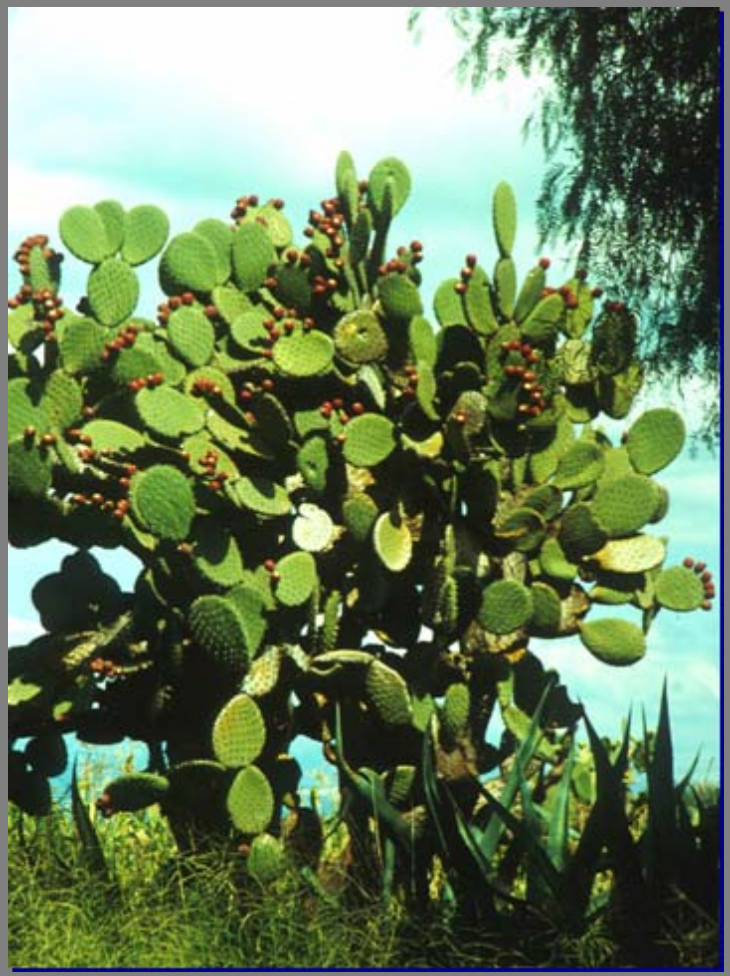


Taxonomy and Distribution of *Opuntia* and Related Genera

Raul Puente
Desert Botanical Garden

Donald Pinkava
Arizona State University

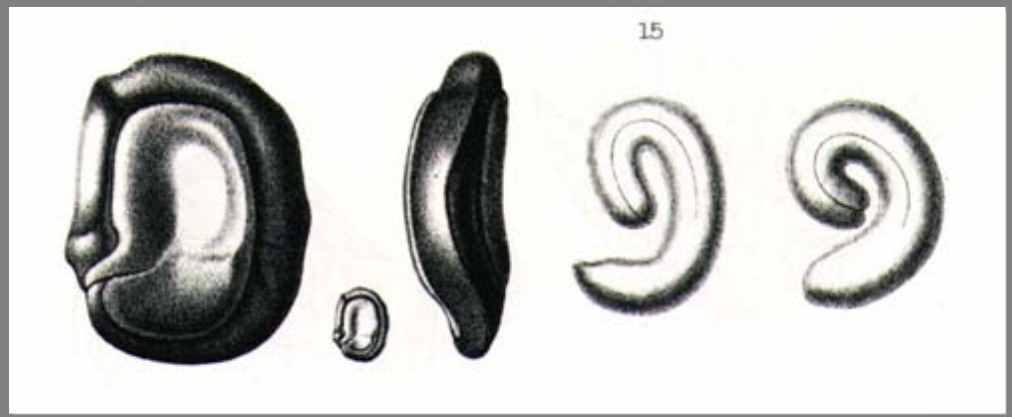
Subfamily Opuntioideae

- Ca. 350 spp.
- 13-18 genera
- Very wide distribution (Canada to Patagonia)

Morphological consistency

- Glochids

- Bony arils



Generic Boundaries

Britton and Rose, 1919
-- Seven genera

- *Grusonia*
- ***Maihuenia***
- *Nopalea*
- *Opuntia*
- *Pereskiopsis*
- *Pterocactus*
- *Tacinga*

Anderson, 2001
-- 15 genera

- *Austrocylindropuntia*
- *Brasiliopuntia*
- *Consolea*
- *Cumulopuntia*
- *Cylindropuntia*
- *Grusonia*
- *Maihueniopsis*
- *Miqueliopuntia*
- *Opuntia*
- *Nopalea*
- *Pereskiopsis*
- *Pterocactus*
- *Quiabentia*
- *Tacinga*
- *Tephrocactus*
- *Tunilla*

Hunt, 2006
--18 genera

- *Austrocylindropuntia*
- *Brasiliopuntia*
- *Consolea*
- *Cumulopuntia*
- *Cylindropuntia*
- *Grusonia*
- *Corynopuntia*
- *Micropuntia*
- *Maihueniopsis*
- *Miqueliopuntia*
- *Opuntia*
- *Nopalea*
- *Pereskiopsis*
- *Pterocactus*
- *Quiabentia*
- *Tacinga*
- *Tephrocactus*
- *Tunilla*

Classification:

Family: Cactaceae

Subfamily: Maihuenioideae
Pereskioideae
Cactoideae
Opuntioideae

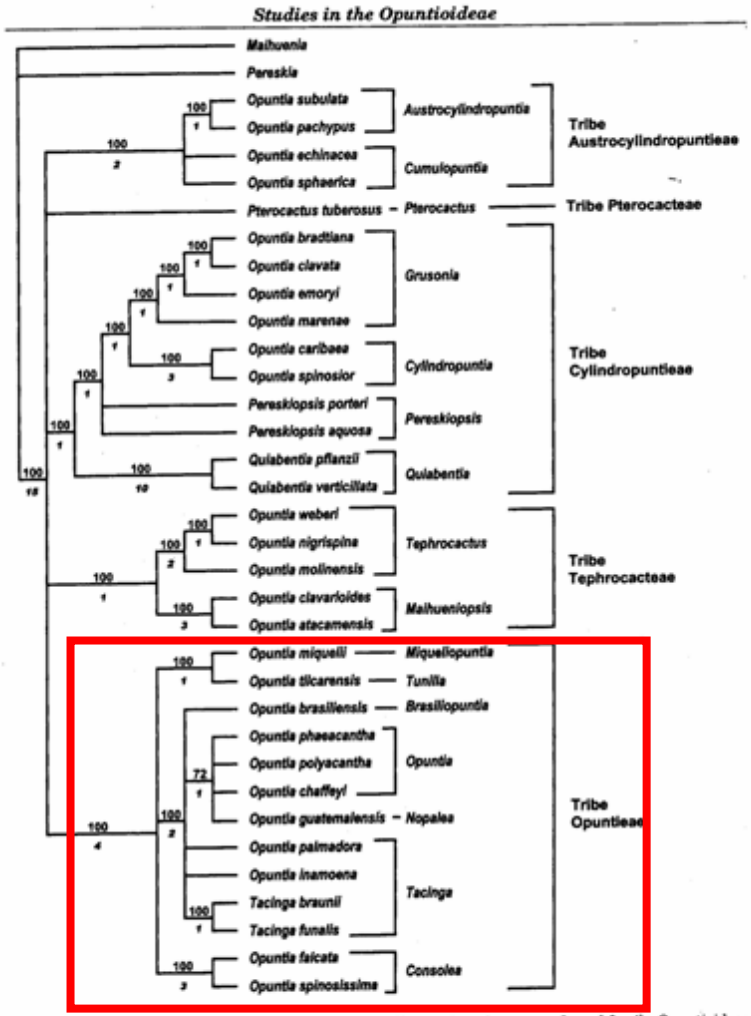
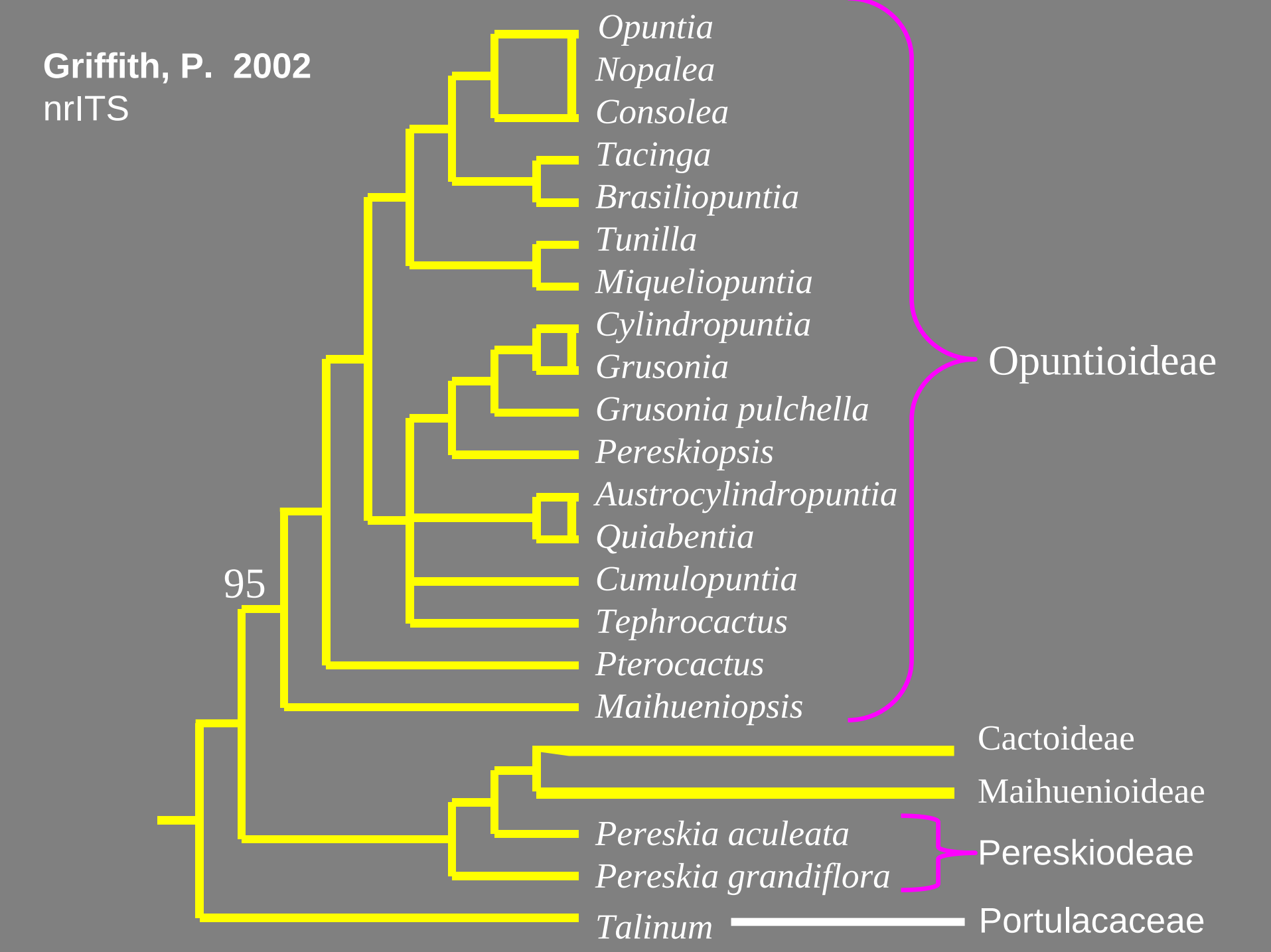


Figure 1. Majority rule consensus tree of 32,700 equally parsimonious trees for subfamily Opuntioideae based on comparative sequencing of *rpl*16 intron sequences. CI = 0.802, RI =0.799. Numbers above the branches are bootstrap replicate percentages; number below branch is the decay value. Consensus tree is rooted with *Pereskia* and *Maihuenia*. (Figure modified from Dickie 1997.)

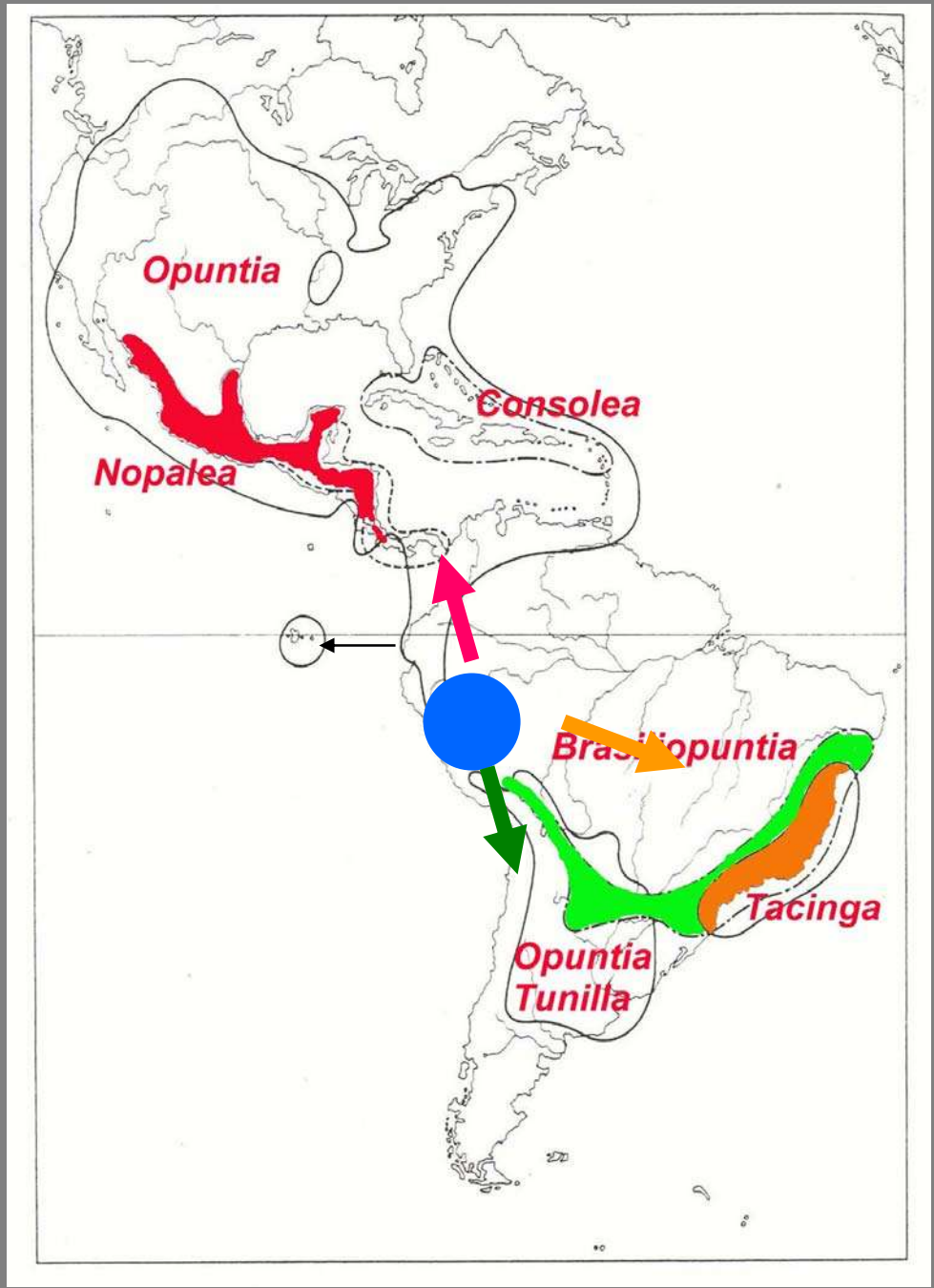
12

Wallace, 2002

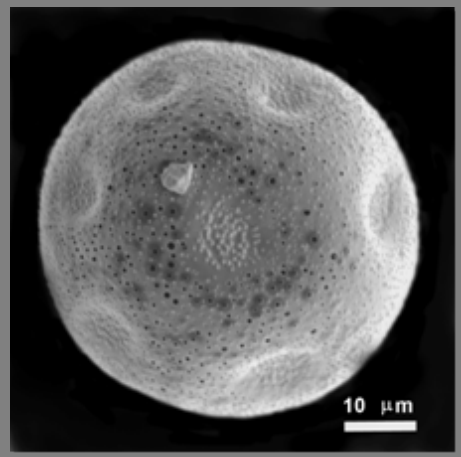

Griffith, P. 2002
nrITS
Opuntia
Nopalea
Consolea
Tacinga
Brasiliopuntia
Tunilla
Miqueliopuntia
Cylindropuntia
Grusonia
Grusonia pulchella
Pereskiopsis
Austrocylindropuntia
Quiabentia
Cumulopuntia
Tephrocactus
Pterocactus
Maihueniopsis
95
Opuntioideae
Cactoideae
Maihuenioideae
Pereskia aculeata
Pereskia grandiflora
Pereskiodeae
Talinum
Portulacaceae

Origin and Dispersal

Andean Region
(Wallace and Dickie, 2002)



Cylindropuntia

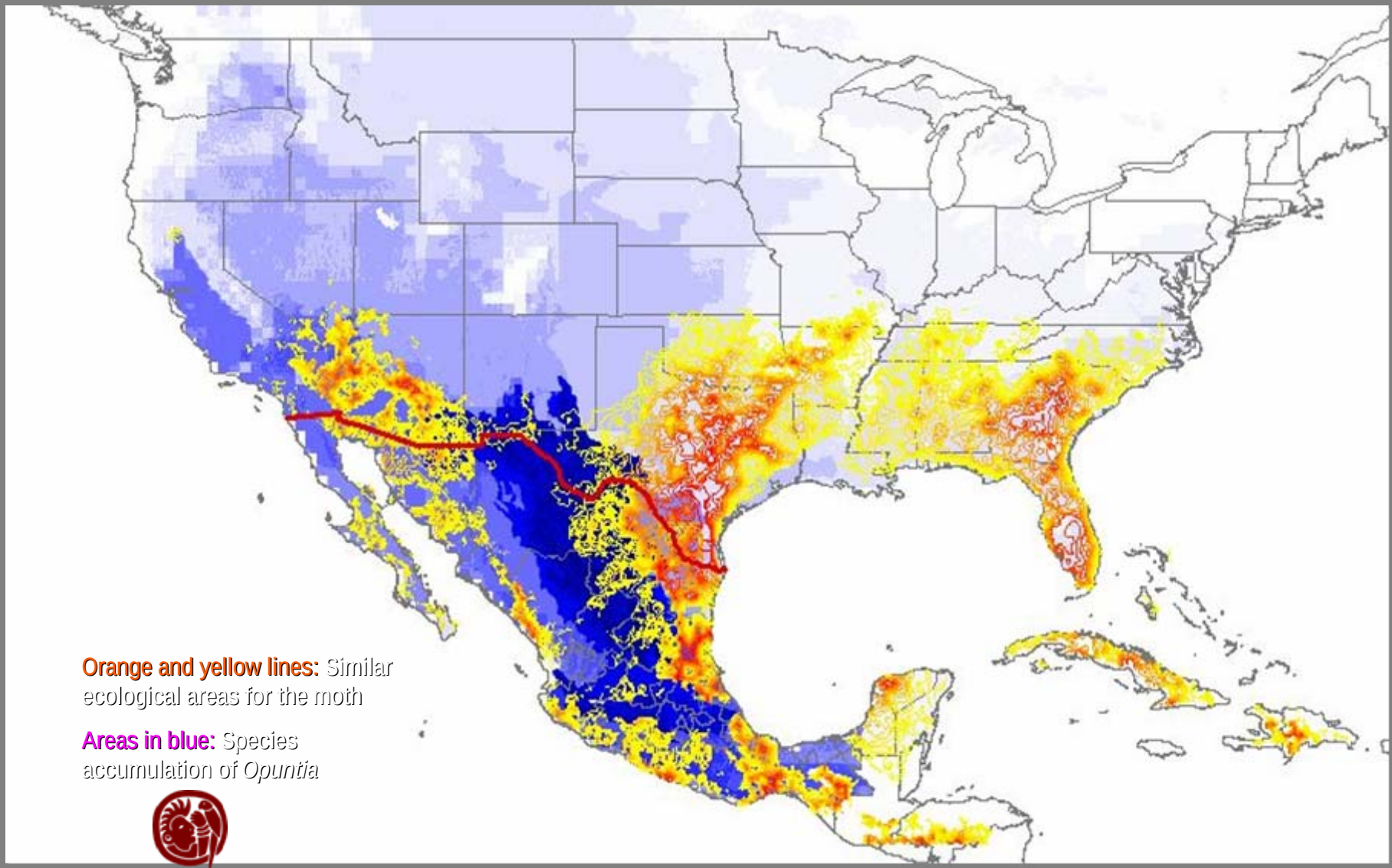


Cylindropuntia tesajo

Cylindropuntia thurberi
(Engelmann) F. M. Knuth

Cylindropuntia cholla (Weber) F. M. Knuth

Potential overlapping areas between the *Opuntia* and the moth, *Cactoblastis cactorum*, in North America



Consolea Lemaire

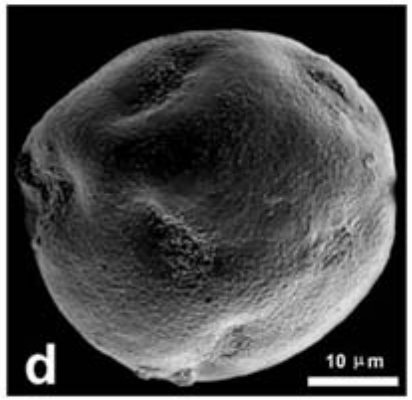
Caribbean Region and Florida
9 species

Consolea corallicola Small

Florida Keys

Endangered

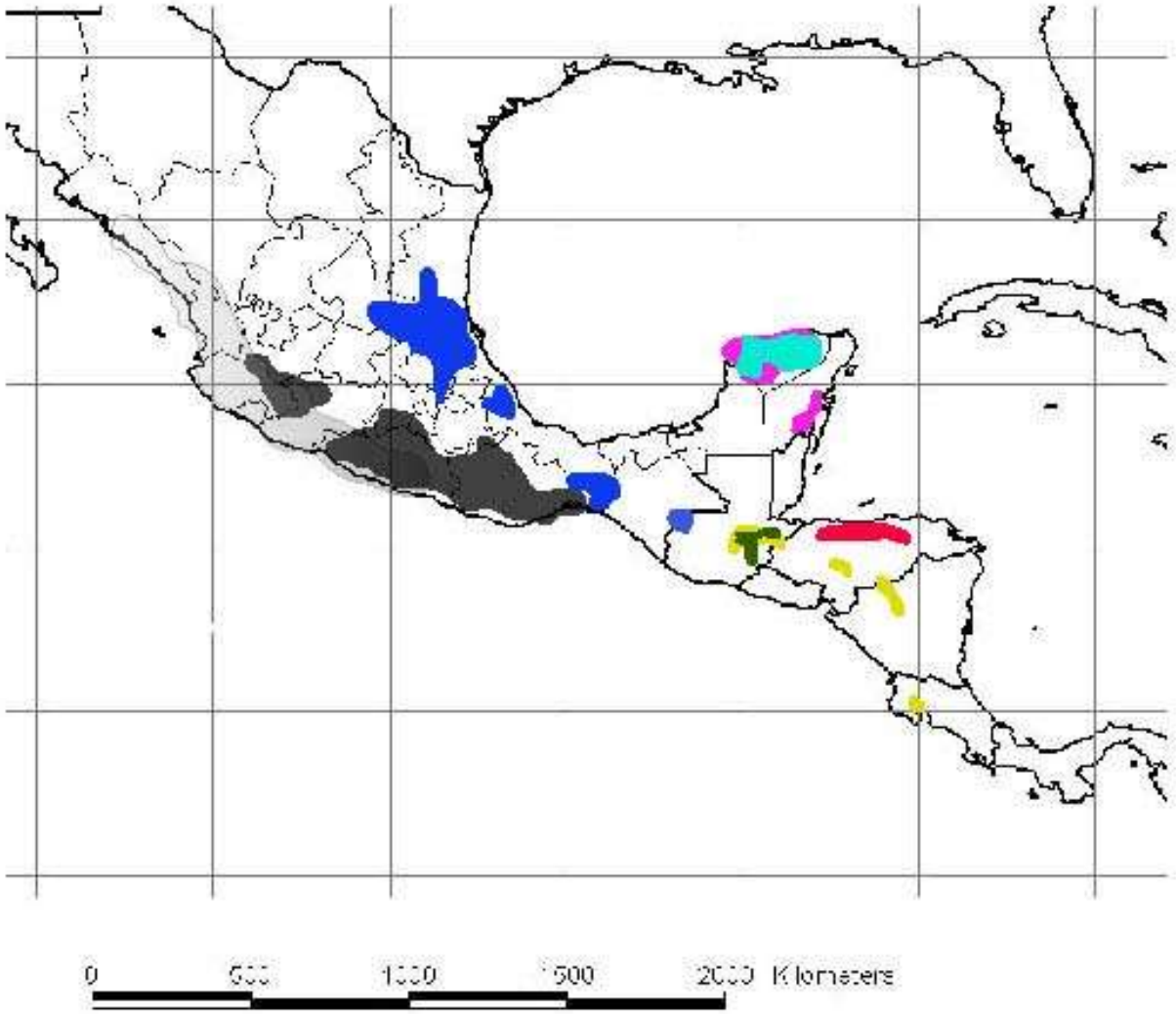
Genus *Nopalea* Salm-Dyck



Nopalea cochenillifera (L.) Salm-Dyck

Near Valles, San Luis Potosi, Mexico.

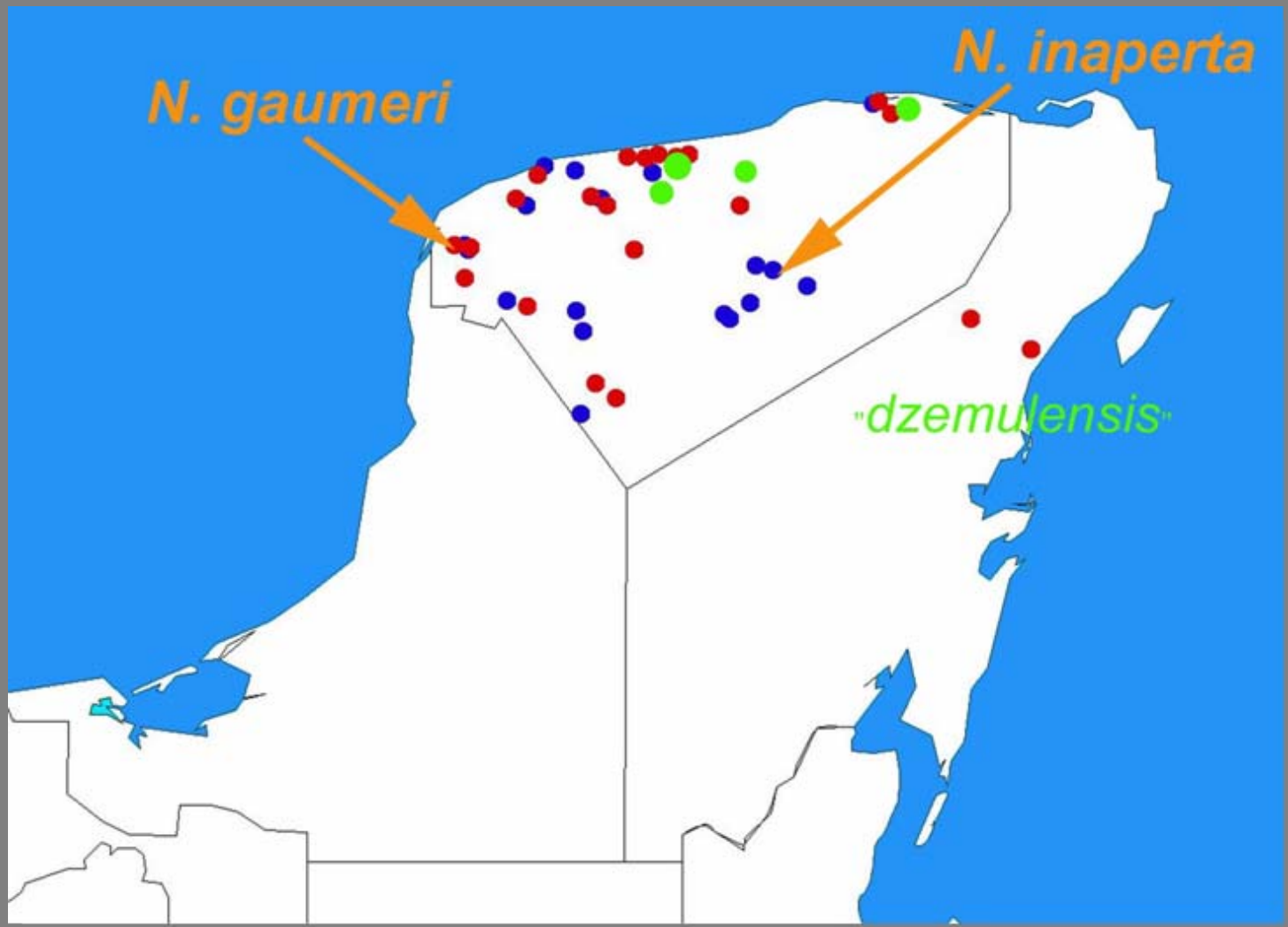
Distribution of *Nopalea spp*



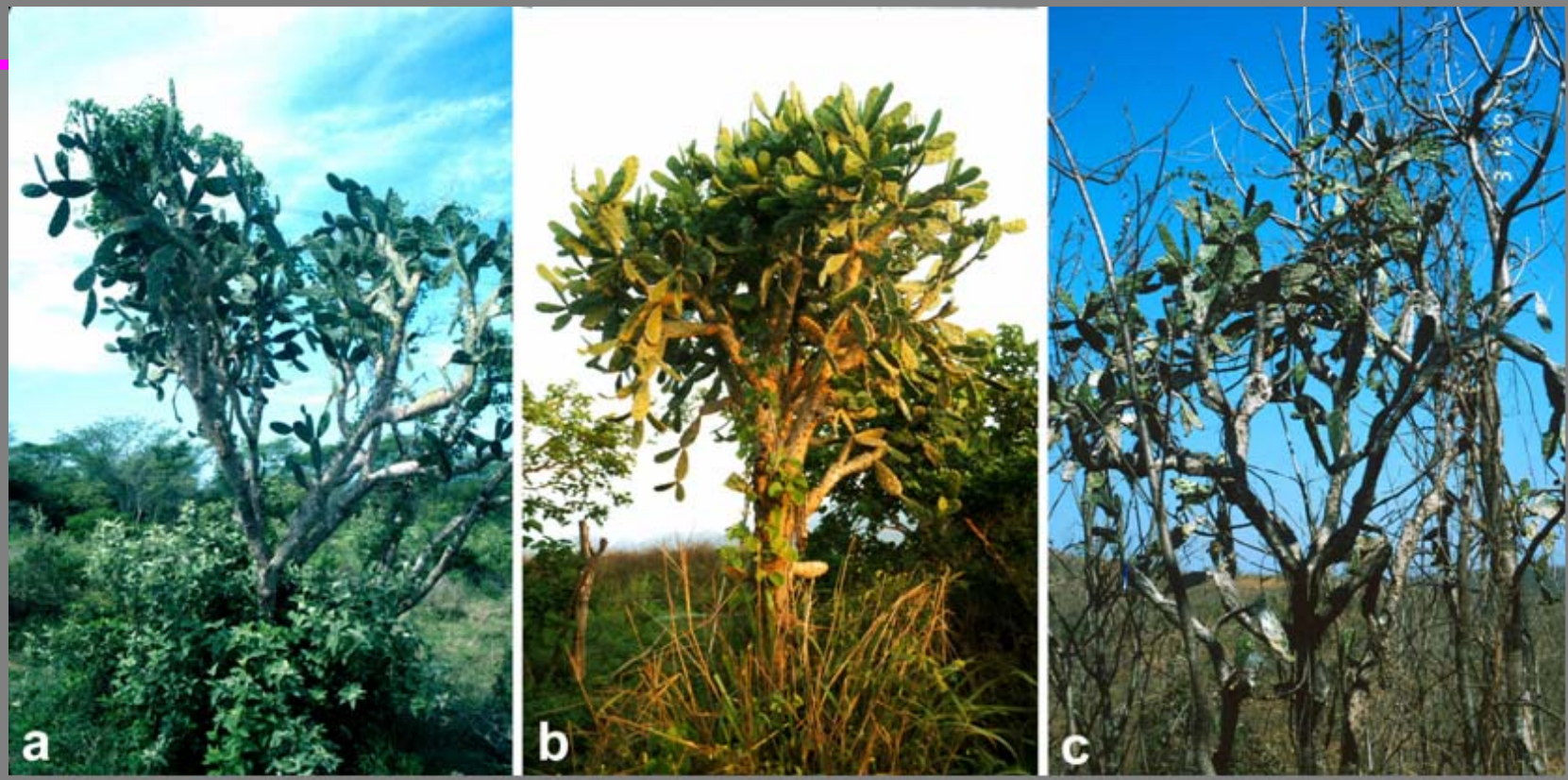
Nopalea gaumeri Rose

Yucatan Peninsula

Nopalea spp in the Yucatan Peninsula



Nopalea dejecta Salm-Dyck



a. Valles, San Luis Potosi, Mexico
b. Sierra Soconusco, Chiapas
c. Nenton, Guatemala

Nopalea lutea Rose

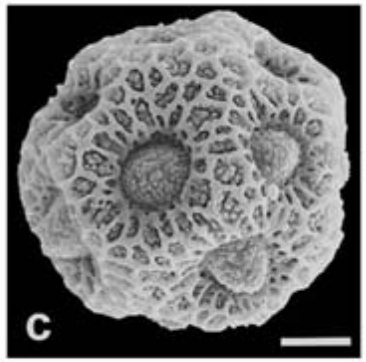
Guatemala to Costa Rica

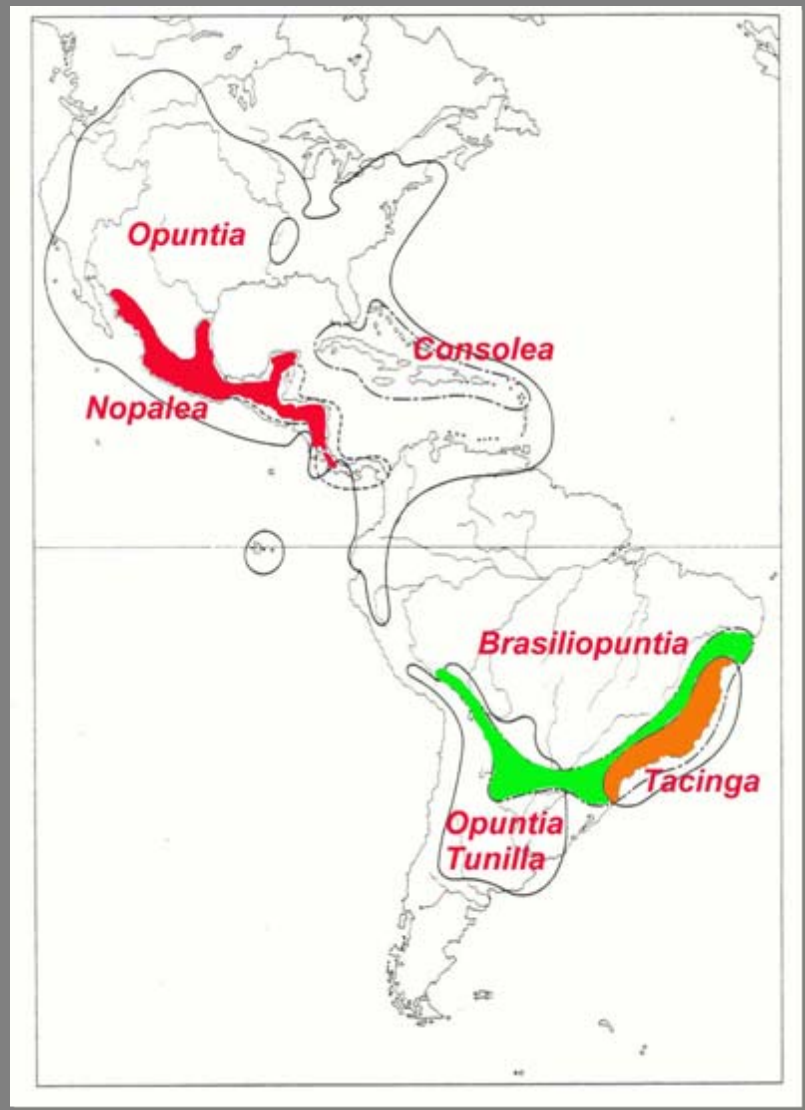
Nopalea hondurensis (P.C. Standley) R. Puente

Honduras

Opuntia (L.) Miller

About 80-120 species





Opuntia engelmannii Salm-Dyck

var. engelmannii

var. lindheimeri

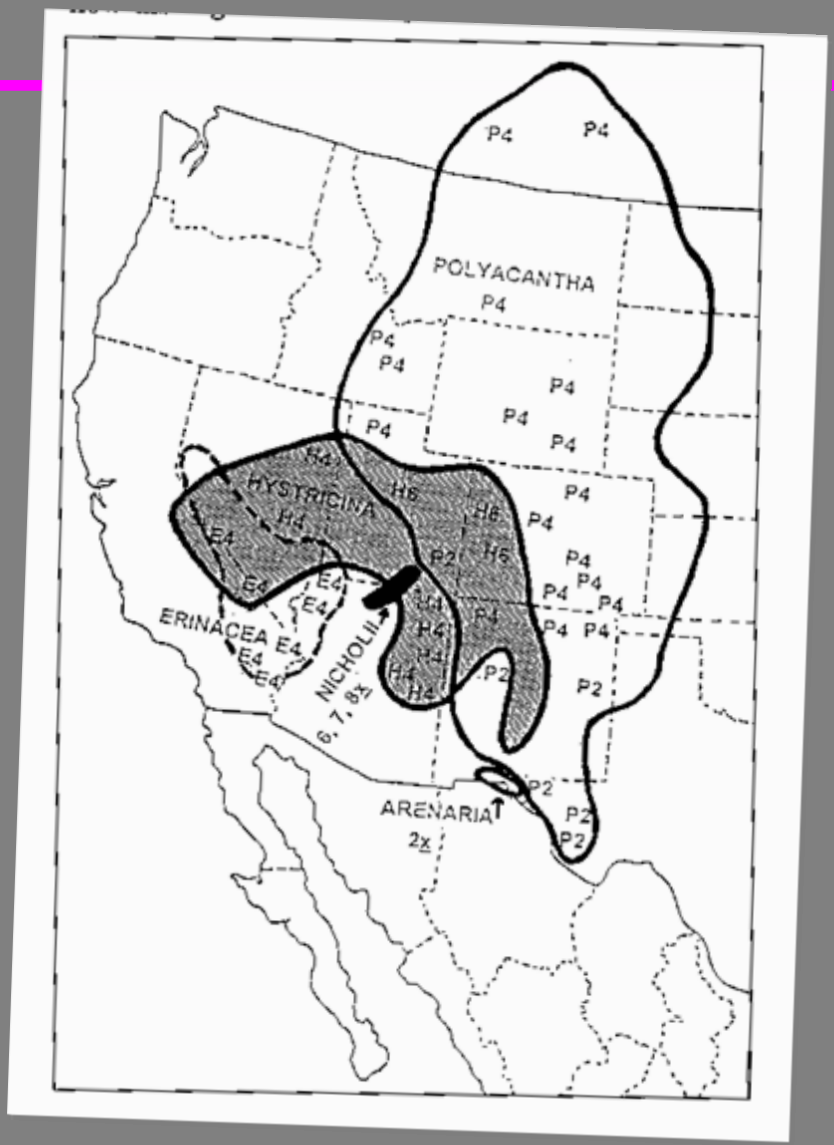
var. linguiformis

Opuntia rastrera Weber

Opuntia engelmannii

a. var. *engelmannii 66*
b. var. *lindheimeri 66*
c. var. *linguiformis 66*
d. var. *flavispina 66*
e. var. *flexispina?*
var. *cuija 22*
var. *rastrera?*

Opuntia polyacantha



polyacantha
erinaceae
nichollii
histricina

Southwest US:

Opuntia basilaris
AZ and CA.

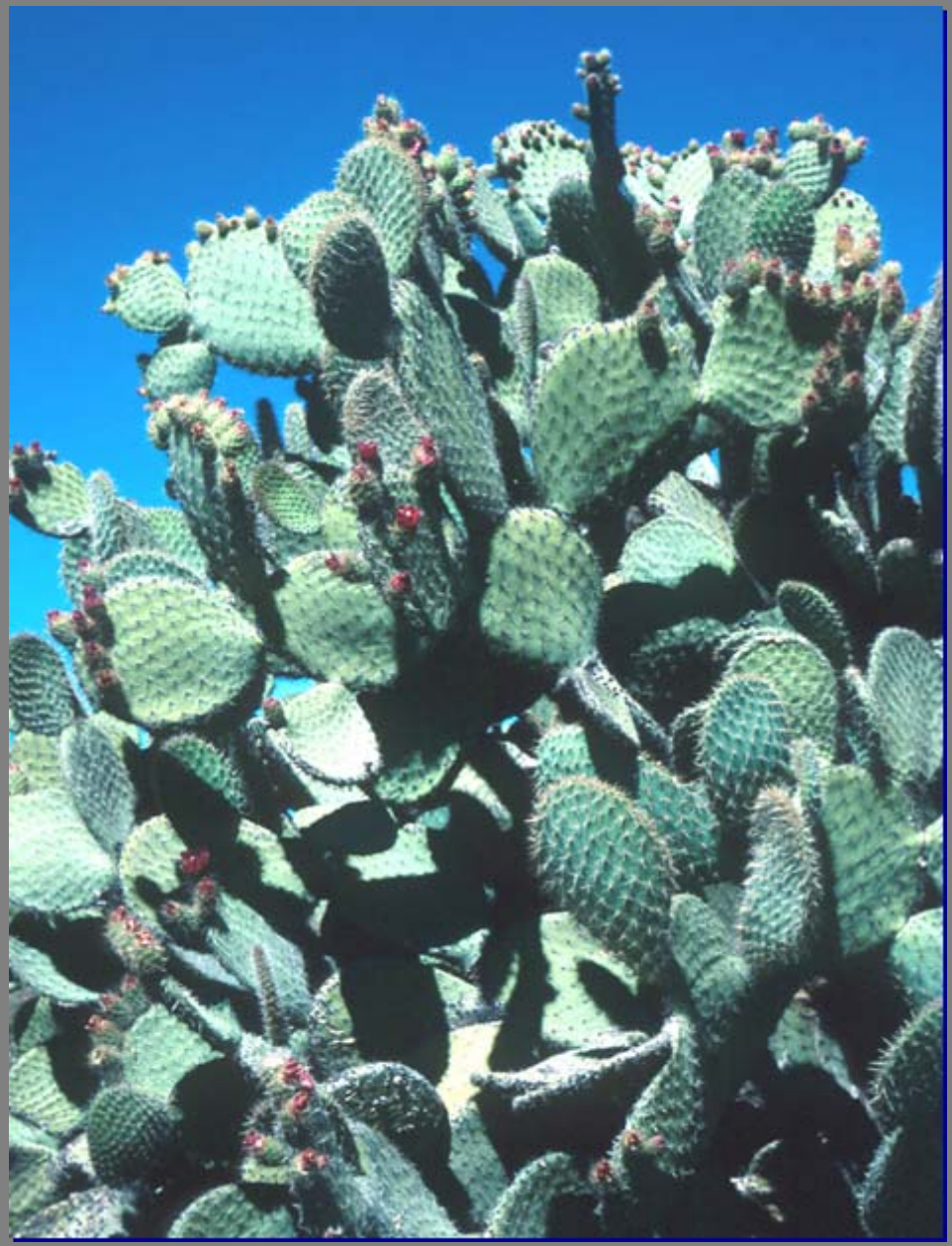
Opuntia gosseliniana
Arizona and Sonora, Mexico

Opuntia oricola
California

Opuntia santa-rita
Arizona

Opuntia streptacantha
"Nopal Cardon"

Central Mexico



Opuntia pilifera

Puebla and Oaxaca
Mexico

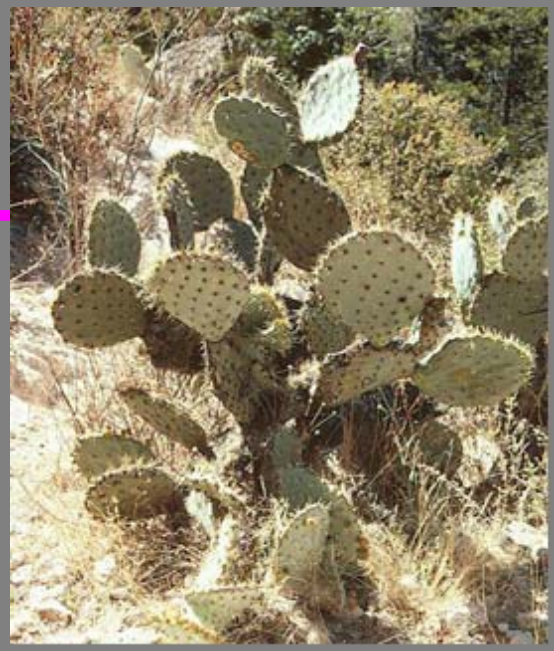
Tuna Reyna
O. ficus-indica
San Luis Potosi

Opuntia stricta
(*O. dillenii*)
(*O. inermis*)

Sisal, Yucatan

Opuntia stricta
Santa Clara, Yucatan

Opuntia robusta Wendland



Sonora and Chihuahua
To Hidalgo

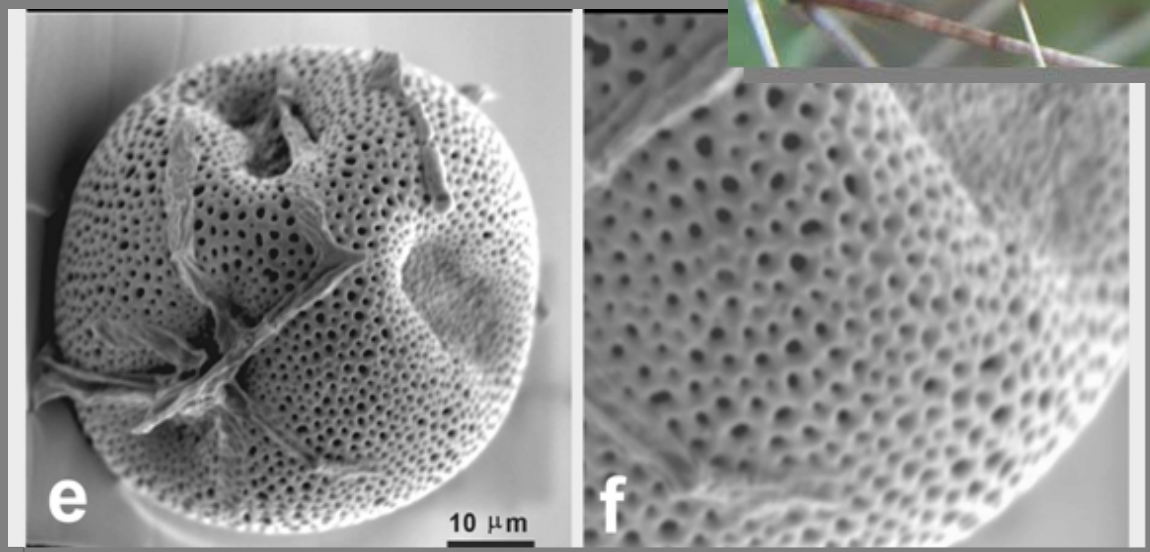
Opuntia puberula Pfeiffer

Sonora, Mexico to Costa Rica

Opuntia stenopetala Engelm.

Mexico: Coahuila to Hidalgo and Queretaro

- Male or female flower (dioecious)
- Pollen 6-periporate



O. megarhiza Rose

San Luis Potosi

Endangered

Opuntia sulphurea G. Don

Northern Argentina

Tacinga Britton & Rose

6 species
Easthern Brazil

T. palmadora (Britton & Rose) Stuppy & N. P. Taylor

T. funalis
Britton & Rose

Brasiliopuntia (K. Schumann) A. Berger

1 species

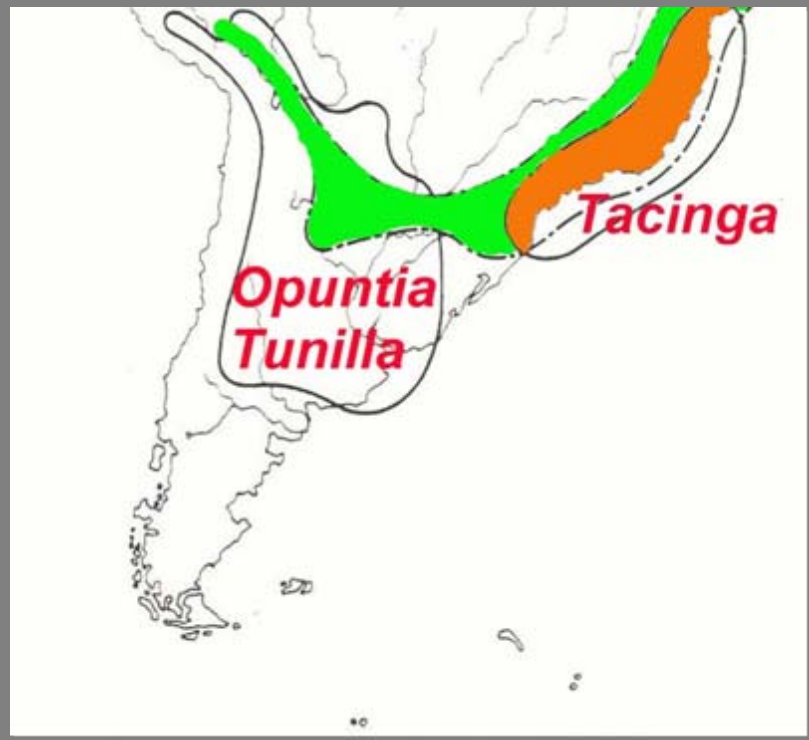
Brasiliopuntia brasiliensis (Willd.) Berger

Tunilla Hunt & Illif

9 species

Peru, Chile to Argentina

Tunilla corrugata (Salm-Dyck) Hunt & Illif

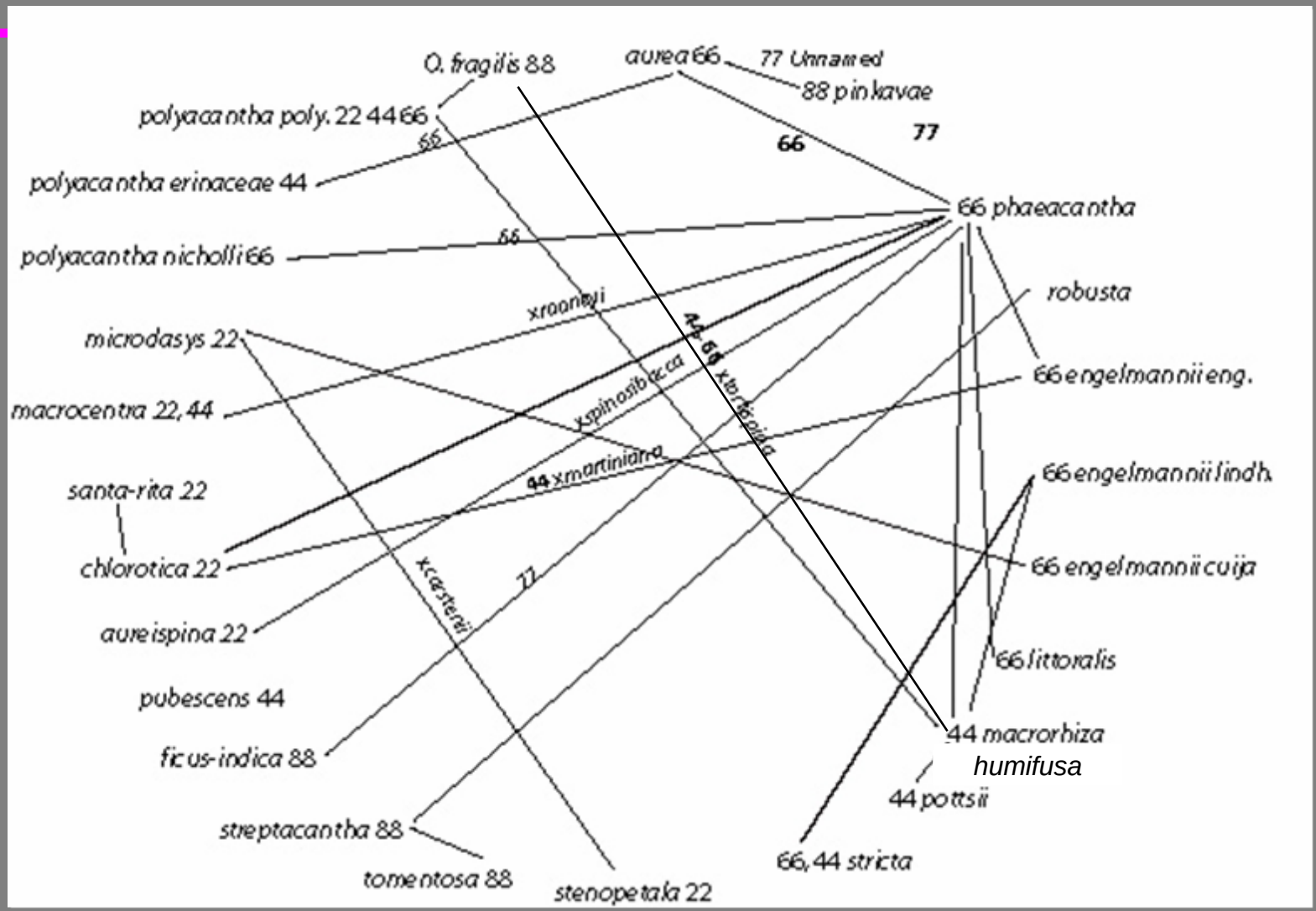


Tunilla soherensii (Britton & Rose) Hunt & Illif

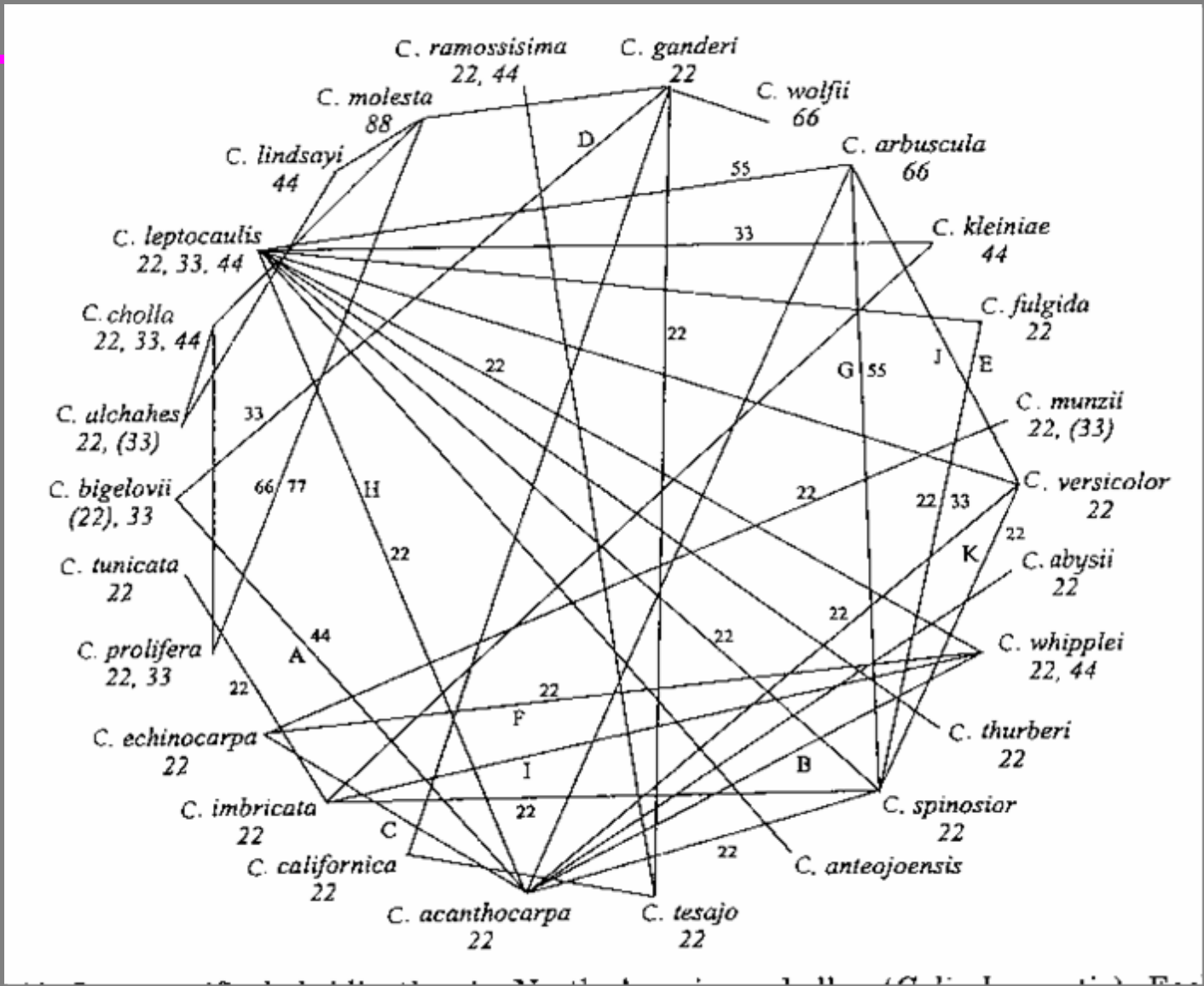
Hybrids:

Opuntia xandersoni
(O. engelmanni var. cuija x O. microdasys

Putative Interspecific Hybridization in *Opuntia spp*



Putative Interspecific Hybridization in *Cylindropuntia spp*



Hybridization: Intergeneric Hybrids

Opuntia stricta x Nopalea dejecta

Opuntia xacaulis
Haiti

(Consolea nashii x Opuntia stricta)

Summary:

- Numerous taxa are still poorly known as far as distribution, delimitation, ploidy level, etc.
- Several species complexes still require more study into their genetic relations.
- Taxa immune to *Cactoblastis* may provide a methodology to prevent damage to susceptible species
- Species found along tropical and semi-tropical regions may be more susceptible.
- *Nopalea, Consolea* and *Opuntia* appear to be the most susceptible genera.
-