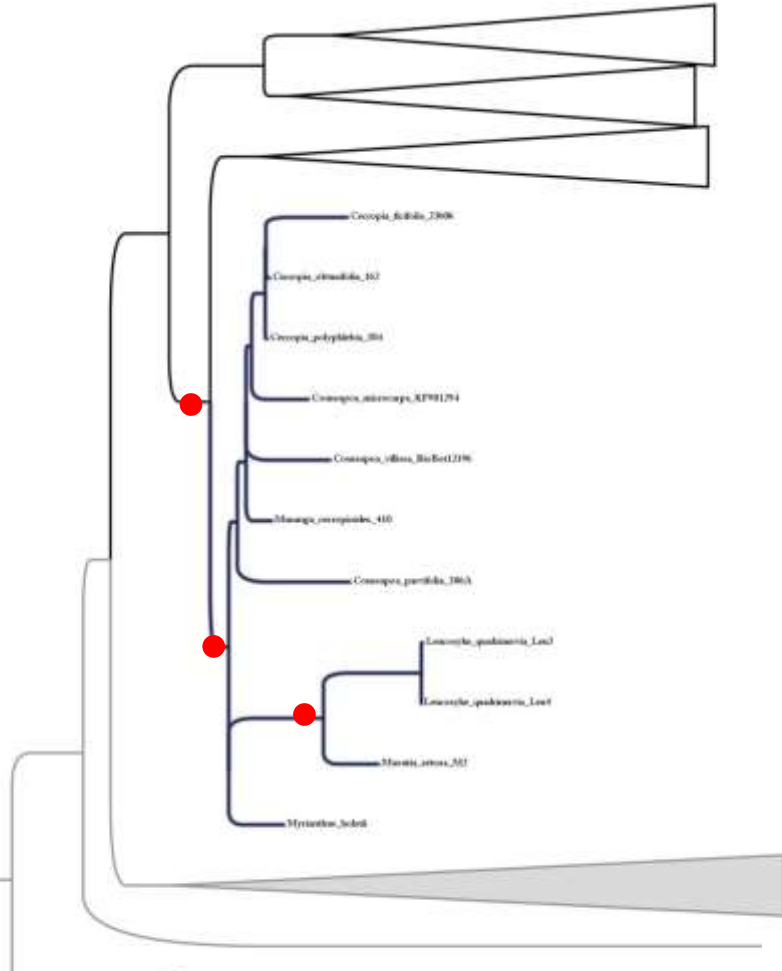
Forsskaolea

Parietaria (*Soleirolia*, *Gesnouinia*)





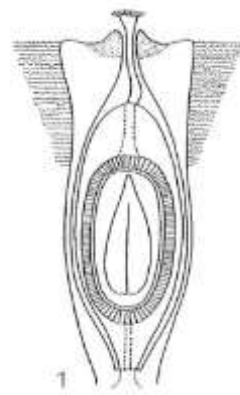
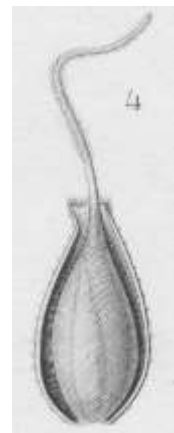
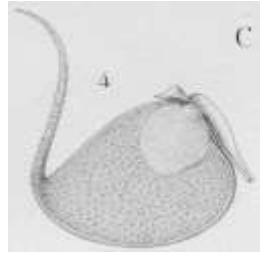
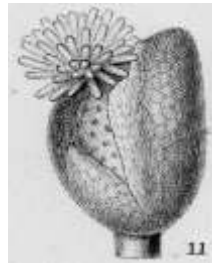
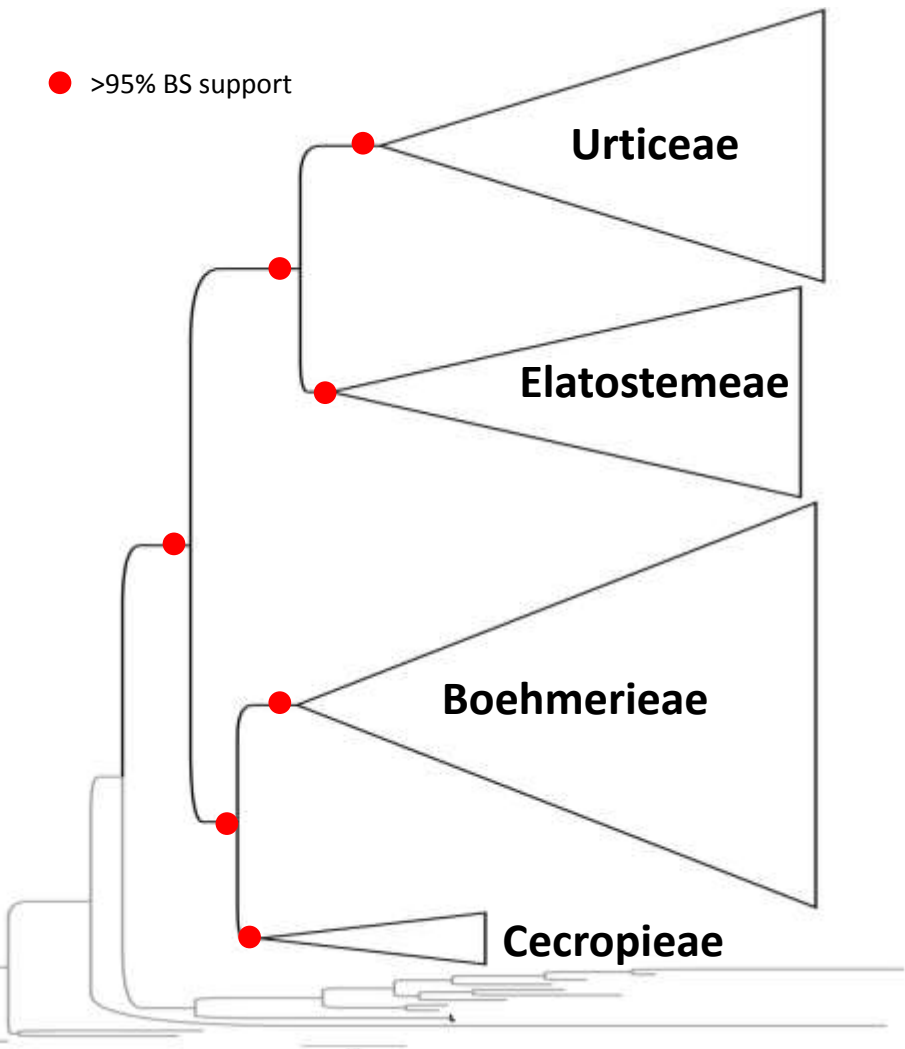
Cecropieae



Unresolved: *Cecropia* / *Coussapea* /
Musanga / *Myrianthus* / *Maoutia* /
Leucosyke



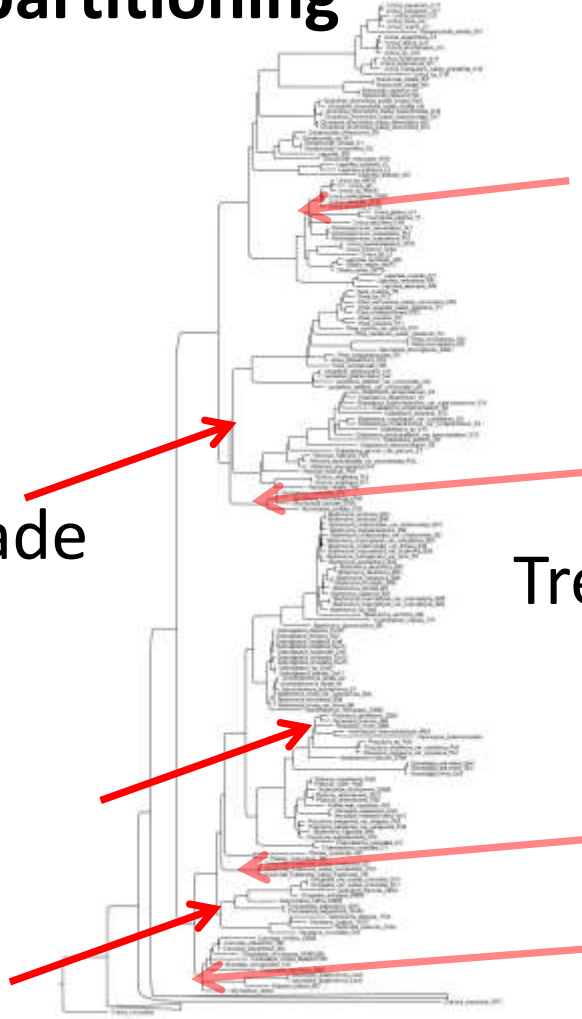
● >95% BS support



Future Directions

- Generate a dated ultrametric tree based on a revision of known fossils
- Test hypotheses about:
 - drivers female flower / inflorescence
 - drivers of ecological partitioning
 - drivers of species-richness focussing on colonisation of karsts

Drivers of ecological partitioning



Succulent herbs \approx shade specialists

Trees \approx Pioneer species

Drivers of species-richness

Pilea ca 700 sp
Elatostema 500-1000 sp









Thanks to

**Zhengwan Wu, Sven Buerki, Jacquie Ujetz, Steve
Russell, Wei Yi-Gang, Li De Zhu, Curators at BM, K,
KIB, MO, INB, HAJB, PE**



Hugh Algernon Weddell
1819-1877

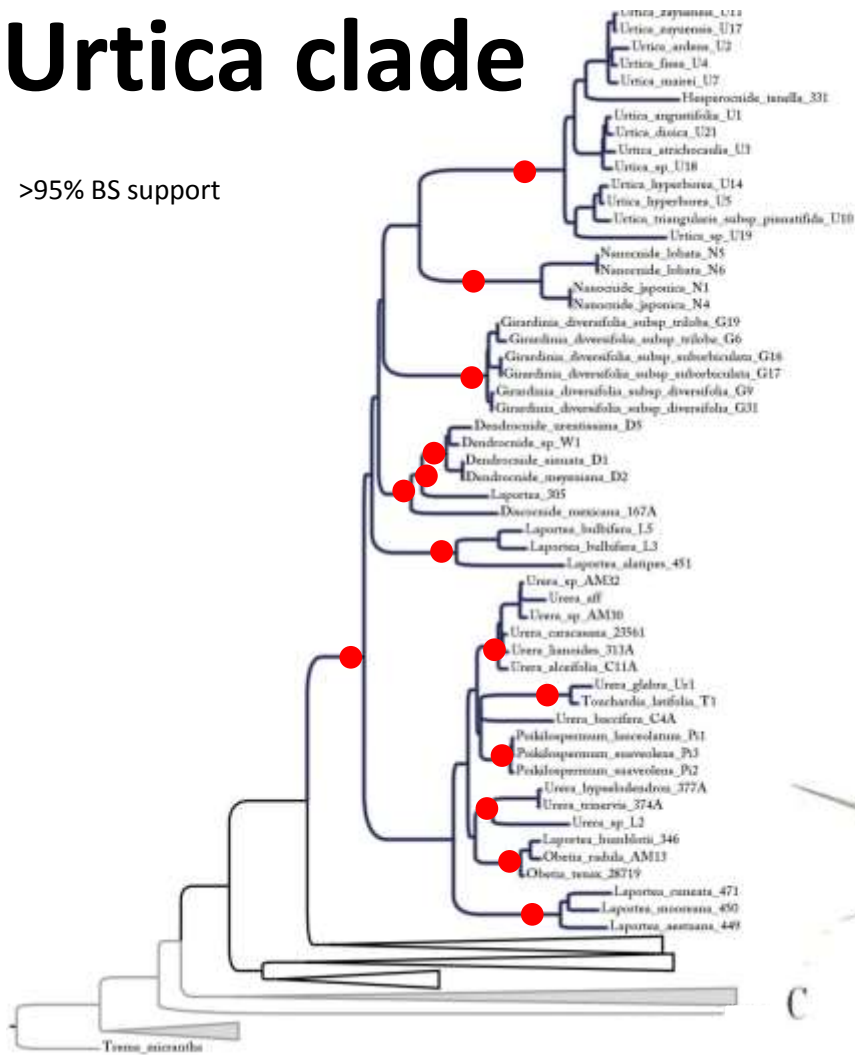


Melanie Thomas *aka*
Melanie Wilmot-Dear

@RBG Kew

Urtica clade

● >95% BS support



Urtica

Hesperocnide



© Kati Morse

C

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- The characters used in these studies were stamen number, presence of stinging hairs, pistillate perianth divided or not, symmetry of the pistillate perianth parts where divided, adnation of the perianth to the ovary where fused / tubular, leaves alternate or opposite, stigma penicillate or not, symmetry of the achene, sexuality of the flowers, inflexion of the stamen in bud, pubescence of the pistillode