

# The effects of forest disturbances on spatial genetic structure in *Jacaranda copaia*.

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## > context:

An experiment of **controlled logging** (1983), with four levels of disturbance, on a total area of 30 ha in French Guiana (Paracou site)

A single event of **regeneration** in the artificial canopy gaps, plus the background regeneration in undisturbed areas, for

*Jacaranda copaia*

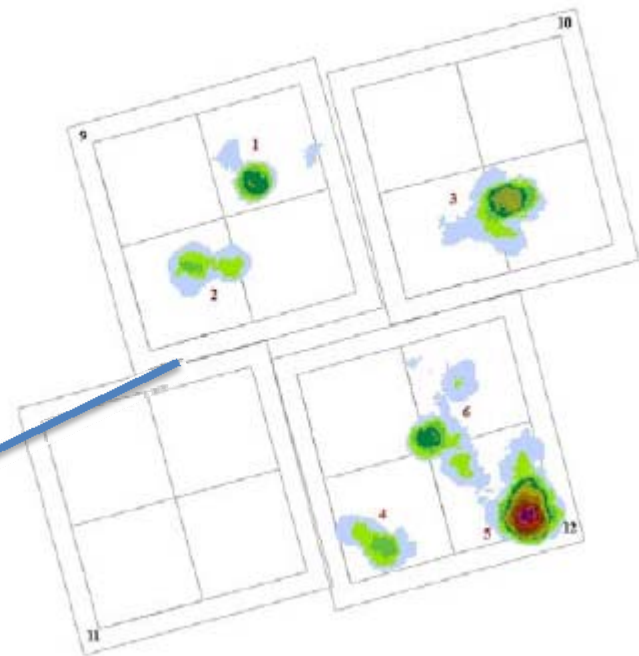
A permanent **demographic survey** since the logging

A **genetic survey** on all mature trees and saplings (height > 130 cm) (> 600 samples) with four SSR markers



Increasing treatment strength

Stem density-based  
definition of gaps



## > results:

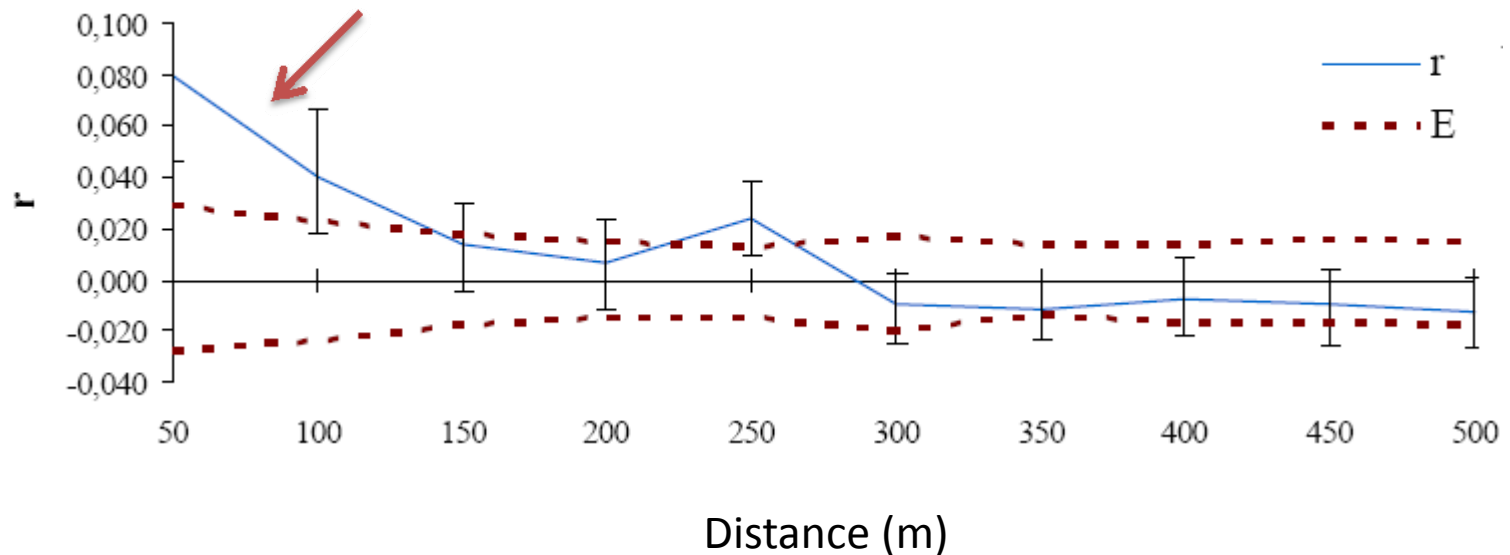
Analysis of spatial autocorrelation of  
genotypes

Analysis of gametic disequilibrium

Data partitioned by:

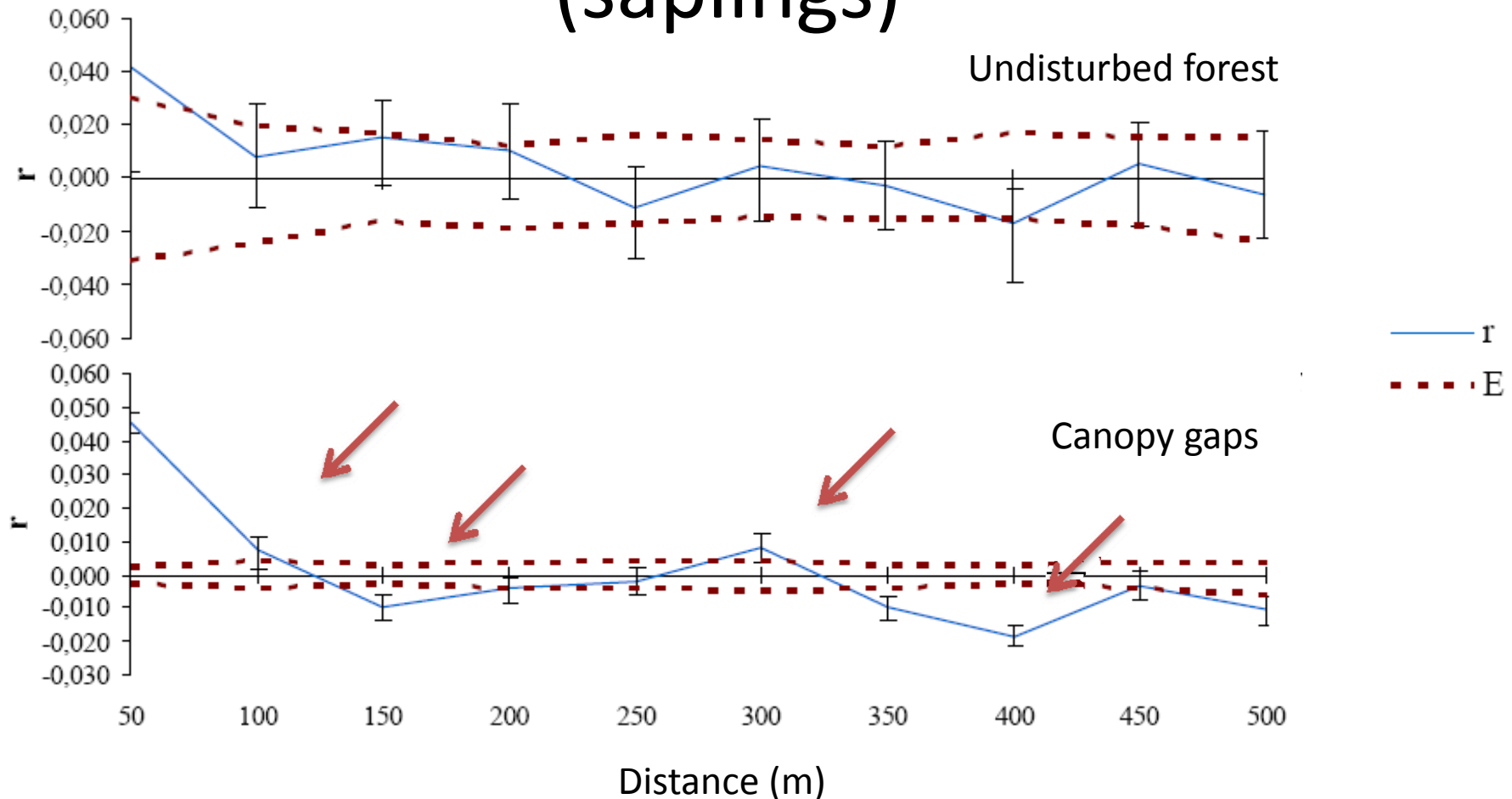
*strength of treatment* (levels 0 through 3),  
*ecological condition* (undisturbed/canopy gap),  
*cohort* (mature/sapling)

# Spatial autocorrelation of genotypes (mature trees)



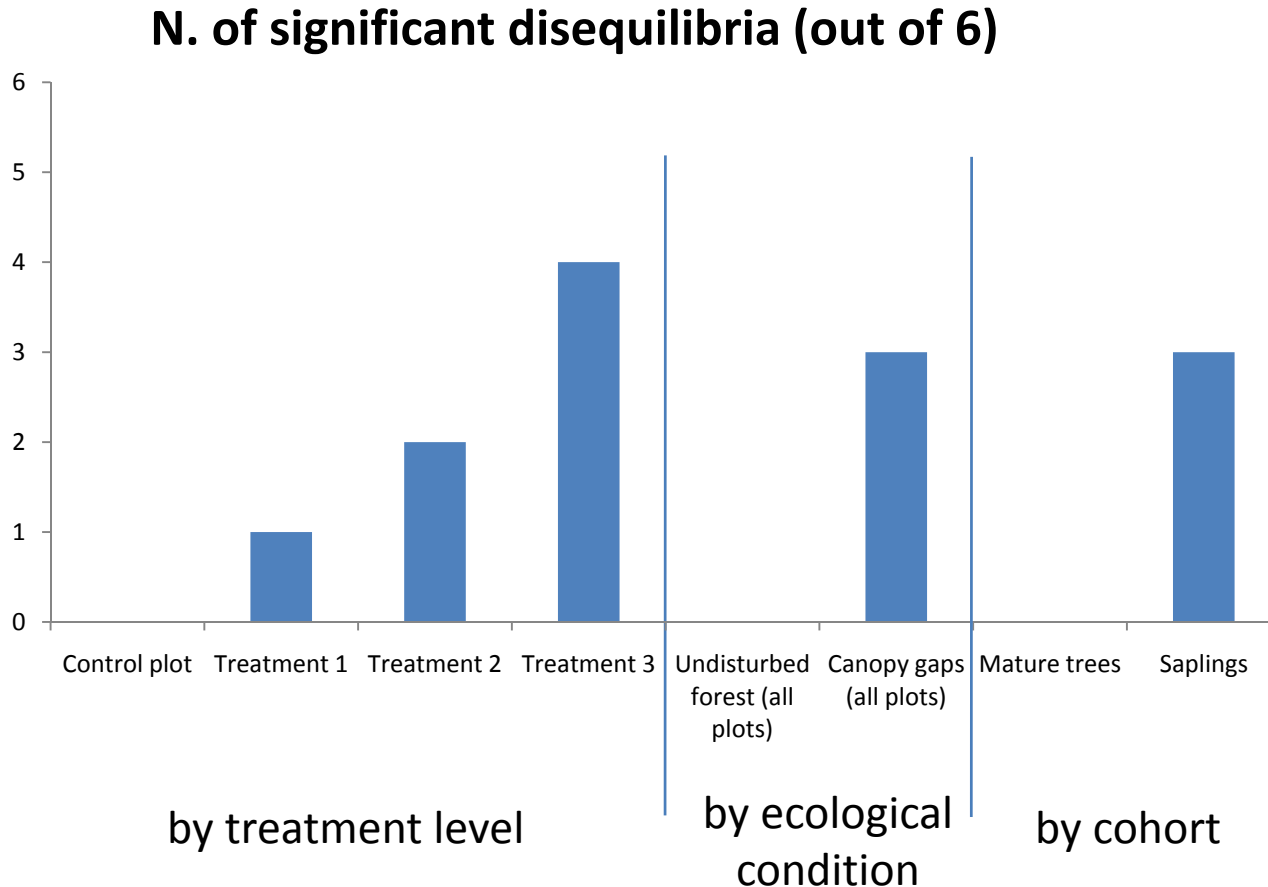
The mature tree stand displays a typically clustered structure

# Spatial autocorrelation of genotypes (saplings)



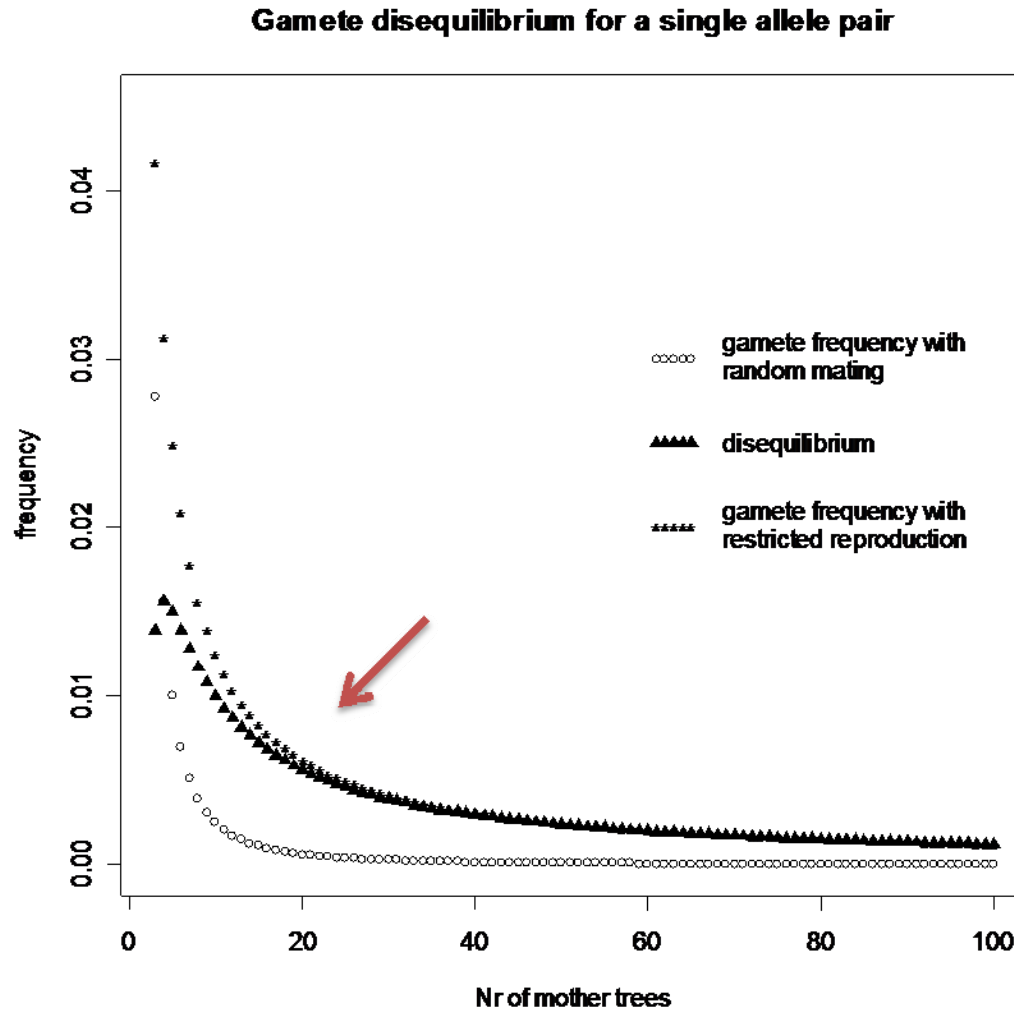
Canopy gap saplings display the strongest structure – stronger than mature trees; the sign of limited dispersal?

# Gametic disequilibrium



Is sapling genetic diversity family-structured in canopy gaps?  
Or is it “just” a demographic effect?

Expectation based on a finite number of equally fertile mother trees and open pollination from an infinite, homogeneous pollen cloud, compared with random mating:



observed values not incompatible with a limited number of mother trees



# Artificial disturbance: does it matter (genetically)?

- Patterns of **spatial distribution** of genetic diversity are **affected**, but we cannot tell how these patterns will evolve with sapling cohort's demographic transitions
- Patterns of **within-individual distribution** of multi-locus genetic variation are **affected** – this may change the genetic control of ecologically important traits, *if epistatic interactions among loci are significant*

Disturbance may have long-term consequences, the size of which seems to depend upon the intensity of the disturbance

> next:

Analyse parentage

Analyse the impact of disturbance on genetic diversity

Model the evolution of genetic structures on the long term

Compare with other species