Challenges for the conservation of Azorean endemics

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The 5 key challenges

1. habitat destruction
2. exotic invaders
3. incomplete taxonomic and biological data
4. inbreeding depression and genetic swamping
5. climate change

and the interactions between all 5…

1. Habitat destruction

- huge percentage of protected area in the Azores, many species protected by law
- but: still massive loss of old native trees and forest patches throughout the archipelago
- overgrazing of the most precious plant diversity hotspots
- cutting of endemics on roadside slopes

Flores:
Zona Central


Pico:
cloud forest
© H. Schaefer

Pico:
cloud forest

Portal do Leite e Lacticínios dos Açores

ENTRADA | PRODUTOS DOS AÇORES | LEITE À PRODUÇÃO | INDÚSTRIA | COMERCIALIZAÇÃO | I & D

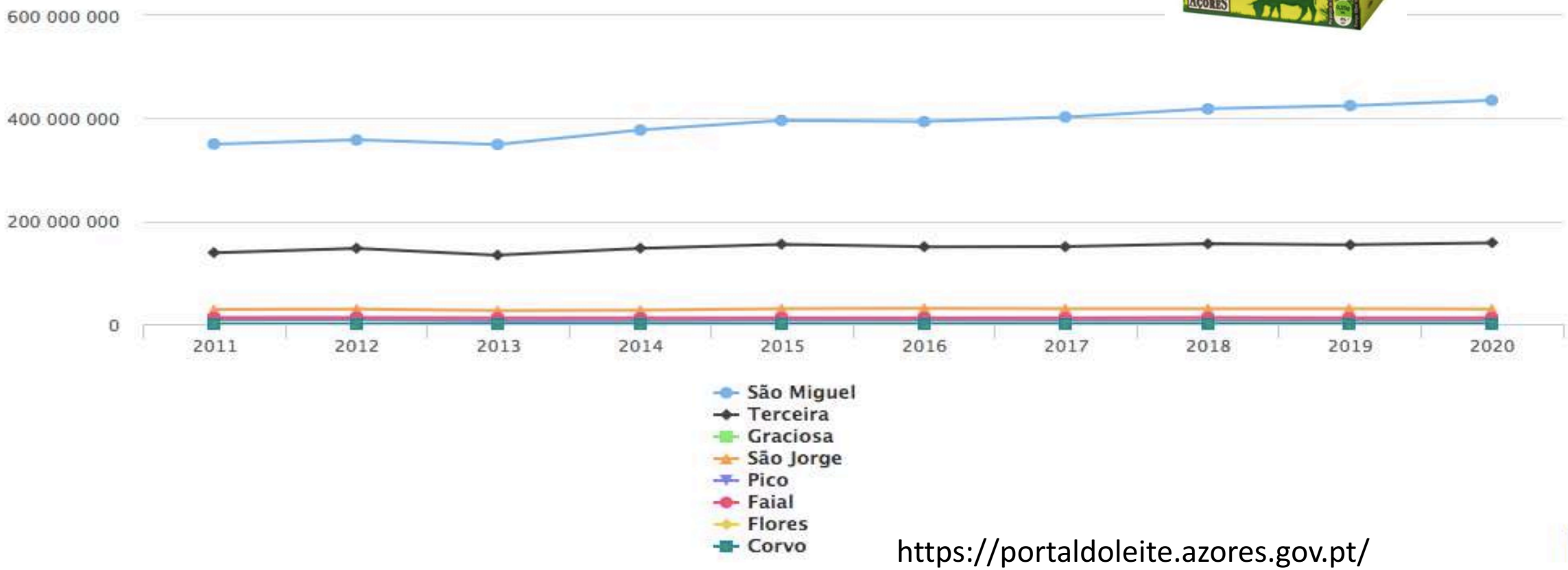
Leite à Produção > Estatísticas > Quantidades por Ilha > Anual

Entregas anuais e produtores

Entregas de leite nas unidades industriais de lacticínios da RAA (fonte dos dados: IAMA, anális

Entregas

Fonte: IAMA



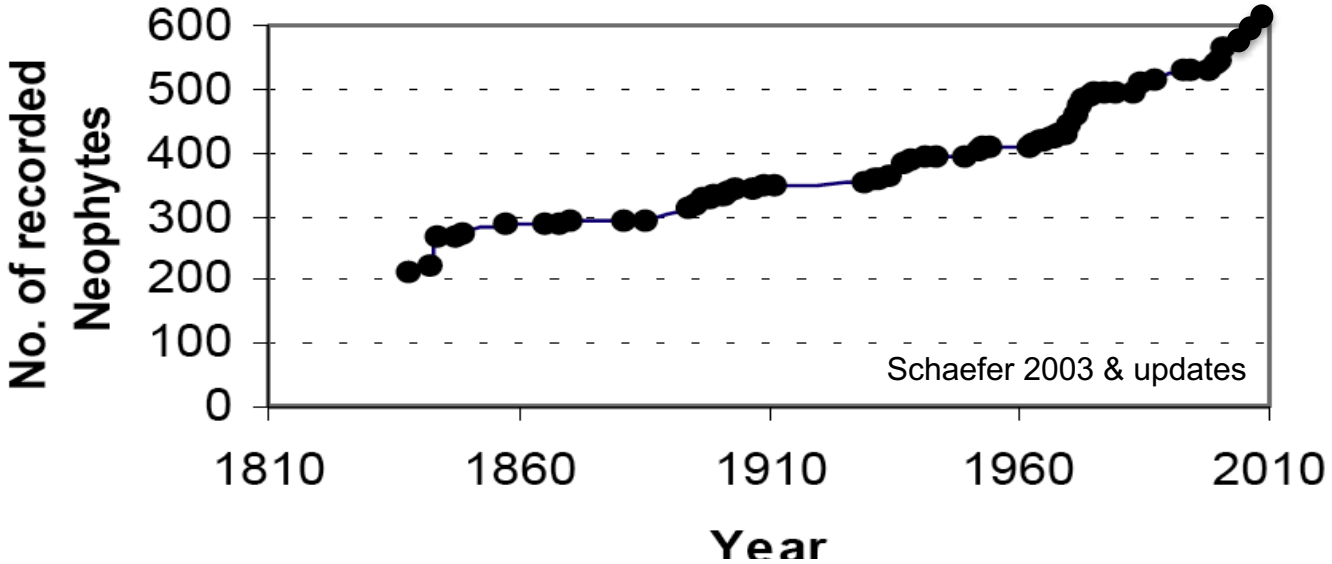
https://portaldoleite.azores.gov.pt/


Flores:
North coast

Azores Angelica (*Angelica lignescens*)

- fly pollinated
- very limited seed dispersal

2. Exotic invaders



2-3 new exotic plant species per year

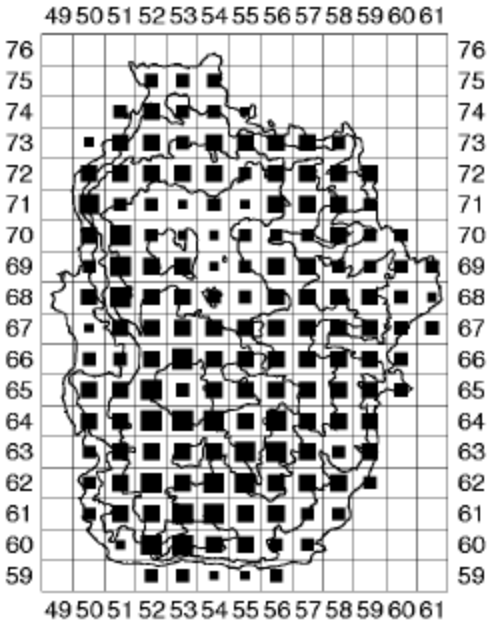
Gunnera tinctoria first report from the Azores 1966

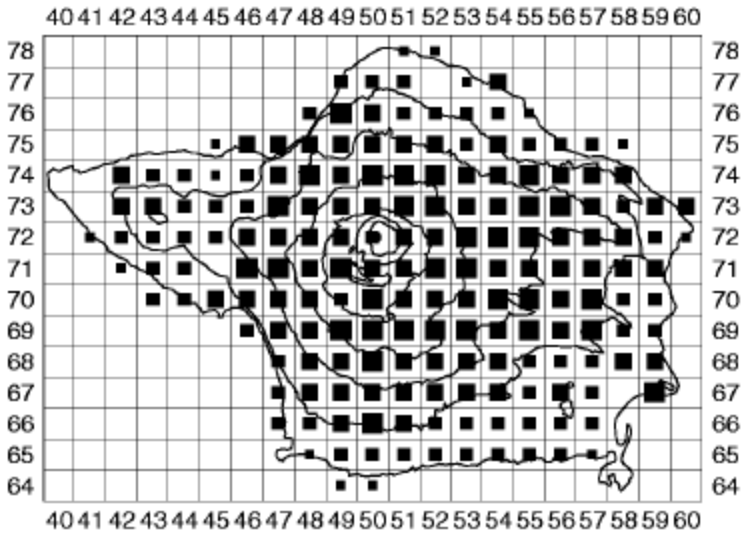

Hortensia (*Hydrangea macrophylla*)
– first reported from the Azores in 1934
© H. Schaefer

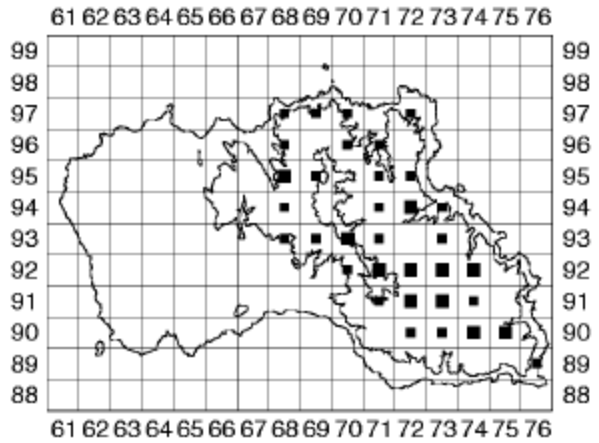
Hydrangea macrophylla (Thunb.) Ser. in DC., Prodr. 4: 15. 1830.

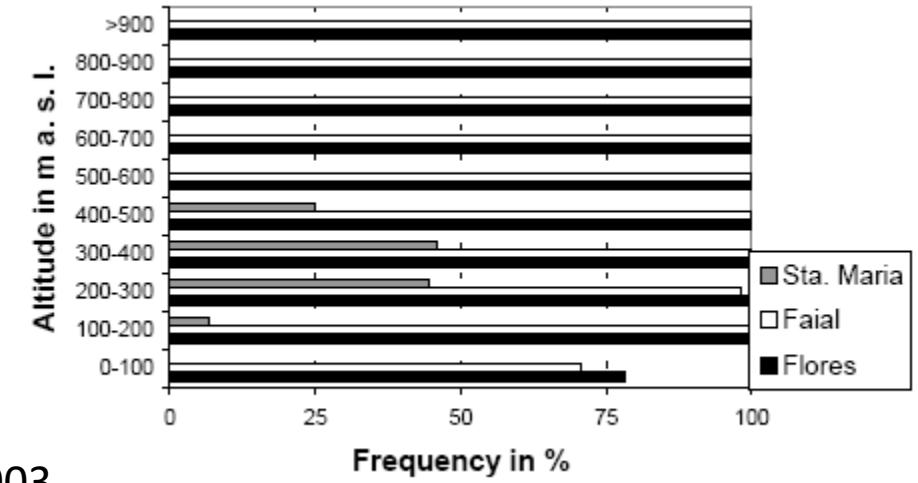
Hydrangea arborescens L.; *Hydrangea hortensia* Sieb.

Hôrtensias, Novelão, Granja









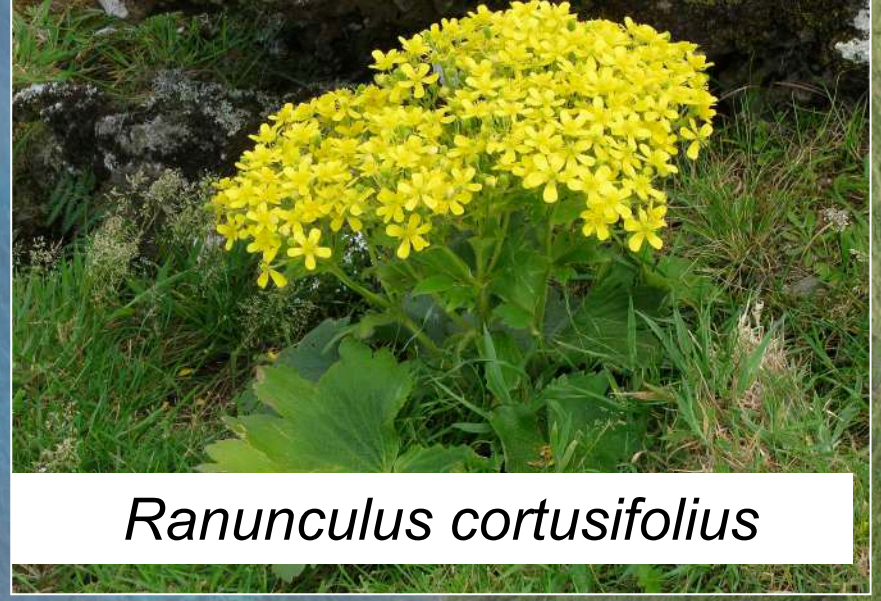
Schaefer 2003


Carpobrotus edulis
Azores Bellflower
Azorina (Campanula) vidalii
Carpobrotus edulis
Stenotaphrum secundatum
© H. Schaefer


Santa Maria

3. Incomplete taxonomic and biological data

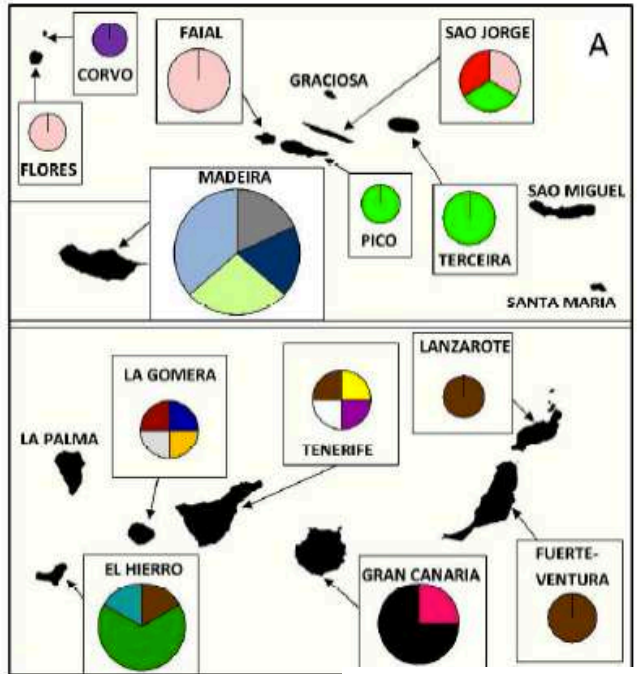
- large number of new endemic taxa discovered in the past 20 years
- but: for most of them we know hardly anything about their biology
- still many taxa that have to be investigated with genetic/genomic approaches

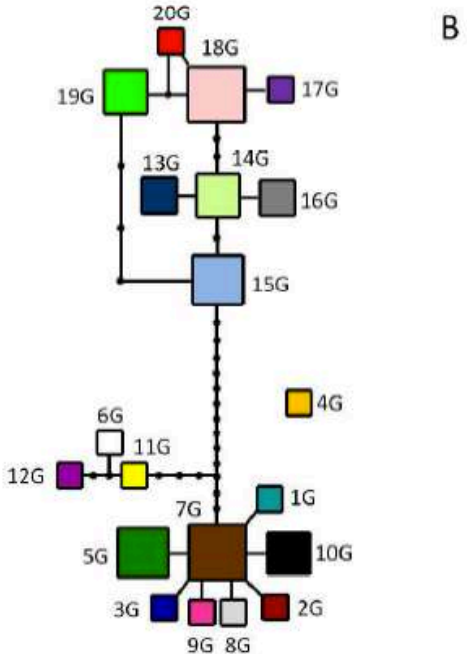


Ranunculus cortusifolius

Are there any widespread endemic flowering plant species in Macaronesia? Phylogeography of *Ranunculus cortusifolius*[1]

Bethany R. M. Williams[2], Hanno Schaefer[3], Miguel Menezes De Sequeira[4], J. Alfredo Reyes-Betancort[5], Jairo Patiño[6,7], and Mark A. Carine[2,8]





Tolpis: currently 2 native species

Tolpis succulenta – coastal taxon

Tolpis azorica – high altitude taxon

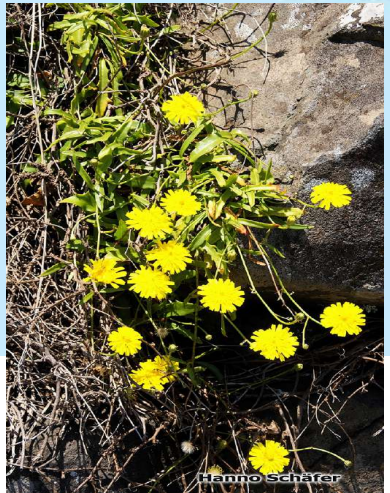
Tolpis „succulenta“ – coastal taxon

Santa Maria:
self incompatible (SI)

cannot be crossed successfully!

Prof. Dan Crawford, Kansas Univ.

Graciosa:
self compatible (SC)

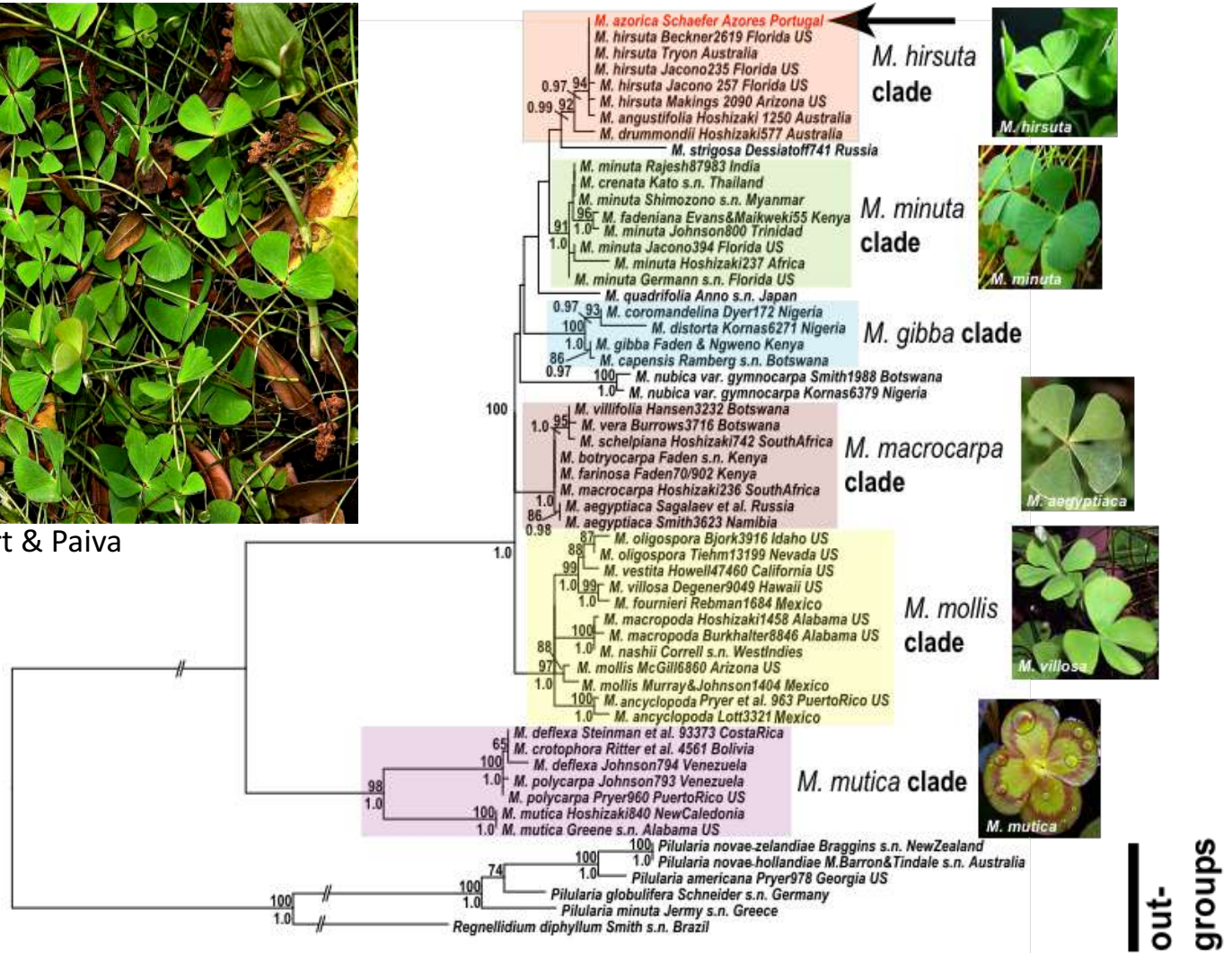

Hanno Schäfer

endemic ➢ invasive

Azores clover fern (*Marsilea azorica*) = invasive *M. hirsuta* from Australia

Marsilea azorica Launert & Paiva

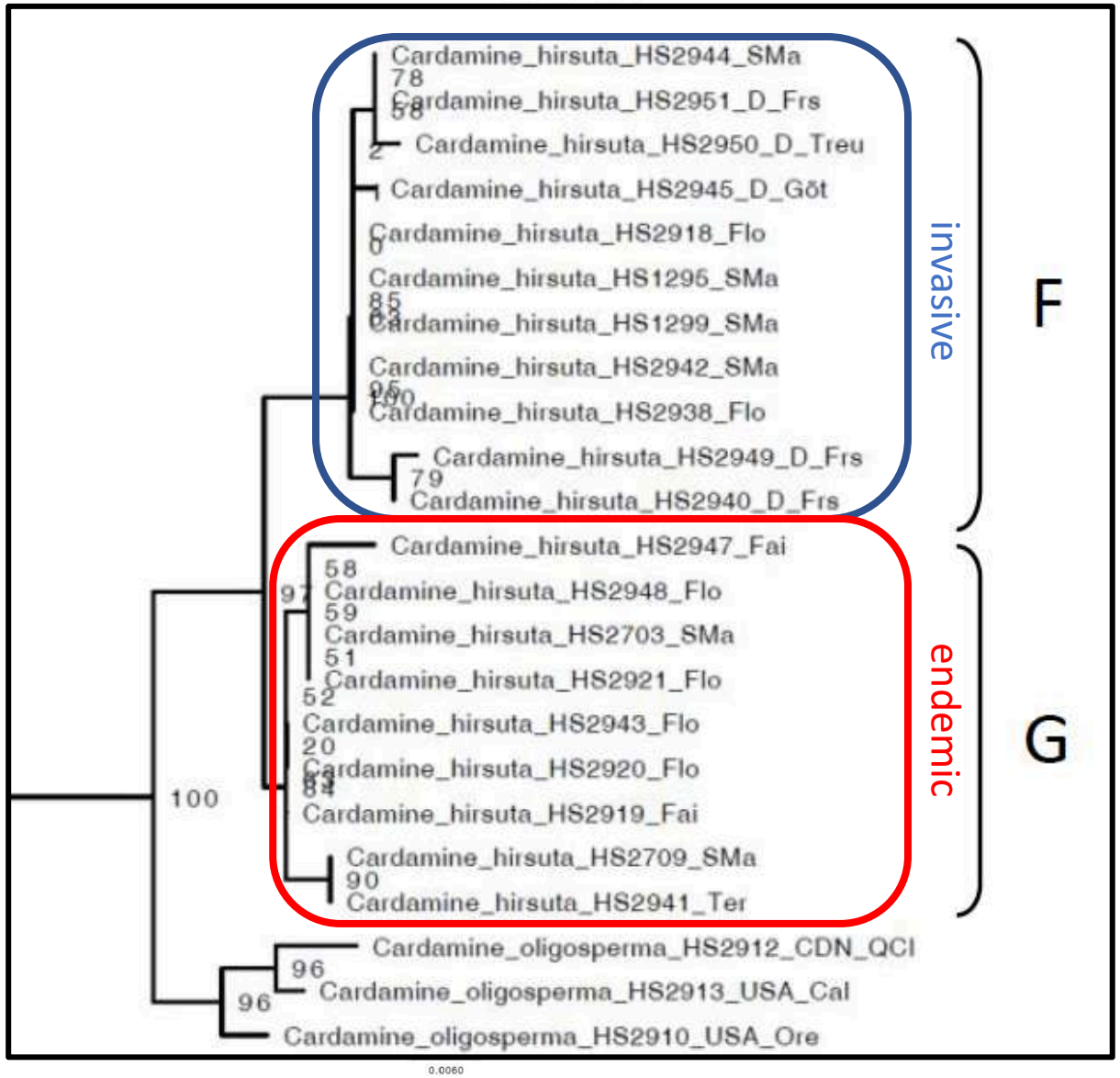
= ***Marsilea hirsuta* R.Br.**



Schaefer et al., Syst. Bot. 2011

invasive ➢ endemic

Cardamine hirsuta = mix of an endemic taxon and a recently introduced invasive taxon



BSc thesis Iris Krömmüller

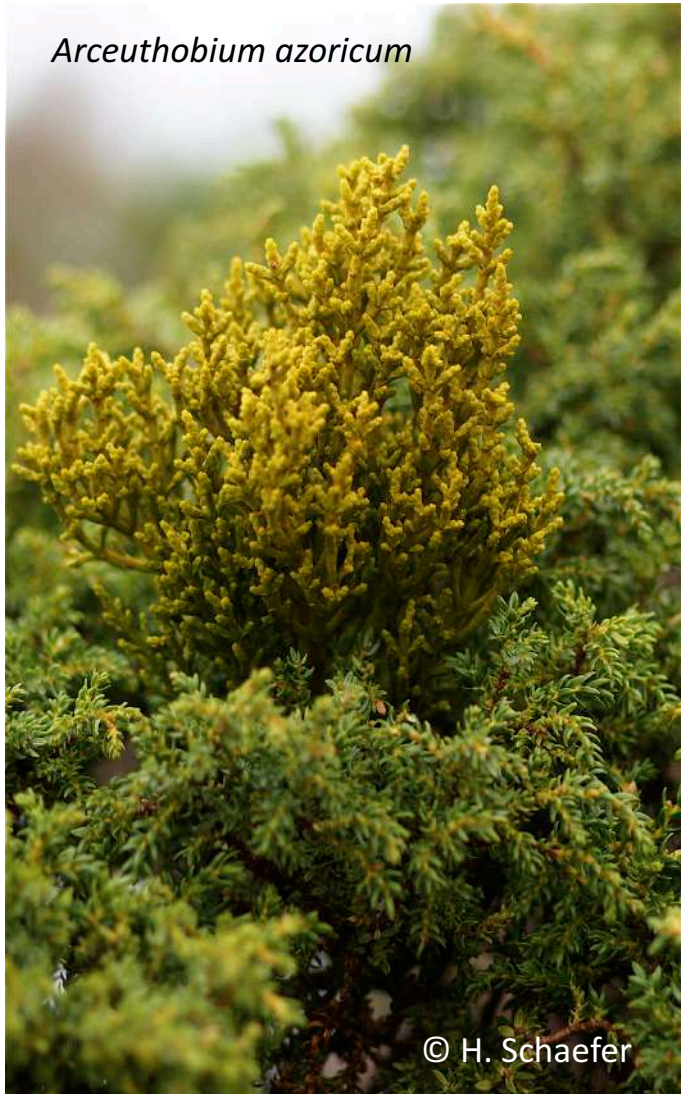
4. Inbreeding and genetic swamping

- risk for small isolated populations
- potential problem in conservation actions
- need more data!

Azores Forget-me-not
(*Myosotis azorica*)

5. Climate change effects

- risk for small isolated populations
- juniper forest ecosystem (cloud forest)
- crater lake ecosystem



Take home messages

- **most important task: protect remaining natural habitats**

➢ for this, a change of politics is needed: European funding for protection of natural habitats not for meat and milk production

➢ control of invasive species at local scale to protect the most endangered endemics (but try to minimize disturbance)

- ex-situ conservation and seed-banking (keeping different origins separate) as insurance
- more research on pollination biology and geneflow patterns of endemic species

Muito obrigado!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