

A Primer on the genus Philodendron

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Philodendron- 487 published species

More than 1,000 species,
many undescribed





P. anisotomum



P. pinnatifidum



P. pastazanum



P. billietae



P. bipinnifolium



P. bethoweniae



P. patriciae

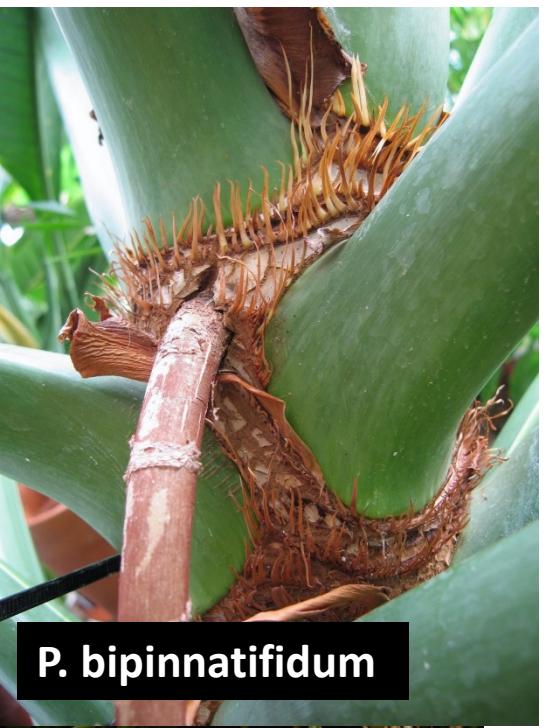


P. goeldii

Probably no other genus
has so much diversity of leaf
form with plants of beauty

Philodendron consists of 3 subgenera

- Subgenus *Meconostigma* – ca. 20 species
- Subgenus *Pteromischum* – ca. 75 species
- Subgenus *Philodendron* – ca. 385 published species
- In the *Philodendron* Lucid Key – 624 species with an estimated 400 more species to be described.



Philodendron subgenus Meconostigma





P. pierrei



P. senatocarpium



Philodendron inaequilaterum Liebm



P. alliodorum

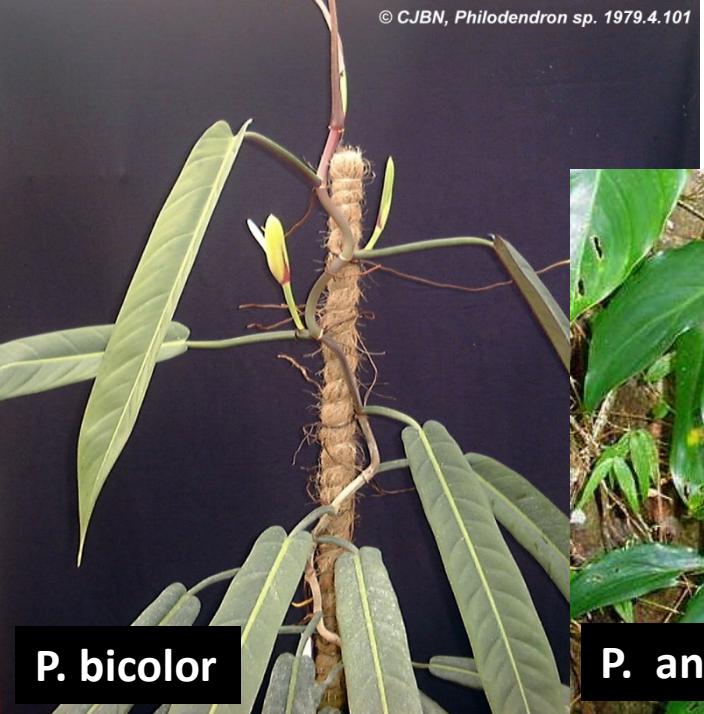


6 5 2007

Subgenus Pteromischum

Philodendron

-more than 700 species,
many undescribed



P. bicolor



P. annisotomum



P. annularum



P. lynnhammadiae



P. gardeniorum



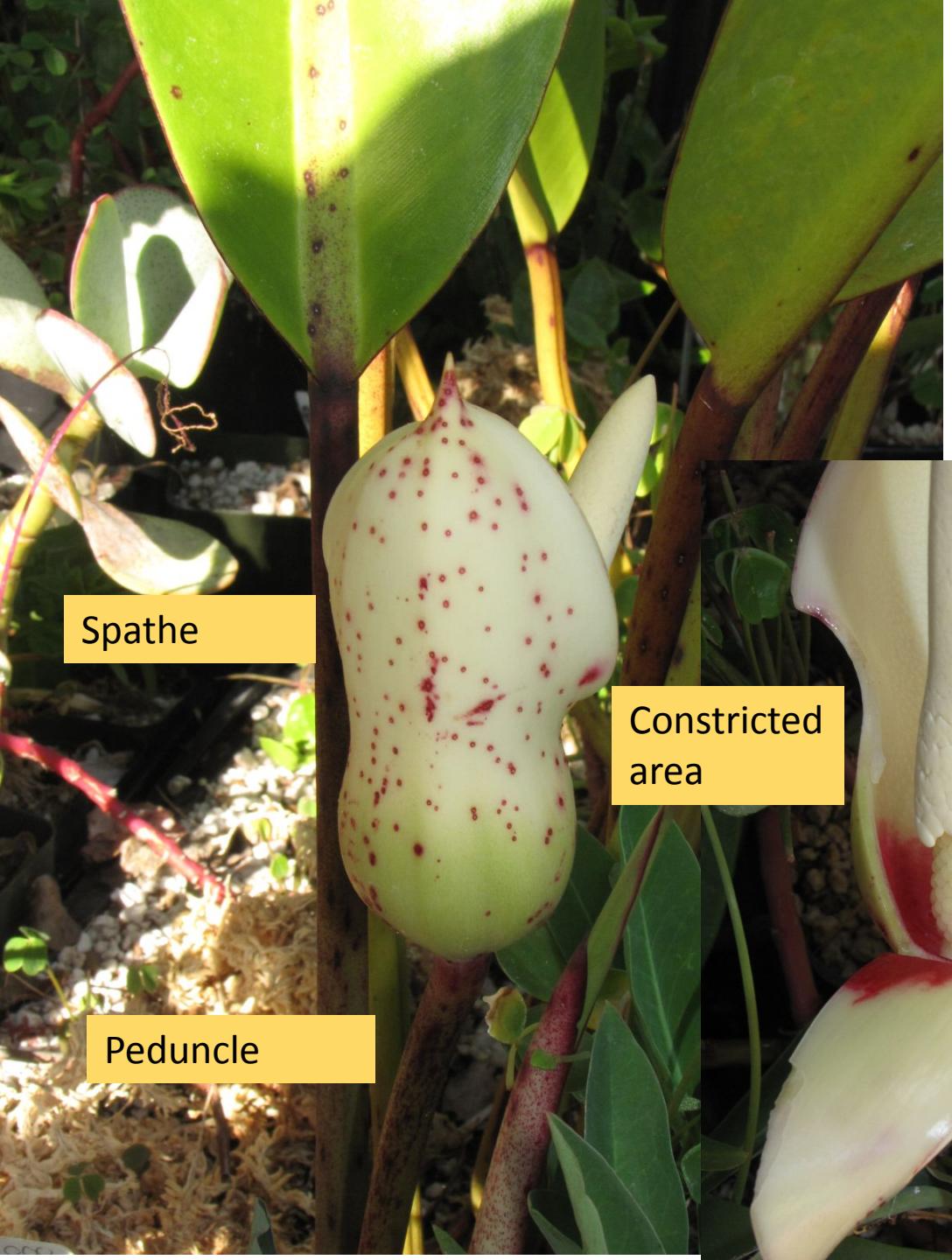
P. acuminatissimum



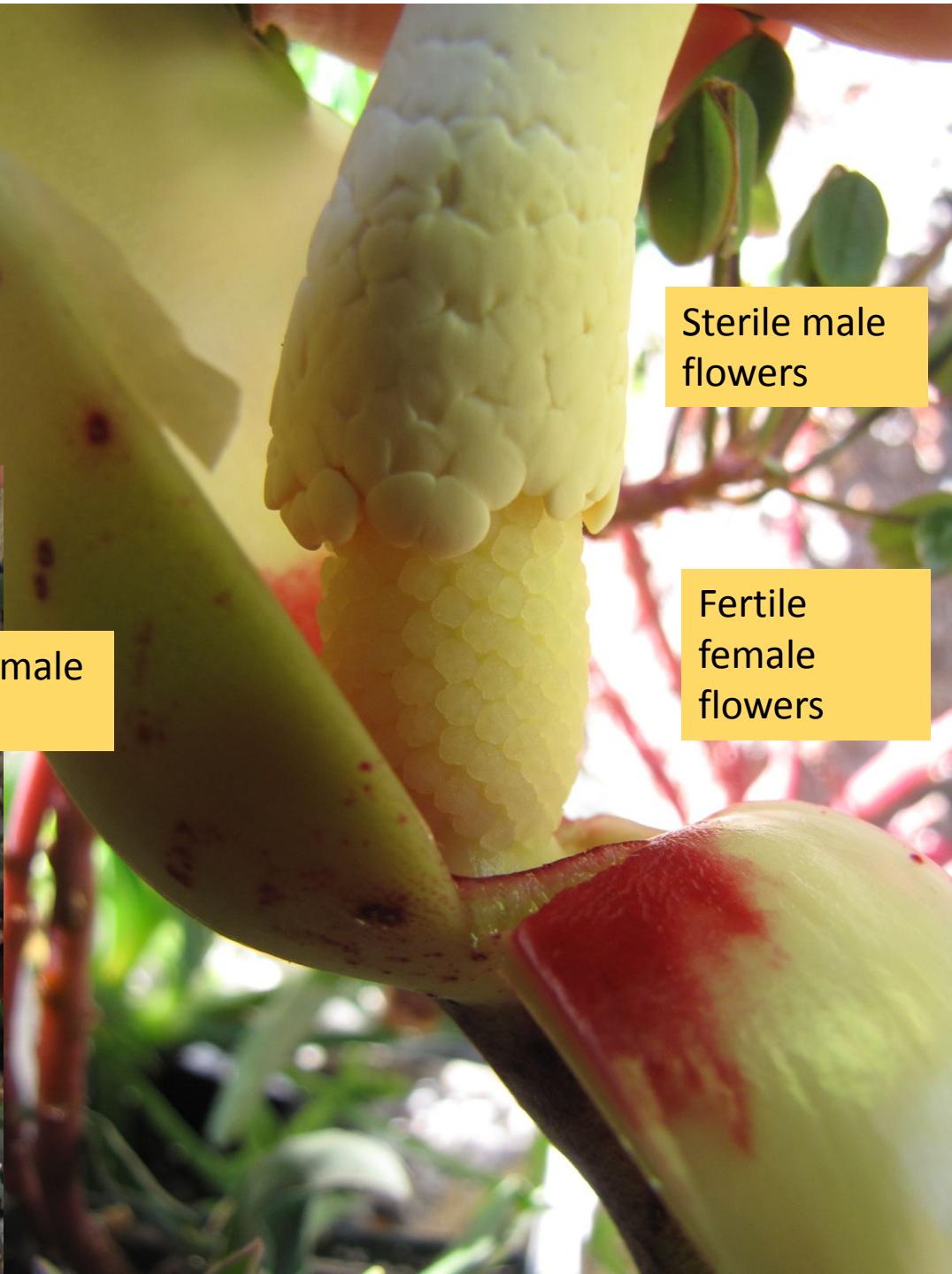
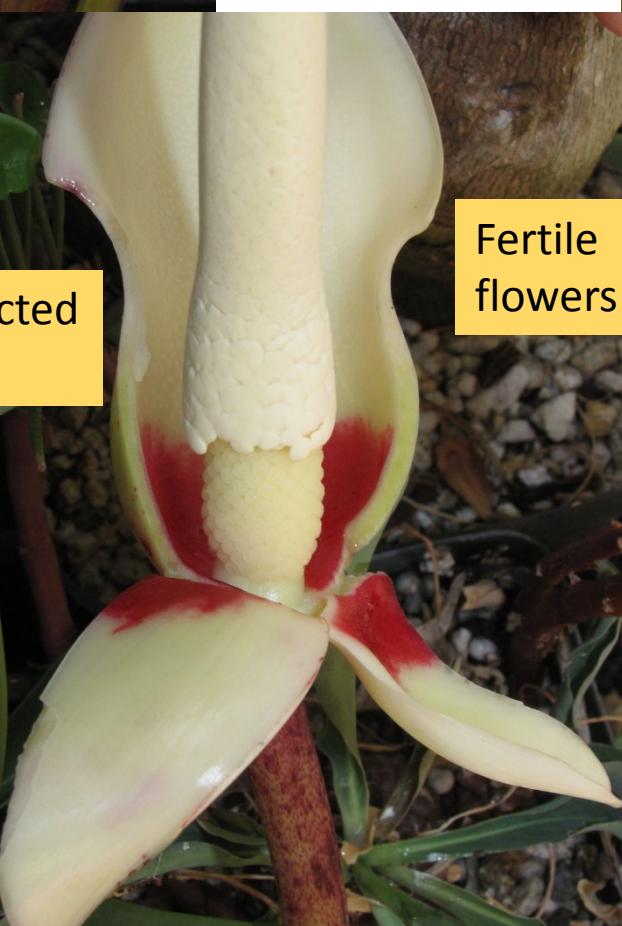
P. acutifolium



P. alatiundulatum



Characteristics of Philodendron



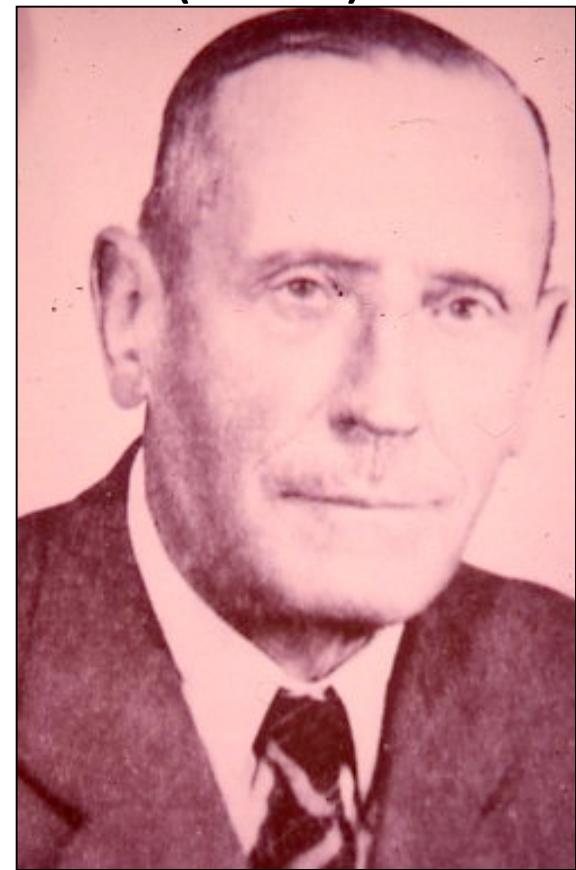
Fertile
female
flowers

History of classification of Philodendron

- **Heinrich Wilhelm Schott** (Vienna) described Philodendron (1829)
- **Adolf Engler & Kurt Krause** (Berlin) made the last full revision (1913)



Working at Berlin before World War II, Engler revised the entire family worldwide (*Das Pflanzenreich*). Krause helped with only *Philodendron* and its close allies.



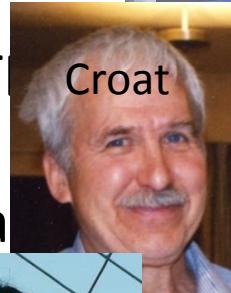
Research with Philodendron



- **George Bunting** - principal role in discovering and describing Philodendron especially in Venezuela



- **Simon Mayo** - subgen. Meconostigma; developed CATI and Lucid



- **Tom Croat** - subgen. Philodendron for Central America, further development of Lucid key



- **Mike Grayum** - subgen. Pteromischum of C. Amer., W. Indies & W. South Amer.

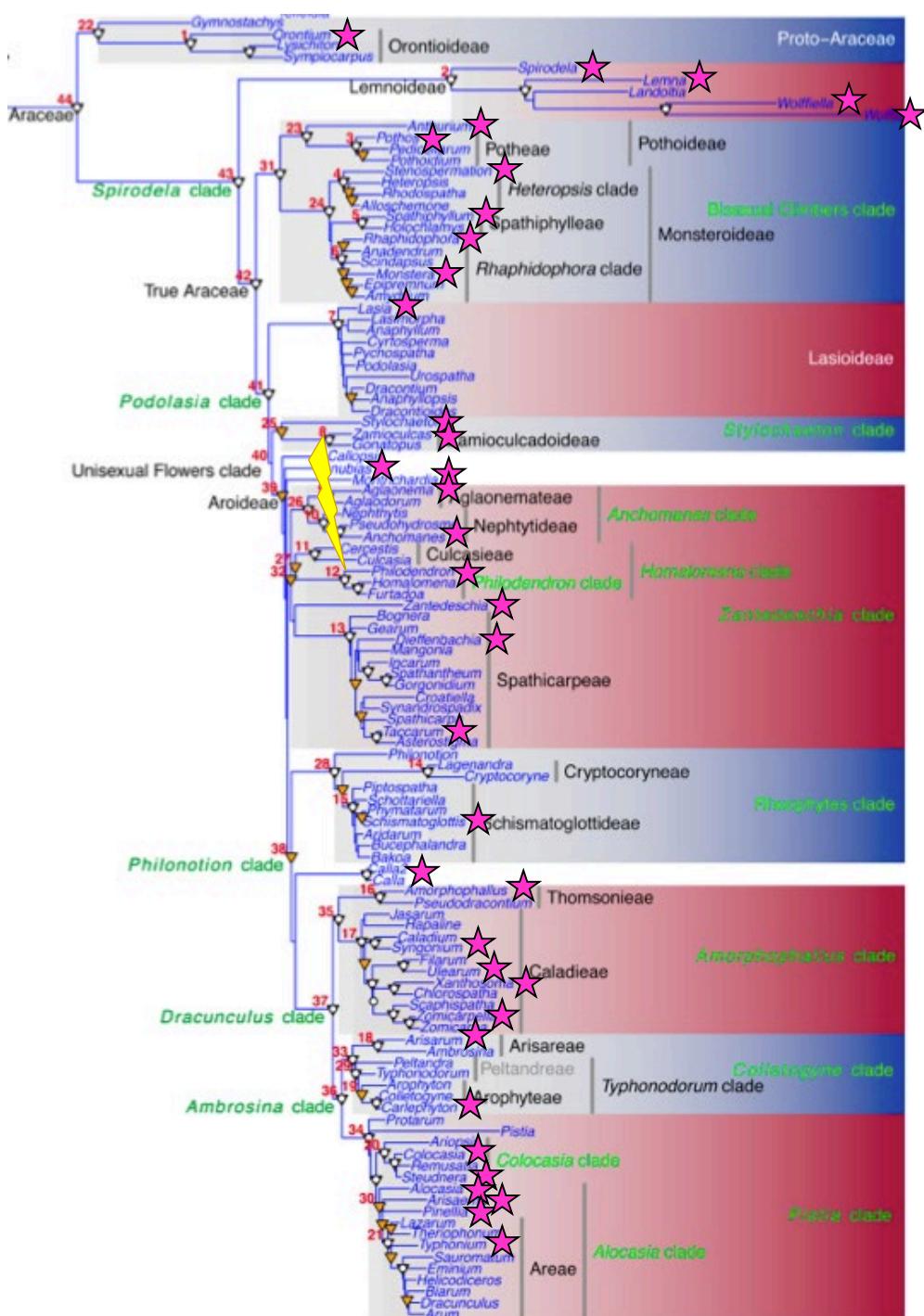


- **Marcela Mora** wrote Lucid key for Philodendron



- **Cassia Sakuragui** revised Philodendron sect. Macrobelium for Brazil; Philodendron Rio d. J. State

- **Camila Butari**, Brazil



Next Generation Sequencing

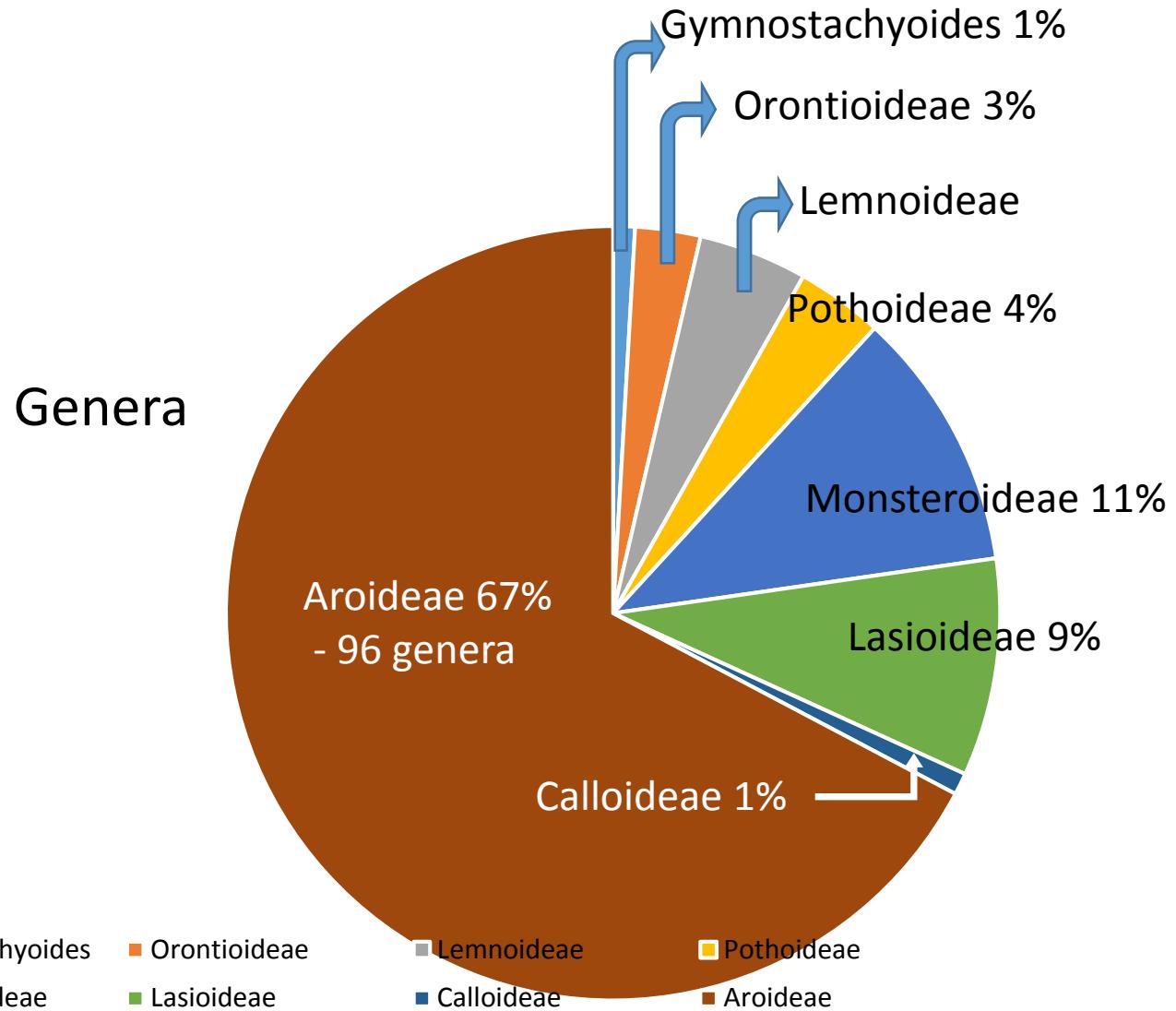
37 genera, 42 of 44 clades

Illumina data

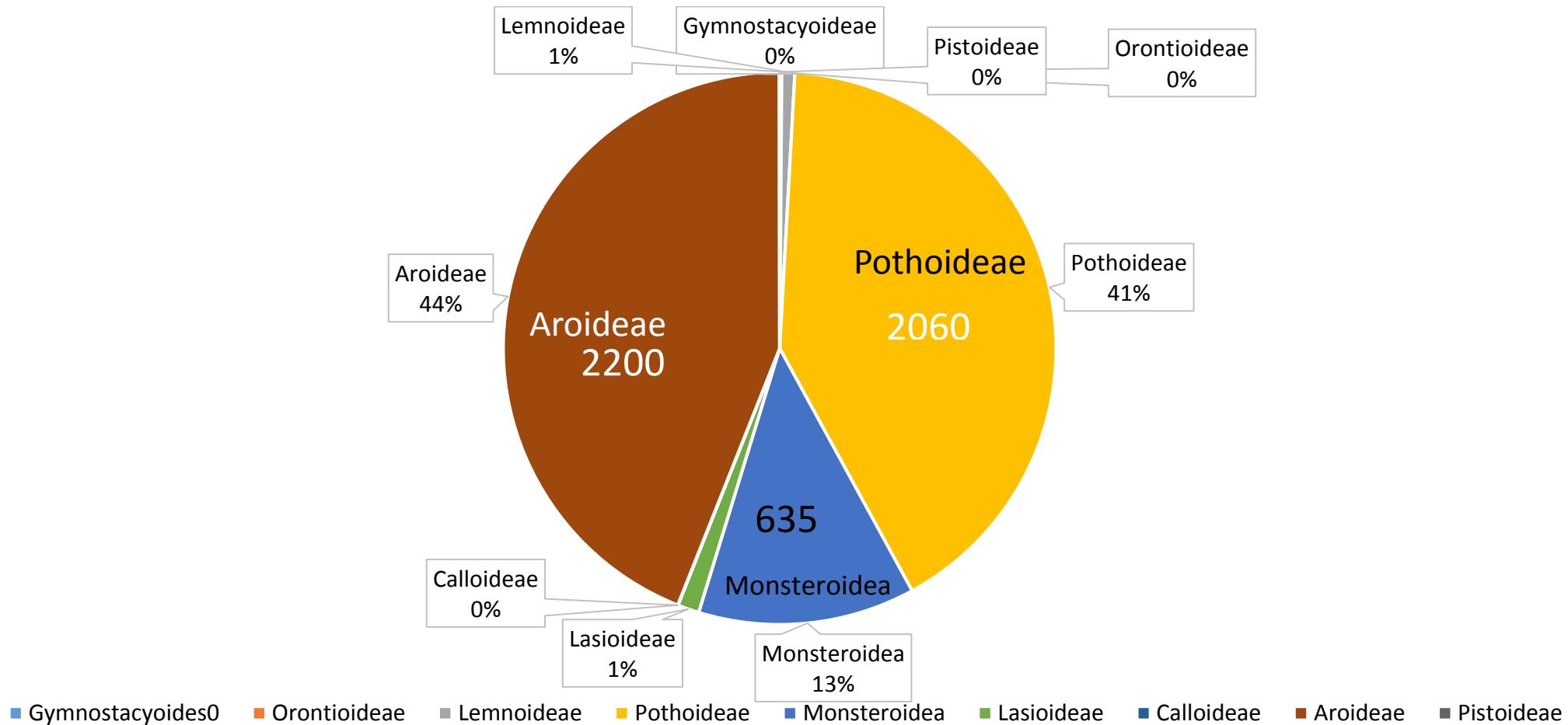
Reference based – *Lemna*



Respective Sizes of Subfamilies in Genera



Respective Size of Subfamilies in Species



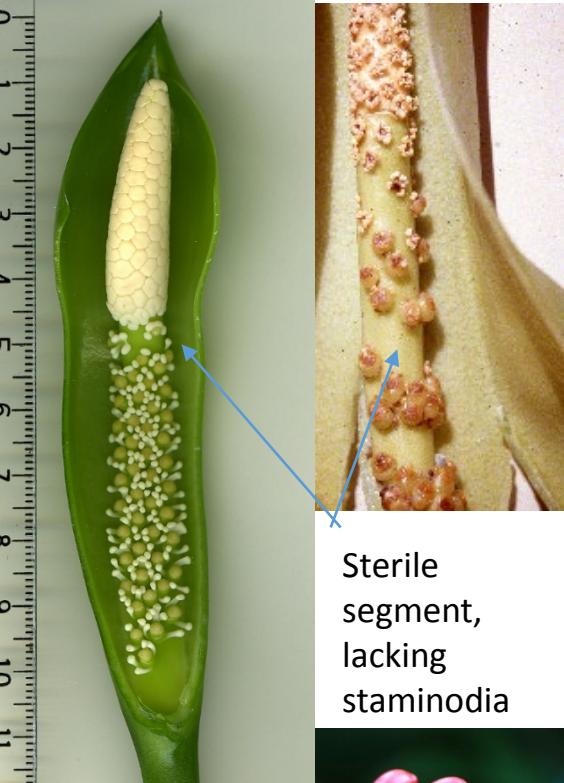
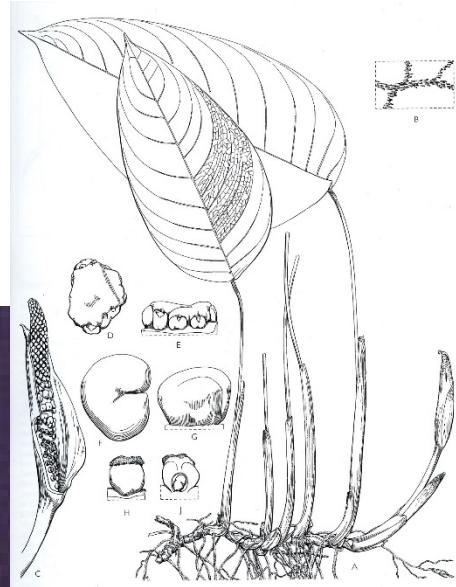
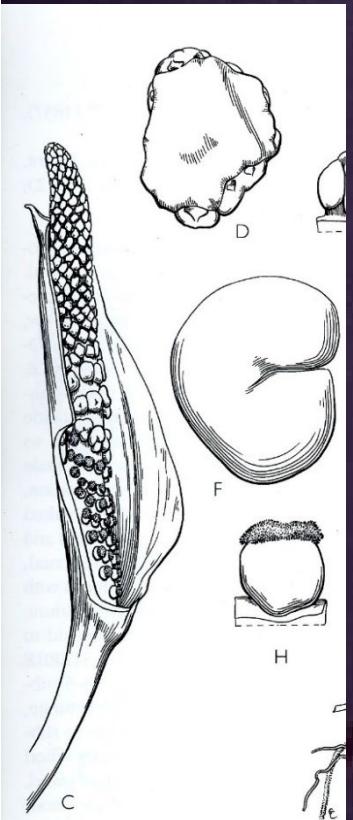
Closest Relatives to Philodendron (Tribe Aroideae)

- Tribe Dieffenbachiae
- Tribe Spathicarpeae
- Tribe Philodendreae
- Tribe Homalomenae
- Tribe Anubiadeae
- Tribe Schizmatoglottideae
- Tribe Cryptocoryneae
- Tribe Zomicarpeae
- Tribe Caladieae
- Tribe Nephthytideae
- Tribe Aglonemateae
- Tribe Colocasieae
- Tribe Montrichardeae
- Tribe Callopsideae
- Tribe Thompsonieae
- Tribe Arophyteae
- Tribe Peltandreae
- Tribe Arisareae
- Tribe Areae
- Tribe Arismateae
- Tribe Colocasieae
- Tribe Pistieae

Subfamily Aroideae- Tribe *Dieffenbachiae*

Subfamily Aroideae has
overwhelmingly the most genera
with 67% of the total.

Bognera recondita



Dieffenbachia oerstedii



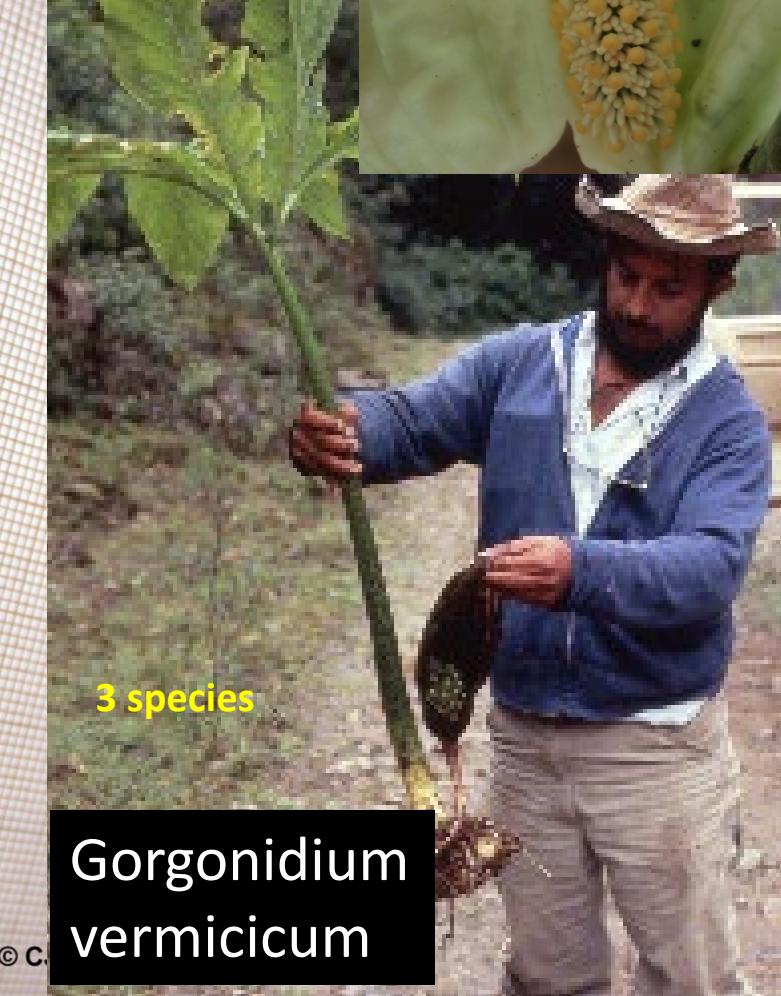
Tribe Spathicarpeae, 9 genera



Croatiella integrifolia, 1 sp.



Asterostigma,
7 species

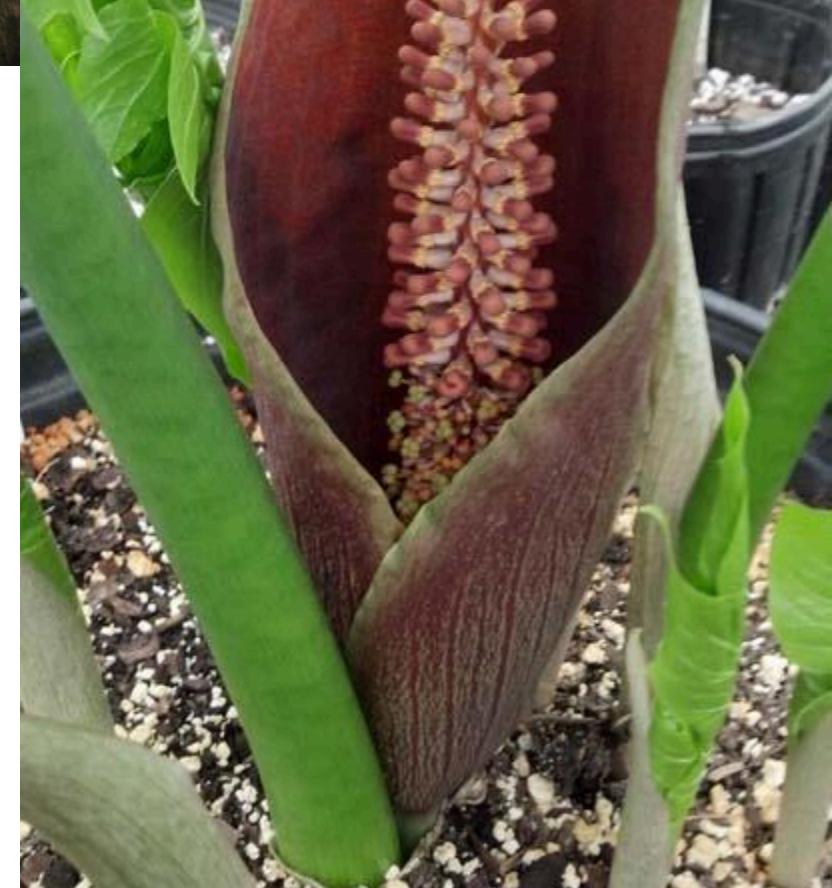


Gorgonidium vermicicum

©c



Taccarum ulei



Taccarum warmingii

Tribe Philodendreae



P. goeldii



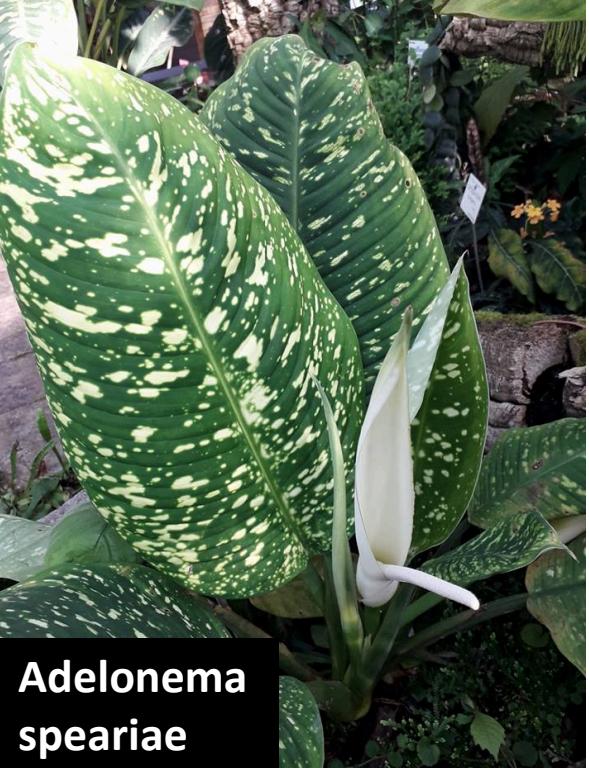
P. pinnatifidum



*Philodendron
alatiundulatum*



*Adelonema
picturata*



*Adelonema
speariae*



*Philodendron
callosum*

Tribe Homalomeniae



Homalomena imitator



Homalomena scutata



Differs from
Philodendron by its
consistently terrestrial
habit, non-resinous
inflorescence, mostly
1-locular ovary; Asia.



H. rubescens



**Homalomena
vellutipedunculum**



Anubias- Africa, mostly
aquatic

Tribe Anubiae



Tribe Schismatoglottideae

Schismatoglottis, 29 species
Philonotus, 3 species



Schismatoglottis petradaea



Inflorescences 1-3
per axil; flower
unsexual; Asian



Schismatoglottis calyprata



Philonotus americanum



Philonotus spruceanum



Schismatoglottideae - Rupicolous group

Borneo endemics Splash cup seed dispersal

All photos P.
Boyce





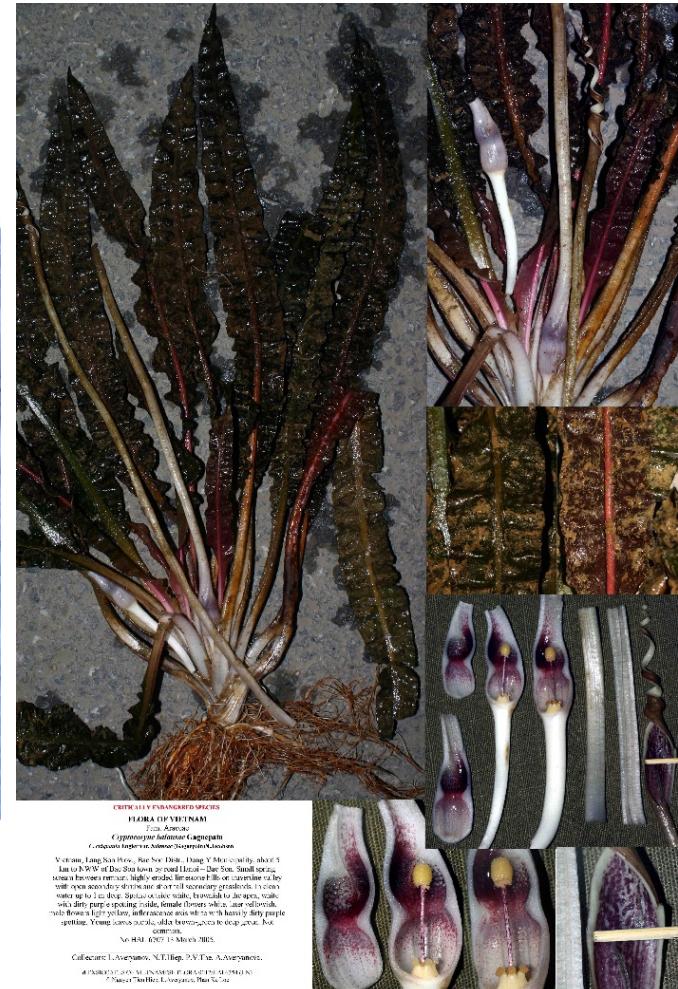
5 cm



Cryptocoryne - 58 spp.



Tribe Cryptocoryneae 2 genera, SE Asia



Tribe Zomicarpeae



Zomicarpel americanum

Tribe Caladieae

Caladium humboldtii



Caladium palaciosii



Caladium lendenii





Tribe Nephthytideae

Nephthytis 5 ssp. 1 Asia, 4 Africa





Tribe Aglaonemateae

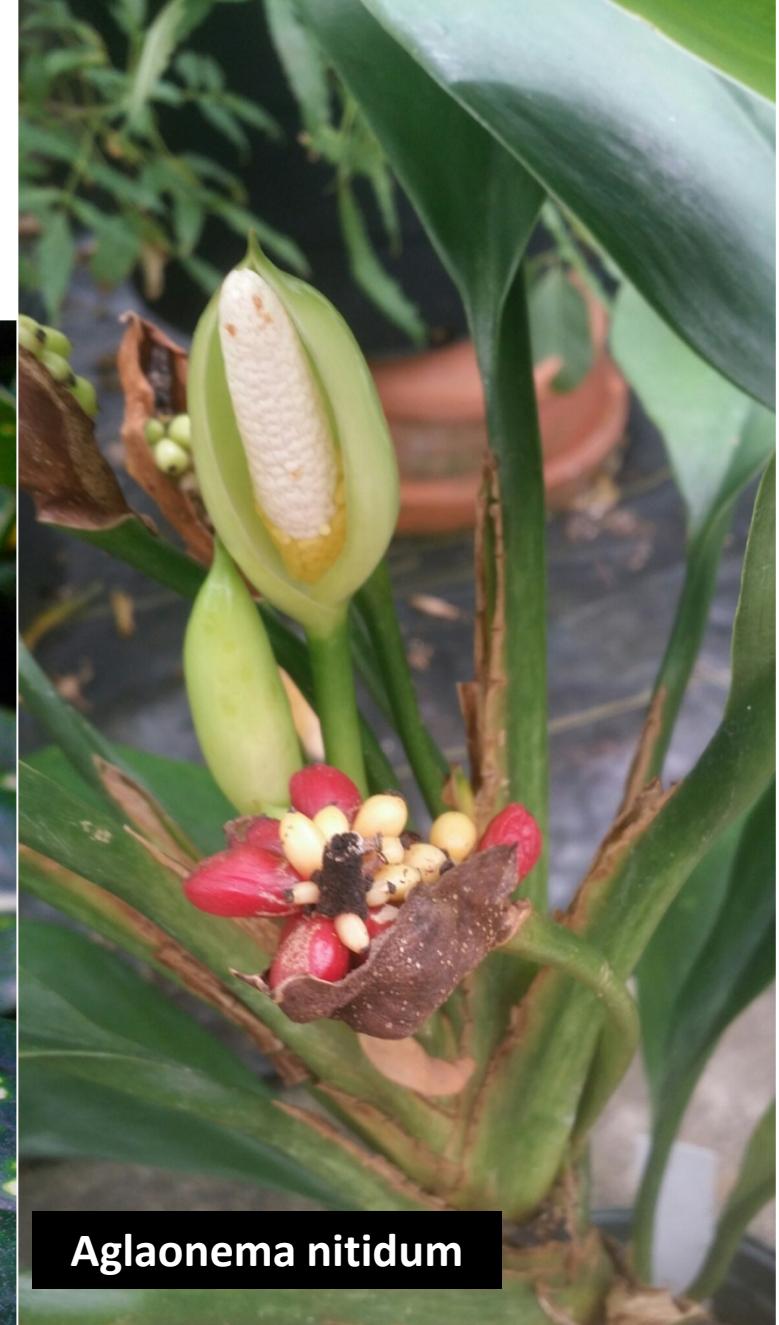
25 spp. Asia



Aglaonema brevispathum



Aglaonema costatum



Aglaonema nitidum



Tribe Culcasieae

Culcasia 28 spp. Africa





Tribe Montrichardieae

2 spp.
American Tropics



**Montrichardia
arborescens**



**Montrichardia
linifera**

Tribe Zantedeschieae

Gartenflora 1898.



8 species
South Africa





Callopsis volkensii

Juni 2007

Hortus botanicus Leiden



Tribe Callopsideae

Callopsis - Kenya,
Tanzania

Flowers unisexual, ovary 1-locular with 1 ovule



Titan's Garden



Amorphophallus

197 species; Africa and Asia



A. croatii



A. dracontoides



A. dzuii



A. sylvaticus



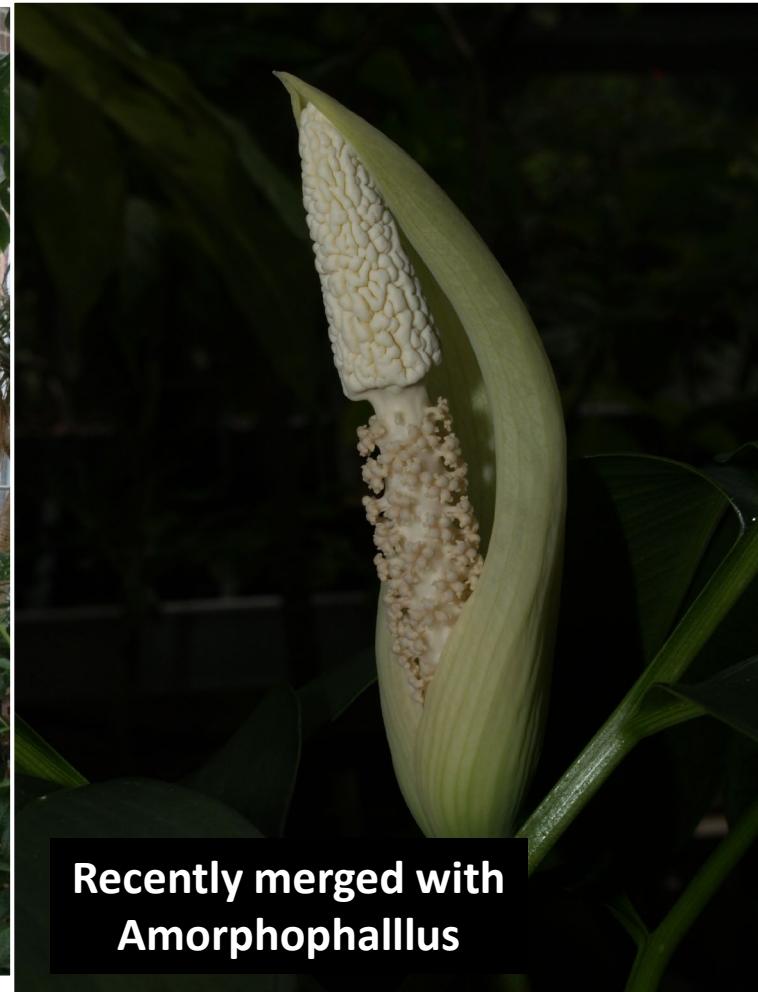
A. prainii

Tribe Thompsonieae



Emily Colletti with
Amorphophallus titanum

Pseudodracontium
Cambodia, Laos, Thailand,
Vietnam



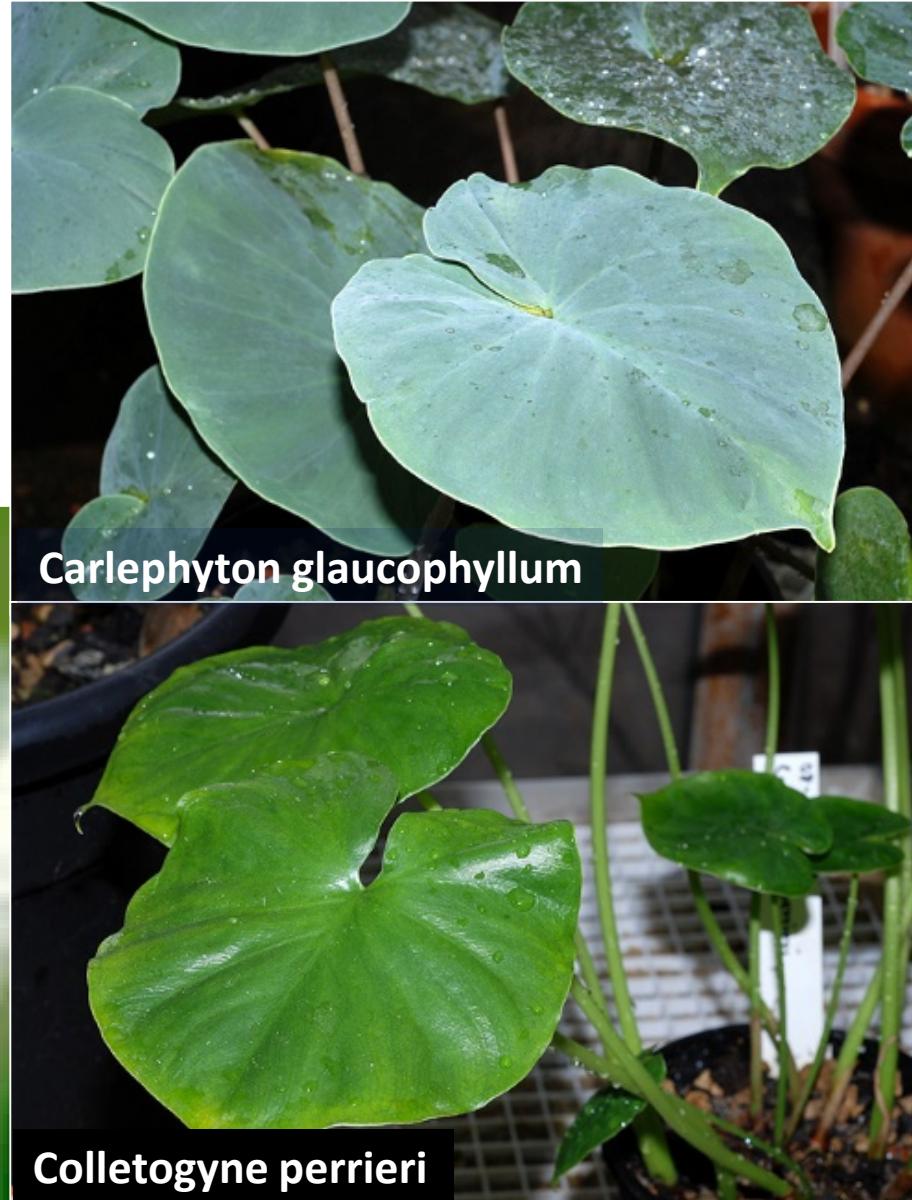
Recently merged with
Amorphophallus



Tribe - Arophyteae

Endemic to Madagascar

- **Arophyton** - 7 species
- **Carlephyton** - 3 species
- **Colletogyne** - 1 species





Tribe Peltandreae



Peltandra – 2 spp
Eastern North America

Typhonodorum - Madagascar



Tribe Colocasieae



4 spp.

Appendix
Male spadix
Female spadix

Monotypic
- Seychelles



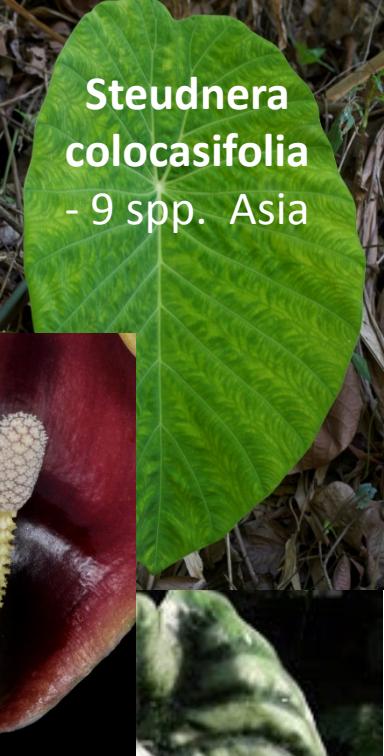
13 spp.



Alocasia macrorhizos



Steudnera
colocasifolia
- 9 spp. Asia



Tribe Arisareae

Arisarum- Circum-
Mediterranean- 3 spp

CC BY SA



Tribe Ambrosineae

Ambrosina- N. Africa, Sicily, S. Italy, 1 sp.



Pollination by flies with
deceit trapping mechanism



Tribe Areae

7 genera, mostly
Mediterranean

Arum- Europe, Middle
East, India- 7 spp.

Eminium- Middle East to
Afghanistan- 9 spp.

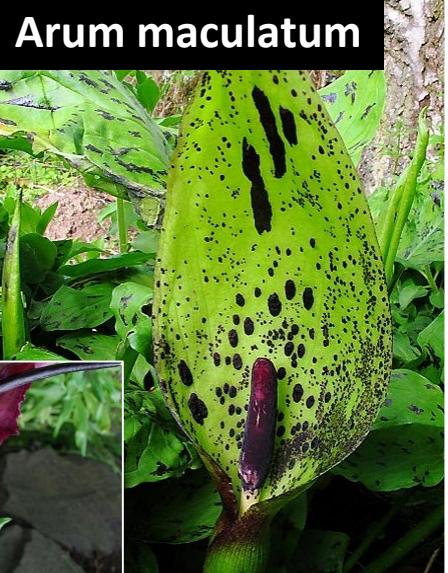
Dracunculus- N. edge of
Mediterranean- 2 spp.

Helicodisceros- Sardinia,
Baleric Is., Corsica- 1 sp.

Typhonium- Asia,
Melanesia, Australia- 65
spp.

Sauromatum- Central
Africa, India to China- 9
spp.

Biarum- Circum
Mediterranean, Middle
East- 23 spp





Ovary several ovulate;
female spadix free
from spathe; septum
lacking



Tribe Arisaemateae

Arisaema - E. N. America, Mexico, E. Africa,
India to Japan, Eastern Melanesia

A. macrophyllum



A. dilatum



A. heterophyllum



Arisaema dracontium



Pinellia - N. Asia

Pinellia cordata



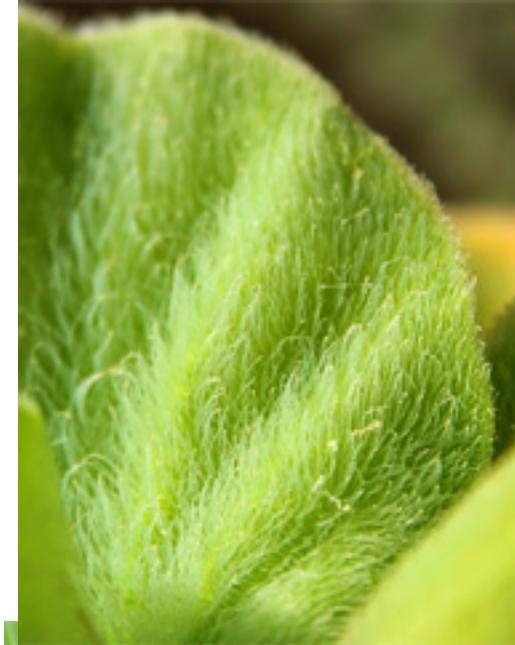
Ovary 1 - ovulate;
female spadix fused
to spathe; septum
separating male and
female flowers

Pinellia tripartita





Tribe Pisteae- 1
Pantropical species



Cultivated by Enid Offolter, Florida





P. sagitifolium



P. radiatum



29
6 2006

P. lazori



P. lazori



P. dodsonii



P. verrucosum



P. grandipes



P. gigas





P. albovirescens



P. lencois (Bahia)



P. saxicolum

P. saxicolum



P. attenuatum
Croat,
Amazonian
Ecuador

P. barrosoanum G. S. Bunting, Venezuela ,
Guianas, Brazil, Ecuador, Peru & Bolivia.



P. baudoense
Croat & D. C.
Bay, *Croat*
10463
Coastal
Colombia and
Ecuador

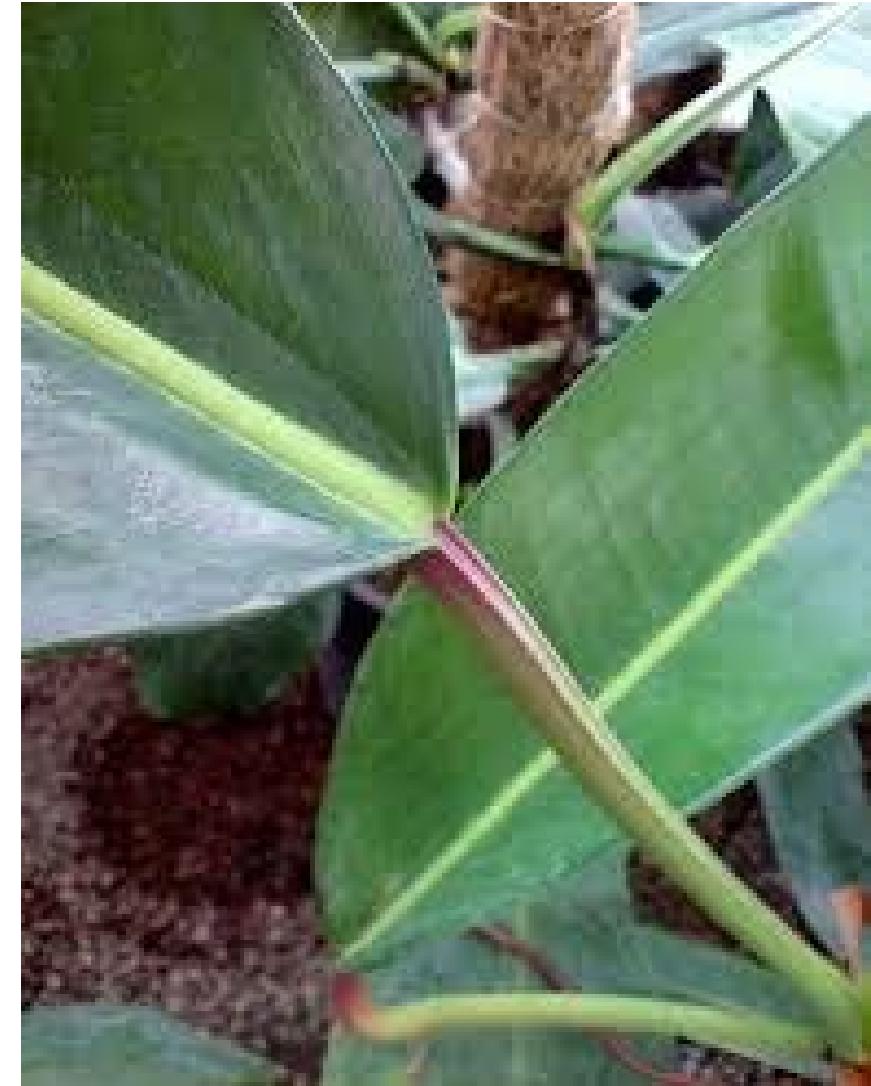


Philodendron bonifaziae

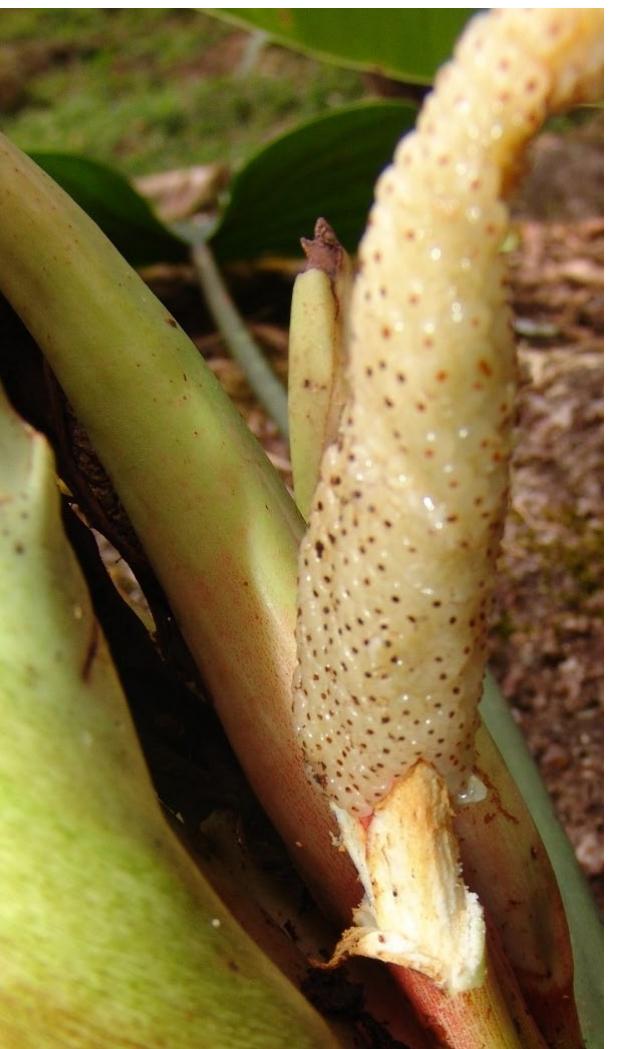
Croat, NE Ecuador



Philodendron callosum



P. caranoense
Croat, Colombia,
Cord. Orientale



Philodendron cerrojefense M. M. Mora & Croat, sp. nov. Cerro Jefe, Panama

The species was previously confused
with *P. tripartitum*.



Philodendron clarkei

Croat



Croat 72310

P. crassispatum Croat,
Costa Rica to Panama,
1100-2600 m



Croat 33150

*Philodendron
crassum*
Rendle, Brazil,
Rio de Janeiro
State



Philodendron cremersii Croat
French Guiana & Suriname,
sea level to 500 m





***Philodendron nullinervium* E. G.
Gonç., Acre State, Brazil**





P. danielii Croat, Antioquia, Colombia





P. davidsonii Croat ,
Panama. Bocas del Toro





Philodendron deflexum,
French Guiana





***Philodendron delinksii* Croat,
Ecuador, Pacific slope**



Philodendron distantilobum
K. Krause, Amazon basin



Philodendron
dodsonii
Croat &
Grayum;
Costa Rica to
Ecuador

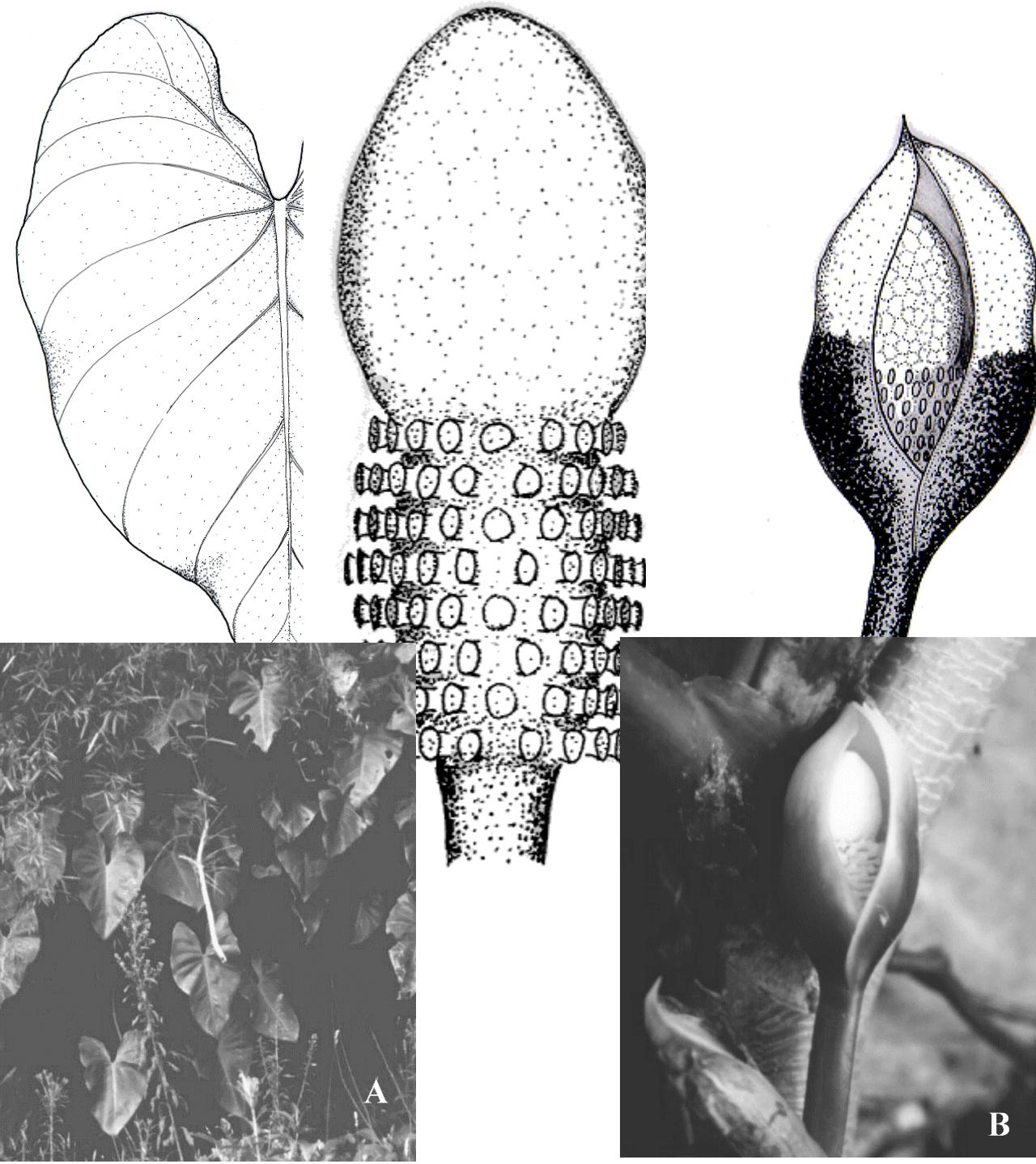
P. edwinii
Croat,
Colombia,
Caqeta, E.
slope of
Cord.
Oriental





P. elegans K. Krause,
Colombia. W. slopes,
Cord. Central





Philodendron ellipticaspathum Jacome & Croat, Colombia (Central & Western Cordilleras)



Philodendron ernestii Engl., Amazon basin





***Philodendron
esmeraldense***
Croat, Ecuador,
Pacific slope

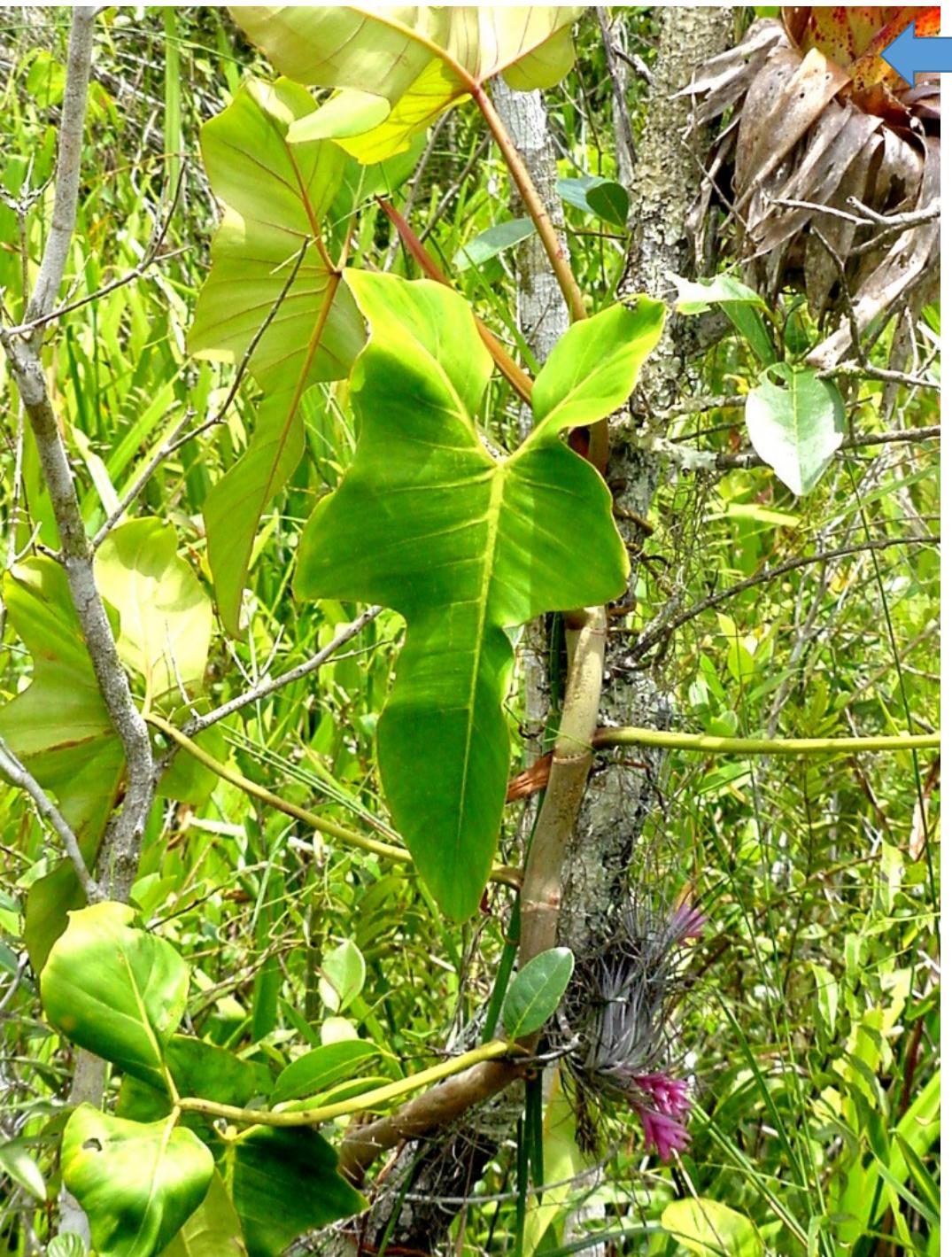


P. fendleri K.
Krause, Martinique
(known from
Venezuela and
Trinidad)



P. fibrosum Engl.,
Ecuador, Western Andes





Philodendron folii Nadruz, eastern Brazil, Espírito Santo

Philodendron fragile Nadruz & Mayo, Rio de Janeiro State, Maca de Cima.





P. fragrantissimum (Hook.) G. Don
Belize to Panama, Colombia, Guianas
& Amazon basin



P. furcatum Croat & D. C. Bay, Colombia, (Pacific coast)





Philodendron gardeniodorum Croat, D. P. Hannon
& Delannay, NW Ecuador,



P. genevieveanum Croat, Colombia,
Antioquia, Cord. Central





P. giganteum Schott, Grenada form with
red spathe tube





Philodendron gigas

Croat, Panama





P. gloriosum
André, Colombia





Philodendron goeldii G. M. Barroso,
Eastern Amazon basin

P. grandifolium (Jacq.) Schott,
NE South America



P. grayumii Croat,
Panama, NW. Colombia



P. gribbianum Croat, Ecuador, Eastern slope of Cordillera Oriental



Along road
between Quito
and Baeza,
between
Cuchauco and
Papallacta, just
W of village of
Papallacta at
km 189, 3205 m

**Philodendron
guttiferum** has
been widely
misused for
many
members of
subgen.
Pteromischum.
The species is
restricted to
the Amazon
basin.



**Philodendron
guttiferum**
Kunth, Amazon
basin

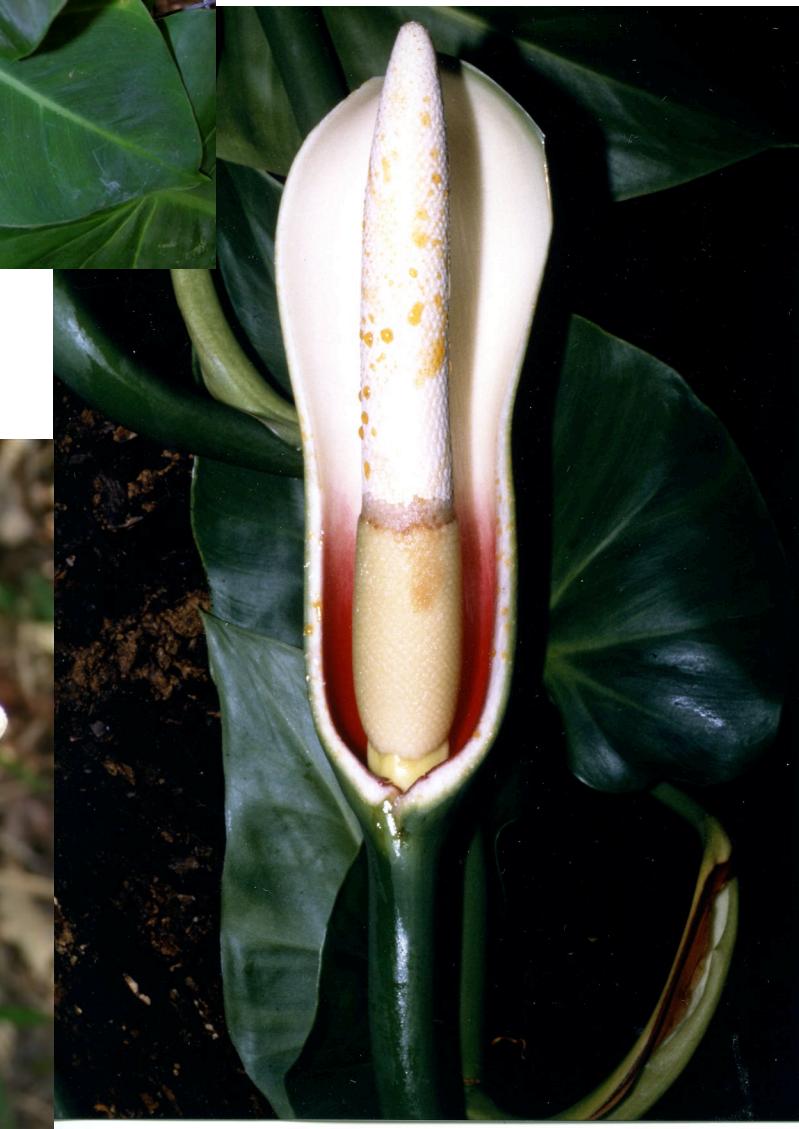


P. hastatum
K. Koch &
Sello,
SE Brazil



P. hebetatum Croat & Grayum,
Costa Rica to Colombia

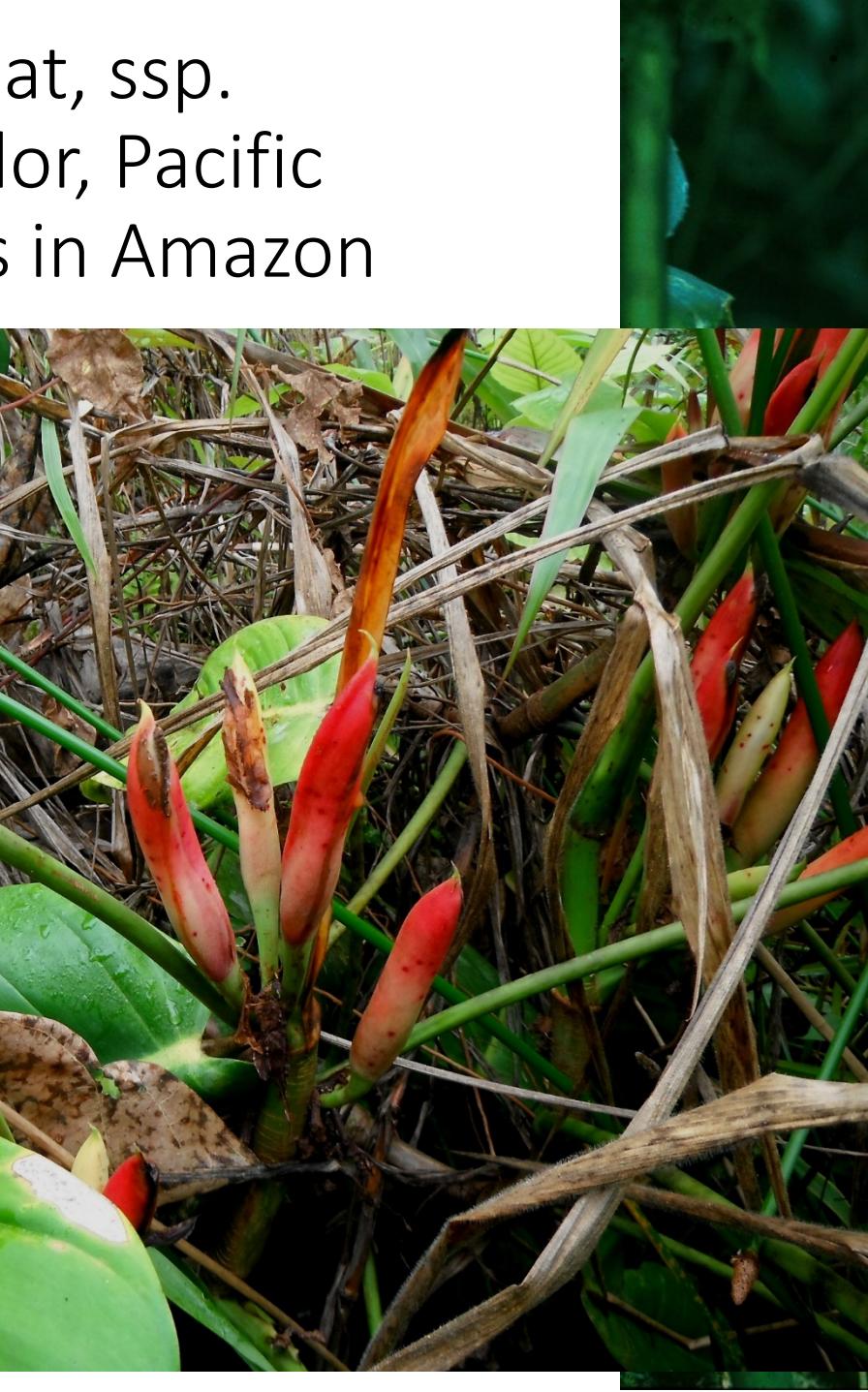




**Philodendron
hederaceum (Jacq.)
Schott, Neotropics**

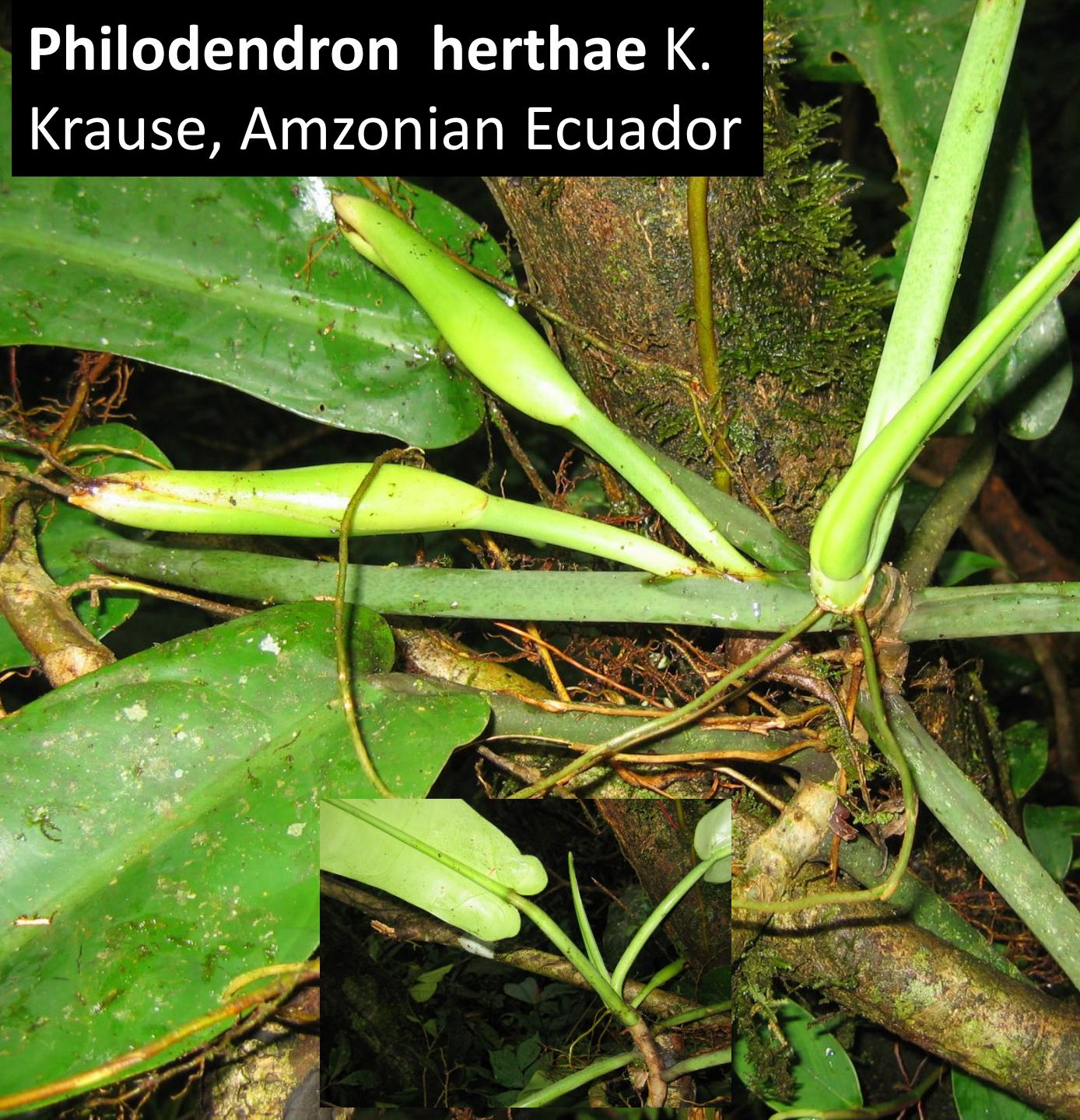
Probably the single most
widespread aroid in the world

Philodendron heleniae Croat, ssp.
heleniae, Colombia-Ecuador, Pacific
slope, ssp. *amazonense* is in Amazon
basin





**Philodendron herthae K.
Krause, Amzonian Ecuador**





P. heterophyllum
Poepp. , Amazonian
Colombia to Bolivia

P. hooveri Grayum,
Pacific slope. N.E. Ecuador



P. huanacapacense Croat, Amazonian Ecuador, Peru & Bolivia



P. hylaeae G. S. Bunting, Amazon basin, Guianas to
E. Colombia, Ecuador, Peru & Bolivia

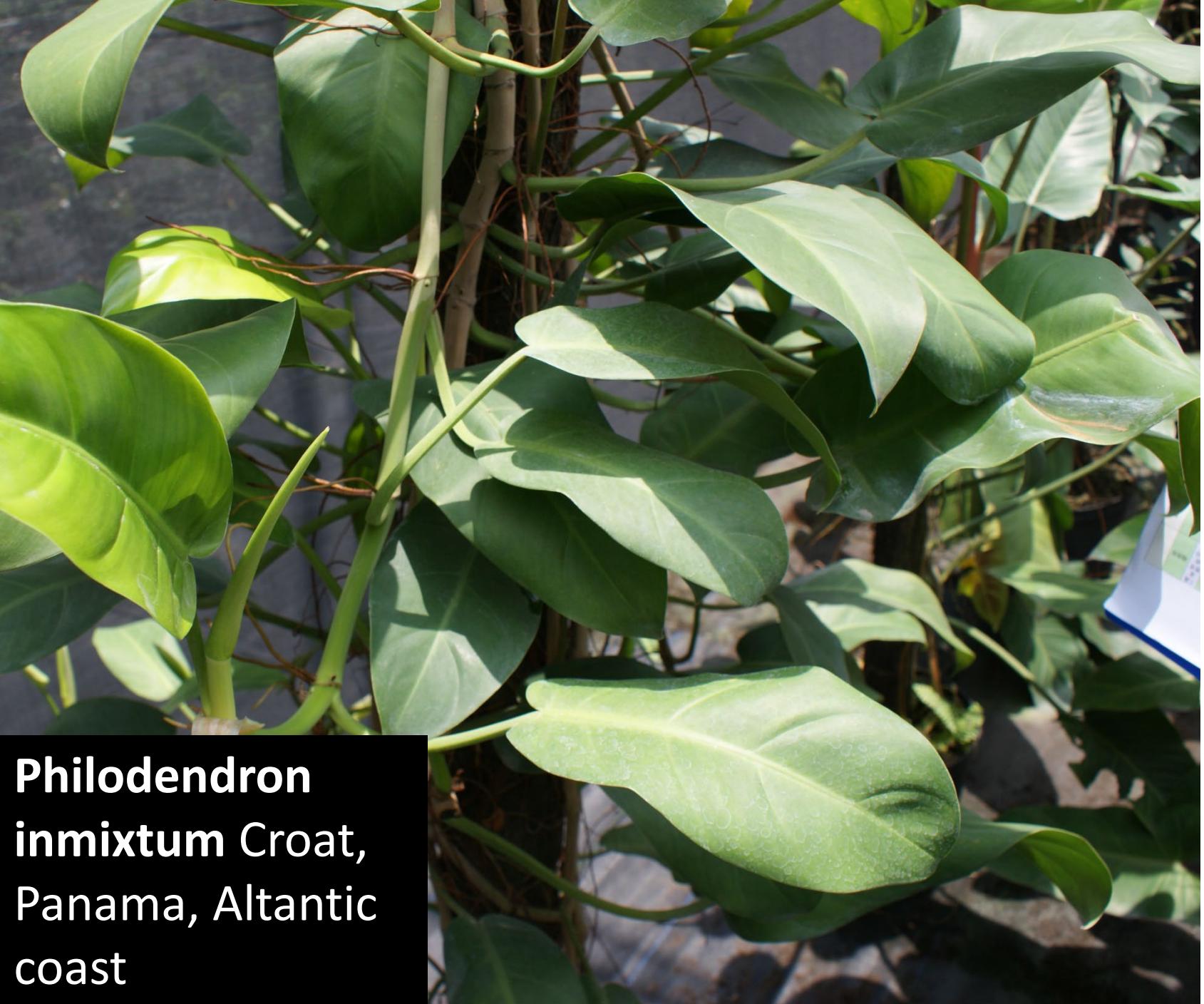




P. ichthyoderma Croat & Grayum, Panama to Colombia, both E slope of Cord. Occidental and E slope of Cord. Central. One of only a few terrestrial species in the group.

Philodendron imbe Schott, Eastern Brazil to Bolivia





**Philodendron
inmixtum** Croat,
Panama, Altantic
coast





Philodendron insigne
Schott, Amazonia,
Guianas to Brazil,
Colombia, Ecuador, &
Peru





P. jacquinii Schott, Central America (El Salvador & Guatemala to Panama, Colombia, Venezuela, Guianas to Colombia. The only member of sect. *Macrogynium*.



P. jimeniae Croat, NW Ecuador



P. joaosilvae Croat et al., lower
Amazon basin



P. jodavisianum
G. S. Bunting,
Mexico to
Panama,
Colombia,
Ecuador, &
Venezuela





P. joepii Croat

Philodendron joepii Croat



Philodendron 'joepii' spathe

Photo: Joep Moonen



P. "joepii"

P. kaieteurense Croat, Suriname





P. kroemeri Croat &
Acebey, Colombia to
Bolivia, Amazon
basin



P. jeanpaulorum Croat & G. Ferry, N. Ecuador,
eastern slope



P. lapoanum Croat, Ecuador



P. laticiferum Croat & M. M. Mora, Colombia, Chocó



P. lazori Croat, Panama, Canal Zone



P. lechlerianum
Schott, Bolivia, Peru,
high elevations



P. lentii Croat, Panama





P. ligulatum Schott,
Nicaragua to Colombia



P. linnaei Kunth, Guianas & Venez. to Brazil,
Colombia , Ecuador & Peru.



Philodendron llanense

Croat, Endemic to Central
Panama



Philodendron longilobatum

Saukur., Brazilian endemic

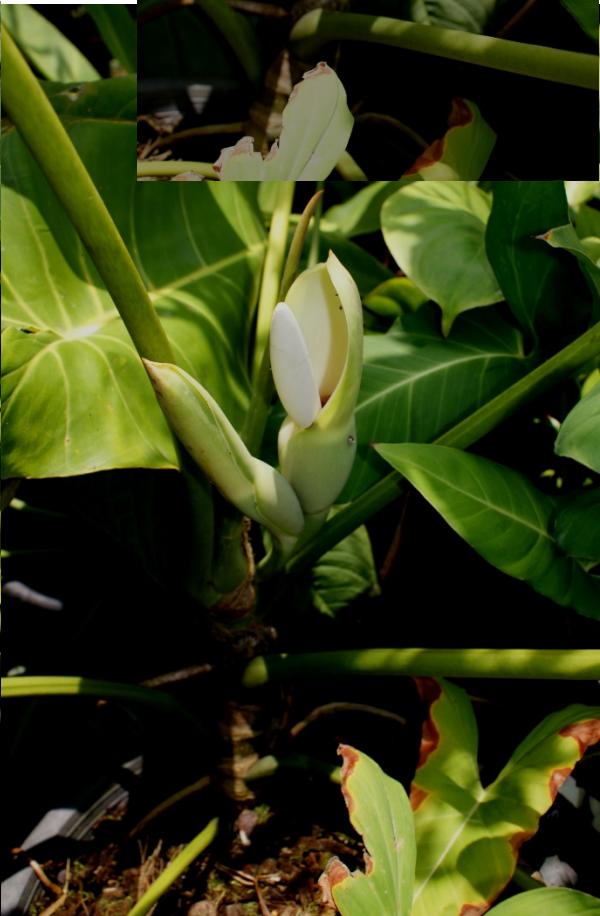
Known only from Espírito Santo State,
certainly a relative of *P. bipennifolium*
Schott



Philodendron longipes Engl., Colombia,
Pacific slope of Cord. Occidentale



P. lindstromii Croat,
Peruvian Amazon, near
Iquitos



Philodendron lindenii
hort ex Engl.,
Colombia

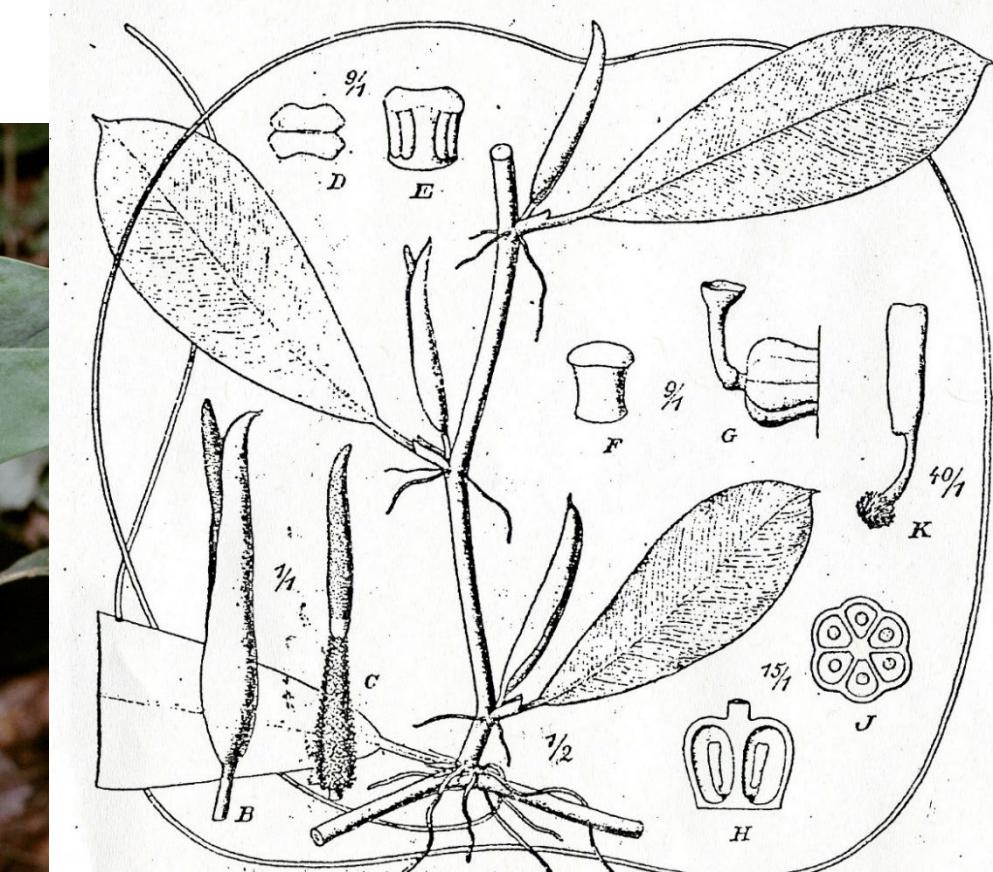


Philodendron longirrhizum M.
M. Mora & Croat, Colombia,
Venezuela, high Andes

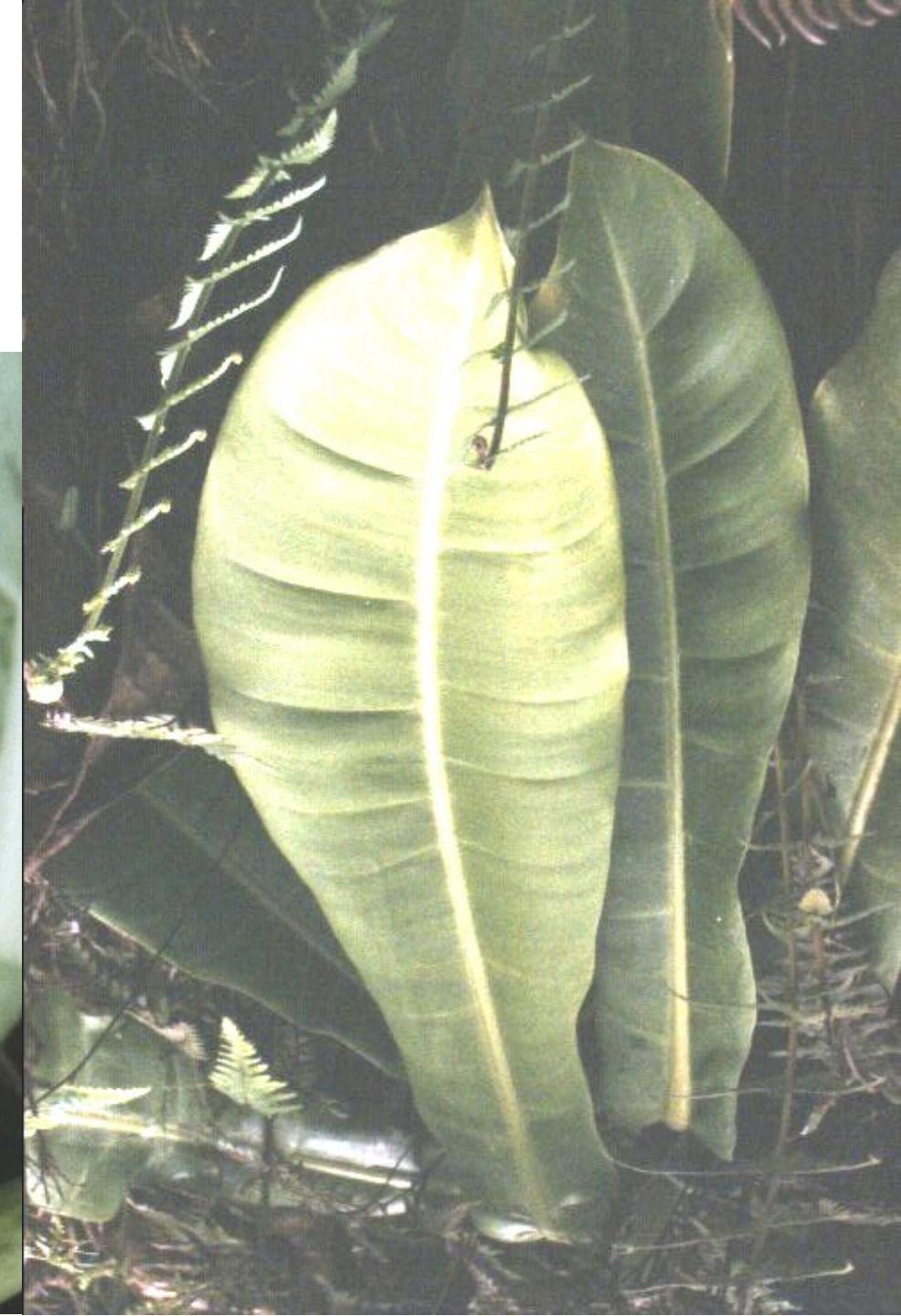




P. longistylum K.
Krause, Amazon
River, Brazil



P. longum Croat, Colombia,
Pacific coast



P. lupinum E. G. Gonç.,
Brazil, Acre, Peru,
Loreto



P. luteonervium Croat, Colombia,
Pacific coast



P. luxurians Croat, D. P.
Hannon & R. Kaufmann,
Colombia, Pacific coast





P. lynamii Croat,
Peruvian lowlands



P. lynnhammadiae
Croat, NE Ecuador,
Pacific slope



P. madronense Croat, Central
Panama, Pacific slope



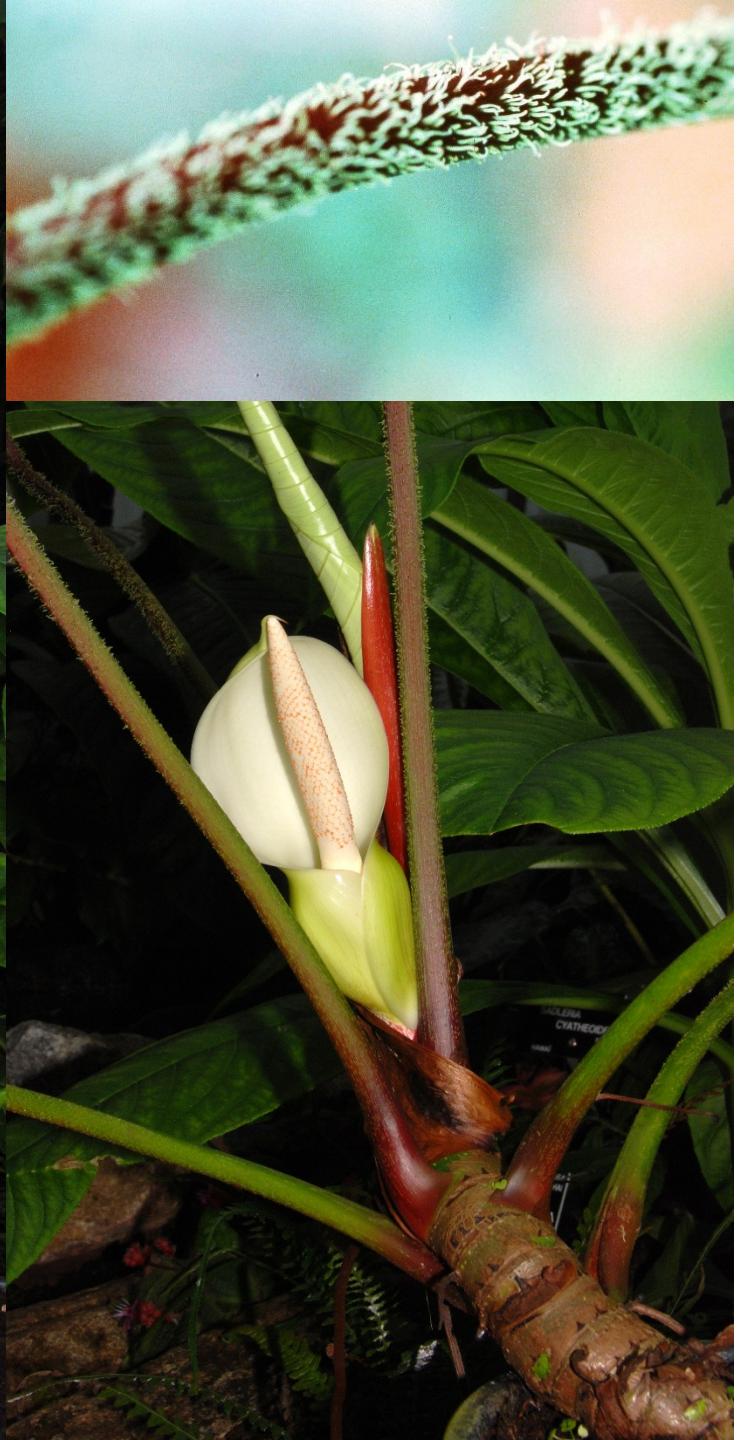
A dense tropical forest scene. In the foreground, there are large, broad green leaves, some with distinct veins and others showing signs of damage or holes. A tree trunk with a textured bark is visible on the left side. The background is filled with more lush greenery and foliage, creating a sense of depth and a rich, natural environment.

See Xavier
Paper where. We had
other images.

P. magnum Croat,
NE. Ecuador

Philodendron malesevichiae

Croat, Colombia & Panama



P. mamei André, Upper Amazon basin, Ecuador, terrestrial with a creeping stem.



12 4 2006

P. marcocorreaeum

Croat, Colombia, E
slope Cord. Oriental





**P. mayoi E. G.
Gonç., Brazil,
Goias, 970 m**

P. melanochrysum Linden & André



**Philodendron
melanolaminum** Croat,
NE Ecuador, Lita





Croat 94626

P. melanonervium Croat, NE Ecuador, Lita area



P. melanum Croat, NE Ecuador, Lita area



P. melinonii Brongn. ex Regel,
Venezuela, Guianas, N. Brazil





P. mello-barretoanum
R. Burle-Marx ex G. M.
Barroso)



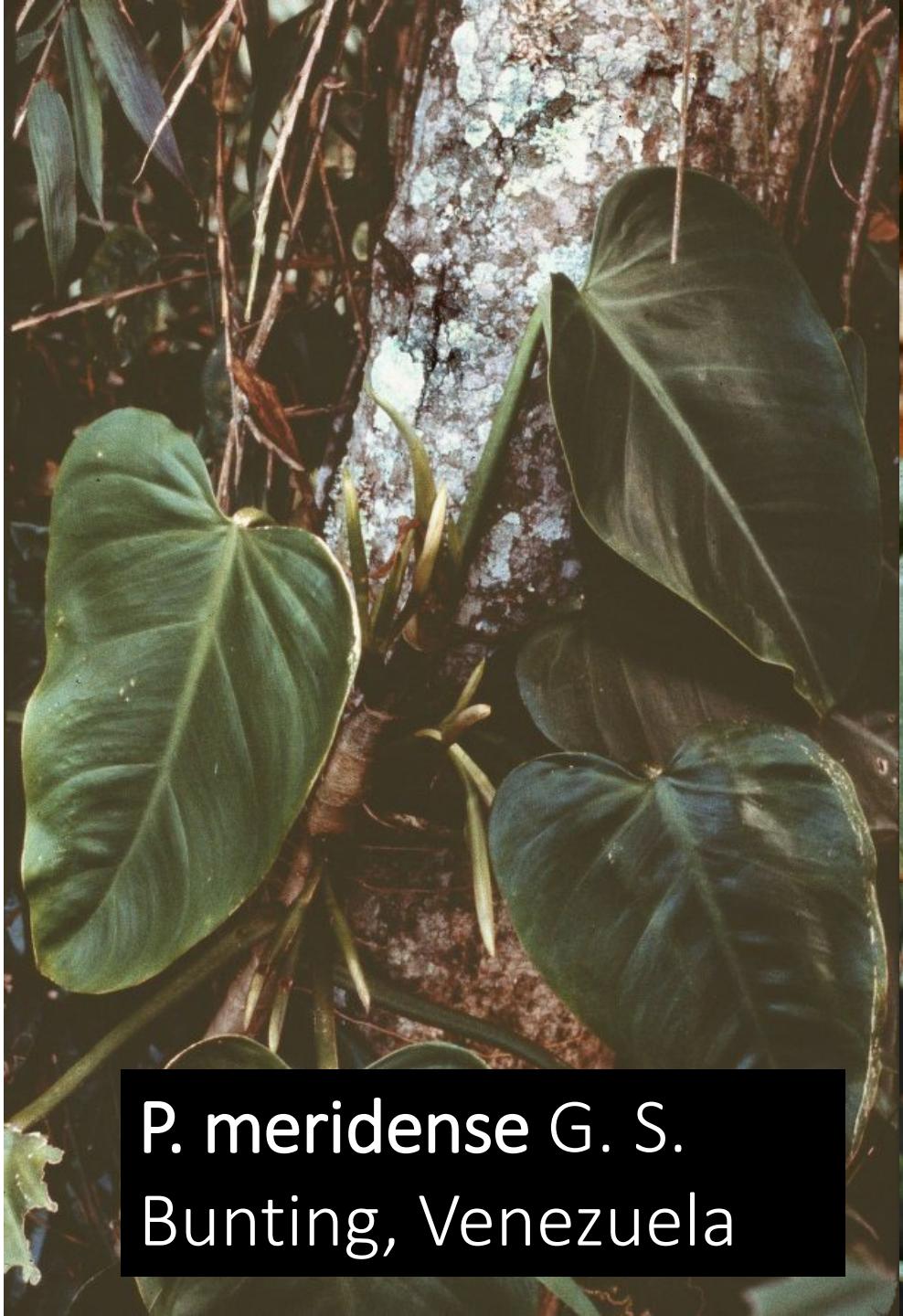
17 9 2006

P. menkei Croat, Amazonian
Ecuador,



P. mentiens Croat & Delannay,
NE Ecuador





P. meridense G. S.
Bunting, Venezuela





Philodendron
mexicanum Liebm.,
Mexico to Honduras



***Philodendron
micranthum* K. Krause ,
Ecuador, Peru & Brazil**



P. monsalvae Croat
& D. C. Bay, coastal
Colombia

Philodendron moonenii
Croat, French Guiana



- Times up Folks and this is only A to M. We'll have to do the rest of the alphabet at another time!
- Thanks for your attention.

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