Anéis de crescimento e dinâmica de populações

Giuliano M. Locosselli

Divisão de Funcionamento de Ecossistemas Tropicais
locosselli@cena.usp.br

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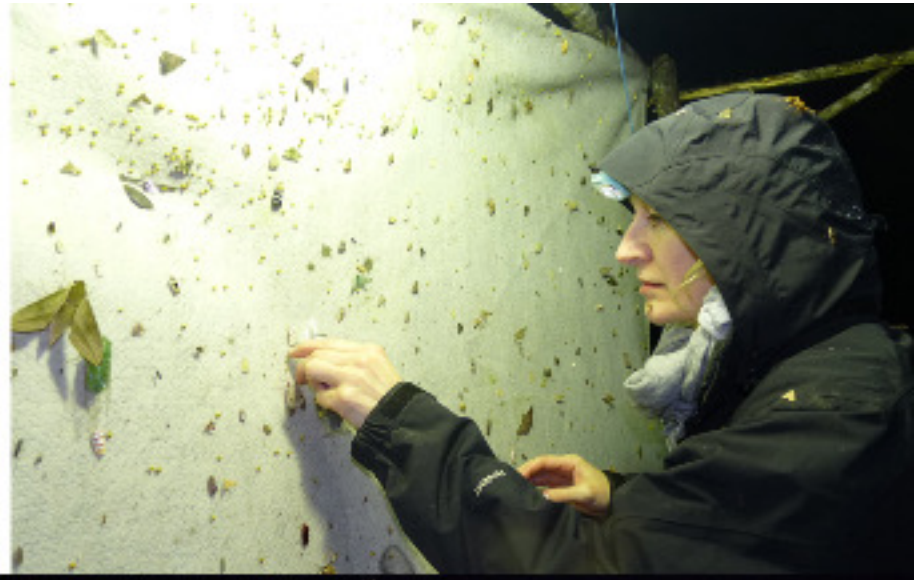

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Afi


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Santiago
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CHILE
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SENEGAL
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CHILE
Dakar
SENEGAL
Conakry

Dinâmica de população de árvores

Crescimento

Reprodução

Recrutamento

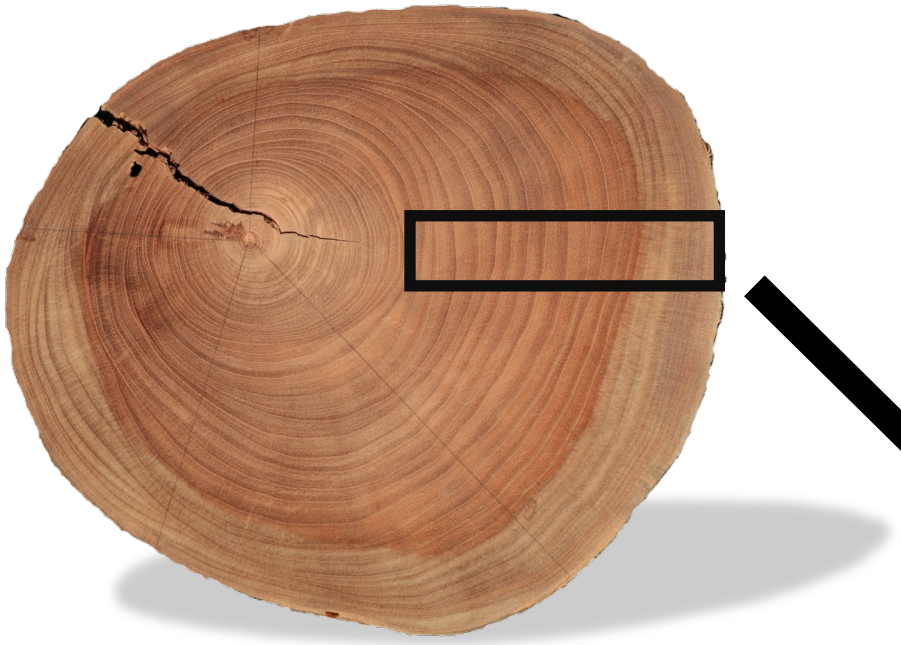
Mortalidade

Auto-biografia

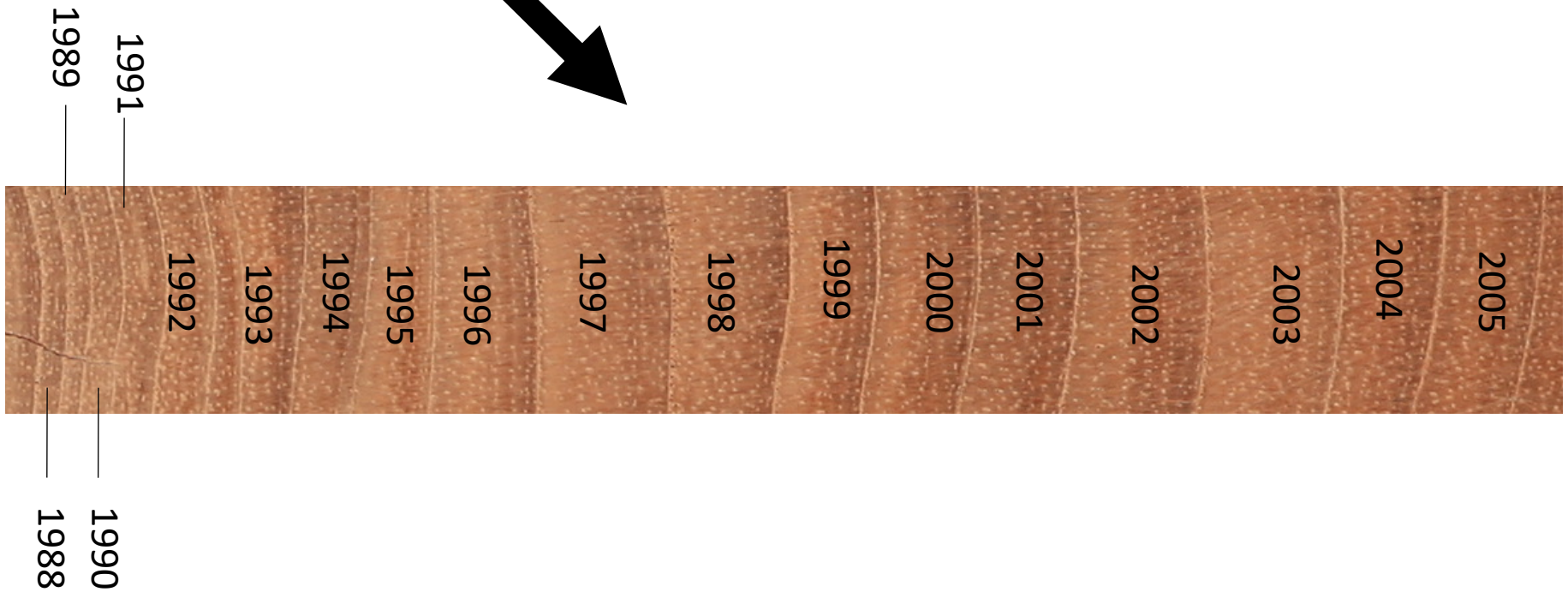
Plântula

Indivíduo jovem

Indivíduo maduro



Ano à ano


1988
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2005

Qual a sua idade?

Qual a sua idade?

Qual a sua idade?

Qual a sua idade?

thecomicstrips.com

Pinus longeva

Até 4833 anos de idade

Dr Jonathan Barichivich

Fitzroya cupressoides

Estimado em 5484 anos de idade, com 80% de chance de ter mais de 5000 anos

Camille Coveti
Florença
Itália
1835

Van Gogh
Saint-r´emy-de-Provence
França
1889

Lindenmayer et al 2016 Biological reviews

K. Hokusai
Província de Kai
Japão
1826

Huc-Mazelet Luquiens’
Hawaii
1922

Lindenmayer et al 2016 Biological reviews

fflorestal - sp

Cariniana legalis (Lecythidaceae)

wwf

Ceiba pentandra (Malvaceae)

Polylepis tarapacana
(Rosaceae)

Quem é mais velha?

Ceiba pentandra (Malvaceae)

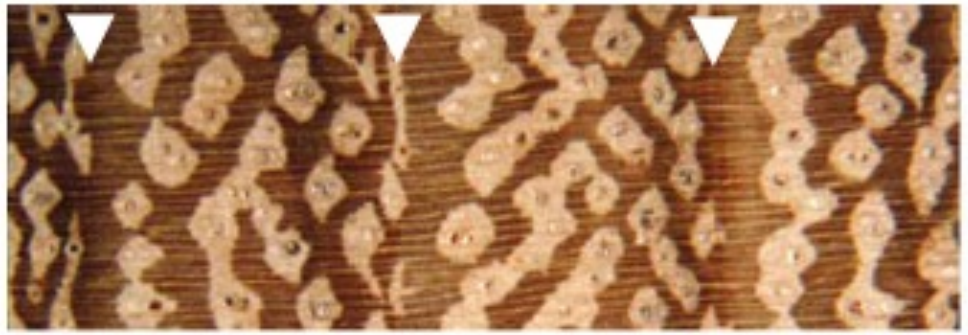
X

arborea.proyungas.org.ar

Polylepis tarapacana (Rosaceae)

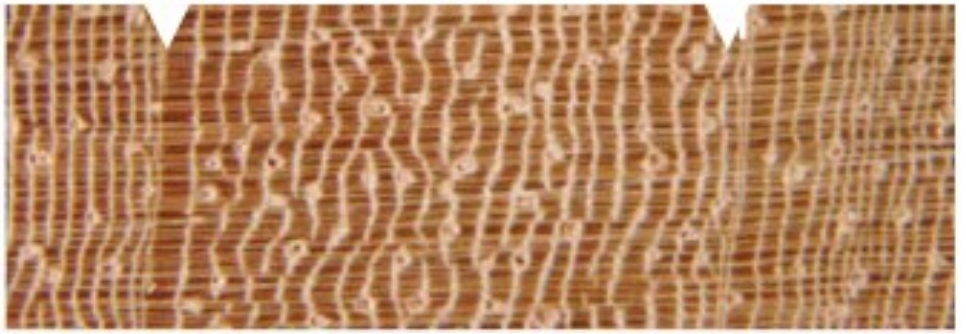
(a) Differences in vessel distribution

Amburana cearensis



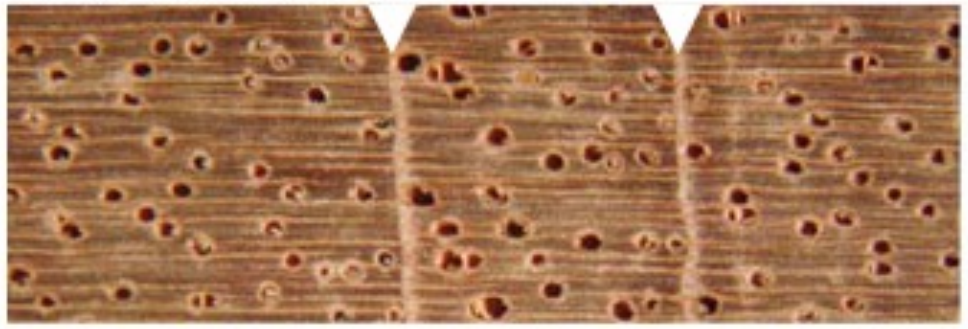
(b) Alternating parenchyma bands

Bertholletia excelsa



(c) *Marginal parenchyma bands*

Cedrela odorata



(d) Variation in wood density

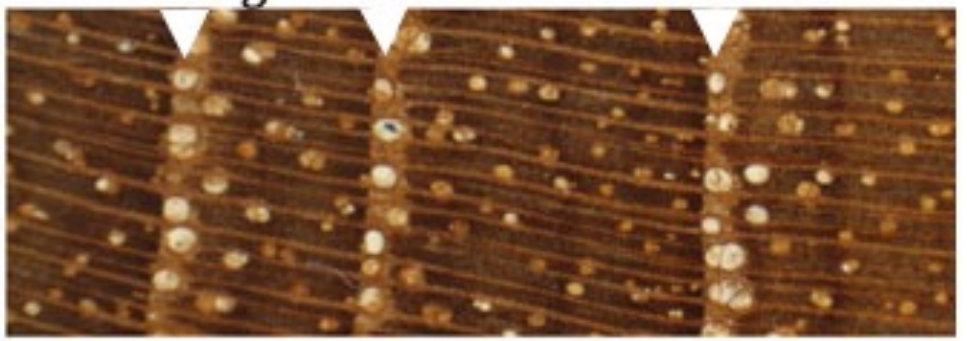
Tachigali vasquezii

(e) Variation in wood density

Cordia alliodora

(f) (Semi) ring porous

Tectona grandis



Brienen et al 2016

Cedrela fissilis (MELIACEAE)

Roupala montana (PROTEACEAE)

Cedrela fissilis (MELIACEAE)

Roupala montana (PROTEACEAE)

Cavalinesia arborea

Godoy-Veiga et al. 2019 Dendrochronologia

Cavalinesia arborea

meuzapzap.com

/br.ifunny.co

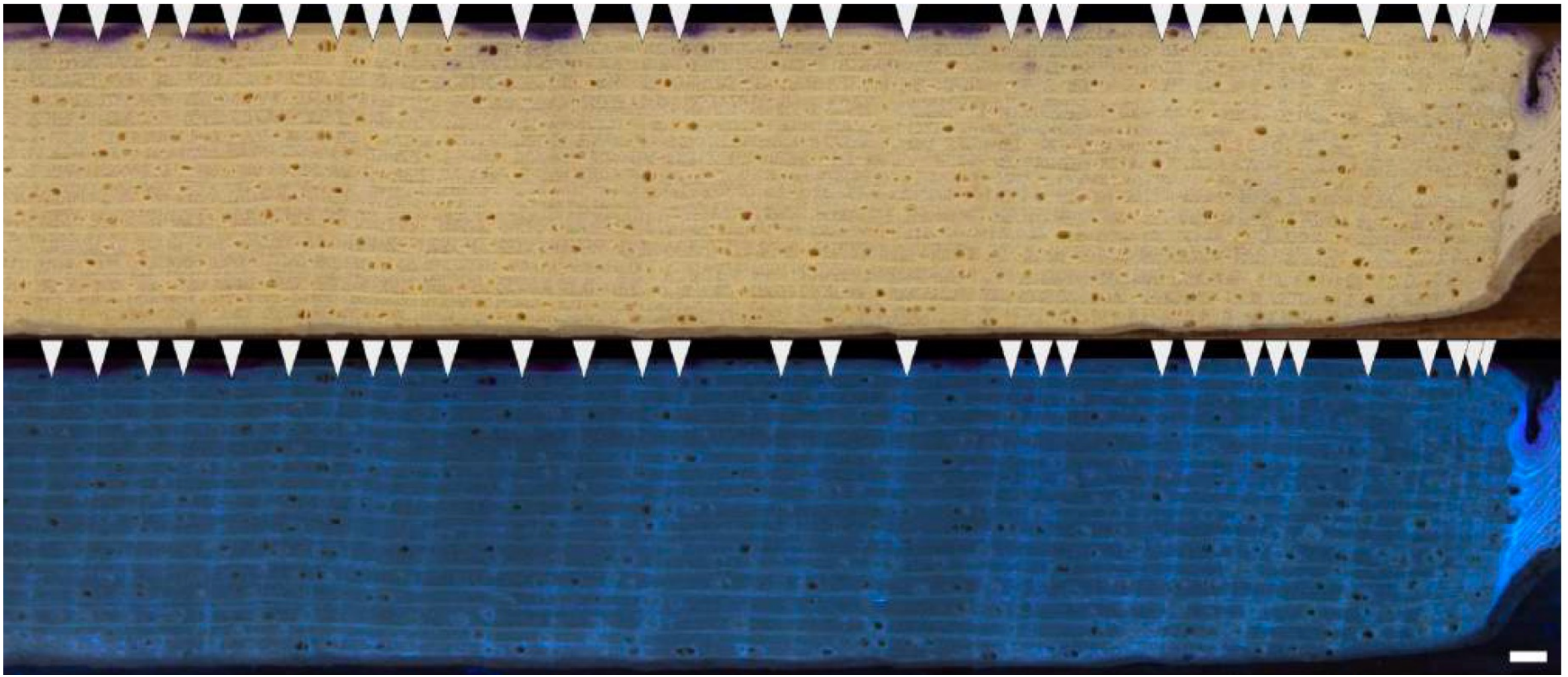
Godoy-Veiga et al. 2019 Dendrochronologia

Cavalinesia arborea

Godoy-Veiga et al. 2019 Dendrochronologia

Cavalinesia arborea

Natural light



UV

Godoy-Veiga et al. 2019 Dendrochronologia

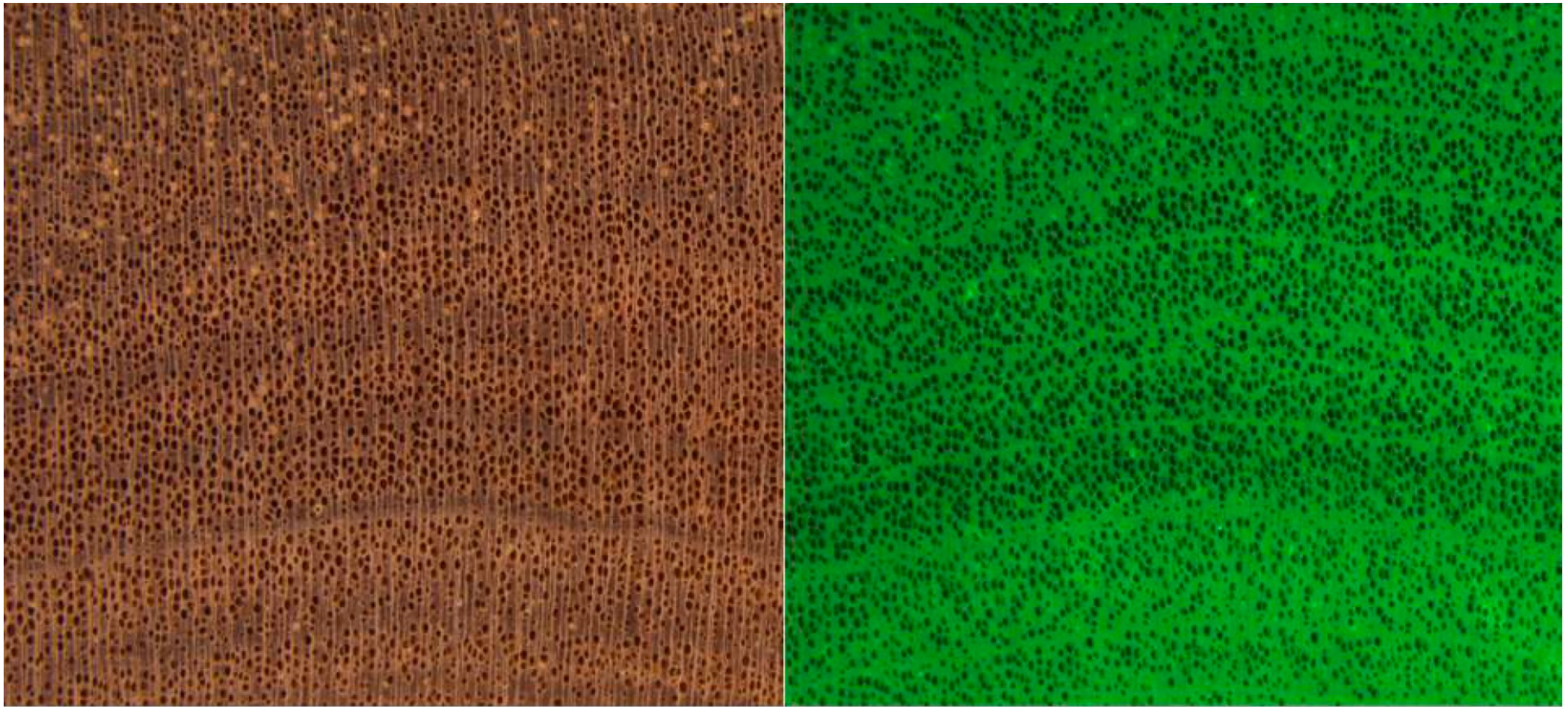
Aspidosperma piryfolium

Godoy-Veiga et al. 2019 Dendrochronologia

Aspidosperma piryfolium

Natural light

Green fluorescence protein – highlights lignin



Godoy-Veiga et al. 2019 Dendrochronologia

Dendrochronologia 55 (2019) 33–42

Contents lists available at ScienceDirect

Dendrochronologia

journal homepage: www.elsevier.com/locate/dendro

Improved tree-ring visualization using autofluorescence

Milena Godoy-Veiga[a,1], Franziska Slotta[b,1], Paula Christiani Alecio[a], Gregório Ceccantini[a], Marcos Silveira Buckeridge[a], Giuliano Maselli Locosselli[a,*]

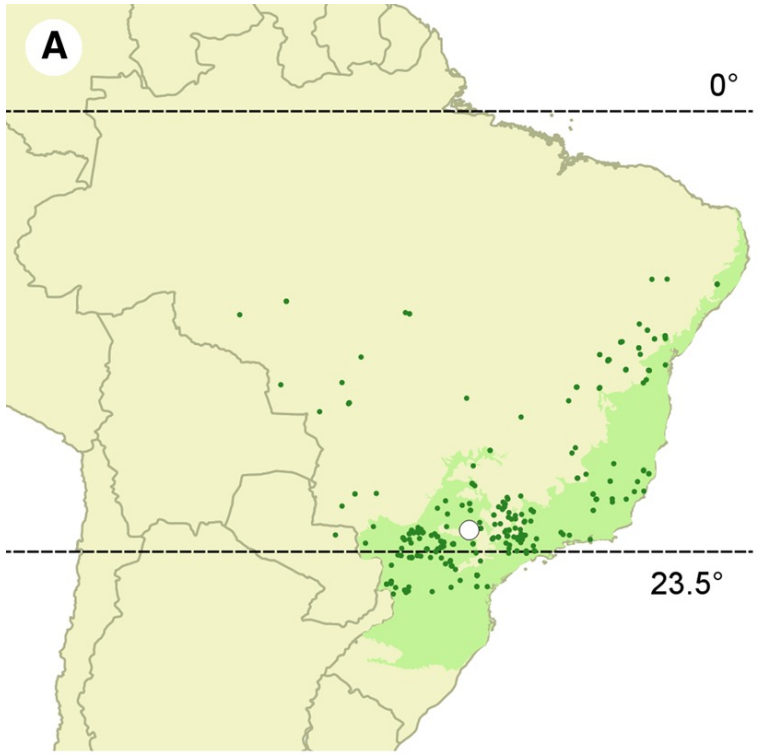
[a] University of São Paulo, Institute of Biosciences, Department of Botany, Rua do Matão 277, 05508-090, São Paulo, Brazil
[b] Free University of Berlin, Institute of Geological Sciences, Department of Earth Sciences, Malteserstrasse 74-100, 12249 Berlin, Germany

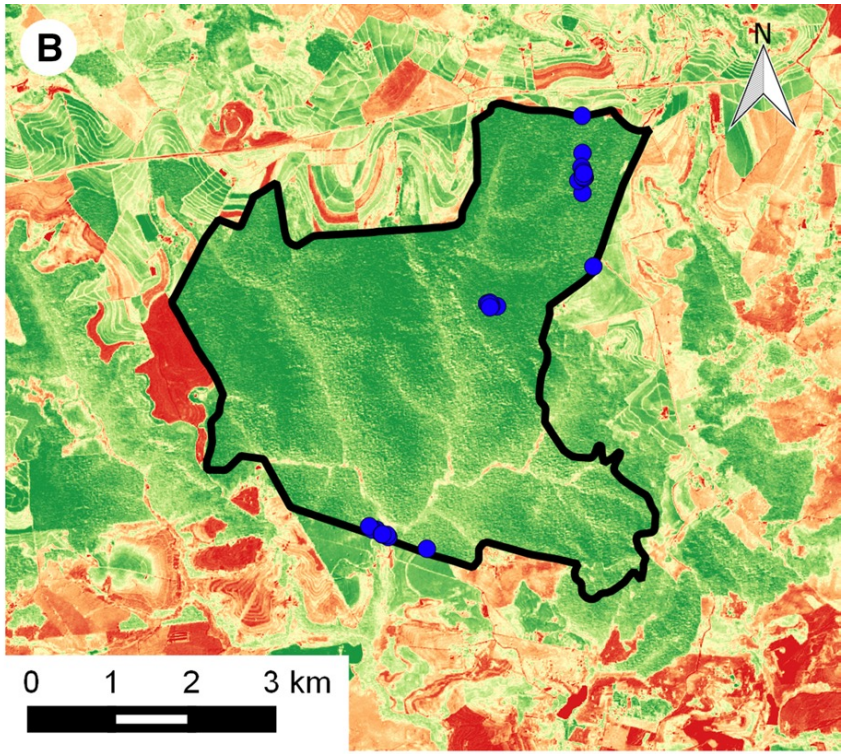
ARTICLE INFO

ABSTRACT

Godoy-Veiga et al. 2019 Dendrochronologia

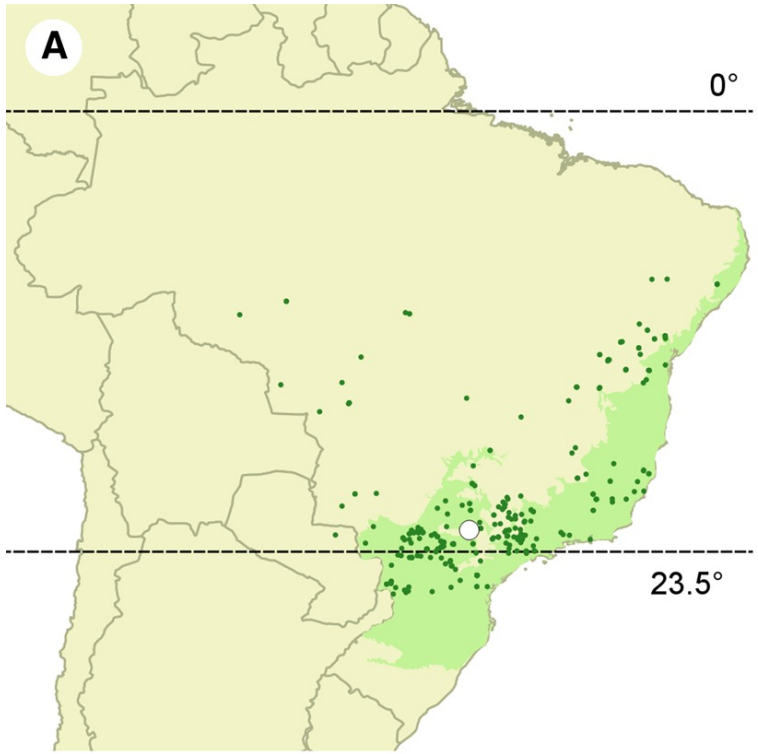
Godoy-veiga et al 2018 Trees, Structure and Function 32: 1073-1082

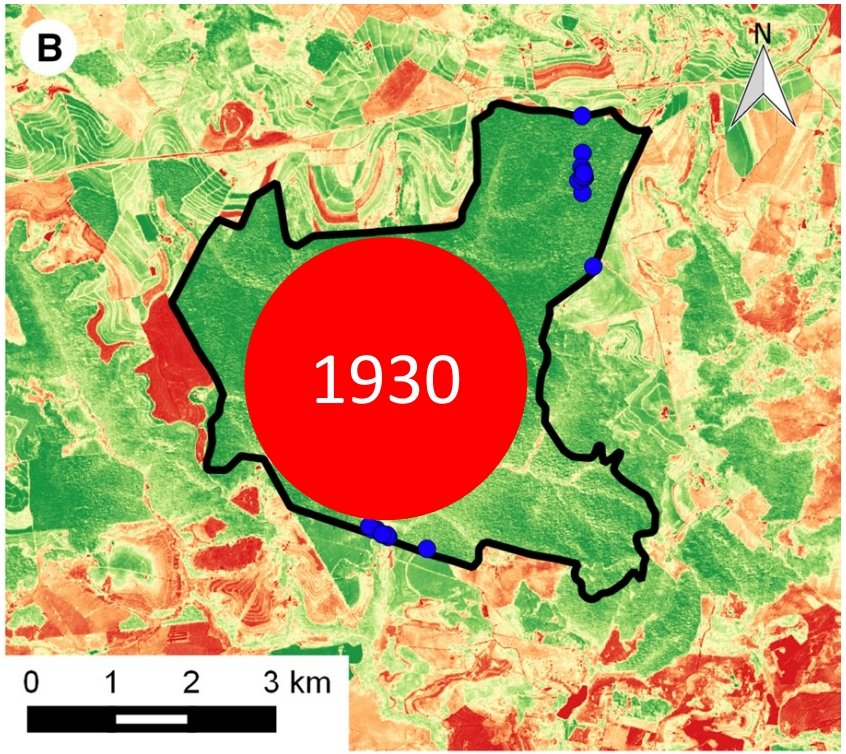




Aspidosperma polyneuron

Godoy-veiga et al 2018 Trees, Structure and Function 32: 1073-1082



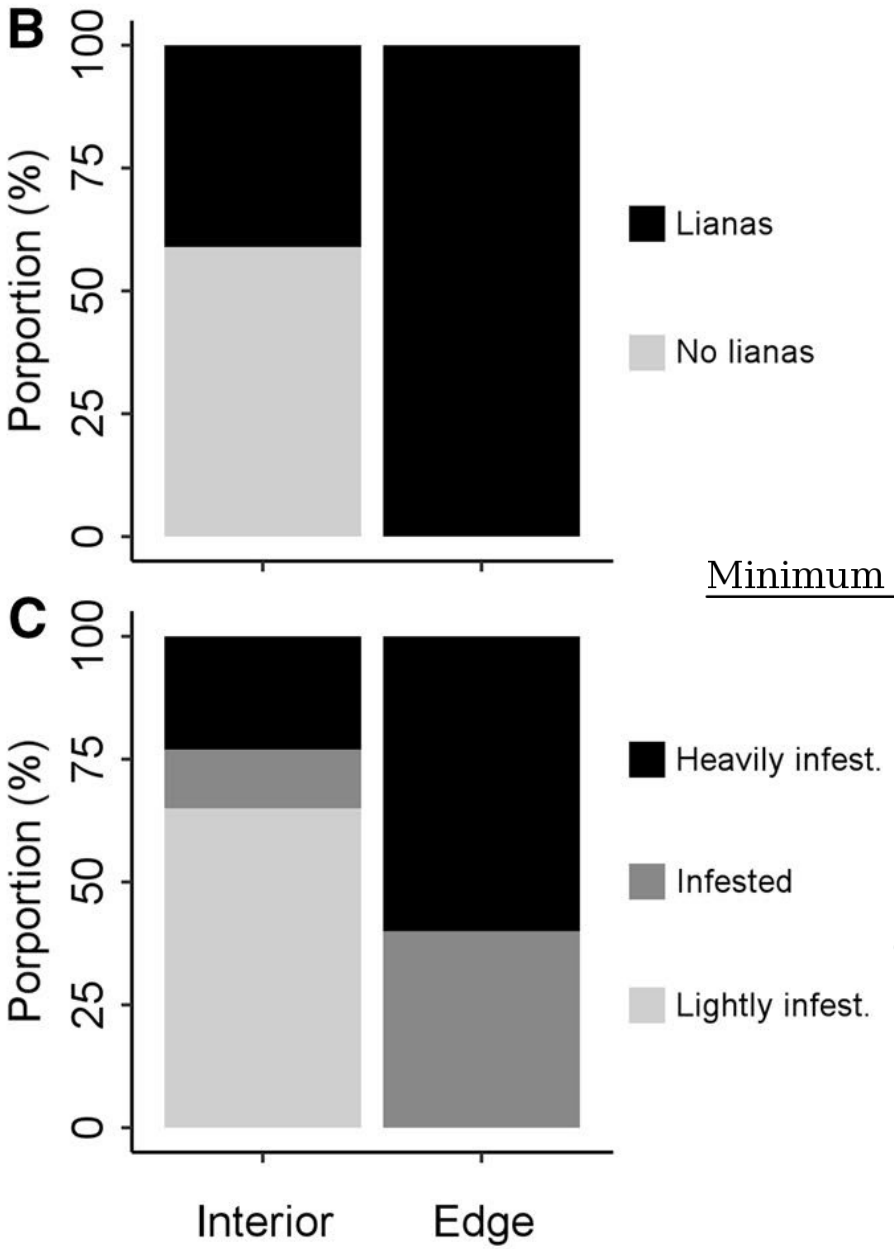


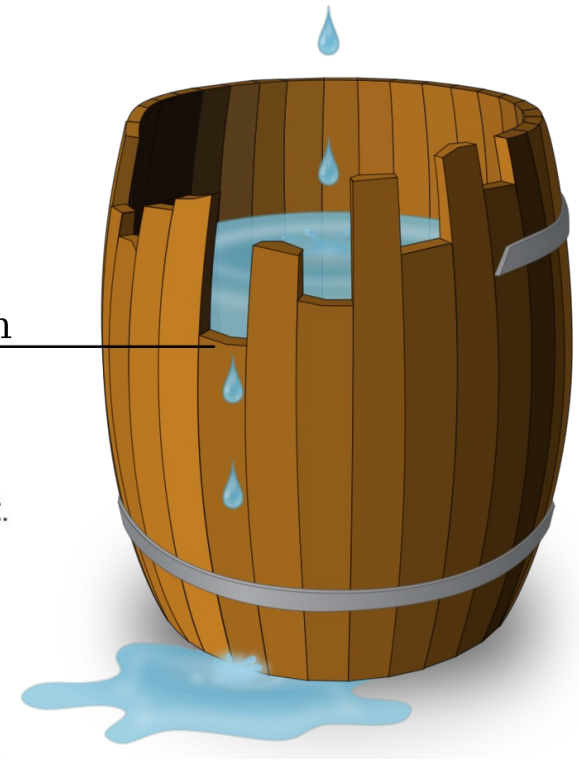
Atlantic rainforest · *A. polyneuron* ○ Caetetus

● Sampled trees

0.0 NDVI 0.6

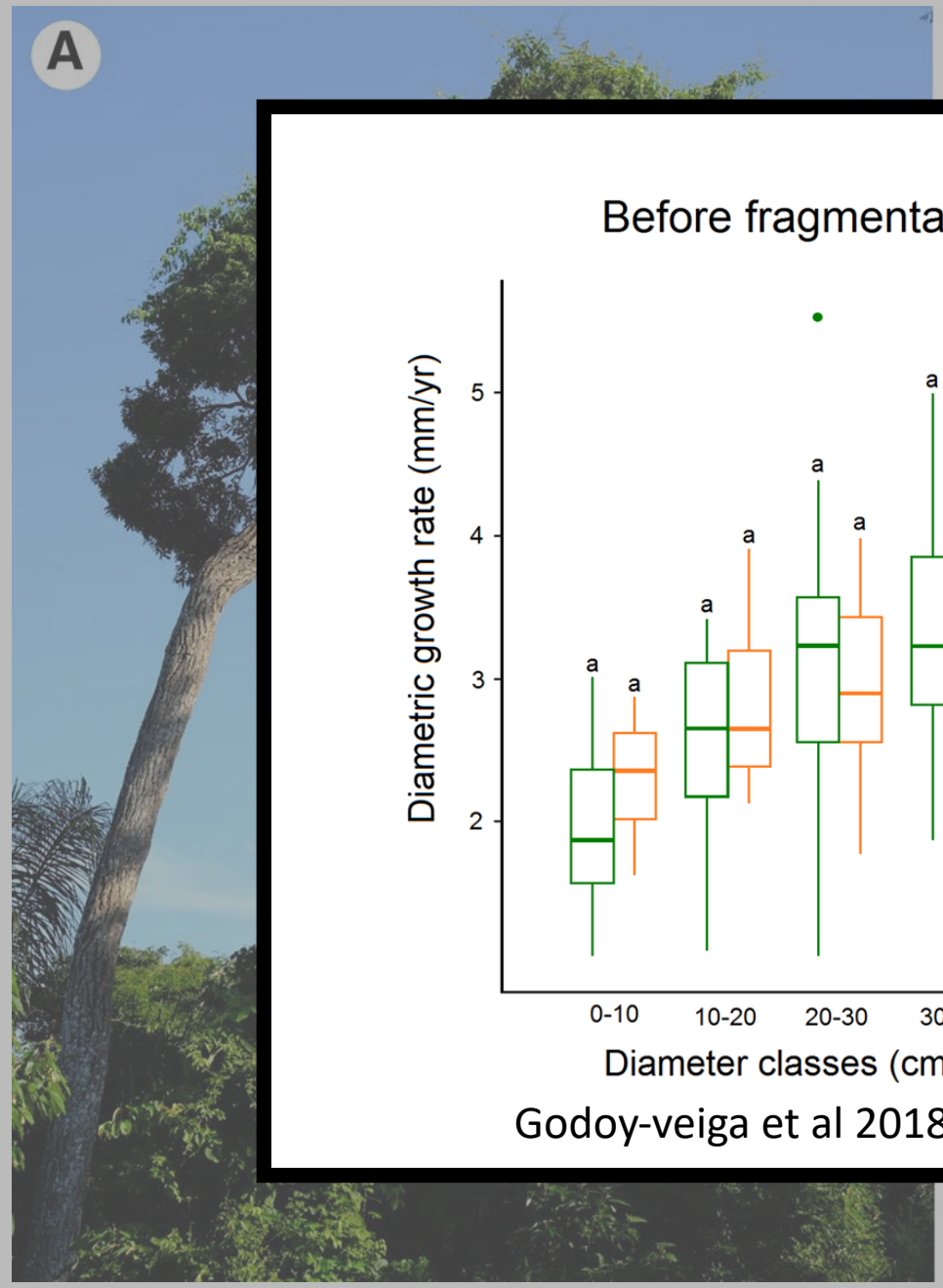
Aspidosperma polyneuron

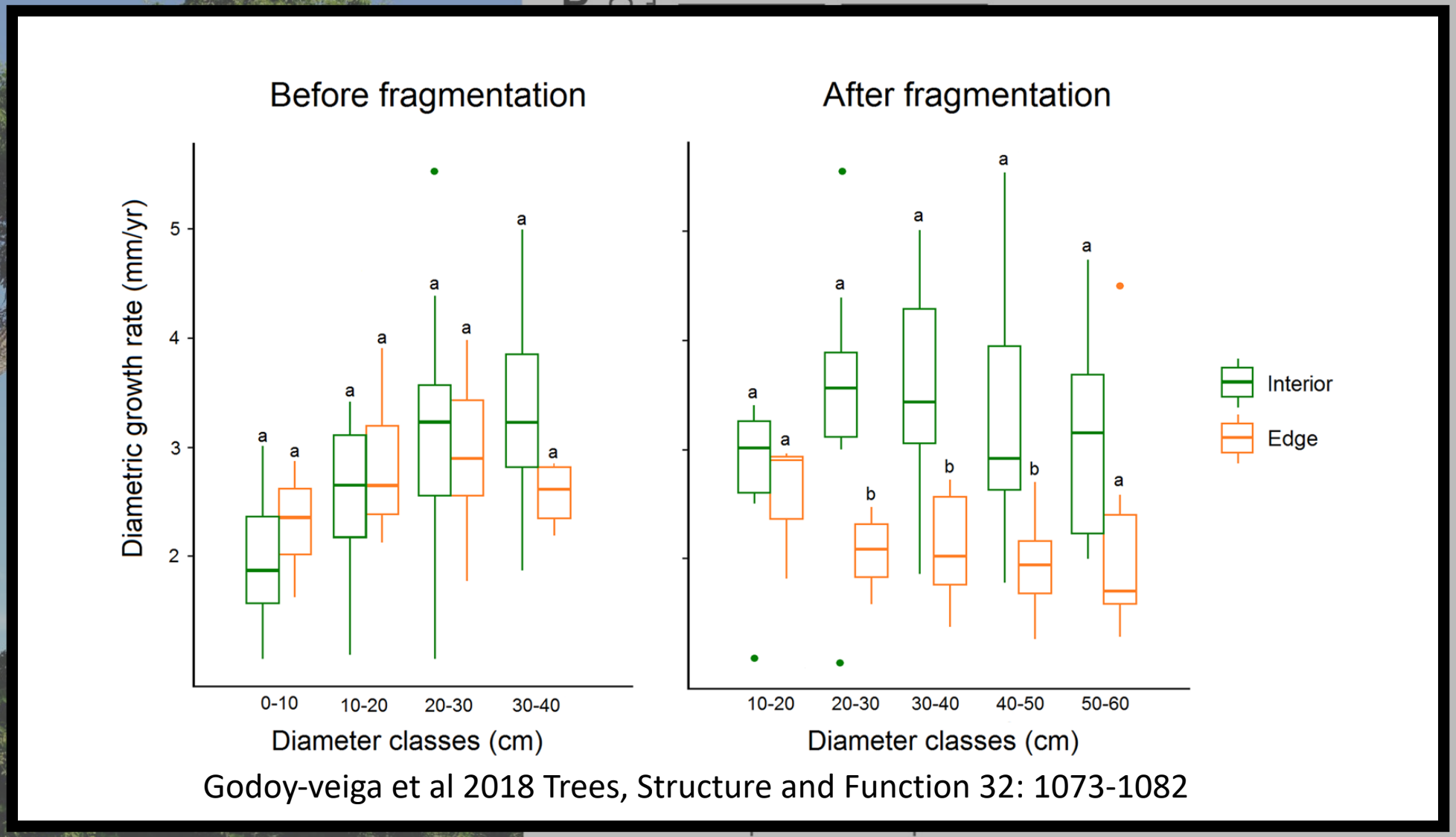




Lei de Liebig

Godoy-veiga et al 2018 Trees, Structure and Function 32: 1073-1082

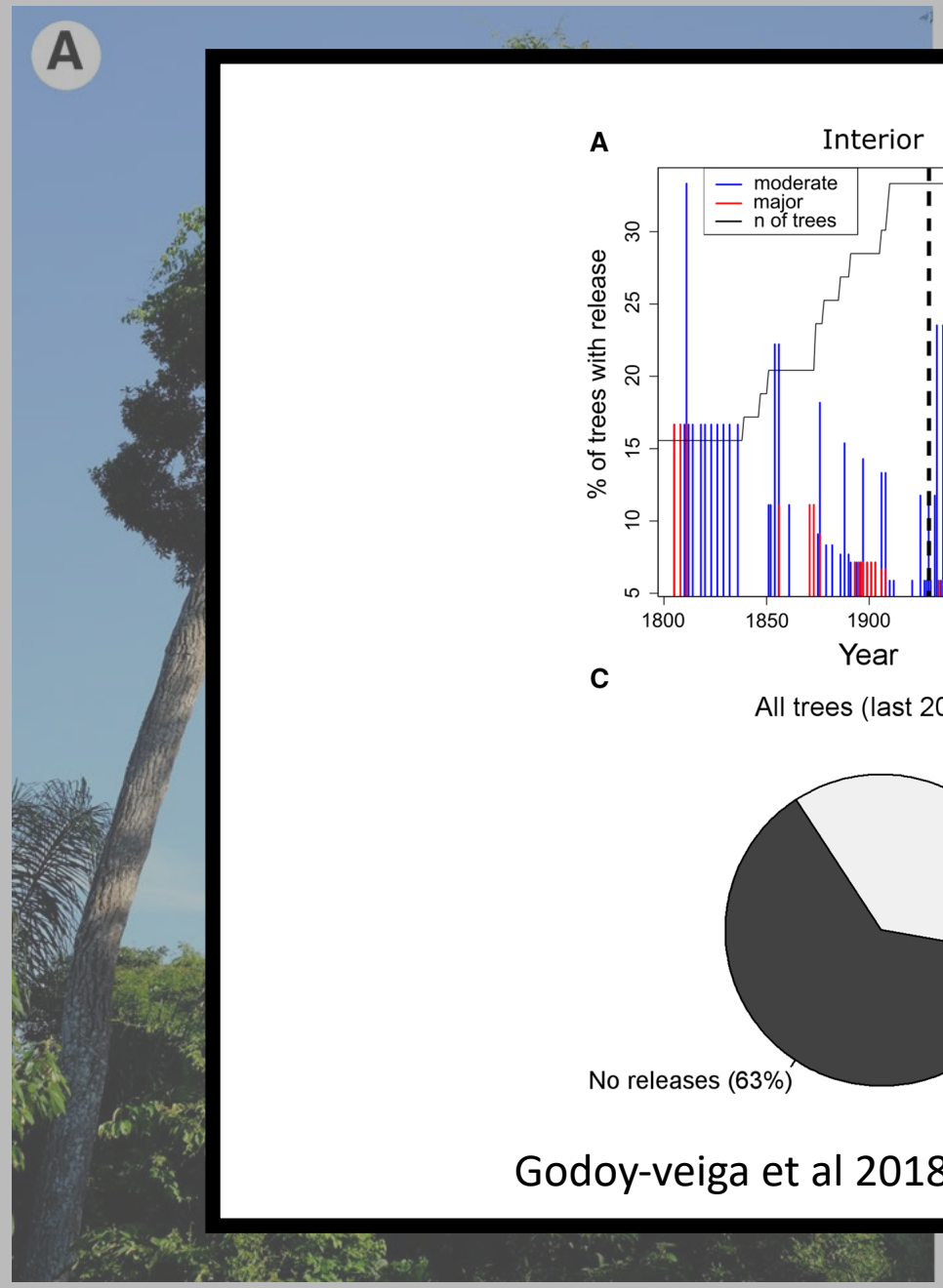


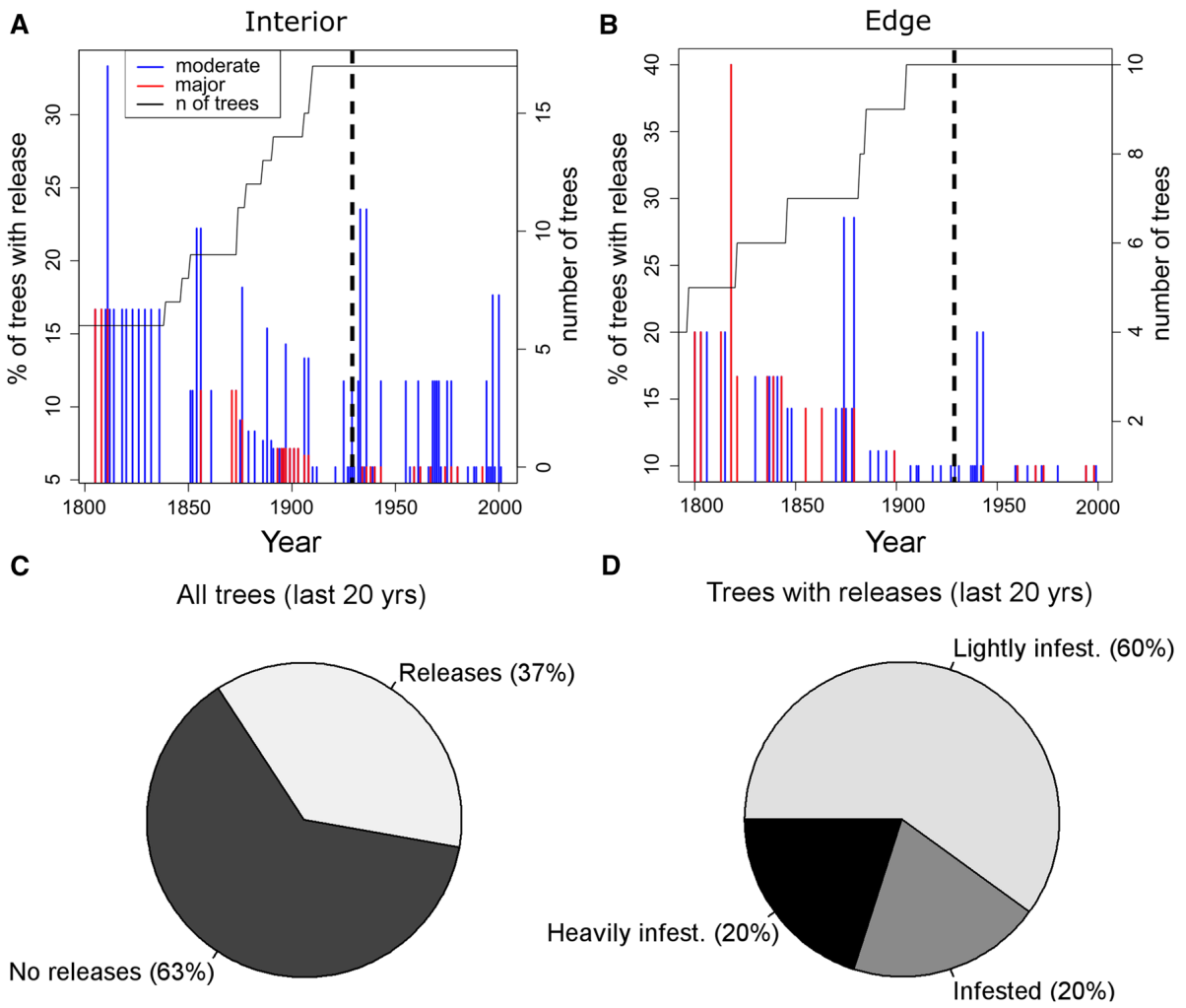


Godoy-veiga et al 2018 Trees, Structure and Function 32: 1073-1082

B

Interior Edge





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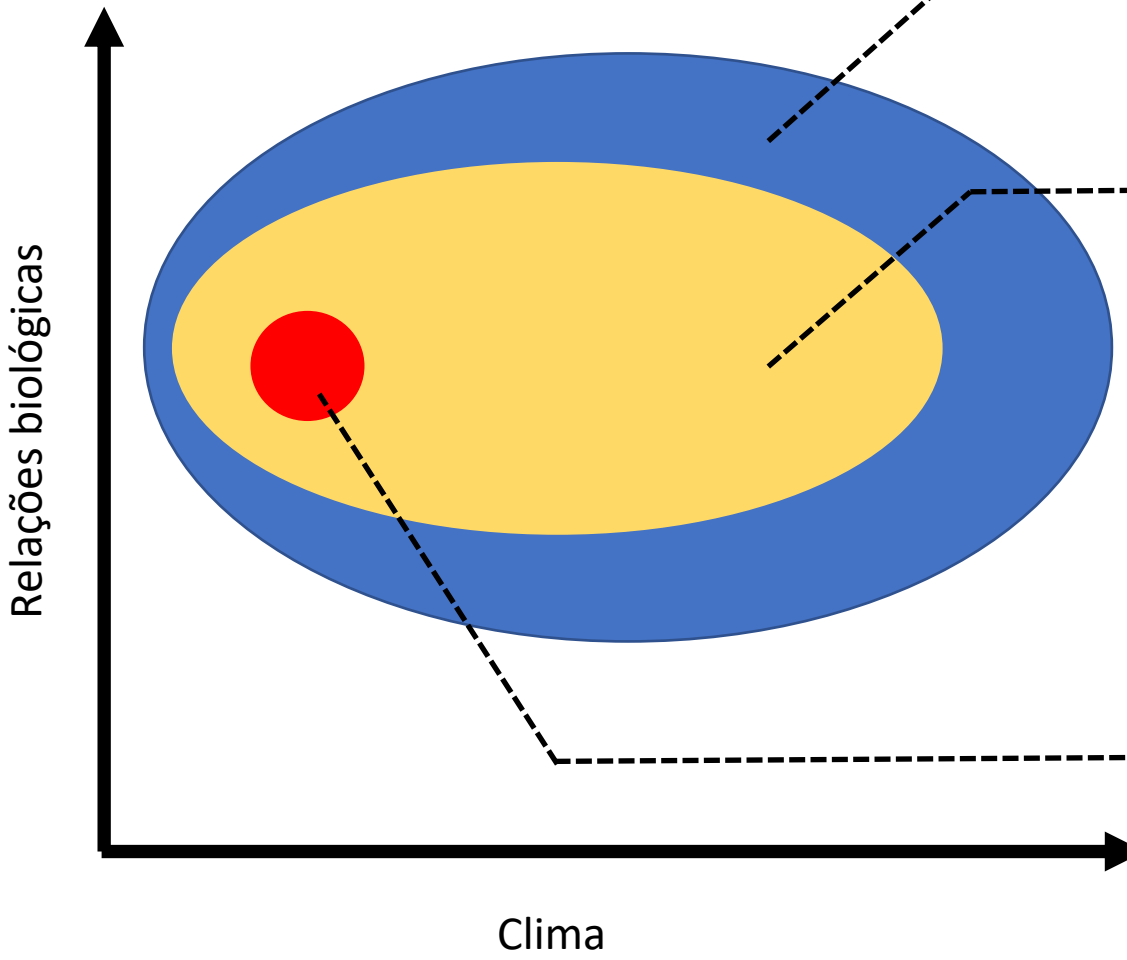
Interior Edge

Nichos ecológicos

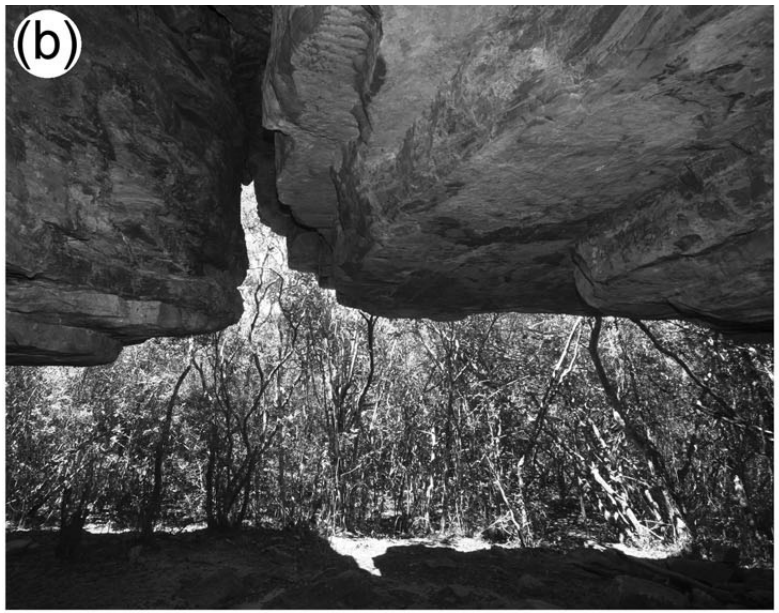


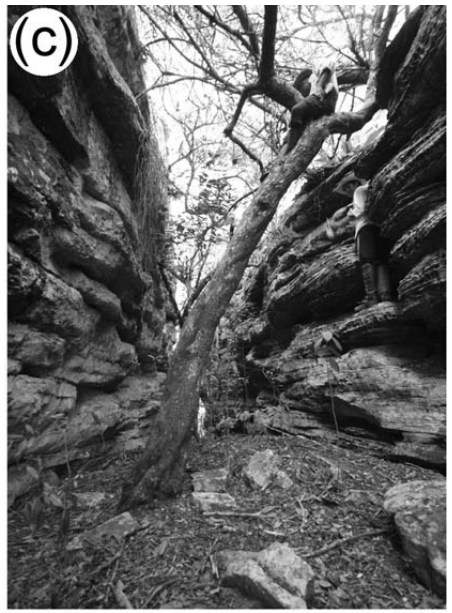
Nicho de tolerância: condições físicas e biológicas permitem a manutenção de uma população

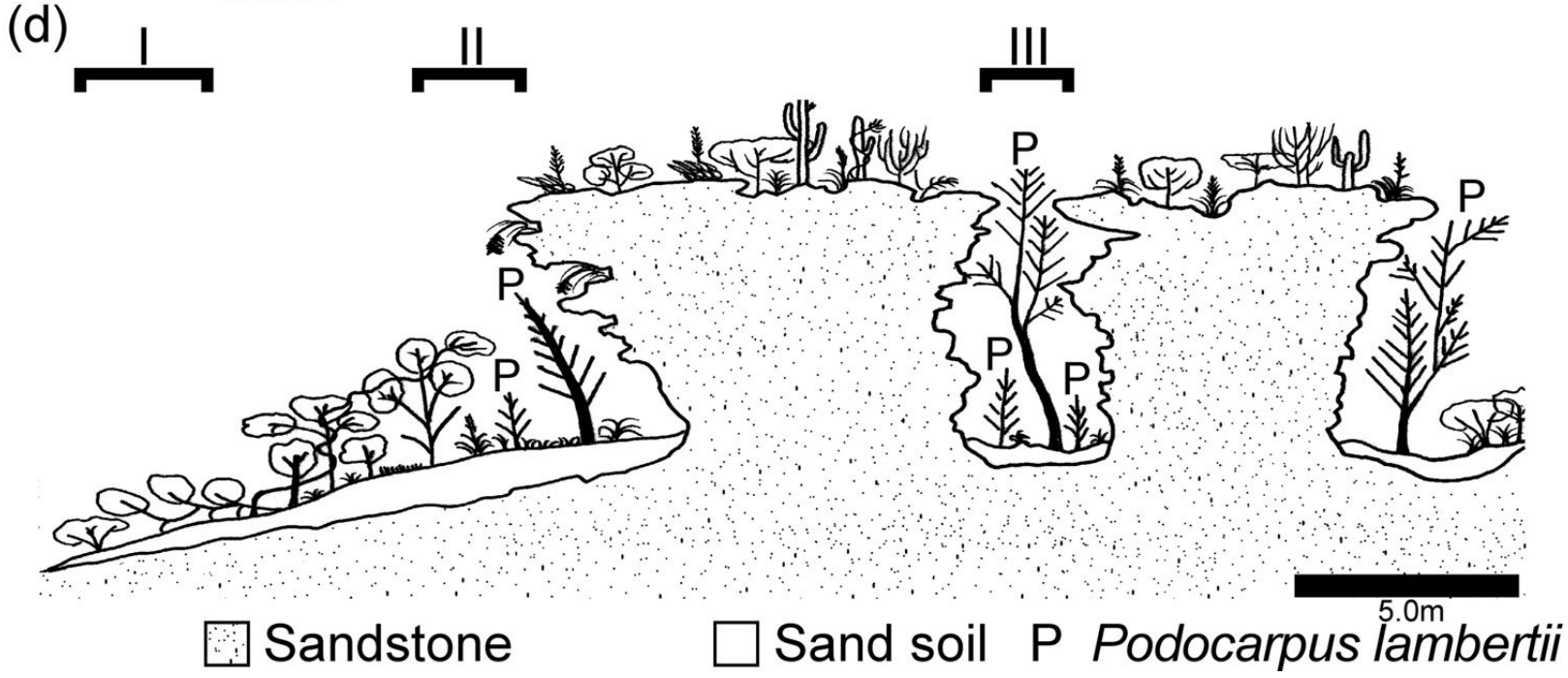
Nicho fundamental: condições físicas e recursos que mantém uma população auto-sustentável

Nicho realizado: condições físicas, recursos e interações biológicas que mantém uma população auto-sustentável

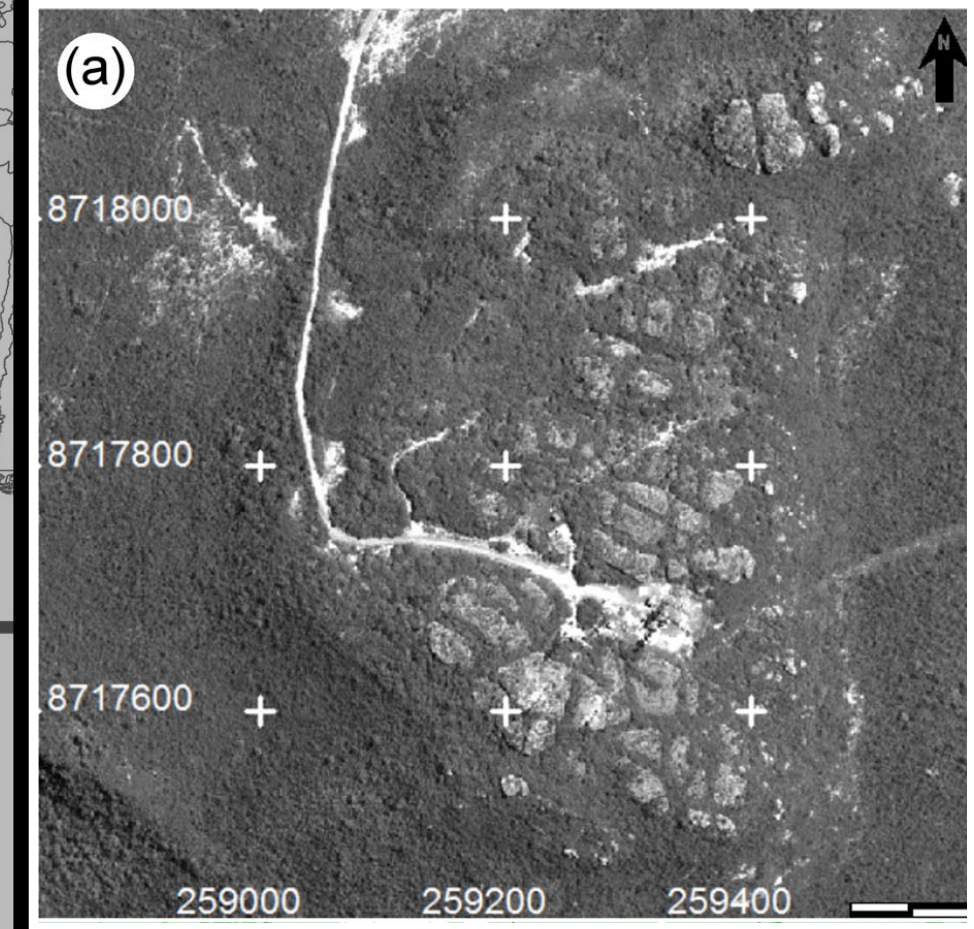
Modificado: Sax et al 2013 Trends in Ecology & Evolution 28: 517 - 523

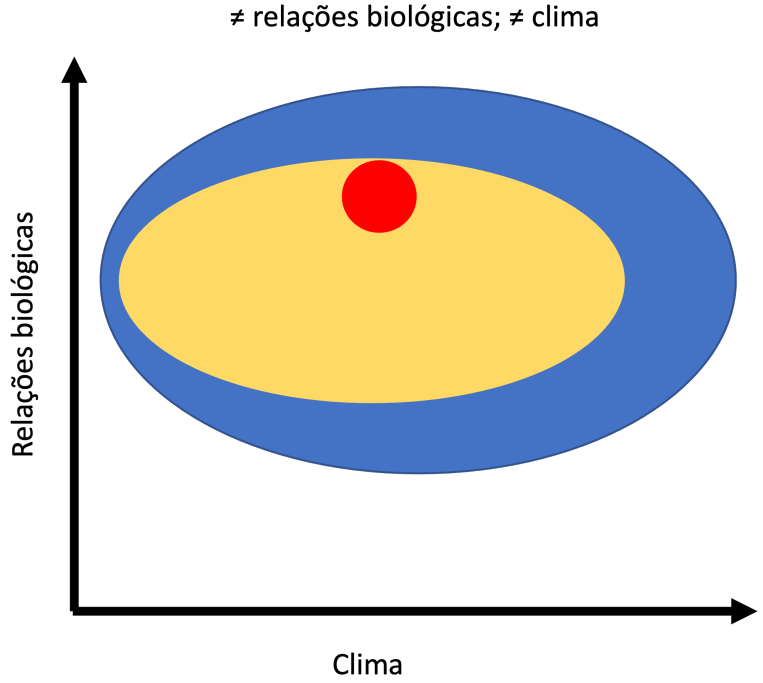






Locosselli et al 2016 International Journal of Biometorology 60: 639-649





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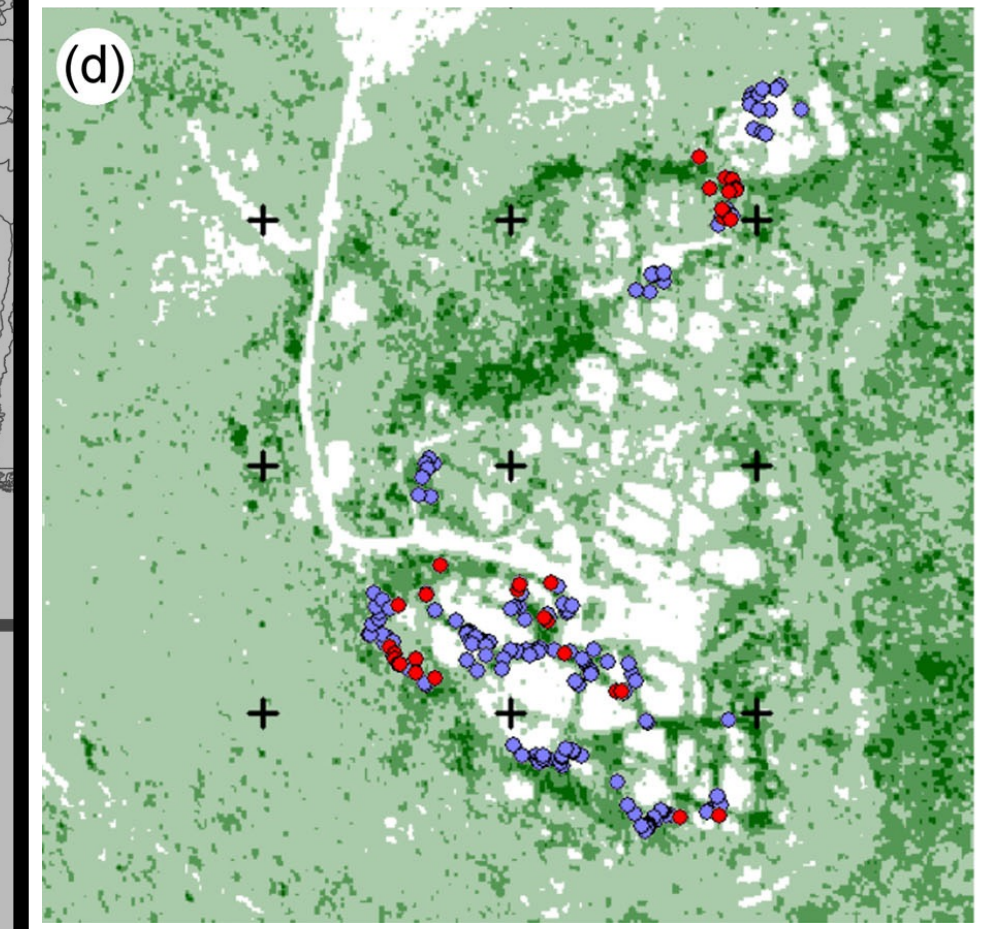
Sandstone Sand soil P *Podocarpus lambertii*

Locosselli et al 2016 International Journal of Biometorology 60: 639-649



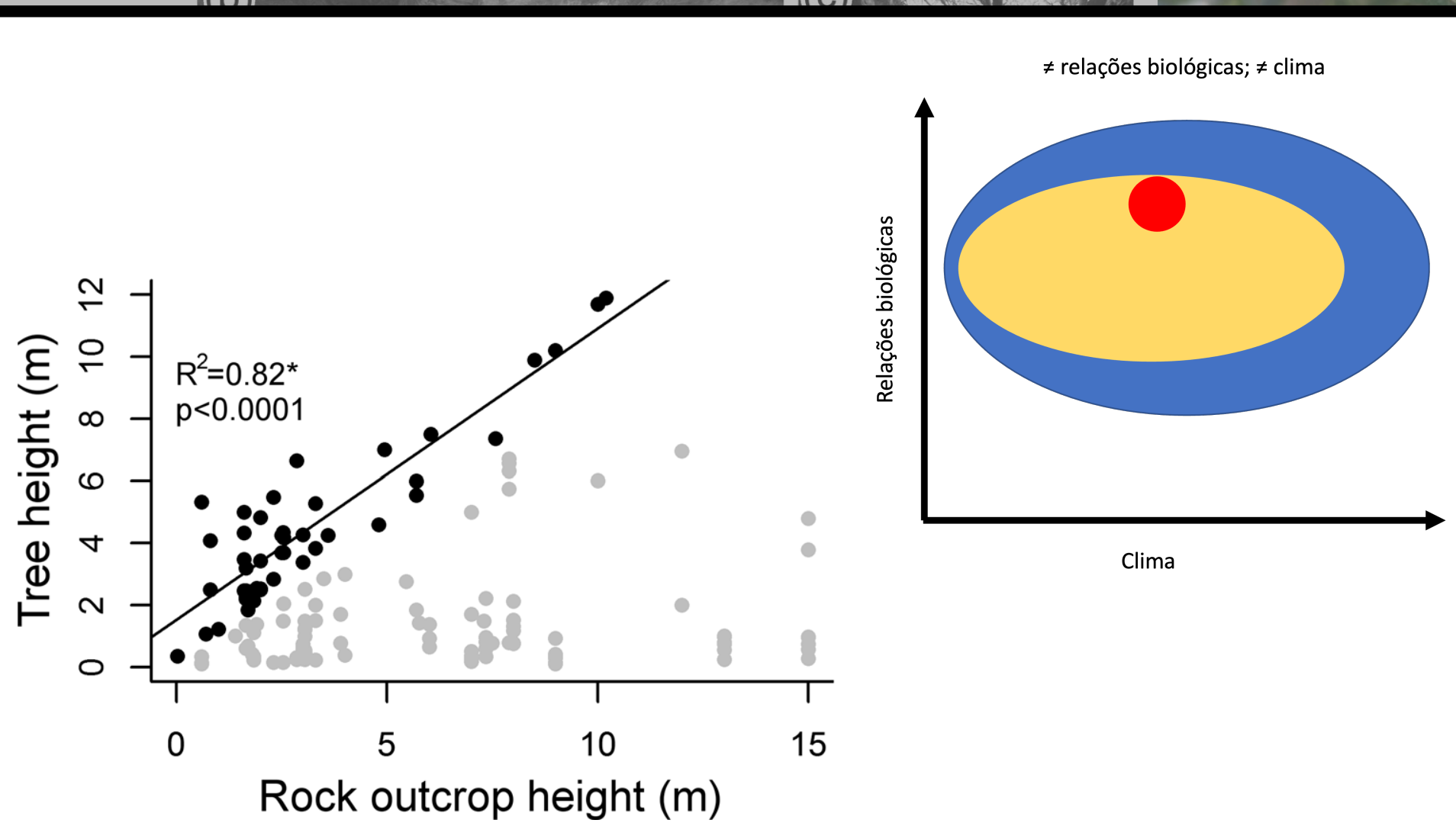
Class 1
Class 2
Class 3
Class 4

≠ relações biológicas; ≠ clima

Clima

Locosselli et al 2016 International Journal of Biometorology 60: 639-649

Locosselli et al 2016 International Journal of Biometorology 60: 639-649



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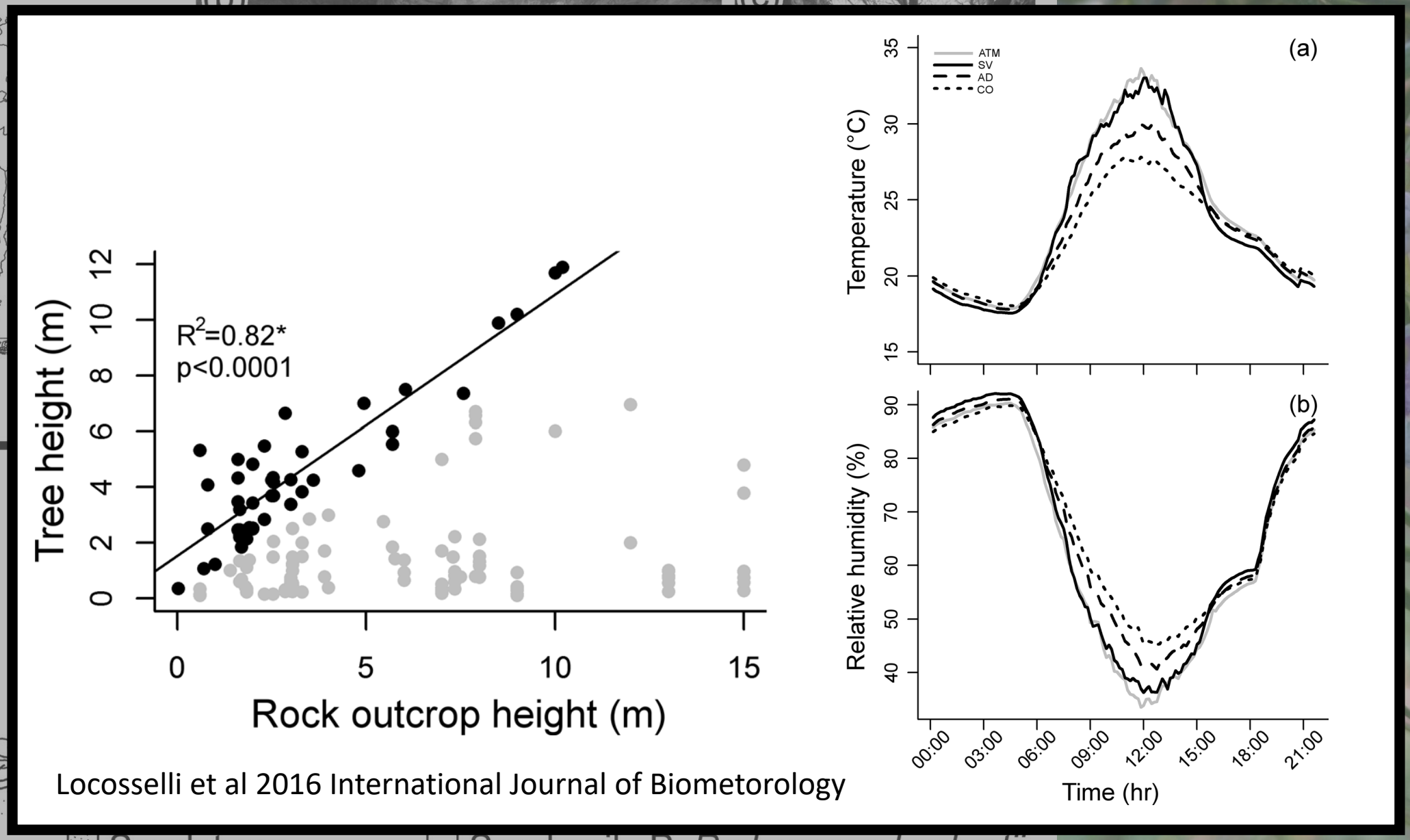

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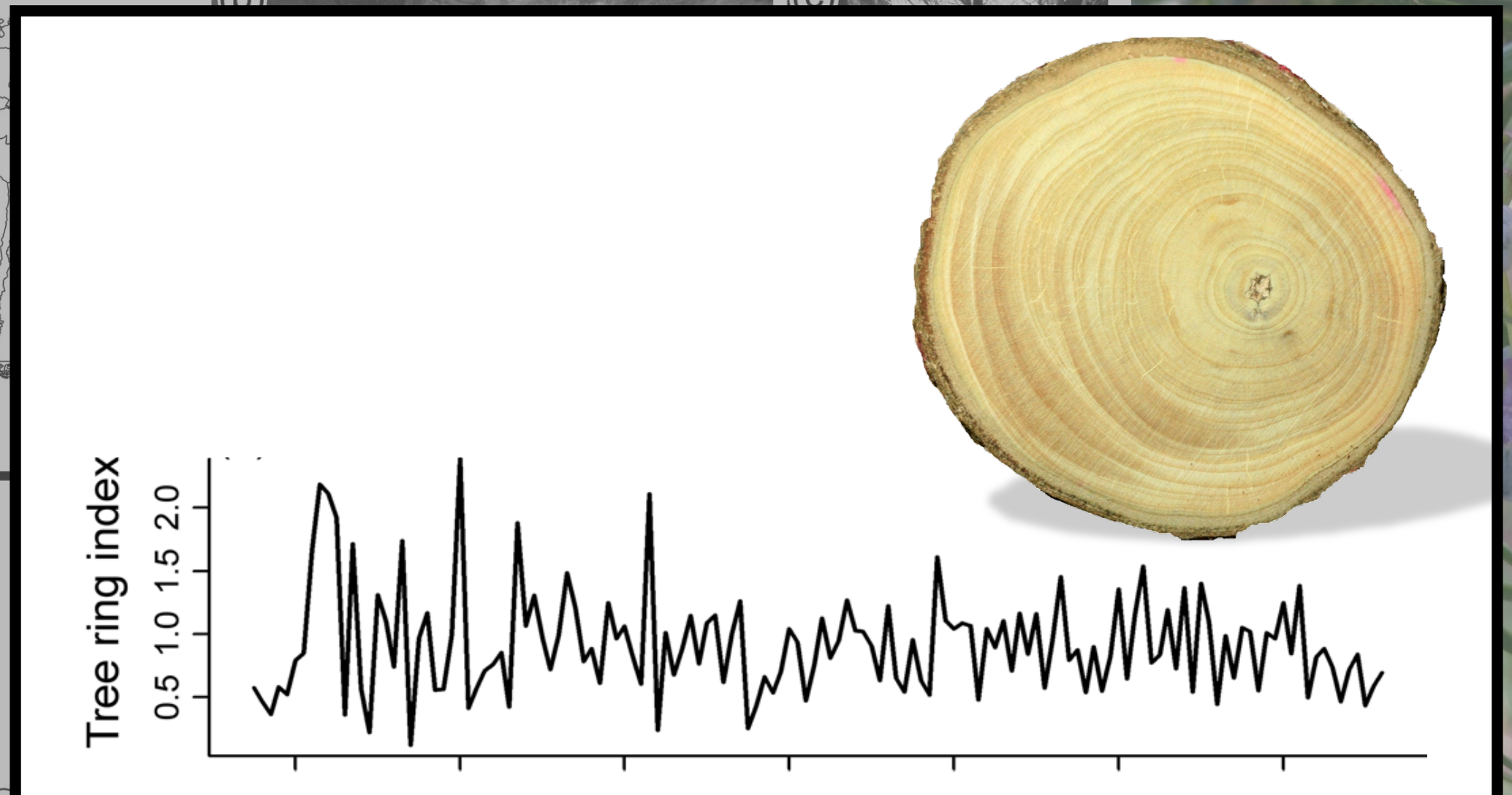

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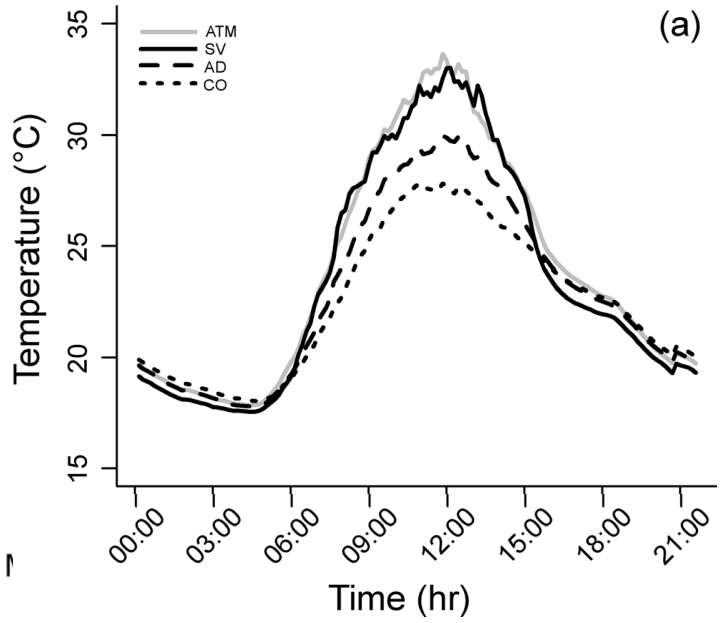

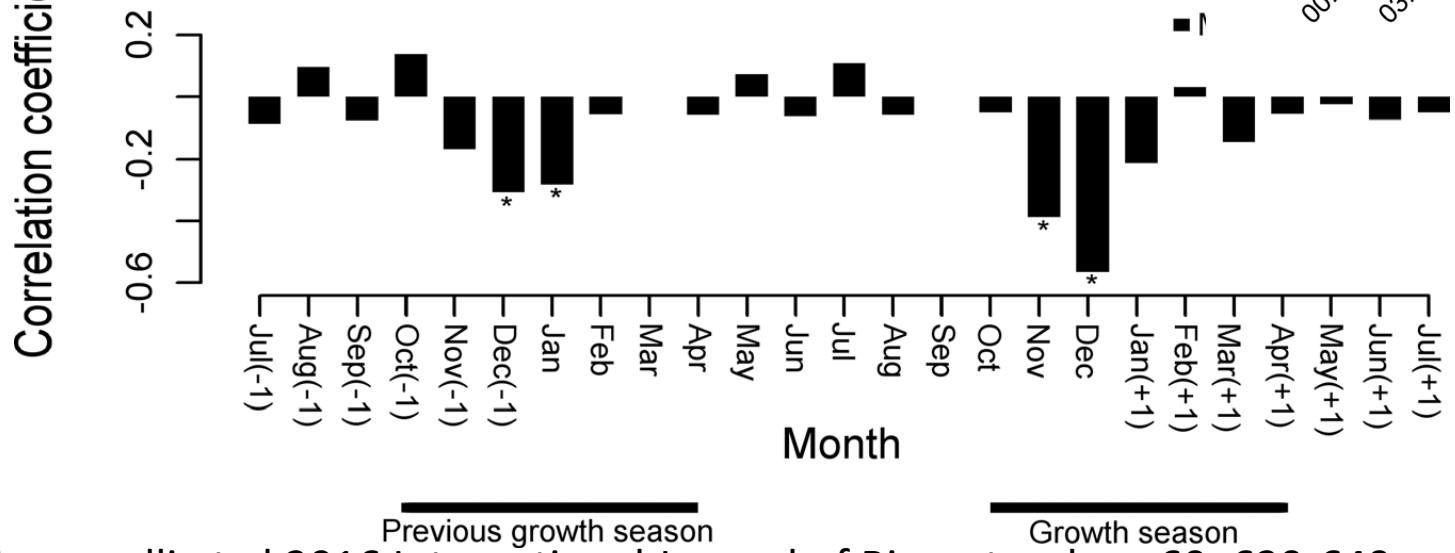

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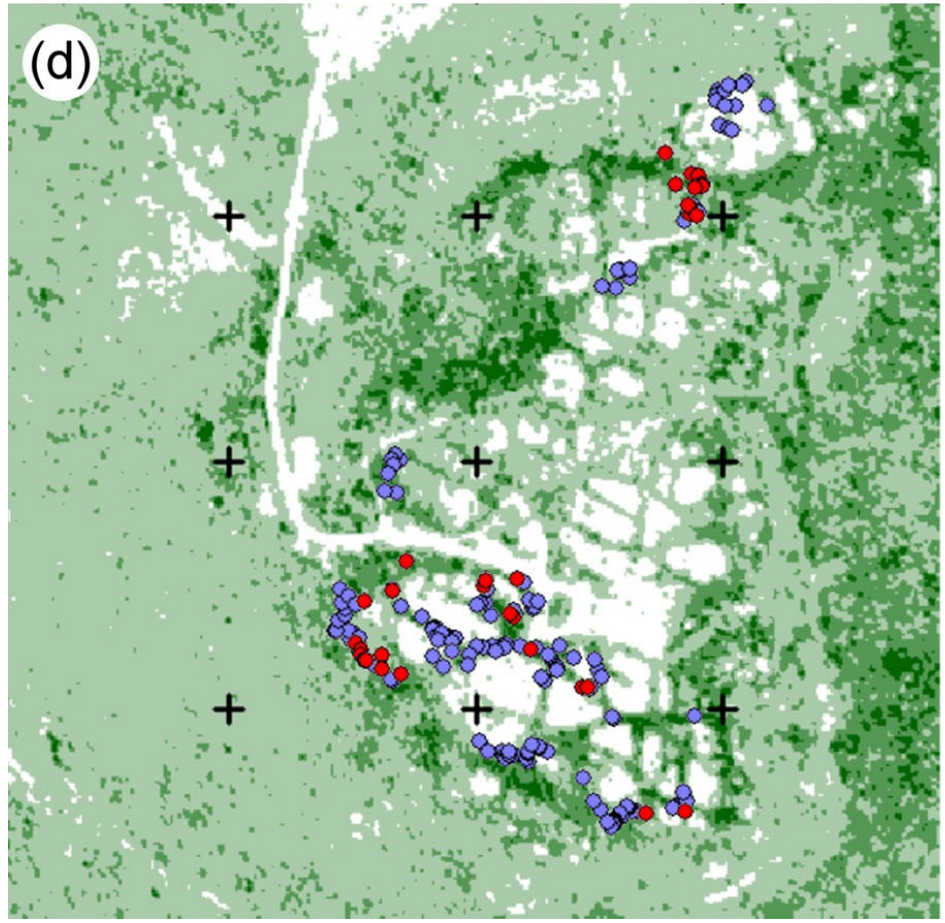

Class 1

Class 2

Class 3

Class 4

Vivas

Mortas

Locosselli et al 2016 International Journal of Biometorology 60: 639-649

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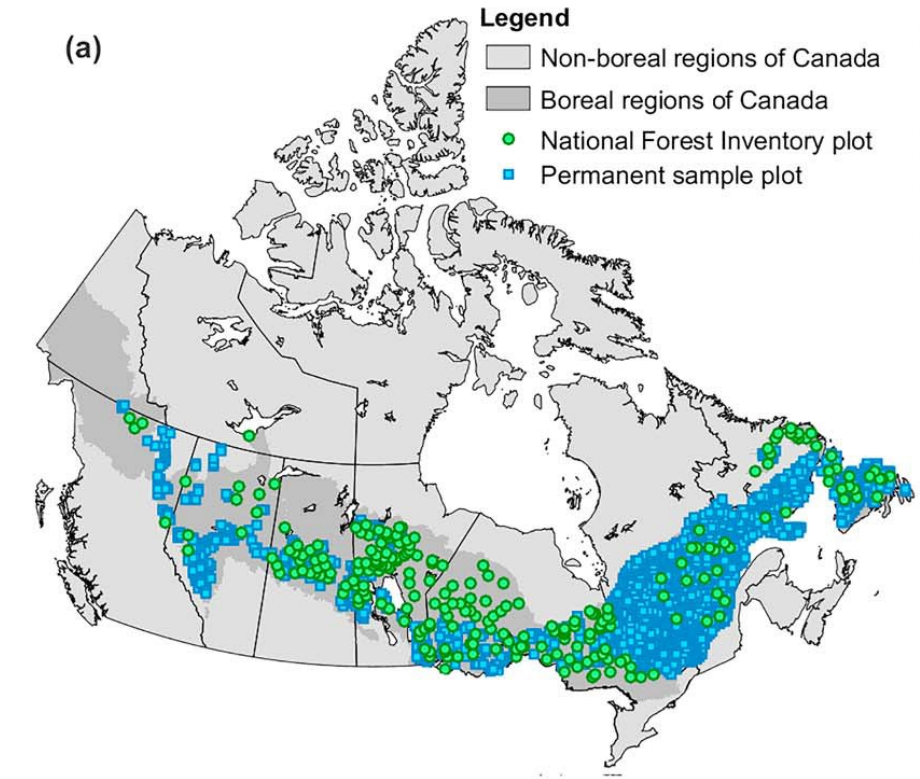
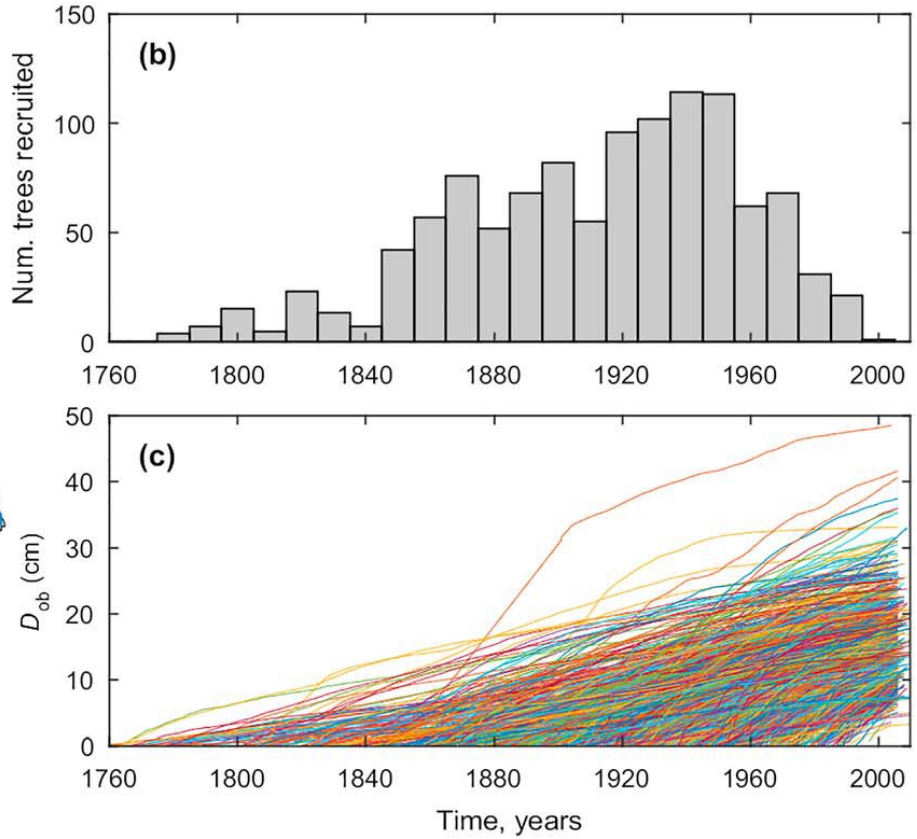
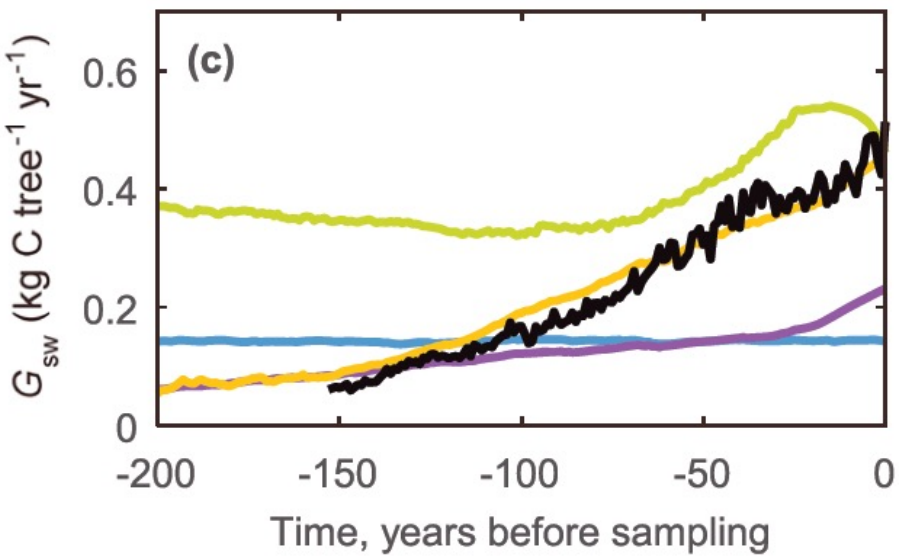






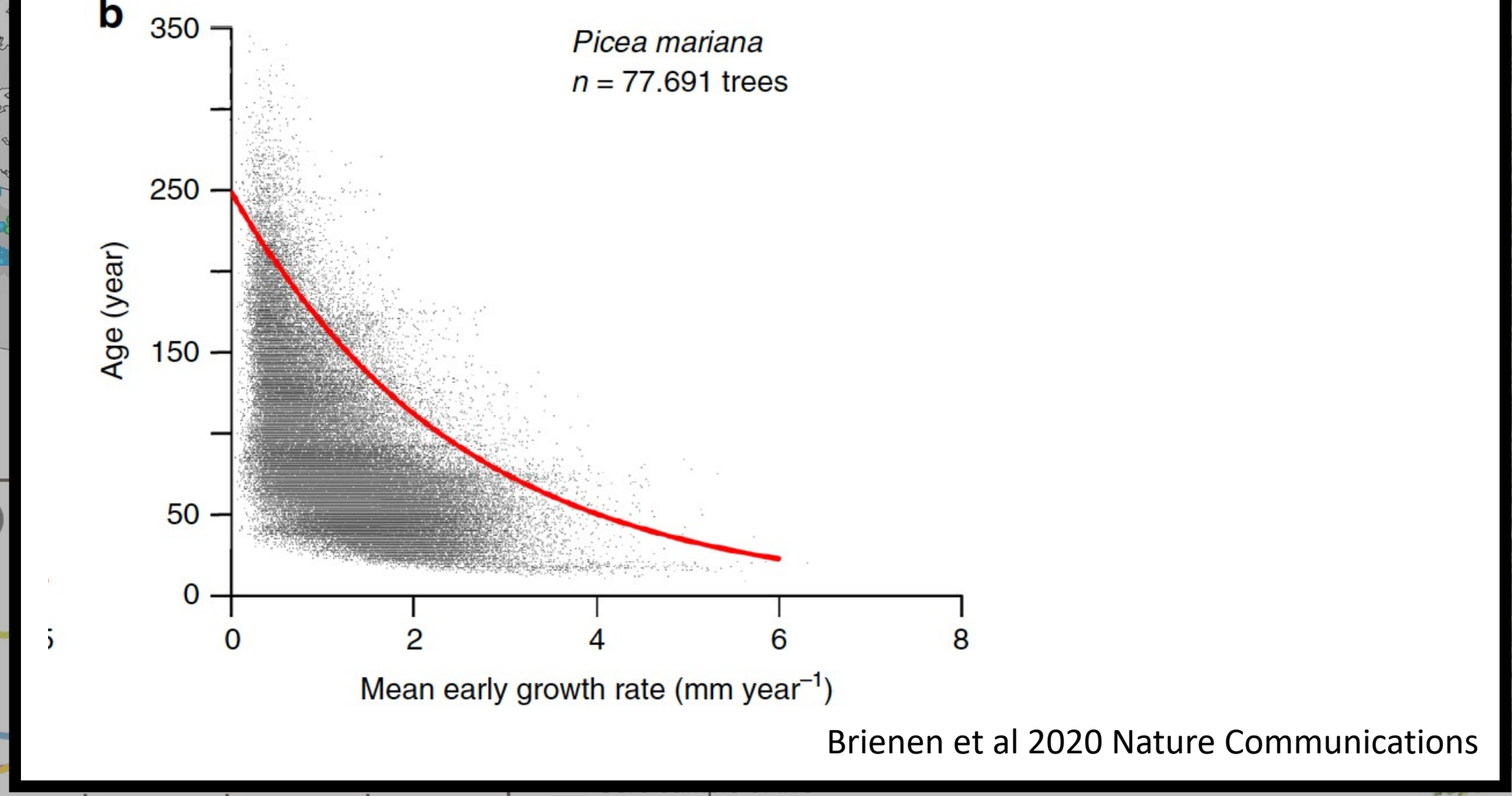
Simulations:

- All live trees (POP)
- Dominant live trees
- Live at t_{samp}
- Live and dominant at t_{samp}

Observations:

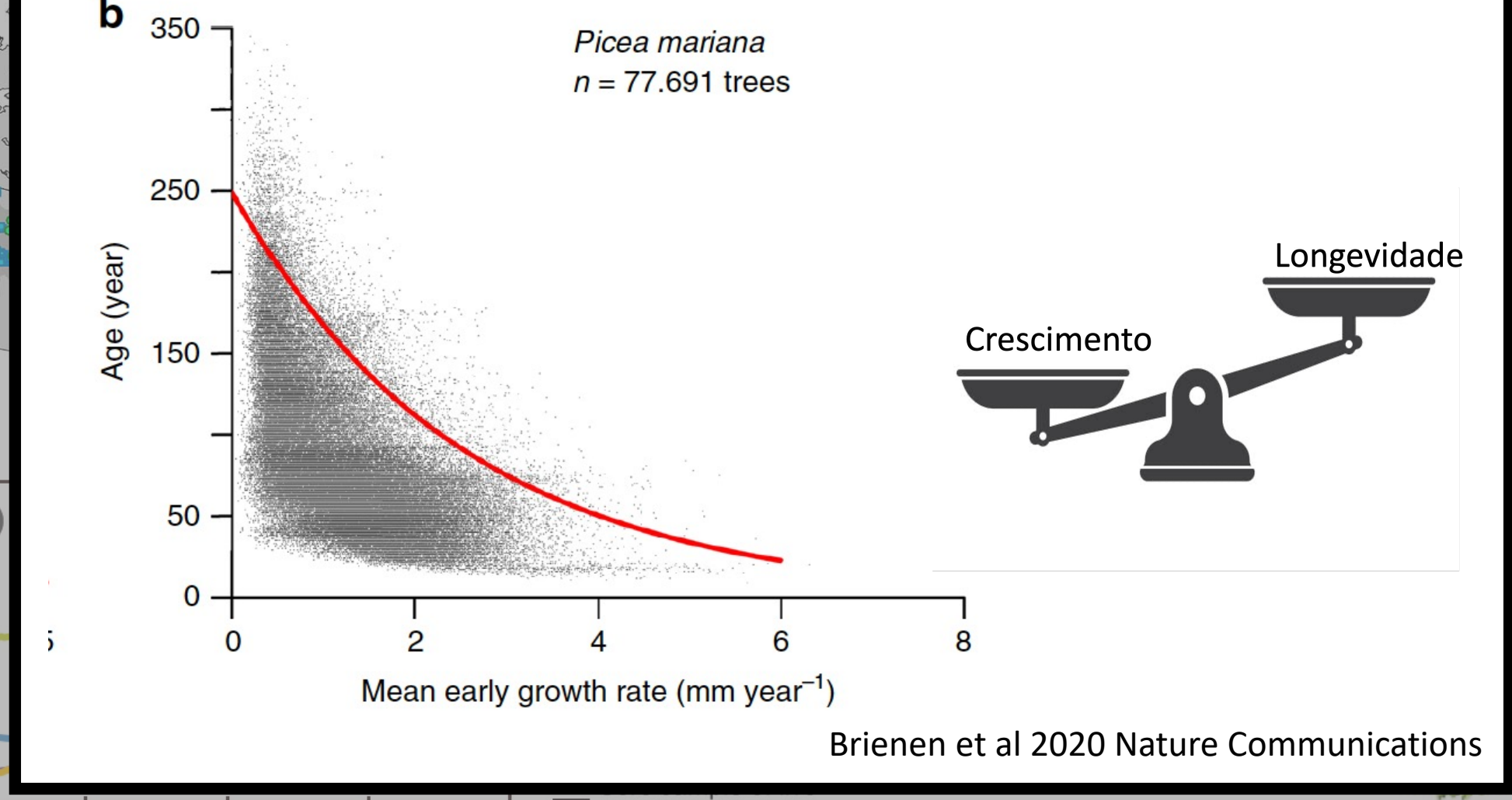
- Core sample of live and dominant trees

Picea mariana



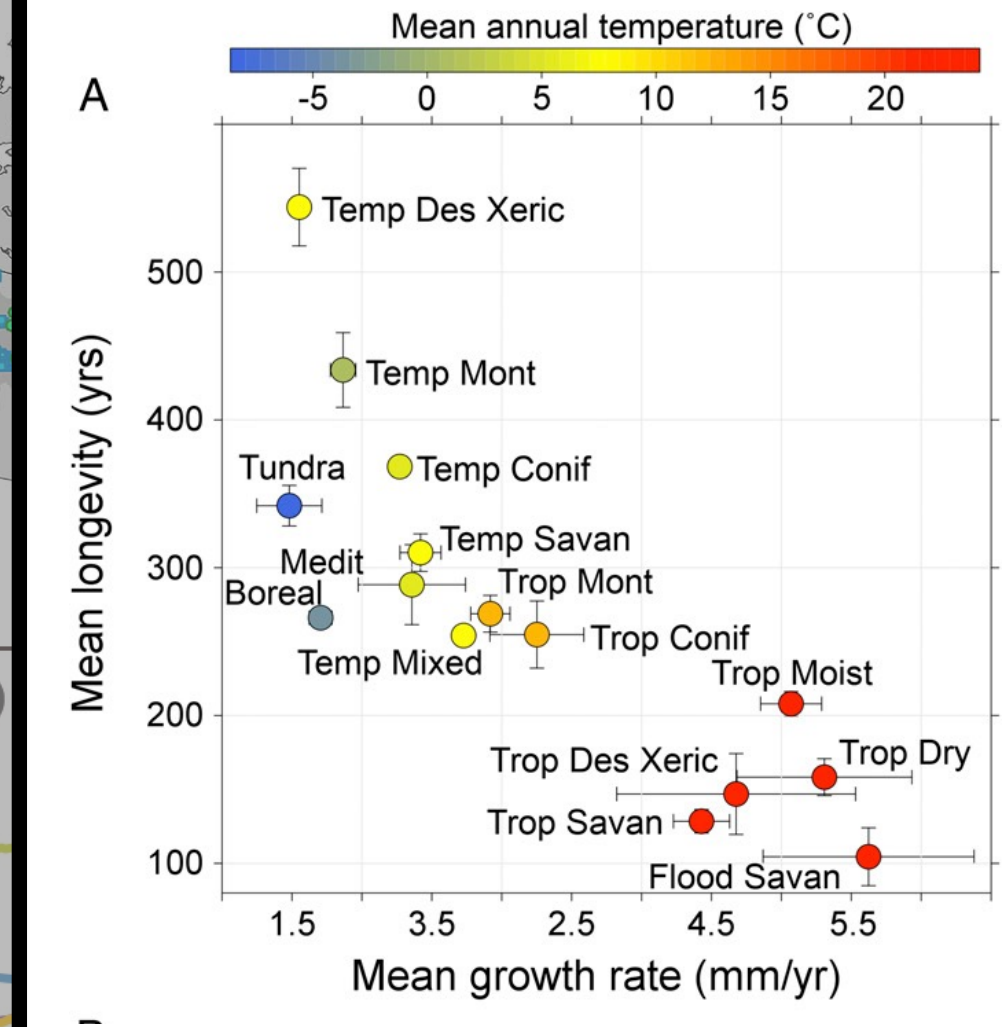
Brienen et al 2020 Nature Communications

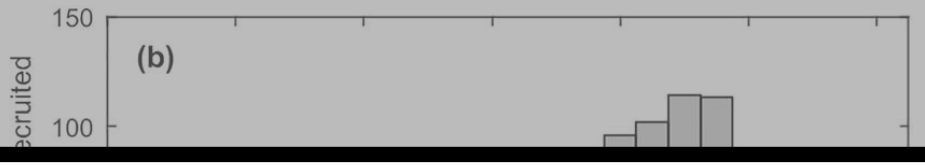
Picea mariana

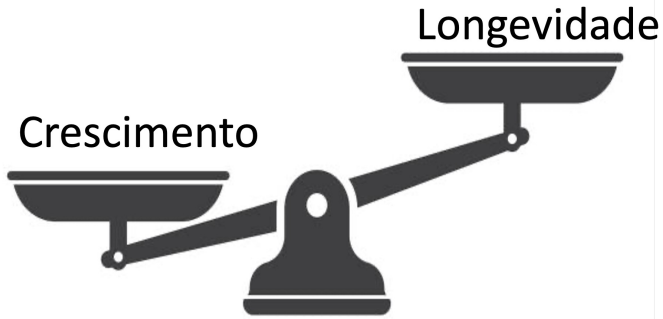


Brienen et al 2020 Nature Communications

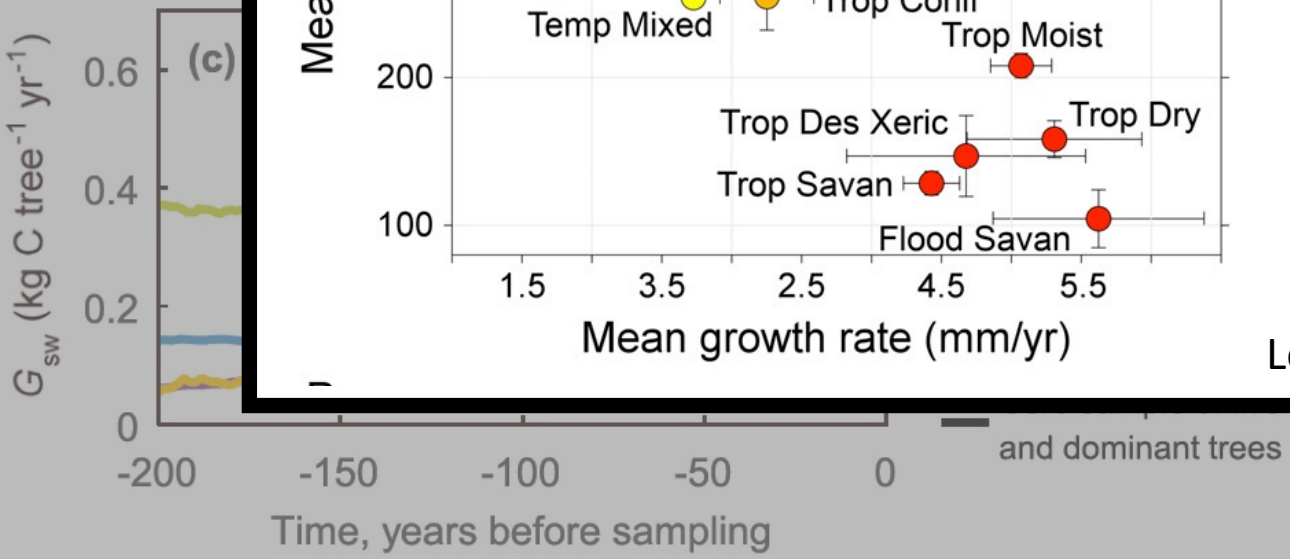
Picea mariana





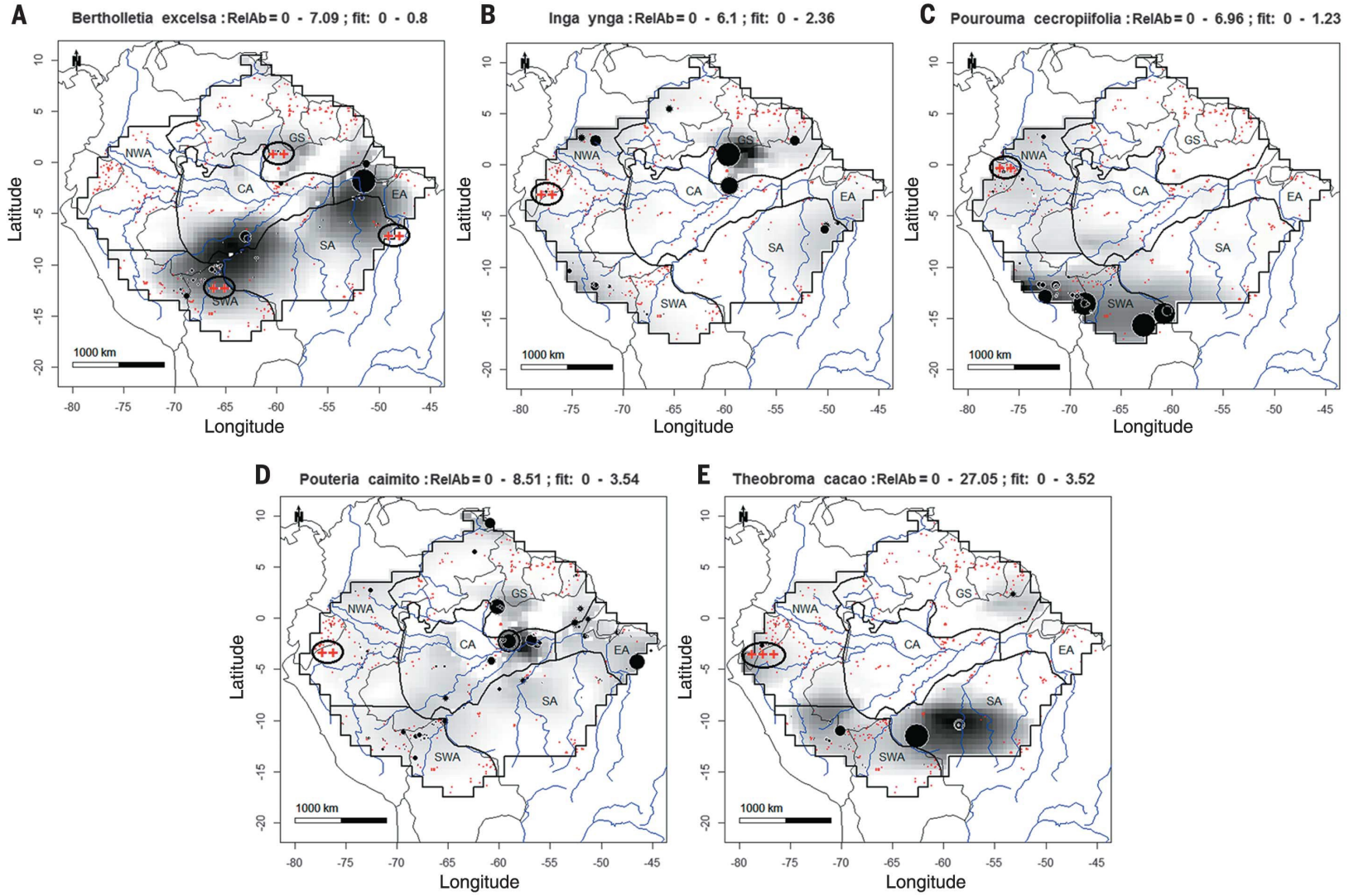


Locosselli et al 2020 PNAS 117: 33358-33364



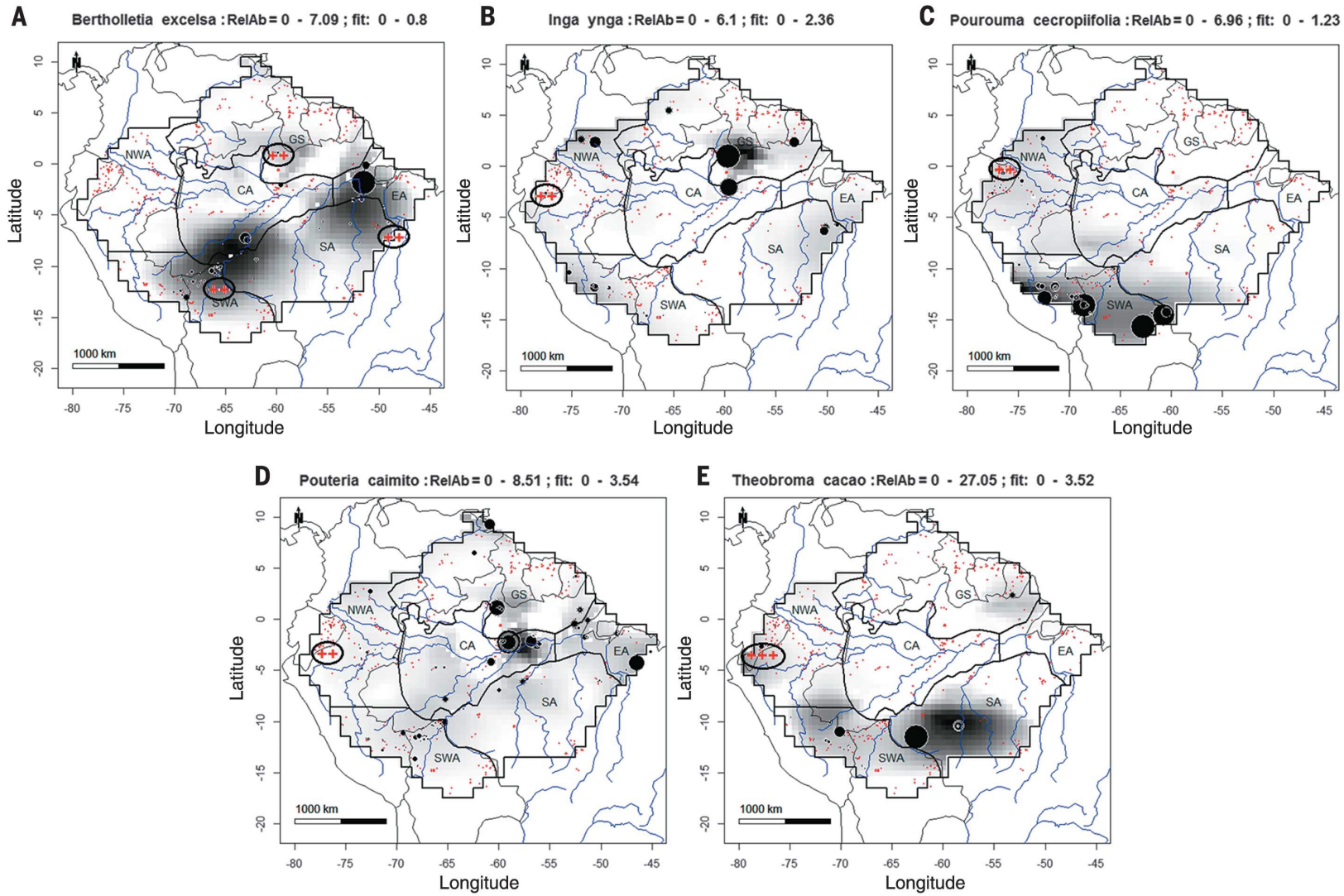
and dominant trees

Picea mariana



Levis et al 2017 Science 355: 925-931

flickr.com/photos/benjamincardenas/



Levis et al 2017 Science 355: 925-931

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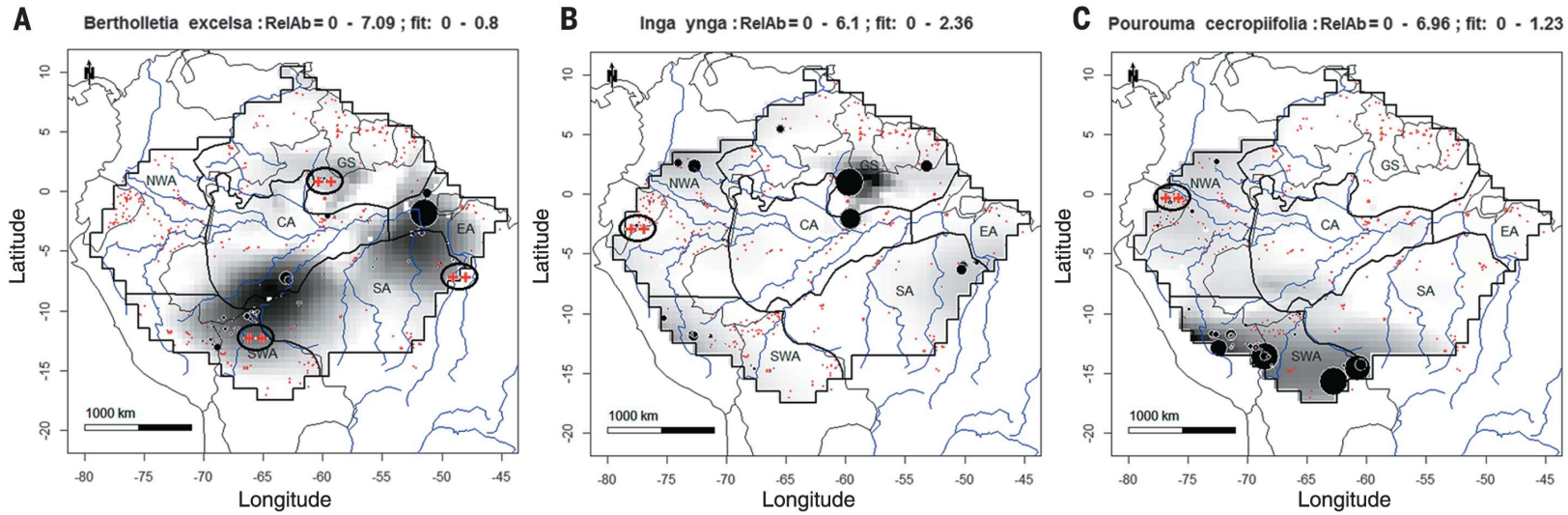
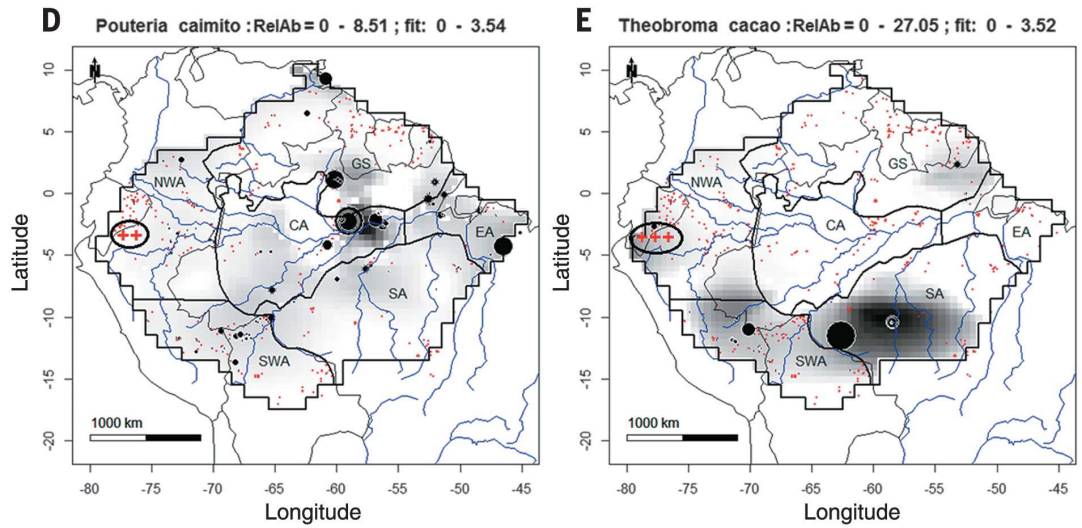
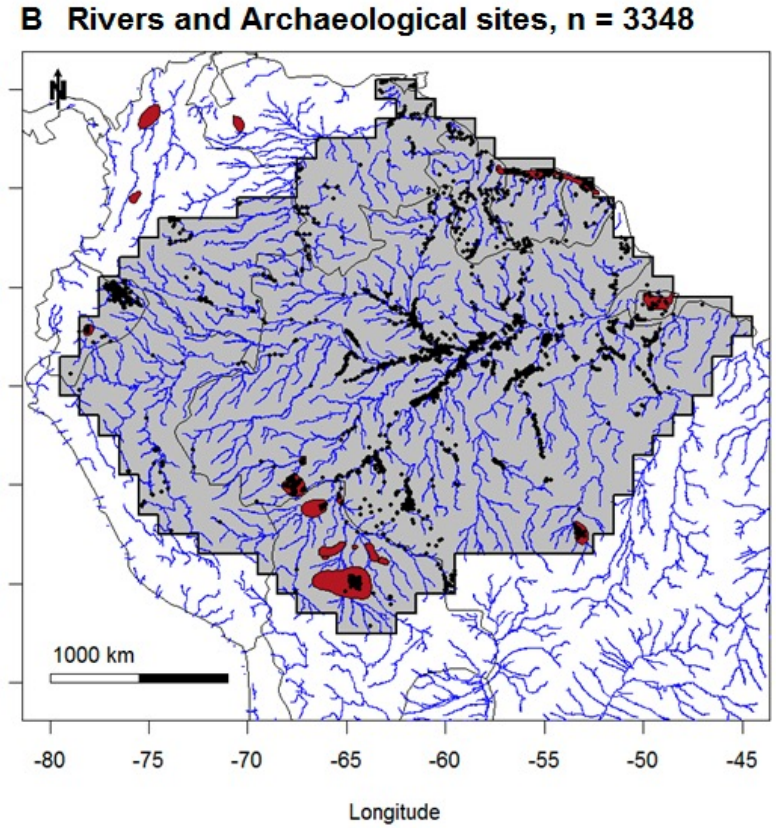
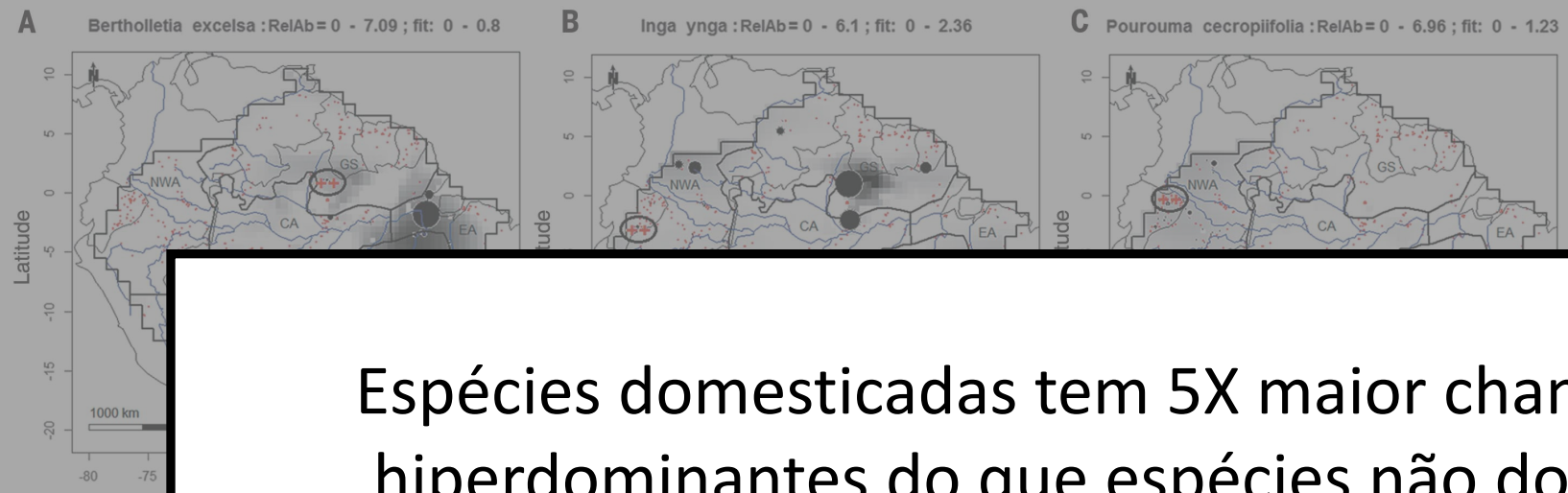






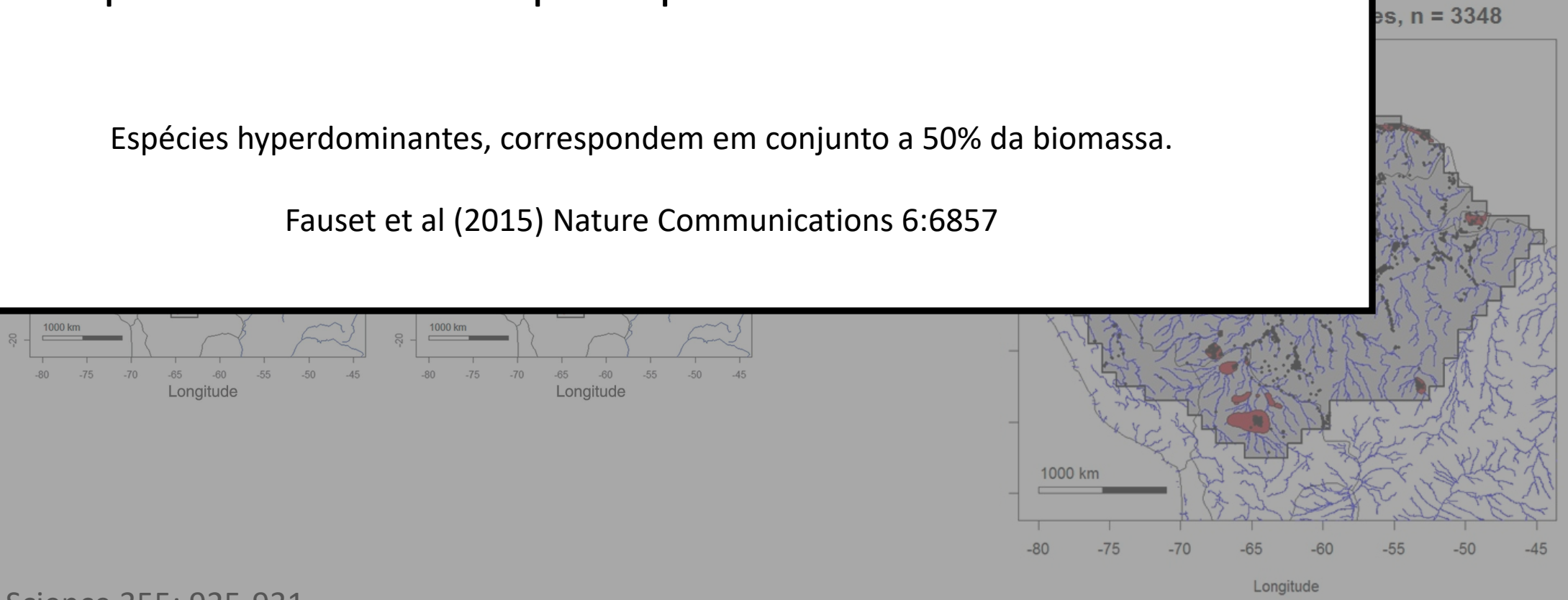
Levis et al 2017 Science 355: 925-931



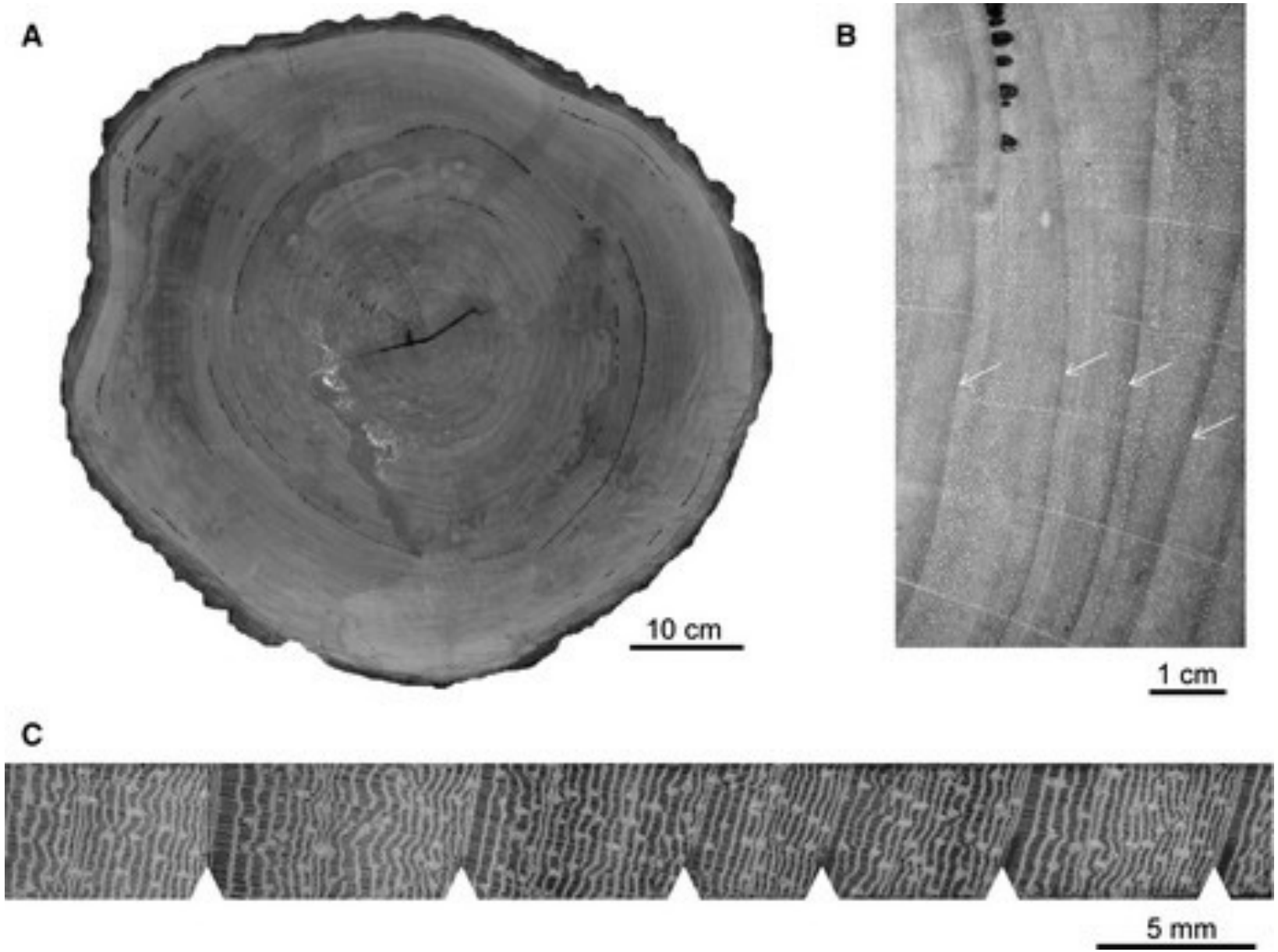
Espécies domesticadas tem 5X maior chance de serem hiperdominantes do que espécies não domesticadas!

Espécies hyperdominantes, correspondem em conjunto a 50% da biomassa.

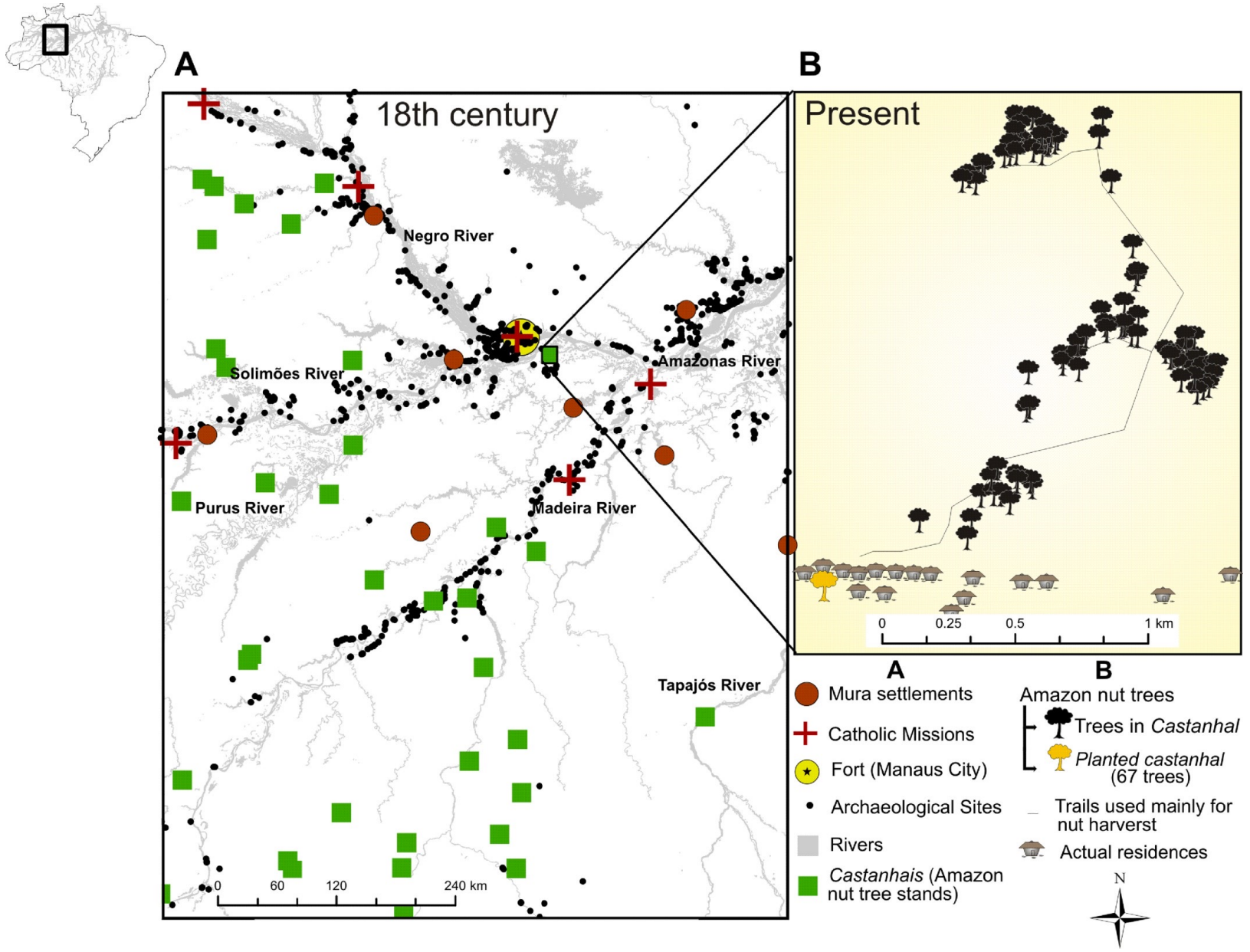
Fauset et al (2015) Nature Communications 6:6857



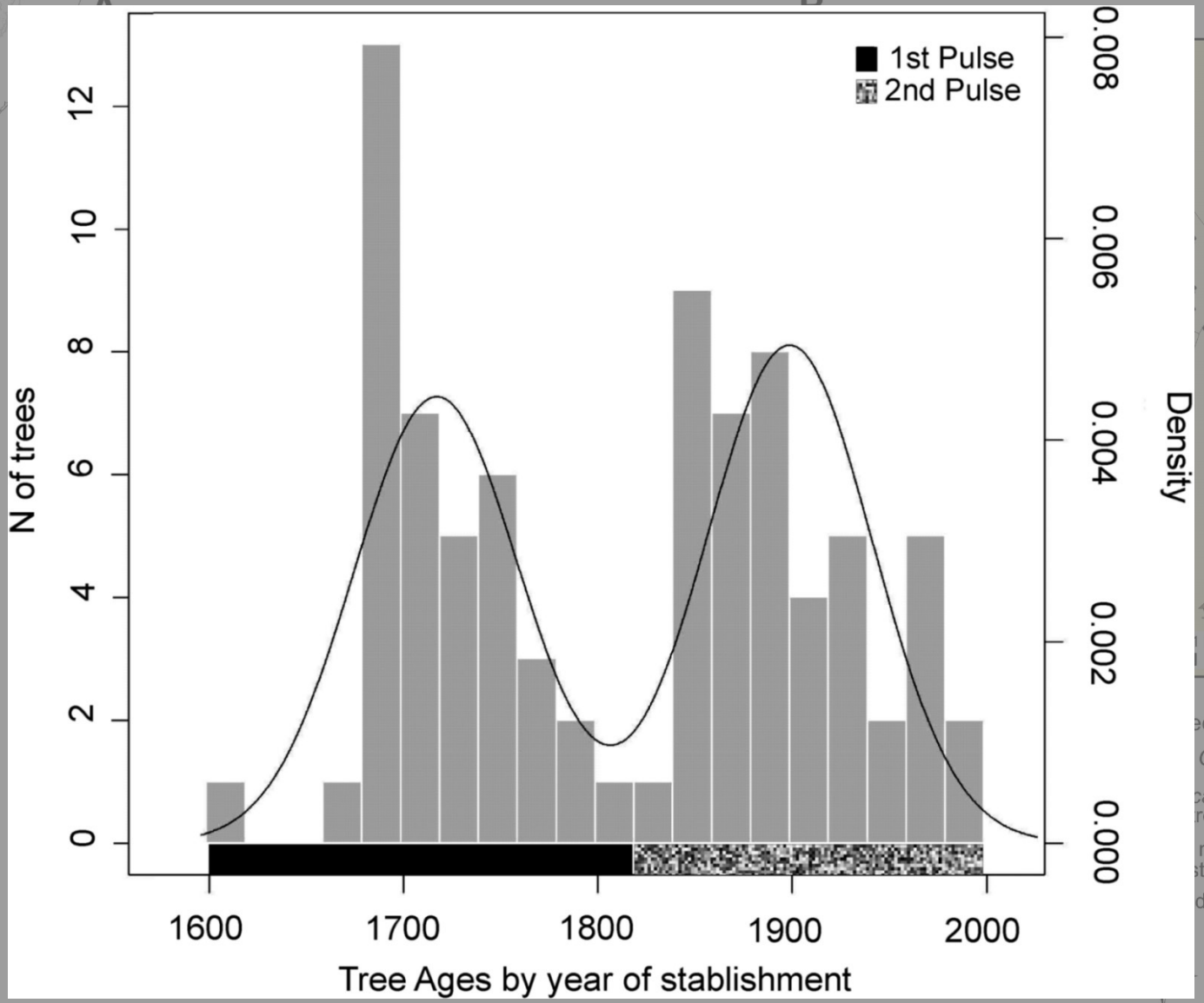
Levis et al 2017 Science 355: 925-931



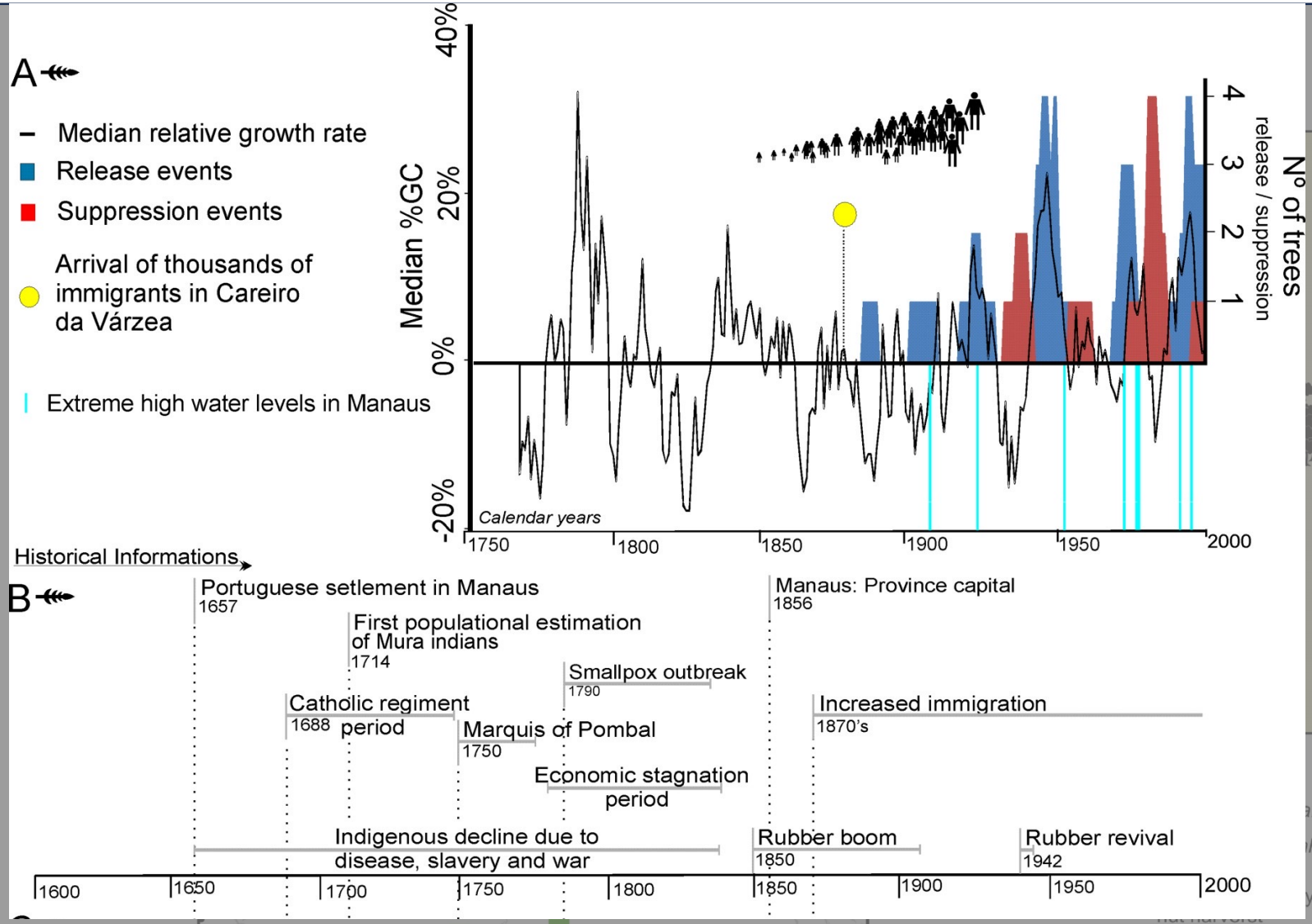
Andrade et al 2019 PloS ONE 14(4): e0214218

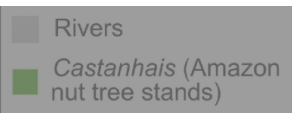


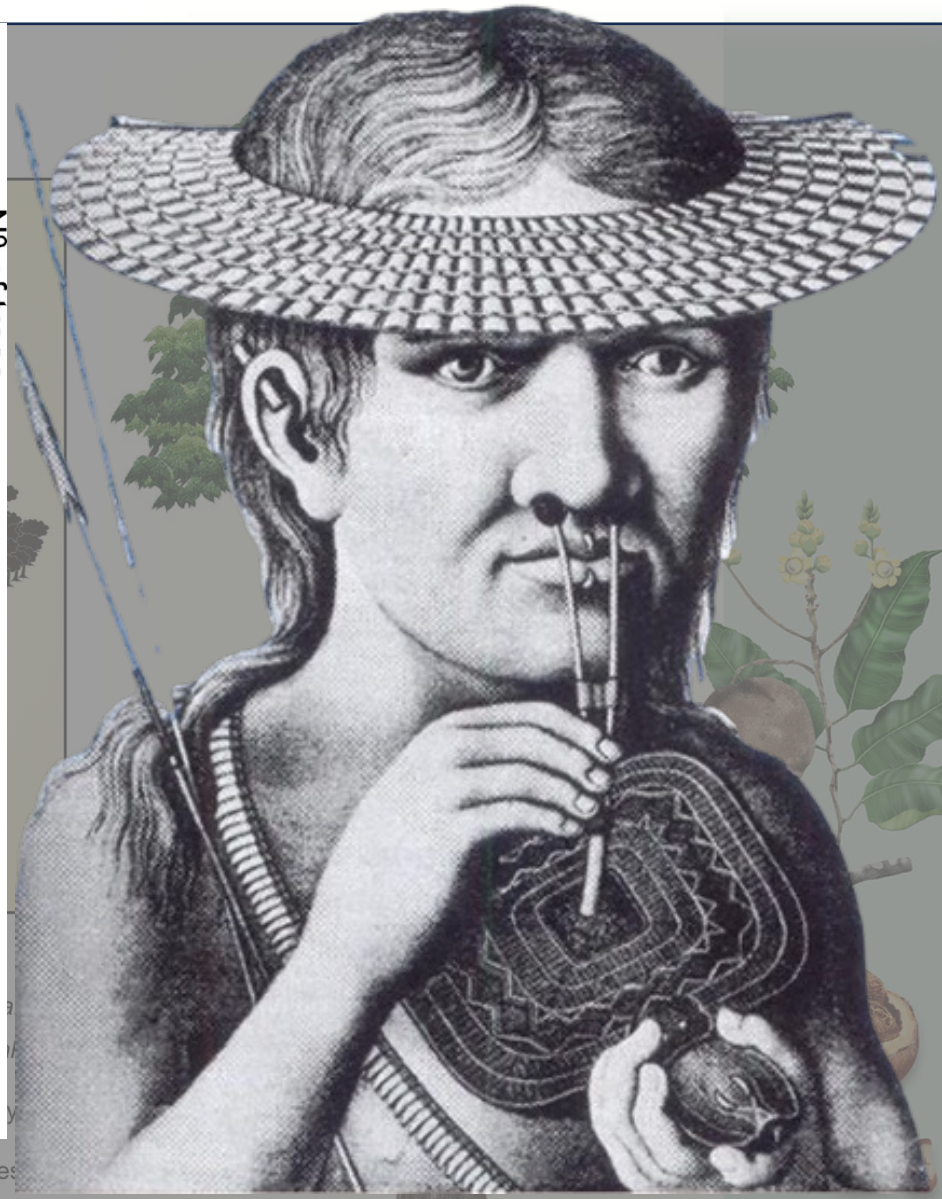
Andrade et al 2019 PloS ONE 14(4): e0214218



Andrade et al 2019 PloS ONE 14(4): e0214218

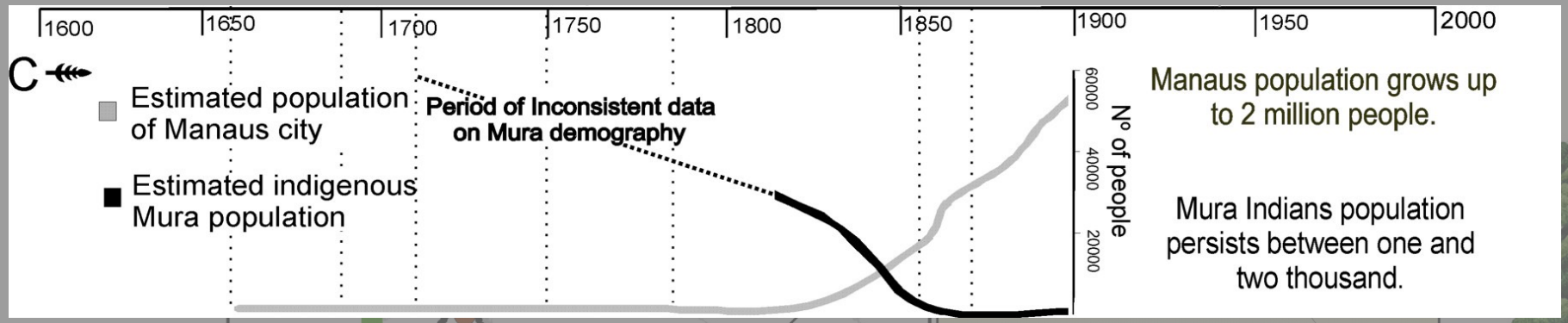


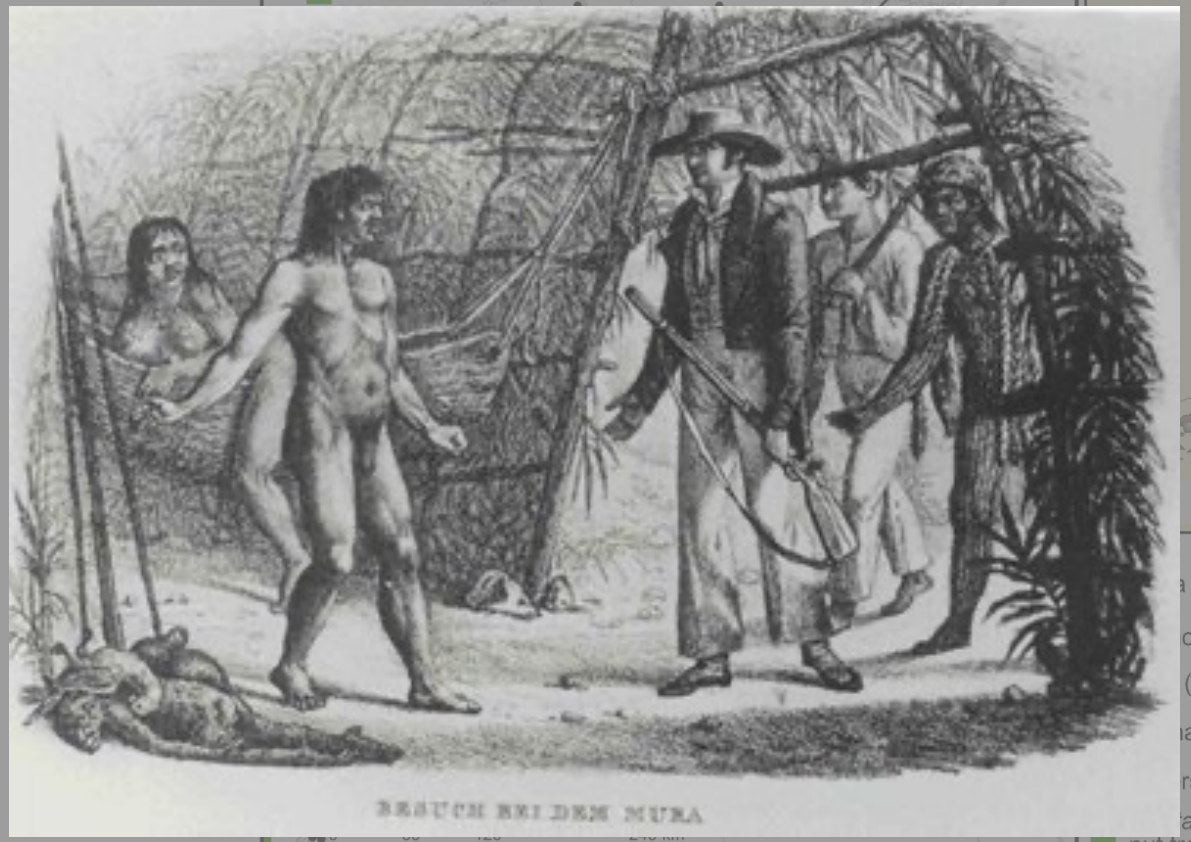




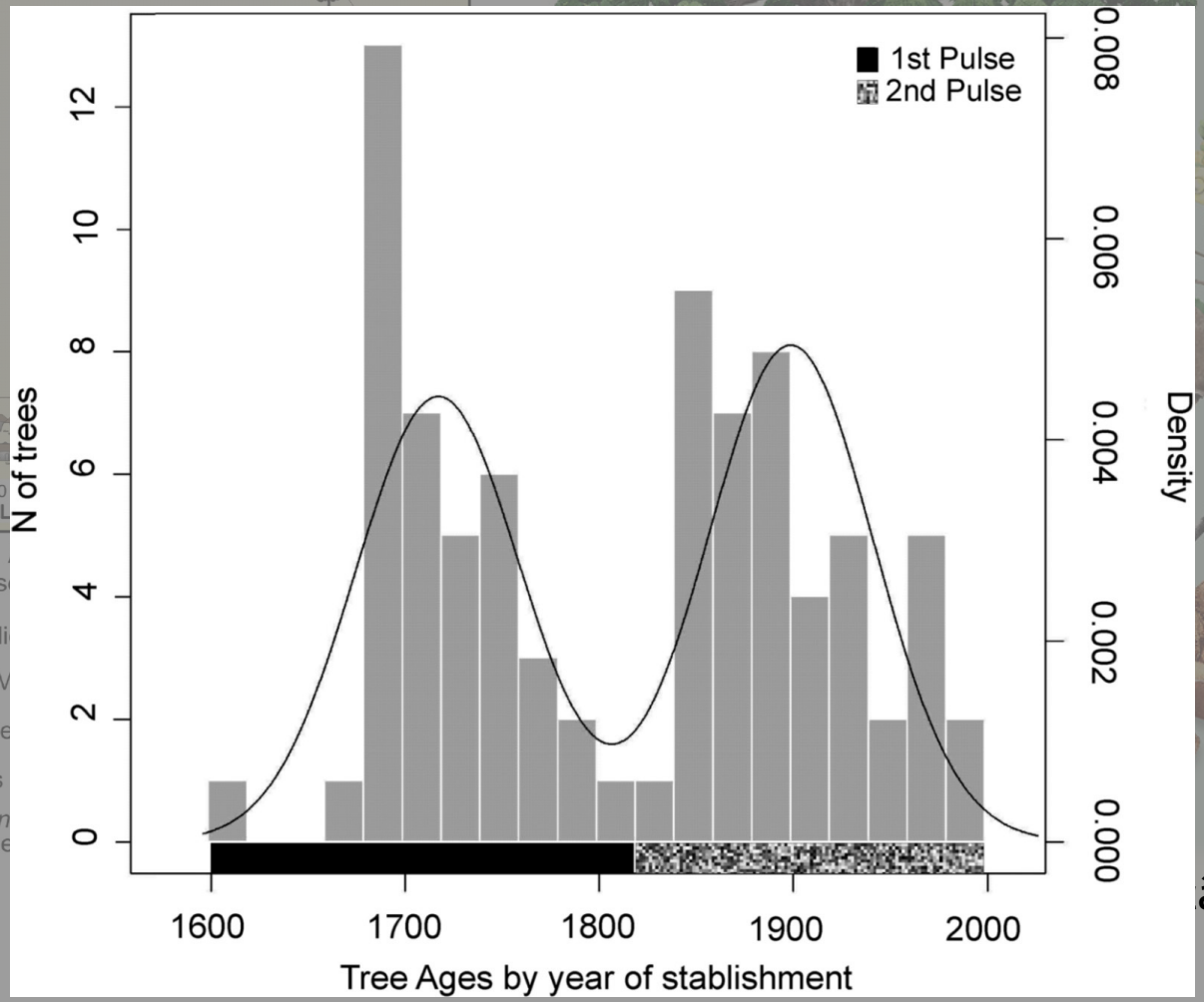
Andrade et al 2019 PloS ONE 14(4): e0214218

Biblioteca Nacional (Brasil), Coleção Alexandre Rodrigues Ferreira





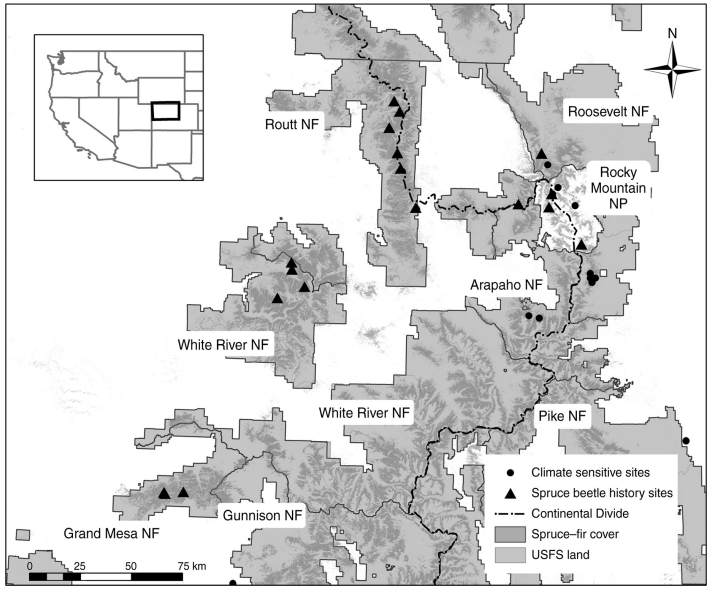
SPIX & MARTIUS. 1981. Viagem pelo Brasil (1817-1820). Belo Horizonte, São Paulo: Itatiaia, EDUSP. (Volume 3)



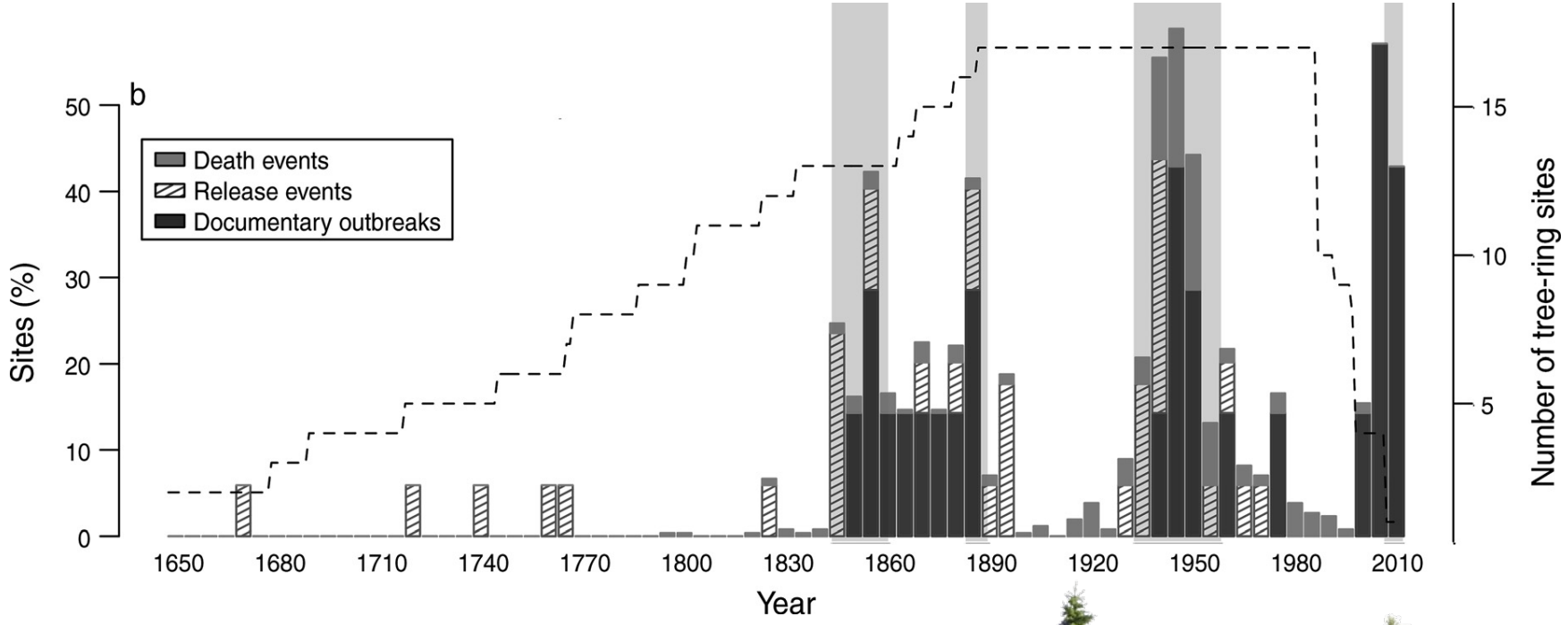
Andrade et al 2019 PloS ONE 14(4): e0214218

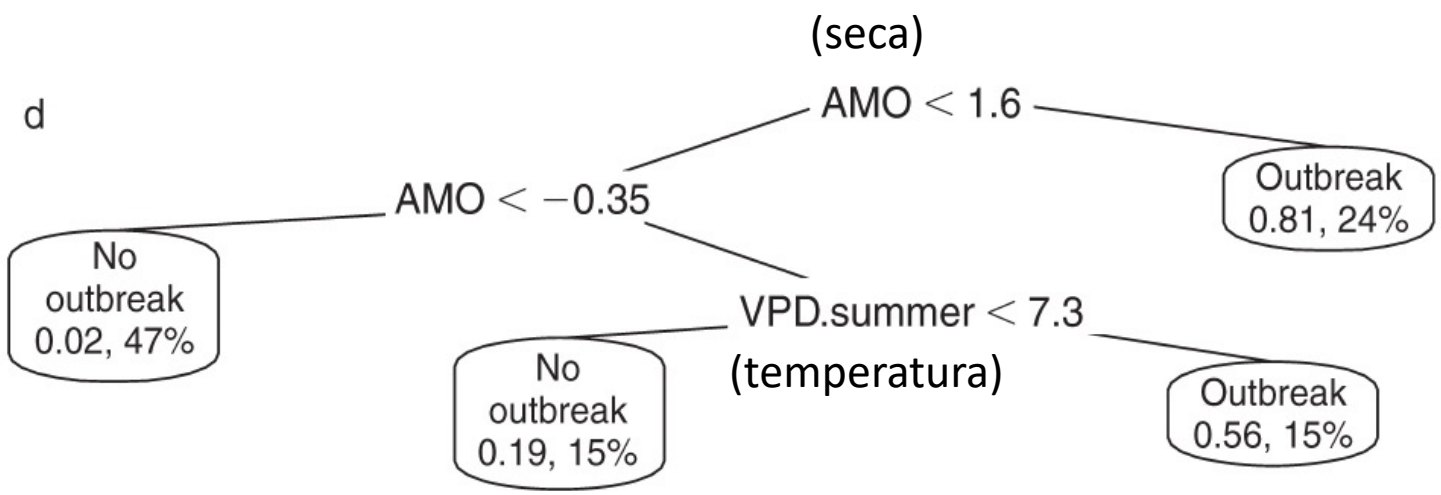
Besouro do spruce (*Dendroctonus rufipennis*), se alimentam dos açucares no floema

nps.gov



Noroeste do colorado

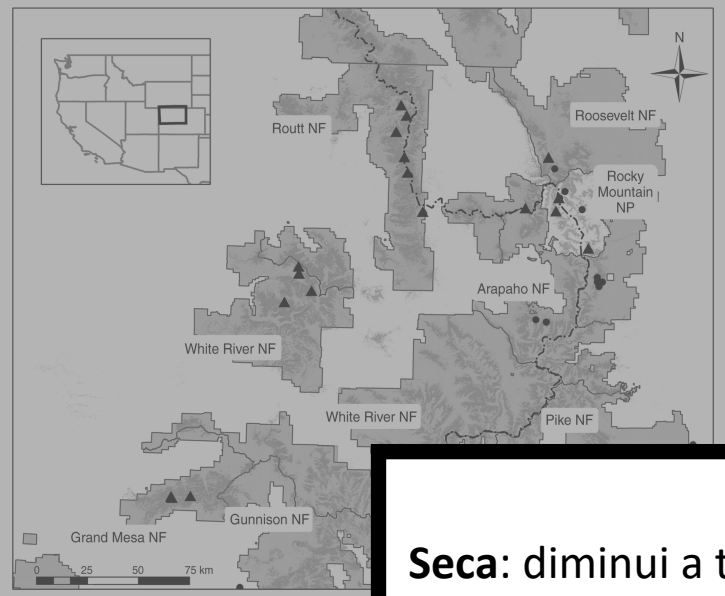




Hart et al (2014) Ecology 95: 930-939

Spruce

Fir



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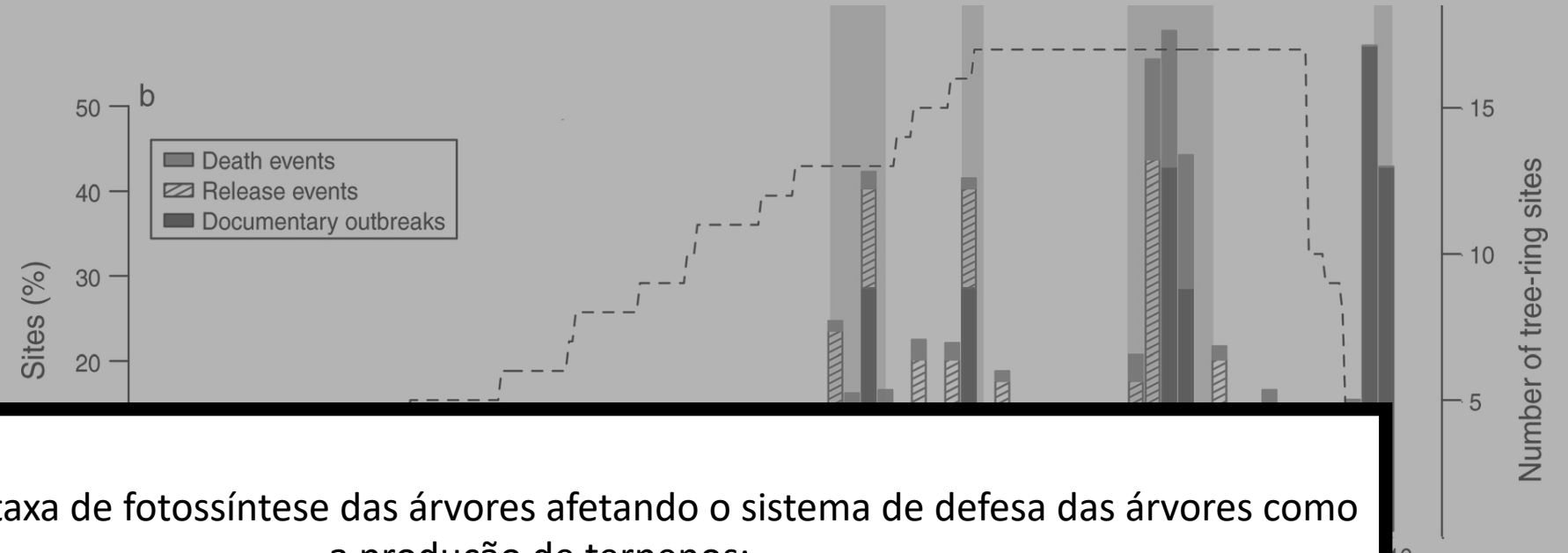
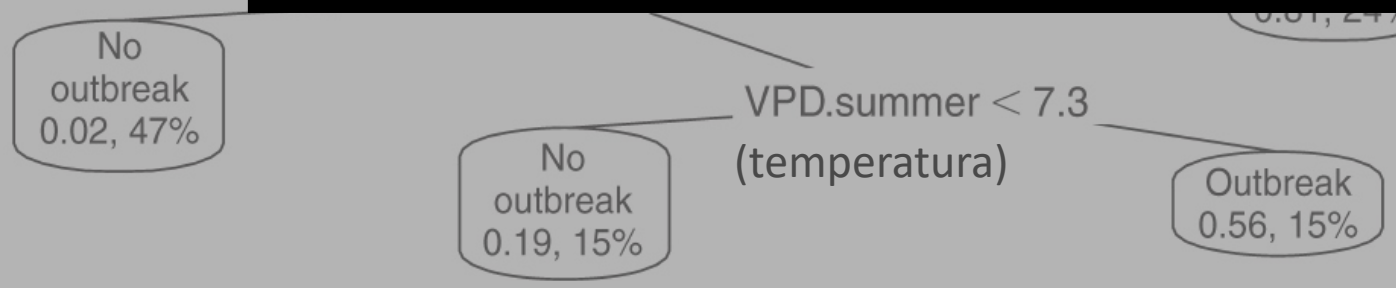
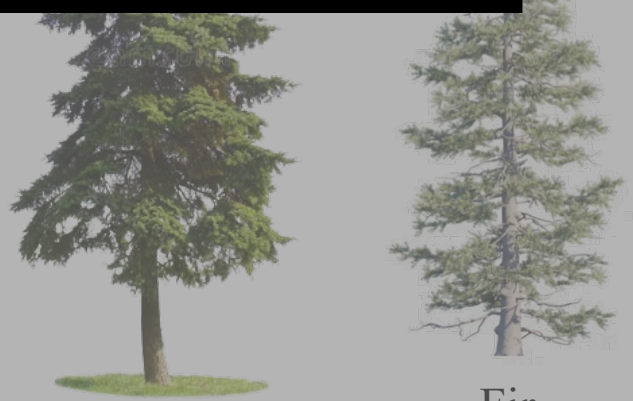


Seca: diminui a taxa de fotossíntese das árvores afetando o sistema de defesa das árvores como a produção de terpenos;

Temperatura mais alta: favorece o desenvolvimento larval e a sobrevivência. No caso da AMO, como é um ciclo multidecadal, favorece o desenvolvimento das populações por anos seguidos levando à explosão populacional.





Spruce

Fir

Hart et al (2014) Ecology 95: 930-939

Vale de Engadine

Vale de Goms

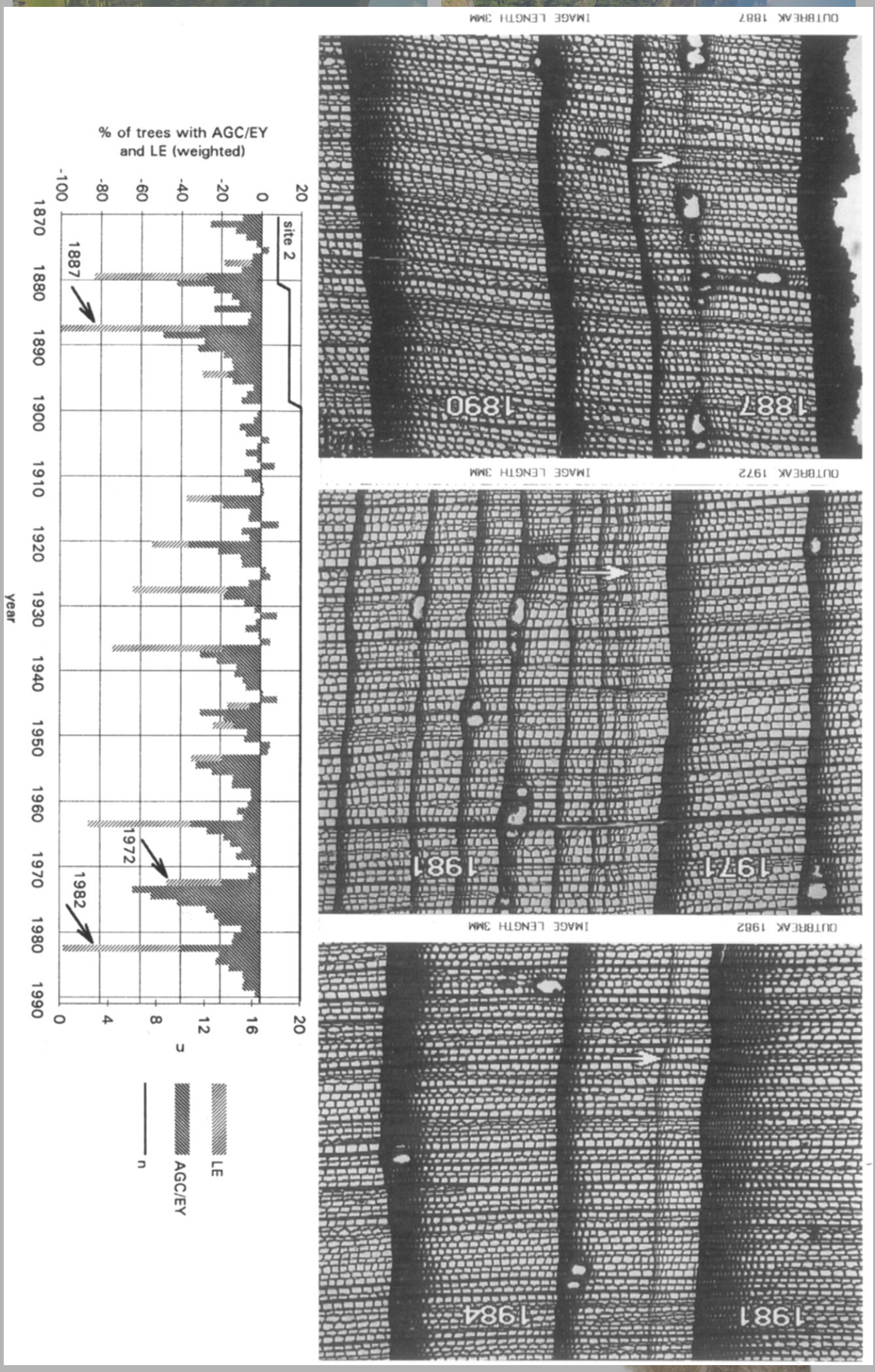
Zeiraphera diniana

Larix decidua

Weber 1997 Trees, Structure and Function 11: 277-290

Vale de Goms

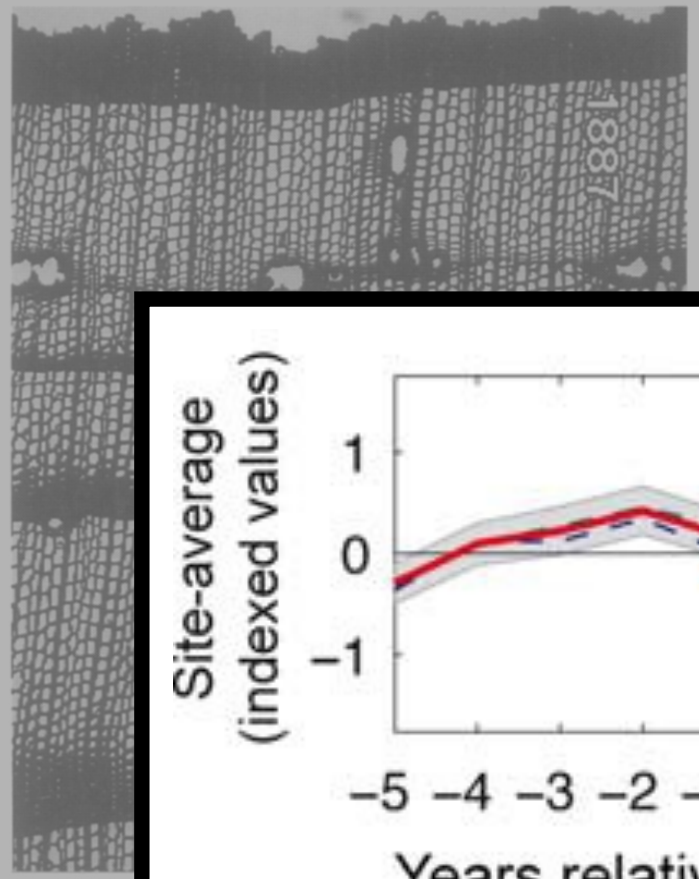
Vale de Engadine

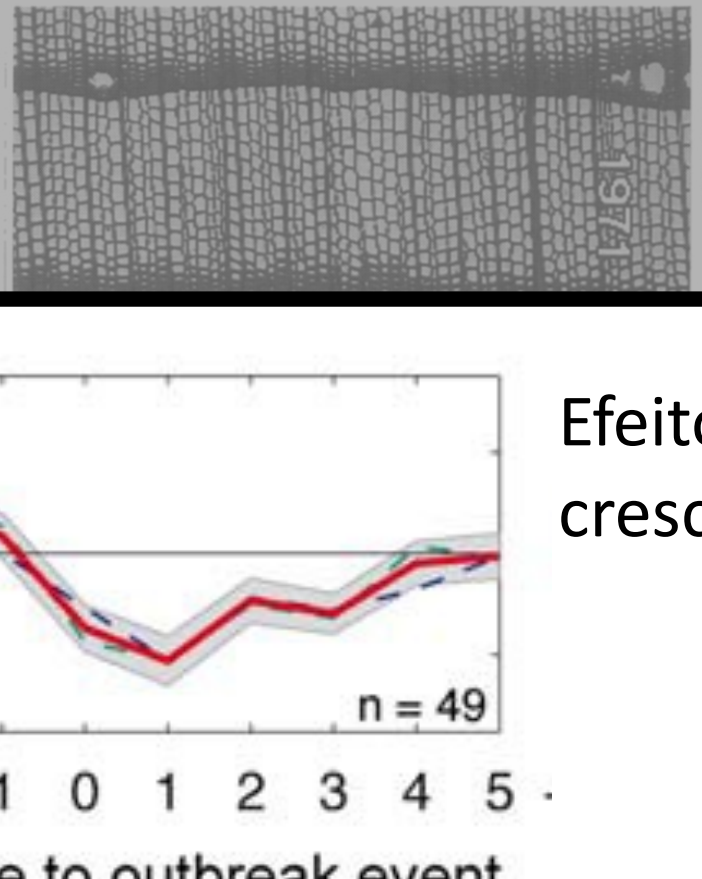


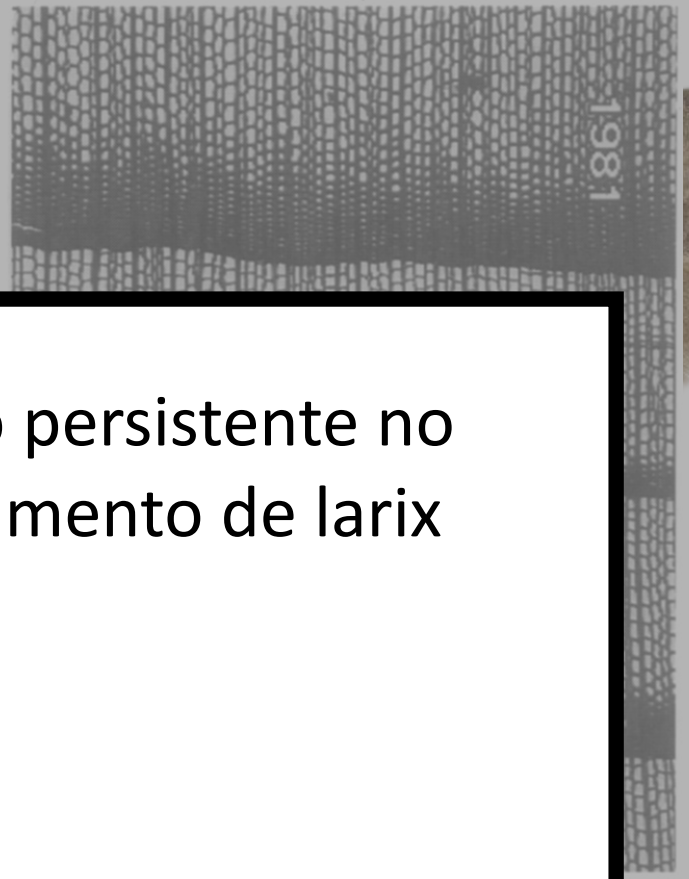
Weber 1997 Trees, Structure and Function 11: 277-290

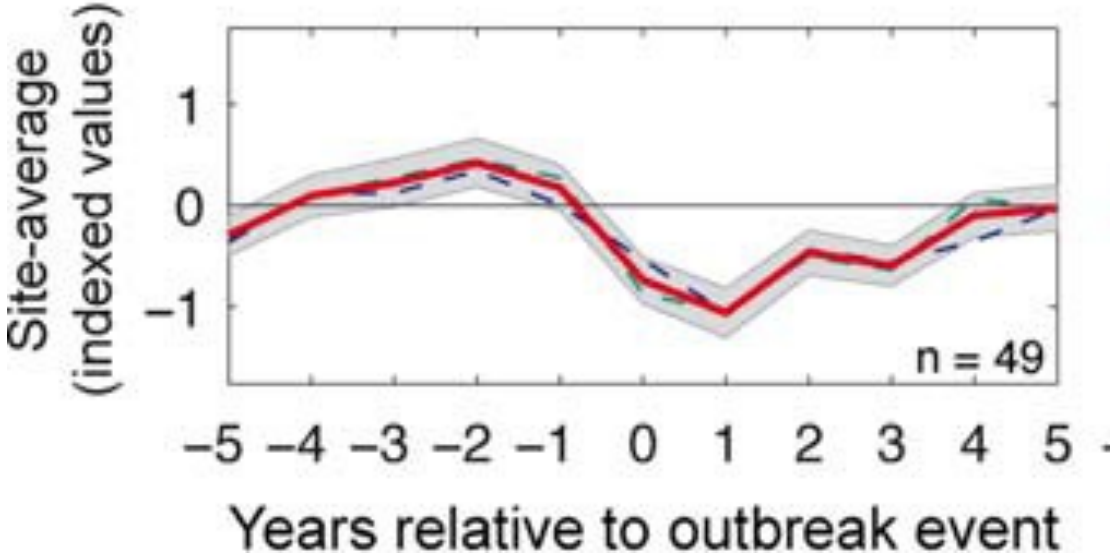
Vale de Engadine

Vale de Goms



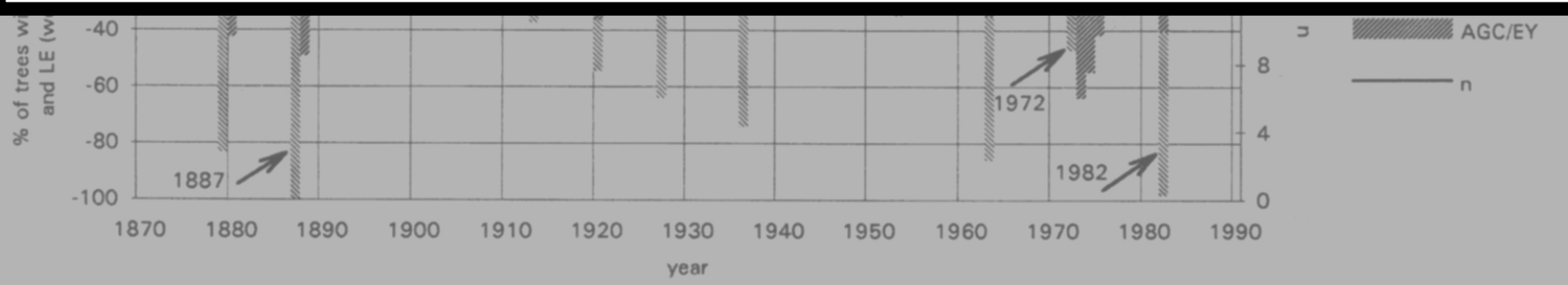






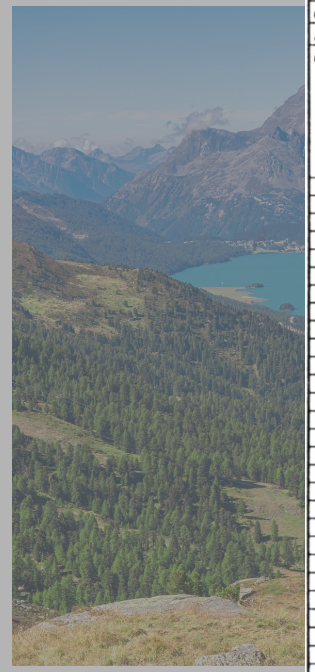
Efeito persistente no crescimento de larix

Kress et al 2009 Oecologia160: 353-365



Weber 1997 Trees, Structure and Function 11: 277-290

Vale de Engadine



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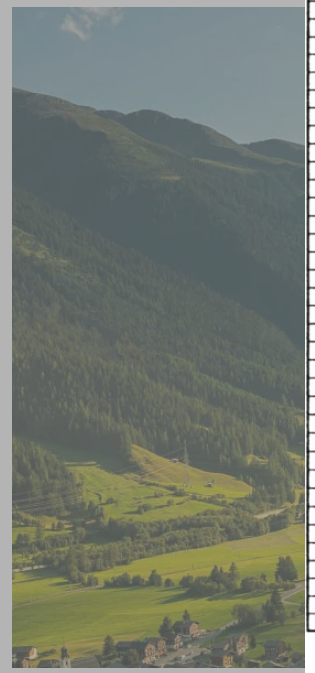

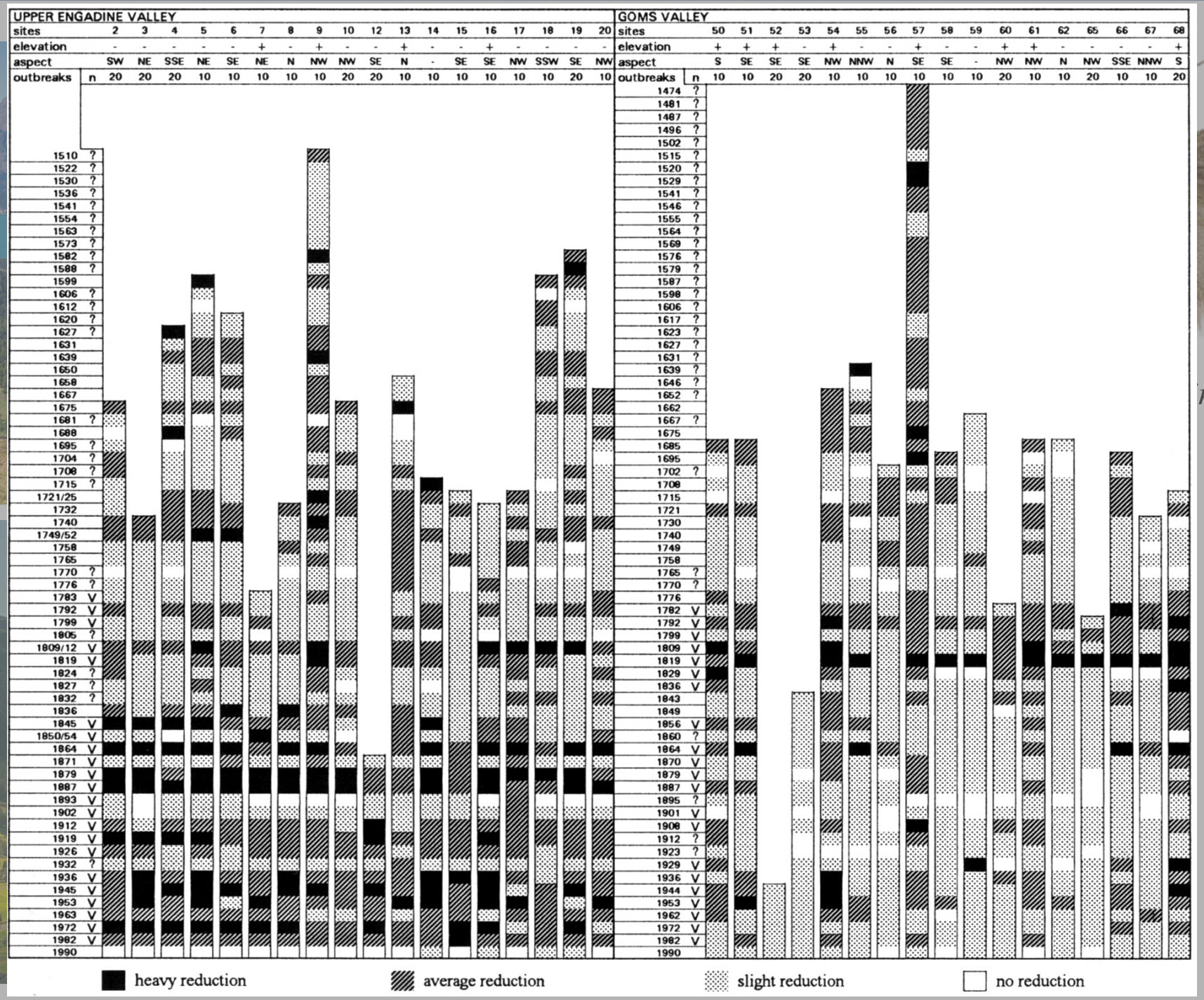

niana

Weber 1997 Trees, Structure and Function 11: 277-290