Araceae of Central America

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Characteristics of Central American Aroid Flora

- Diverse
- Interesting phytogeographic patterns
- Proportionately much less rich than South America
- Unusually rich in some genera, notably *Monstera* and *Syngonium*
- Shares with NW South America a very rich flora of *Anthurium* sect. *Porphyrochitonium*

➢Occurrence

	Genera	Species
Central Am.	23	568
South Am.	37	1433

➢High Rate of Endemism

299 taxa are endemic to Central Am.

49% of the total

Make this into a table

Genera ranked by size

- 568 species (605 taxa) of Araceae
- Anthurium- 264 species 280 taxa (46%)
- Philodendron-114 species (129 taxa) (20% of all species)
- Monstera- 41 species (42 taxa) 7% of total species
- Dieffenbachia- 26 (5% of total species of Araceae)
- Spathiphyllum- 21 (24 taxa)
- Syngonium- 24
- Rhodospatha- 14 (25 taxa)
- Stenospermation- 13
- Xanthosoma- 9

Number of Species in Smaller Genera

- Philonoton- 7

- Dracontium- 5

- Caladium- 2
- Chlorospatha- 3 (4 taxa)
- Montrichardia- 1

- Arisaema- 1
- Urospatha- 1

- Lemna- 9
- Wolffia- 5
- Wolffiella- 4
- Landoltia- 1
- Spirodela- 1

Philonoton is reasonably rich since there are only 10 species total

Caladium, Chlorospatha and Montrichardia are poorly represented in Central America

20 species, 4% of the Central American Araceae Flora are Lemnoideae

Mexico

- A unique aroid flora
- High rate of endemism
- Species rather unrelated to those in the rest of Central America
- Many species share similar fruits in different sections and will readily hybridize
- Anthurium has unique groups unrelated to any other (cordate blades with punctatations)

Make into a table

Total species per country

- Mexico- 15 genera; 120 taxa
- Guatemala- 13 genera; 85 taxa
- Belize- 13 genera; 49 taxa
- El Salvador- 13 genera; 26 taxa
- Honduras- 13 genera; 64 taxa
- Nicaragua- 16 genera; 98 taxa
- Costa Rica- 20 genera; 282 taxa
- Panama- 21 genera; 435 taxa

- **Guatemala, Belize, El Salvador, Honduras and Nicaragua**

322 native taxa Only
98 taxa in Nicaragua

Find map of Middle America if possible. The area between Mexico and Costa Rica

Percentage of Flora which is endemic

- Mexico 41 (34%)
- Belize 1 (2%)
- Guatemala 6 (7%)
- Honduras 0
- El Salvador 0
- Nicaragua 1 (1%)
- Costa Rica 59 (21 %)
- Panama 191 (44%) [If new species are included it will be much more]

Distribution of Genera in Central America

Patterns of distribution are similar to that of the family in general.

Not all genera have the same pattern of distribution

Xanthosoma **- 5 of 9 taxa occur in Mexico**

Arisaema **– found only in Mexico**

Chlorospatha**,** ***Heteropsis,*** **Philonotion and** ***Stenospermation*** **do not occur in Mexico**

Rhodospatha **has 1 of 15 taxa in Mexico**

From Guatemala to Nicaragua – no species of ***Arisaema, Chlorospatha*** **or Philonotion**

Dracontium & Heteropsis only in Nicaragua
Montrichardia & Stenospermation only in Honduras & Nicaragua

Anthurium

264 species; 280 taxa

16 sections

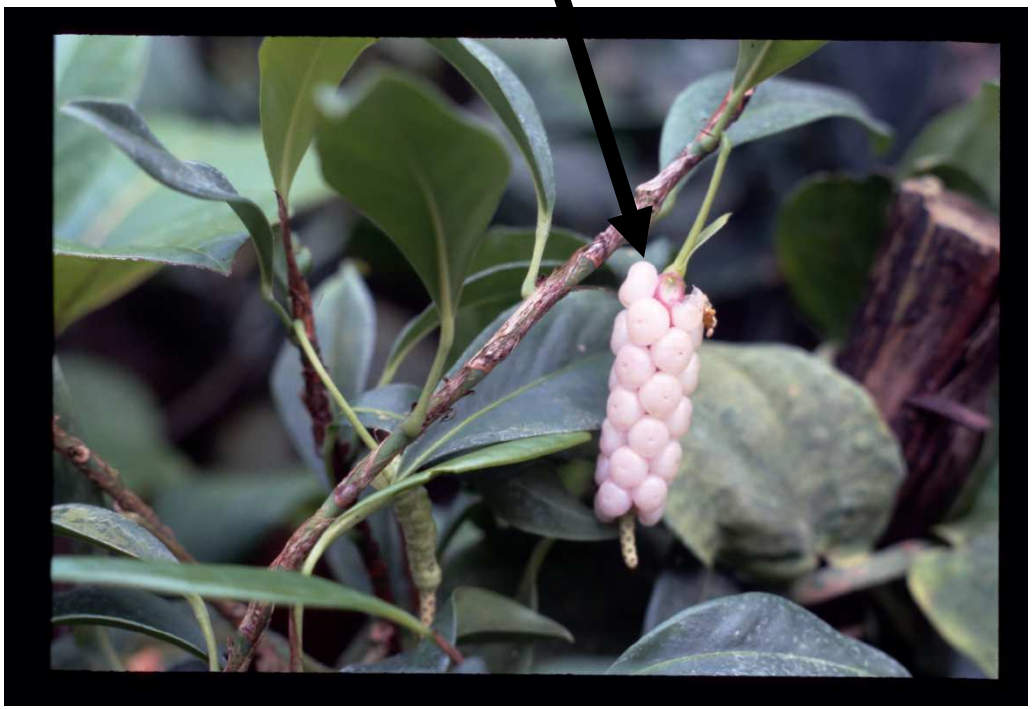
Sectopm	**Species**
Tetraspermium	*A. obtusum* *A. scandens*
Porphyrochitonium	*A. bakeri*
Pachyneurium	*A. cubense* *A. salvadorense* *A. salviniae* *A. schlechtendalii*
Polyphyllium	*A. flexile ssp. flexile* *A. flexile ssp. muelleri*
Leptanthurium	*A. gracile*
Xialophyllium	*A. interruptum* *A. microspadix*

Section	**Species**
Polyneurium	*A. silvigaudens*
Calomystrium	*A. armeniense* *A. huixtlense*
Belolonchium	*A. montanum* *A. titanium*
Dactylophyllium	*A. pentaphyllum var. bombacifolium*
Novo	*A. lucens* *A. verapazense*
What are these?	*A. berriozabalense* (Nuevo) *A. parvispathum* *A. retiferum* *A. subcordatum*

Sect. Tetraspermium

5 taxa

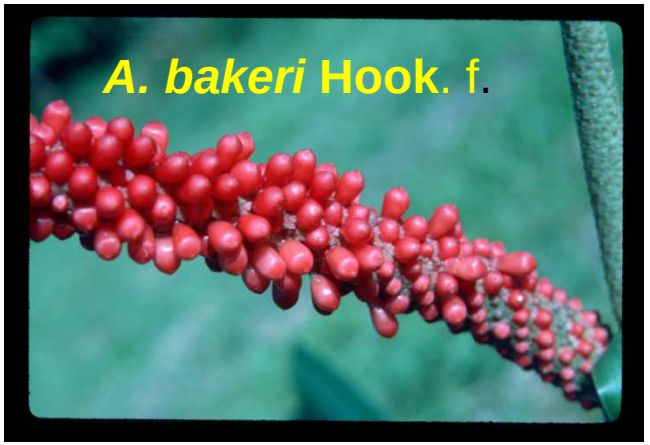
- A. obtusum (2 ssp.)
- A. scandens (2 ssp.)
- A. tonduzii

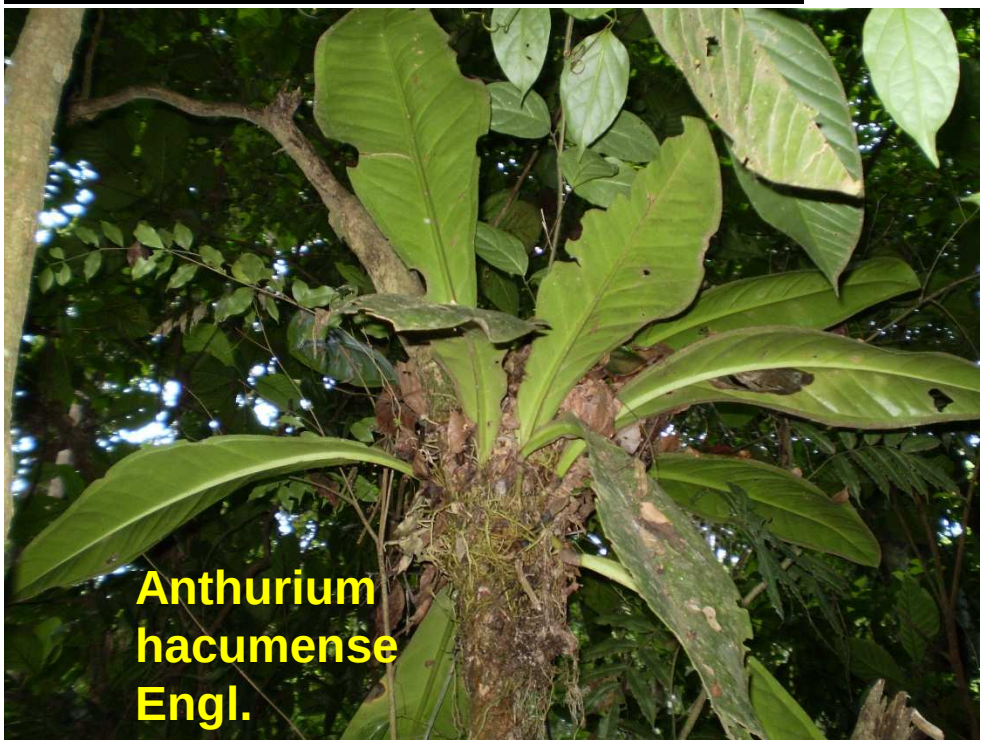


Section Tetraspermium

- Epiphytic
- Internodes elongate
- Leaf blades with glandular punctations
- Seeds more than 4 per berry
- Chromosomes 2n=24

Section Porphyrochitonium
98 species; 100 taxa

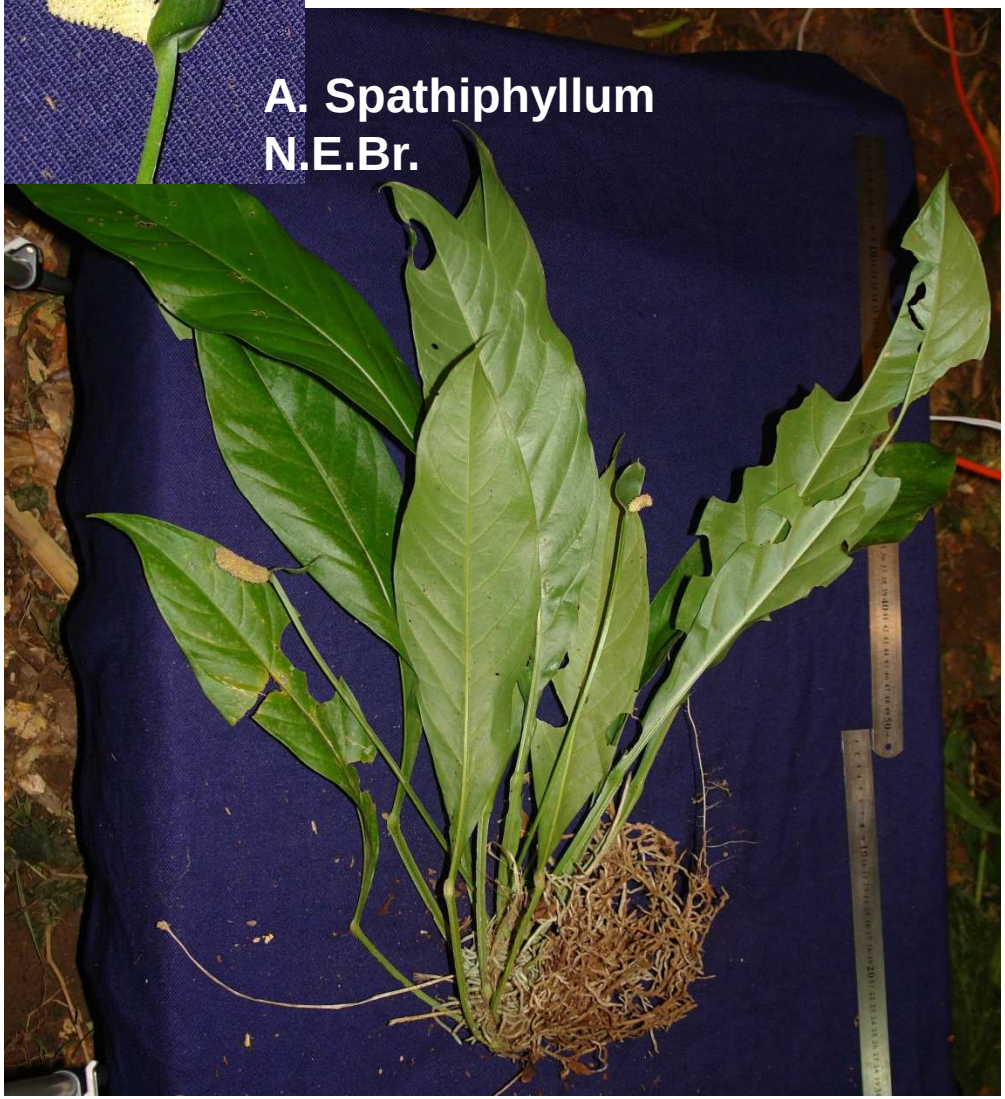




- Internodes short
- Blades elongate
- Blades with dark glandular punctations
- Seeds 2
- Chromosomes 2n=30

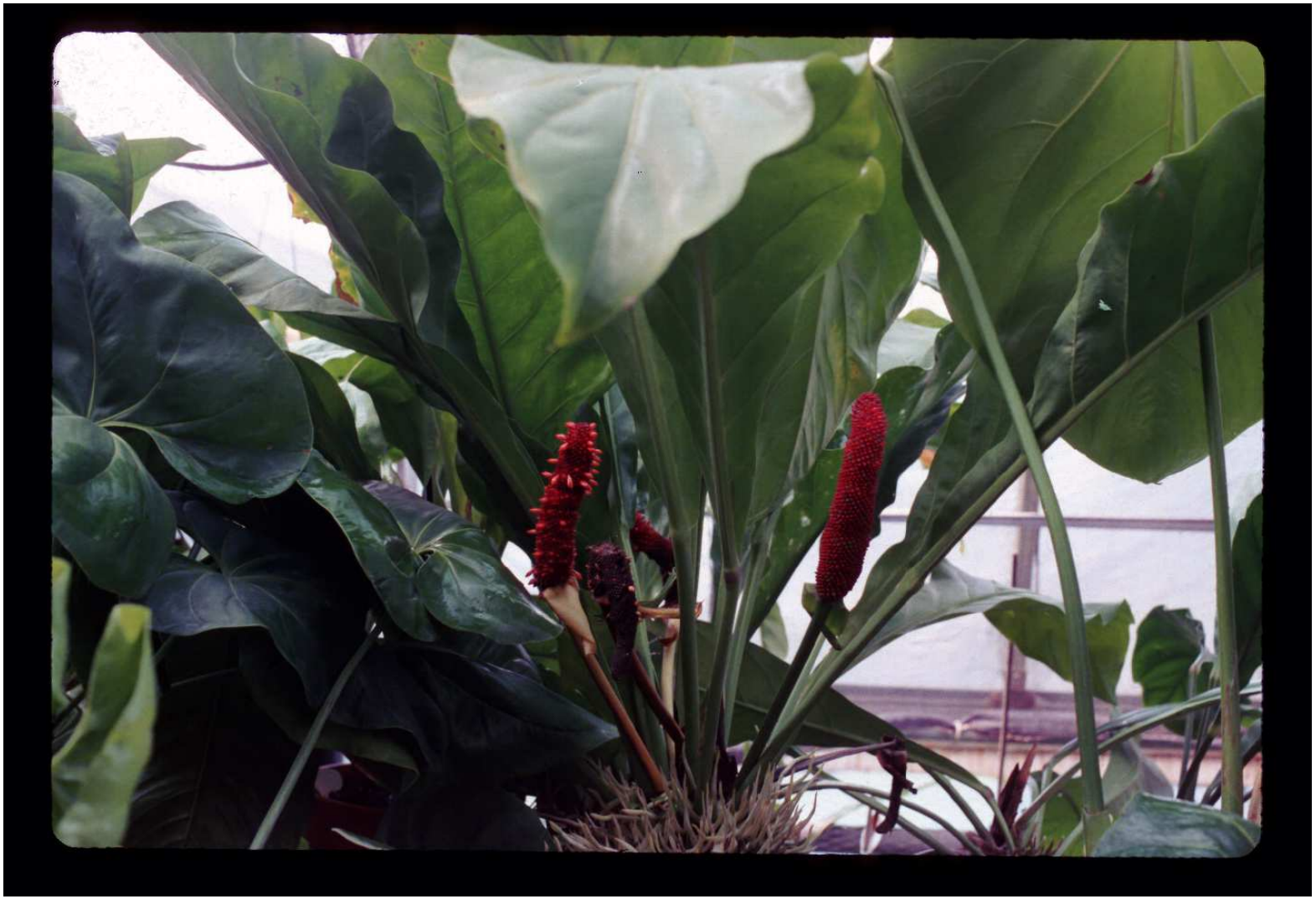
Section Pachyneurium

35 species; 38 taxa



A. Spathiphyllum N.E.Br.

- Habit rosulate with bird's nest habit
- Internodes short
- Leaf blades with involute ptyxis in bud
- Primary lateral veins greatly thickened and frequently not forming a collective vein



Section Pachyneurium

A. cubense Engl.

Section Pachyneurium

A. cubense Engl.

Section Pachyneurium

A. salvadorense Croat

Section Pachyneurium

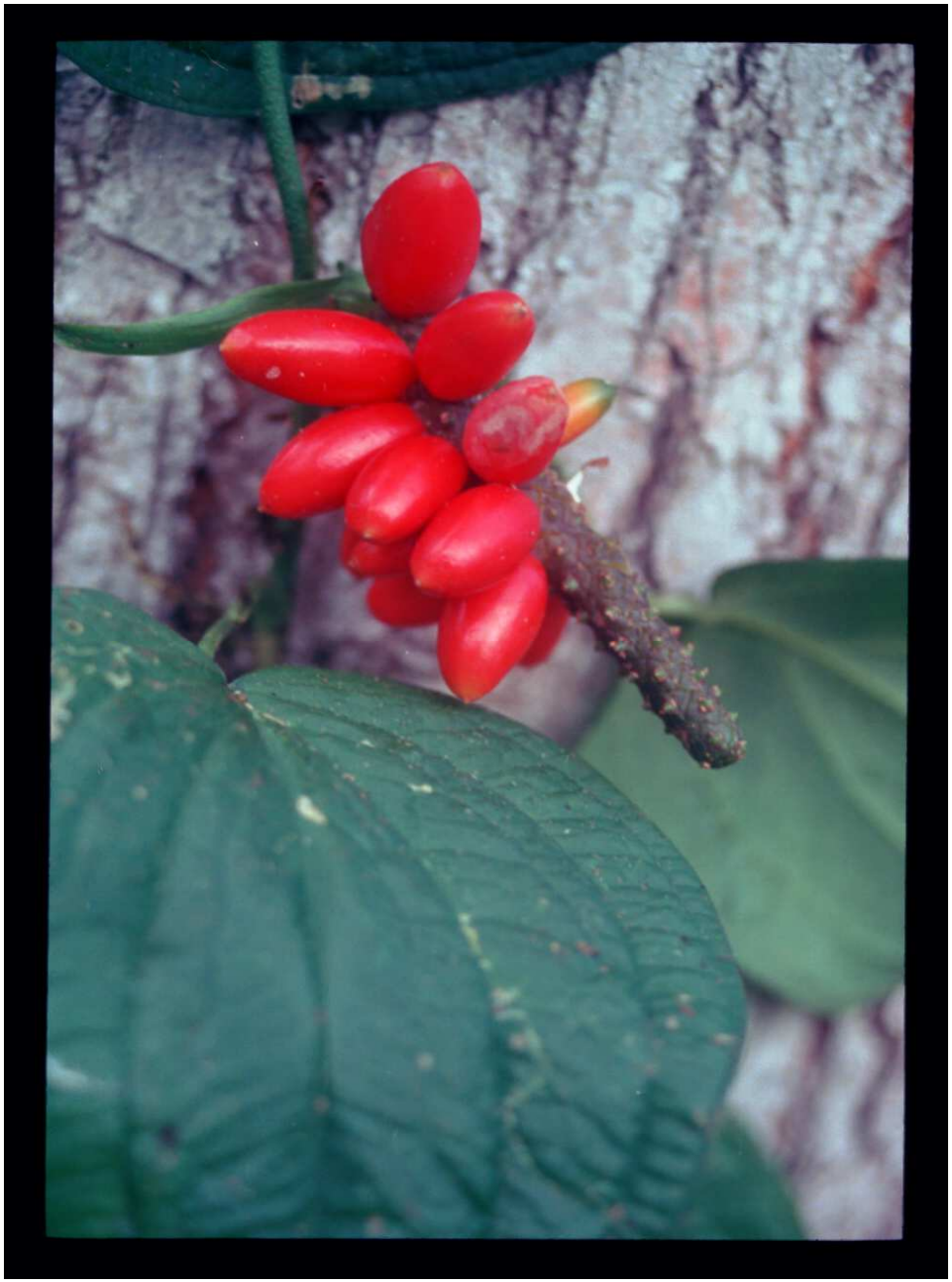
A. salviniae Hemsl.

- Seeds 2 per berry
- Chromosomes 2n=30

Section Polyphyllium
2 species; 4 taxa

- Appresed-climbing hemiepiphyte
- Stems slender
- Roots produced internodally
- Venation scalariforme

A. flexile
Schott
ssp. flexile



Why do these seeds look red????

- Seeds large and black

A. flexile Schott
ssp. flexile

Section Leptanthurium
1 Species

- Roots with velamen
- Cataphylls intact
- Chromsomes 20, 40, 60

A. gracile (Rudge)

Schott

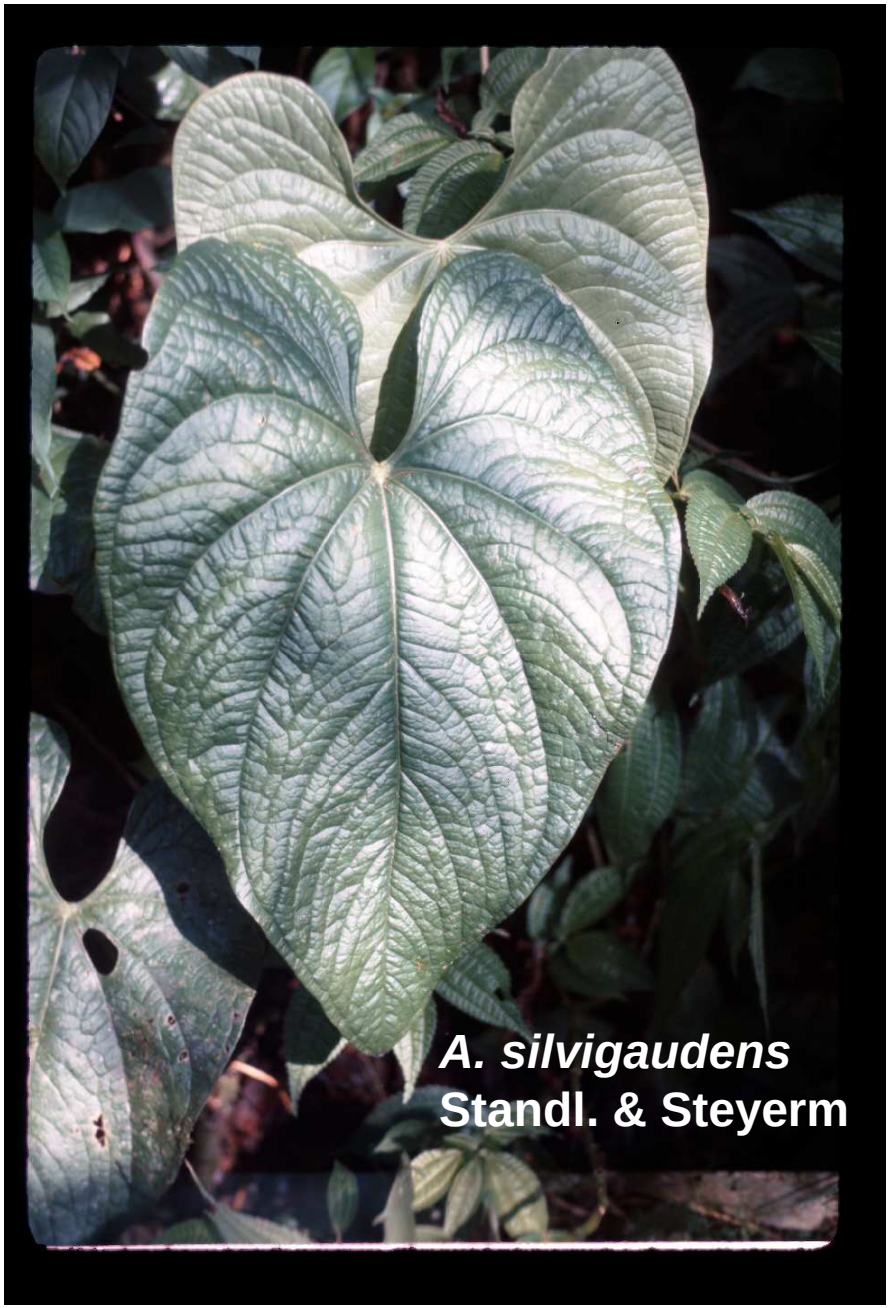
Section Xialophyllium

17 Species; 19 taxa

- Plants from higher elevations
- Internodes elongate
- Chromosomes 2n=30, 60

Section Polyneurium
6 species

- Internodes short
- Leaf blades with prominent venation
- Leaf blades usually cordate or subcordate



Sect. Polyneurium

Sect. Calomystrium
26 species

- Internodes short
- Cataphylls persisting intact
- Leaf blades usually cordate, subcoriaceous
- Spathe & spadix thick, often colorful
- Chromosomes 2n=30


Sect. Calomystrium
A. formosum Schott

Section Belolonchium
28 species; 30 taxa

- Internodes short
- Cataphylls fibers persistent
- Spathe often hooding

Section Belolonchium

A. montanum Hemsl.

Section Belolonchium

A. titanium
Standl. & Steyerm.

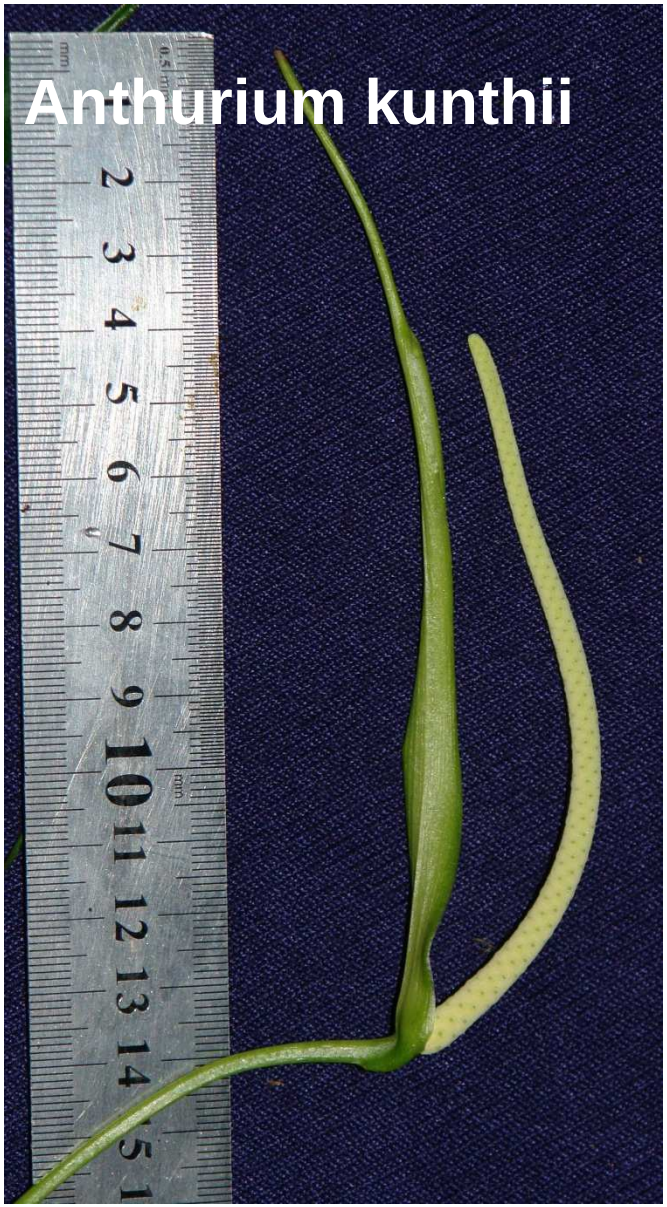
Anthurium
Section Dactylophyllium 4 species

A. clavigerum Poepp.

- Appressed-climbing hemiepiphytes

- Leaves compound, palmate

Sect. Dactylophyllium



Section Dactylophyllium

A. pentaphyllum (Aubl.) G. Don

var. bombacifolium (Schott) Madison

Section Schizoplacium
2 species

- Terrestrial
- Leaf blades

  palmately lobed

Anthurium pedatoradiatum

Anthurium Section Novo
4 species; 5 taxa

- Blades cordate or with basal lobes
- Leaf blades with dark glandular punctations
- Known primarily from Mexico

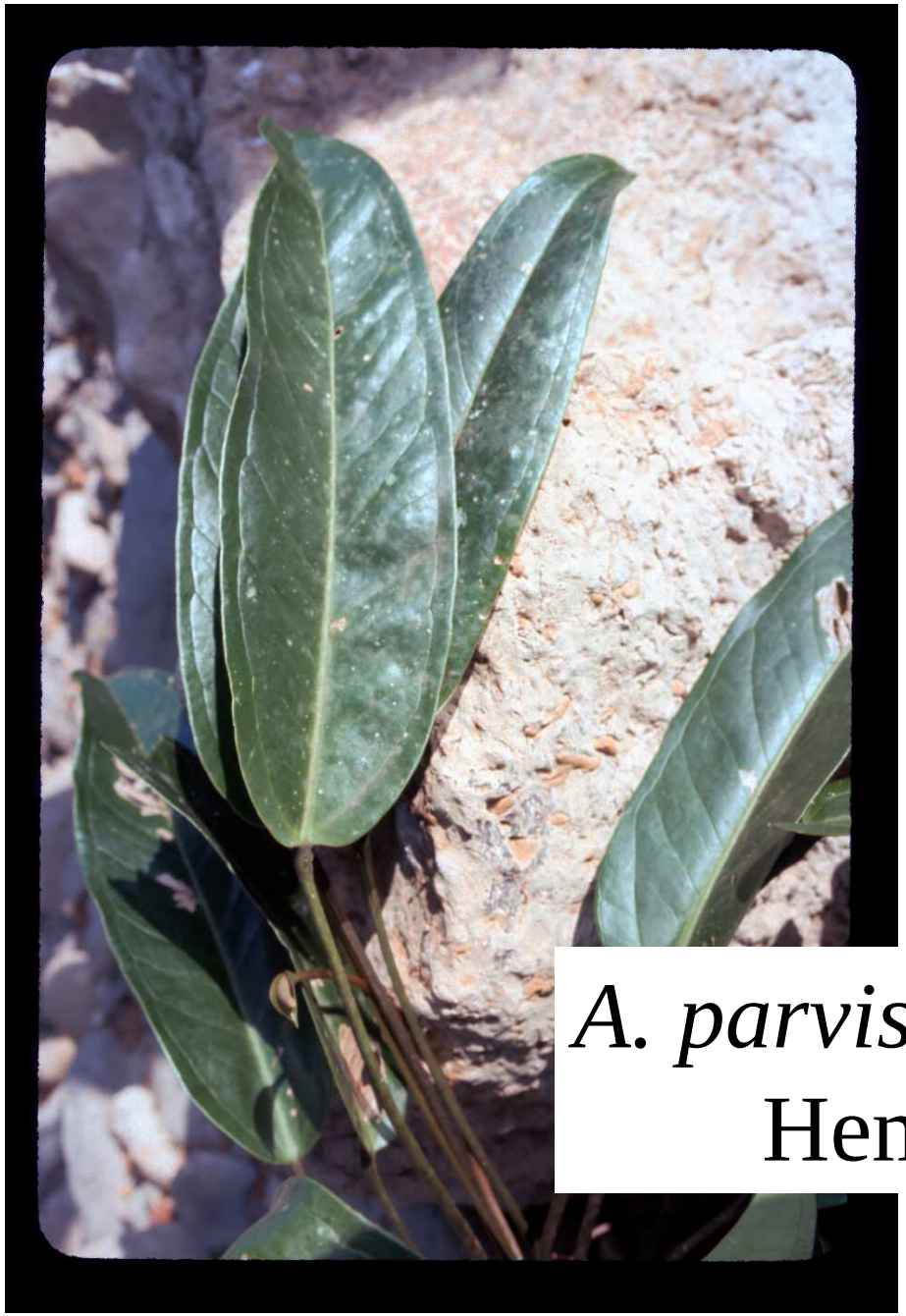
New section (unpublished)

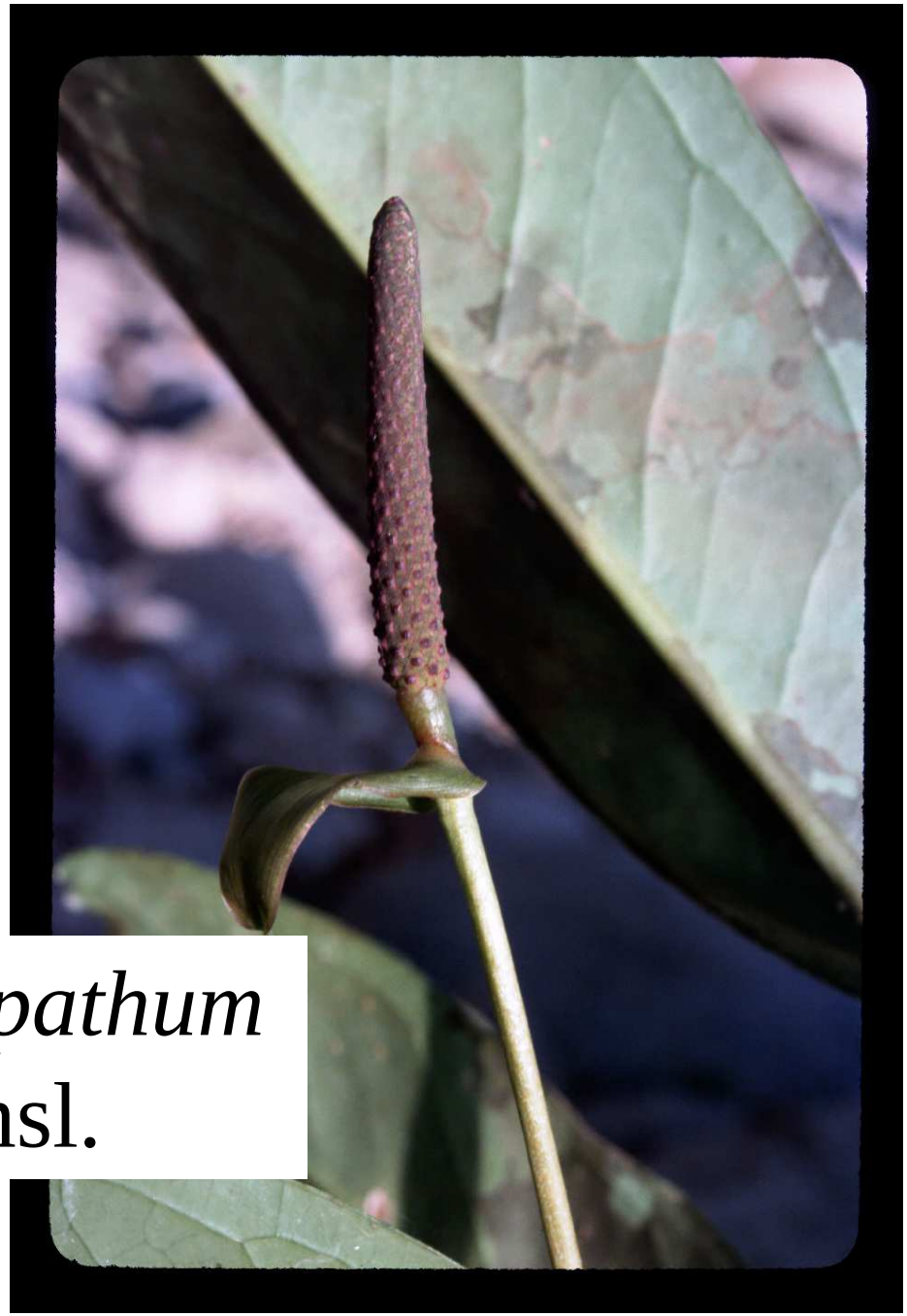
A. lucens Standl. ex Yuncker

A. verapazense Engl..

Sect. Decurrentia
8 species; 10 taxa

- Short internodes
- No glandular punctations
- Elongated leaf blades

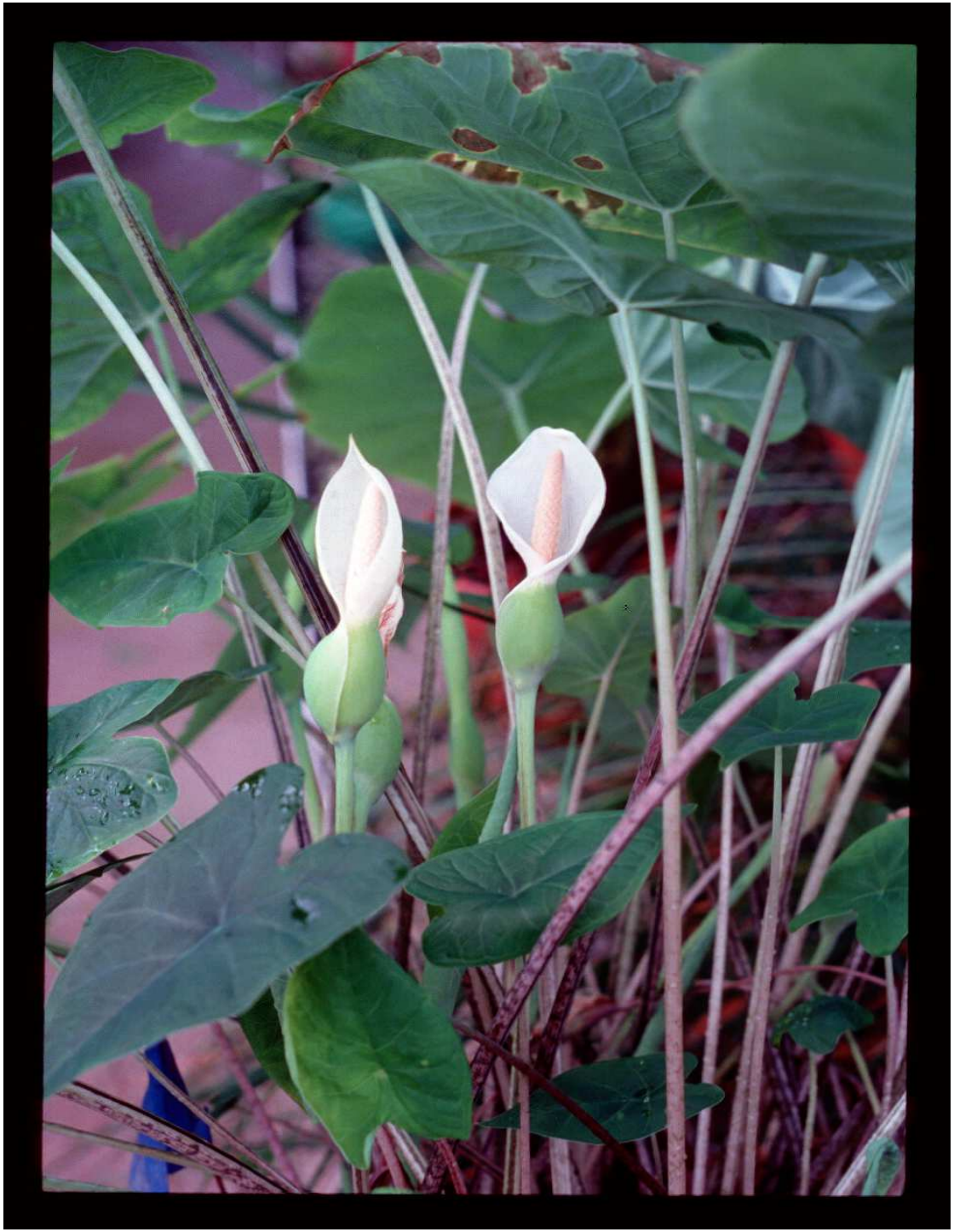




A. parvispathum
Hemsl.

Caladium

- Terrestrial, tuberous
- Leaf blades cordate, thin
- Venation reticulate
- Sap milky
- Flowers unisexual
- Spathe convolute with tube & blade
- Spathe blade deciduous



Caladium bicolor

(Ait.) Vent.

Chlorospatha

- Chlorospatha hammeliana Croat & Grayum from Costa Rica
- Chlorospatha croatiana Grayum, ssp. croatiana from Panama

Find images of C. croatiana or C. hammeliana

Dieffenbachia

Central America	26 species
Mexico	2
Nicaragua	5
Costa Rica	13
Panama	20

7 species extend into Colombia

Dieffenbachia oerstedii Schott

Dieffenbachia wendlandii Schott

Find images of other Central American species

Dracontium

5 Species

Mexico	1
Nicaragua	1
Costa Rica	3
Panama	4

Dracontium

- Terrestrial, tuberous
- Leaves compound, in 3 parts, with highly divided segments
- Spathe usually purple
- Flowers bisexual
- Pollination by flies

Dracontium soconuscum Matuda

Philoxton

7 species in Costa Rica & Panama

P. erythropus Schott var. *allenii* Croat & Grayum

P. hammelii Croat & Grayum

P. panamensis Croat

P. peltata Poeppig

P. picturata (Linden) Regel

P. wallisii Regel

P wendlandii Schott

Philonoton

- Terrestrial, rhizomatous
- Leaf blades simple
- Petioles frequently with trichomes or spines
- Sap with scent of anise
- Pistillate flowers with interspersed staminodia

Philonoton wendlandii (Schott) Croat

Landoltia
1 species

Landoltia punctata (G. Meyer) Les & D. J. Crawford

Lemna
9 Species

- L. gibba L.
- L. aequinoctialis Welw
- L. minor L.
- L. minuta Kunth in H.B.K.
- L. obscura (Austin) Daubs
- L. perpusilla Torr.
- L. trisulca L.
- L. turionifera Landolt
- L. valdiviana Phil

- Monstera species per country must be recounted, especially those from Costa Rica and Panama. See mss.

Monstera

Central America	41 species; 42 taxa
Mexico	8 taxa
Belize	5 taxa
Guatemala	7 taxa
El Salvador	1 taxon
Nicaragua	8 taxa
Costa Rica	26 taxa
Panama	27 taxa
South America	115 or more

Monstera acuminata
K. Koch

Monstera

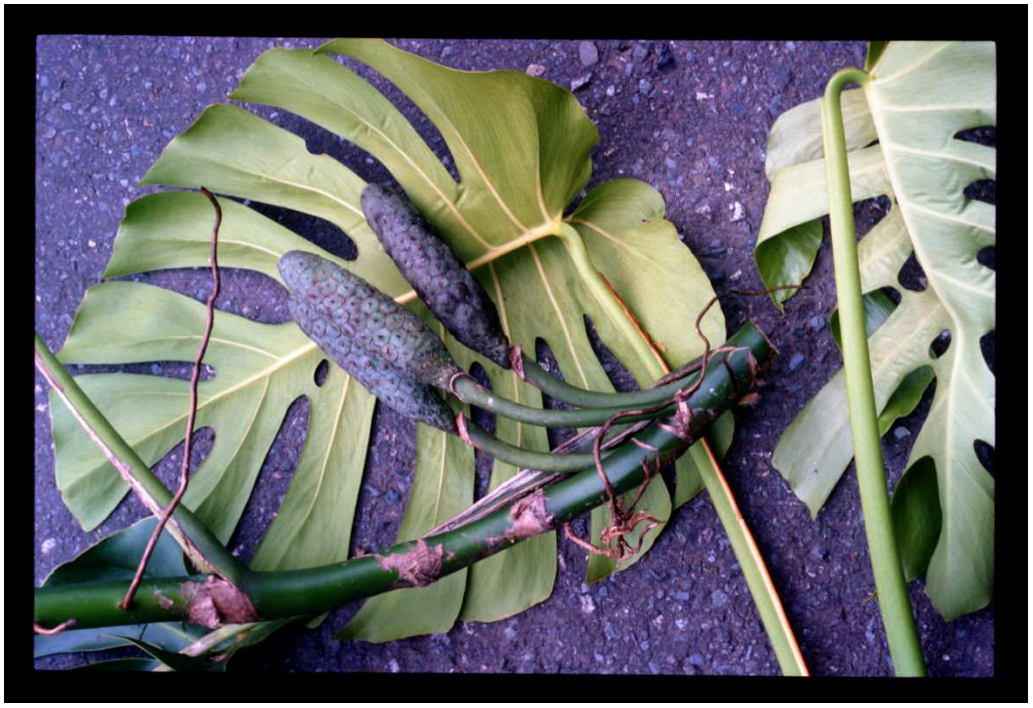
- Hemiepiphytes
- Internodes usually elongate
- Juvenile plants distinct and different
- Petiole prominently sheathed
- Leaf blades frequently perforate or pinnately lobed
- Spathe boat-shaped and deciduous
- Flowers unisexual

Monstera adansonii Schott

var. *laniata* (Schott) Madison

Monstera deliciosa
Liebm.

Monstera deliciosa
Liebm.



Monstera siltepecana
Matuda

Monstera tuberculata L. var. *tuberculata*

Montrichardia

Montrichardia arborescens (L.) Schott

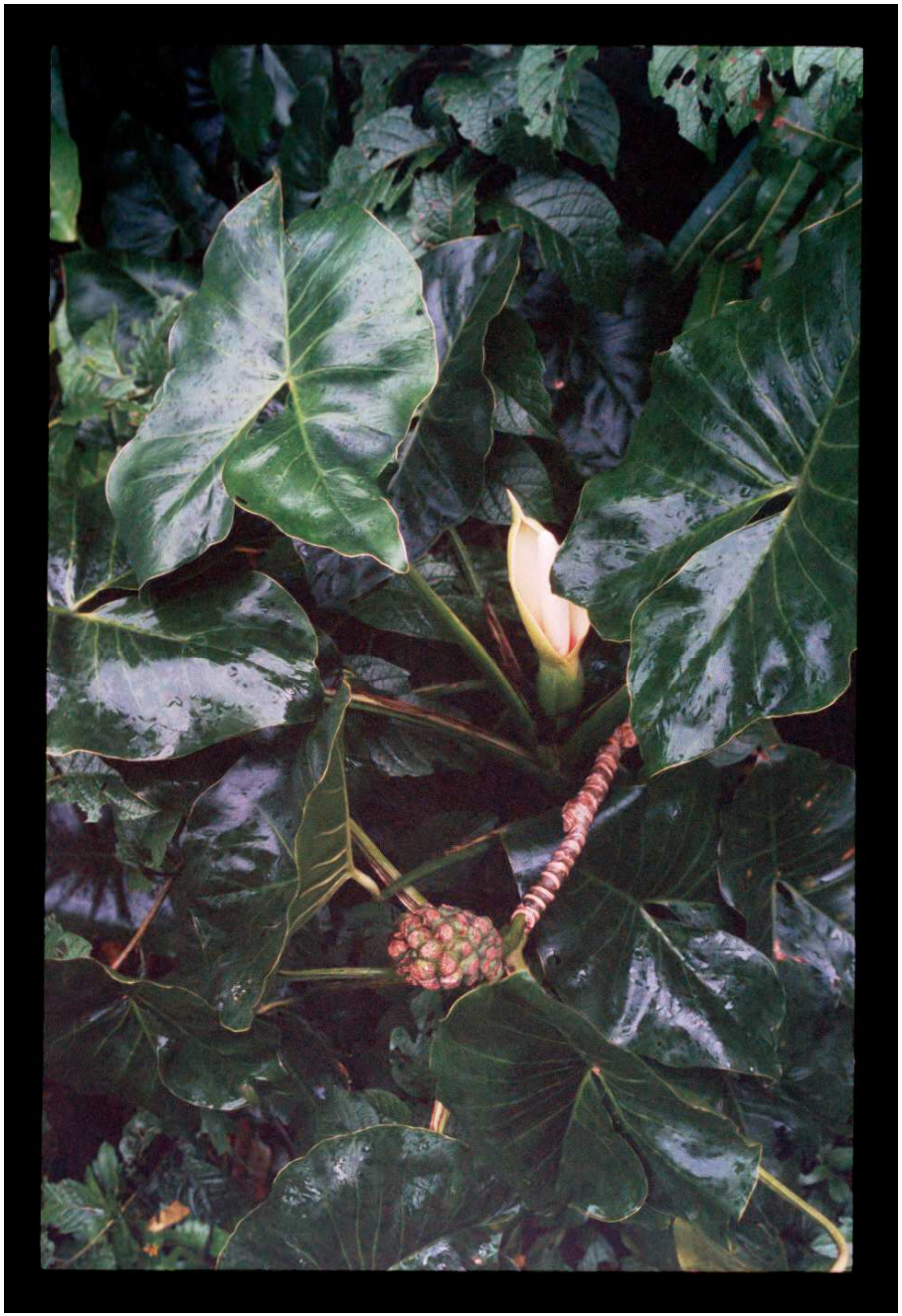
Widespread in aquatic situations

Montrichardia linifera (Arruda) Schott

In Central America known only from Panama

Montrichardia

- Rooted aquatic, shrub-like
- Internodes elongatae
- Leaf blades with the posterior lobes longer than anterior lobe
- Spathe boat-shaped



Montrichardia arborescens (L.) Schott

Philodendron

114 species; 129 taxa

Philodendron

- Terrestrial or hemiepíphytic
- Internodes short or elongated
- Leaf blades simple, lobed or compound
- Venation parallel
- Spathe convolute, constricted above tube
- Flowers unisexual

Philodendron

Subgenus Pteromischum	*P. aurantiifolium* Schott ssp. *aurantiifolium* *P. aurantiifolium* Schott ssp. *calderense* (K.Kr.) M. Grayum *P. inequilaterum* Liebm *P. popenoi* Standl. & Steyerm. *P. rojasianum* Standl. & Steyerm. *P. schottii* K. Koch ssp. *talamancae* (Engl.) M. Grayum *P. sequine* Schott *P. standleyi* Grayum

Philodendron
Subgenus *Pteromischum*

- Adult plants with petioles exensively sheathed

- Several to many leaves produced between each inflorescence

Philodendron popenoi Standl. & Steyerm.

Philodendron popenoi Standl. & Steyerm.


Philodedndron sulcatum

Philodendron inequilaterum Liebm.

Philodendron
Subgenus *Philodendron*

- Adult plants usually scarcely sheathed
- Each leaf potentially with an inflorescence

Philodendron subgenus ***Philodendron***

Section ***Philodendron***

subsection ***Macrolonchium***	*P. fragrantissimum* (Hook.) Kunth
subsection ***Solenosterigma***	*P. hederaceum* (Jacq.) Schott
subsection ***Philodendron***	*P. jodavisianum* Bunting *P. purulhense* Croat
subsection ***Achyropodium***	*P. glanduliferum* Matuda

Philodendron subgenus ***Philodendron***

Section **Macrobelium** subsection ***Macrobelium***	*P. advena* Liebm. *P. mexicanum* Liebm. *P. sagittifolium* Liebm. *P. verapazense* Croat
Section ***Calostigma*** subsection ***glossophyllum***	P. *smithii* Engl.
Section ***Tritimophyllum***	*P. anisotomum* Schott *P. tripartitum* (Jacq.) Schott
Section ***Polytomium***	*P. radiatum* Schott *P. warscewiczii* Schott
Section ***Macrogynium***	*P. jacquinii* Schott

Philodendron subgenus ***Philodendron*** Section *Philodendron*

- Placentation axillary
- Ovules more than 5 per ovule

Section ***Philodendron***
Subsection ***Macrolonchium***

- Internodes short
- Petioles D-shaped

Philodendron fragrantissimum

(Hook.) Kunth

Section ***Philodendron***

Subsection

Solenosterigma

- Internodes elonate
- Plants scandent
- Petíole terete
- Leaf blades cordate

P. hederaceum

(Jacq.) Schott

P. hederaceum
(Jacq.) Schott

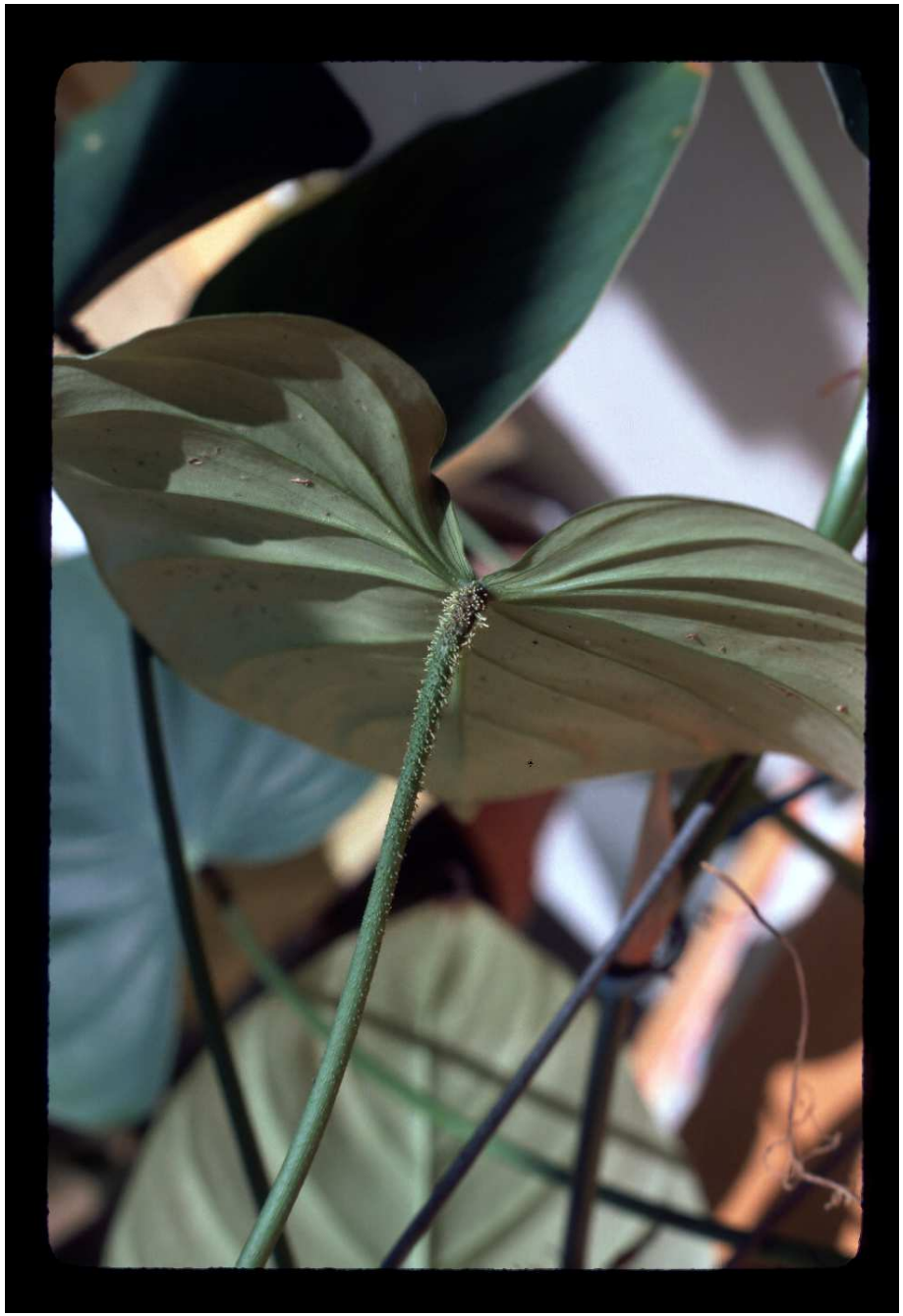
Section ***Philodendron***
Subsection ***Philodendron***

- Internodes short
- Cataphylls persistent
- Petioles terete or subterete

Philodendron jodavisianum Bunting

P. jodavisianum

Bunting



Section
Philodendron

Subsection
Achyropodium

- Internodes short
- Petioles glandular

Anthurium glanduliferum Matuda

Philodendron subgenus ***Philodendron***

Section ***Calostigma***

- Placentation basal
- Ovules few per locule

Section
Macrobelium
Subsection
Macrobelium

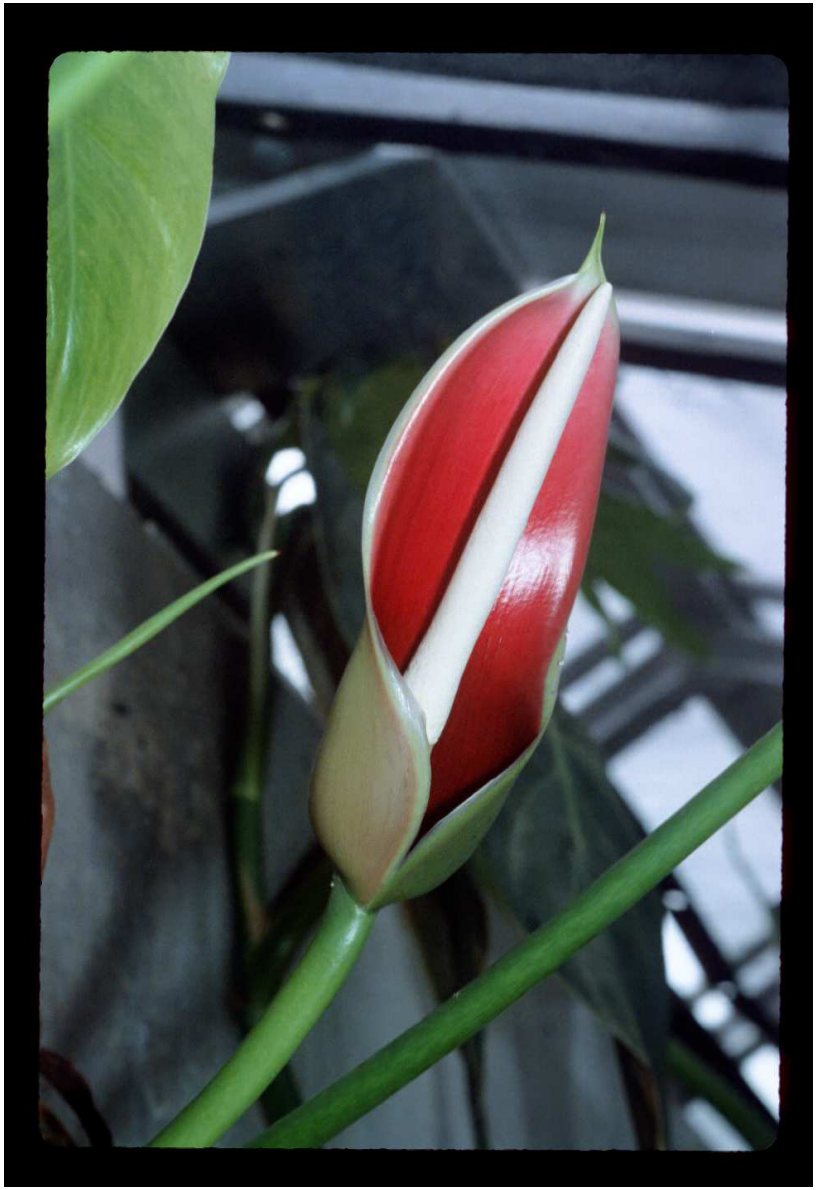
- Petioles without purple ring at apex
- Cataphylls deciduous
- Blades cordate or sagittate

Philodendron advena Schott

Philodendron advena Schott

Philodendron advena Schott

P. mexicanum
Liebm.



P. sagittifolium

Liebm.

Subgenus ***Philodendron***
Section ***Macrobelium***
Subsection ***Glossophyllum***

- Petoles with a purple ring at apex
- Pistilla 1 per locule

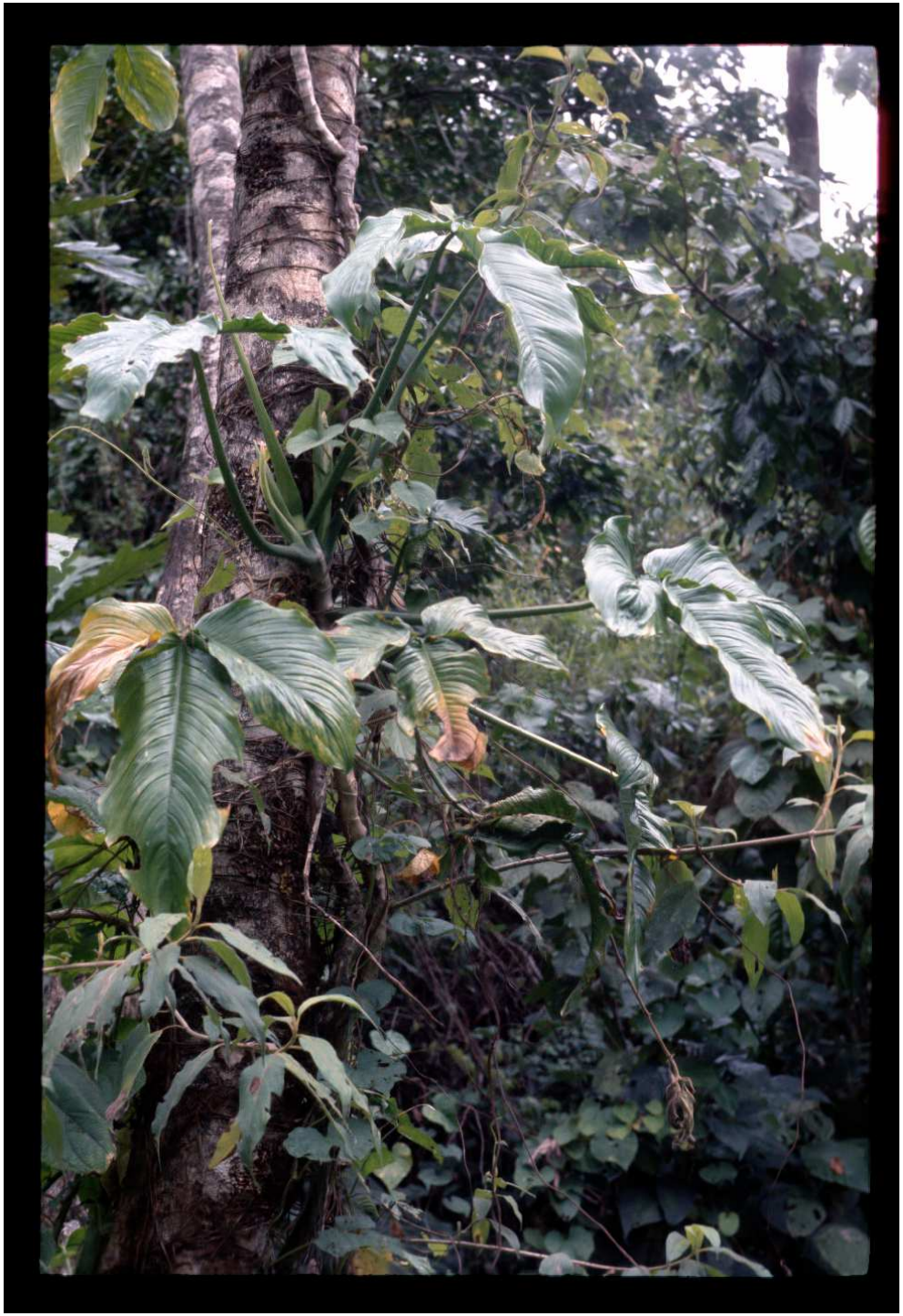
P. smithii Engl.

P. smithii Engl.

Subgenus
Philodendron

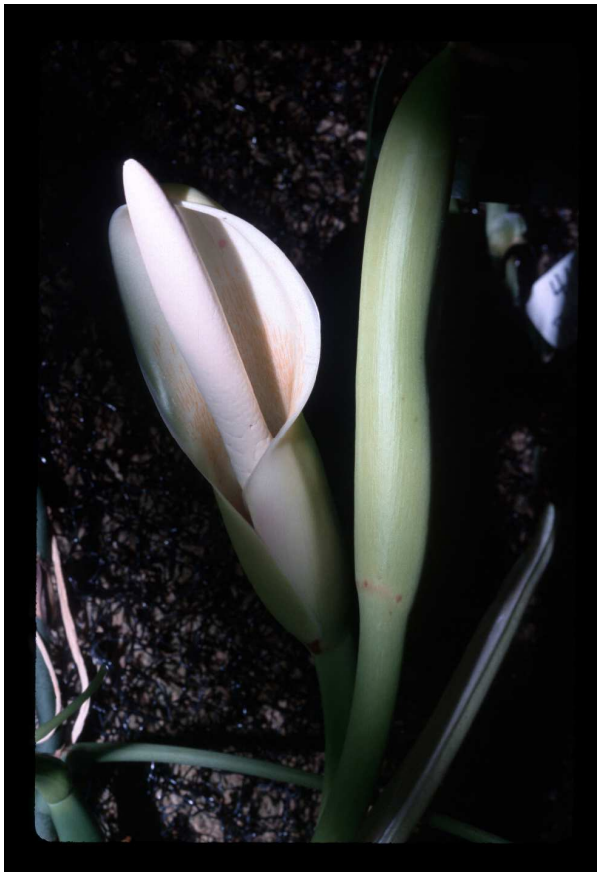
Section
Tritimophyllum

➢Leaf blades 3-lobed



P. tripartitum

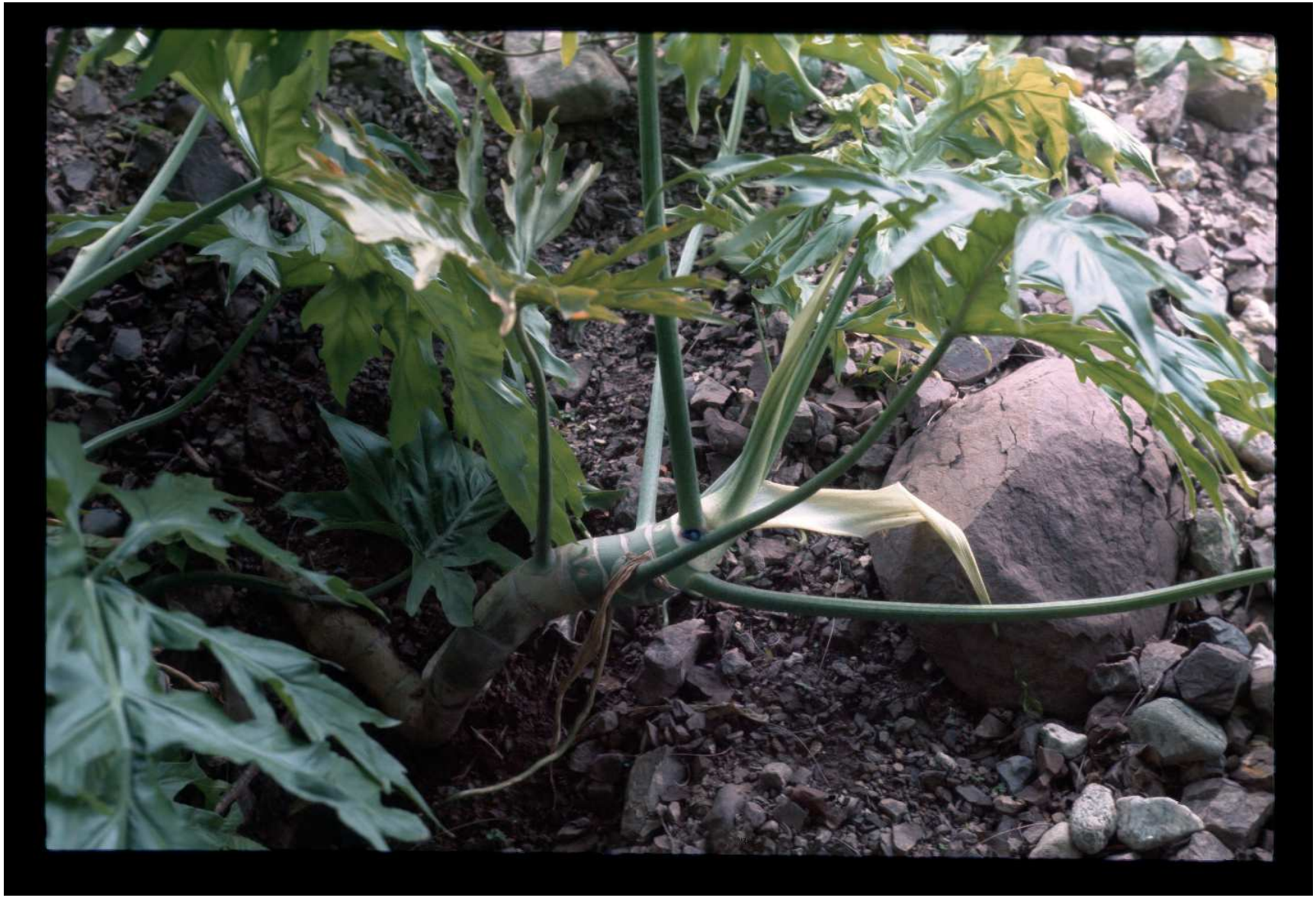
(Jacq.) Schott



Subgenus
Philodendron
Section
Polytomium

- Leaf blades pinnati-partite

P. radiatum
Schott



P. warscewiczii K. Koch & Bouché

Subgenus
Philodendron
Section
Macrogynium

- Stems with trichomes
- Leaves deciduous
- Spathe much larger than spadix
- Pistil with estile narrowed and elongate

P. jacquinii Schott

Pistia

Pistia stratiotes L.

Occurs throughout Central America

Pistia
stratiotes L.

- Floating aquatics
- Leaves in rosettes, spongy
- Inflorescences tiny
- Spathe contracted midway
- Spadix with 1 flower

Rhodospatha

14 species; 15 taxa in Central América

Ranging from Mexico to Colombia

Costa Rica - 4 species endemic

Panama - 4 species endemic

Rhodospatha

- Appresed-climbing hemiepiphytes, rarely terrestrial
- Petiole sheathed
- Leaf blades oblong-elliptica
- Spathe promptly deciduous
- Flower bisexual, naked

Rhodospatha wendlandii Schott

Spathiphyllum

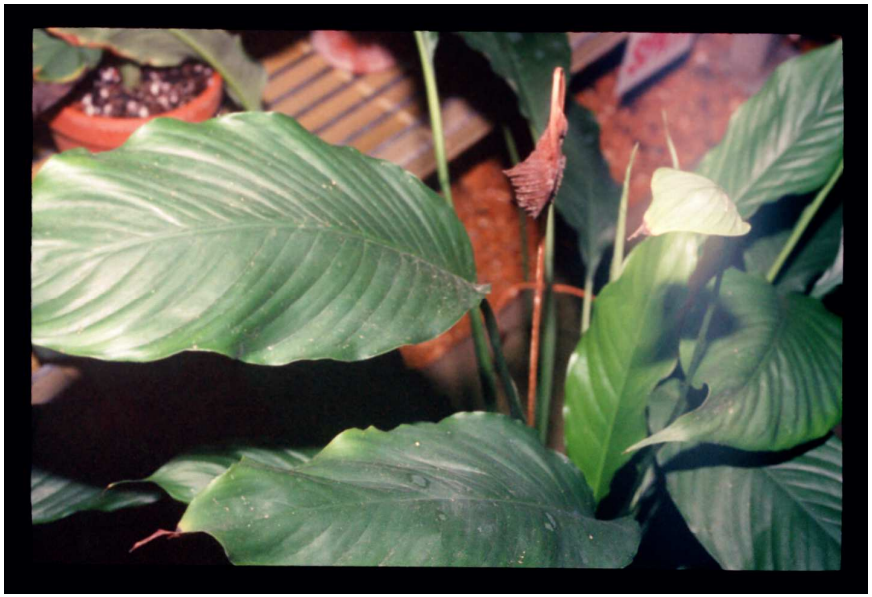
21 species; 24 taxa

in Central América

Spathiphyllum

- Terrestrial
- Internodes short
- Petioles prominently sheathed
- Blades oblong to oblong-elliptic
- Primary lateral veins prominent
- Spathe boat-shaped, persistent
- Flowers bisexual, with tepals

Spathiphyllum blandum Schott



Stenospermation

13 species in Central América

1 species in Guatemala

2 species in Nicaragua

8 in Costa Rica

11 in Panama

Stenospermation

- Epiphytes
- Internodes short or elongate
- Petioles prominently sheathed
- Blades elongate with weak or absent lateral venation
  - Flowers bisexual
  - Spathe boat-shaped, deciduous

Stenospermation multiovulatum (Engl.) N.E. Br.

Stenospermation multiovulatum (Engl.) N.E. Br.

Syngonium

24 species in Central América

Mexico	7
Guatemala	6
Belize	6
El Salvador	2
Honduras	6
Nicaragua	6
Costa Rica	18
Panama	12

Syngonium

- Hemiepíphytes with milky sap
- Leaf blades diverse
- Venation reticulate
- Spathe constricted
- Flowers unisexual
- Fruits syncarps

Syngonium angustatum Schott

Syngonium chiapense Matuda

Syngonium chiapense Matuda

Syngonium macrophyllum Engl.

Syngonium macrophyllum Engl.

Syngonium podophyllum Schott

Syngonium

salvadorense Schott

Syngonium steyermarkii Croat

Syngonium

steyermarkii Croat

Urospatha

Urospatha grandis Schott

1 species in Central America

10 species in South America

Urospatha

- Aquatic
- Blades sagittate
- Basal lobes elongate
- Spathe twisted, much longer than spathe
- Flower bisexual

Urospatha grandis Schott

Xanthosoma

9 species in Central America

Mexico	5
Guatemala	3
Belize	2
El Salvador	3
Honduras	2
Nicaragua	3
Costa Rica	5
Panama	4

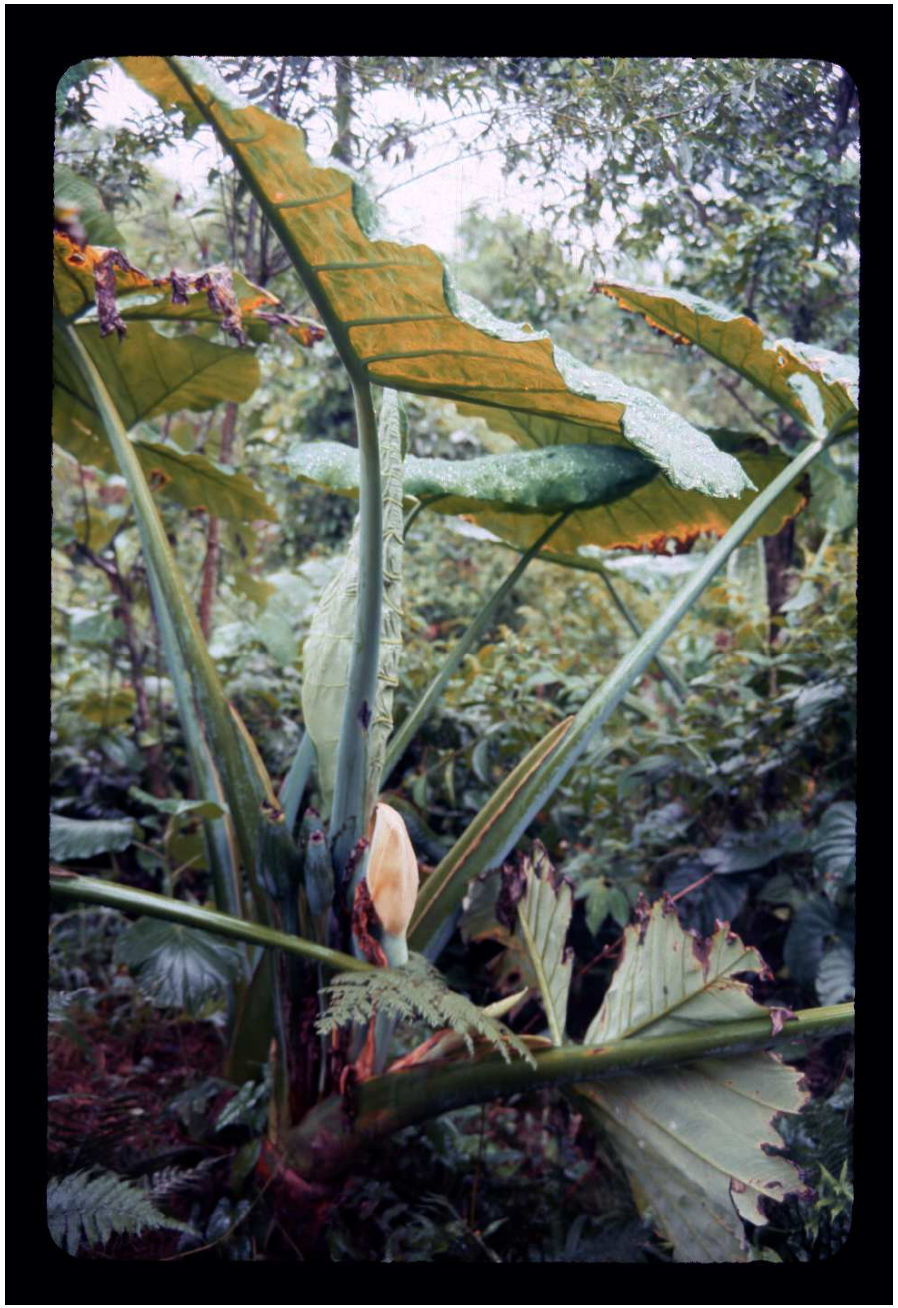
Xanthosoma

- Terrestrial
- Internodes short
- Sap milky
- Petioles prominently sheathed
- Leaf blades thin, venation reticulate
- Spathe constricted, the blade deciduous
- Flowers unisexual

Xanthosoma mexicanum Liebm.

Xanthosoma mexicanum Liebm.

Xanthosoma robustum Schott



Xanthosoma

robustum Schott

Wolffia

5 species

W. arrhiza (L.) Horkel ex Wimm

W. borealis (Engelm. ex Hegelm.) Landolt

W. brasiliensis Wedd.

W. columbiana H. Karst

W. globosa (Roxb.) Hartog & Plas

Wolffiella

4 Species

List the species from the spreadsheet

This slide needs a picture ???

Conclusion

The Araceae of Central America will effectively be covered in the Mesoamerican Flora Project which should be completed within the next two years.