# Efeito do distúrbio nas estratégias de vida

## Dinâmicas ecológicas e evolutivas

Luísa Novara Monclar Gonçalves

Orientador: Prof. Dr. Alexandre Adalardo de Oliveira

Coorientador: Prof. Dr. Paulo Inácio Prado

# atributo

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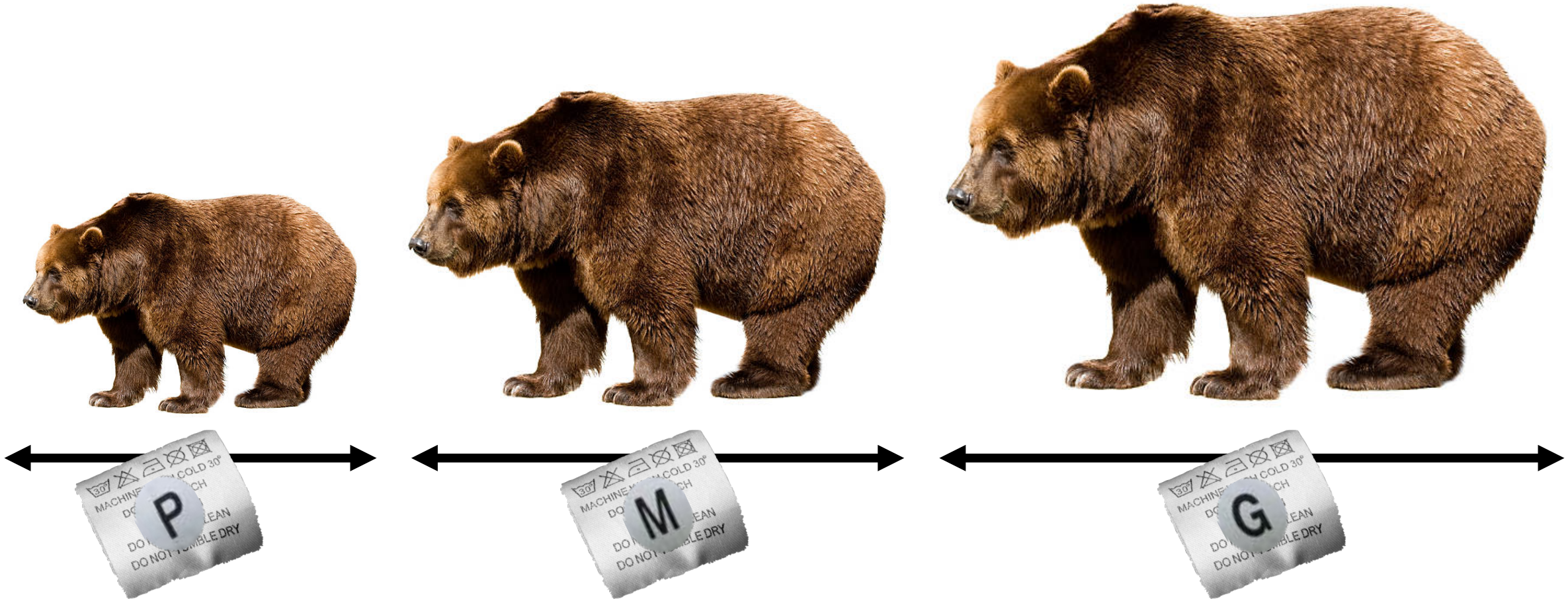

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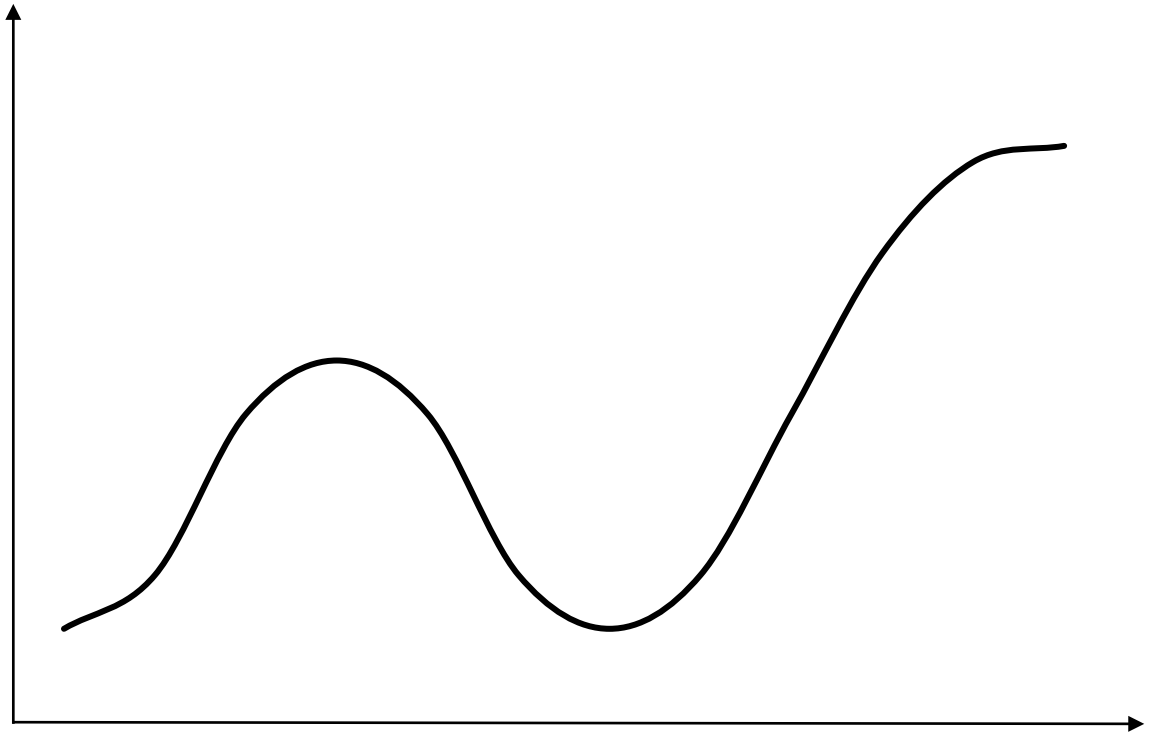

**atributo**

Biologia Evolutiva

Ecologia de Comunidades

**atributo**

dinâmica evolutiva

dinâmica ecológica

# atributo

dinâmica evolutiva

dinâmica ecológica

mudanças na frequência de um **atributo** na **população** a partir de alterações na **frequência relativa dos alelos**

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## dinâmica evolutiva

mudanças na frequência de um **atributo** na **população** a partir de alterações na **frequência relativa dos alelos**

## dinâmica ecológica

mudanças na frequência de um **atributo** na **comunidade** a partir de alterações na **frequência relativa das espécies**

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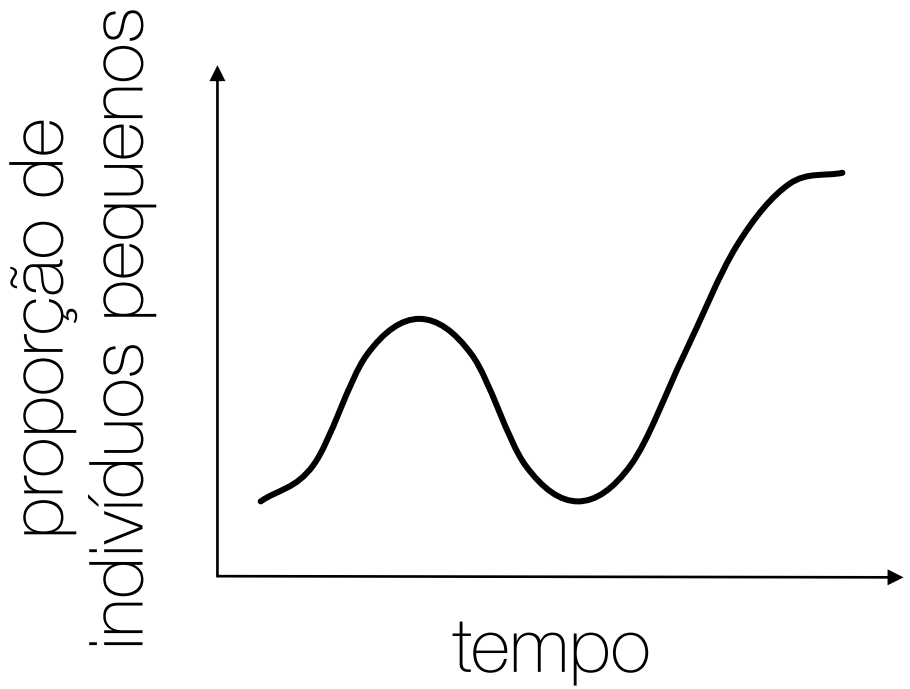
dinâmica evolutiva

dinâmica ecológica



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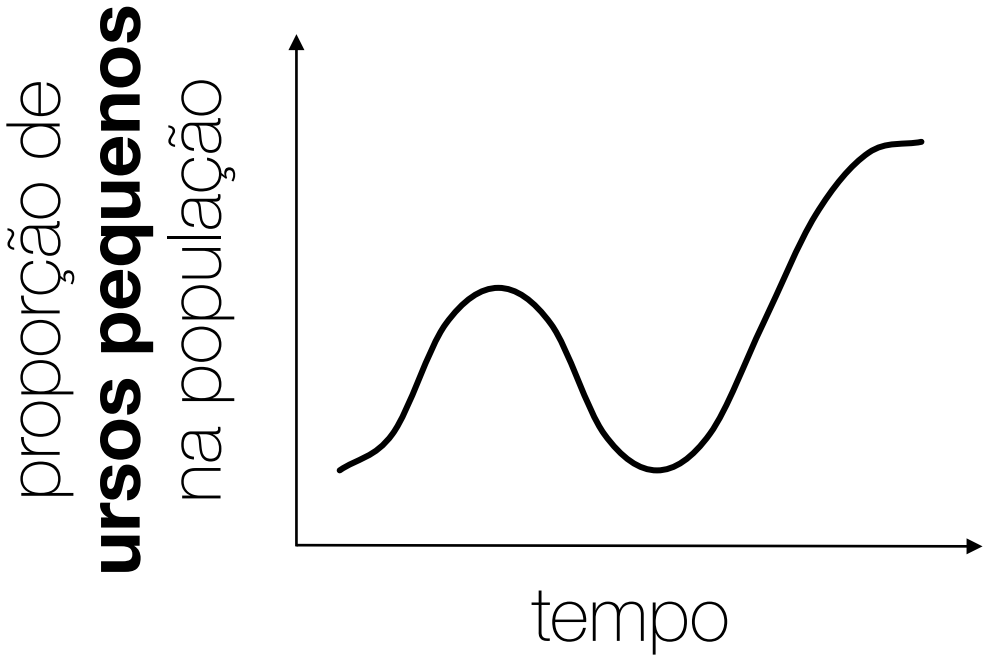

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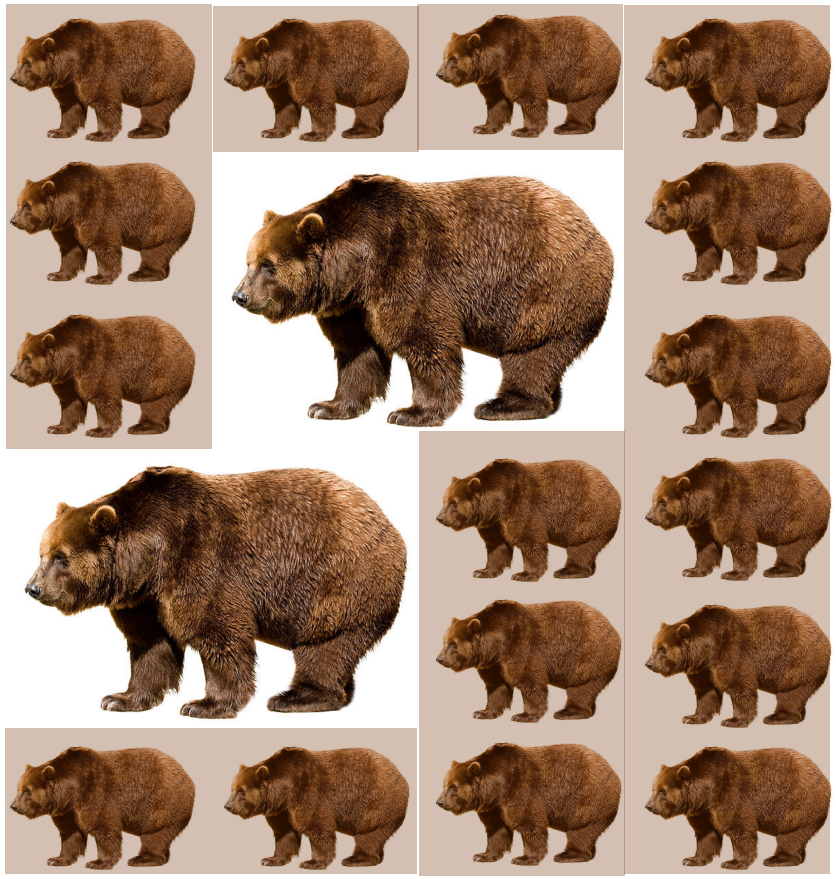

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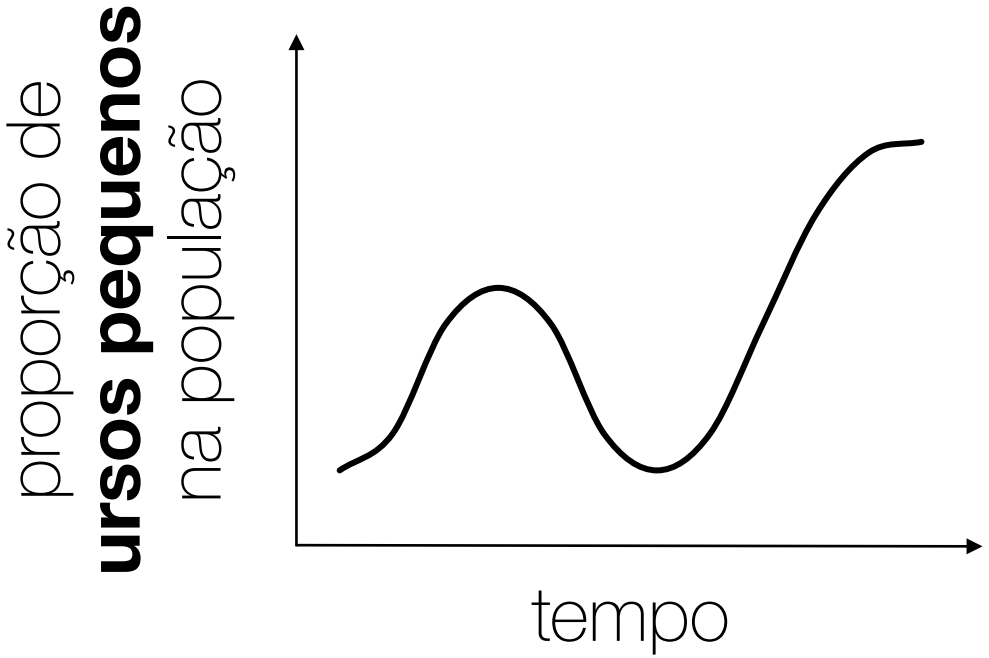


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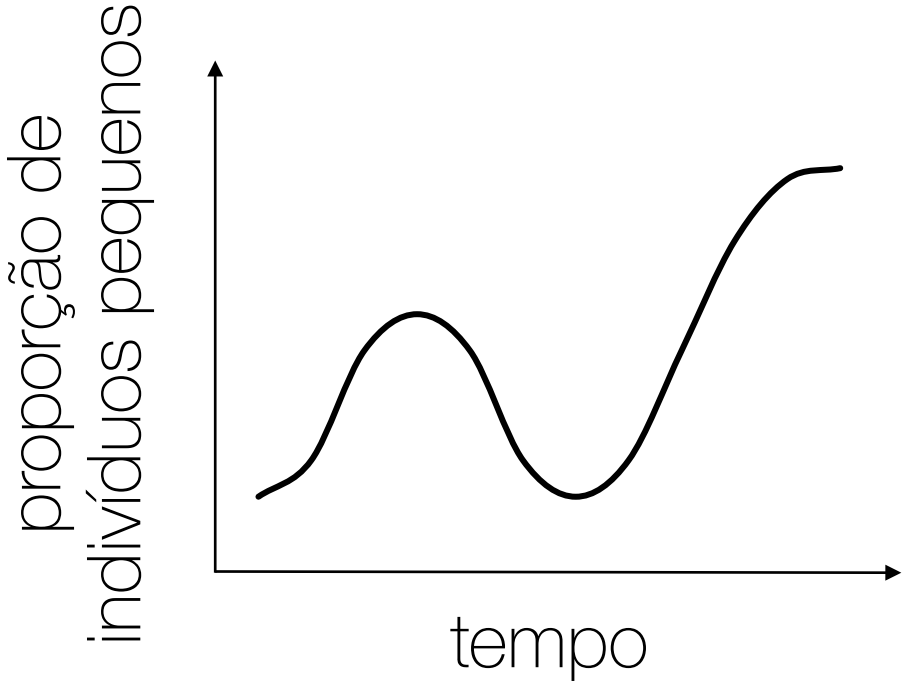

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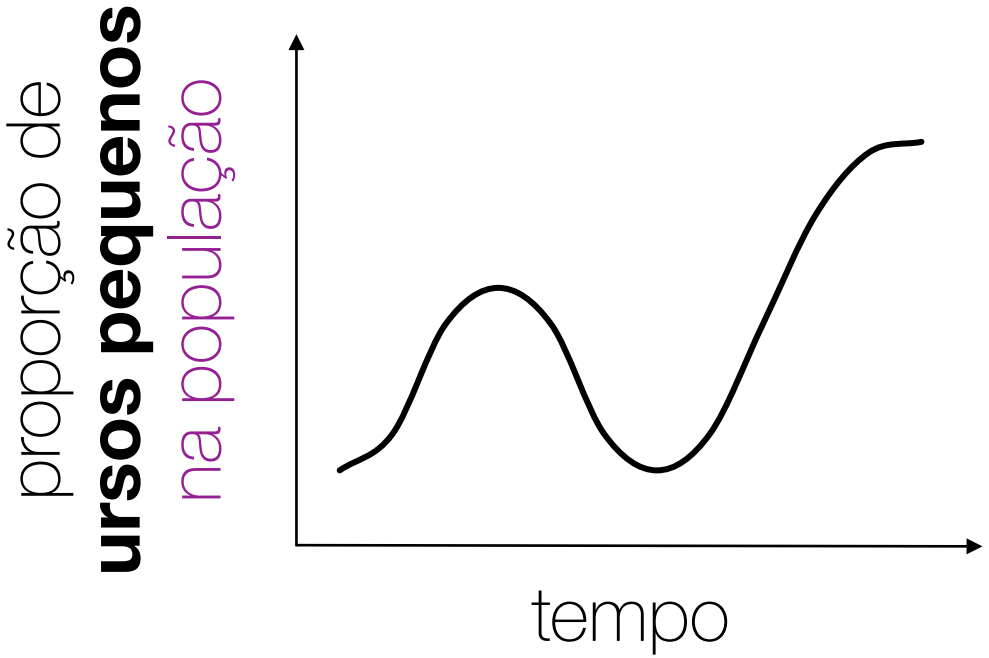


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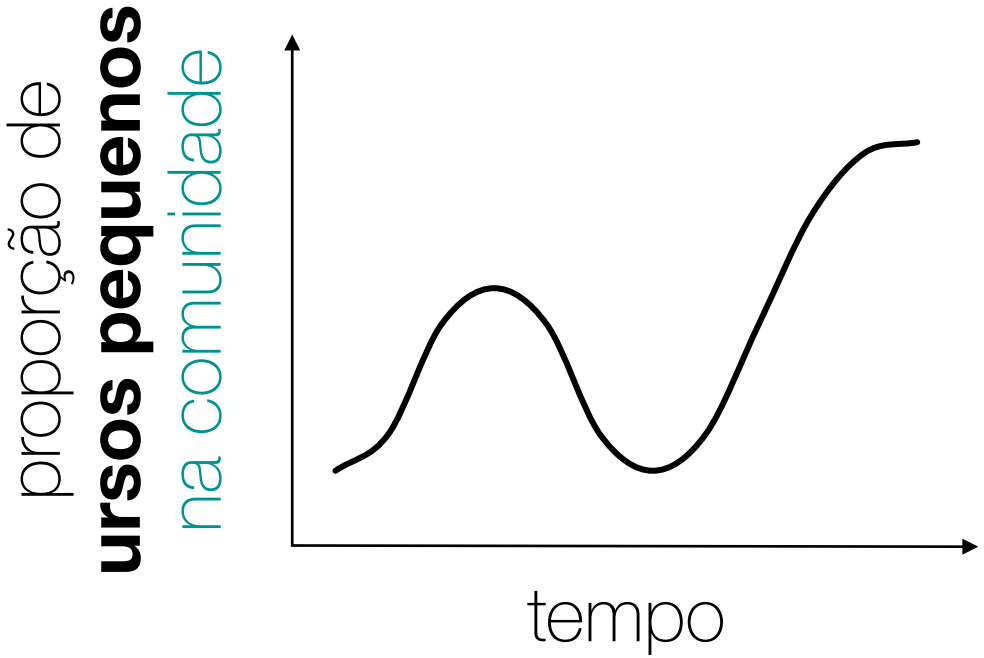

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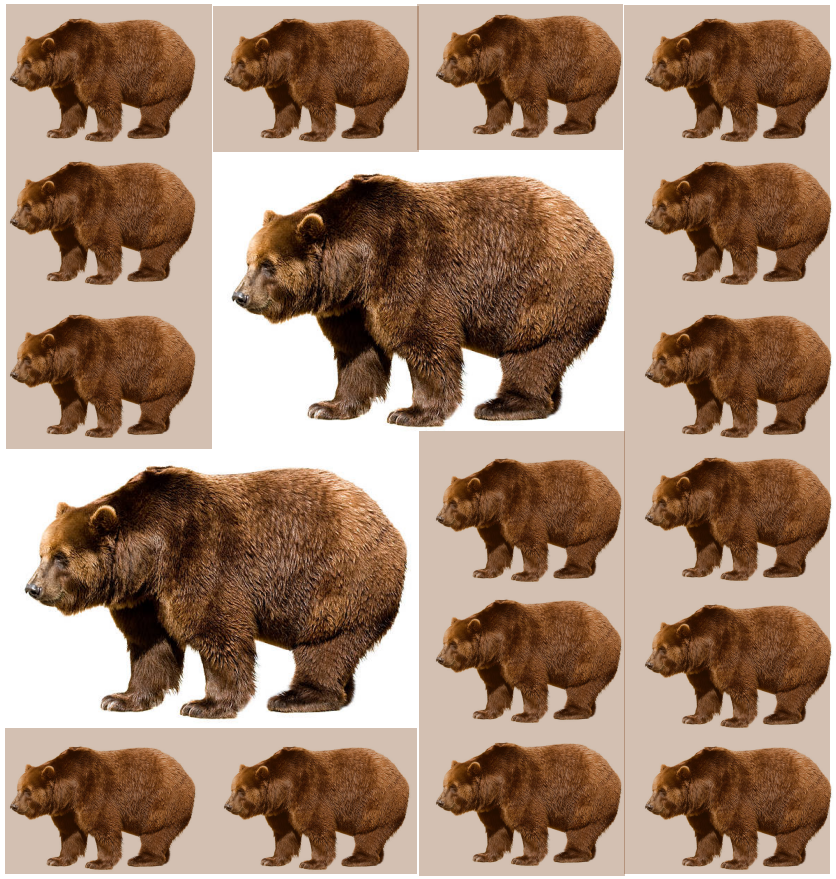

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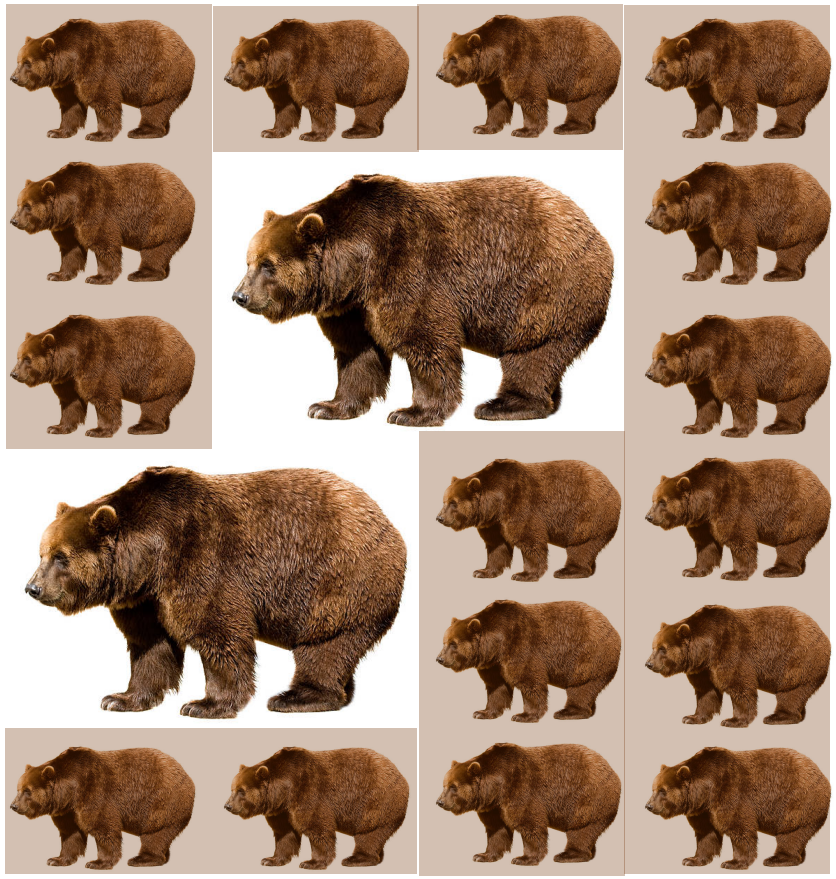

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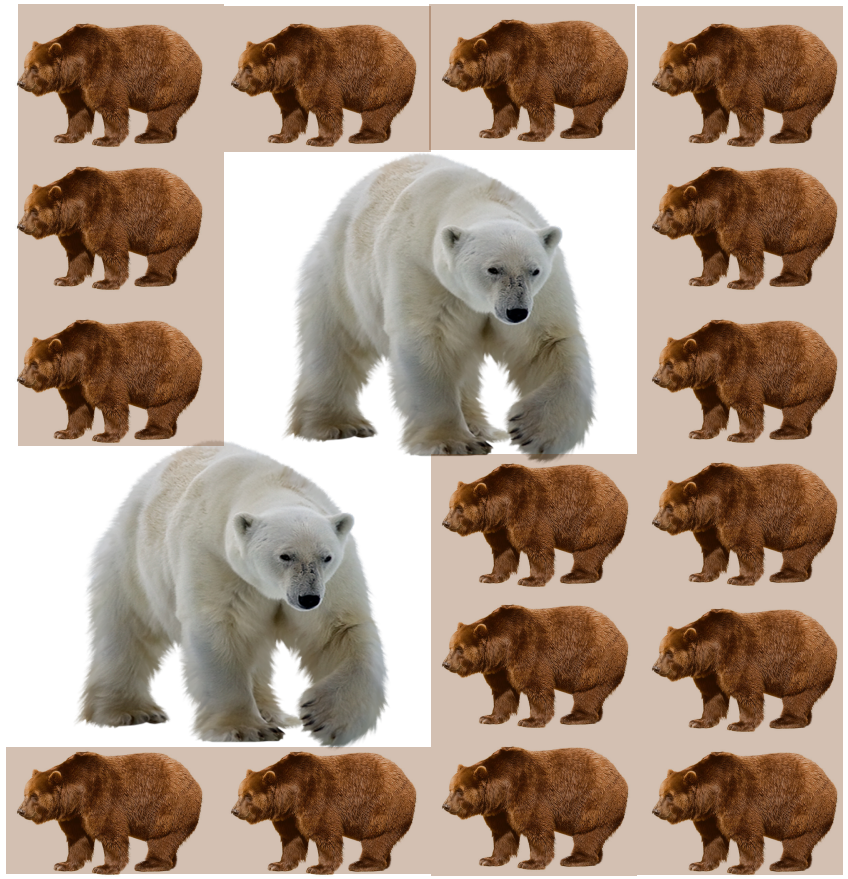

dinâmica evolutiva

- seleção
- deriva genética
- fluxo gênico
- mutação

dinâmica ecológica

## dinâmica evolutiva

- seleção
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## dinâmica ecológica

- filtragem ecológica
- deriva ecológica
- migração
- especiação

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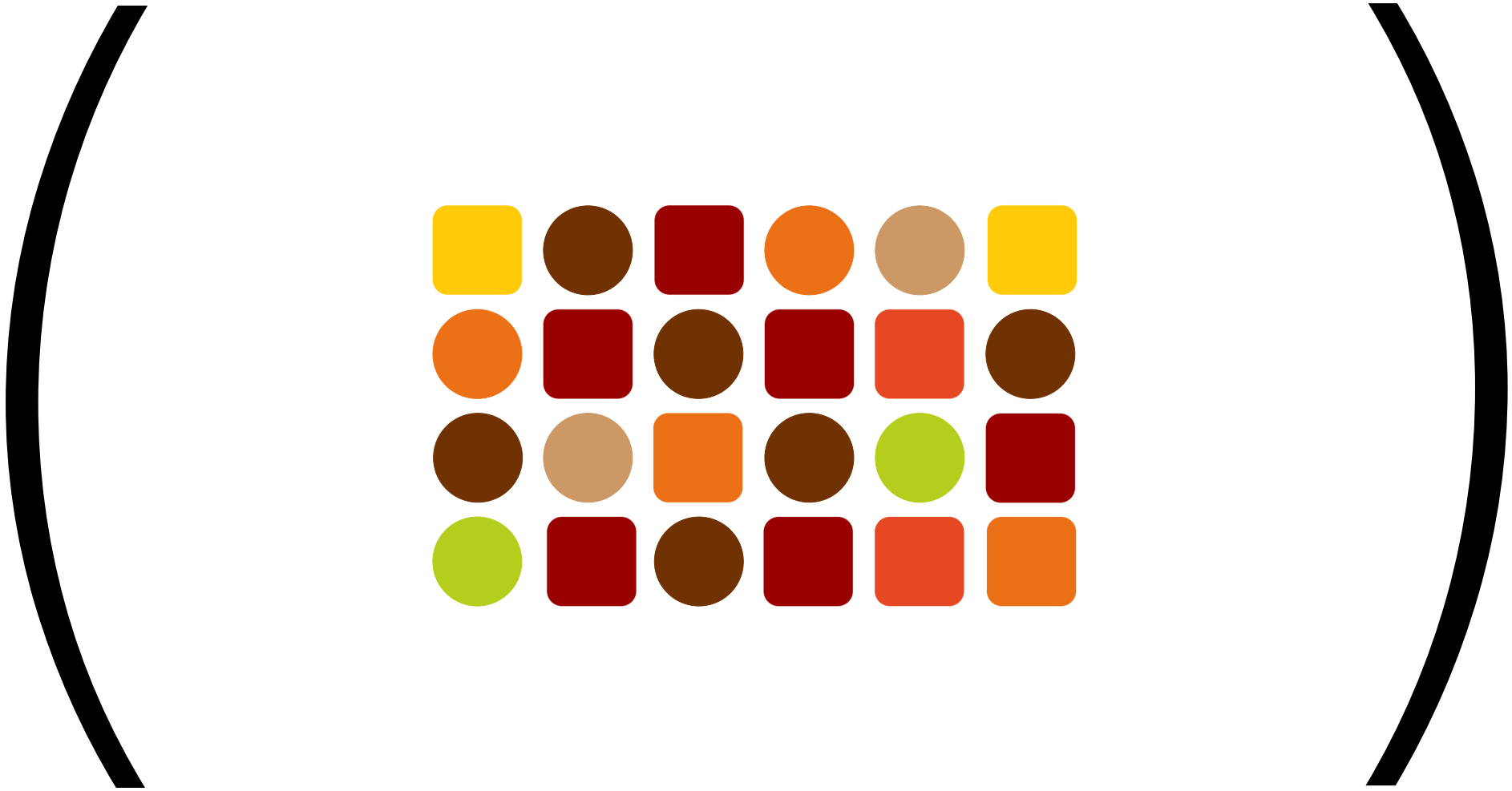

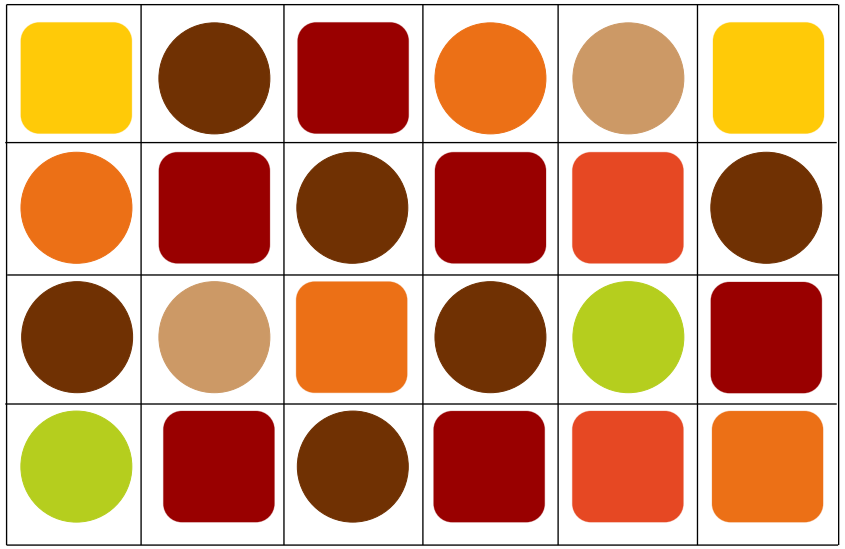

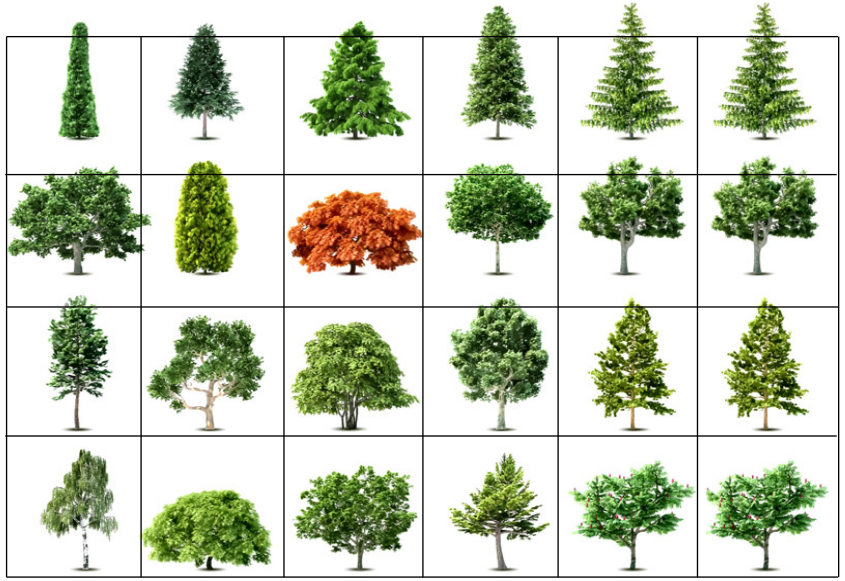

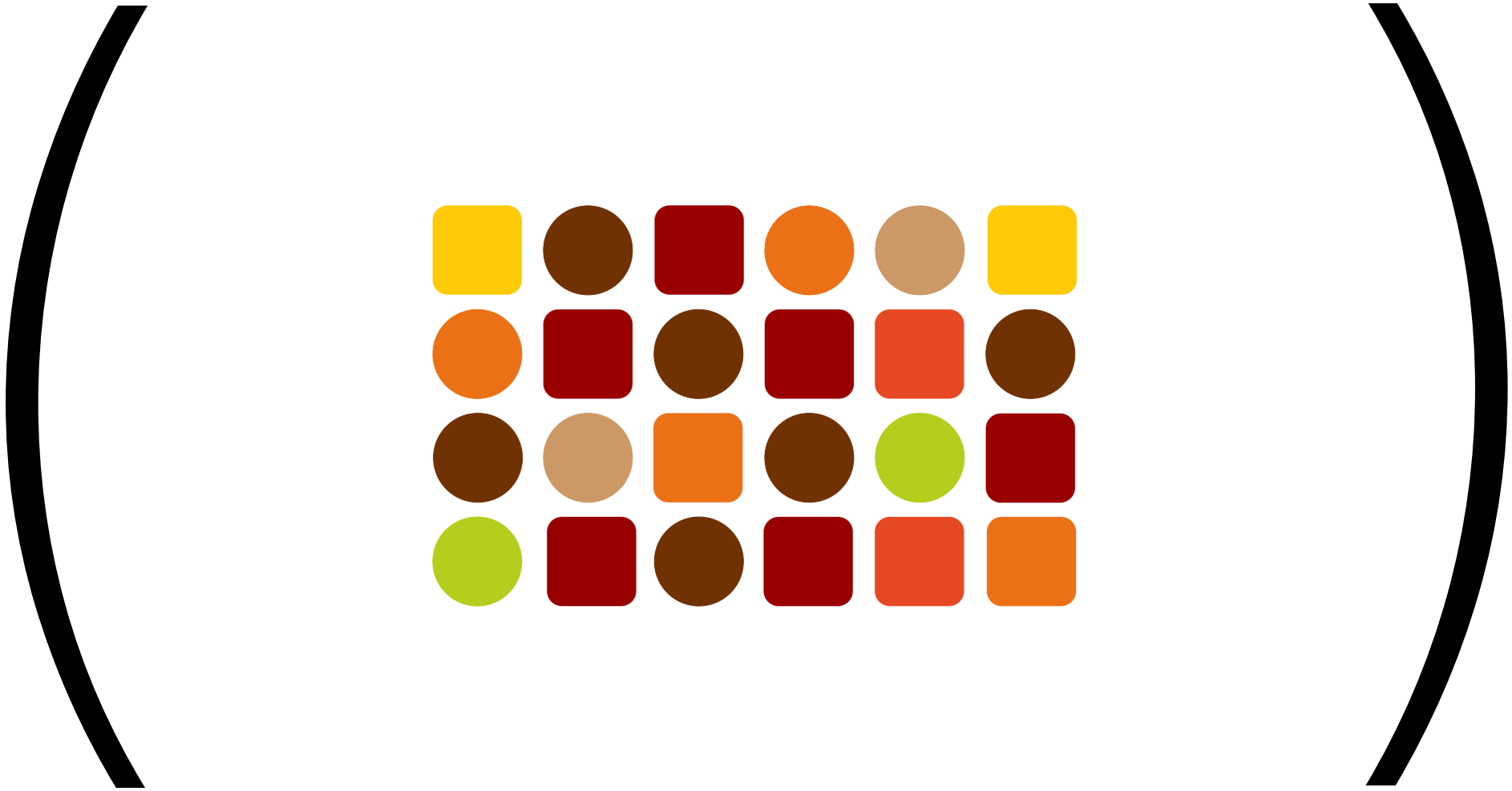

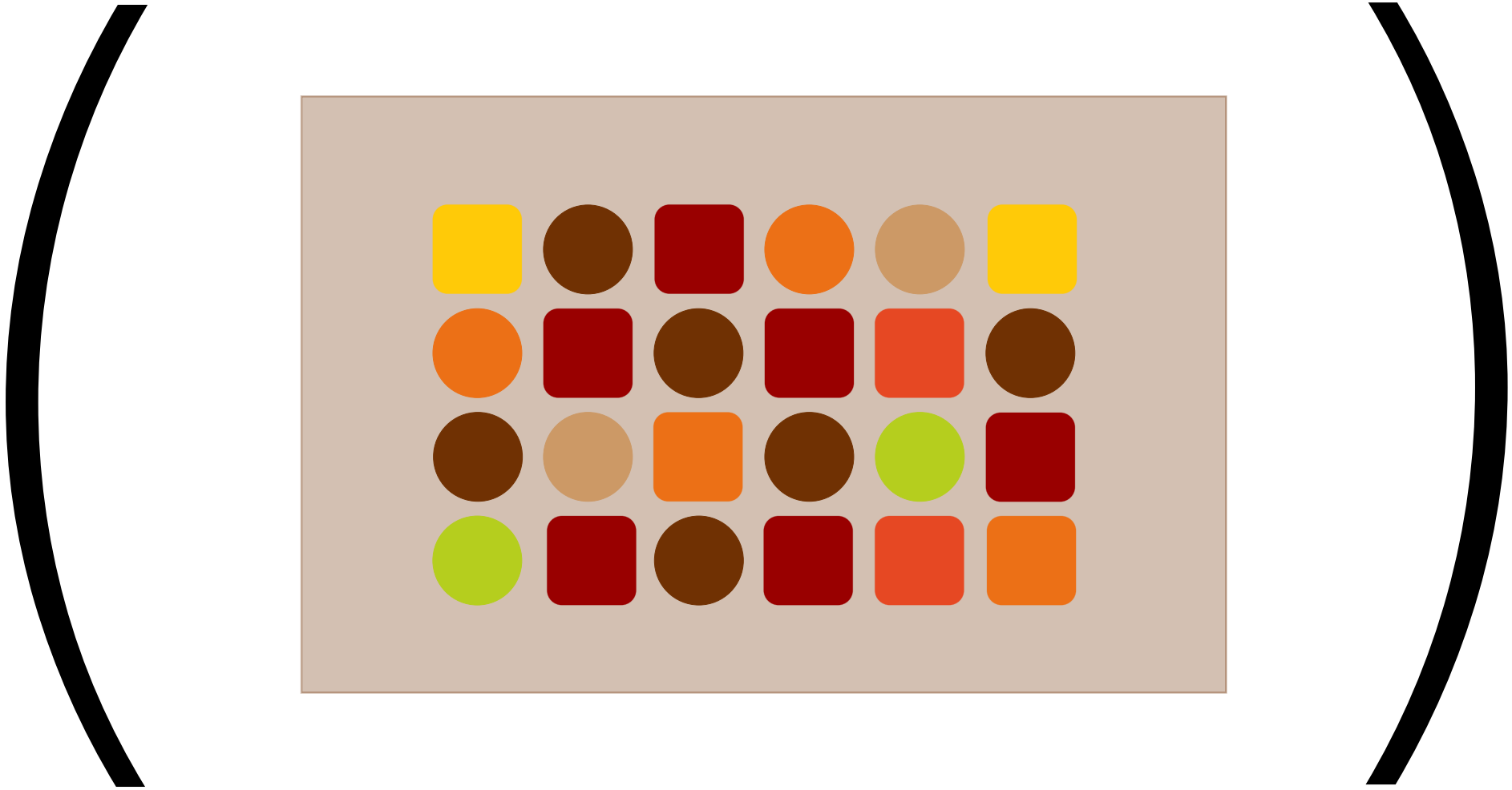

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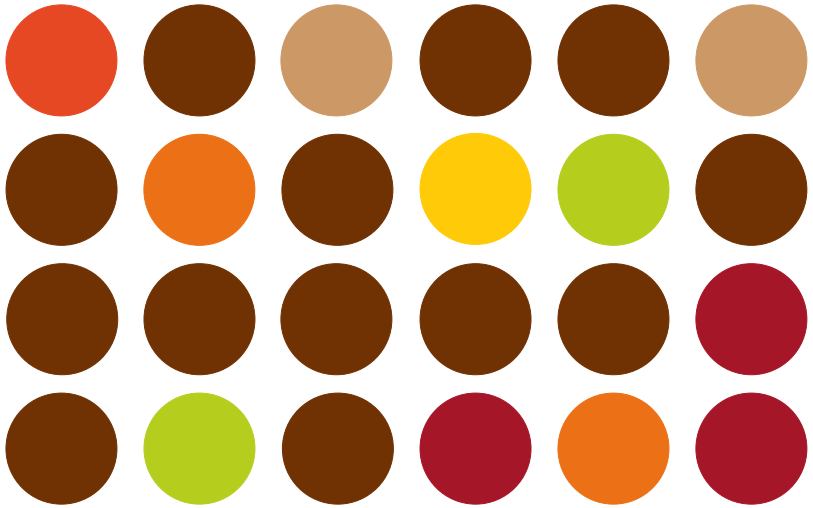

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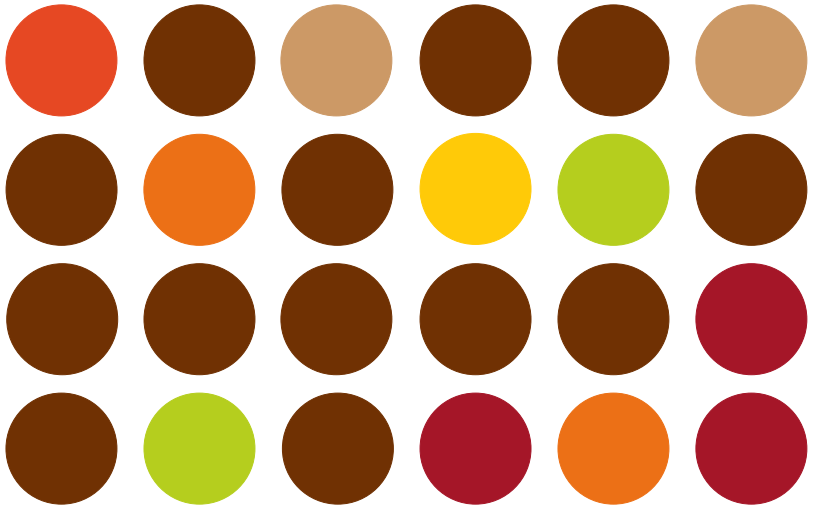

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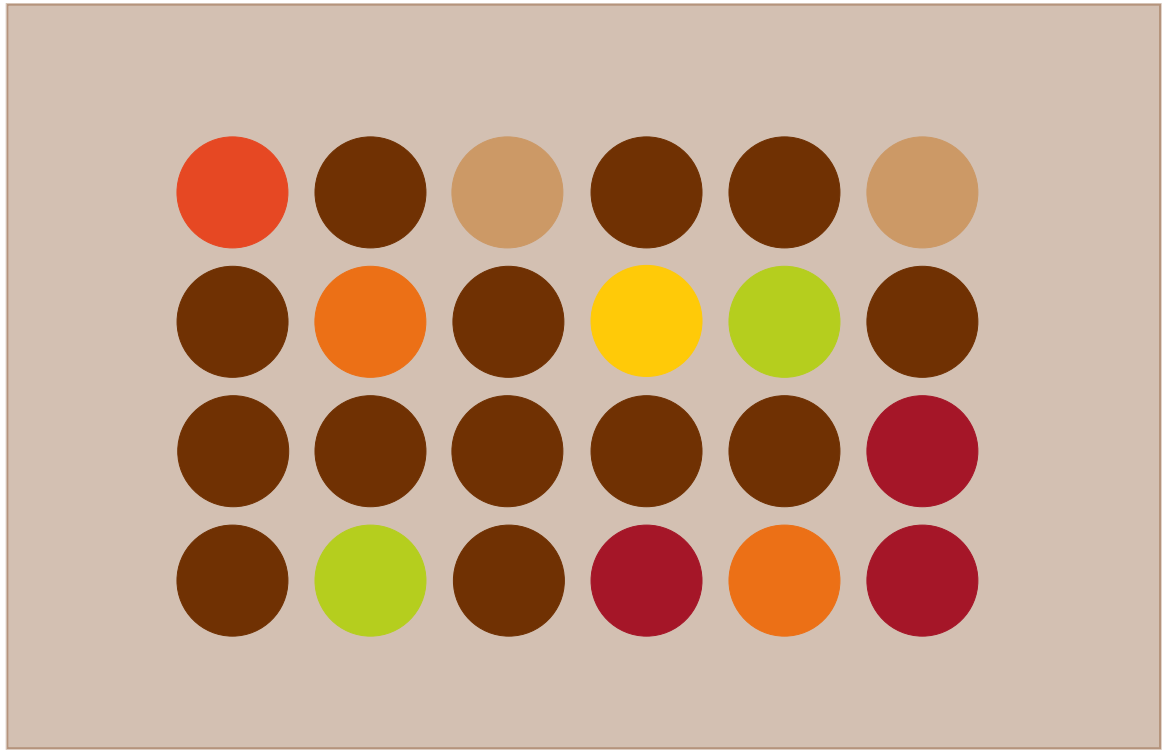

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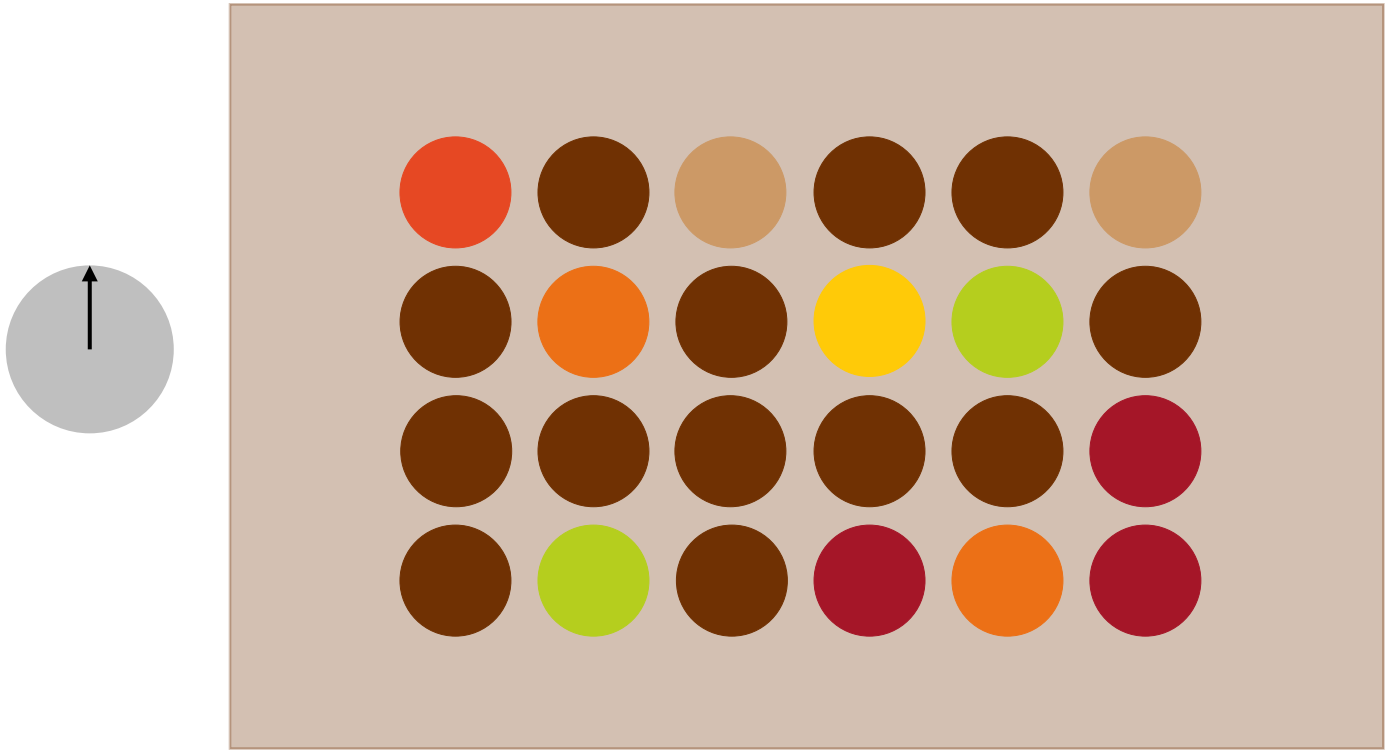

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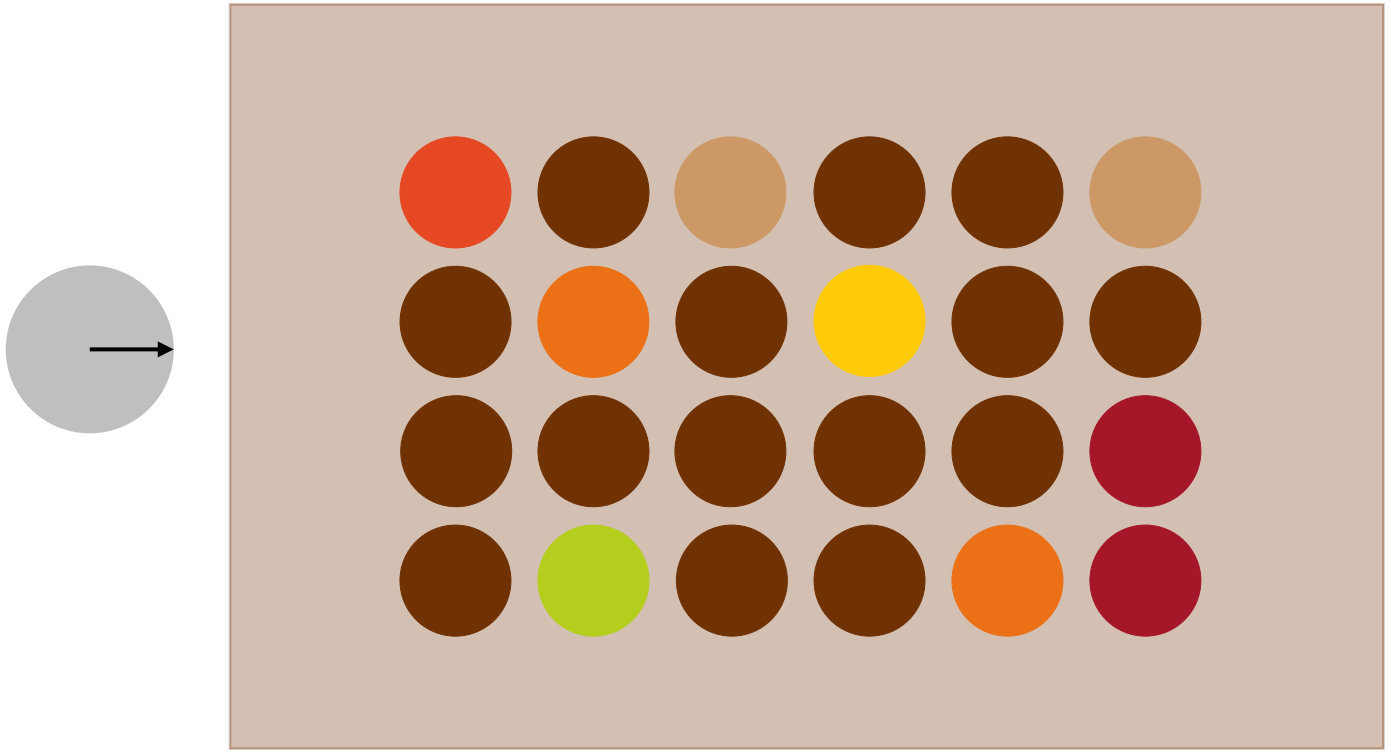

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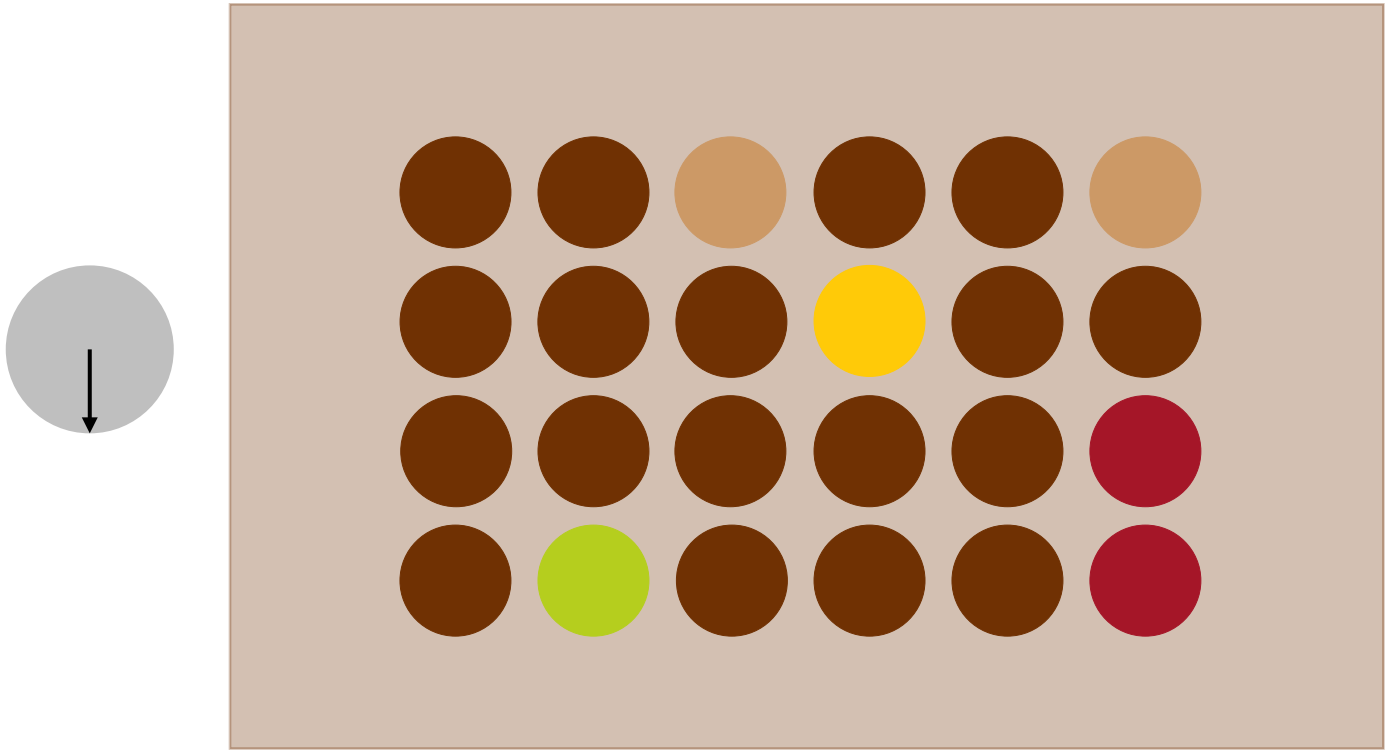

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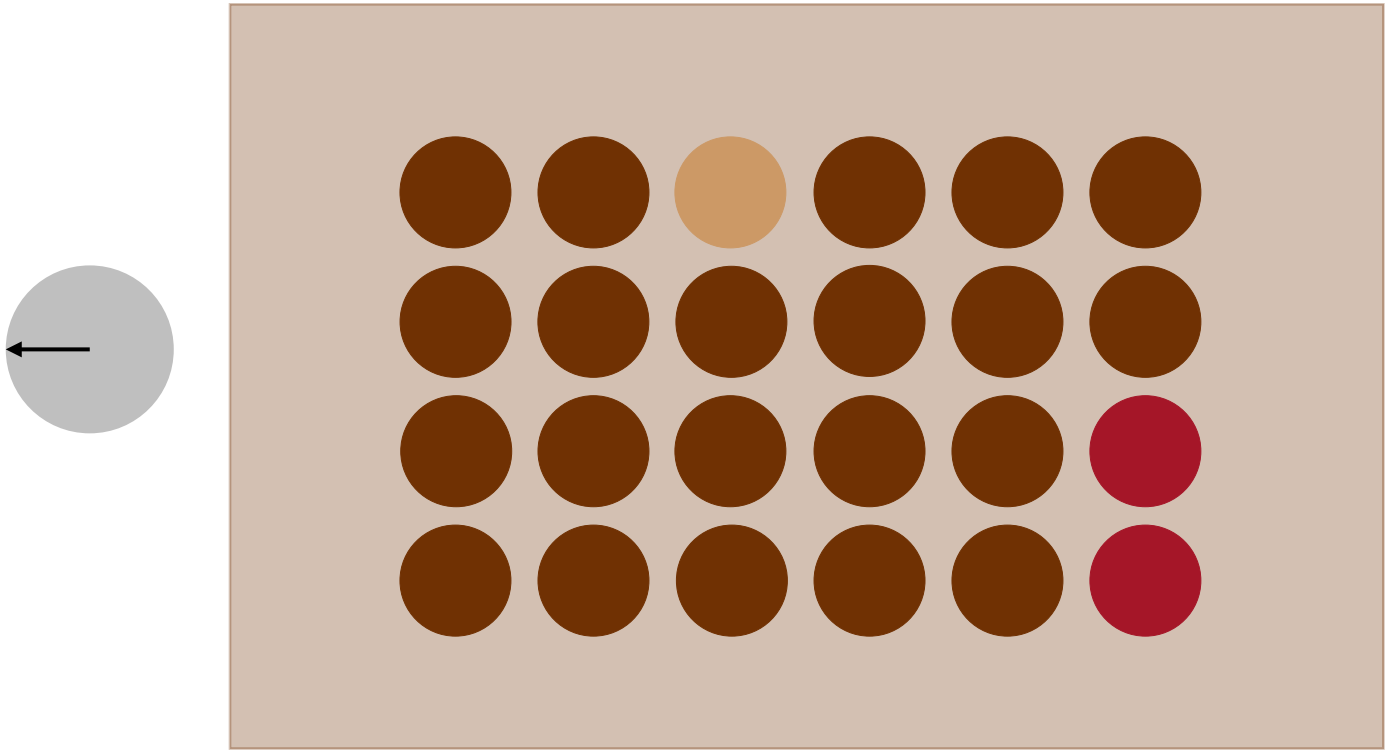

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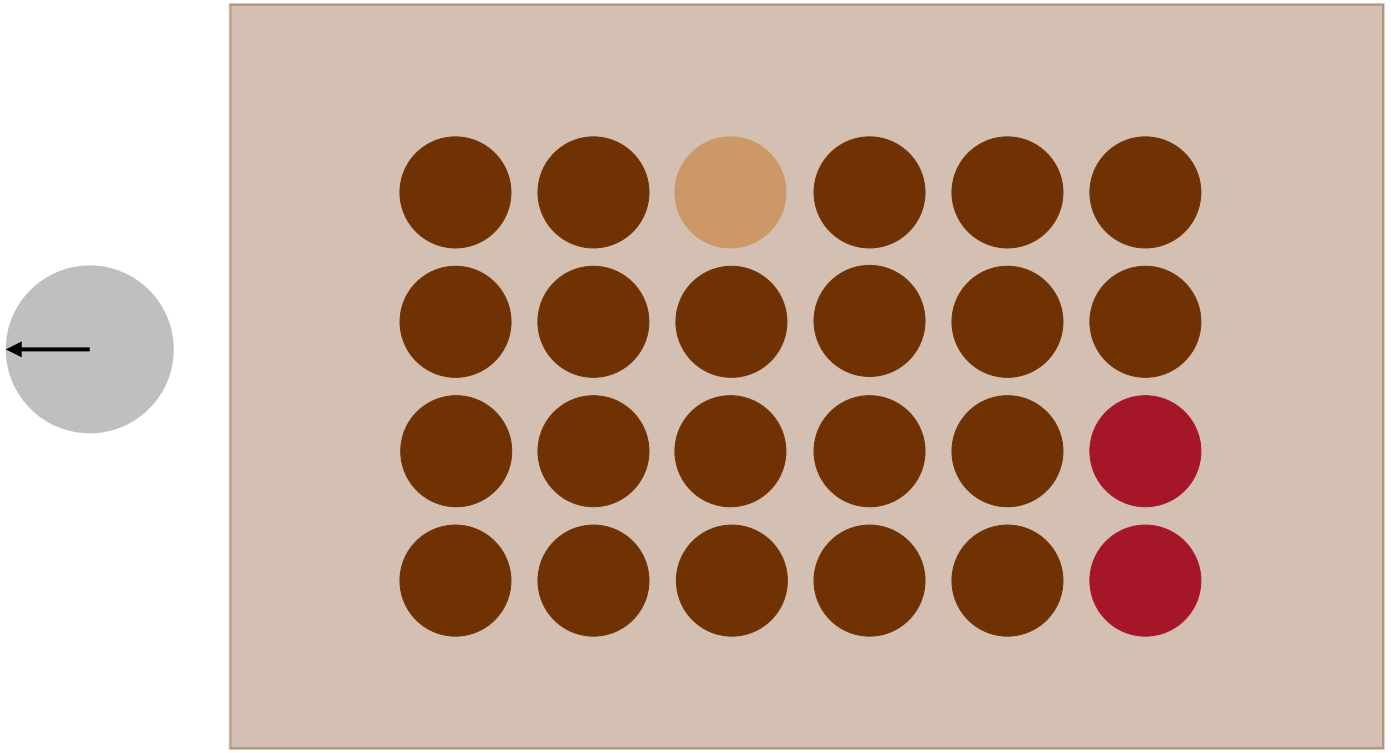

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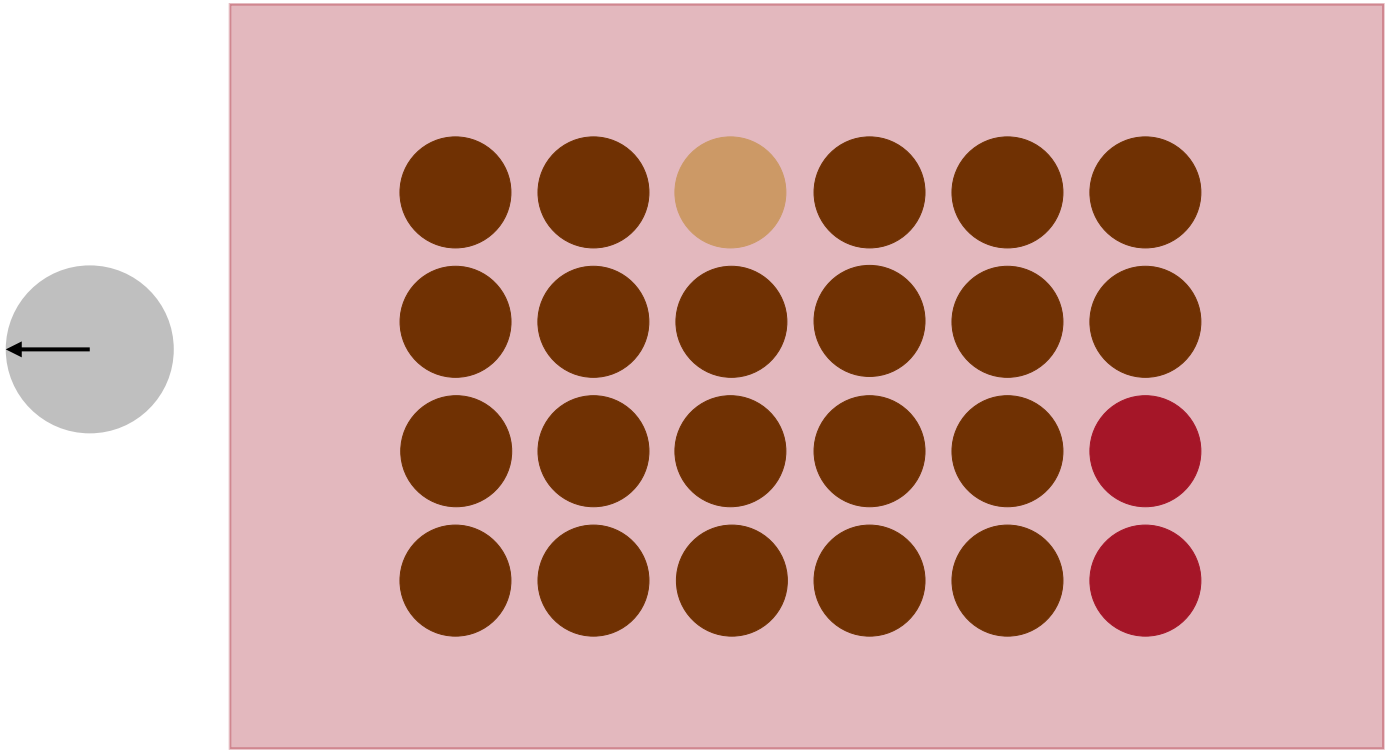

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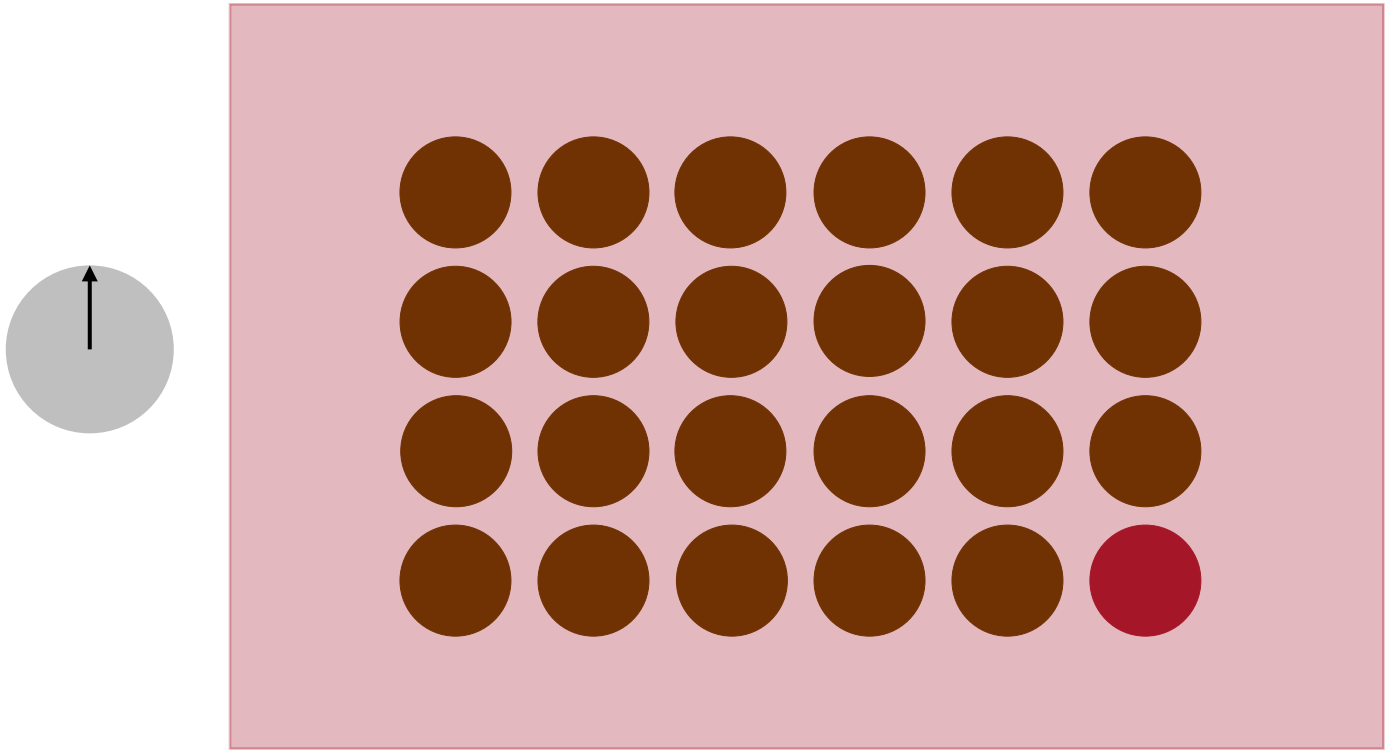

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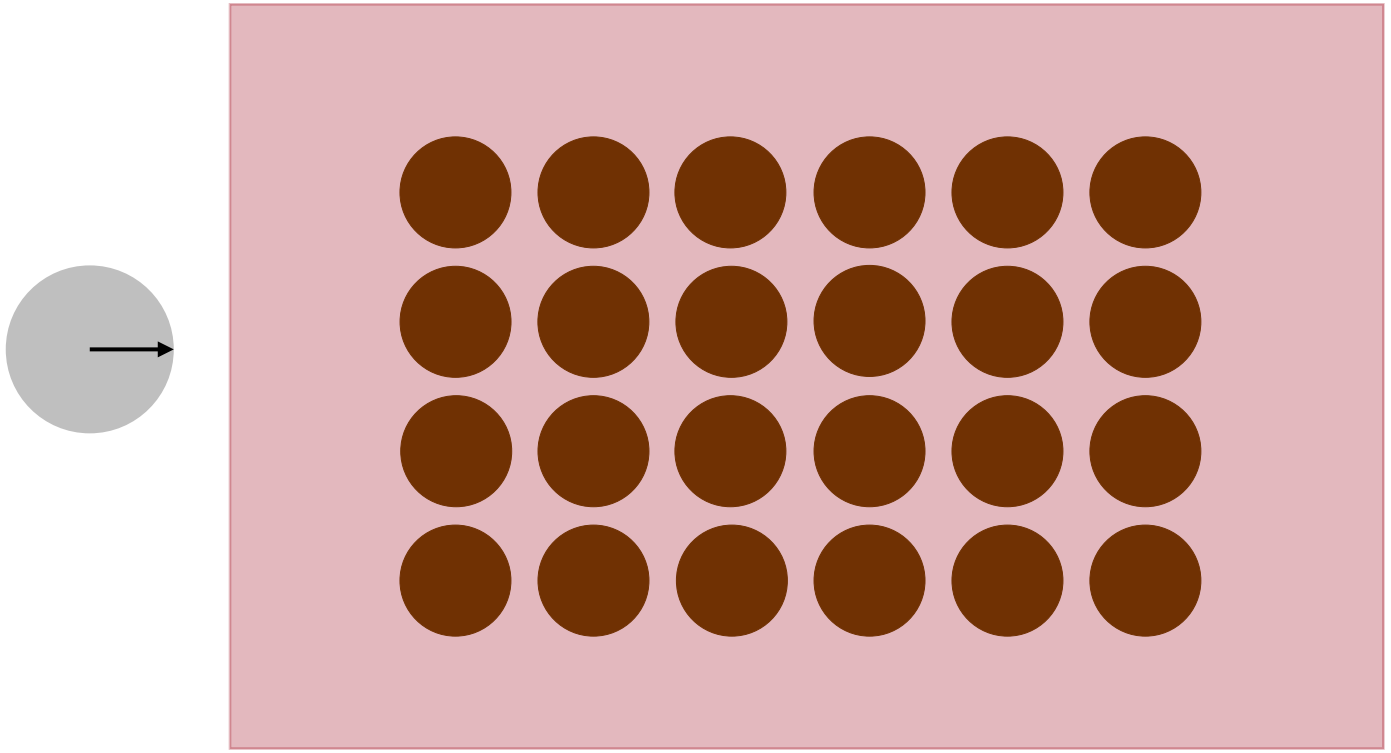

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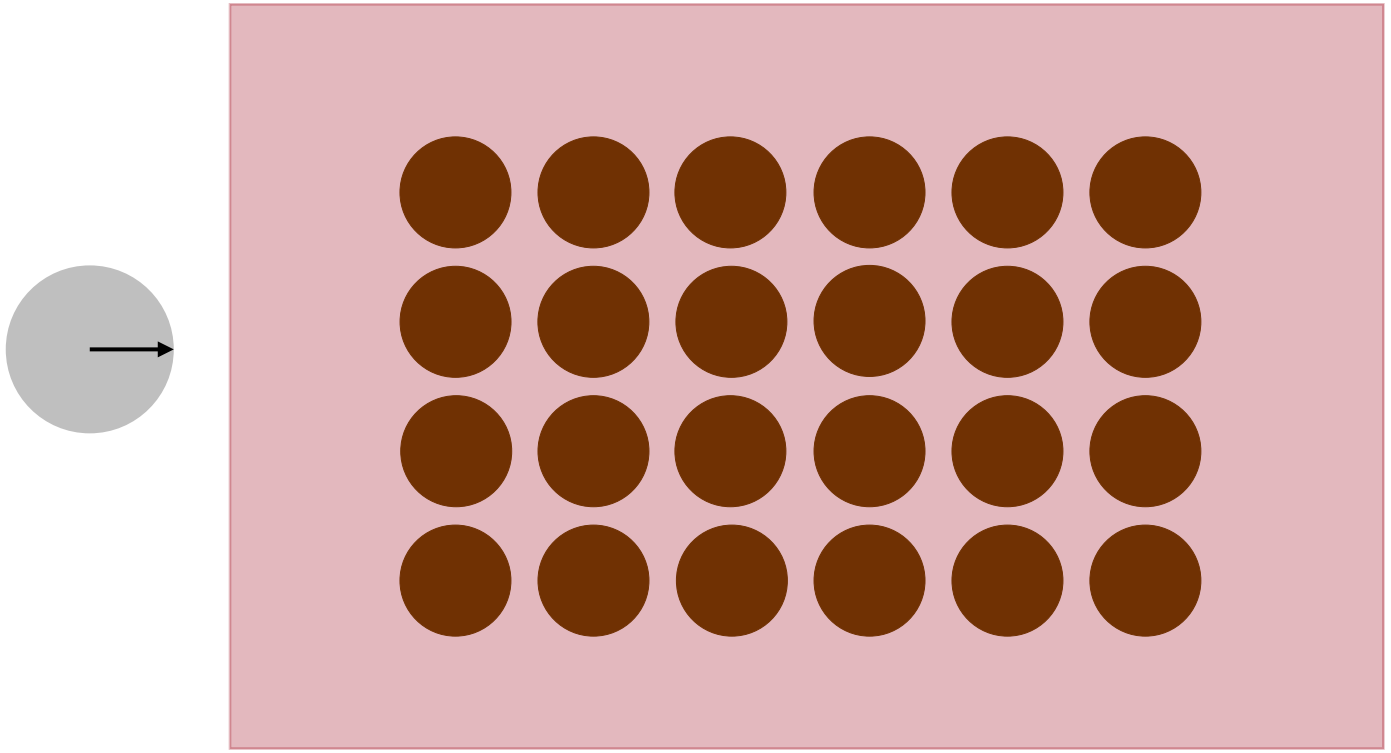

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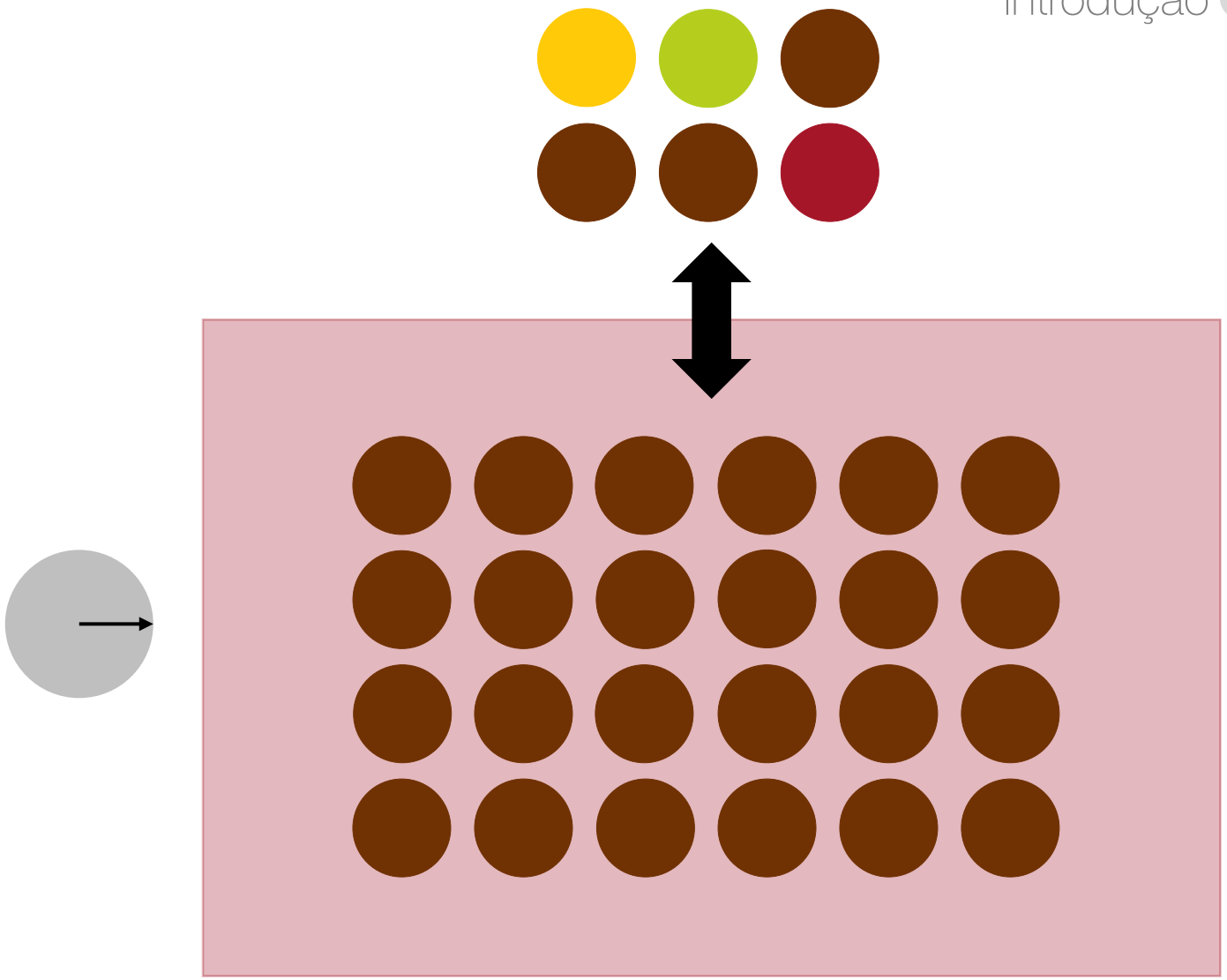

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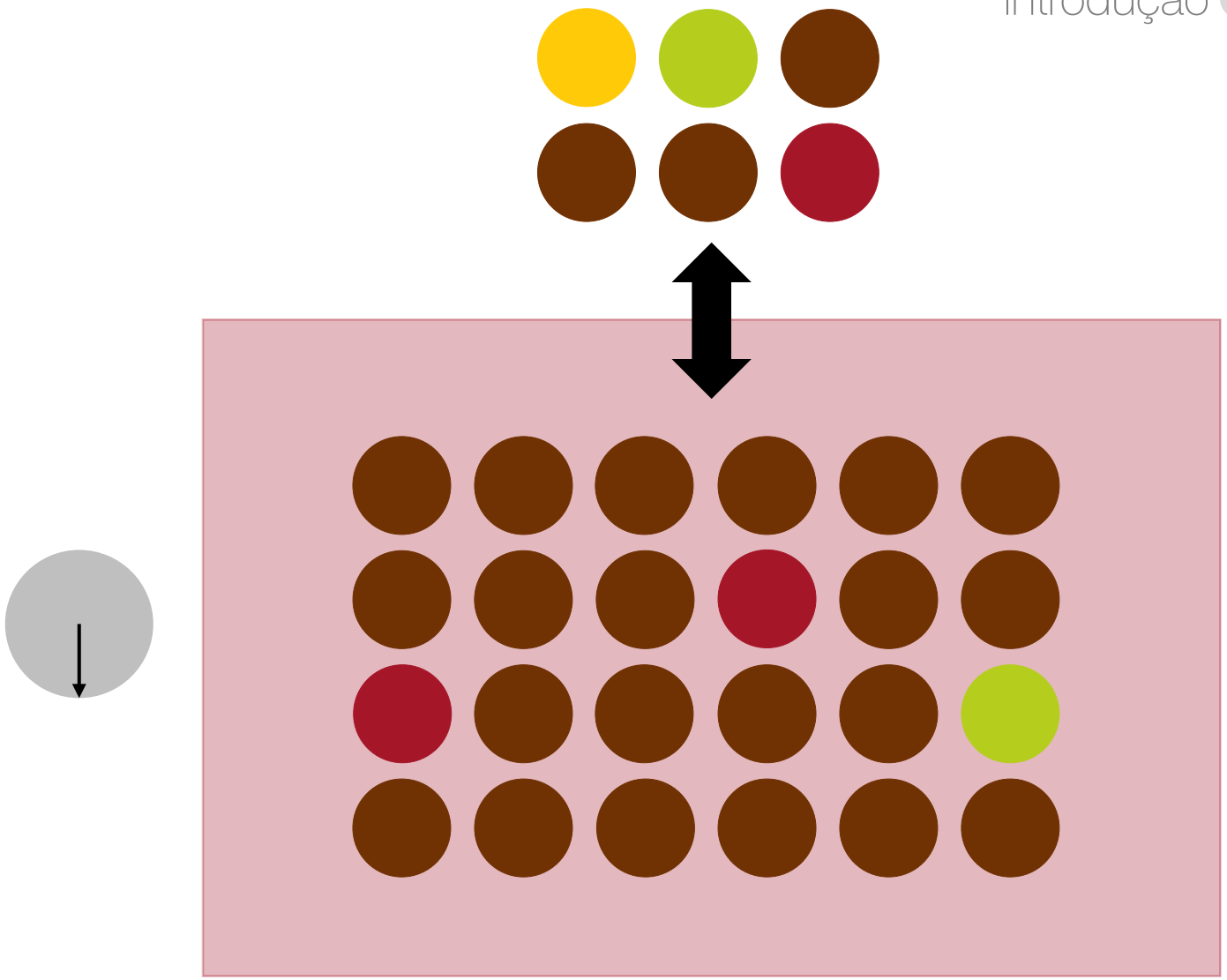

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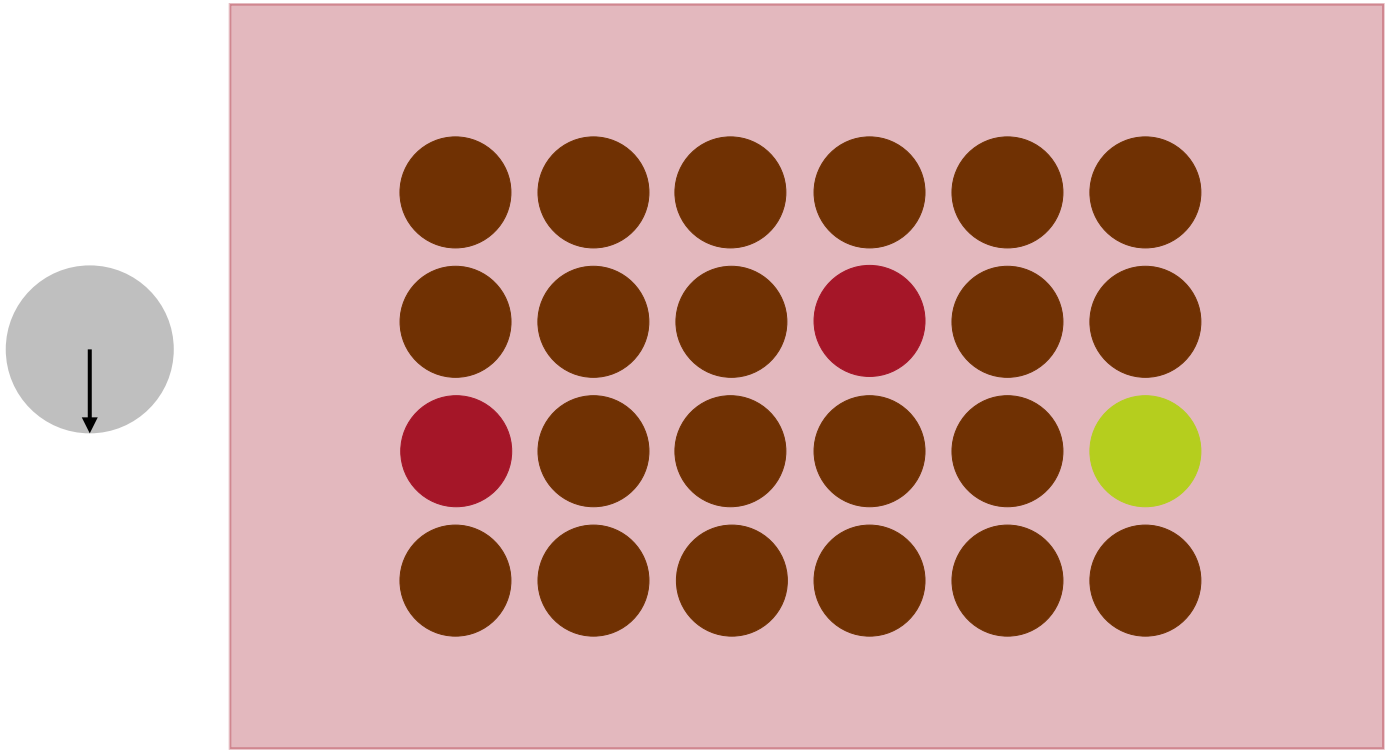

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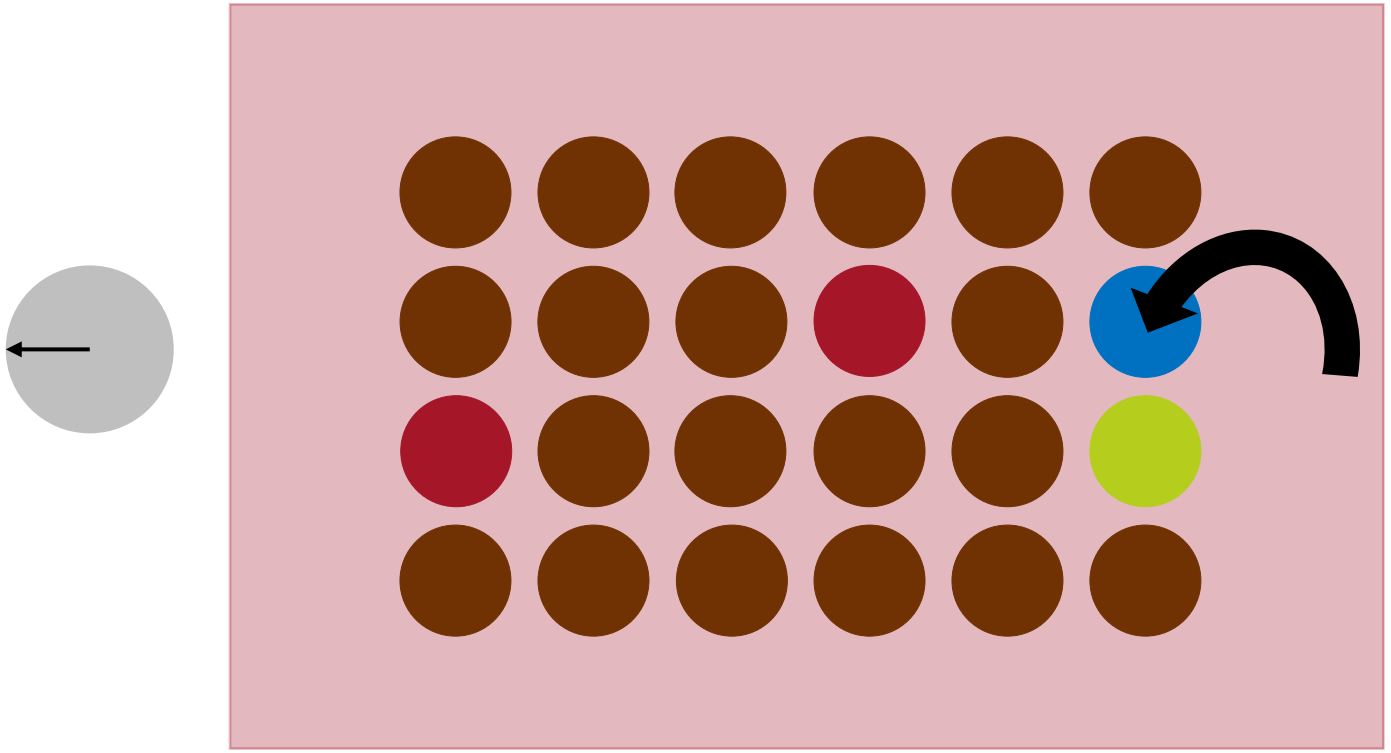

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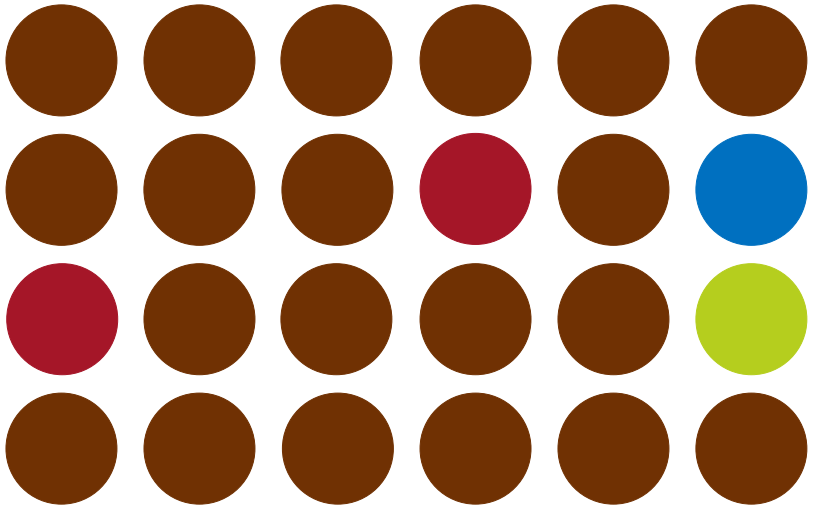

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- seleção
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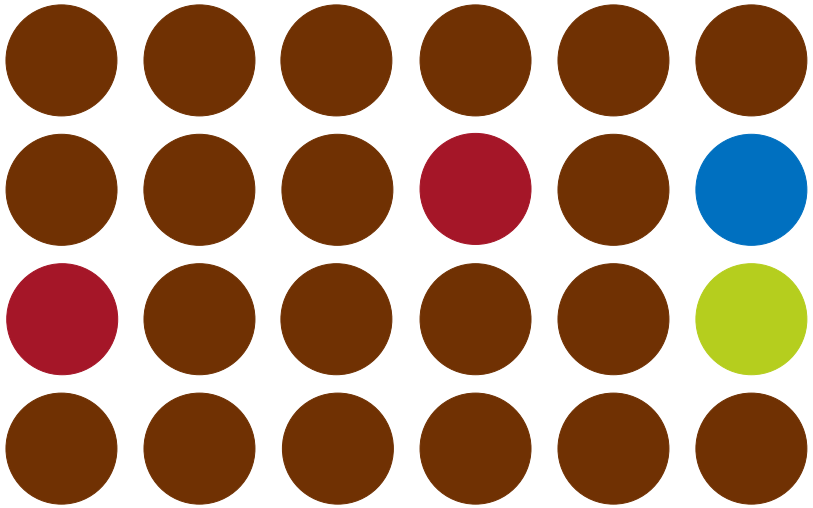
diversidade



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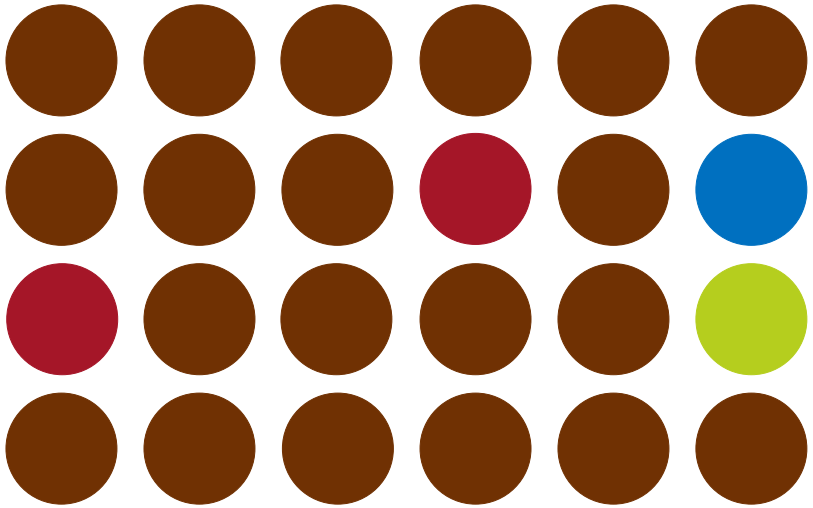

## dinâmica ecológica

- filtragem ecológica
- deriva ecológica
- migração
- especiação

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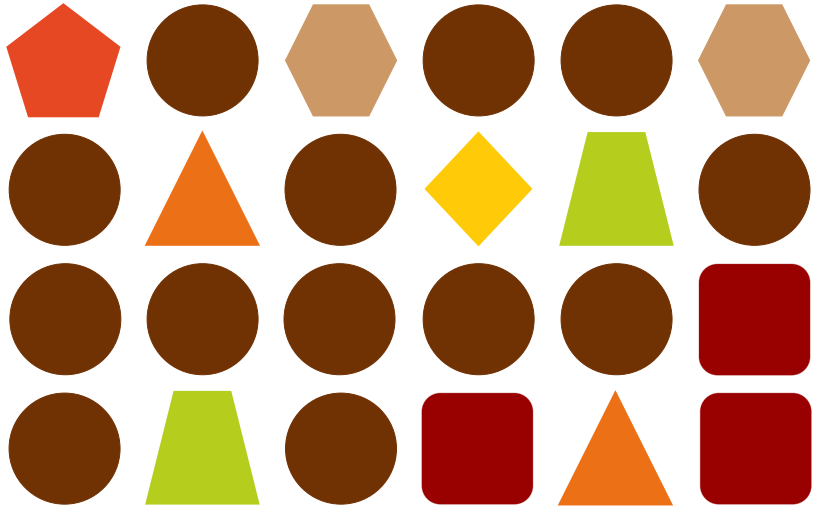

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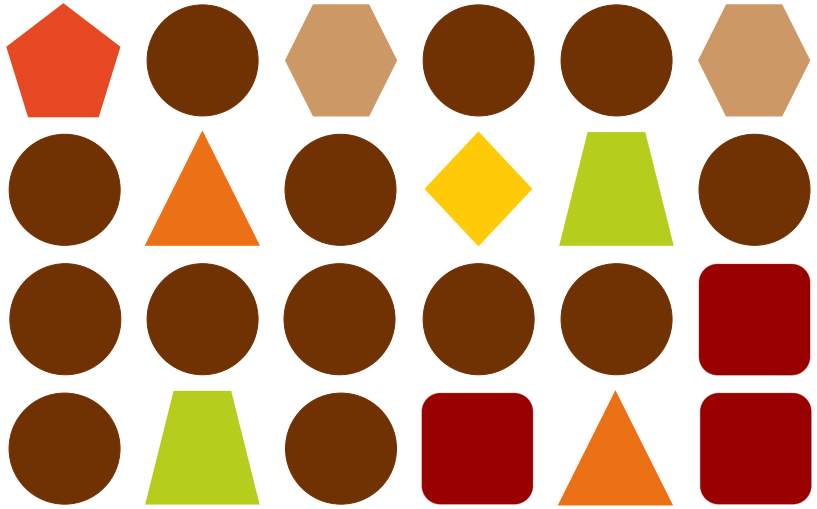

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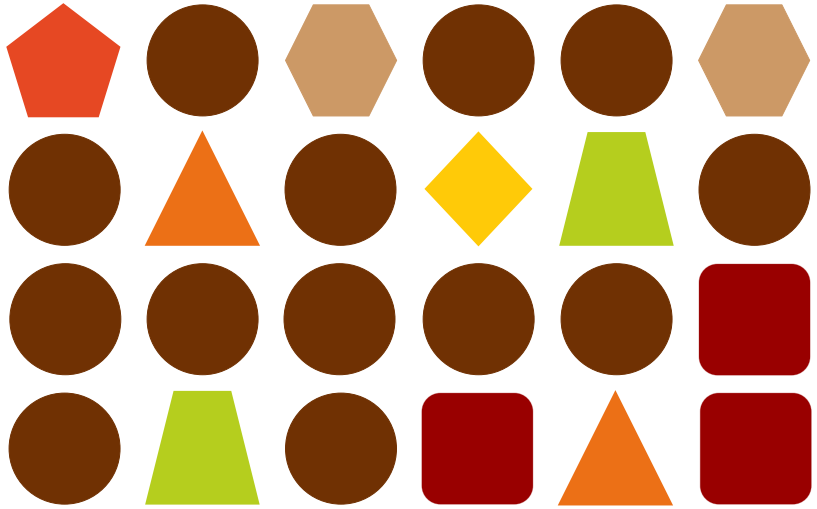

- **exclusão competitiva**
- deriva ecológica
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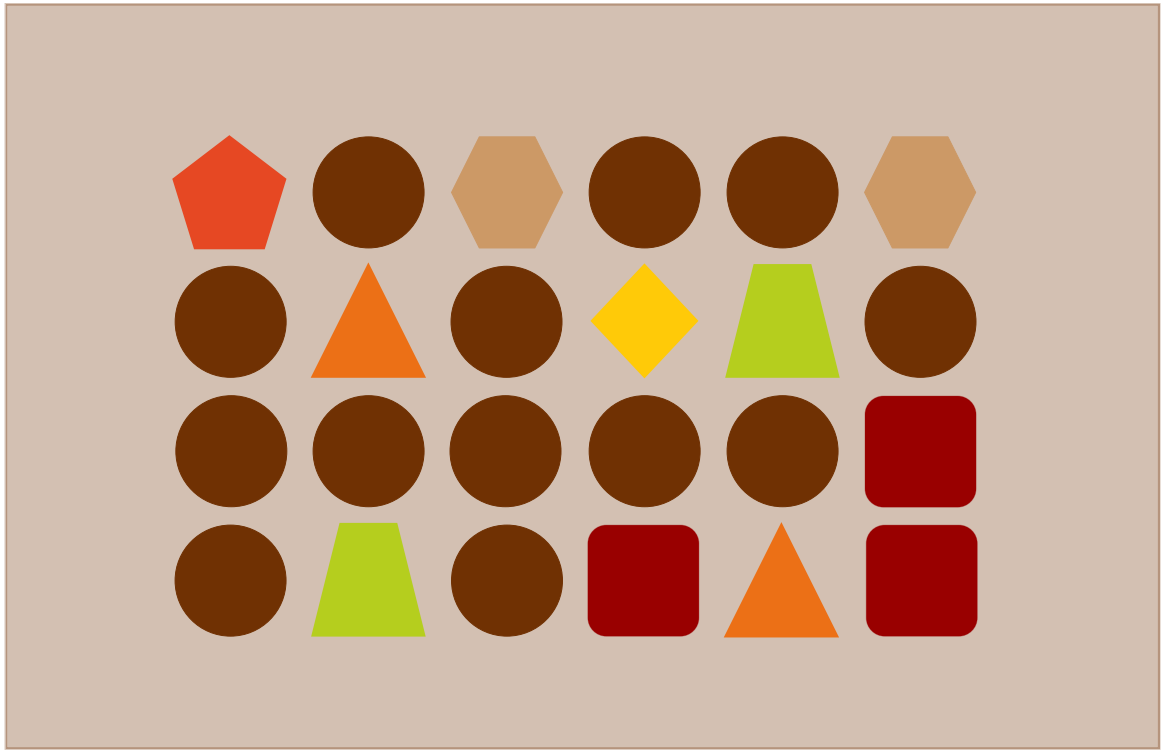

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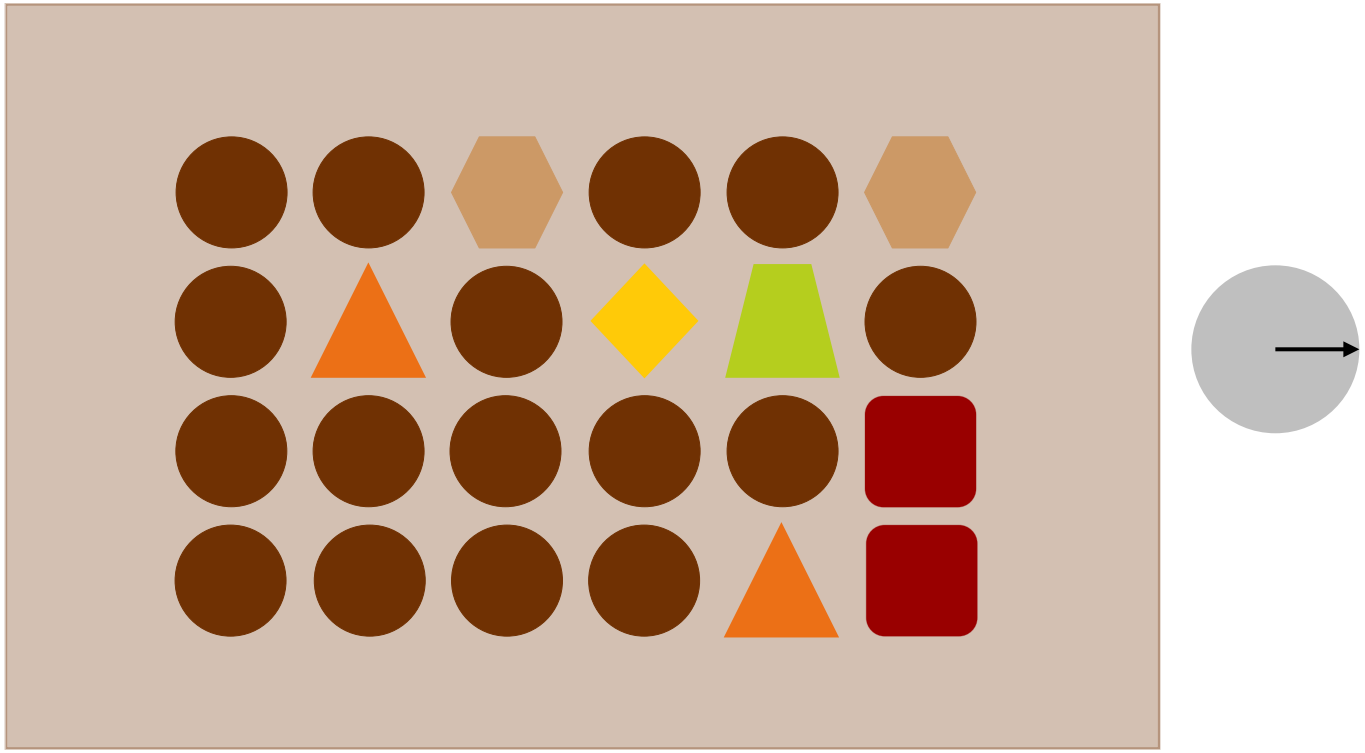

- **exclusão competitiva**
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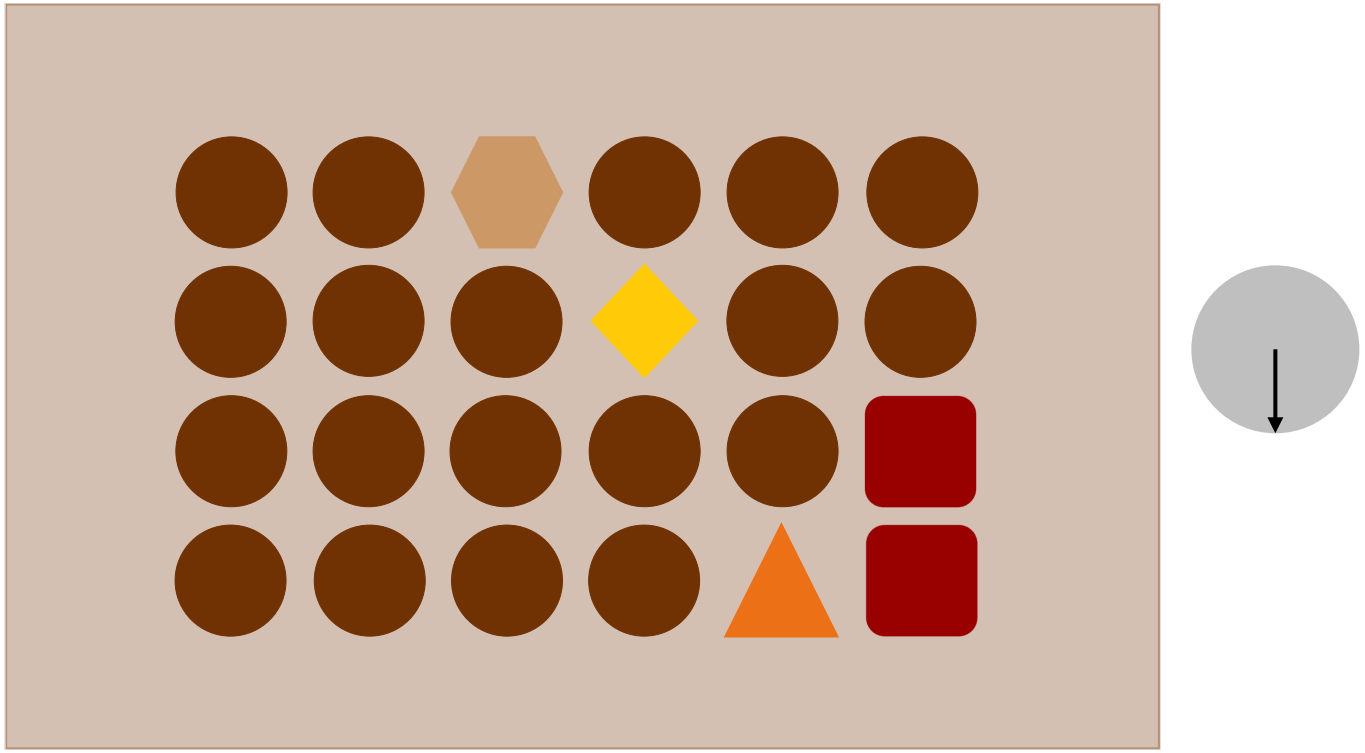

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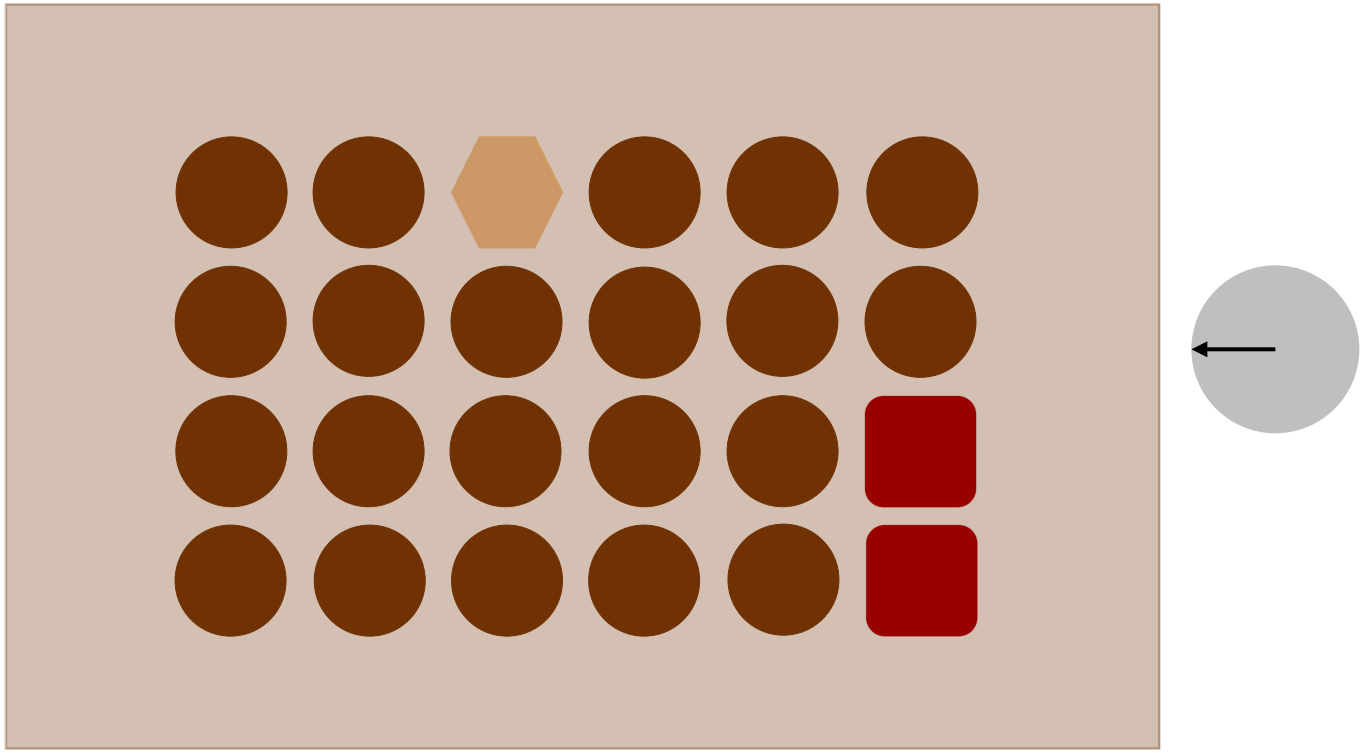

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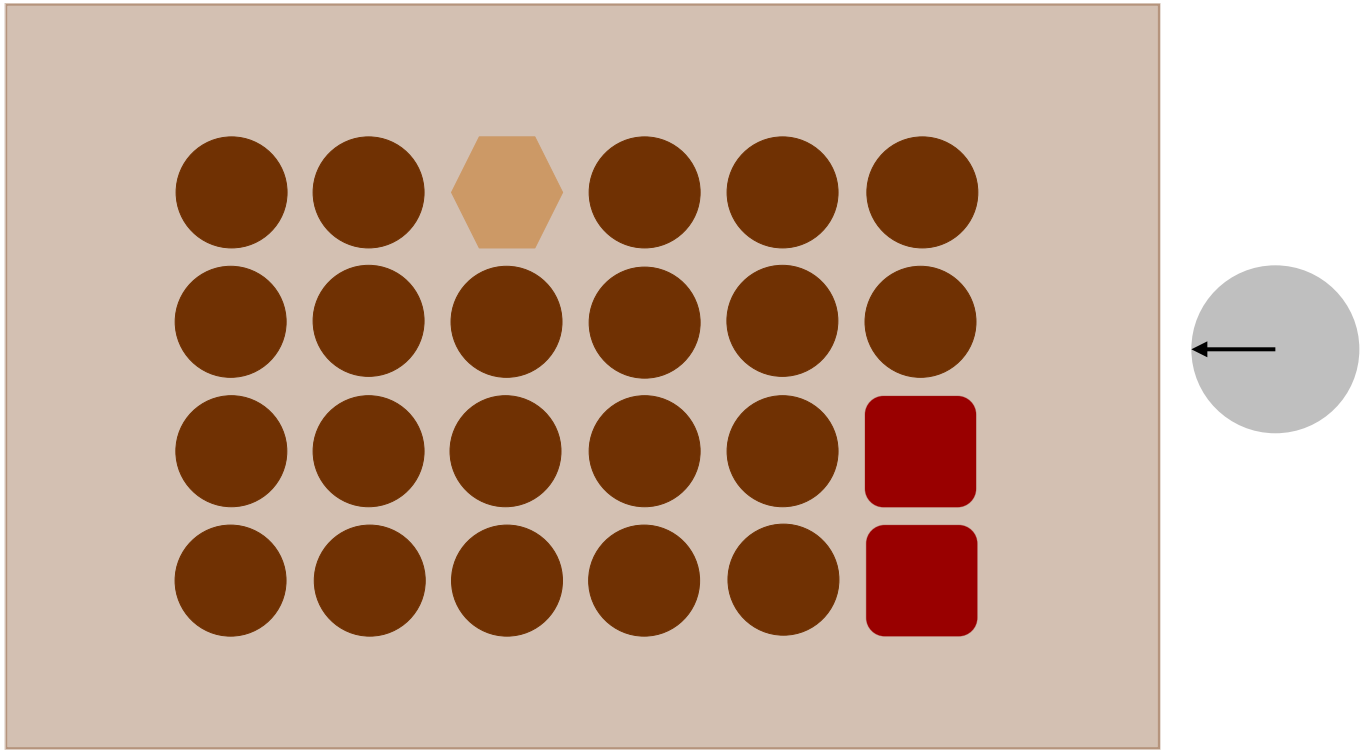

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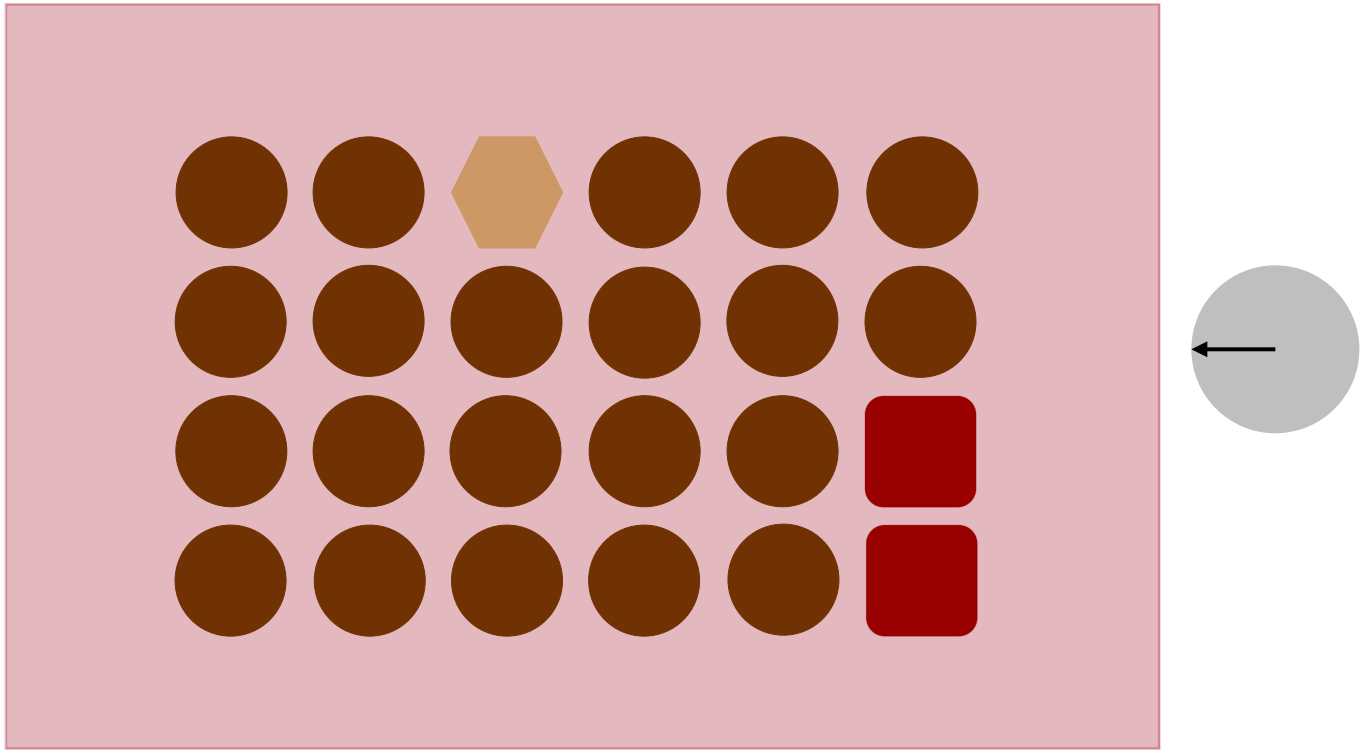
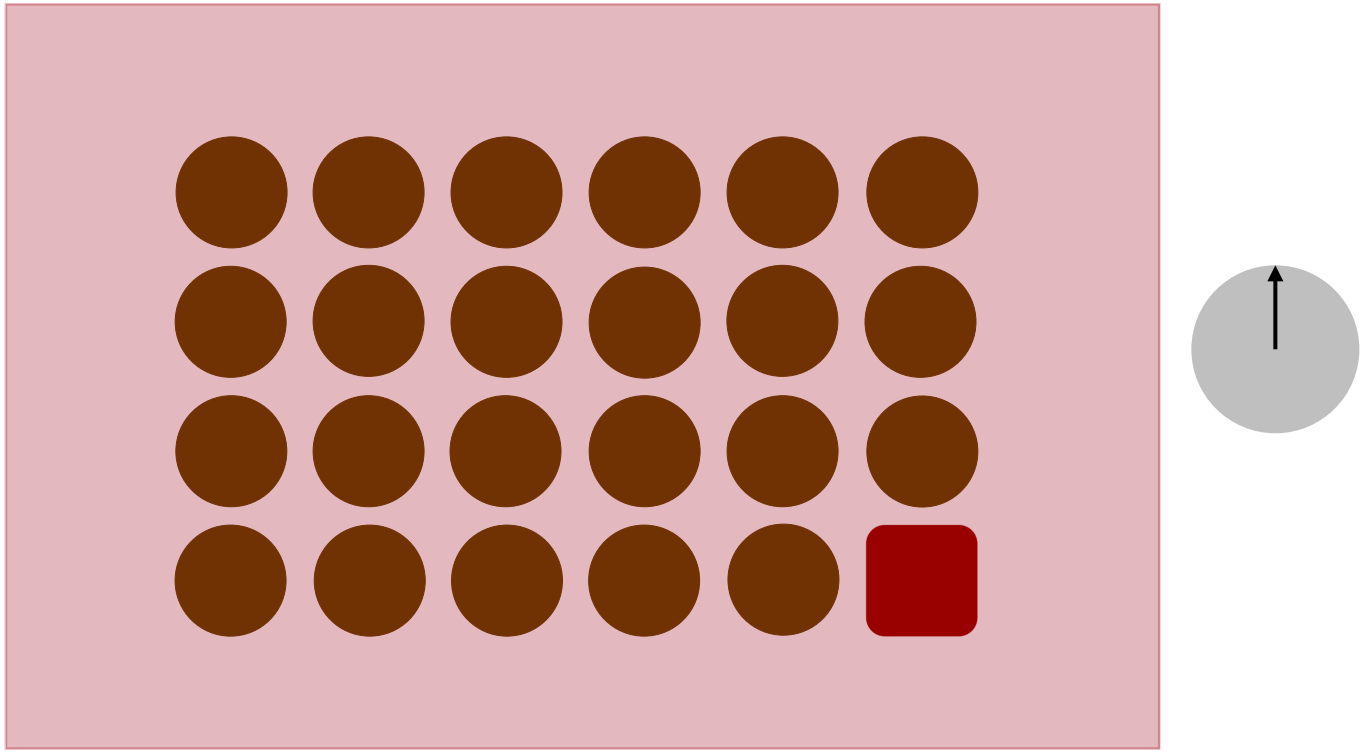
# dinâmica ecológica



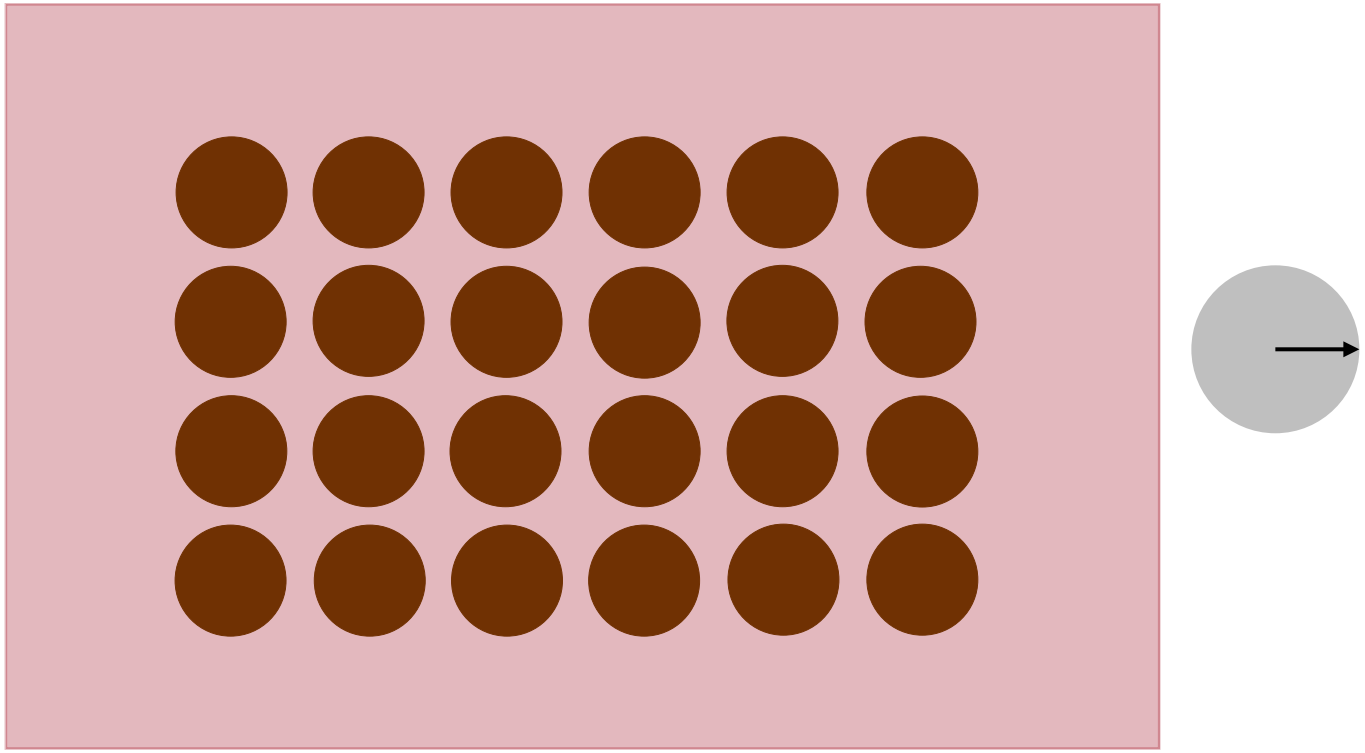
- exclusão competitiva
- **deriva ecológica**
- migração
- especiação

## dinâmica ecológica



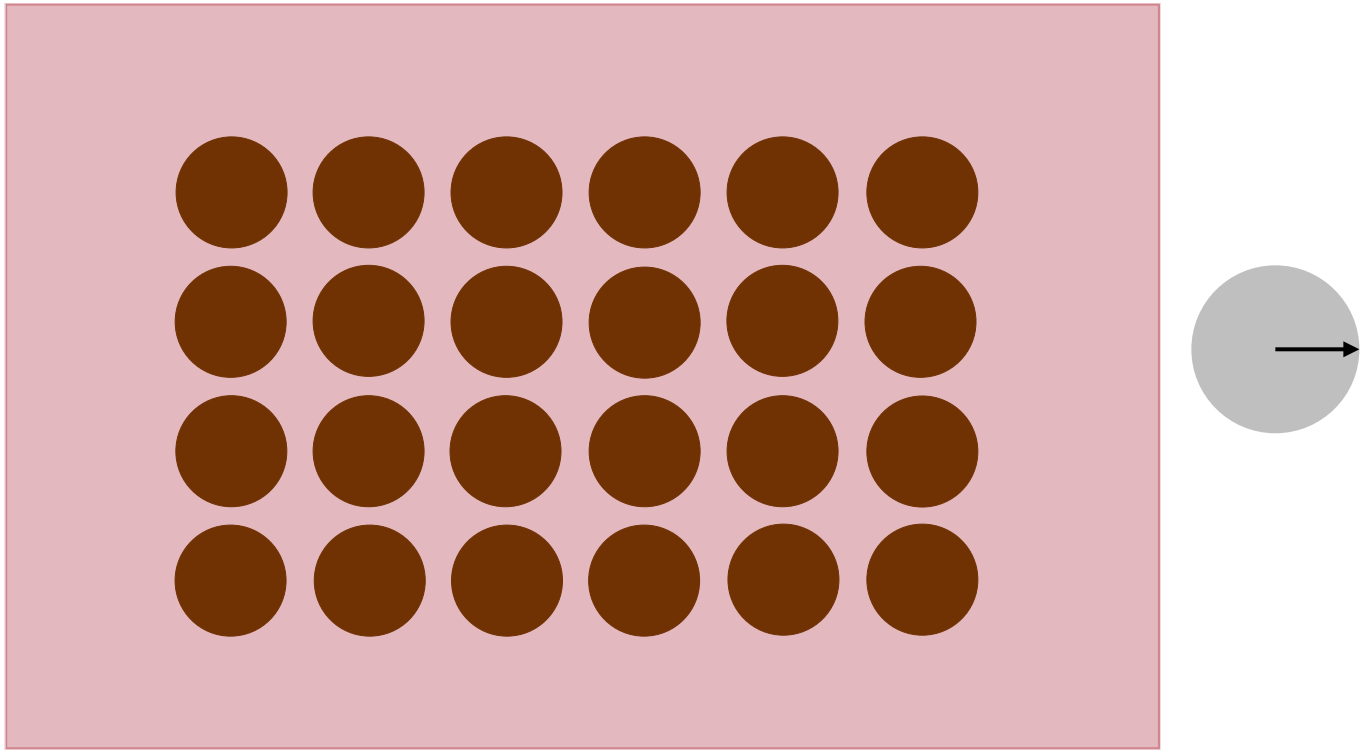
- exclusão competitiva
- **deriva ecológica**
- migração
- especiação

## dinâmica ecológica

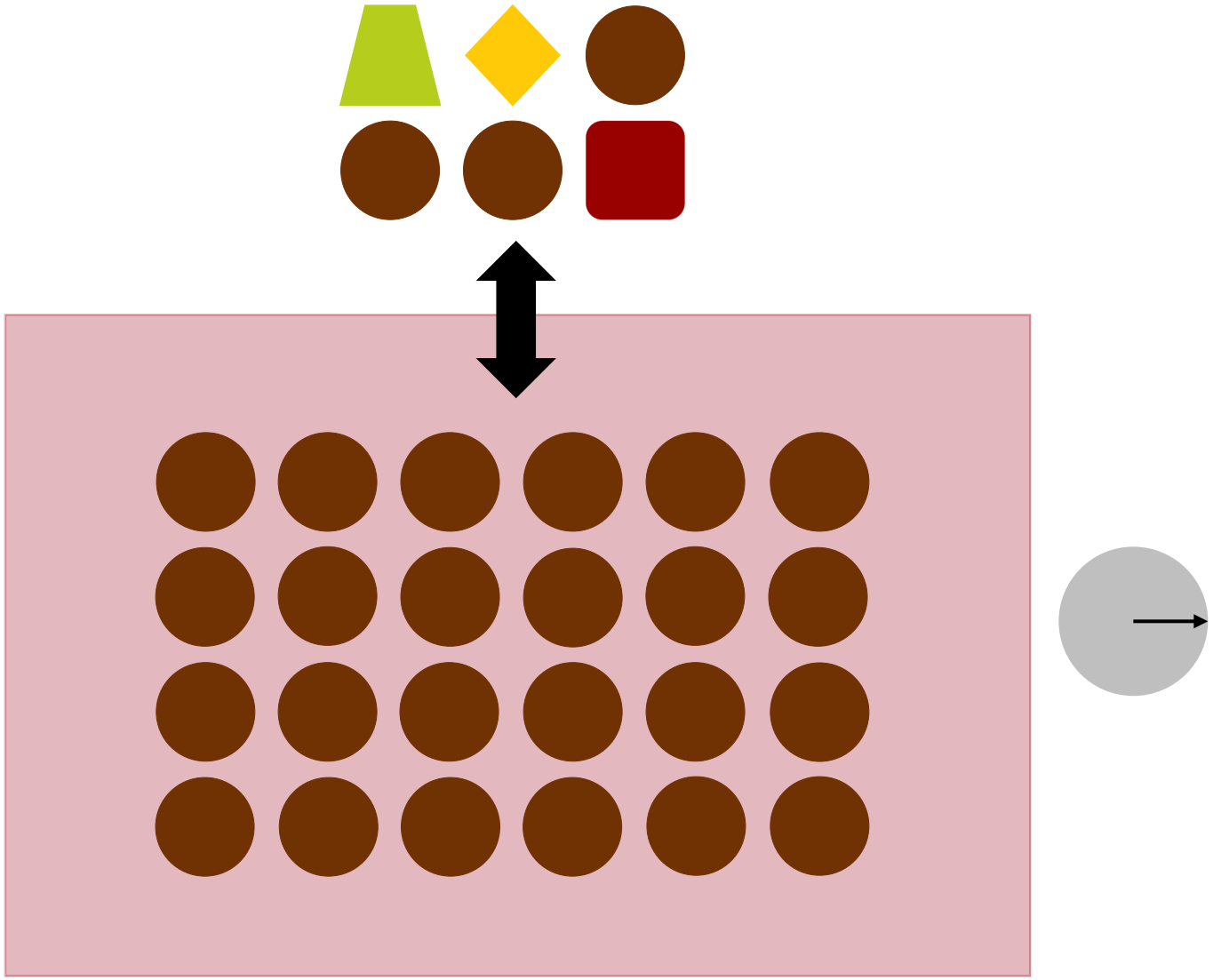


- exclusão competitiva
- **deriva ecológica**
- migração
- especiação

## dinâmica ecológica

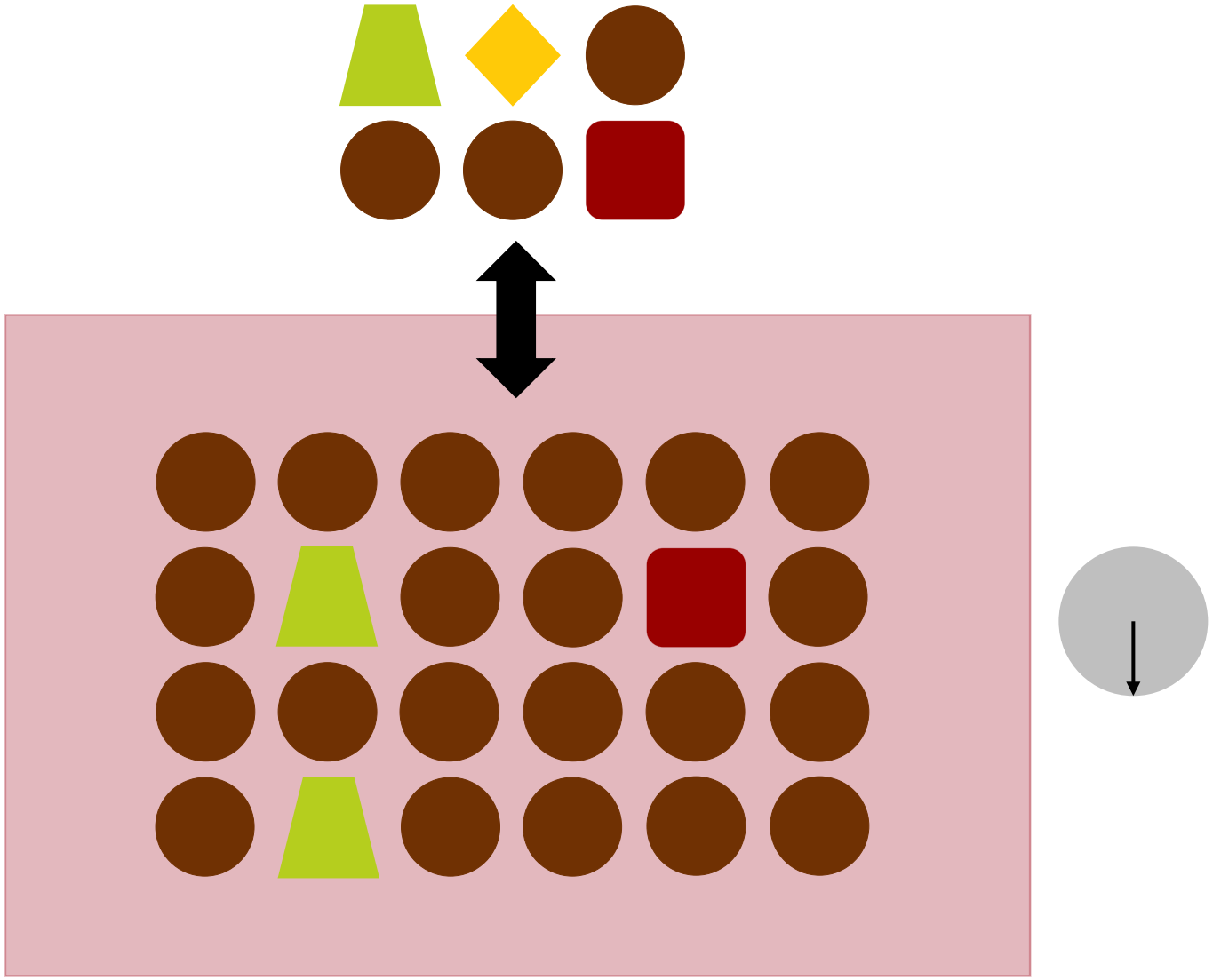


- exclusão competitiva
- deriva ecológica
- **migração**
- especiação



## dinâmica ecológica

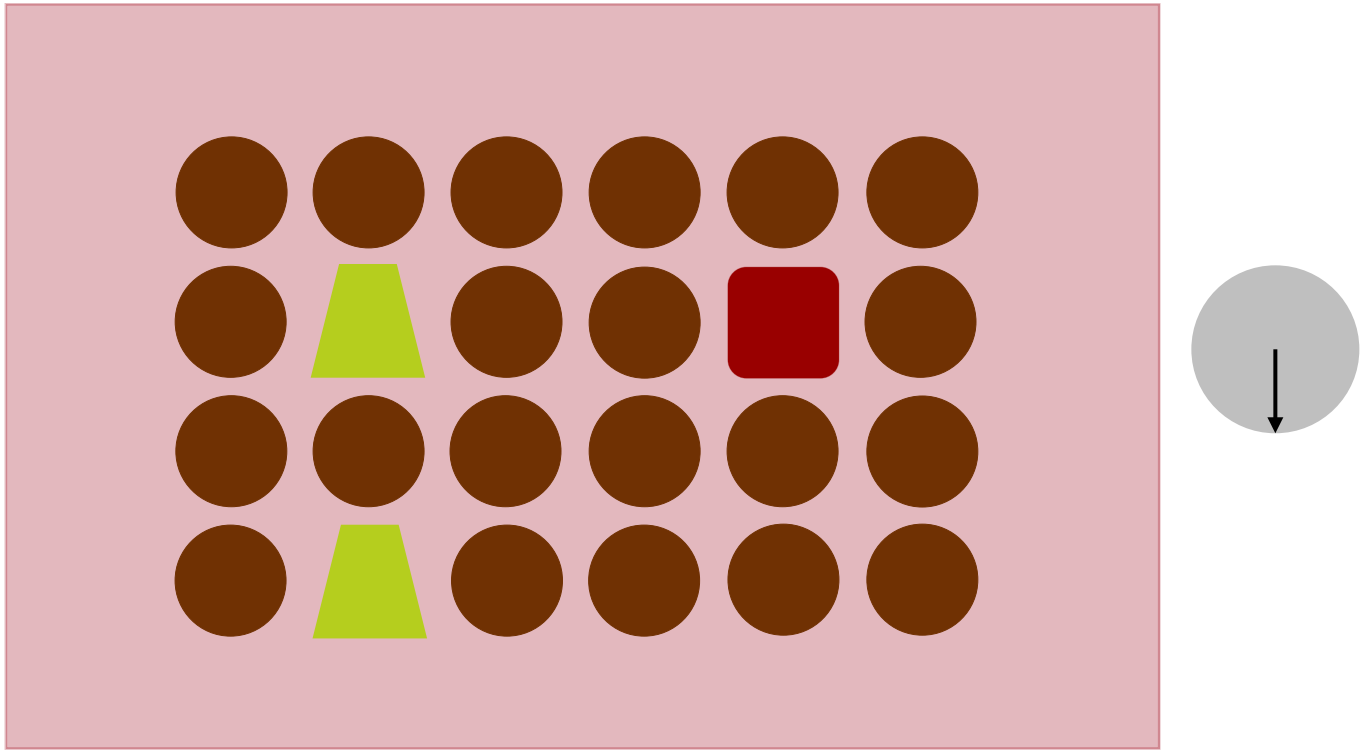
- exclusão competitiva
- deriva ecológica
- **migração**
- especiação



## dinâmica ecológica

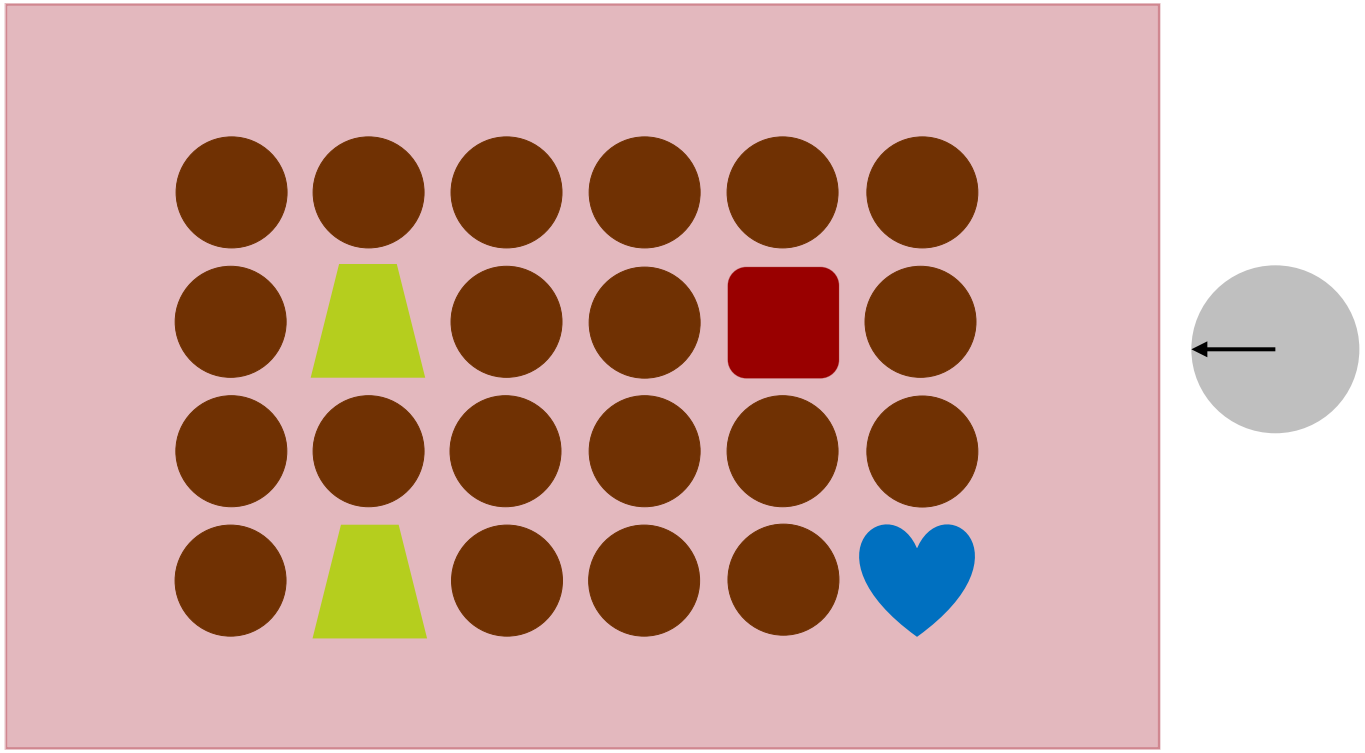
- exclusão competitiva
- deriva ecológica
- **migração**
- especiação

## dinâmica ecológica



- exclusão competitiva
- deriva ecológica
- migração
- **especiação**

# dinâmica ecológica



- exclusão competitiva
- deriva ecológica
- migração
- **especiação**

## dinâmica ecológica

diversidade

- filtragem ecológica
- deriva ecológica
- migração
- especiação

## dinâmica ecológica

diversidade

- filtragem ecológica
- deriva ecológica

diversidade

- migração
- especiação

## dinâmica evolutiva

- seleção
- deriva genética
- fluxo gênico
- mutação

diversidade

diversidade

## dinâmica ecológica

- filtragem ecológica
- deriva ecológica
- migração
- especiação

dinâmica evolutiva ⟷ dinâmica ecológica

- seleção
- deriva genética
- fluxo gênico
- mutação

- filtragem ecológica
- deriva ecológica
- migração
- especiação

dinâmica
eco-evolutiva

dinâmica
evolutiva

dinâmica
ecológica

- seleção
- deriva genética
- fluxo gênico
- mutação

- filtragem ecológica
- deriva ecológica
- migração
- especiação

dinâmica
eco-evolutiva

dinâmica
evolutiva

dinâmica
ecológica

- seleção
- deriva genética
- fluxo gênico
- mutação

- filtragem ecológica
- deriva ecológica
- migração
- especiação

dinâmica eco-evolutiva

dinâmica evolutiva ⟷ dinâmica ecológica

melhores competidores = mais aptos

- seleção
- deriva genética
- fluxo gênico
- mutação

- filtragem ecológica
- deriva ecológica
- migração
- especiação

dinâmica eco-evolutiva

dinâmica evolutiva ⟷ dinâmica ecológica

- seleção → filtragem ecológica
- deriva genética
- fluxo gênico
- mutação

- filtragem ecológica
- deriva ecológica
- migração
- especiação

dinâmica eco-evolutiva

dinâmica evolutiva ⟷ dinâmica ecológica

mudança nos atributos = mudança nas interações

- seleção → filtragem ecológica
- deriva genética → deriva ecológica
- fluxo gênico → migração
- mutação → especiação

dinâmica
eco-evolutiva

dinâmica
evolutiva

dinâmica
ecológica

- seleção
- deriva genética
- fluxo gênico
- mutação

- filtragem ecológica
- deriva ecológica
- migração
- especiação

dinâmica eco-evolutiva

dinâmica evolutiva ⟷ dinâmica ecológica

- seleção ⟷ filtragem ecológica
- deriva genética
- fluxo gênico ⟵ migração
- mutação
- especiação

dinâmica
eco-evolutiva

dinâmica
evolutiva

dinâmica
ecológica

dinâmica
evolutiva

dinâmica
ecológica

**estratégia de vida**

dinâmica
eco-evolutiva

dinâmica
evolutiva

dinâmica
ecológica

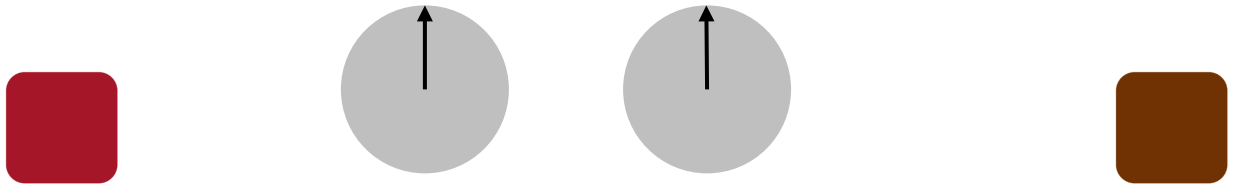
**estratégia de vida**

**estratégia de vida**

sobrevivência ⟷ reprodução

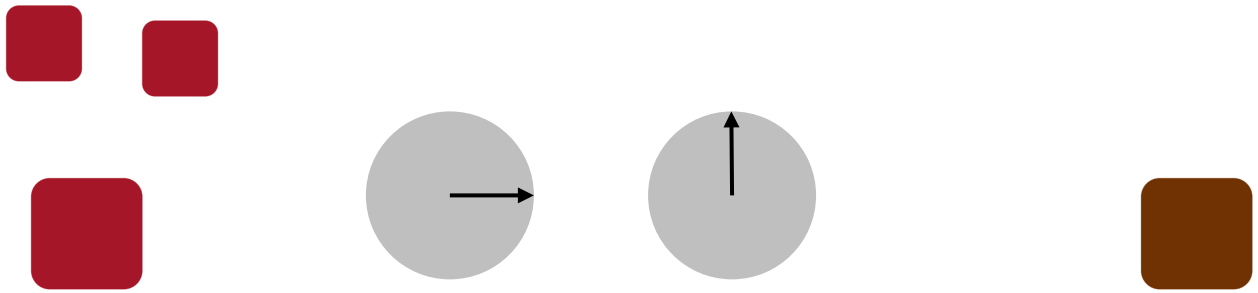
# estratégia de vida

sobrevivência ⟷ reprodução



# estratégia de vida

sobrevivência ⟷ reprodução



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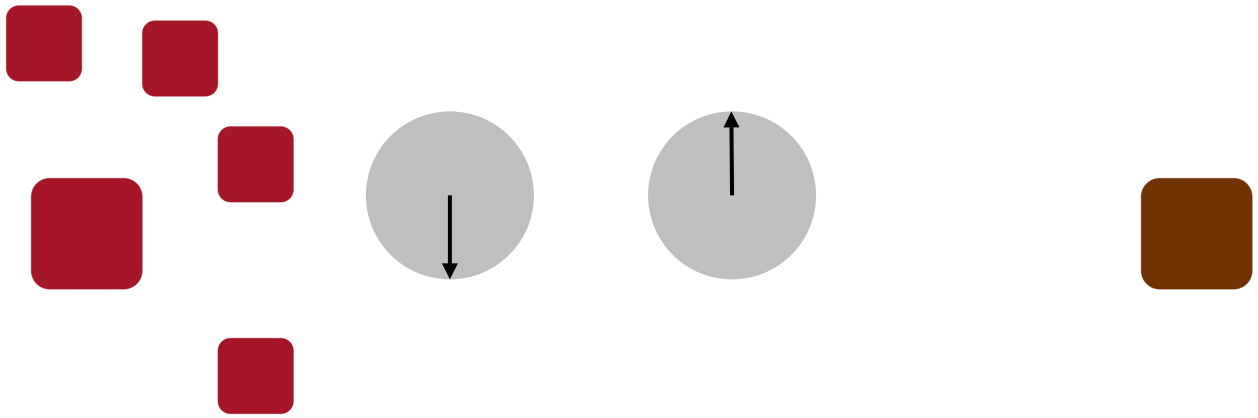

# estratégia de vida

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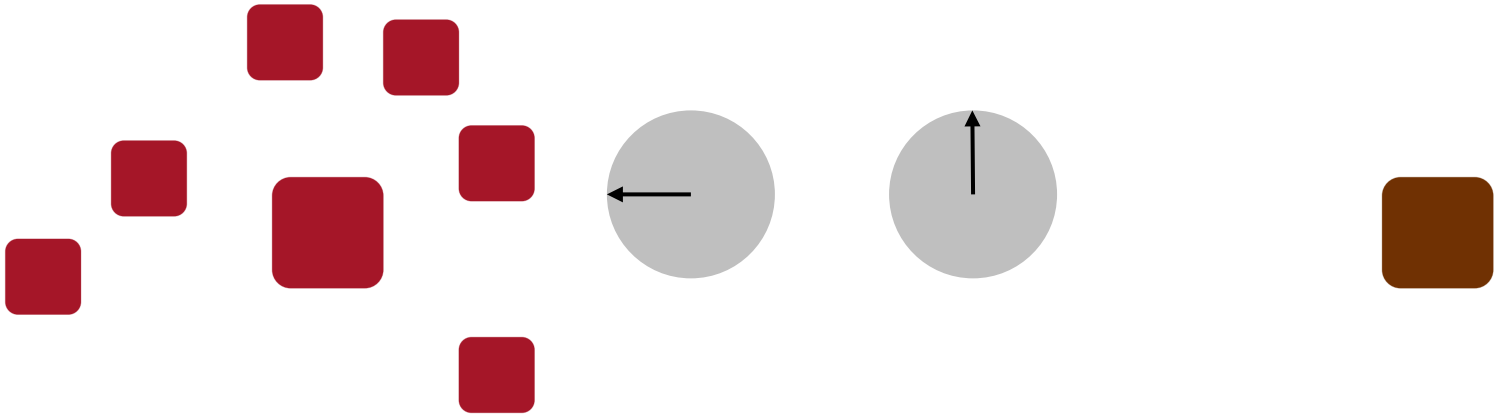

# estratégia de vida

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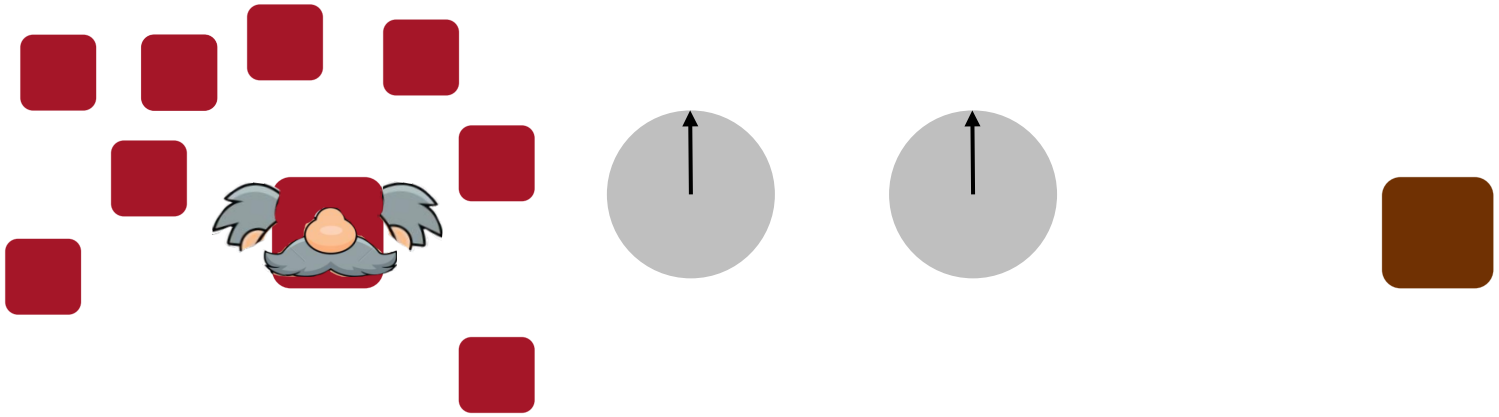
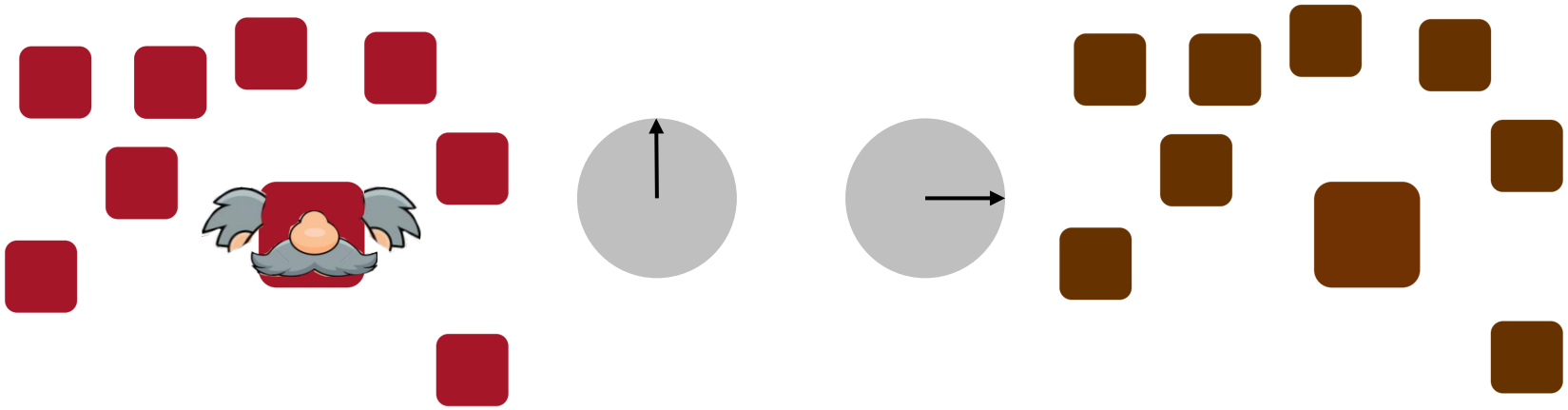


# estratégia de vida

sobrevivência ⟷ reprodução



# estratégia de vida

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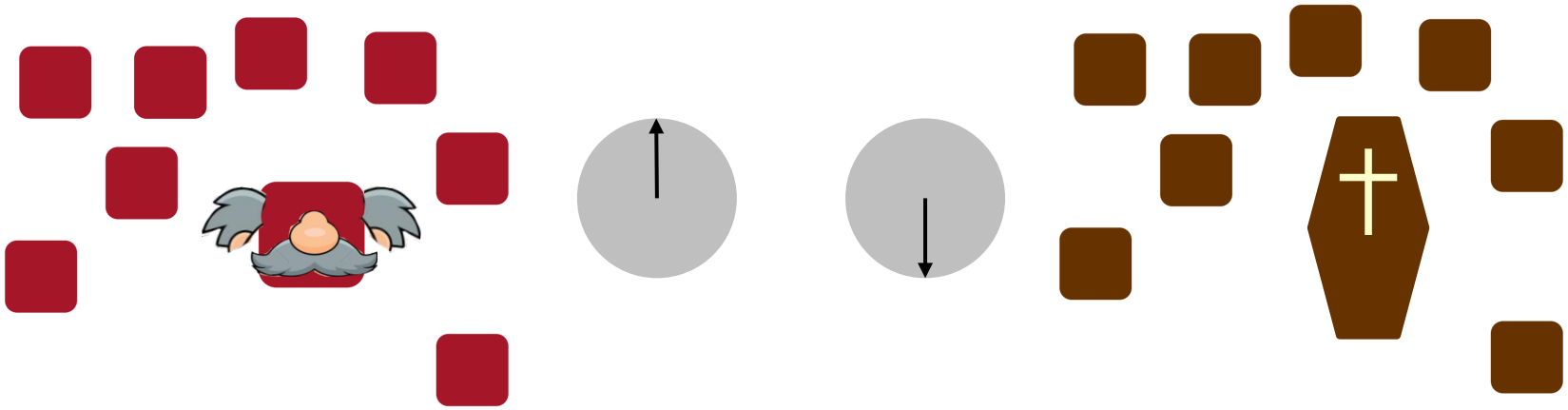

# estratégia de vida

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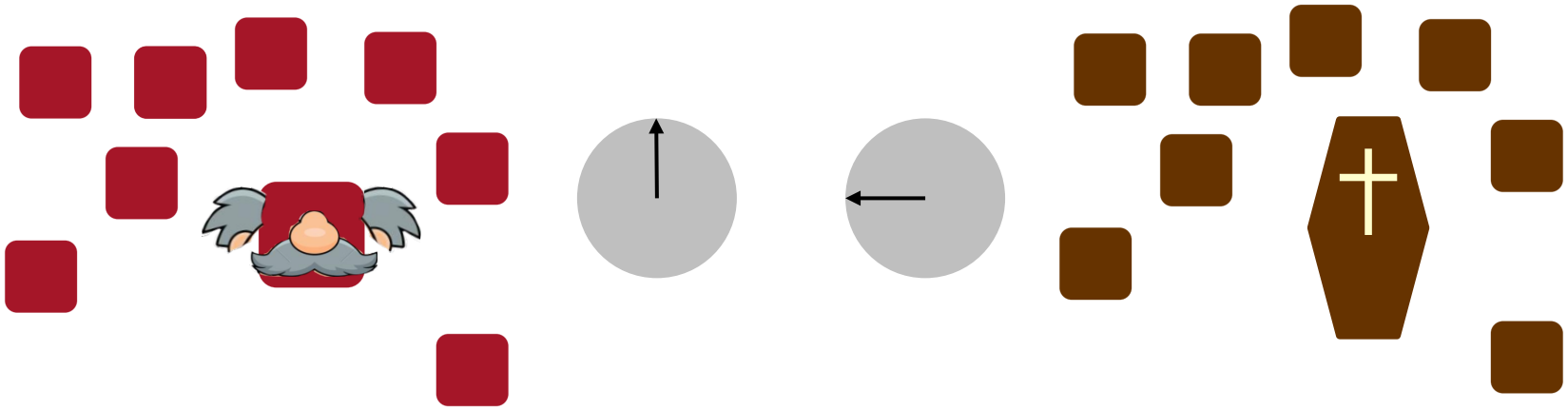

# estratégia de vida

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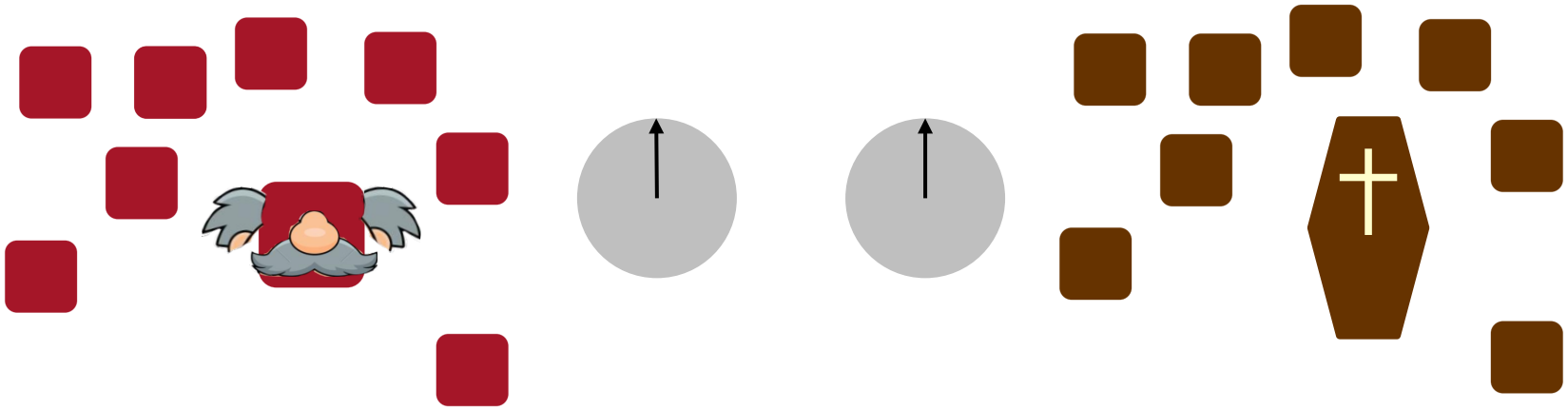


dinâmica
eco-evolutiva

dinâmica
evolutiva

dinâmica
ecológica

**estratégia de vida**

dinâmica
eco-evolutiva

dinâmica
evolutiva

dinâmica
ecológica

**estratégia de vida**

número de
descendentes

dinâmica
eco-evolutiva

dinâmica
evolutiva

dinâmica
ecológica

**estratégia de vida**

aptidão

dinâmica
eco-evolutiva

dinâmica
evolutiva

dinâmica
ecológica

**estratégia de vida**

aptidão

uso eficiente
do recurso

dinâmica
eco-evolutiva

dinâmica
evolutiva

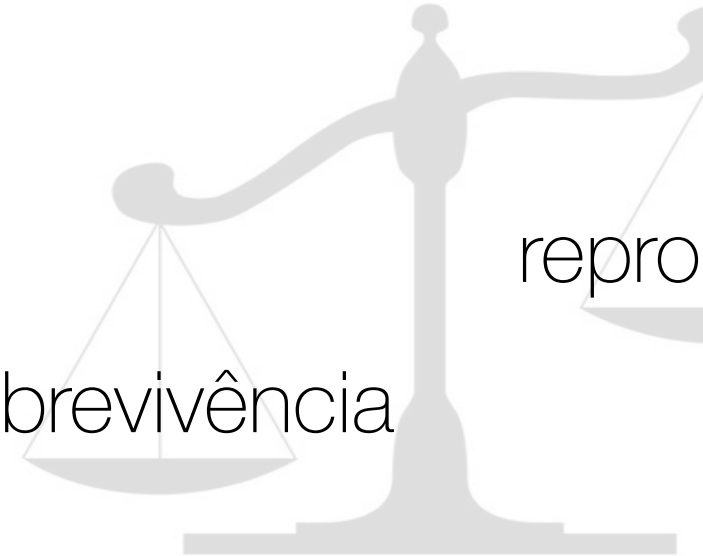
dinâmica
ecológica

**estratégia de vida**

aptidão

habilidade
competitiva

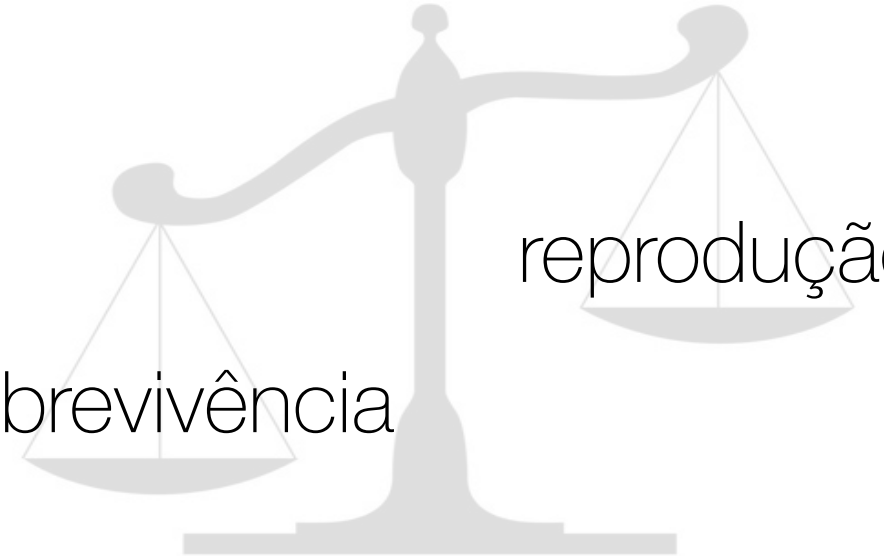
**estratégia de vida**



reprodução

sobrevivência

fatores ambientais



reprodução

sobrevivência

recurso

sobrevivência

**reprodução**

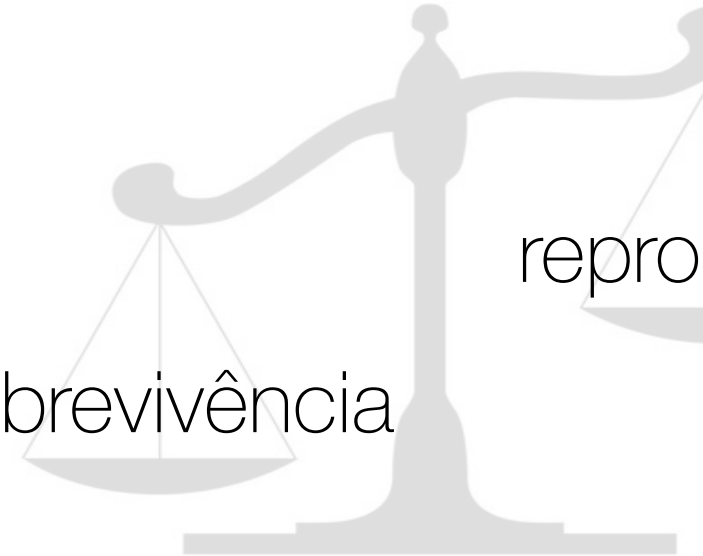
recurso

reprodução

**sobrevivência**

**distúrbio**

recurso

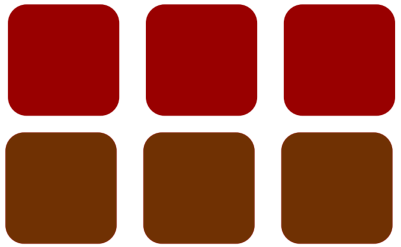


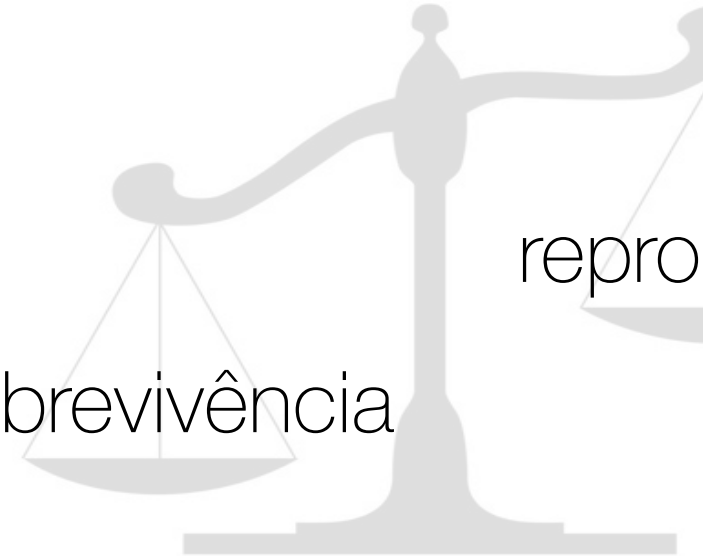
reprodução

sobrevivência

**distúrbio**

recurso



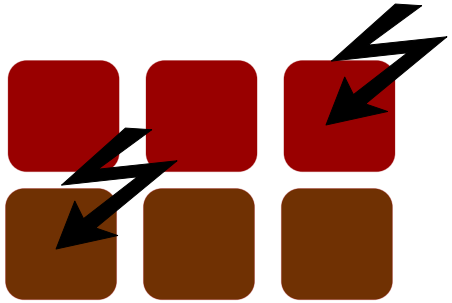


reprodução

sobrevivência

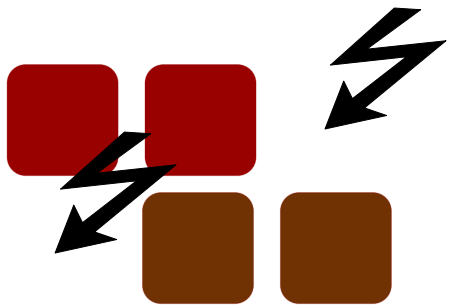
**distúrbio**

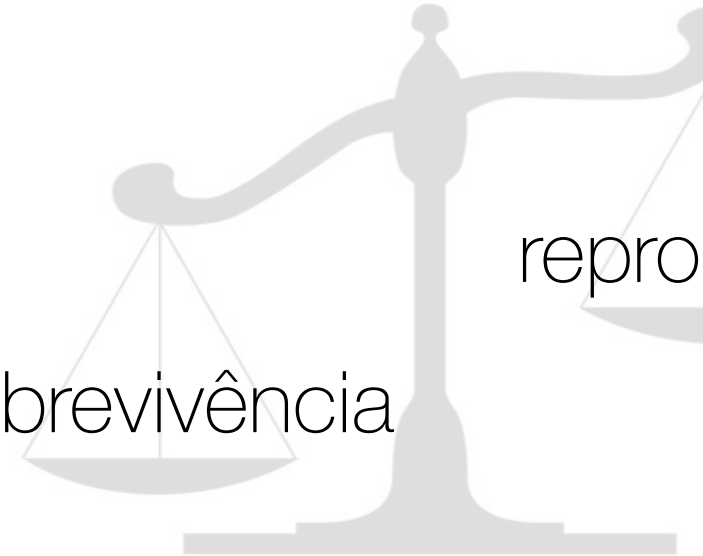
recurso



**distúrbio**

recurso



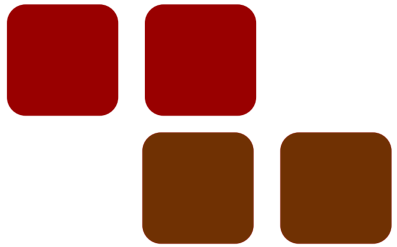


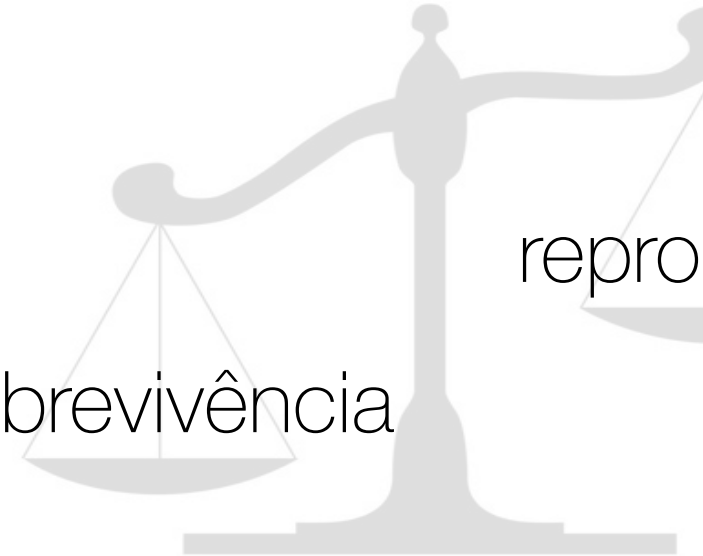
reprodução

sobrevivência

**distúrbio**

recurso



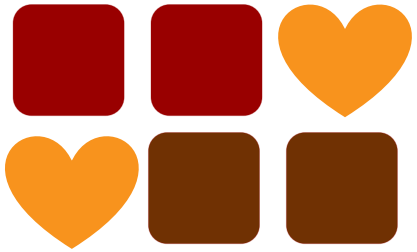


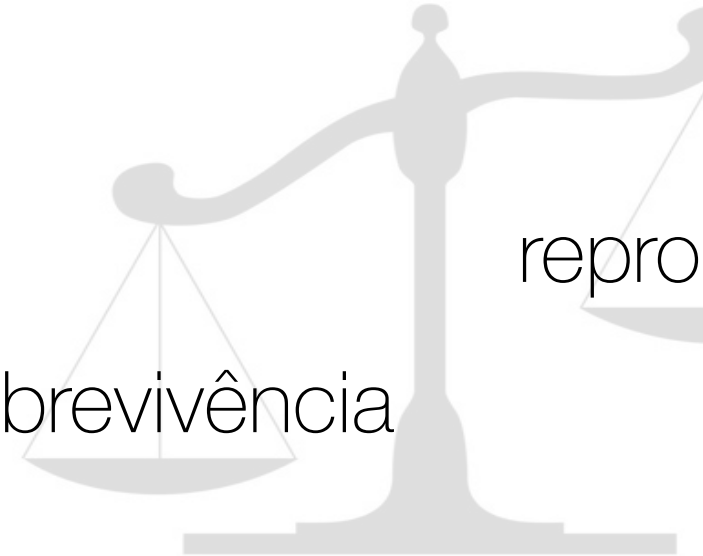
reprodução

sobrevivência

**distúrbio**

recurso



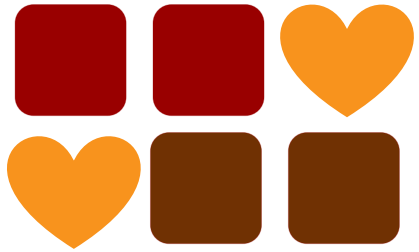


reprodução

sobrevivência

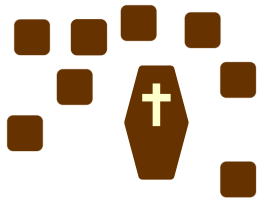
**distúrbio**

recurso



sobrevivência

**reprodução**



# distúrbio

- abundância
- recurso

# distúrbio

- abundância
- recurso

dinâmica evolutiva

dinâmica ecológica

# distúrbio

- abundância
- recurso

## dinâmica evolutiva

- seleção
- deriva genética
- fluxo gênico
- mutação

## dinâmica ecológica

- filtragem
- deriva ecológica
- migração
- especiação

# distúrbio

- abundância
- recurso

## dinâmica evolutiva

- seleção
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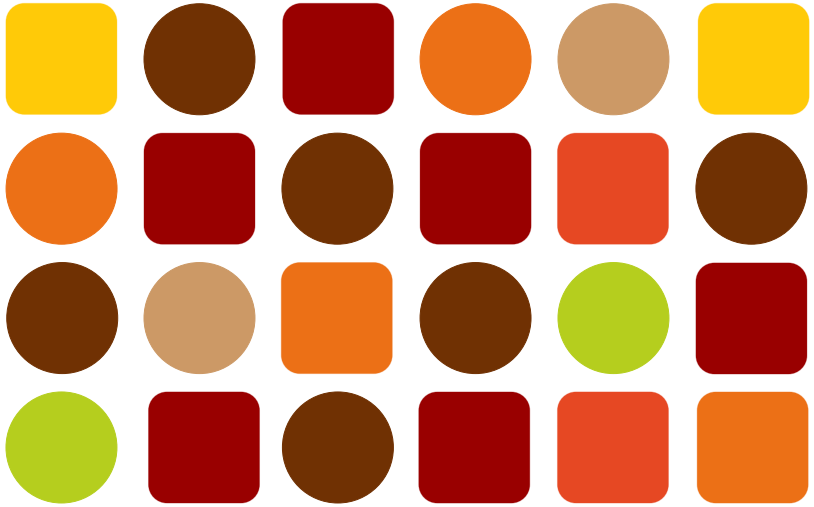
- mutação



## dinâmica ecológica

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# distúrbio

- abundância
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## dinâmica evolutiva

- seleção
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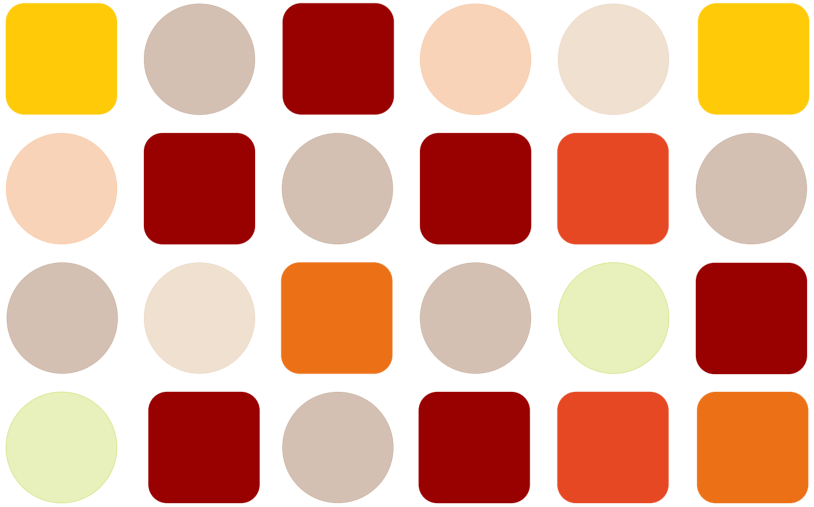

## dinâmica ecológica

- filtragem
- deriva ecológica
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# distúrbio

- abundância
- recurso

## dinâmica evolutiva

- seleção
- deriva genética
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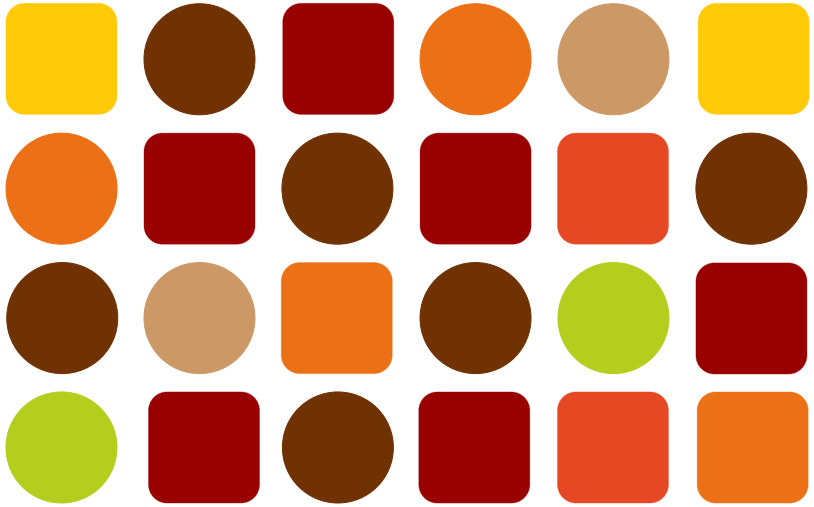

## dinâmica ecológica

- filtragem
- deriva ecológica
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- especiação

# distúrbio

- abundância
- recurso

## dinâmica evolutiva

- seleção
- deriva genética
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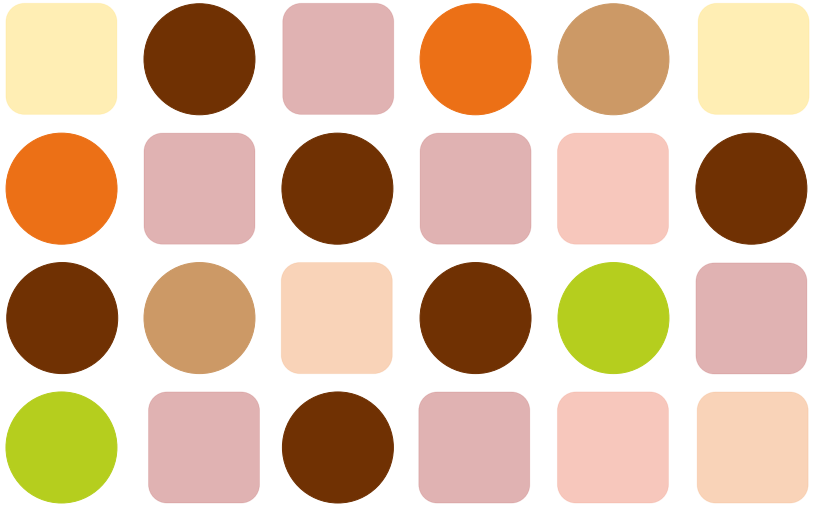

## dinâmica ecológica

- filtragem
- deriva ecológica
- migração
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# distúrbio

- abundância
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## dinâmica evolutiva

- seleção
- deriva genética
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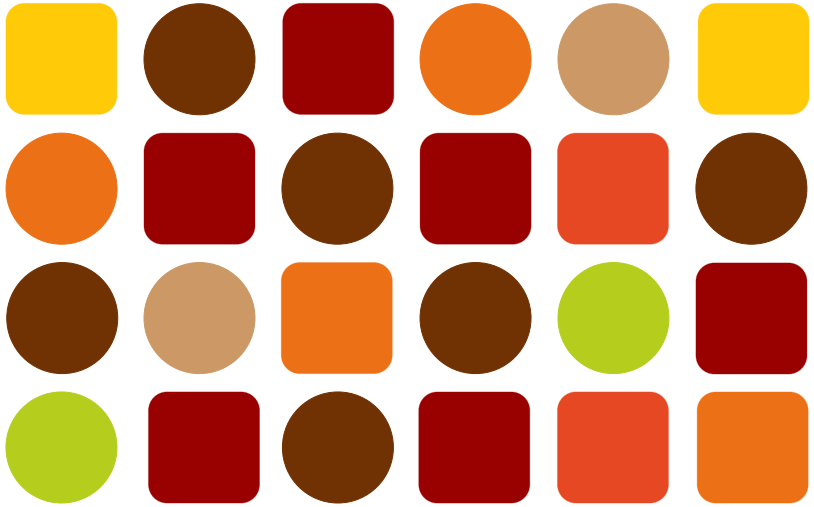

## dinâmica ecológica

- filtragem
- deriva ecológica
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# distúrbio

- abundância
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## dinâmica evolutiva

- seleção
- deriva genética
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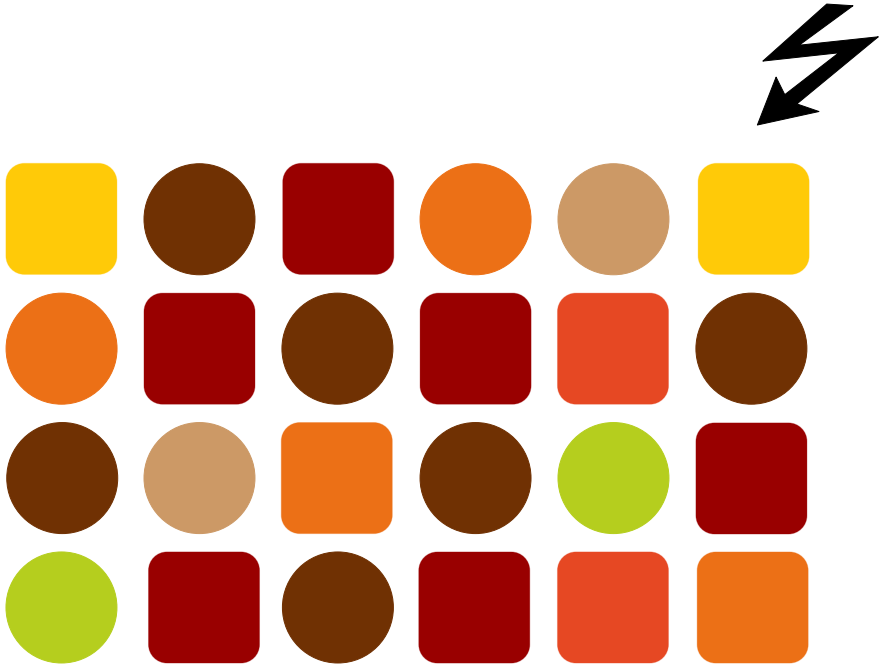


## dinâmica ecológica

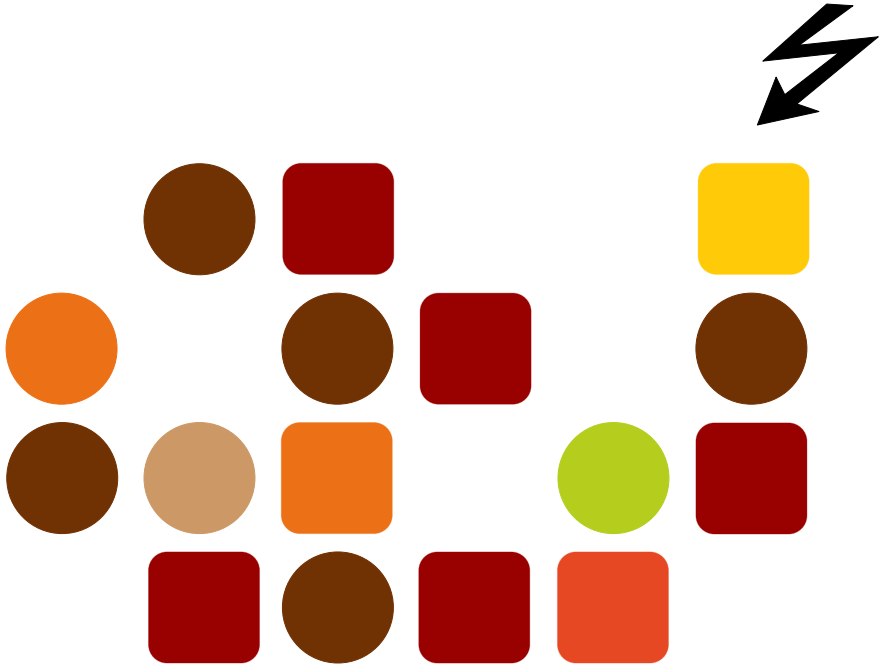
- filtragem
- deriva ecológica
- migração
- especiação

# distúrbio

- abundância
- recurso

## dinâmica evolutiva

- seleção
- deriva genética
- fluxo gênico
- mutação



## dinâmica ecológica

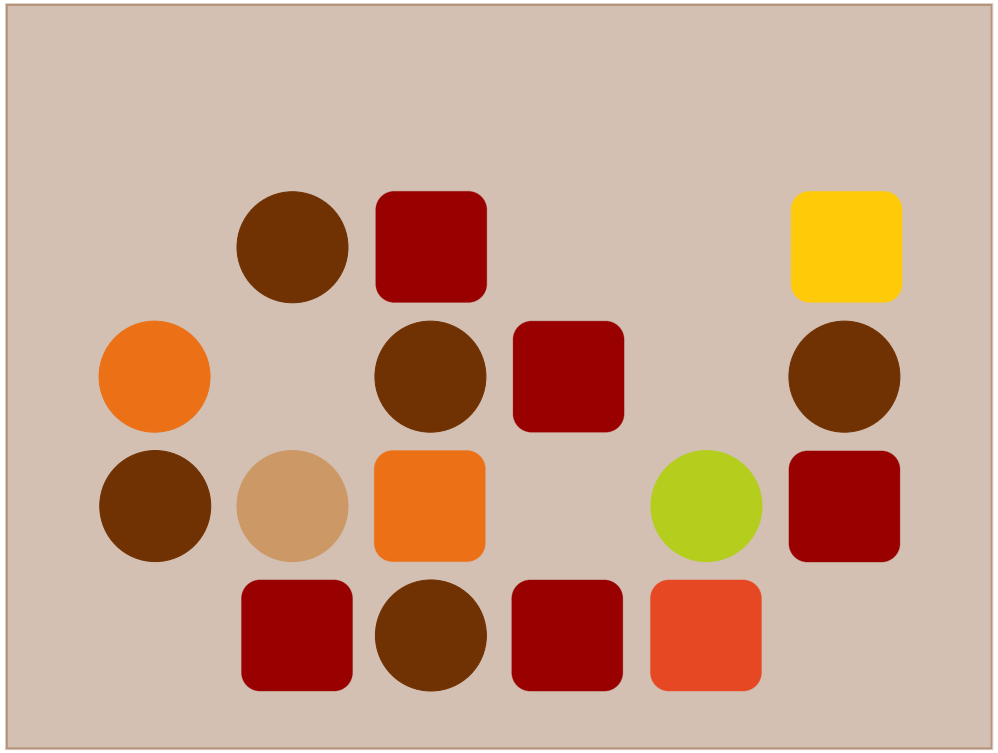
- filtragem
- deriva ecológica
- migração
- especiação

# distúrbio

- abundância
- recurso

## dinâmica evolutiva

- seleção
- deriva genética
- fluxo gênico
- mutação



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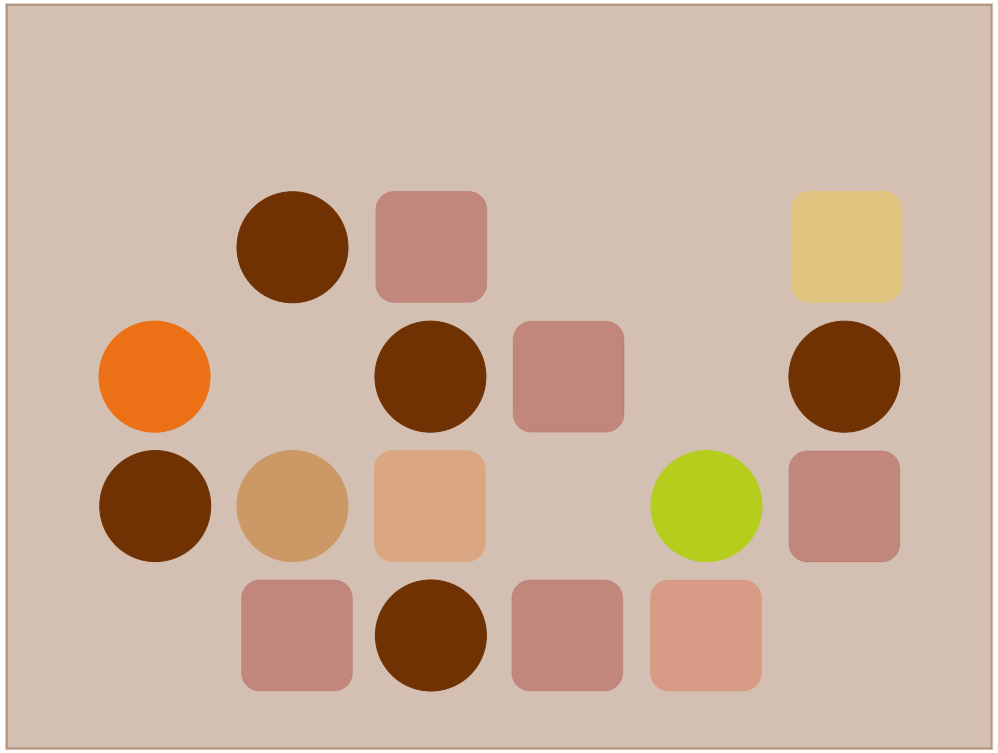

## dinâmica ecológica

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## dinâmica evolutiva

- **seleção**
- deriva genética
- fluxo gênico
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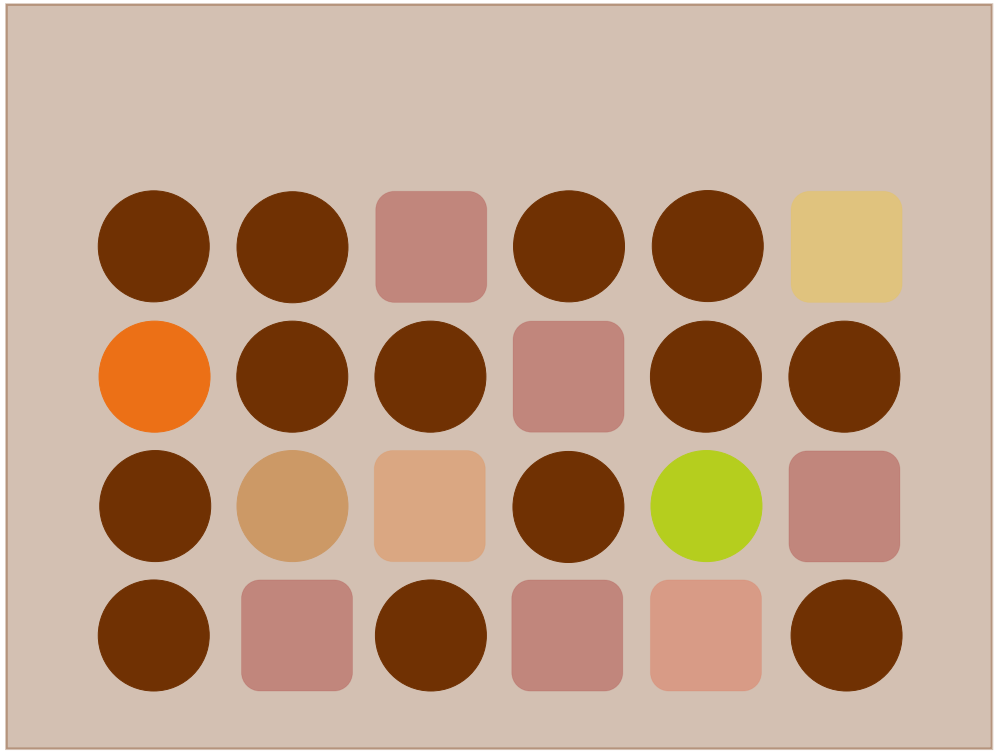

## dinâmica ecológica

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- deriva ecológica
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## dinâmica evolutiva

- **seleção**
- deriva genética
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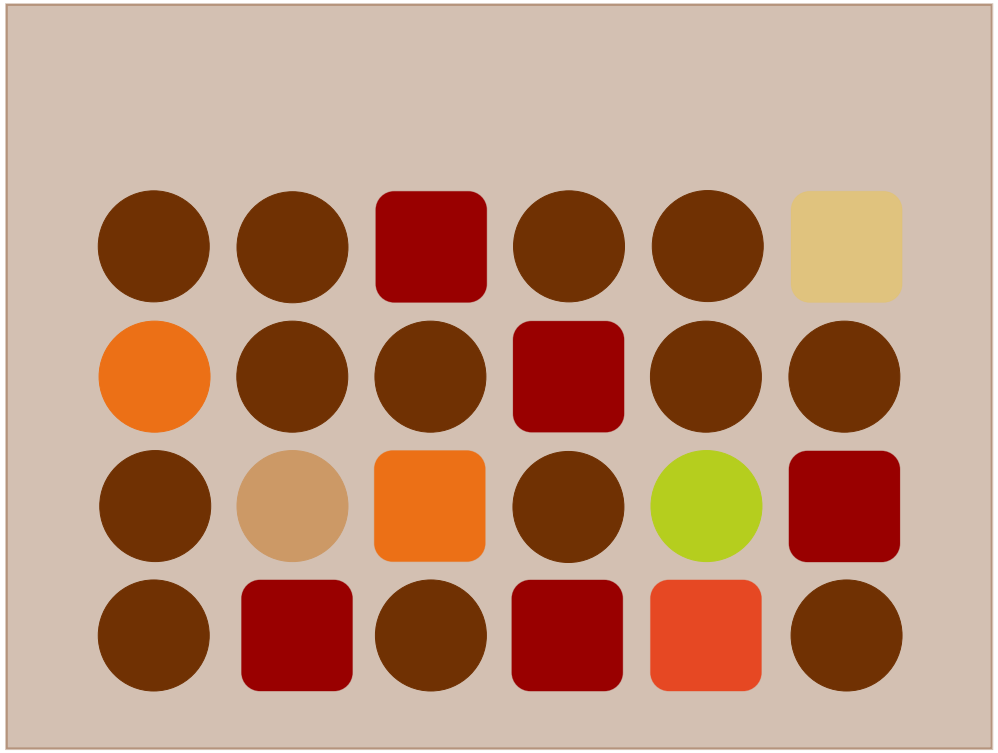

## dinâmica ecológica

- filtragem
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- deriva genética
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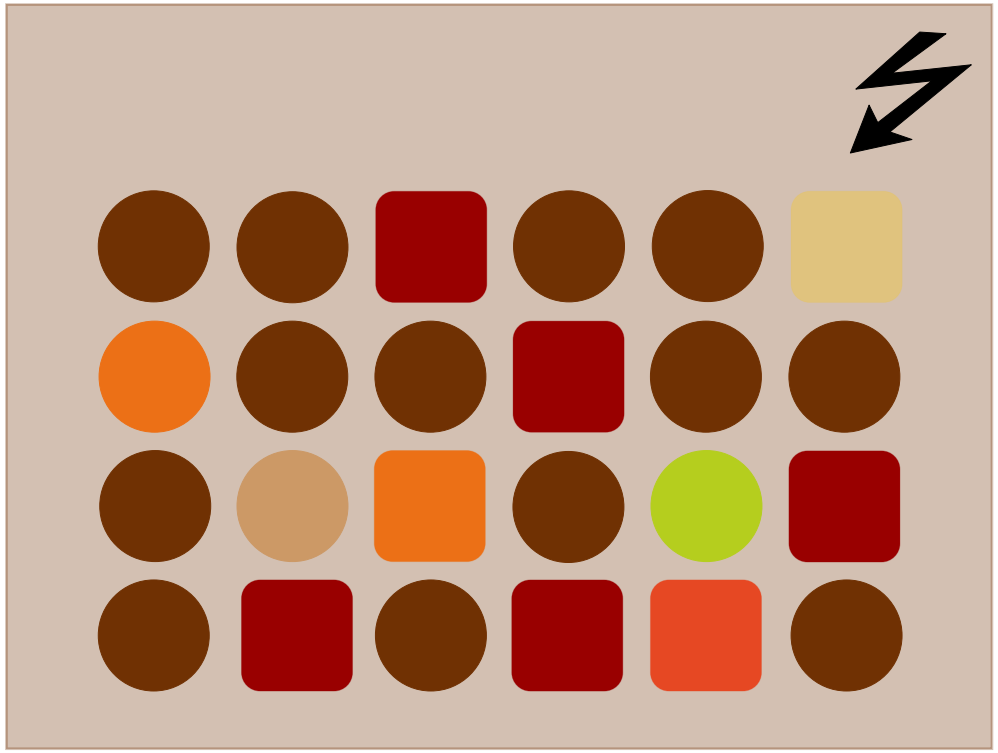

## dinâmica ecológica

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- deriva ecológica
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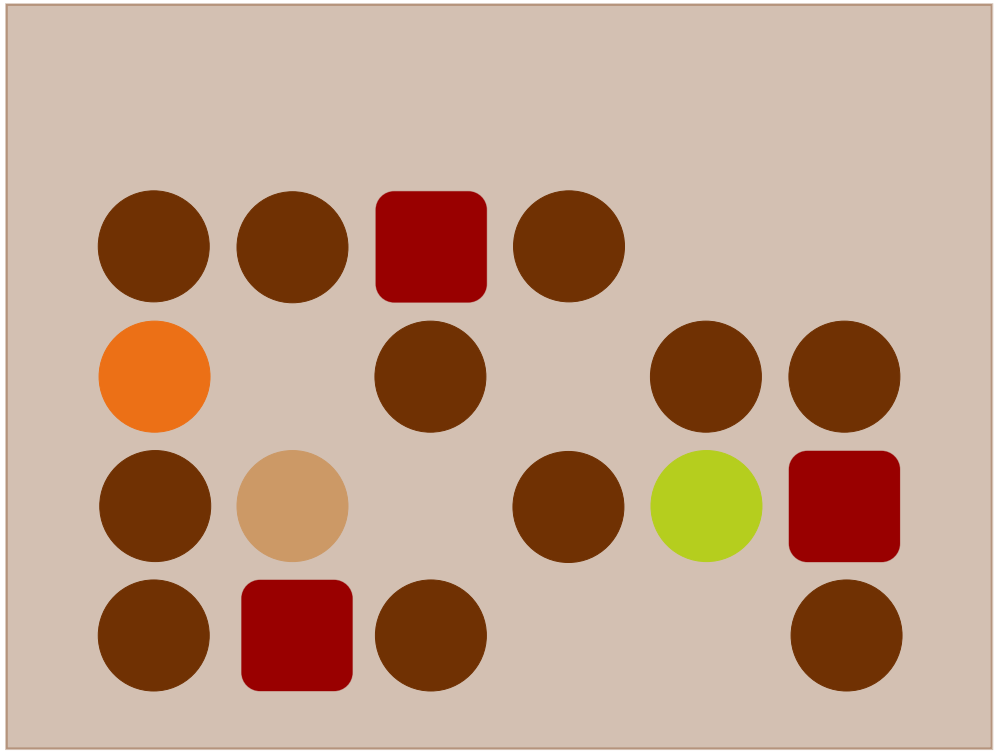

## dinâmica ecológica

- filtragem
- deriva ecológica
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## dinâmica evolutiva

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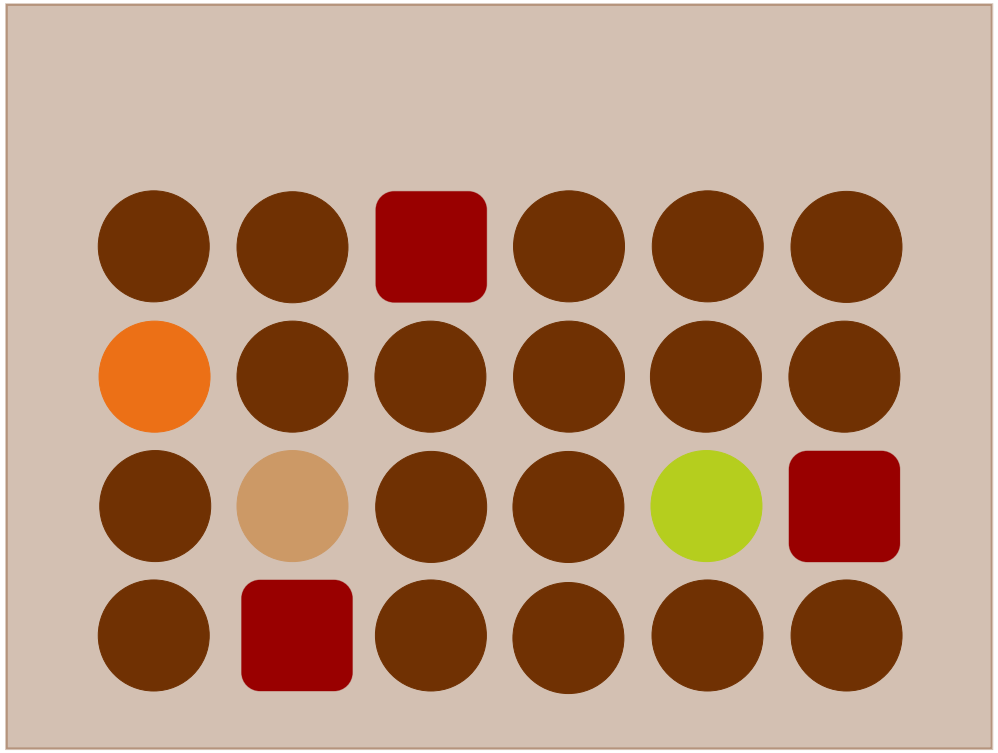

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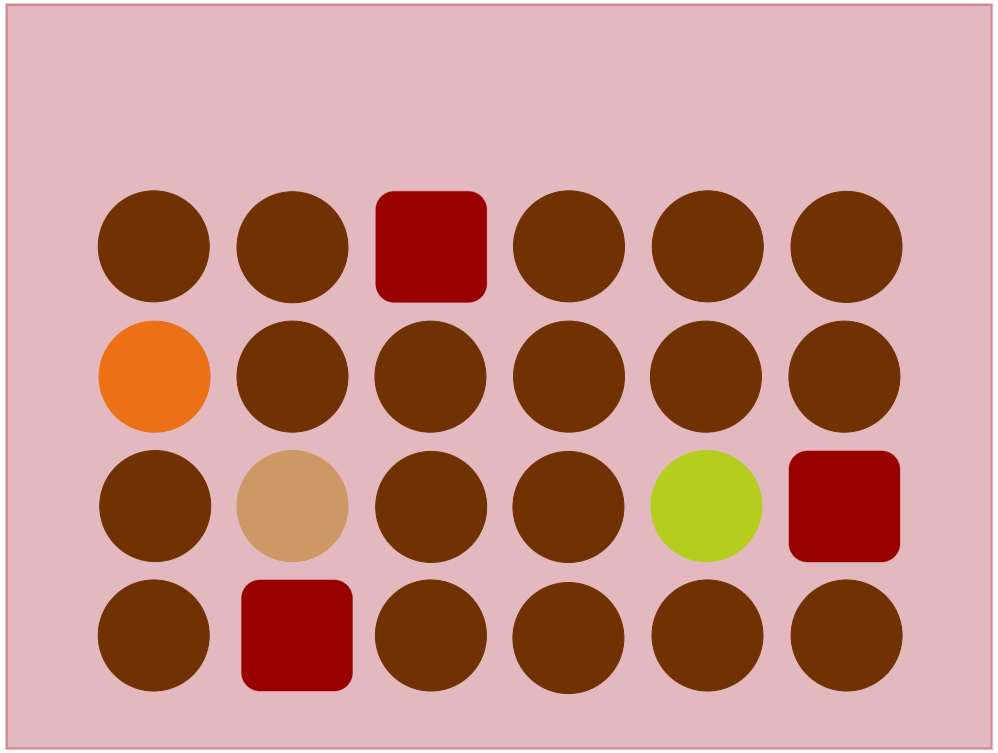


## dinâmica ecológica

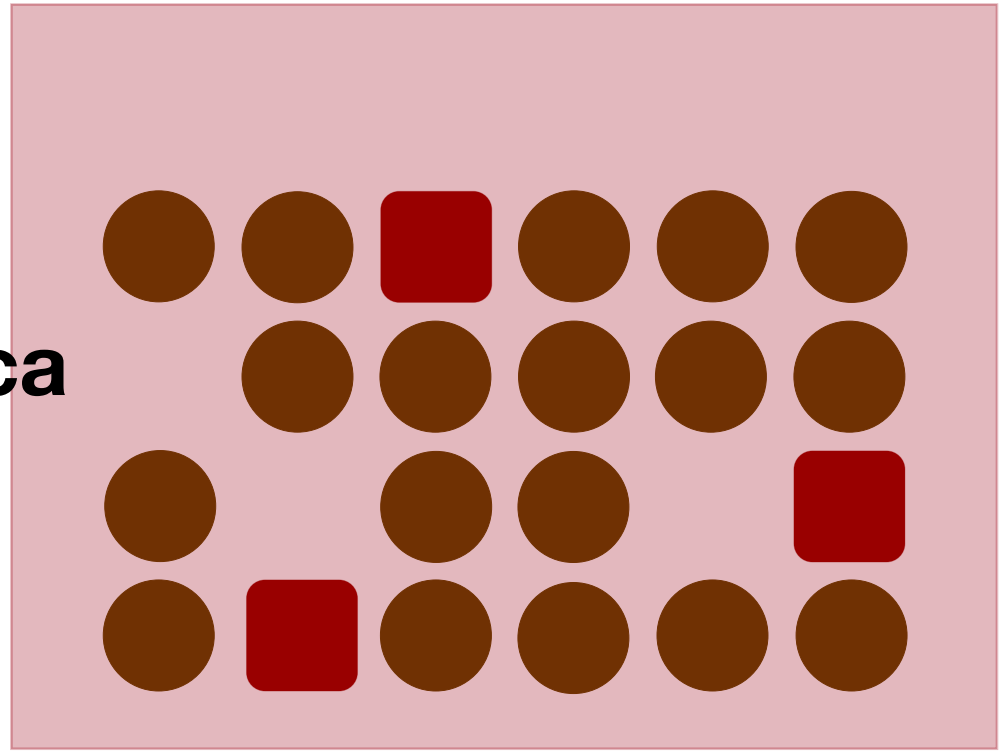
- **filtragem**
- deriva ecológica
- migração
- especiação

# distúrbio

- abundância
- recurso

## dinâmica evolutiva

- **seleção**
- **deriva genética**
- fluxo gênico
- mutação



## dinâmica ecológica

- **filtragem**
- deriva ecológica
- migração
- especiação

# distúrbio

- abundância
- recurso

## dinâmica evolutiva

- **seleção**
- **deriva genética**
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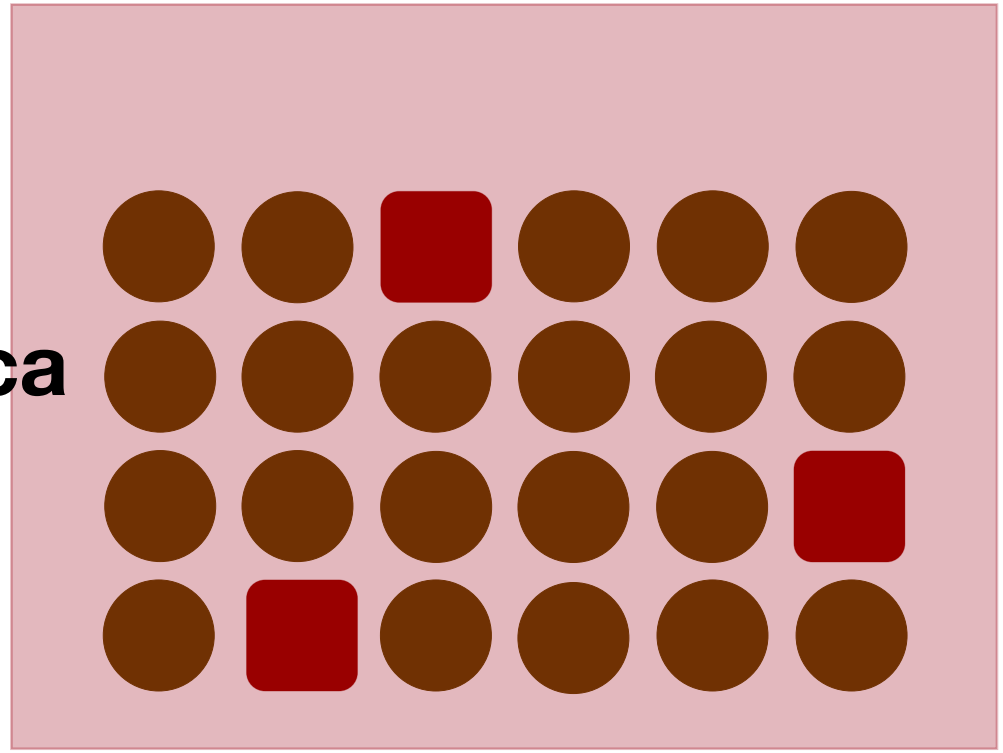

## dinâmica ecológica

- **filtragem**
- deriva ecológica
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- abundância
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- **seleção**
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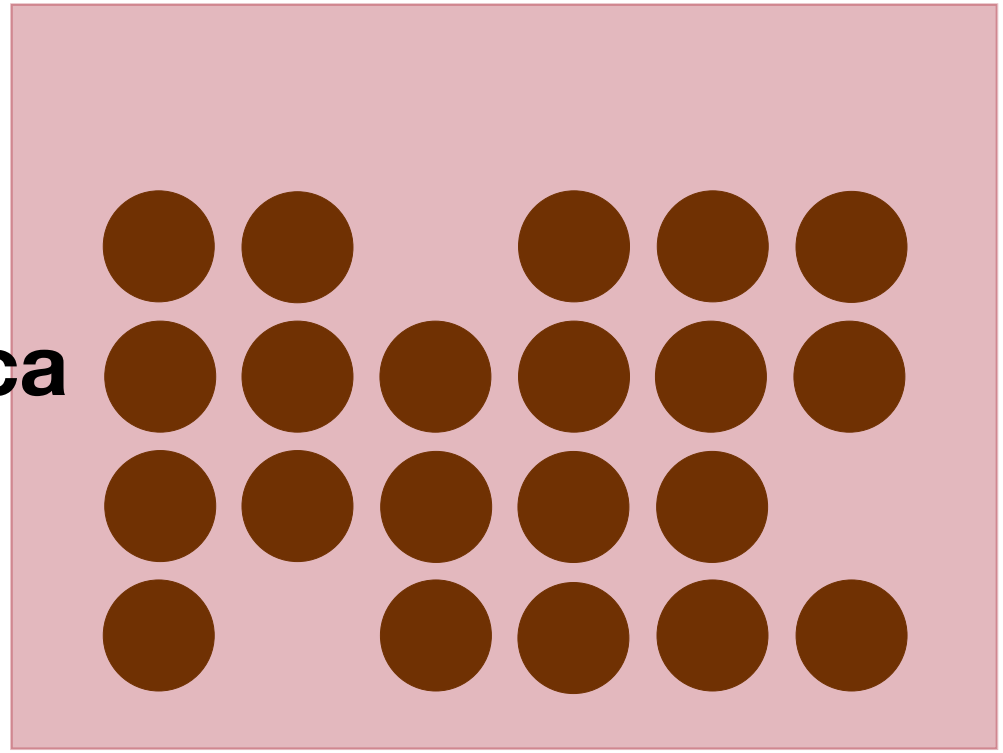

## dinâmica ecológica

- **filtragem**
- **deriva ecológica**
- migração
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# distúrbio

- abundância
- recurso

## dinâmica evolutiva

- **seleção**
- **deriva genética**
- fluxo gênico
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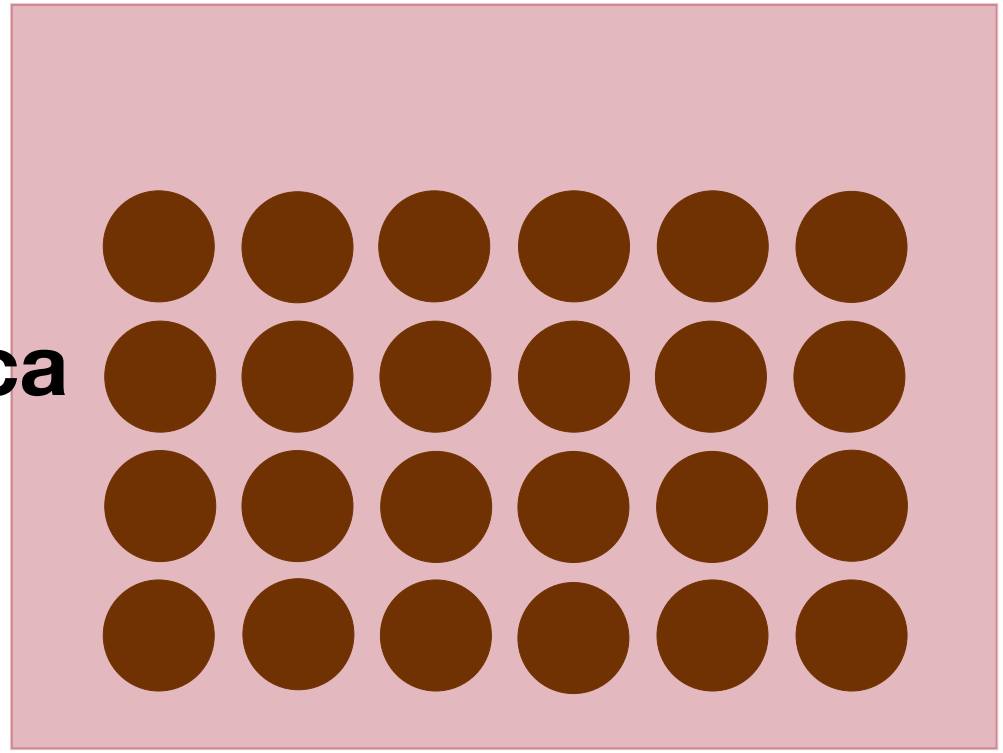


## dinâmica ecológica

- **filtragem**
- **deriva ecológica**
- migração
- especiação

# distúrbio

## Biologia Evolutiva

- população
- adaptação

## Ecologia de Comunidades

- comunidade
- exclusão competitiva de populações

# porém…

dinâmica evolutiva ⟷ dinâmica ecológica

# porém…

dinâmica
eco-evolutiva

dinâmica
evolutiva

dinâmica
ecológica

# porém…

dinâmica
eco-evolutiva

dinâmica
evolutiva

dinâmica
ecológica

- contextos multiespecíficos
- espécies sob evolução

# logo…

dinâmica
eco-evolutiva

dinâmica
evolutiva

dinâmica
ecológica

# logo…

dinâmica
eco-evolutiva

dinâmica
evolutiva

dinâmica
ecológica

**distúrbio**

# logo…

dinâmica
eco-evolutiva

dinâmica
evolutiva

dinâmica
ecológica

**distúrbio**

predições
distintas e imprecisas

# Como o **distúrbio** determina

Como o **distúrbio** determina

as **estratégias de vida** presentes

Como o **distúrbio** determina

as **estratégias de vida** presentes

em populações e comunidades sob **dinâmicas**

Como o **distúrbio** determina

as **estratégias de vida** presentes

em populações e comunidades sob **dinâmicas**

**evolutivas**, **ecológicas** e **eco-evolutivas**?

# modelo baseado em indivíduo

# modelo baseado em indivíduo

# modelo baseado em indivíduo

***parâmetros***

# modelo baseado em indivíduo

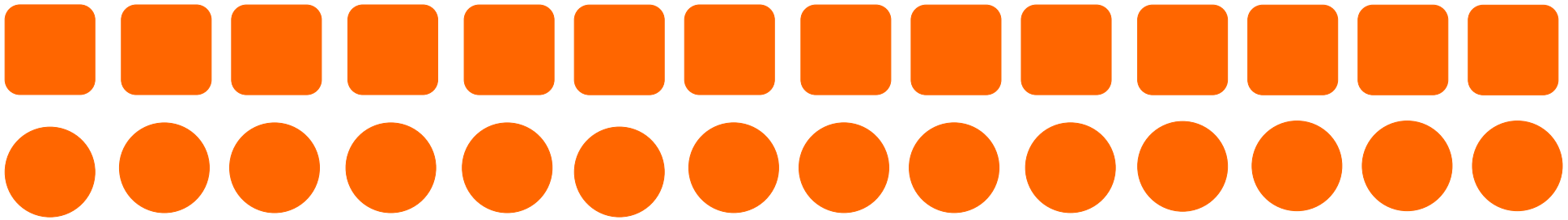
***parâmetros***

# modelo baseado em indivíduo

**parâmetros**

*riqueza t0*

# modelo baseado em indivíduo



***parâmetros***

*riqueza t0*

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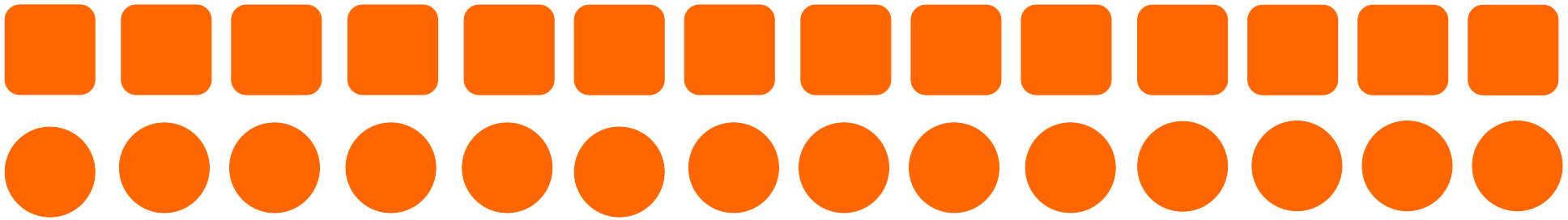

***parâmetros***

*riqueza t0*

*abundância t0*

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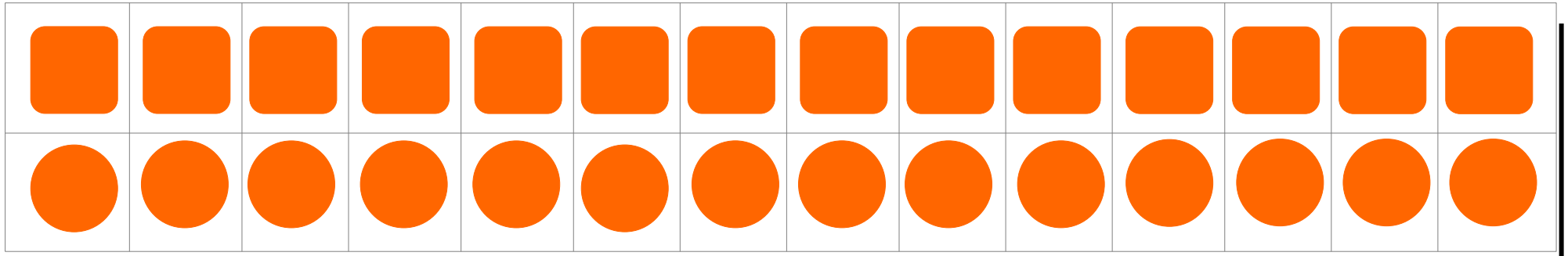

***parâmetros***

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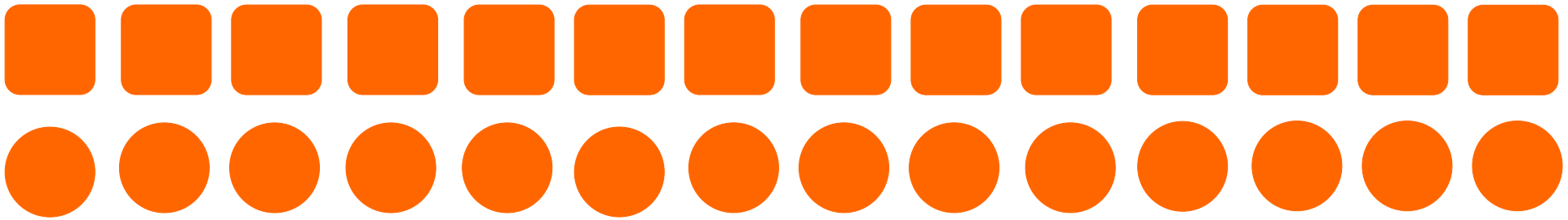

***parâmetros***

*riqueza t0*

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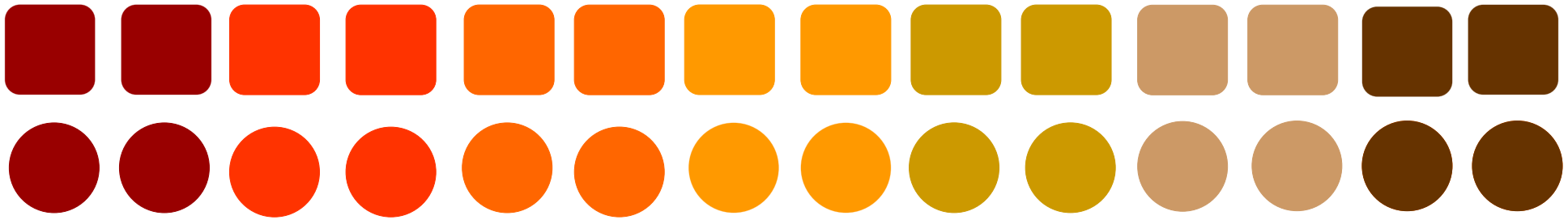

***parâmetros***

*riqueza t0*

*abundância t0*

# modelo baseado em indivíduo

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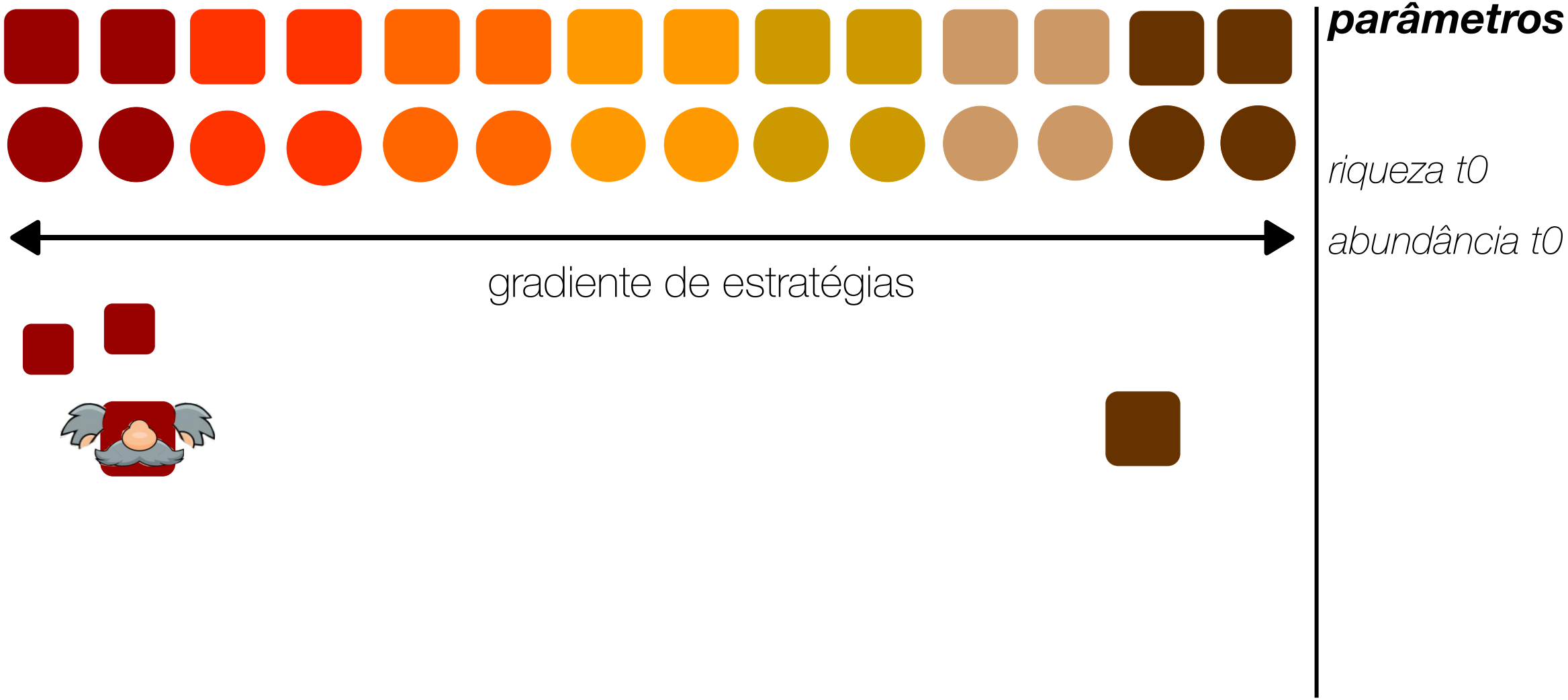

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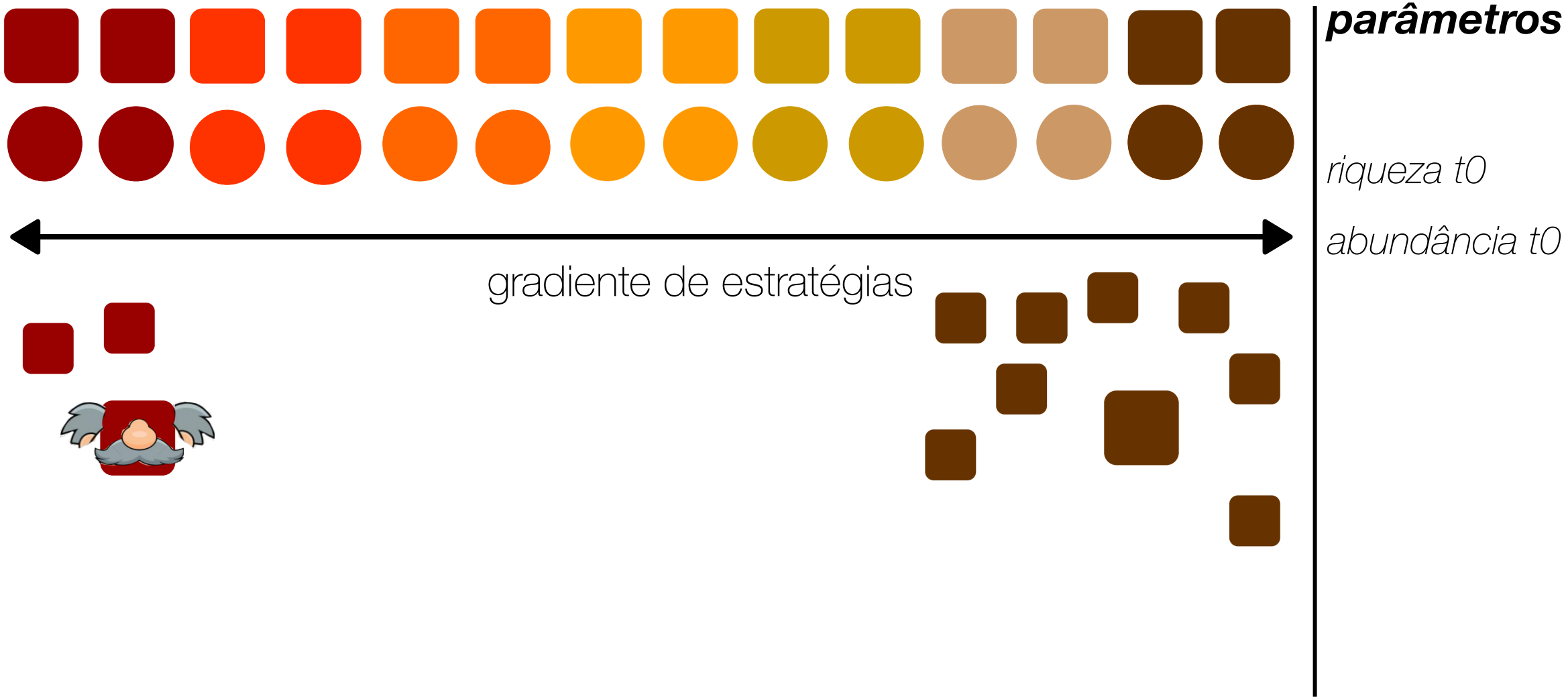

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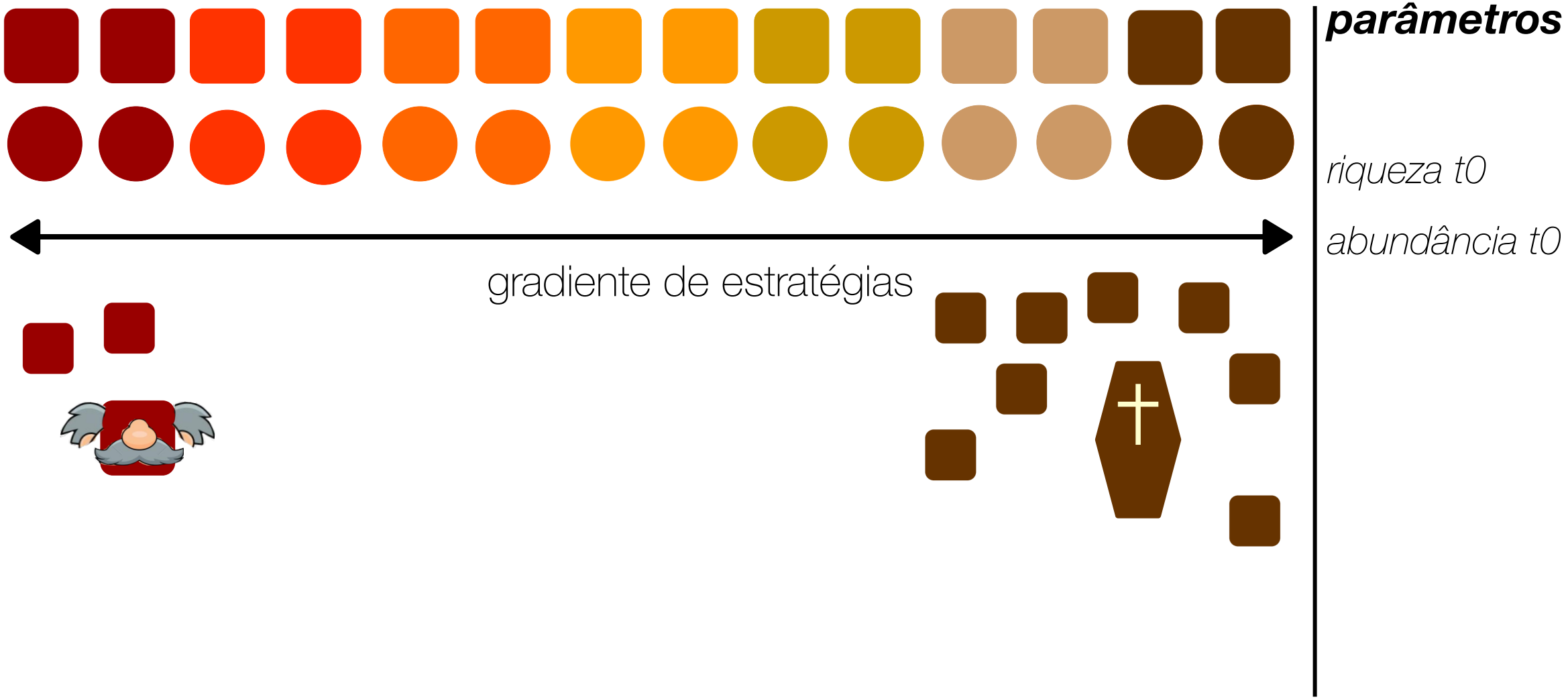

# modelo baseado em indivíduo

*trade-off*:

# modelo baseado em indivíduo

*trade-off*: $\dfrac{\text{número de gametas femininos / ciclo}}{\text{probabilidade de morte / ciclo}}$

# modelo baseado em indivíduo

***parâmetros***

*riqueza t0*

*abundância t0*

*no gametas♀/ciclo*

*trade-off*: número de gametas femininos / ciclo

---

probabilidade de morte / ciclo

# modelo baseado em indivíduo

***parâmetros***

*riqueza t0*

*abundância t0*

*no gametas♀/ciclo*

*trade-off*: $\dfrac{\text{número de gametas femininos / ciclo}}{\text{probabilidade de morte / ciclo}} = \text{constante}$

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***parâmetros***

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*constante*

*trade-off*: $\dfrac{\text{número de gametas femininos / ciclo}}{\text{probabilidade de morte / ciclo}} = \text{constante}$

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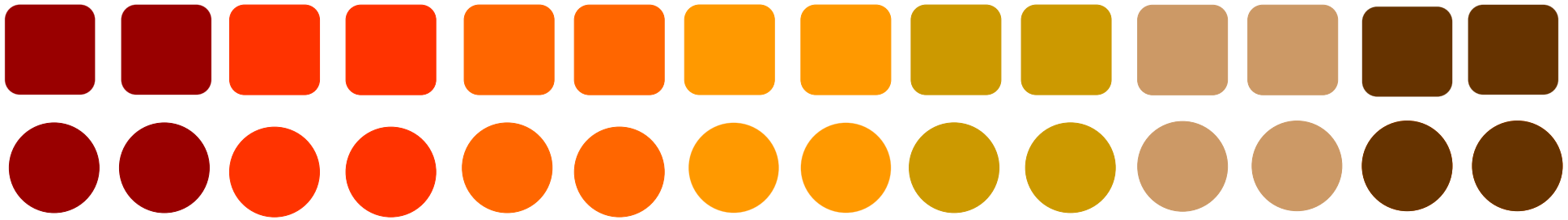

***parâmetros***

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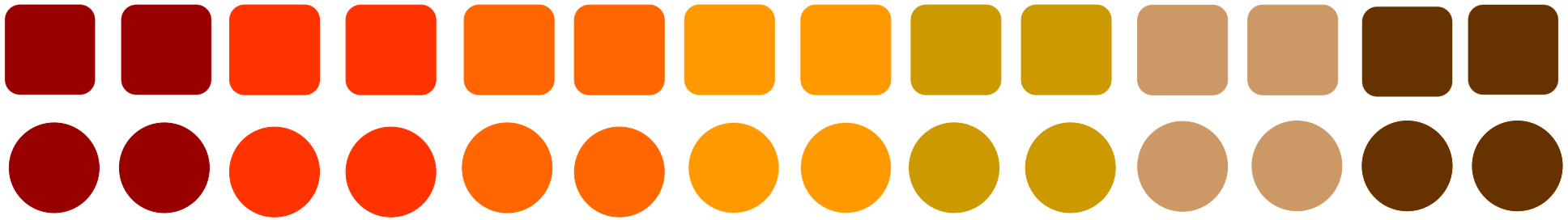

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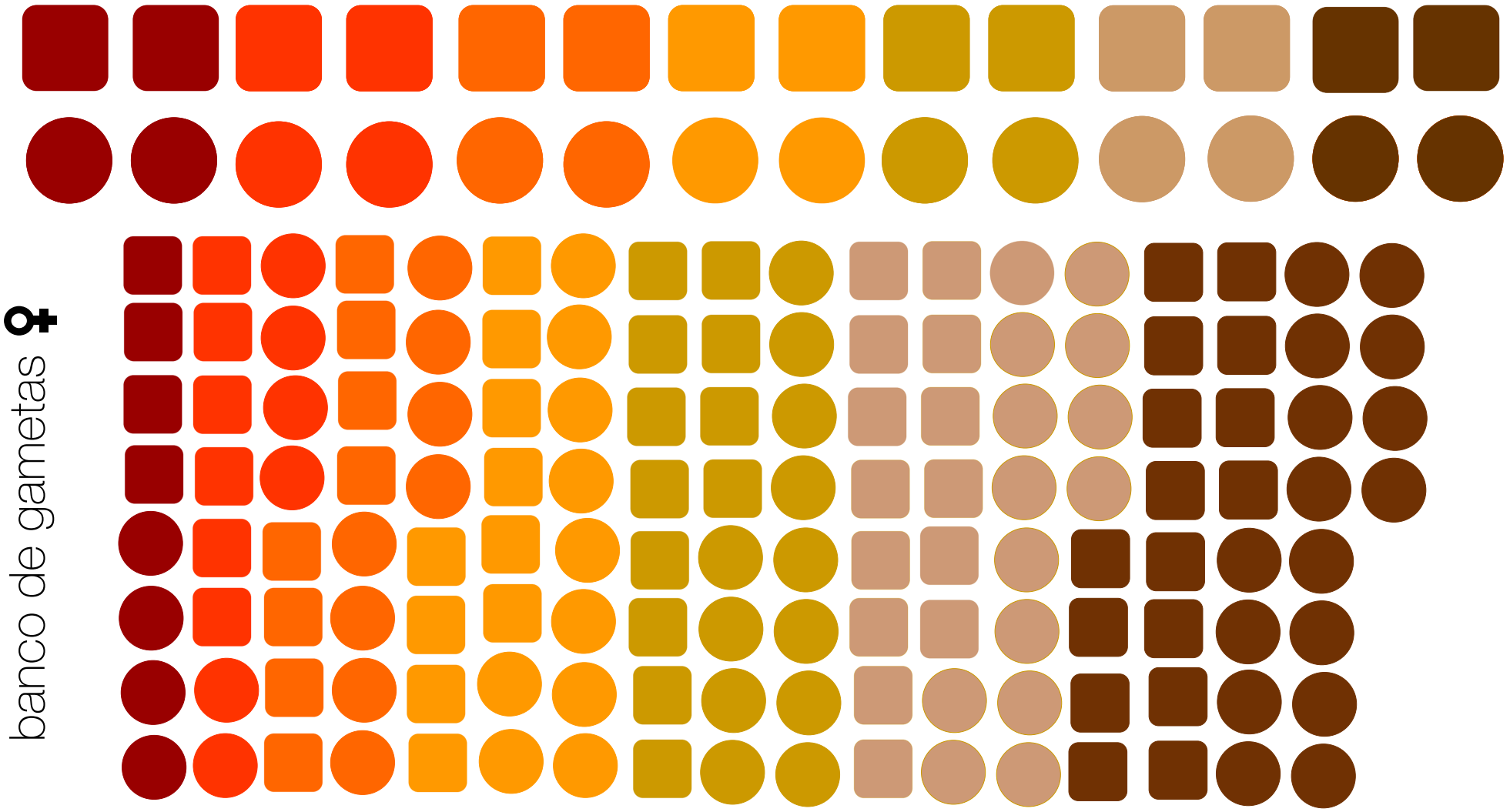


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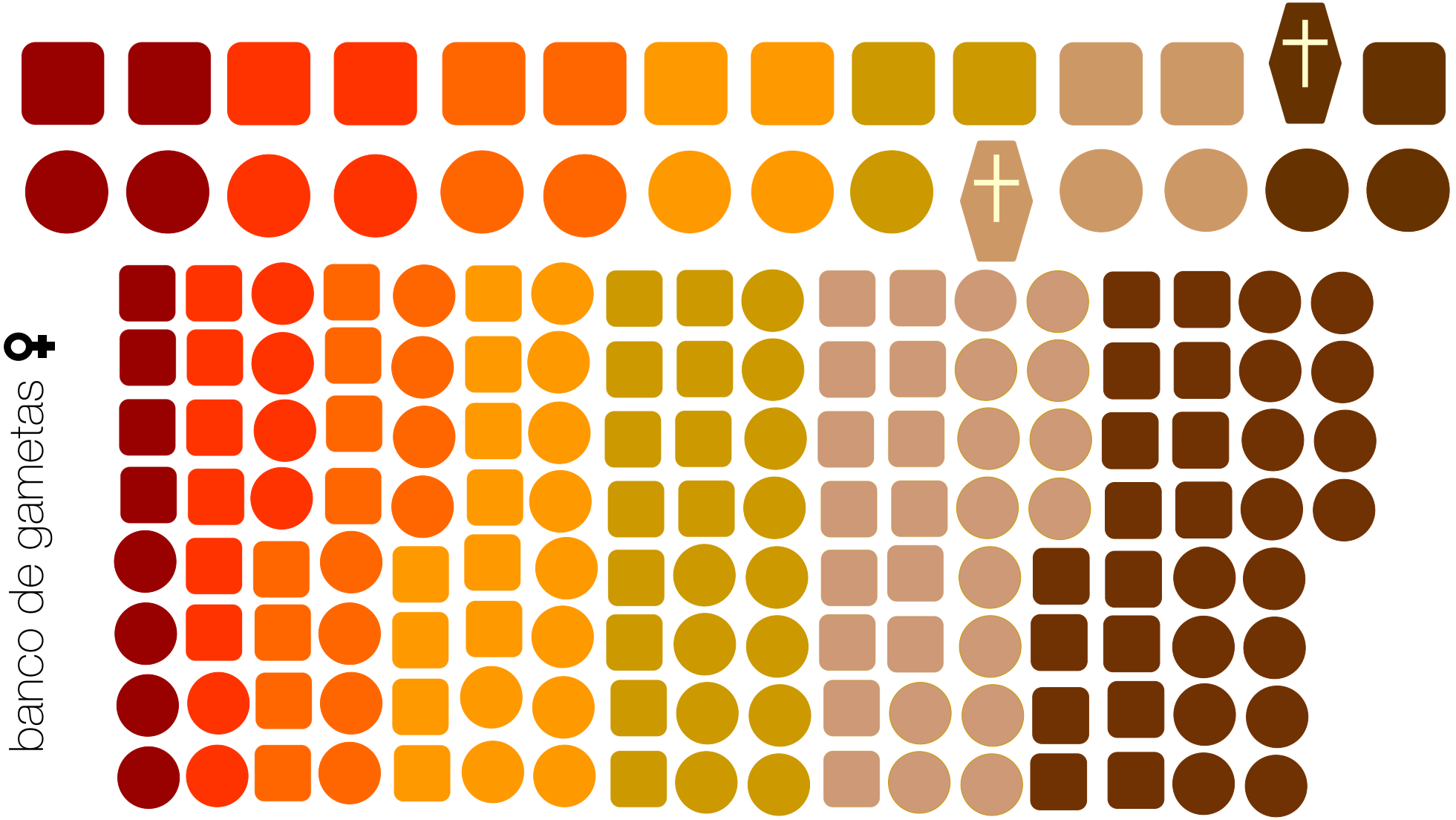


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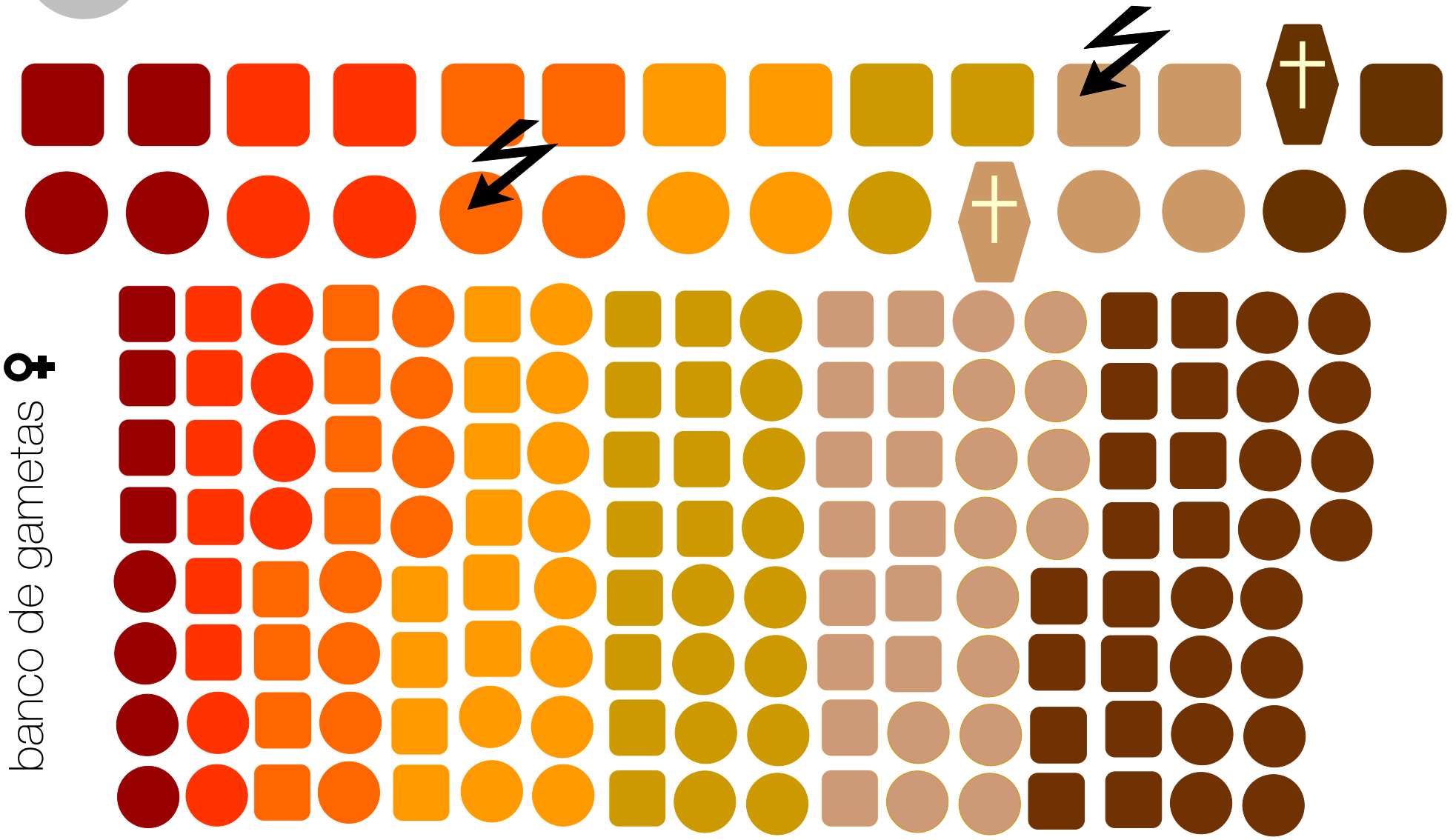


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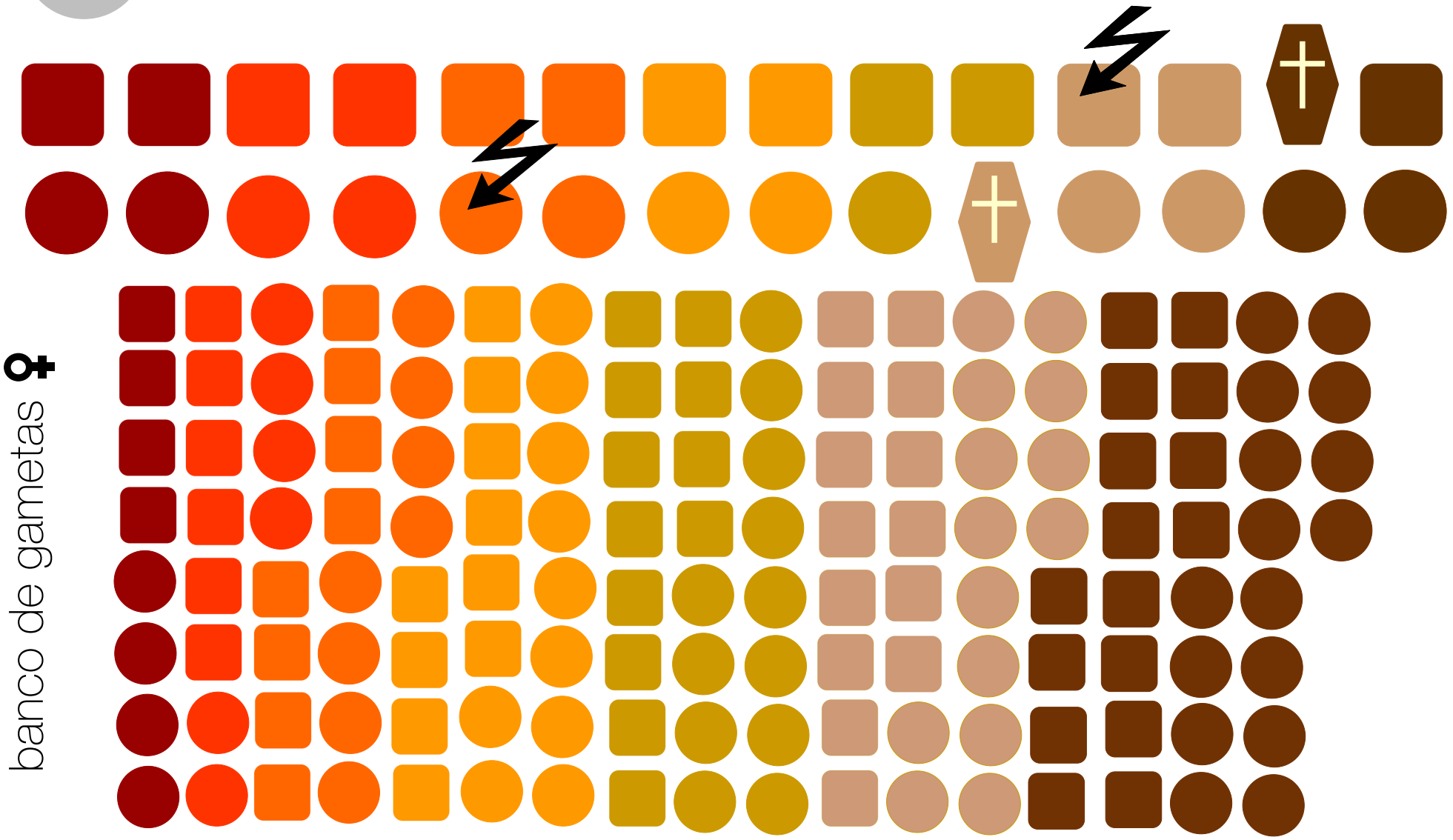


***parâmetros***

*riqueza t0*

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*constante*

*no distúrbios*

*% morta/distúrbio*

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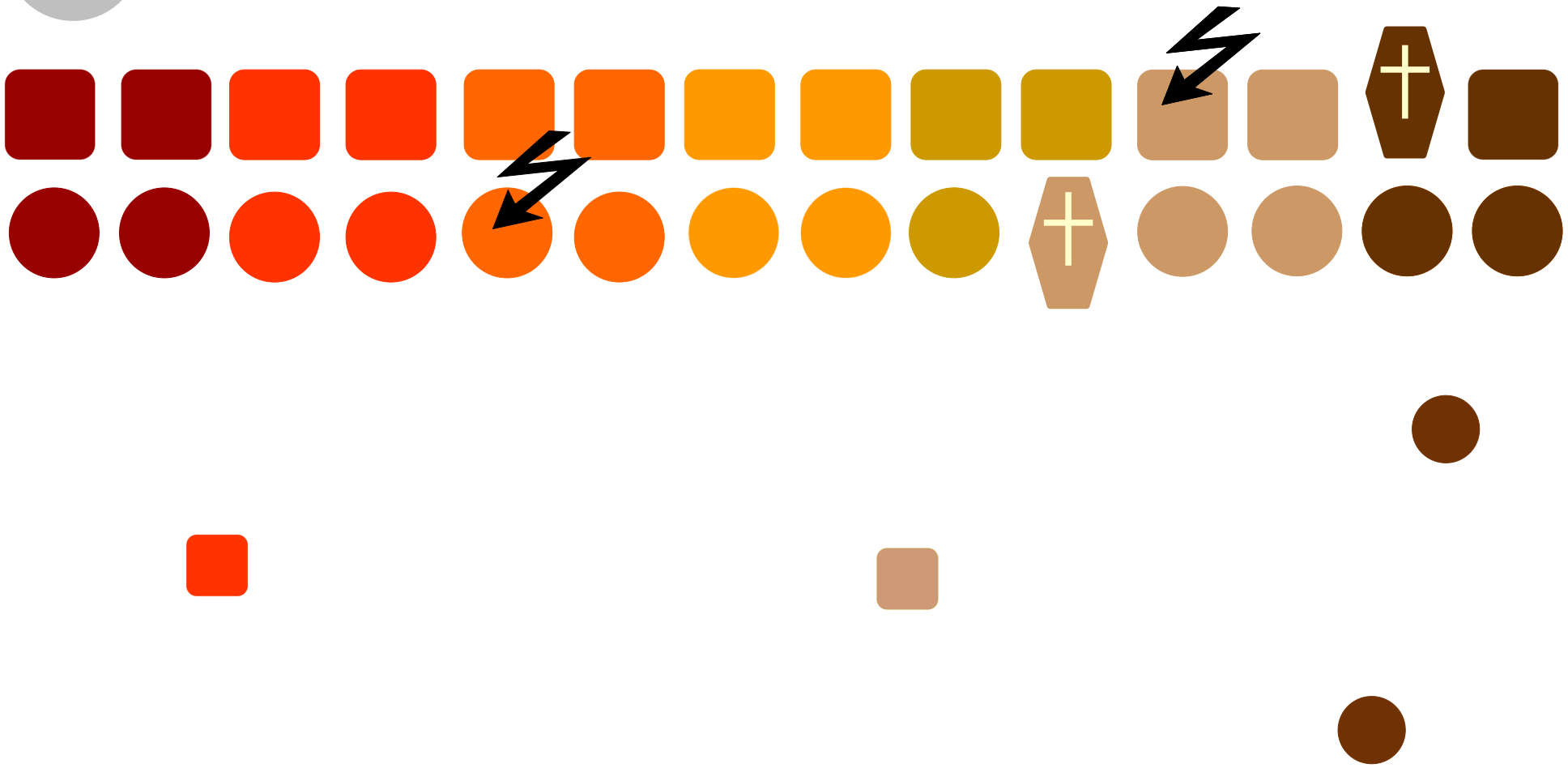

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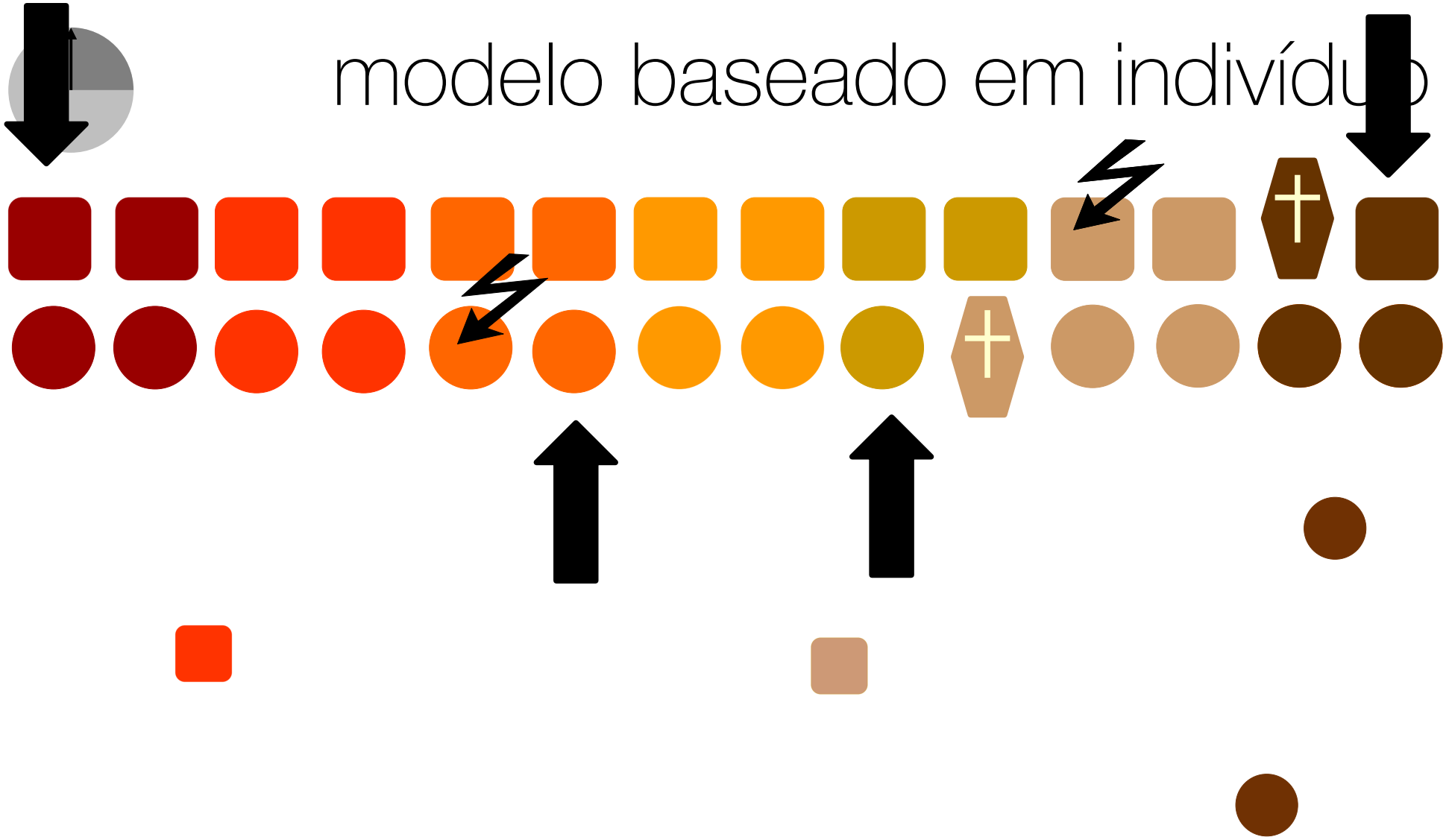

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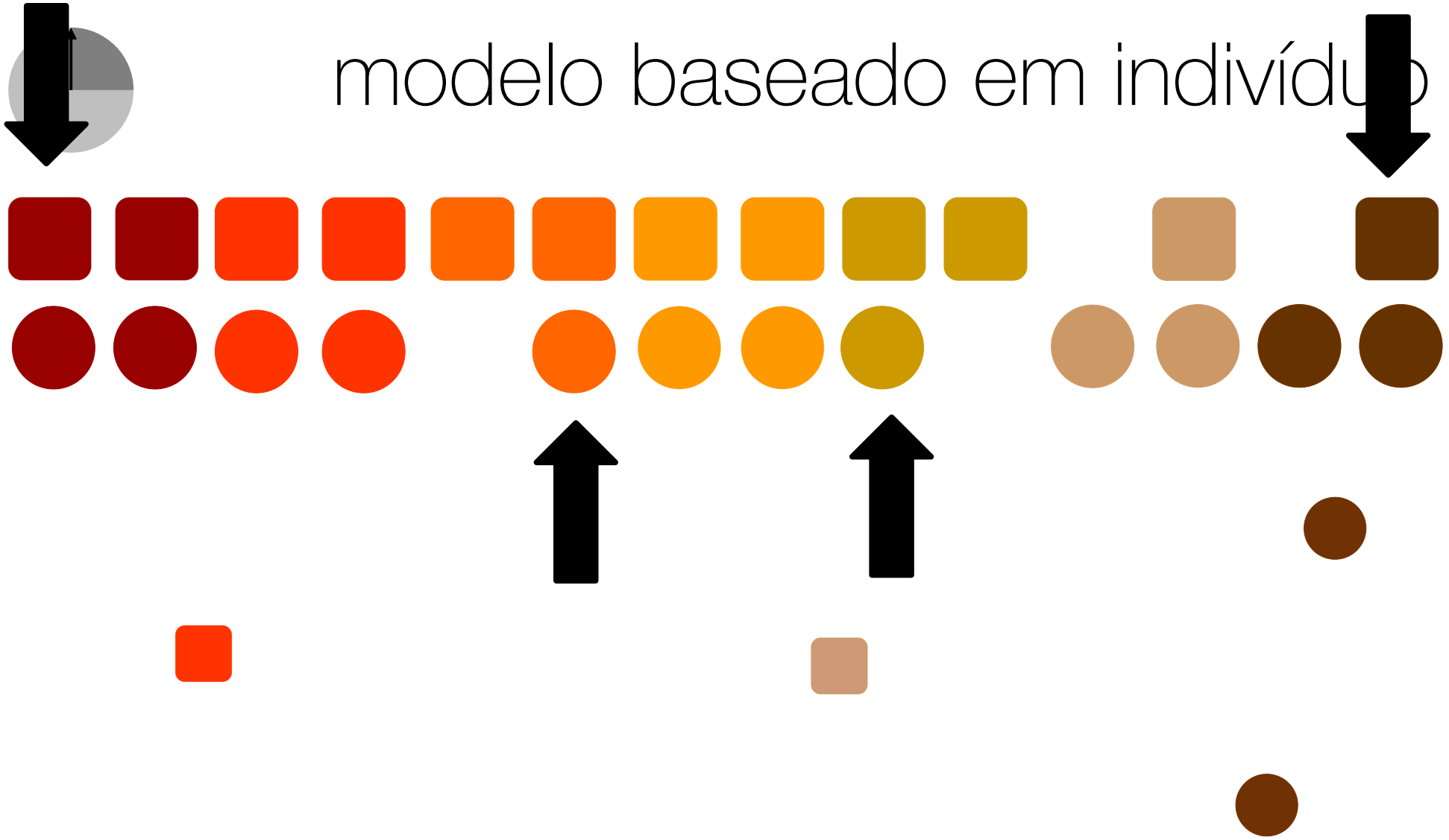

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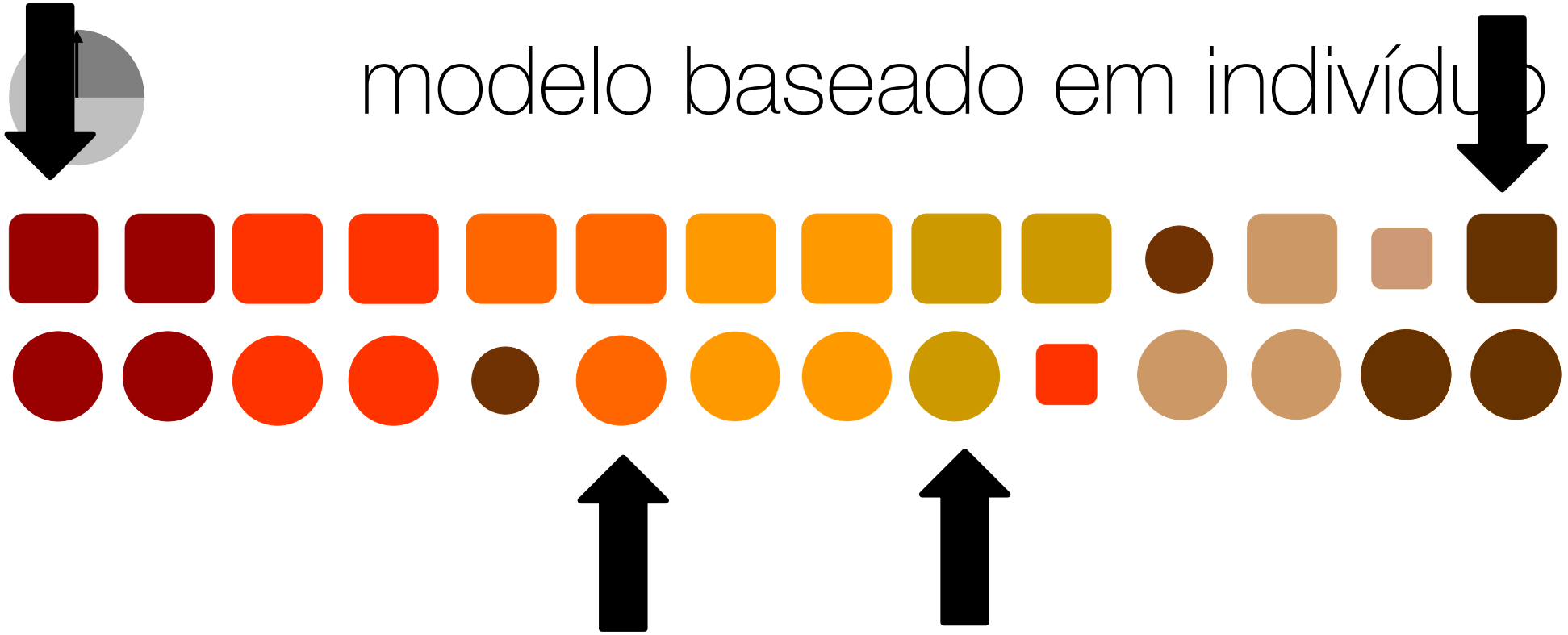

***parâmetros***

*riqueza t0*

*abundância t0*

*no gametas♀/ciclo*

*constante*

*no distúrbios*

*% morta/distúrbio*

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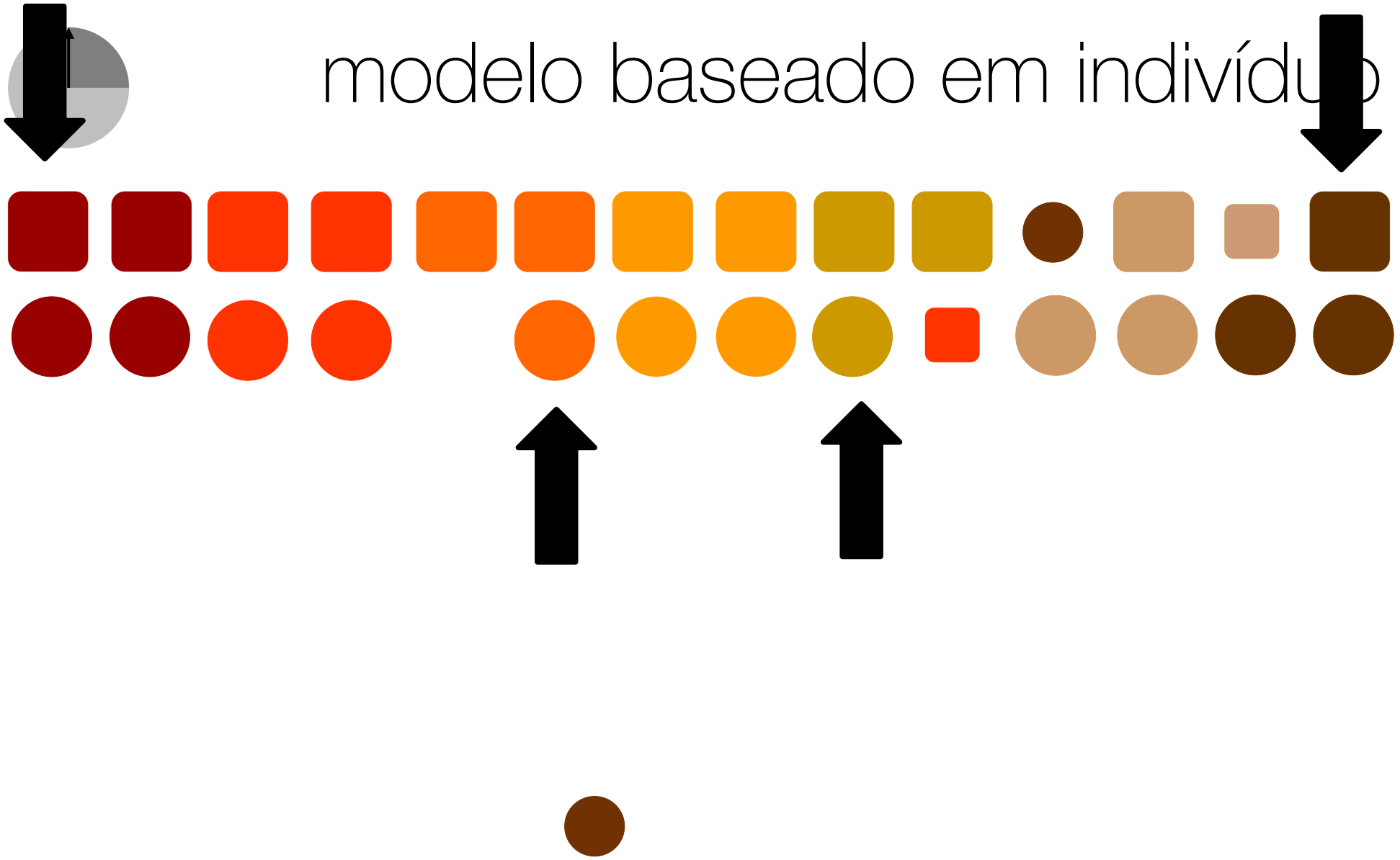

***parâmetros***

*riqueza t0*

*abundância t0*

*no gametas♀/ciclo*

*constante*

*no distúrbios*

*% morta/distúrbio*

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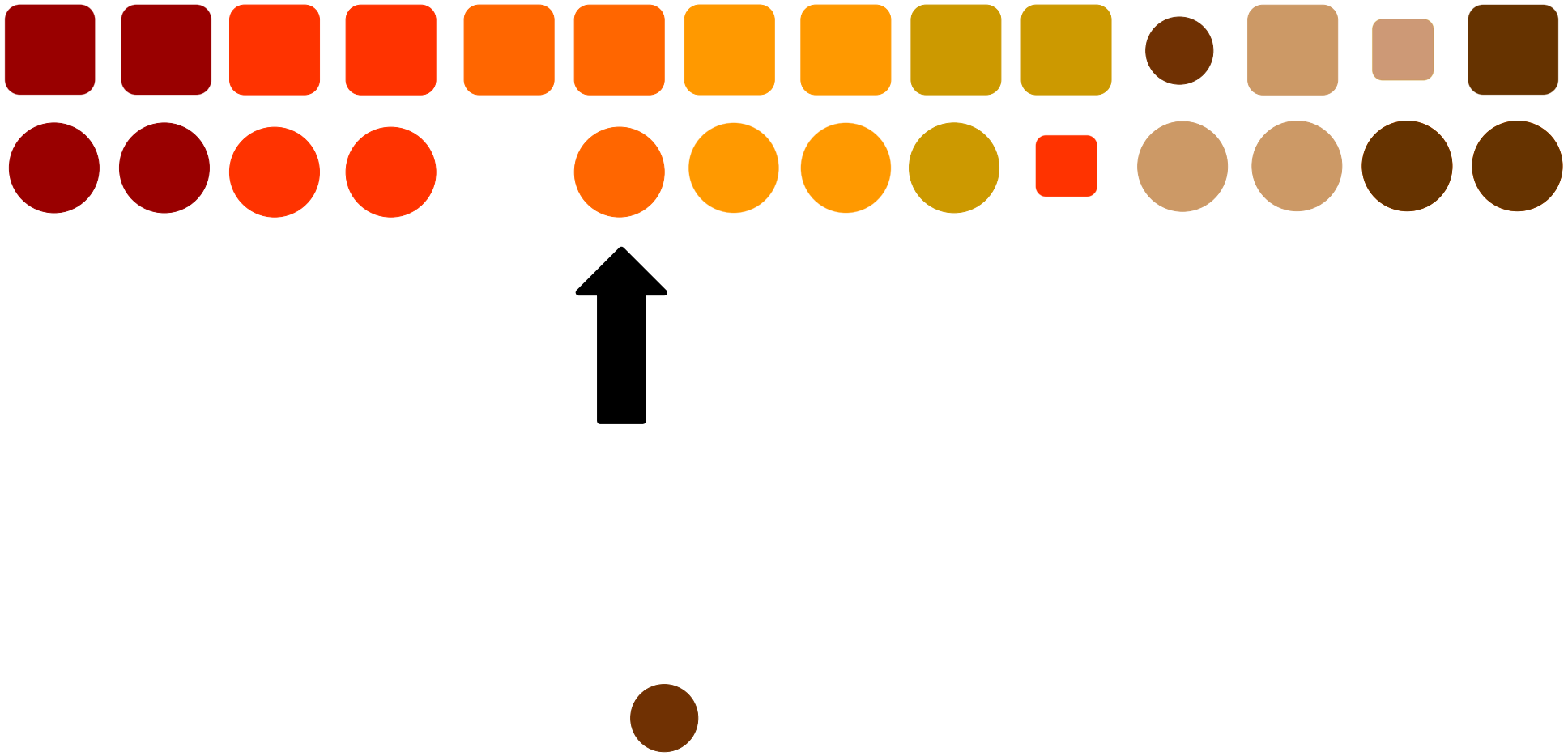

***parâmetros***

*riqueza t0*

*abundância t0*

*no gametas♀/ciclo*

*constante*

*no distúrbios*

*% morta/distúrbio*

# modelo baseado em indivíduo

***parâmetros***

*riqueza t0*

*abundância t0*

*no gametas♀/ciclo*

*constante*

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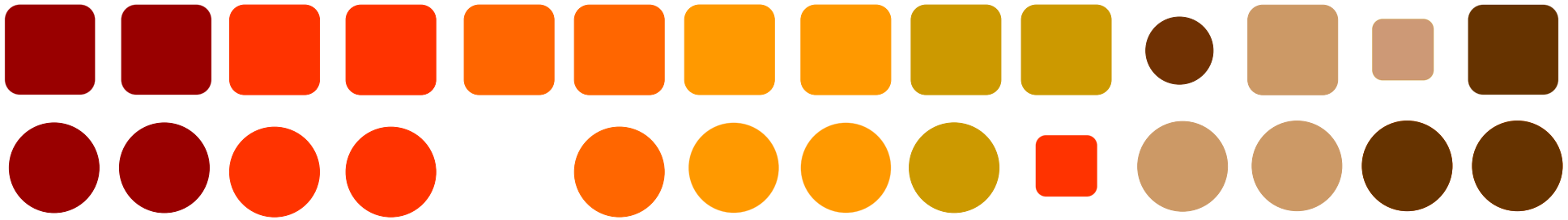
# modelo baseado em indivíduo



***parâmetros***

*riqueza t0*

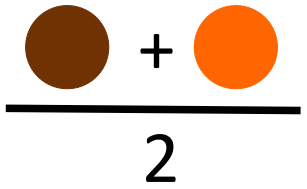
*abundância t0*

*no gametas♀/ciclo*

*constante*

*no distúrbios*

*% morta/distúrbio*



# modelo baseado em indivíduo

***parâmetros***

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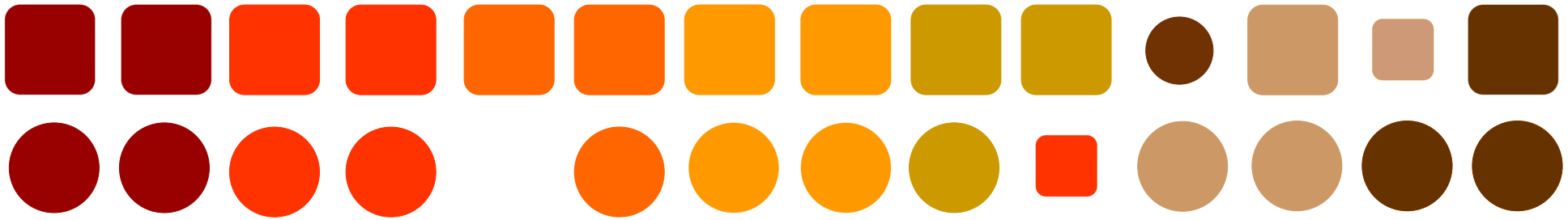

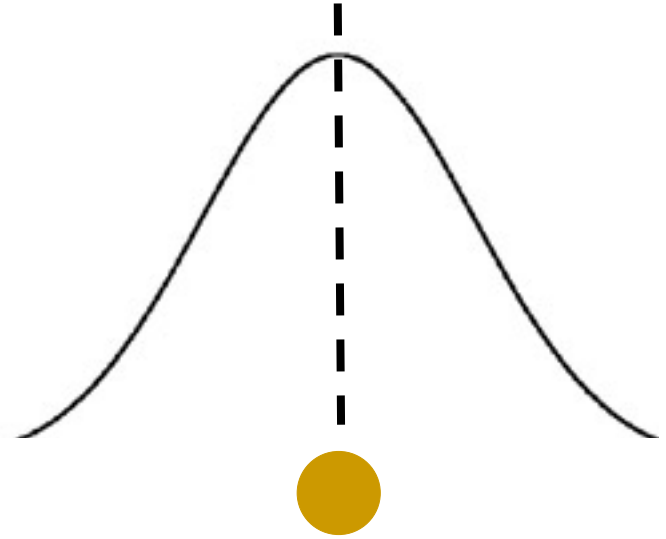

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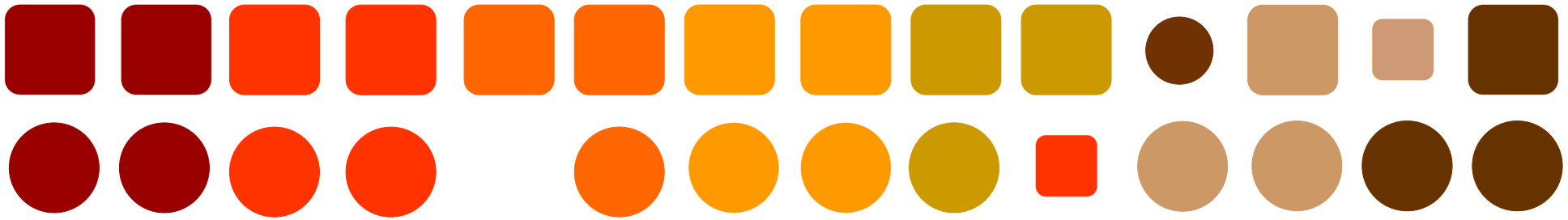

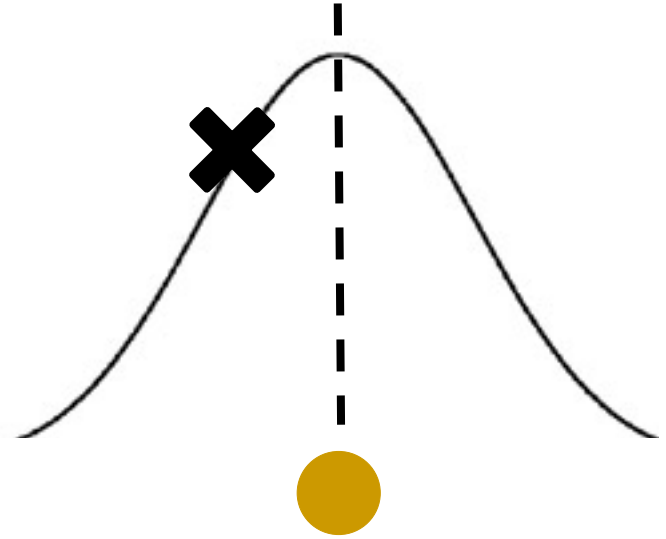

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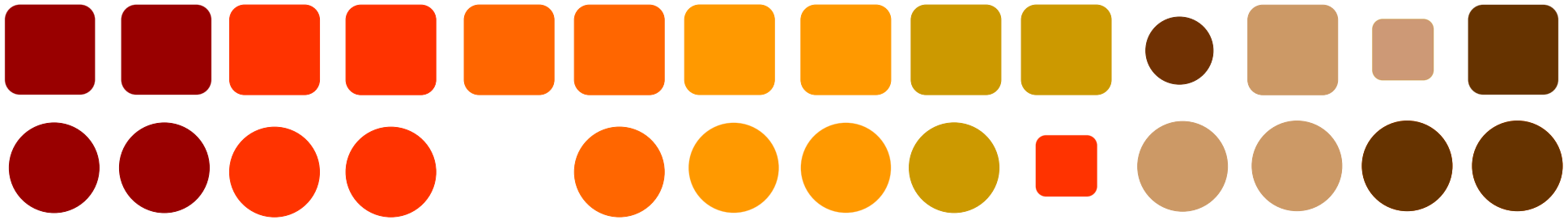

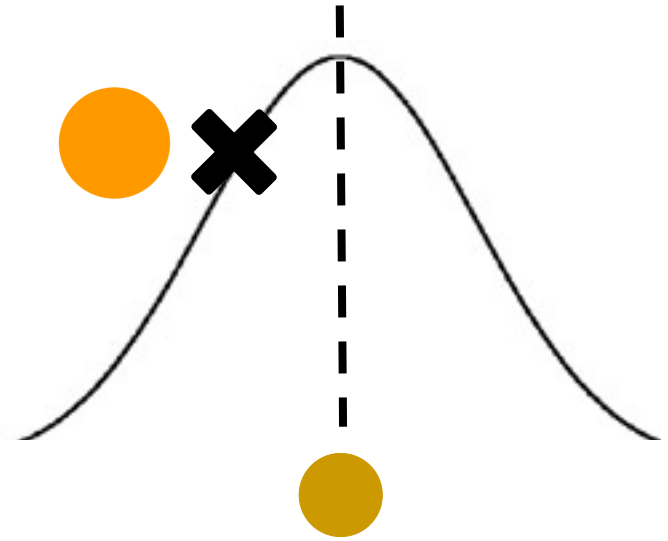

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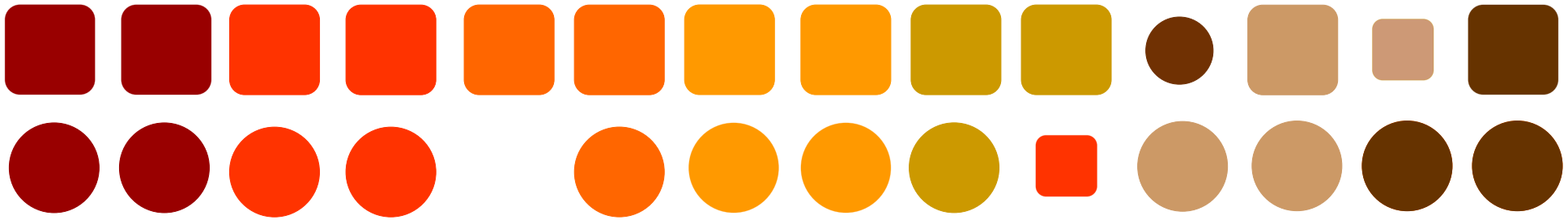

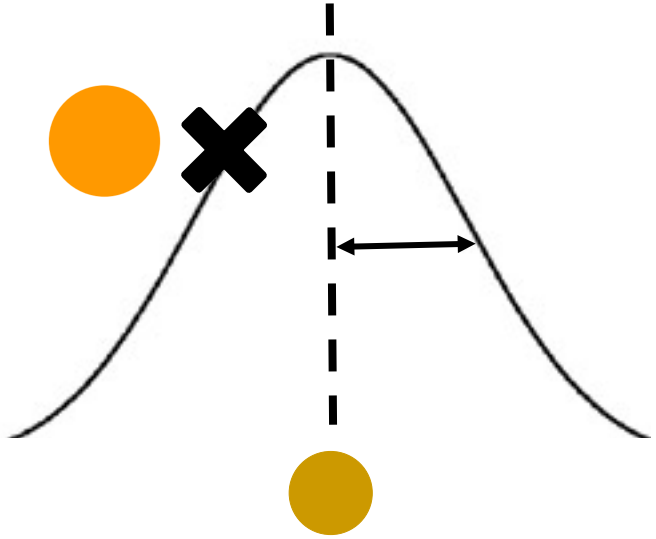

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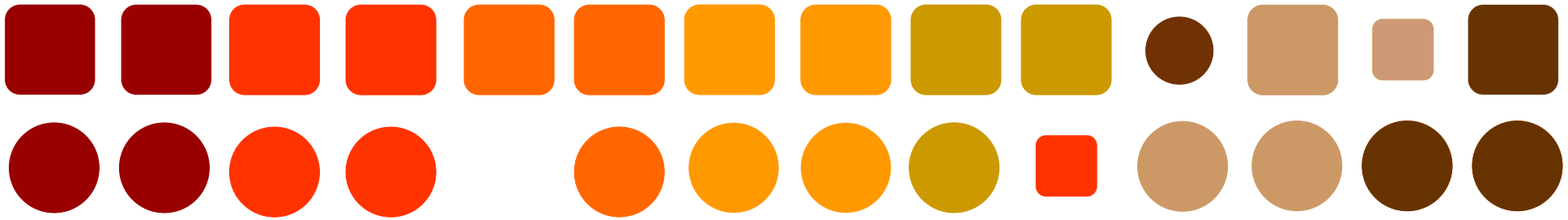

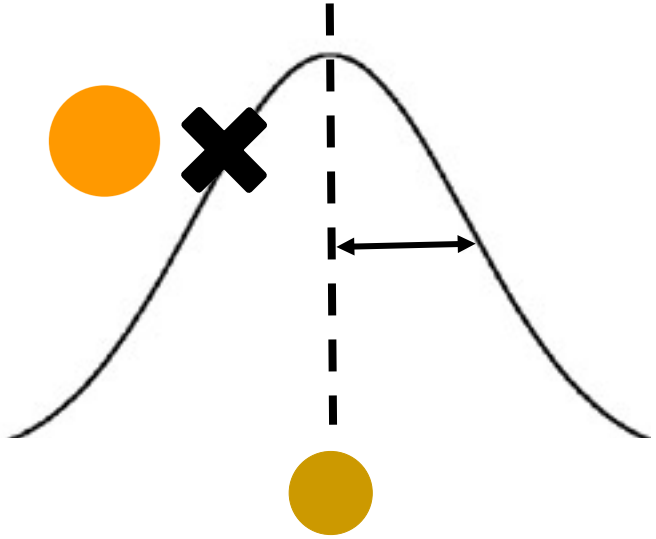

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*abundância t0*

*no gametas♀/ciclo*

*constante*

*no distúrbios*

*% morta/distúrbio*

*taxa de mutação*

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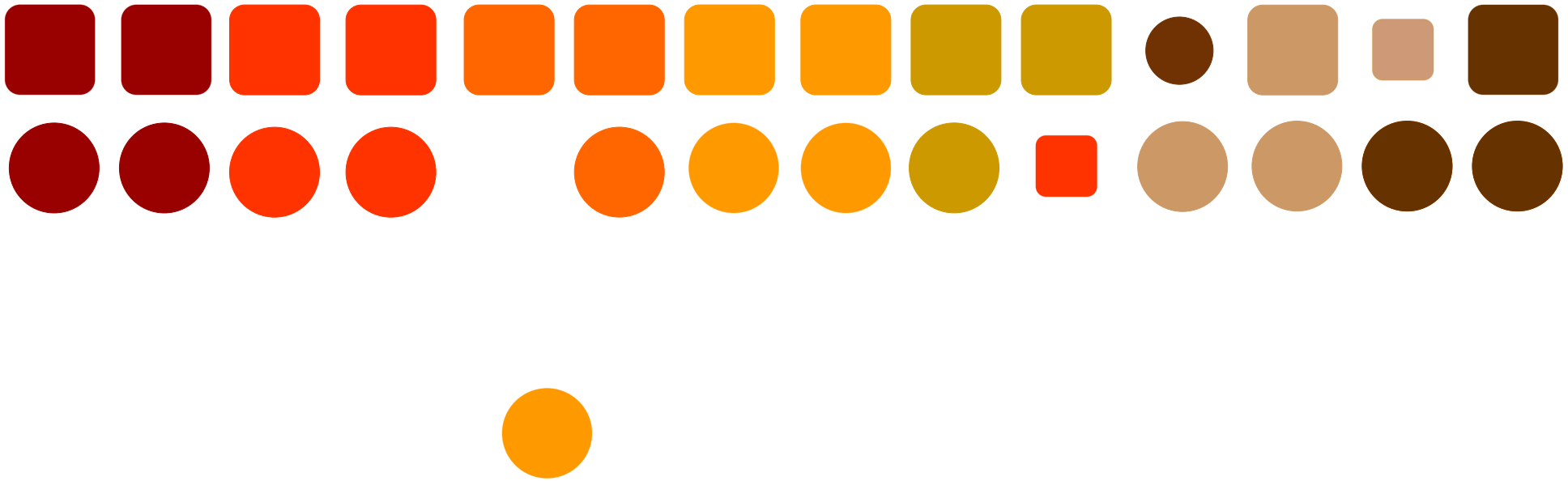

***parâmetros***

*riqueza t0*

*abundância t0*

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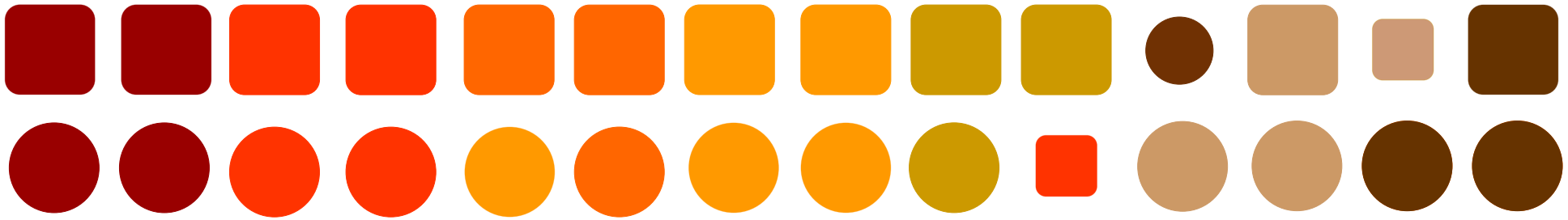

***parâmetros***

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*abundância t0*

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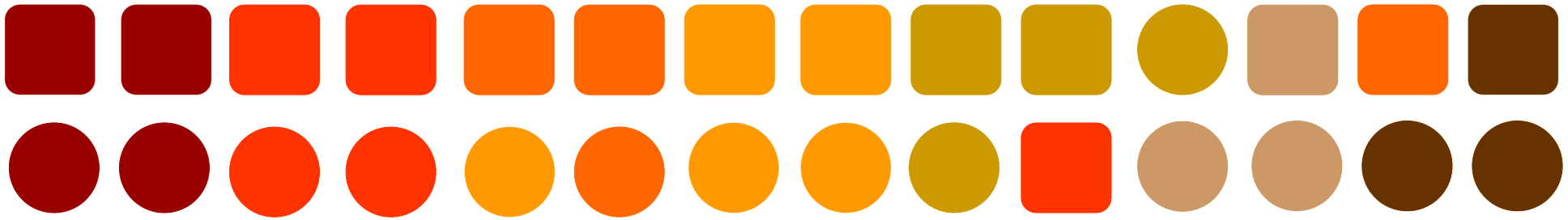

***parâmetros***

*riqueza t0*

*abundância t0*

*no gametas♀/ciclo*

*constante*

*no distúrbios*

*% morta/distúrbio*

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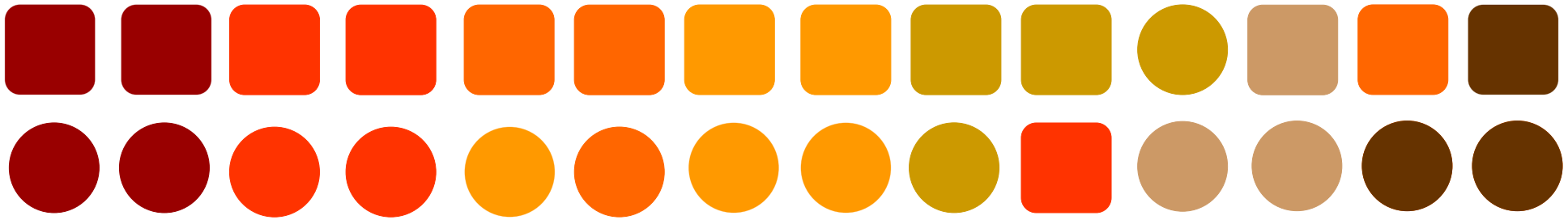

***parâmetros***

*riqueza t0*

*abundância t0*

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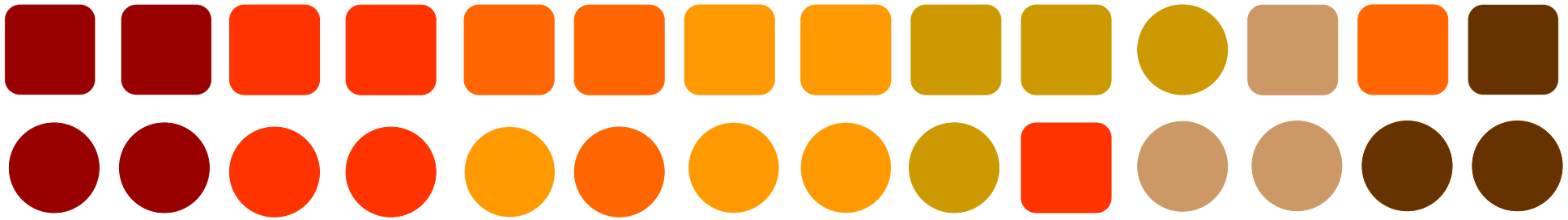

***parâmetros***

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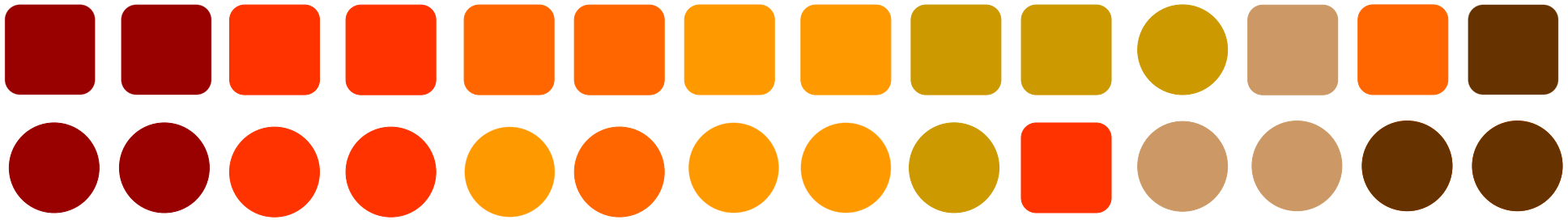

***parâmetros***

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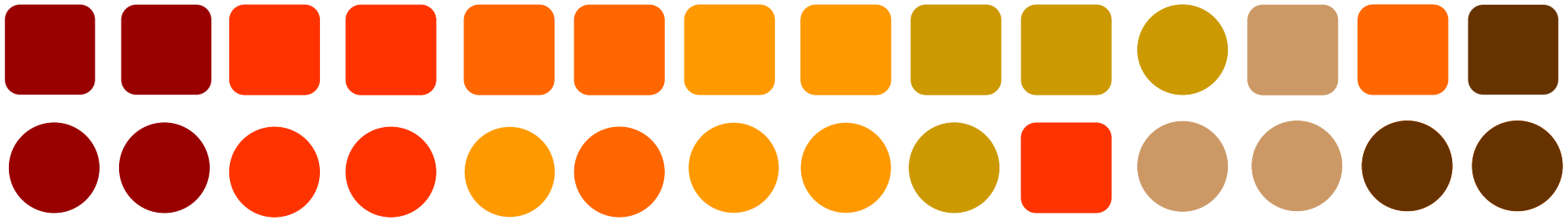

***parâmetros***

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*% morta/distúrbio*

*taxa de mutação*

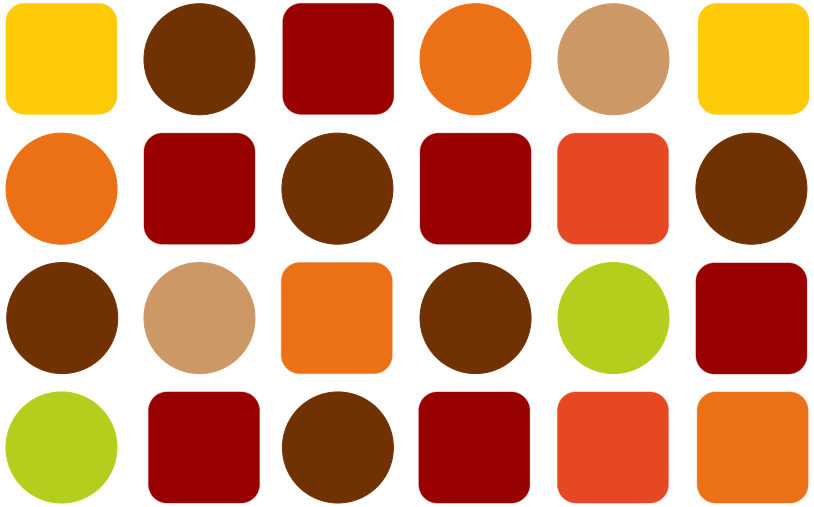
*no tempos*

# processos possíveis

# processos possíveis

dinâmica evolutiva

- **seleção**
- **deriva genética**
- fluxo gênico
- **mutação**



dinâmica ecológica

- **filtragem**
- **deriva ecológica**
- migração
- especiação

# cenários simulados

# cenários simulados

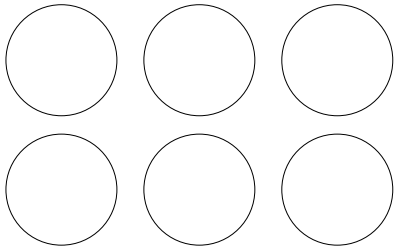
**evolutivo**

**ecológico**

**eco-evolutivo**

# cenários simulados

**evolutivo**

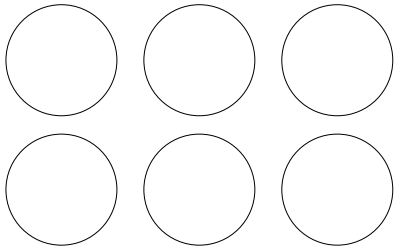


**ecológico**

**eco-evolutivo**

# cenários simulados

**evolutivo**



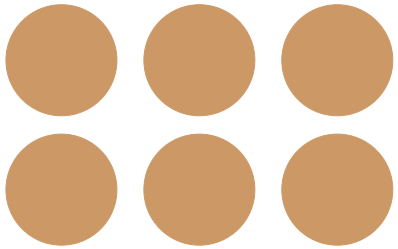
1 espécie

**ecológico**

**eco-evolutivo**

# cenários simulados

**evolutivo**



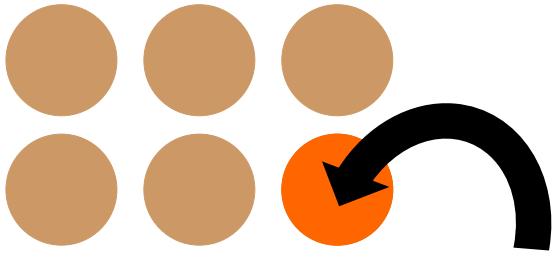
1 espécie

**ecológico**

**eco-evolutivo**

# cenários simulados

**evolutivo**



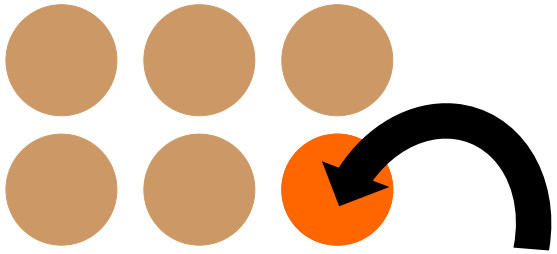
1 espécie

**ecológico**

**eco-evolutivo**

# cenários simulados

**evolutivo**



1 espécie

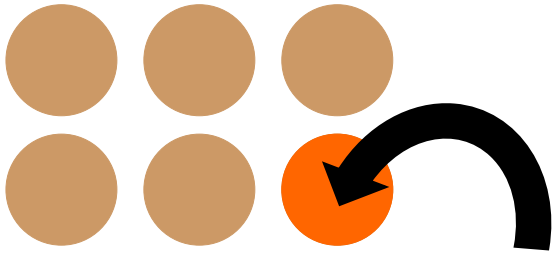
mutação > 0

**ecológico**

**eco-evolutivo**

# cenários simulados

**evolutivo**



1 espécie

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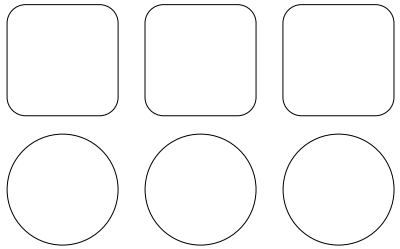

**eco-evolutivo**

# cenários simulados

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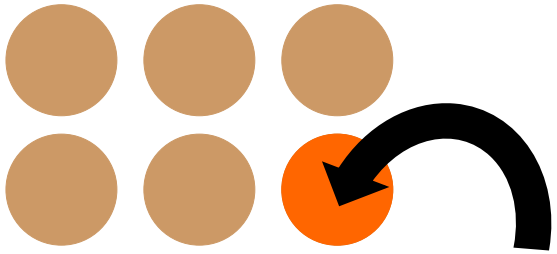
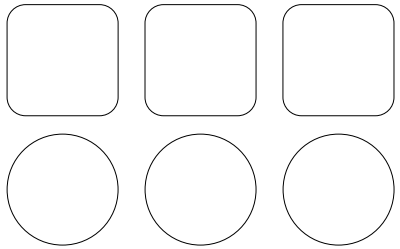


1 espécie

mutação > 0

**ecológico**



+ 1 espécie

**eco-evolutivo**

# cenários simulados

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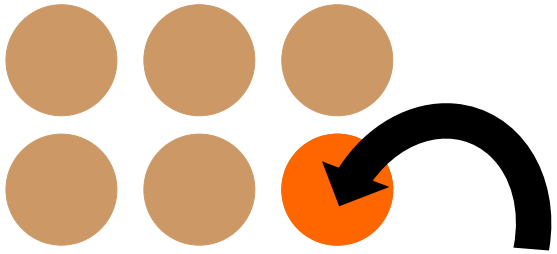

1 espécie

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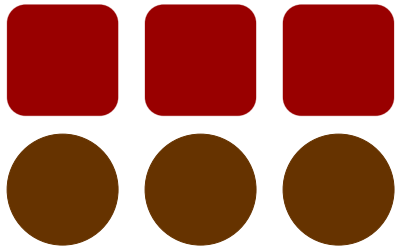
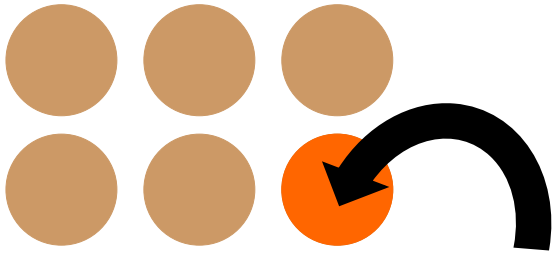


+ 1 espécie

**eco-evolutivo**

# cenários simulados

**evolutivo**



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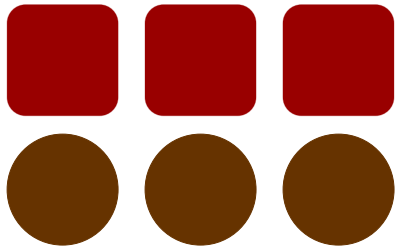

+ 1 espécie

mutação = 0

**eco-evolutivo**

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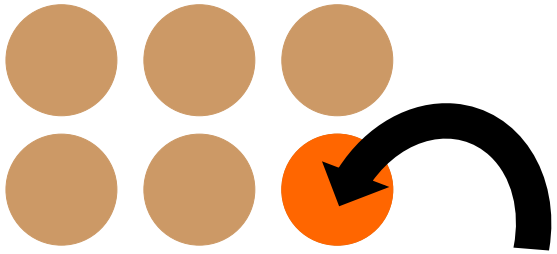

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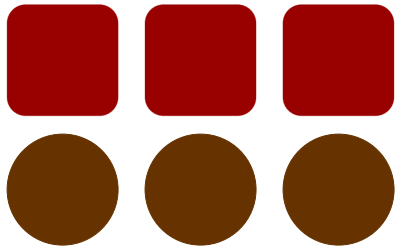

+ 1 espécie

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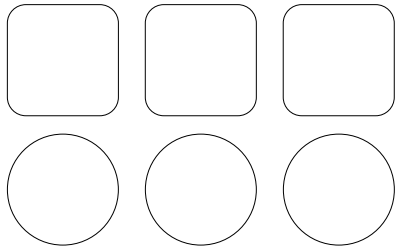

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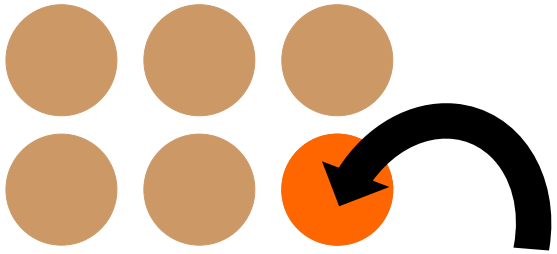

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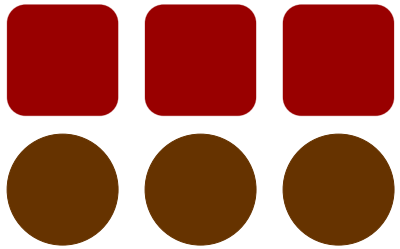

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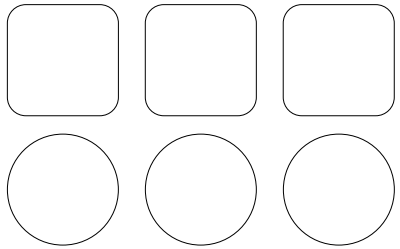

+ 1 espécie

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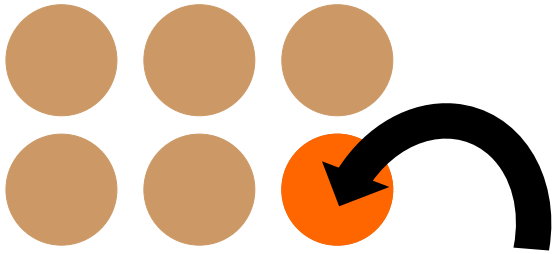

1 espécie

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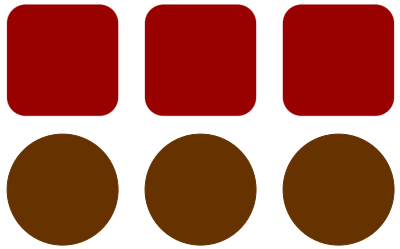
**ecológico**



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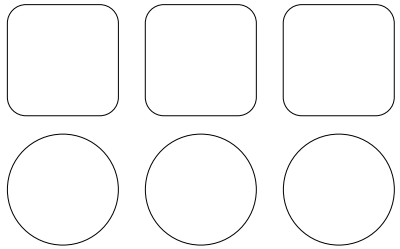
mutação = 0

**eco-evolutivo**



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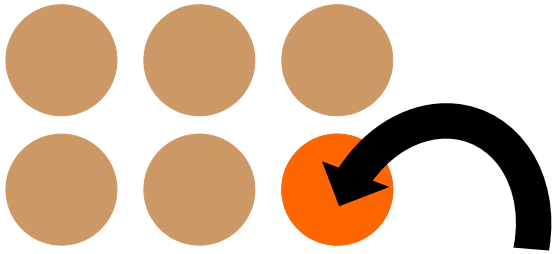
**evolutivo**



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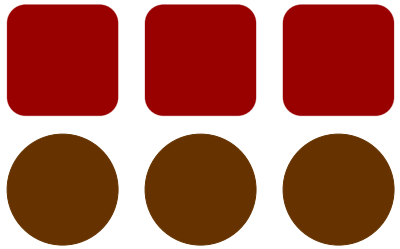
mutação > 0

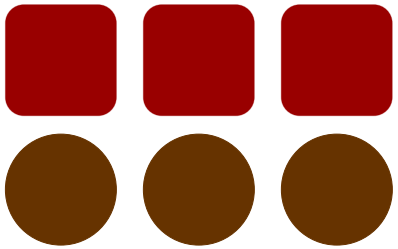
**ecológico**



**+ 1 espécie**

mutação = 0

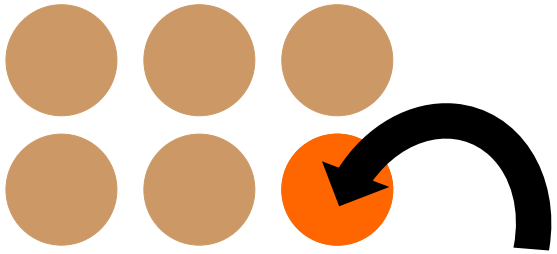
**eco-evolutivo**



**+ 1 espécie**

# cenários simulados

**evolutivo**



1 espécie

mutação > 0

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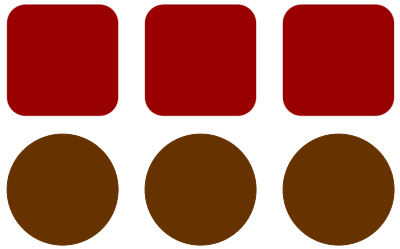
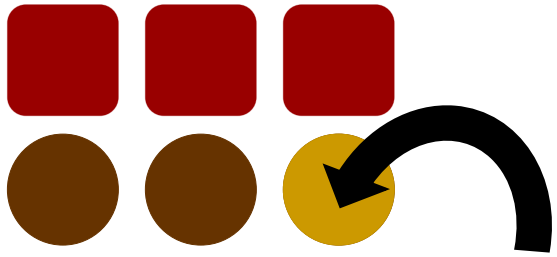


**+ 1 espécie**

mutação = 0

**eco-evolutivo**



**+ 1 espécie**

# cenários simulados

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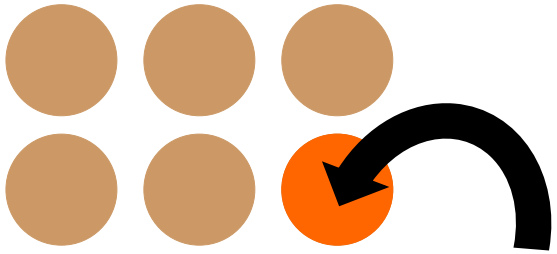
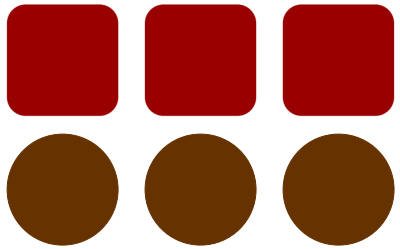


1 espécie

mutação > 0

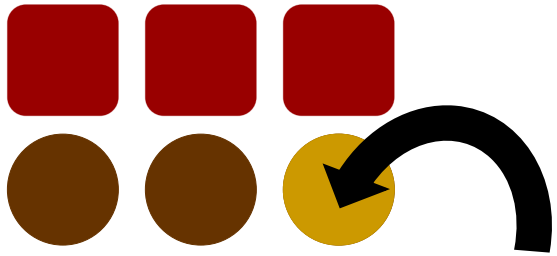
**ecológico**



**+ 1 espécie**

mutação = 0

**eco-evolutivo**

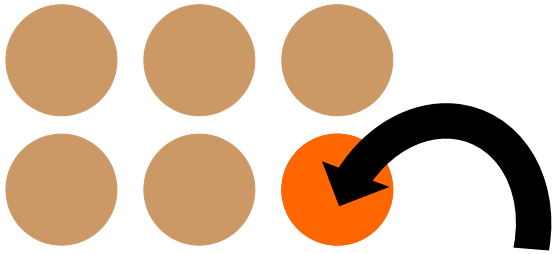


**+ 1 espécie**

mutação > 0

# cenários simulados

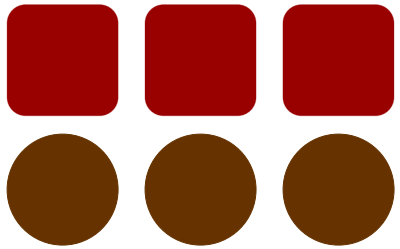
**evolutivo**



1 espécie

**mutação > 0**

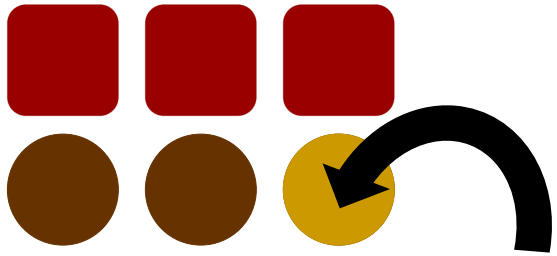
**ecológico**



**+ 1 espécie**

mutação = 0

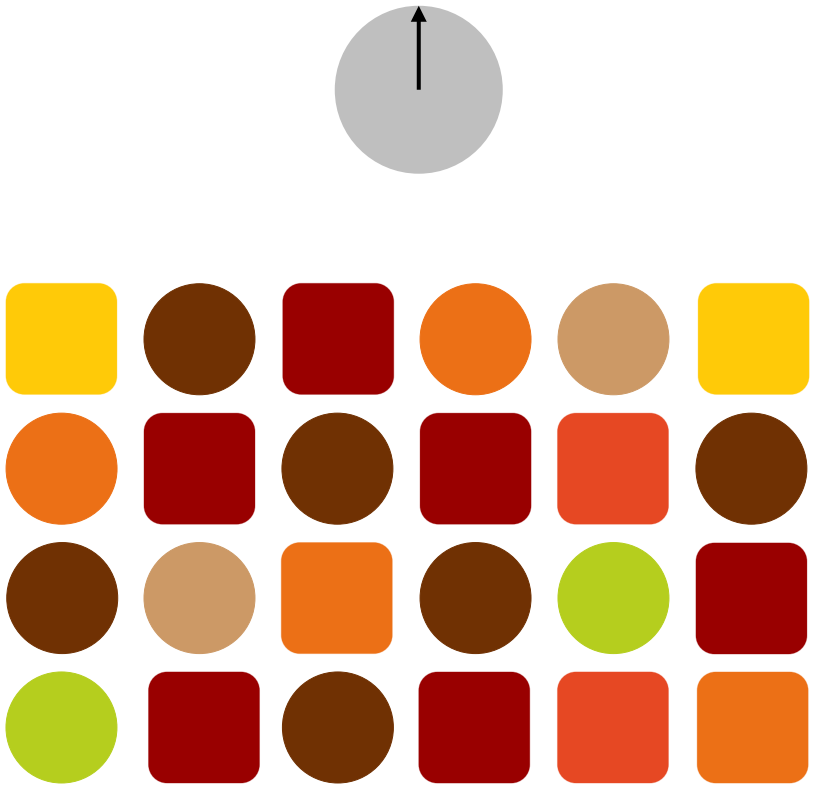
**eco-evolutivo**



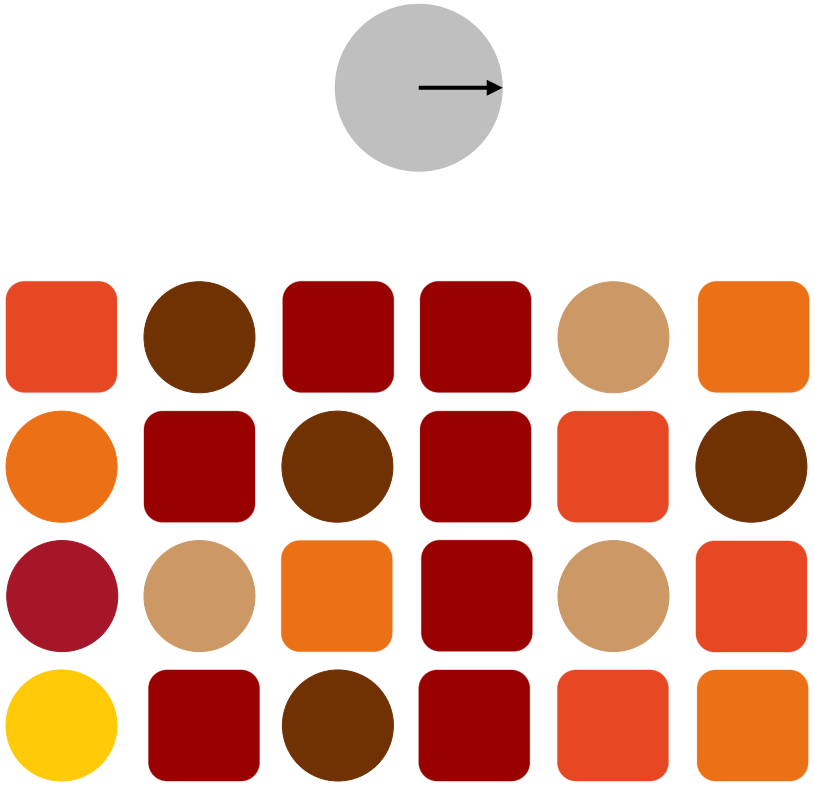
**+ 1 espécie**

**mutação > 0**

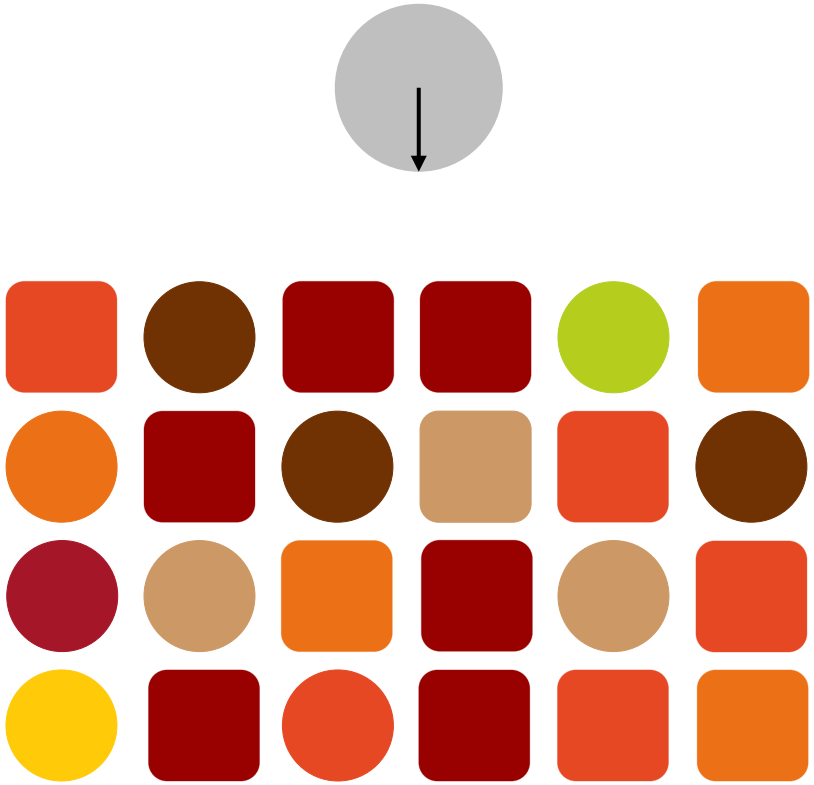
# variáveis de interesse



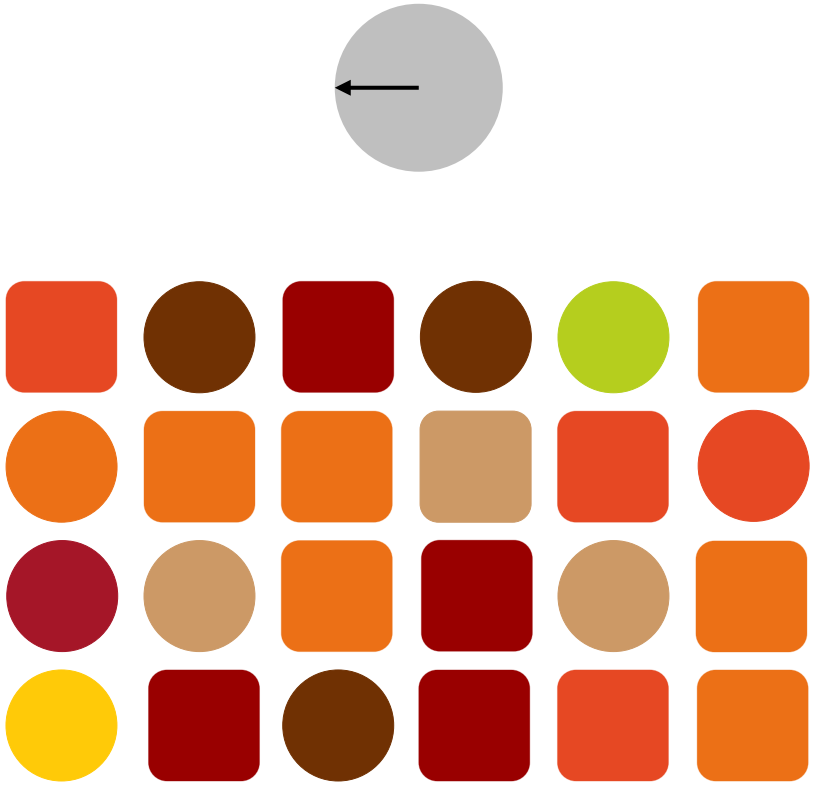
# variáveis de interesse



# variáveis de interesse



# variáveis de interesse



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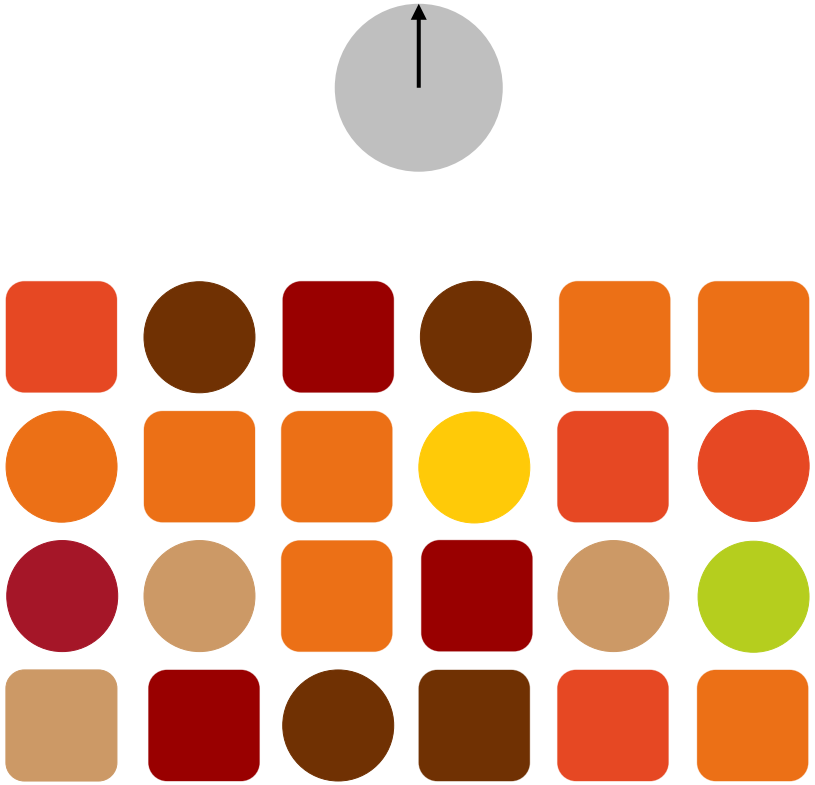
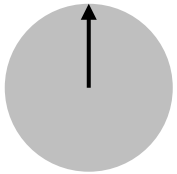


# variáveis de interesse



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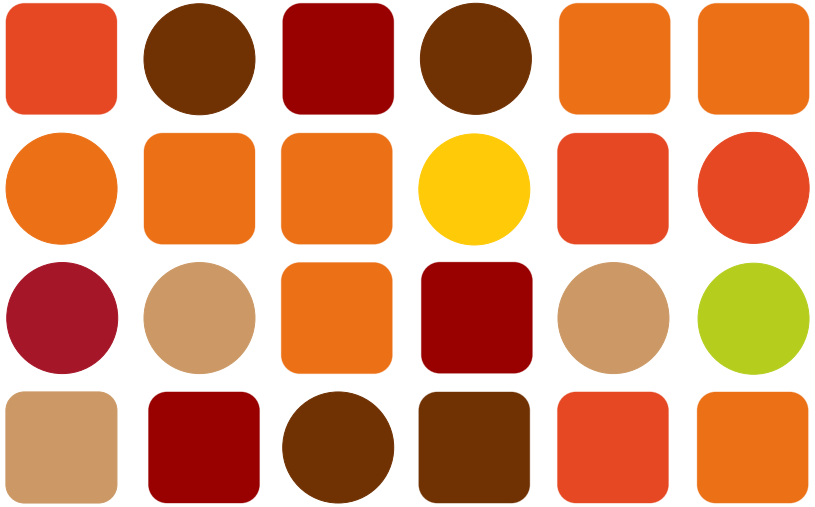

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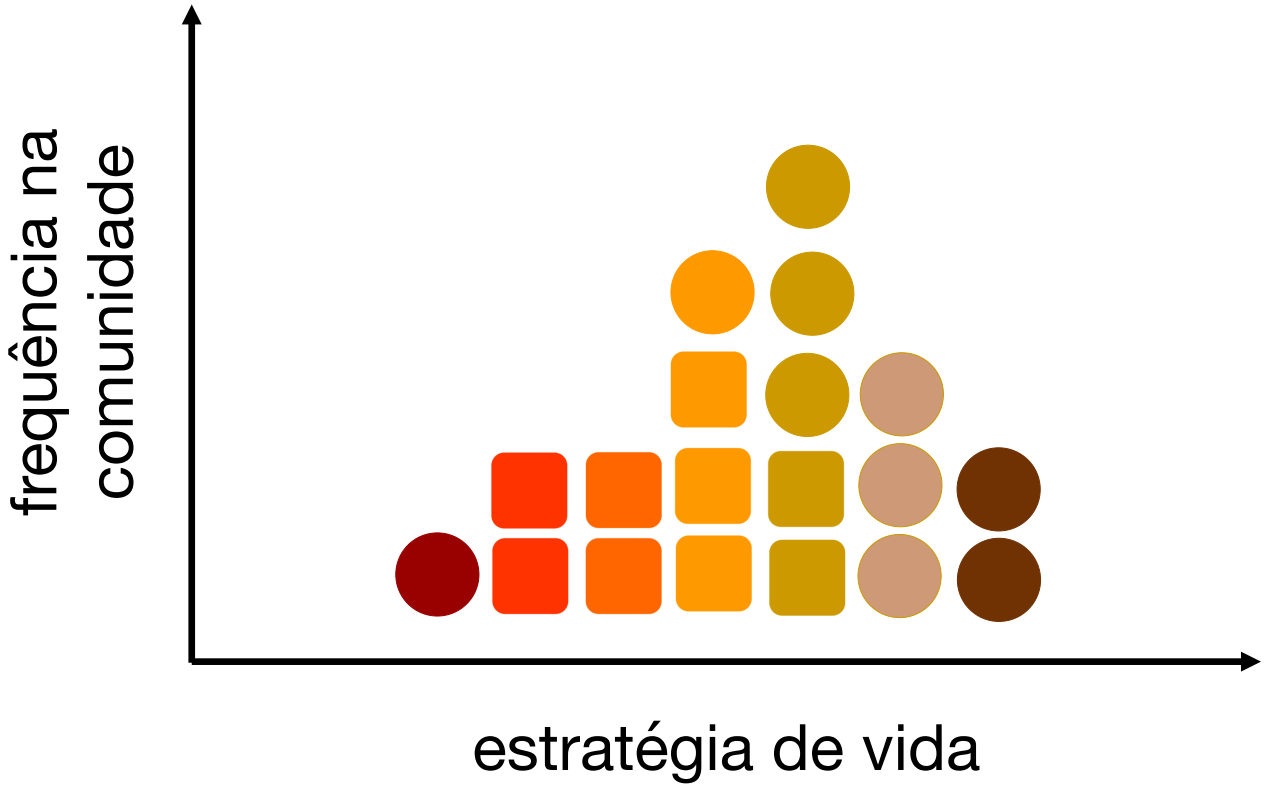

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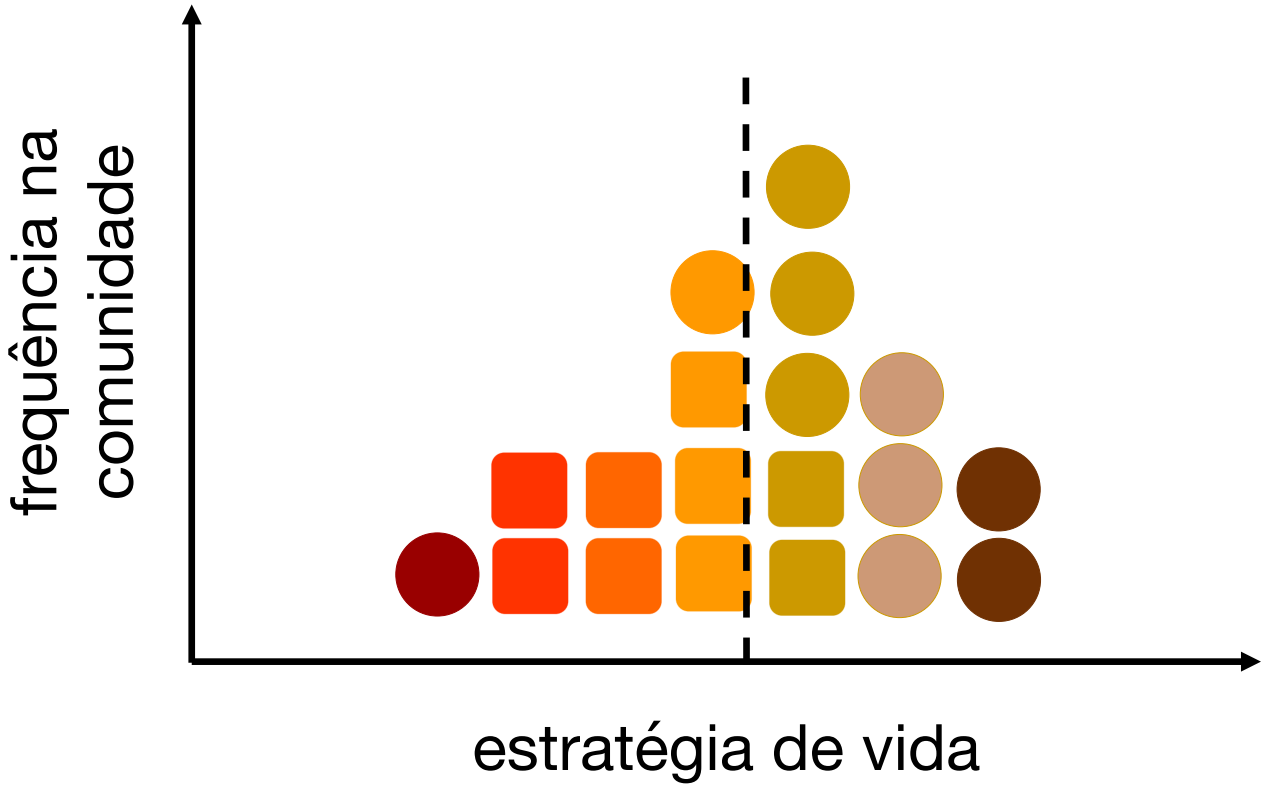

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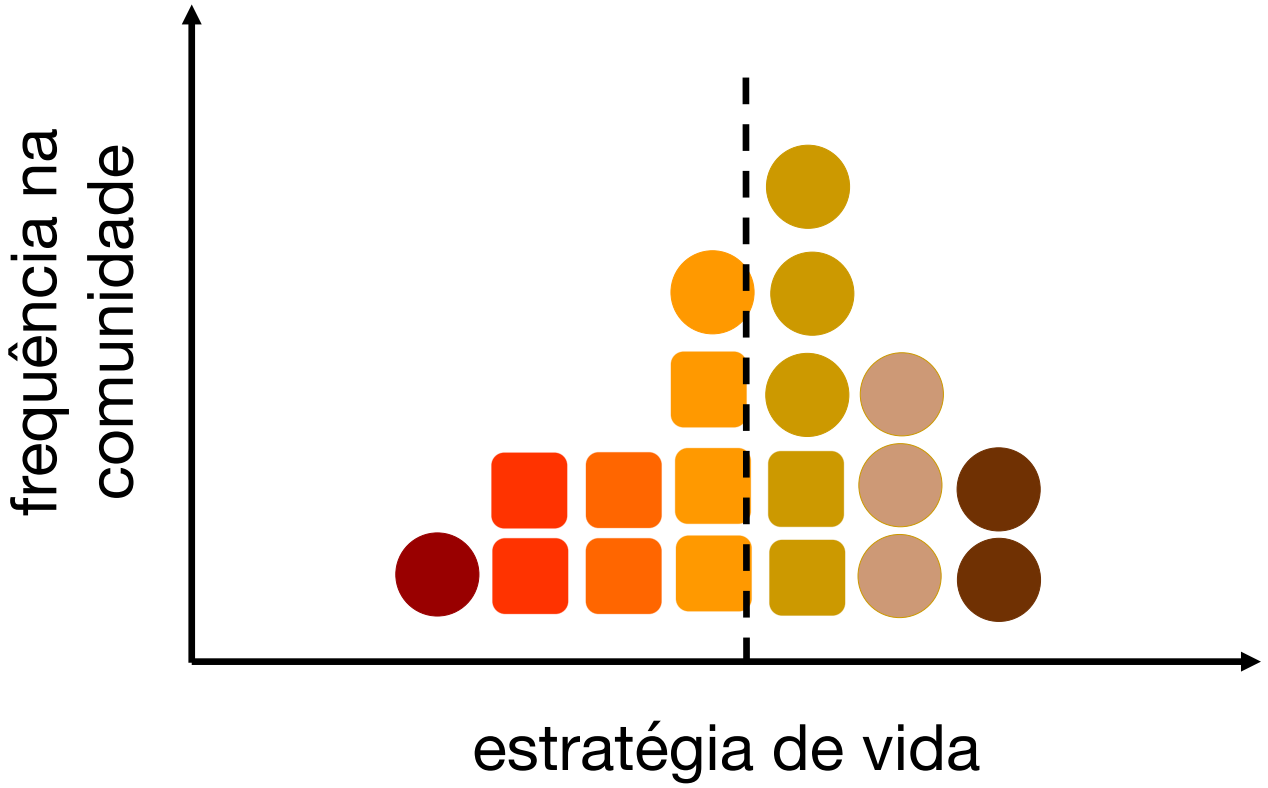
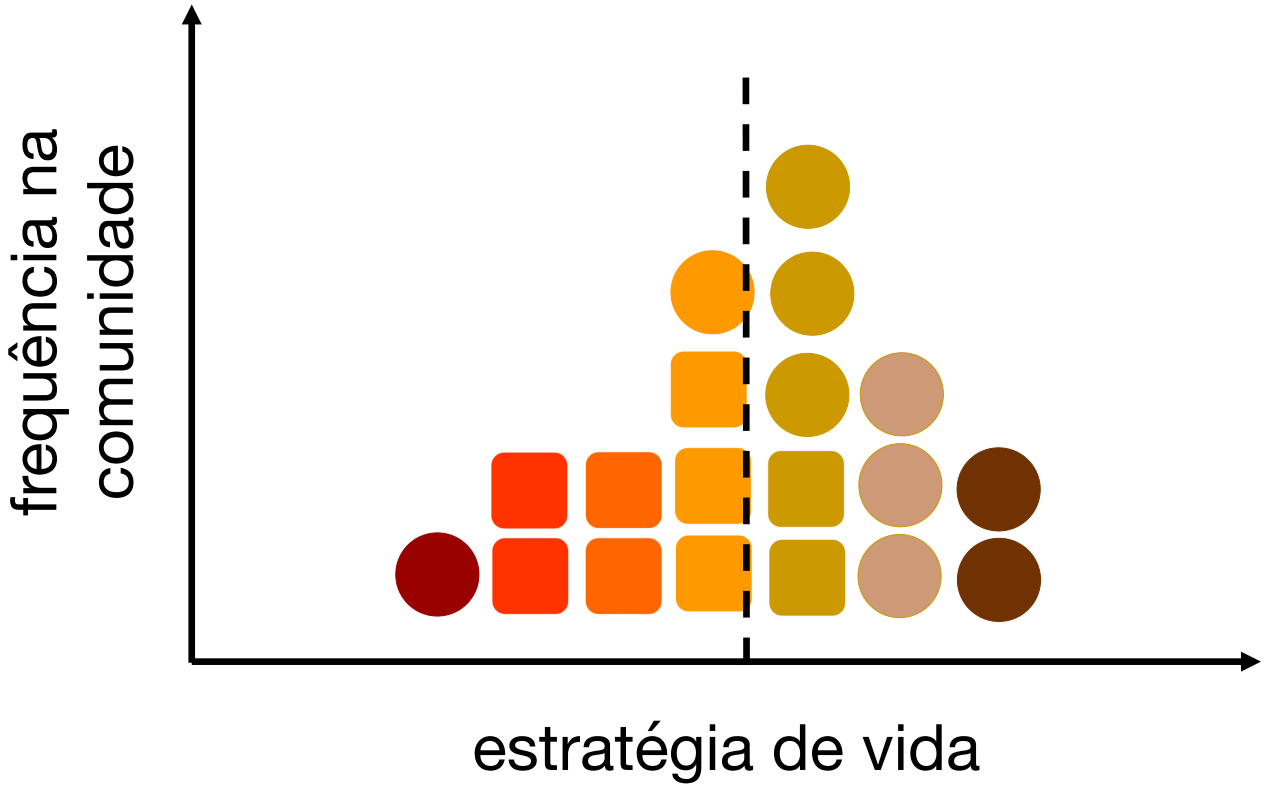



média da estratégia

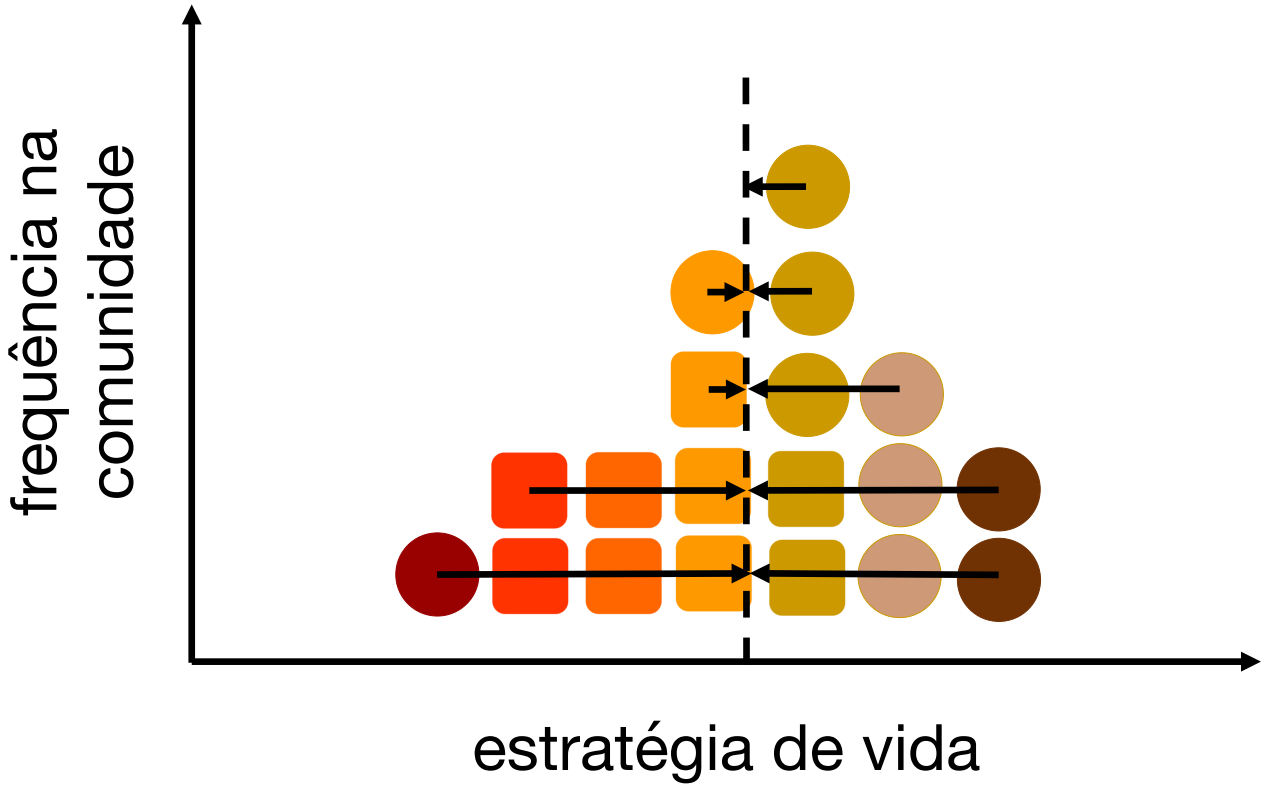
# variáveis de interesse




média da estratégia

**estratégia média**

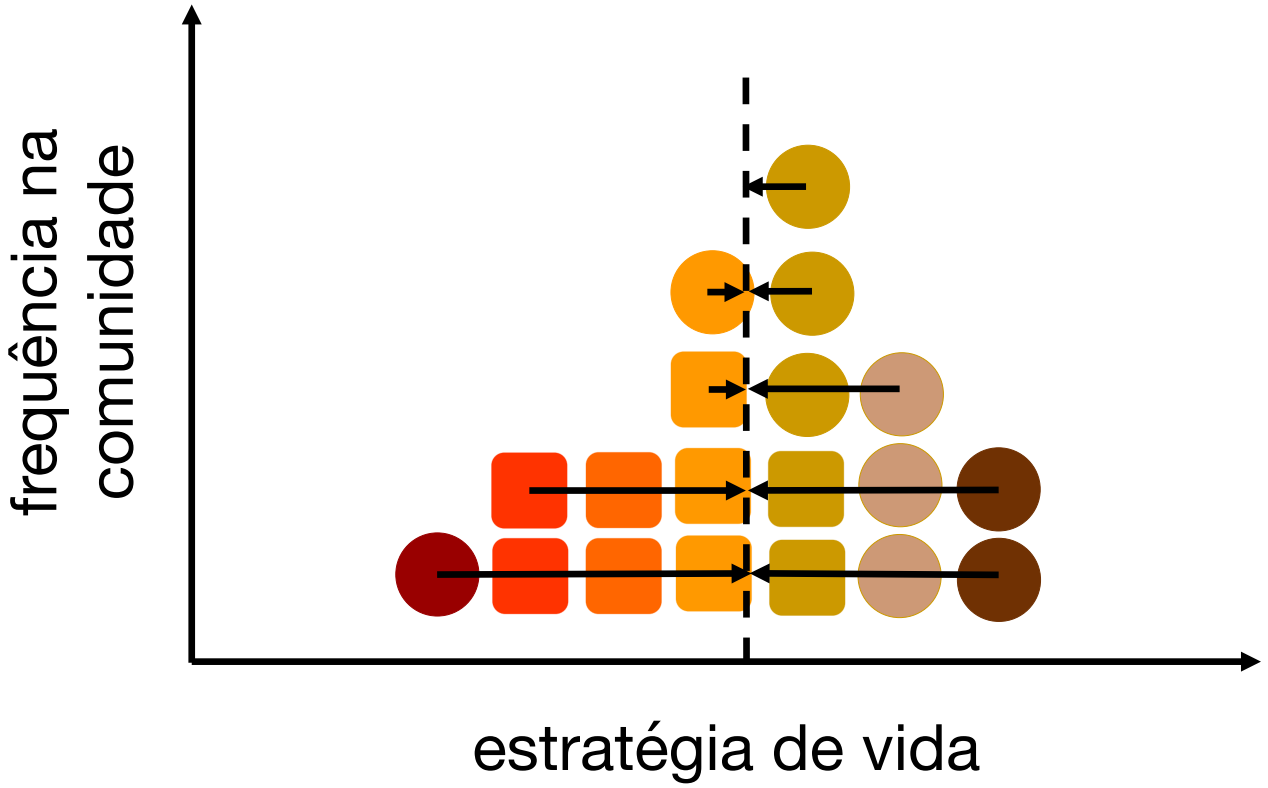
# variáveis de interesse




média da estratégia

**estratégia média**

# variáveis de interesse

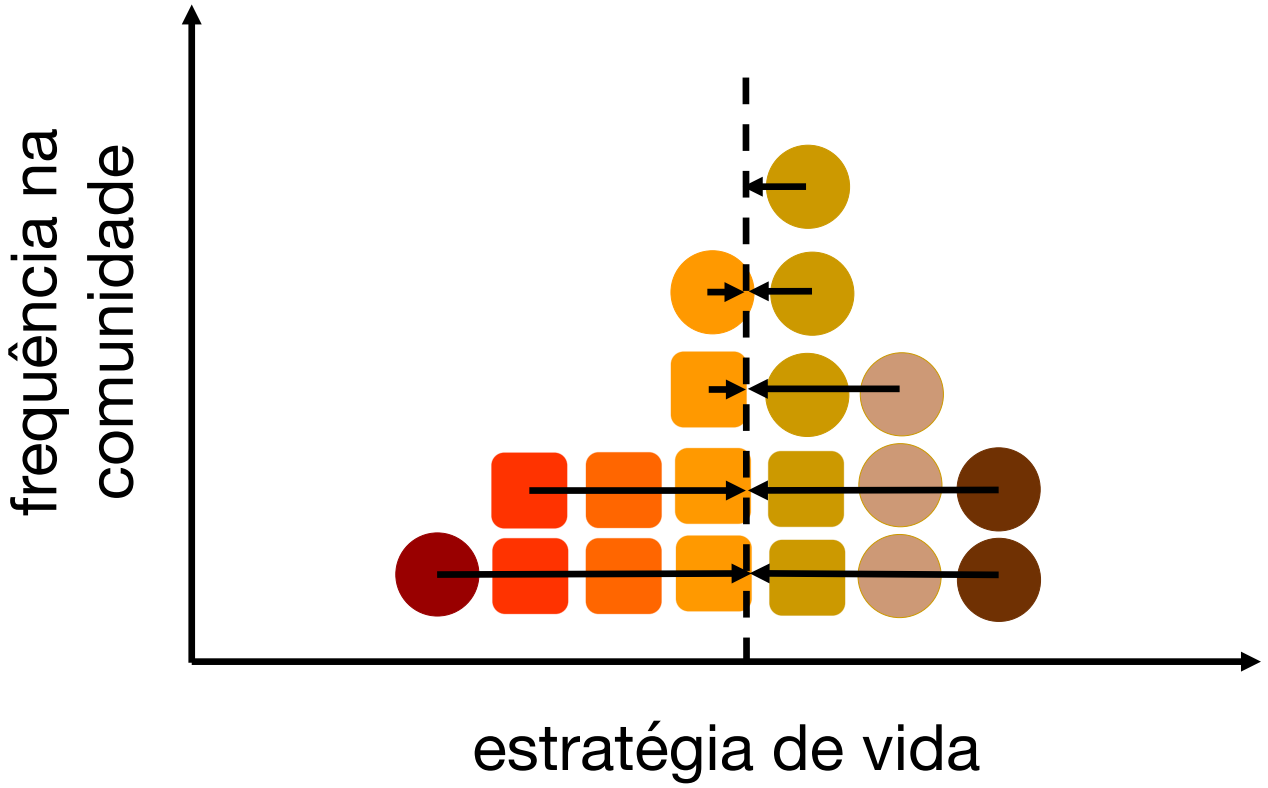



média da estratégia

**estratégia média**

variância total da estratégia

# variáveis de interesse



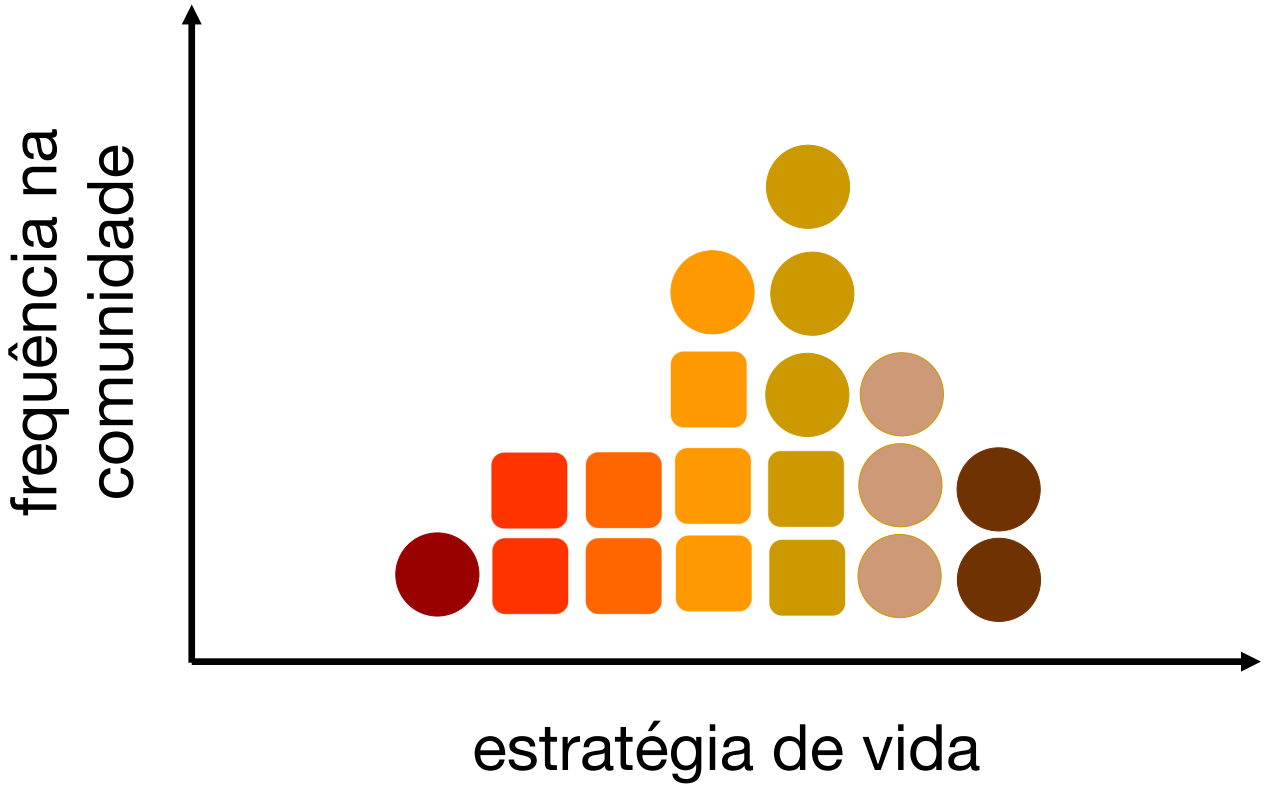

média da estratégia

**estratégia média**

variância total da estratégia

**diversidade de estratégias**

# variáveis de interesse



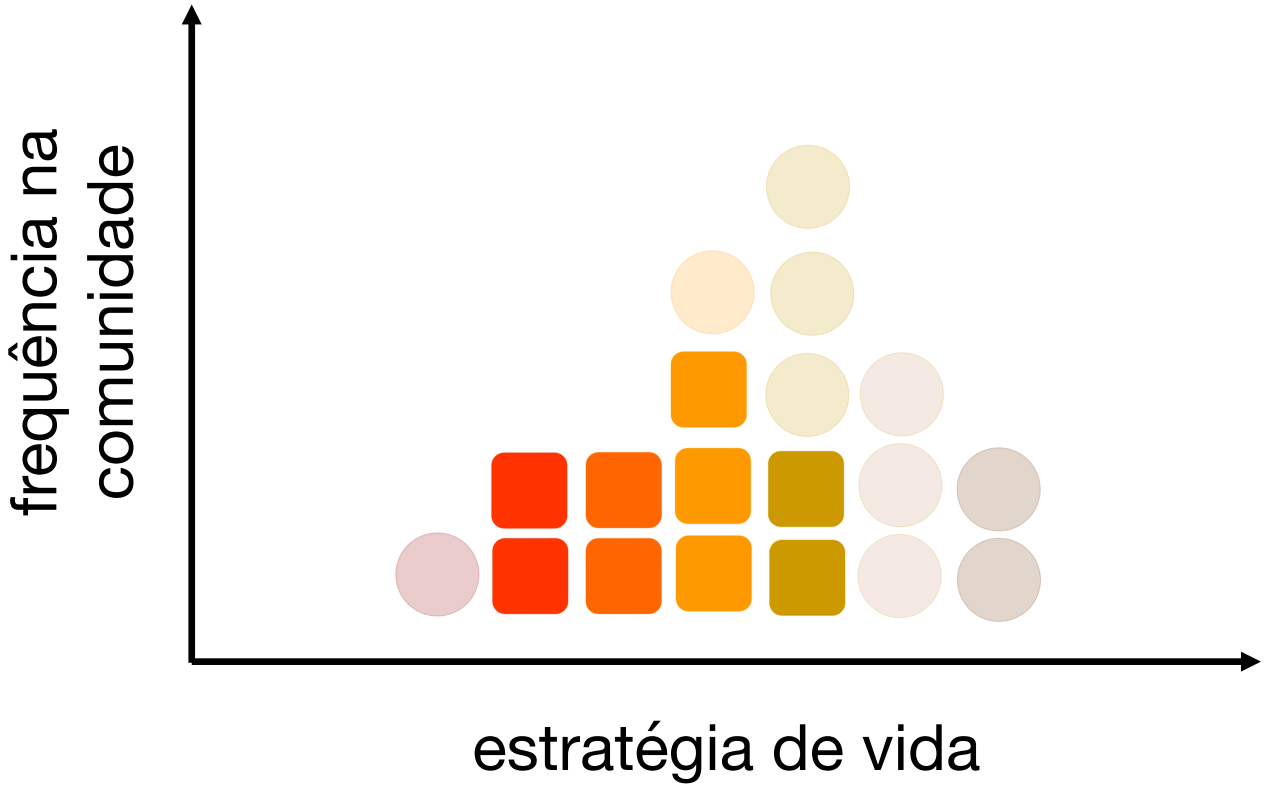

média da estratégia

**estratégia média**

variância total da estratégia

**diversidade de estratégias**

# variáveis de interesse



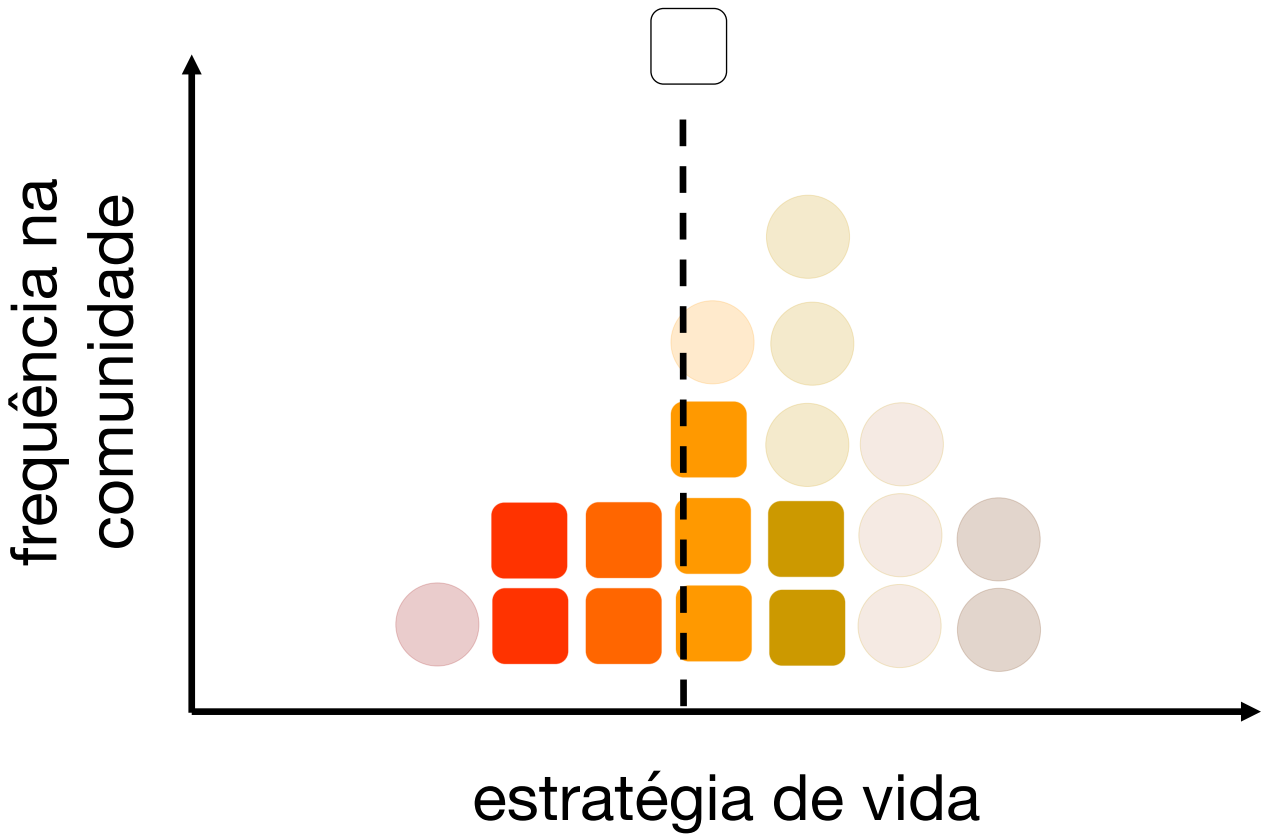

média da estratégia

**estratégia média**

variância total da estratégia

**diversidade de estratégias**

# variáveis de interesse



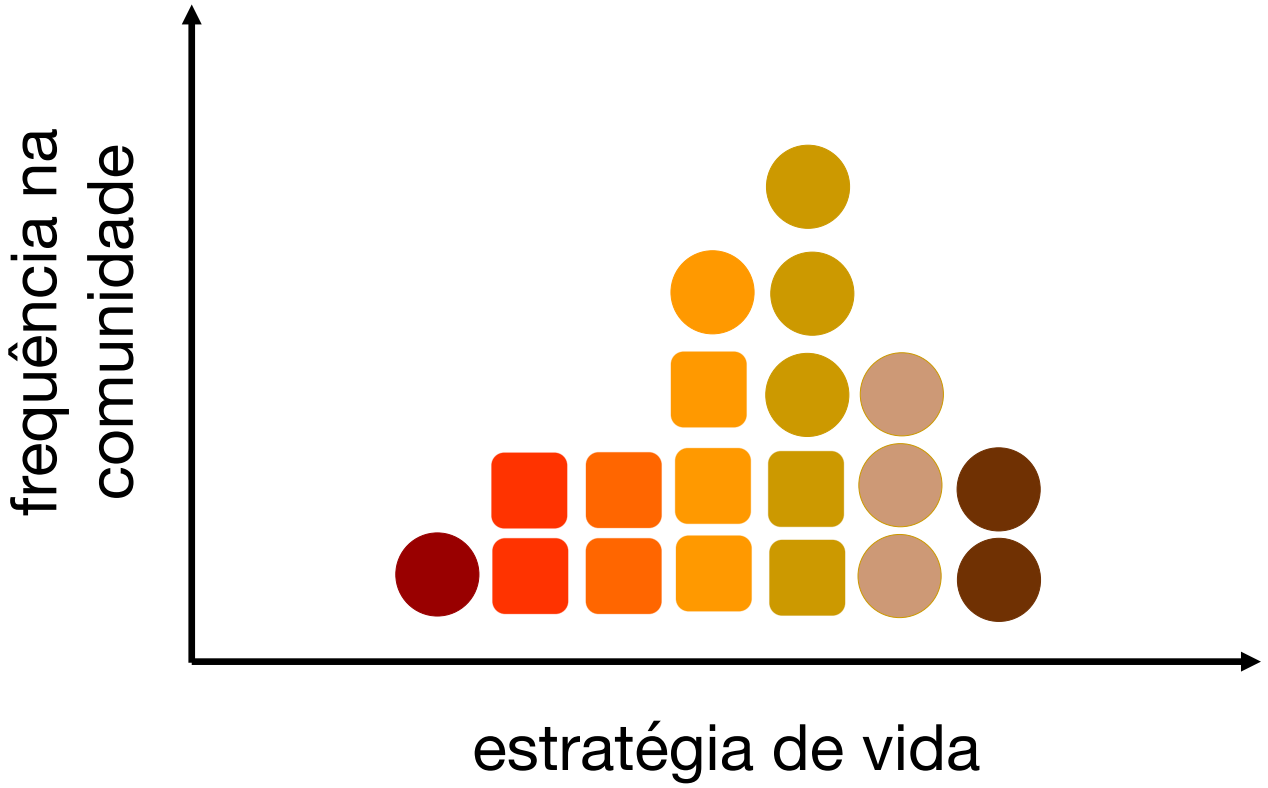

média da estratégia

**estratégia média**

variância total da estratégia

**diversidade de estratégias**

# variáveis de interesse



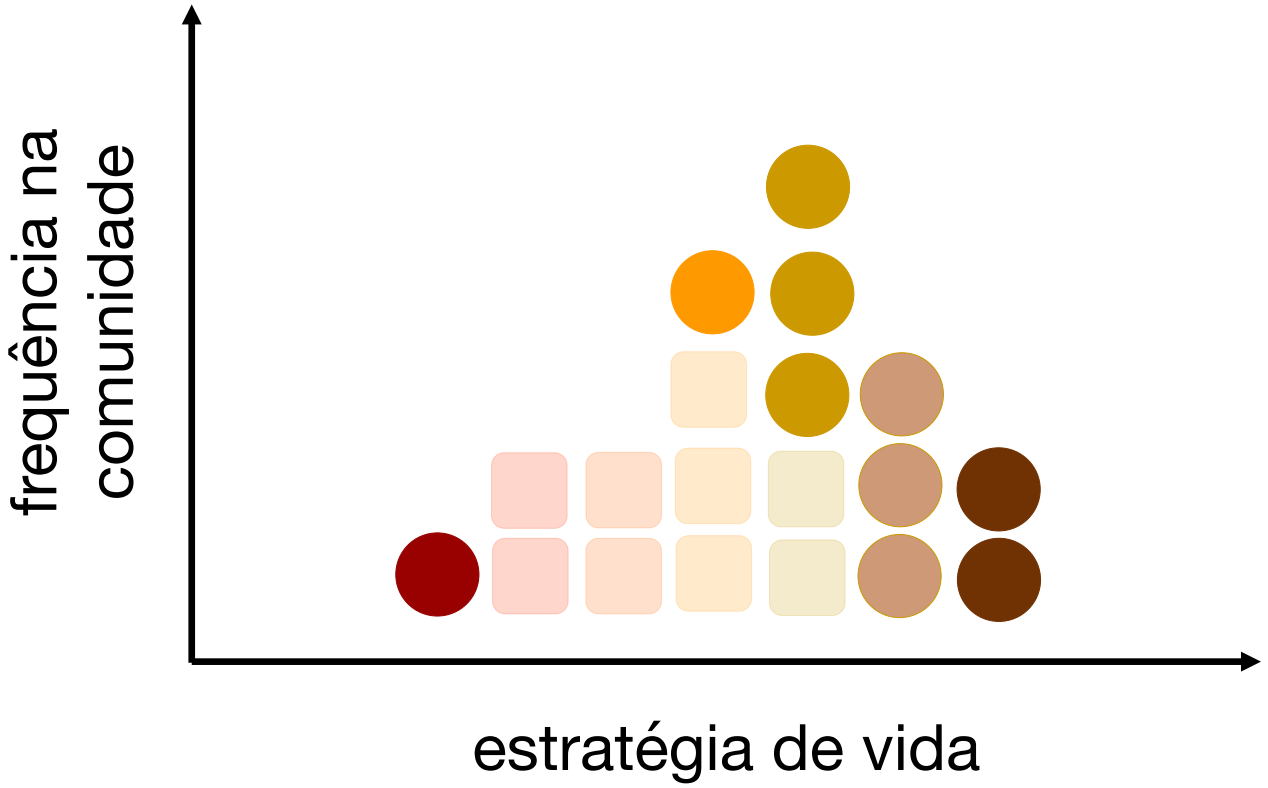

média da estratégia

**estratégia média**

variância total da estratégia

**diversidade de estratégias**

# variáveis de interesse



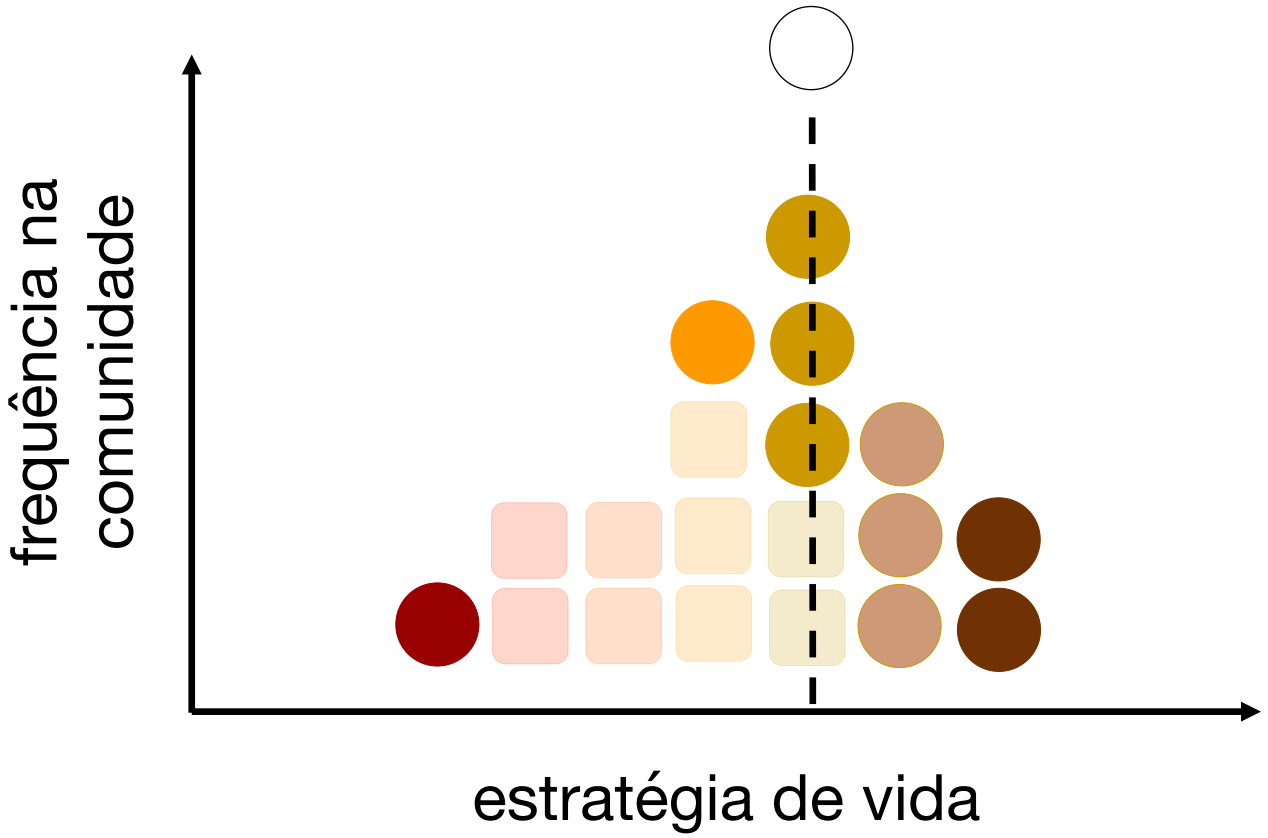

média da estratégia

**estratégia média**

variância total da estratégia

**diversidade de estratégias**

# variáveis de interesse



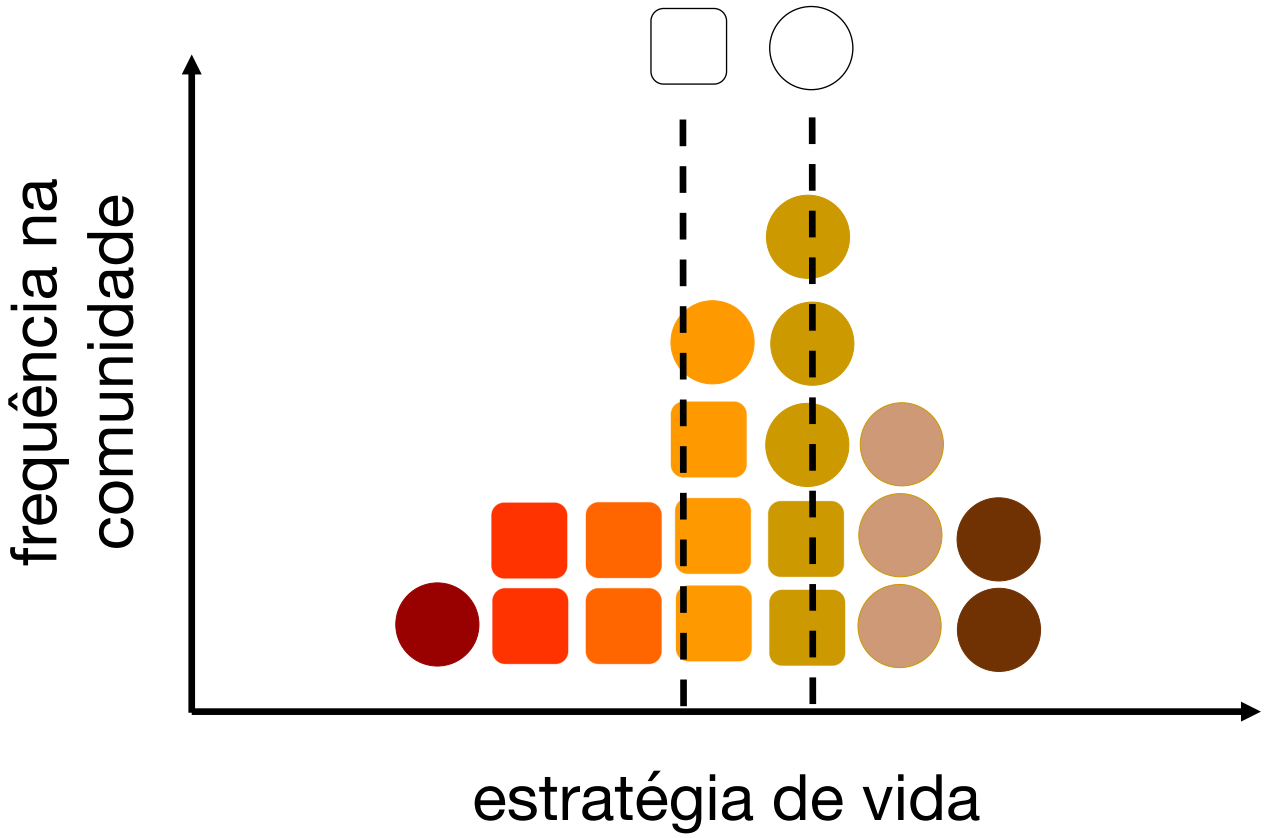

média da estratégia

**estratégia média**

variância total da estratégia

**diversidade de estratégias**

# variáveis de interesse



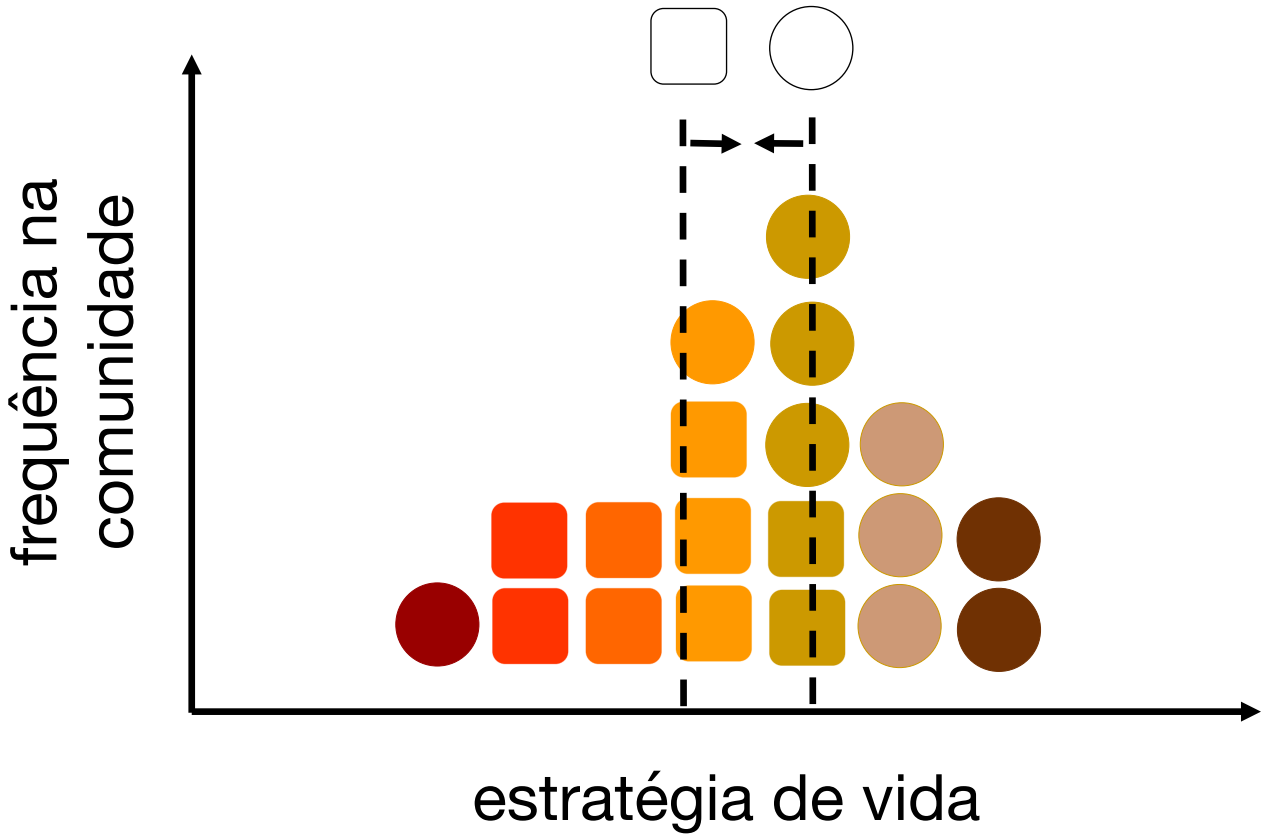

média da estratégia

**estratégia média**

variância total da estratégia

**diversidade de estratégias**

# variáveis de interesse



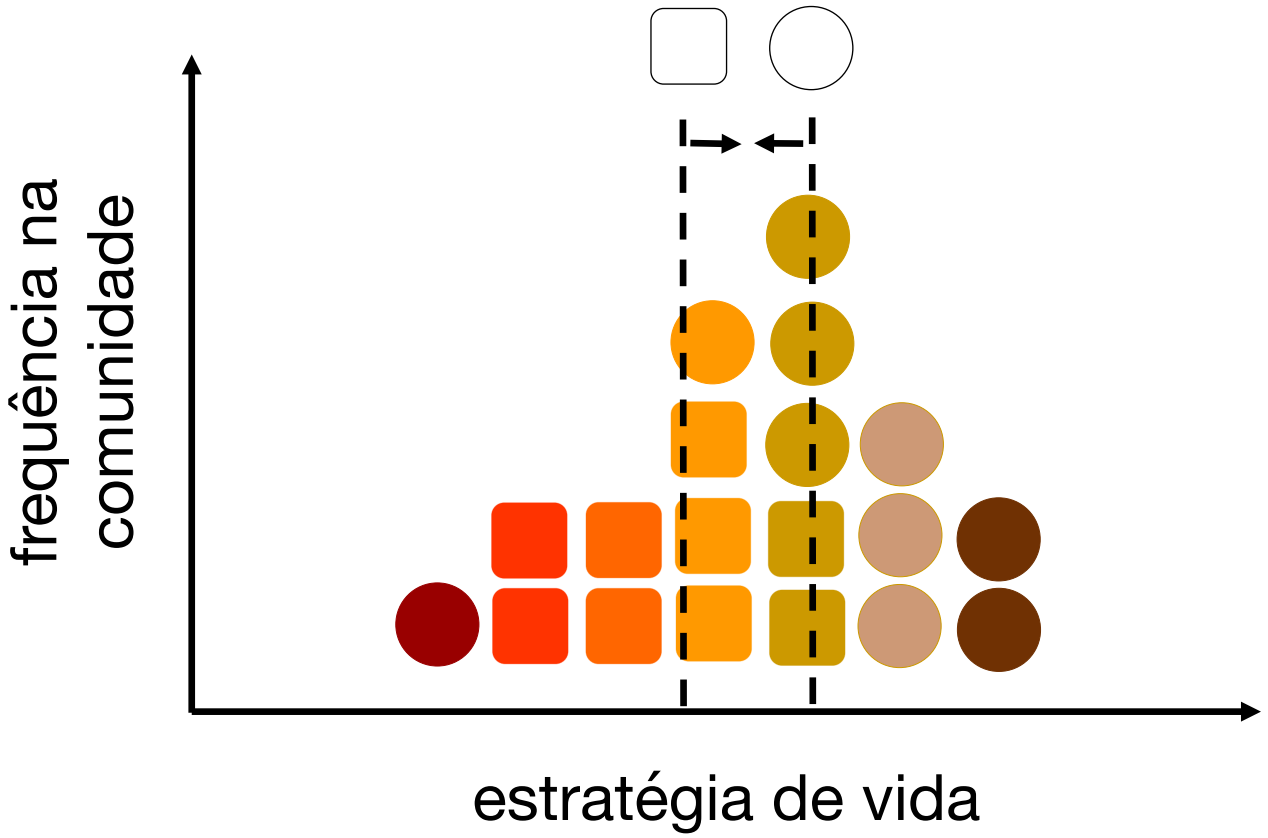

média da estratégia

**estratégia média**

variância total da estratégia

**diversidade de estratégias**

# variáveis de interesse




média da estratégia

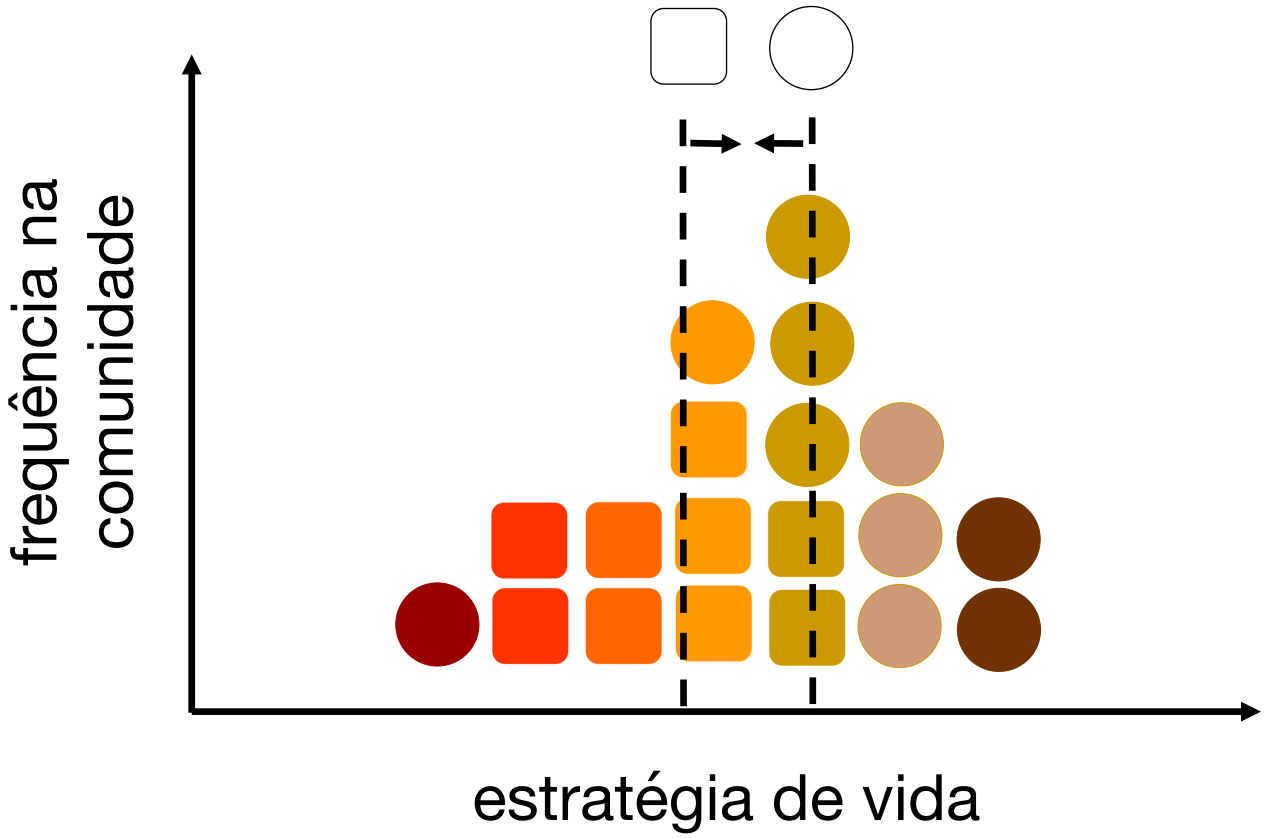
**estratégia média**

variância total da estratégia

**diversidade de estratégias**

variância interespecífica da estratégia

# variáveis de interesse




| | |
|---|---|
| média da estratégia | **estratégia média** |
| variância total da estratégia | **diversidade de estratégias** |
| variância interespecífica da estratégia | **heterogeneidade interespecífica de estratégias** |

# variáveis de interesse

| | |
|---|---|
| média da estratégia | **estratégia média** |
| variância total da estratégia | **diversidade de estratégias** |
| variância interespecífica da estratégia | **heterogeneidade interespecífica de estratégias** |

# variáveis de interesse

| | |
|---|---|
| média da estratégia | **estratégia média** |
| variância total da estratégia | **diversidade de estratégias** |
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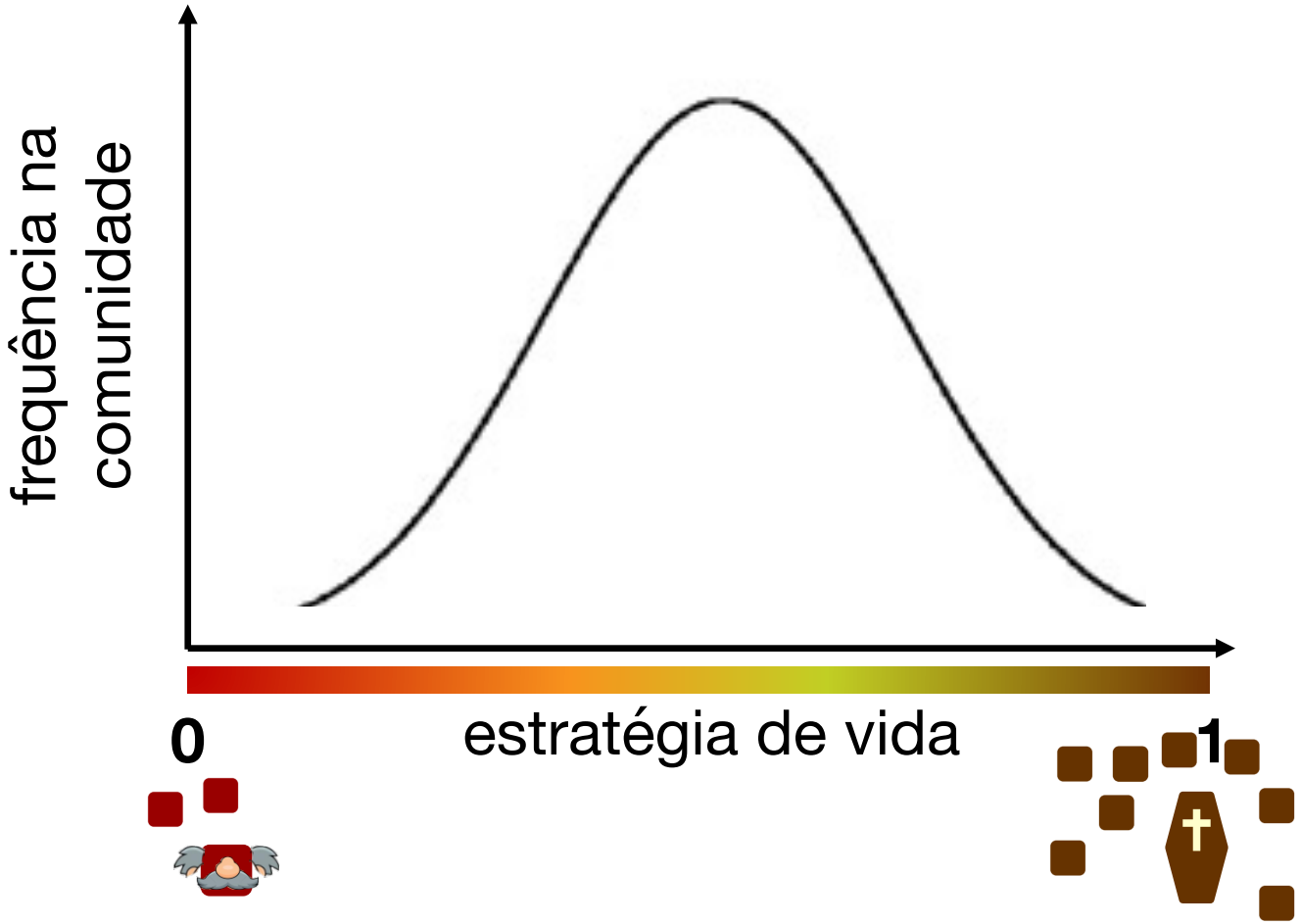
# variáveis de interesse




média da estratégia

**estratégia média**

variância total da estratégia

**diversidade de estratégias**

variância interespecífica da estratégia

**heterogeneidade interespecífica de estratégias**

# variável preditora

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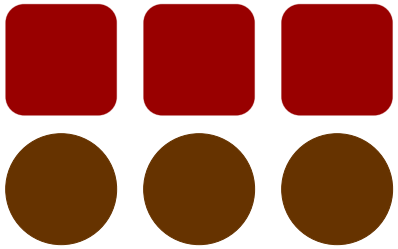
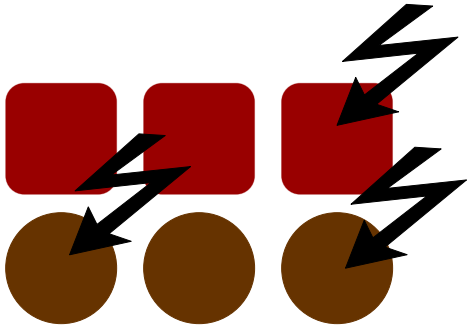
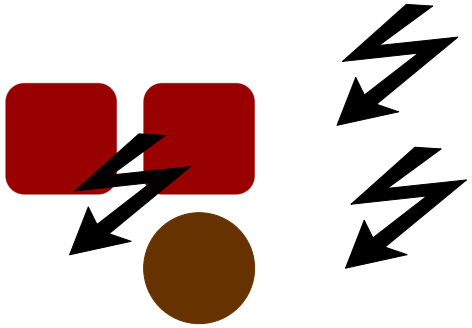


# variável preditora



# variável preditora



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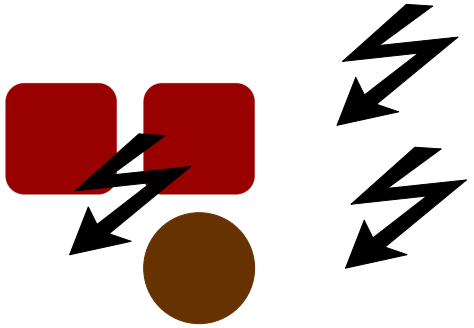

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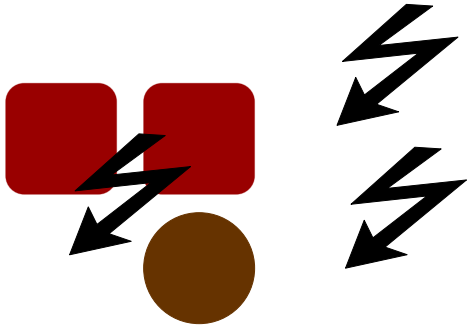

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**intensidade do distúrbio**

# variável preditora

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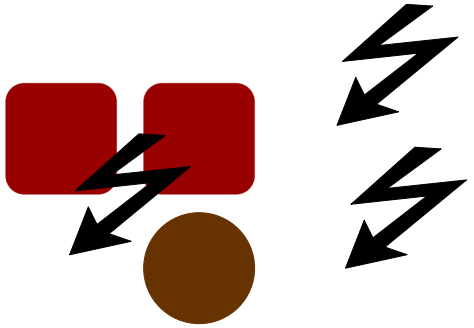
**intensidade do distúrbio**

# variável preditora



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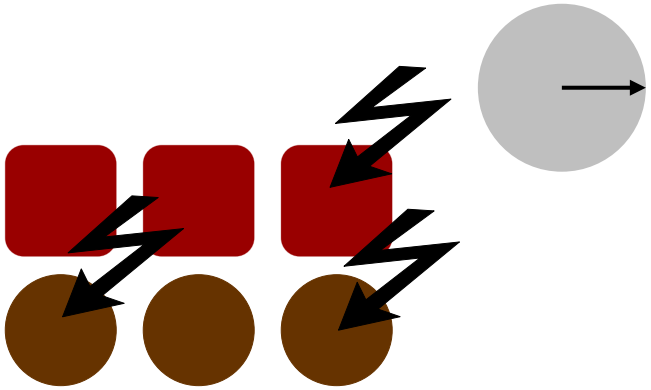
**intensidade do distúrbio**



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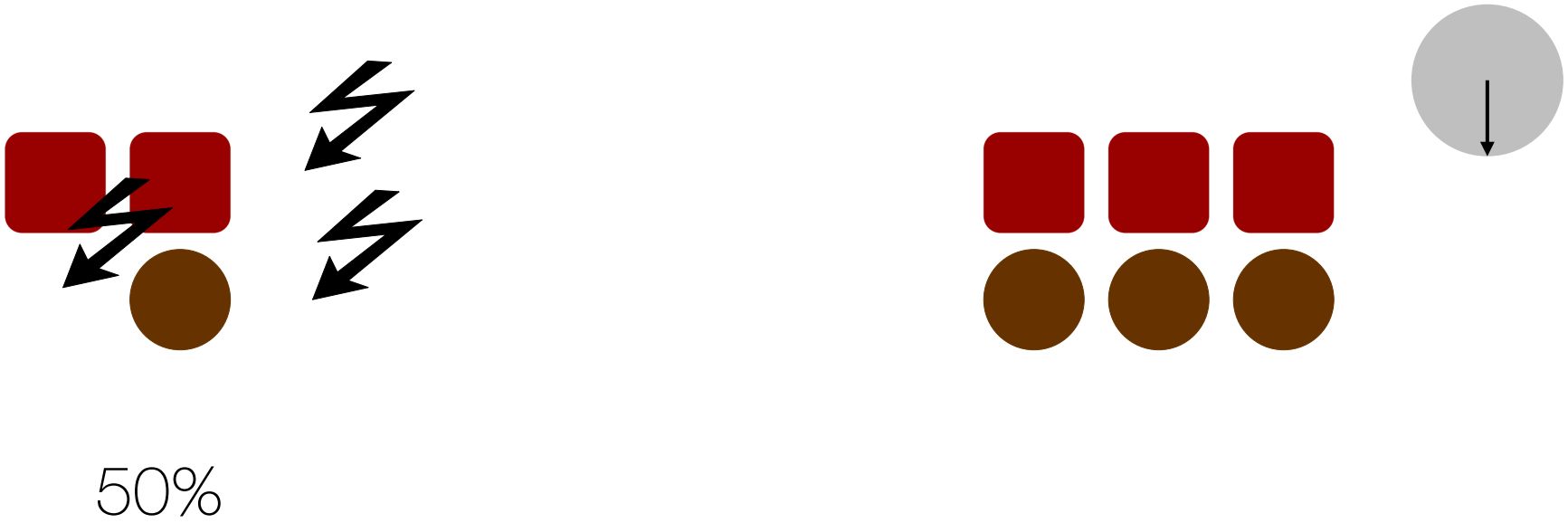
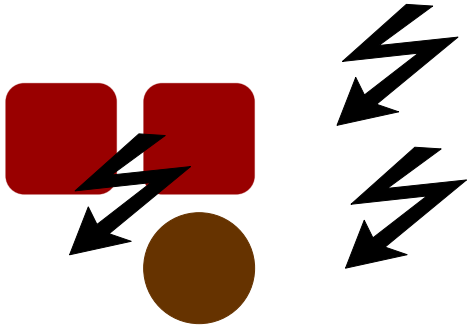



**intensidade do distúrbio**

# variável preditora



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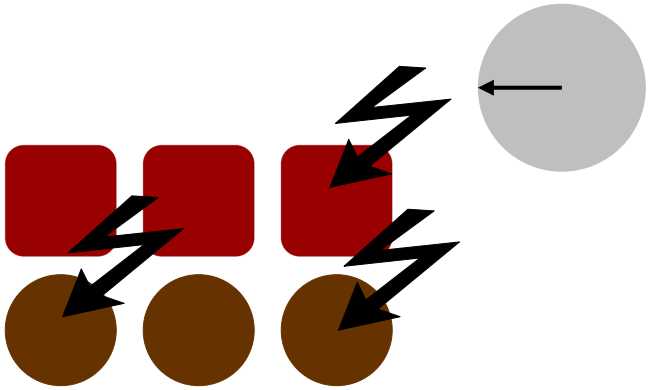
**intensidade do distúrbio**



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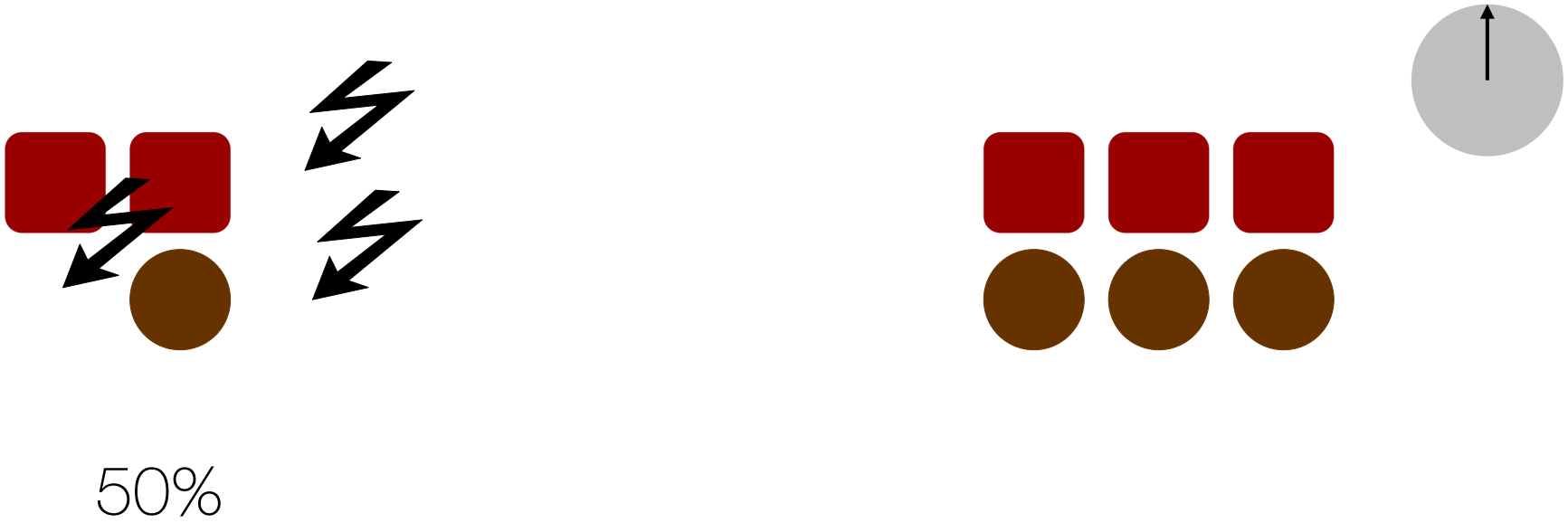
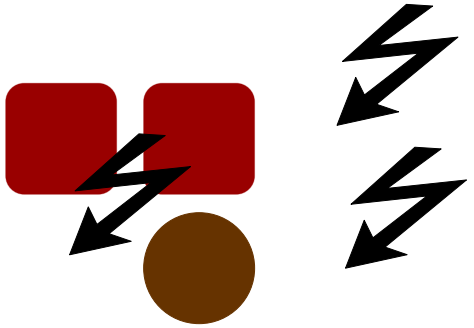



**intensidade do distúrbio**

# variável preditora



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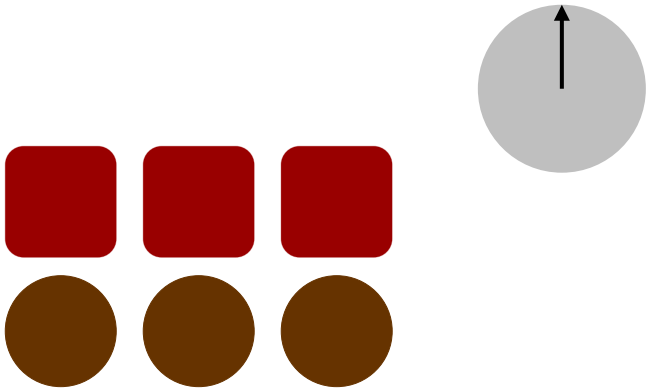
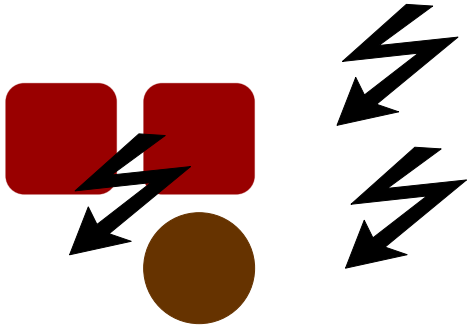
**intensidade do distúrbio**



2 eventos

# variável preditora



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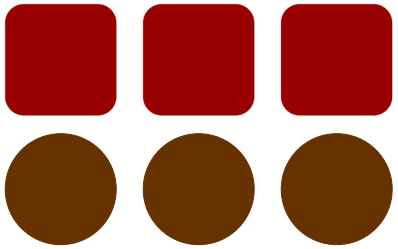
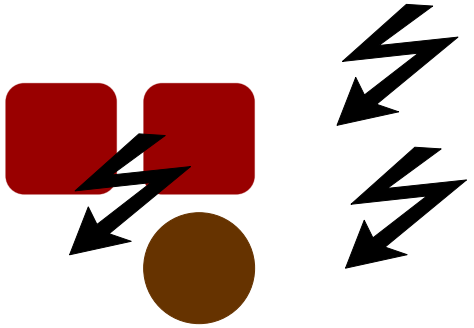
**intensidade do distúrbio**



2 eventos

**número de eventos de distúrbio**

# variável preditora



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**intensidade do distúrbio**

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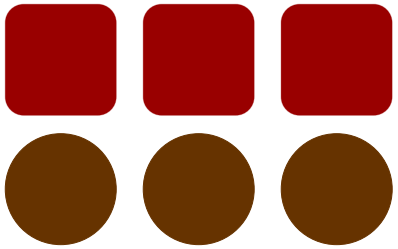


2 eventos

**número de eventos de distúrbio**

# variável preditora

50%

2 eventos

=

# variável preditora

50%

2 eventos

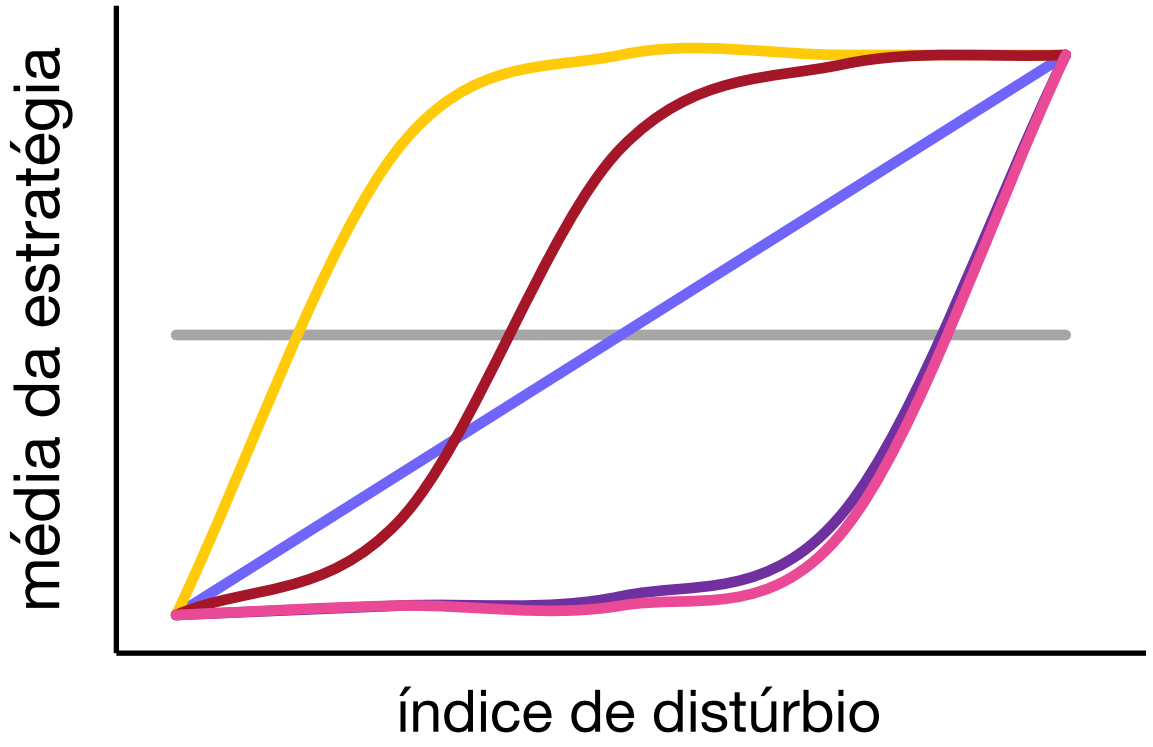
**índice de distúrbio**

# análise dos dados

# modelos

# estratégia média ~ distúrbio

# estratégia média ~ distúrbio



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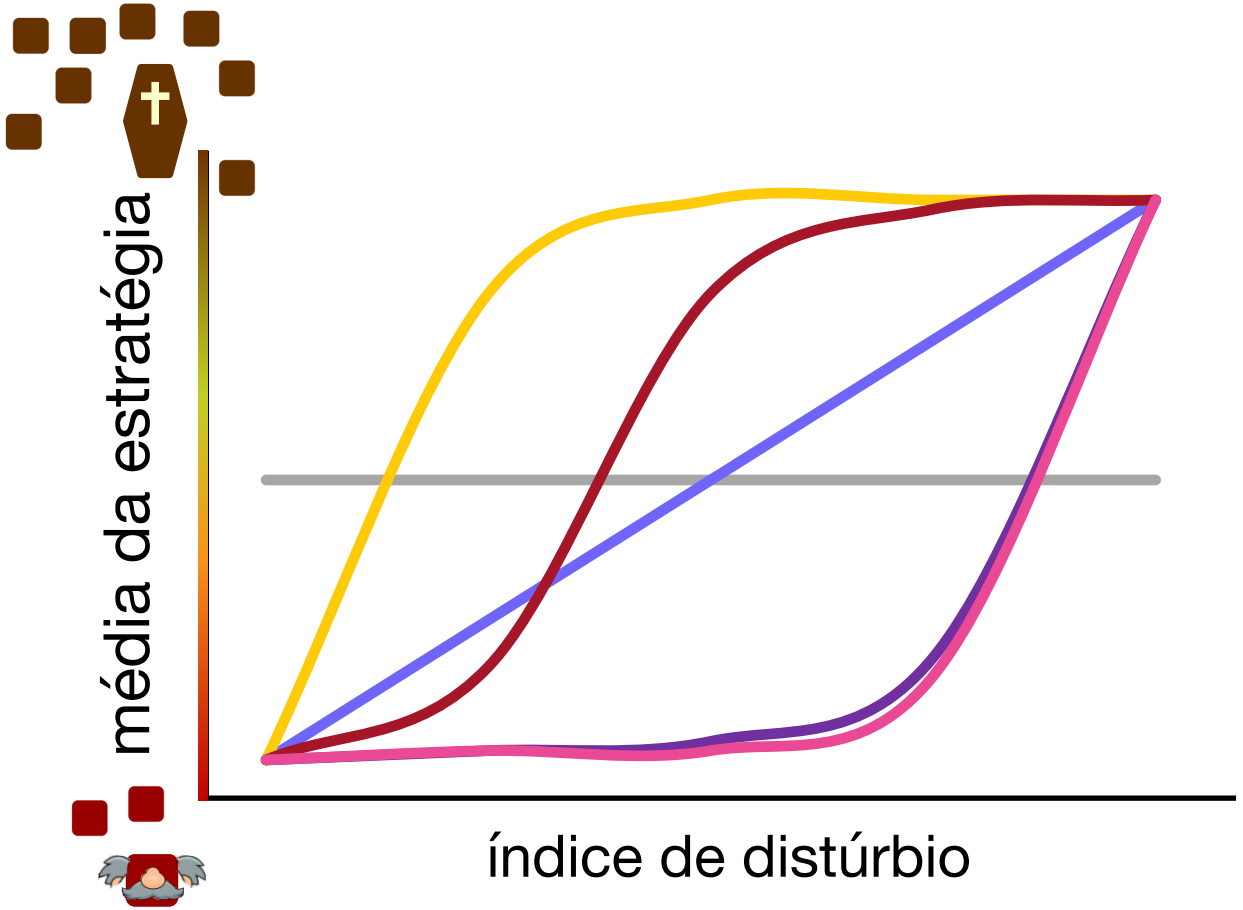

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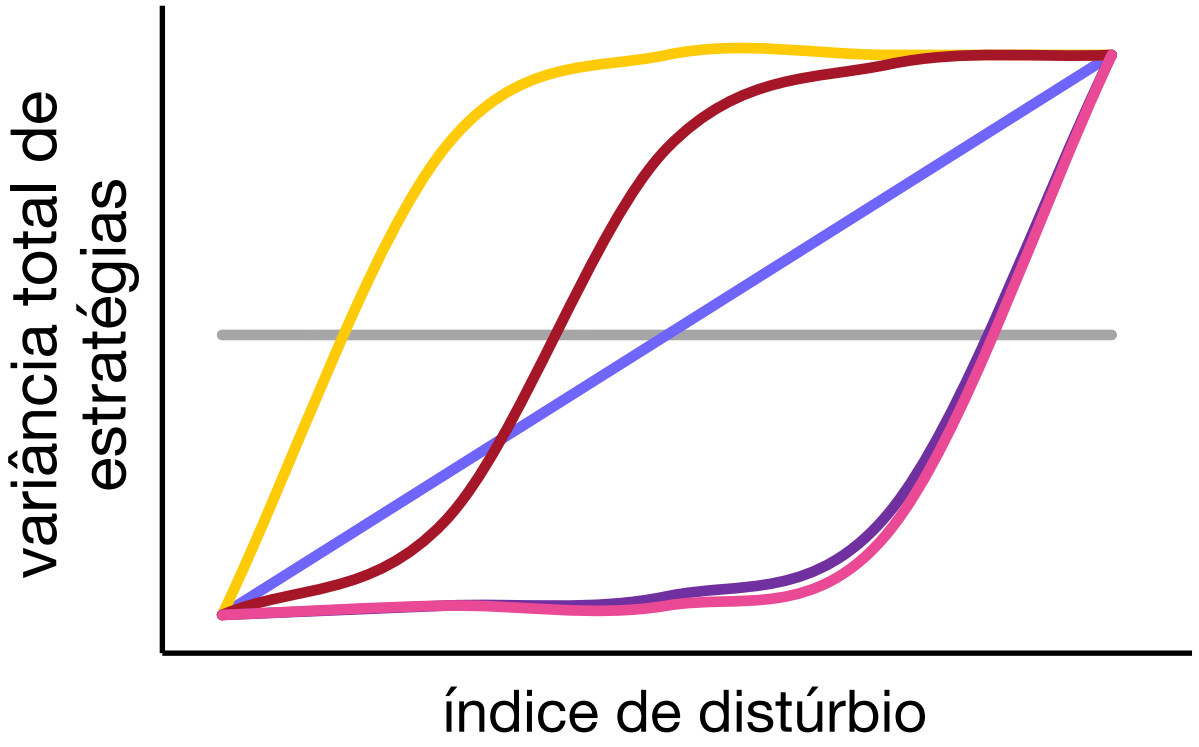
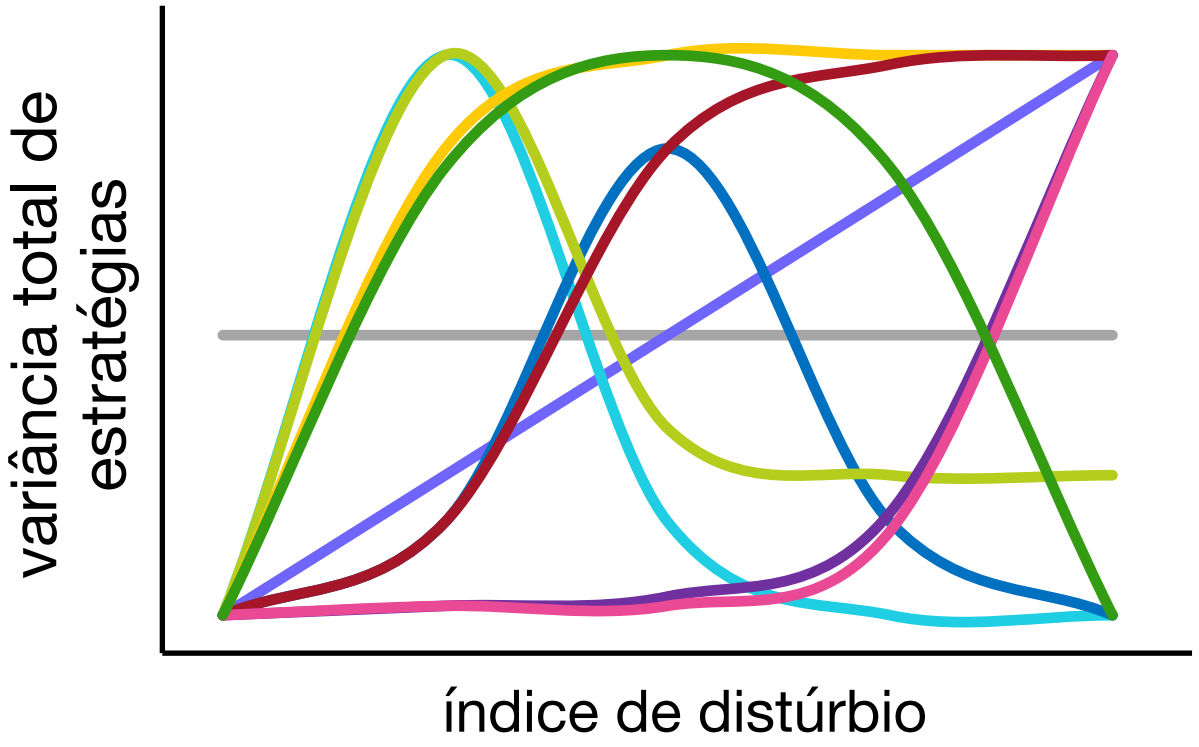
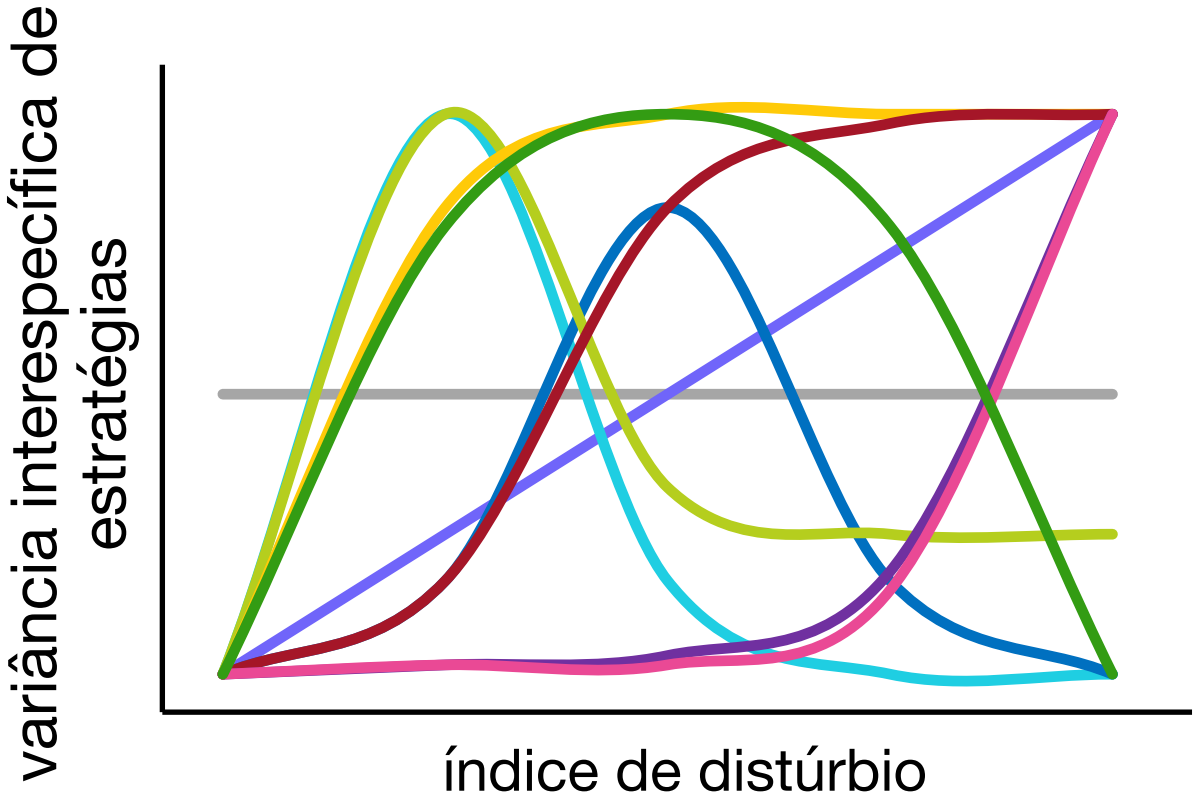


# diversidade de estratégias ~ distúrbio



heterogeneidade interespecífica de estratégias ~ distúrbio



# seleção de modelos

# 8 seleções de modelo

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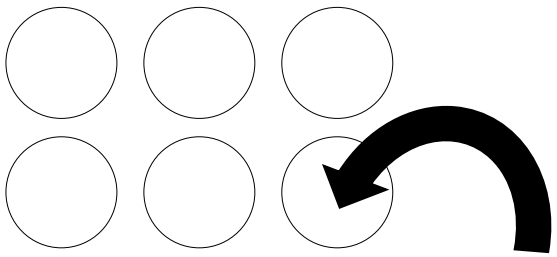
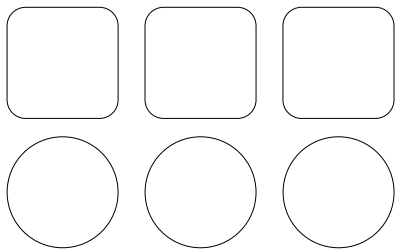
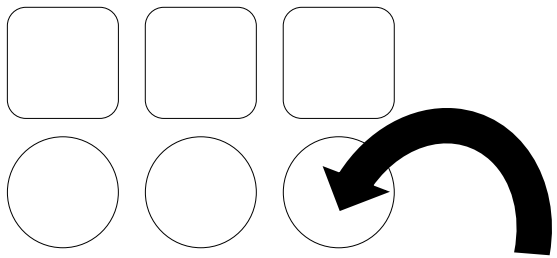
|  |  |  |
| estratégia média | estratégia média | estratégia média |
| diversidade de estratégias | diversidade de estratégias | diversidade de estratégias |
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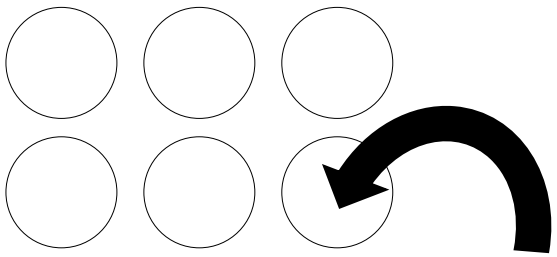
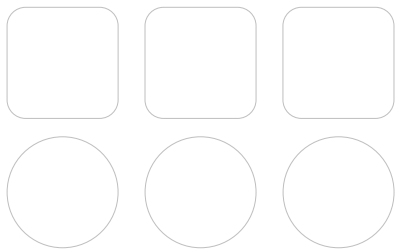
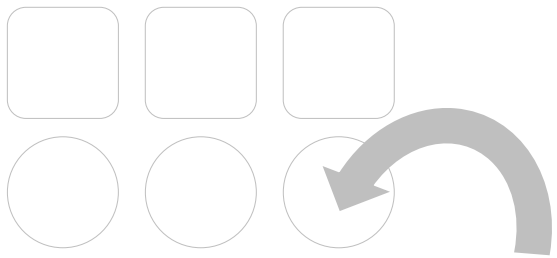
| evolutivo | ecológico | eco-evolutivo |
|---|---|---|
|  |  |  |
| estratégia média | estratégia média | estratégia média |
| diversidade de estratégias | diversidade de estratégias | diversidade de estratégias |
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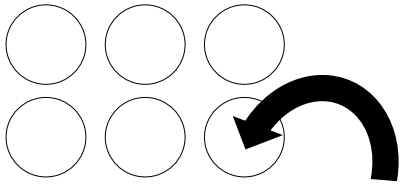
# estratégia média



**evolutivo**

# estratégia média

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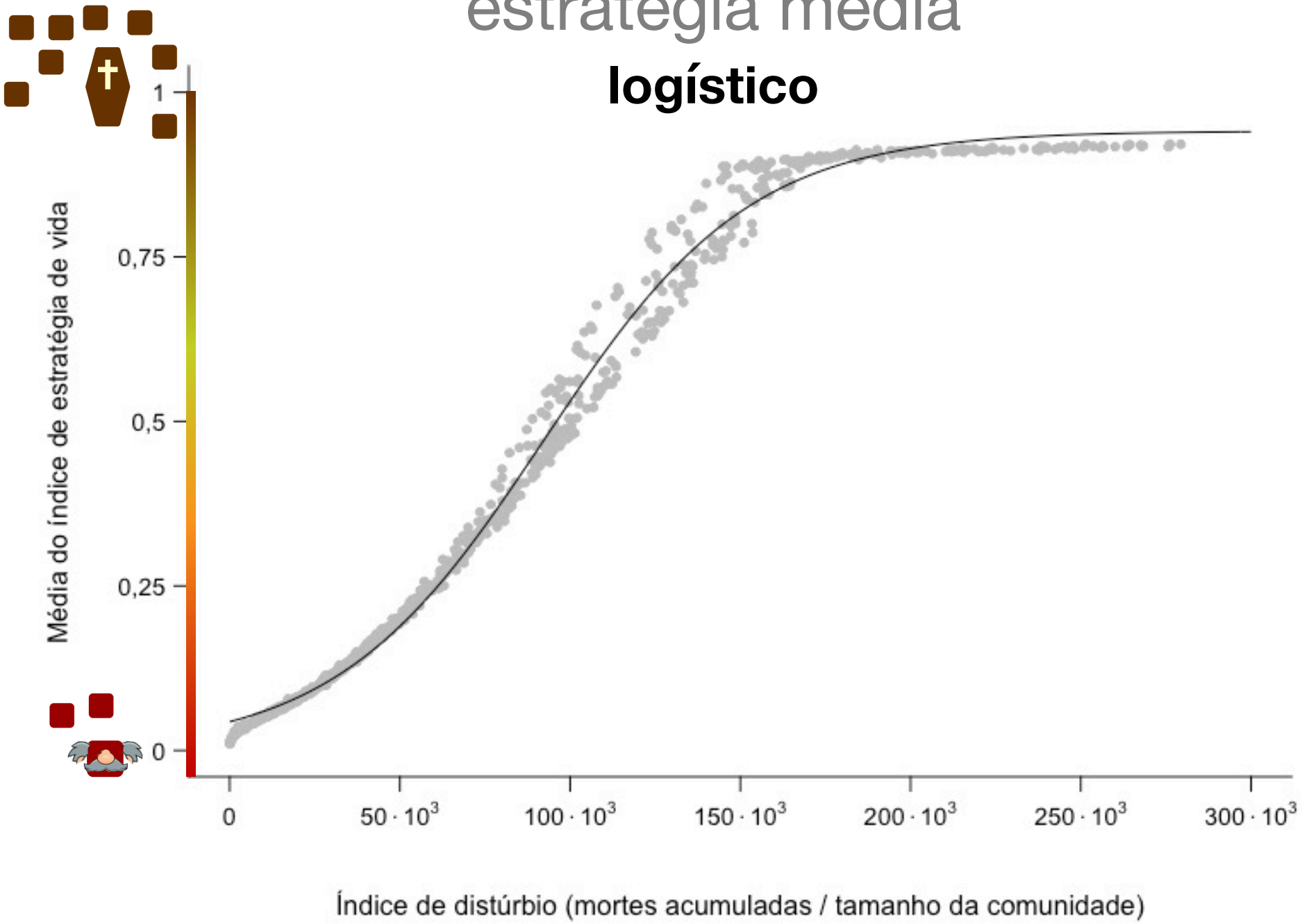
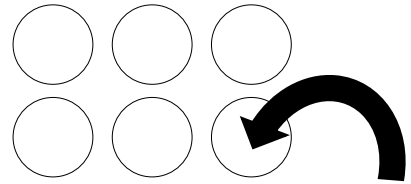
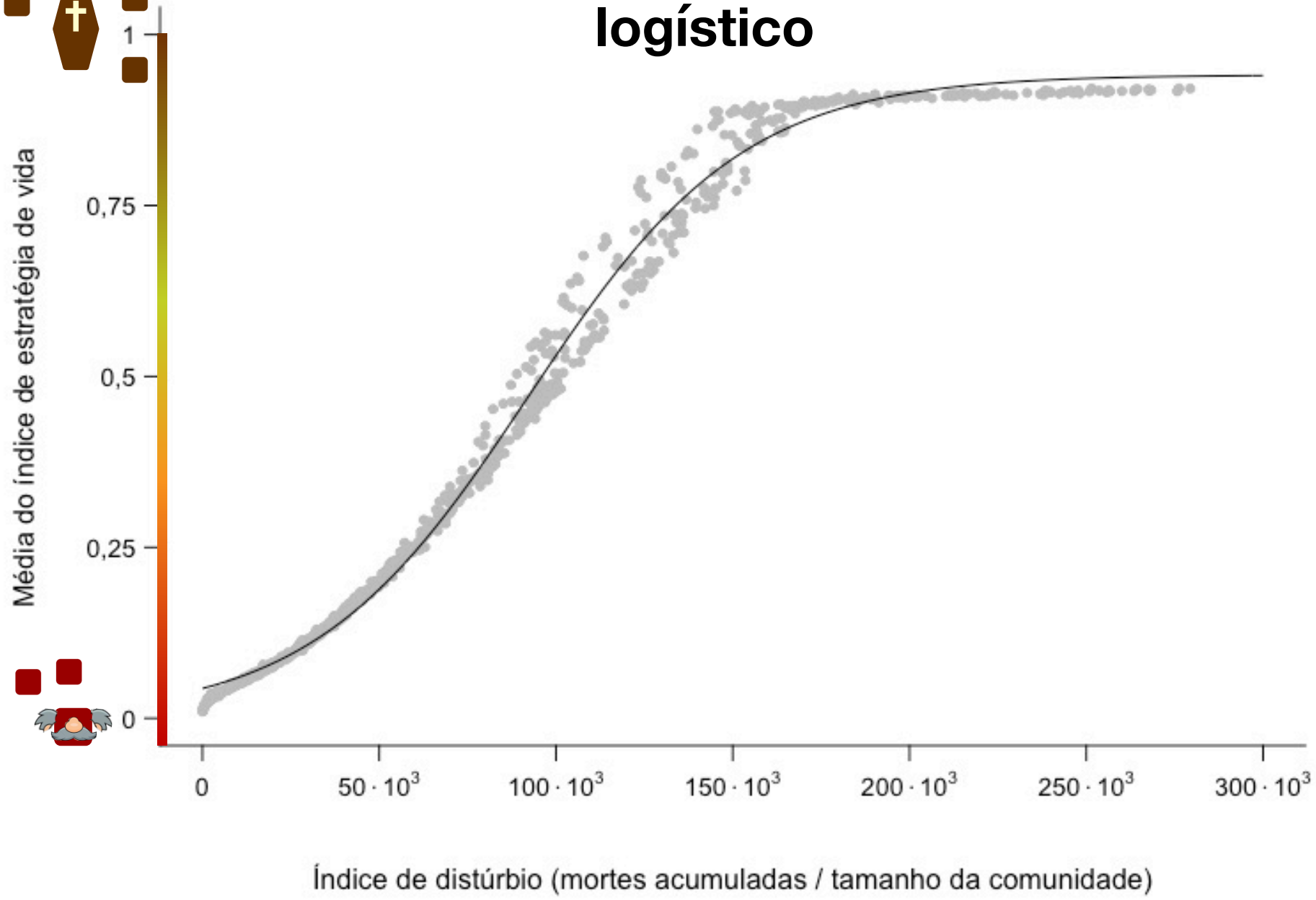


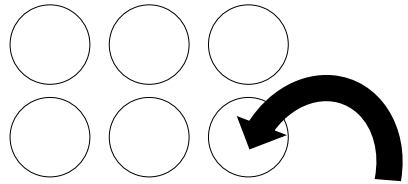



**evolutivo**

# estratégia média

## logístico



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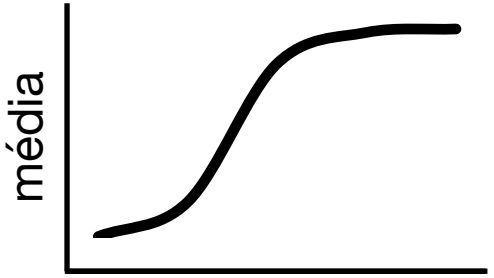
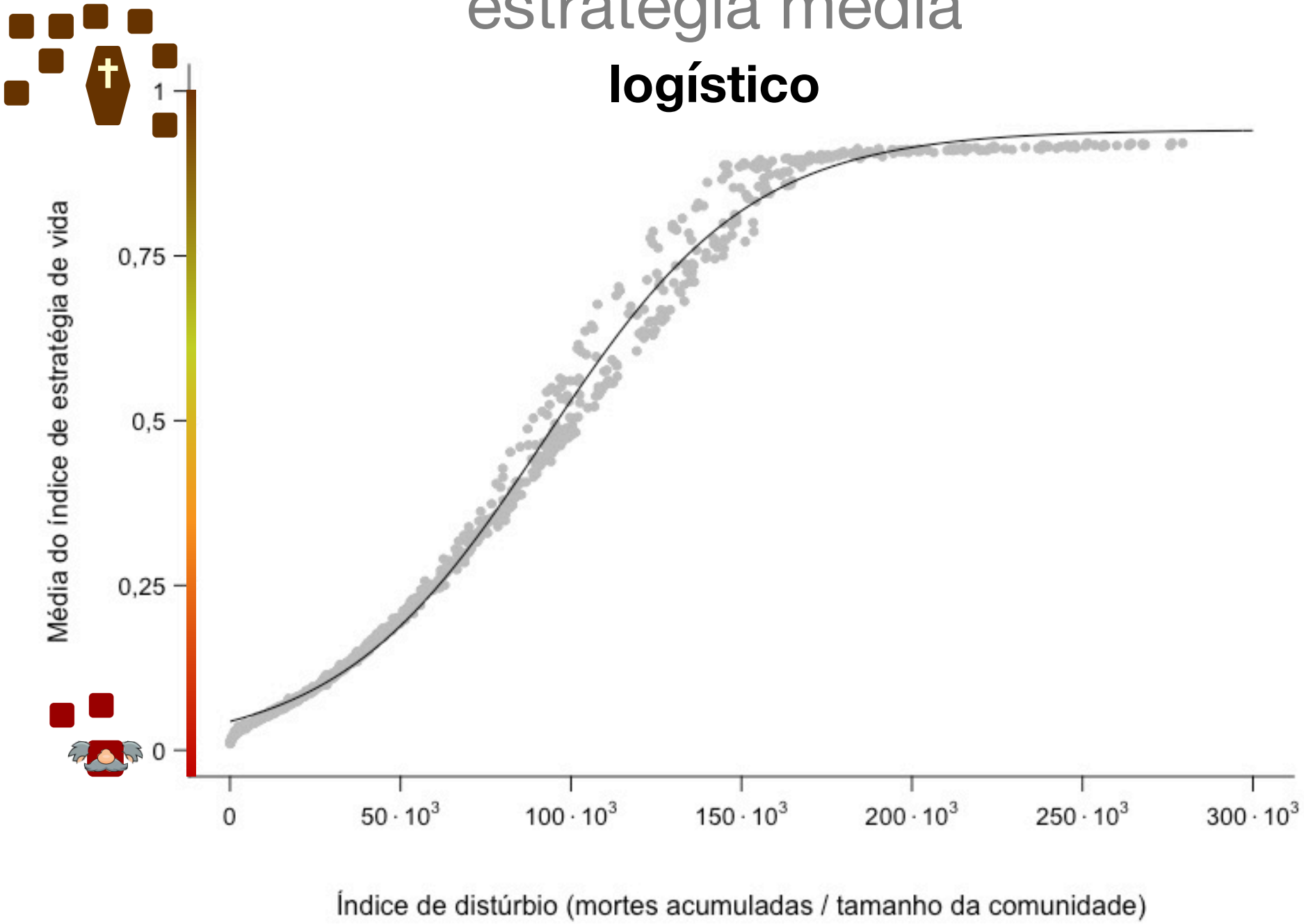
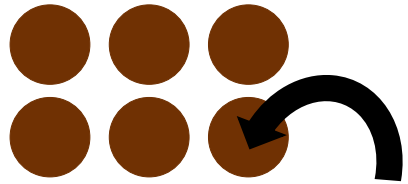


# estratégia média

## logístico



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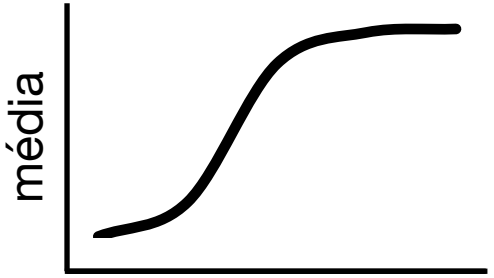
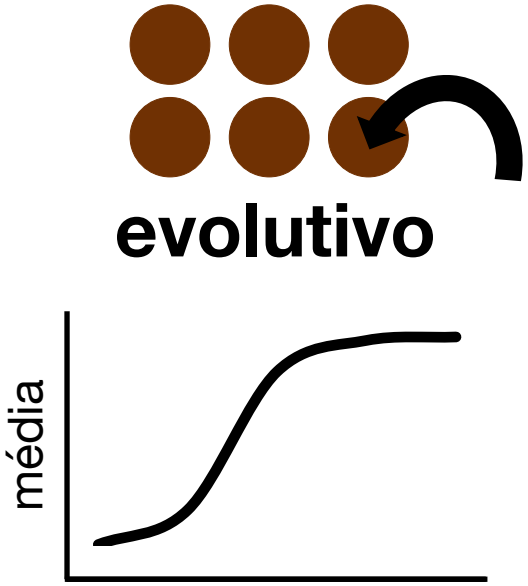


# seleção natural

- variação herdável
- componente da aptidão



# seleção natural

- variação herdável
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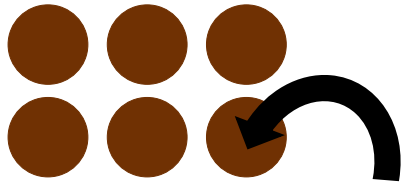
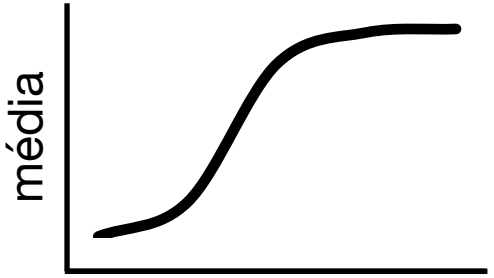


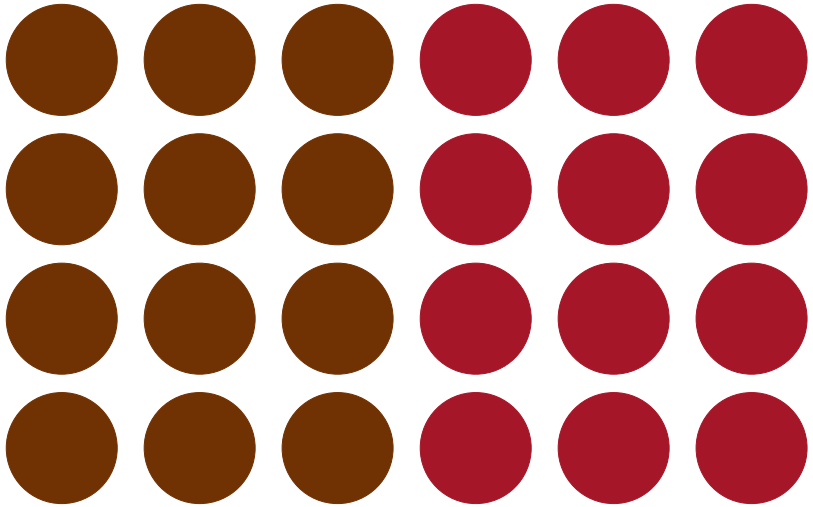
**evolutivo**




banco

x 96

x 24



# seleção natural

- variação herdável
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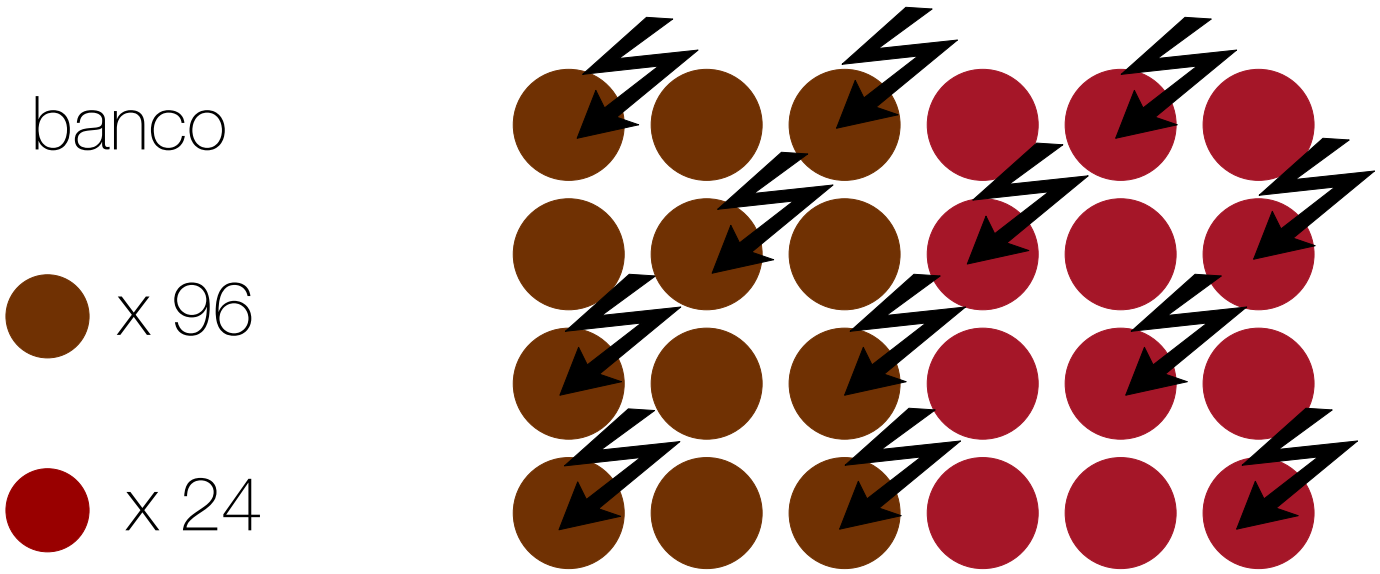


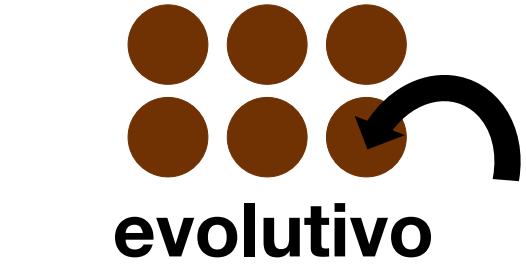


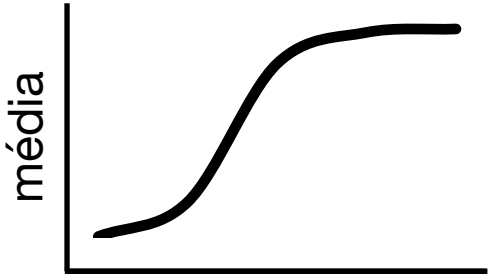

# seleção natural

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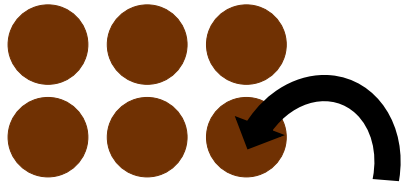
- componente da aptidão



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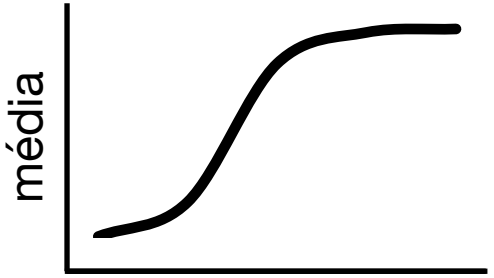
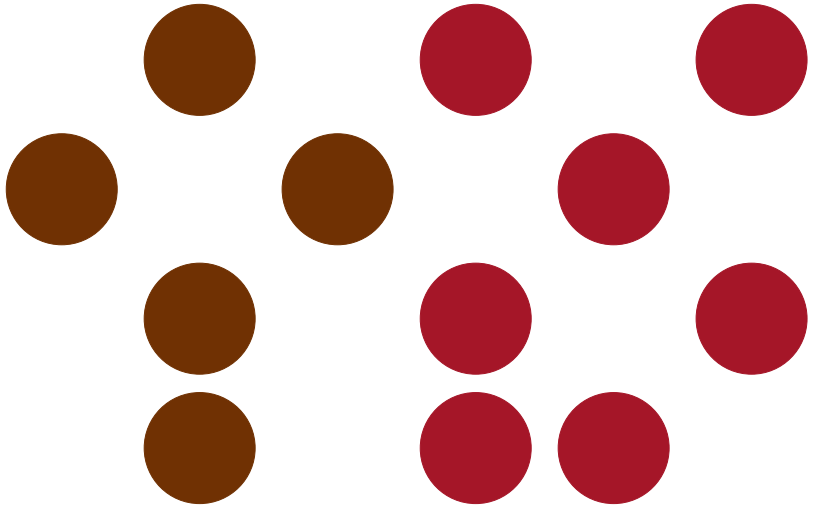



banco

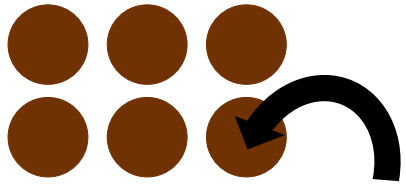
x 96

x 24



# seleção natural

- variação herdável
- componente da aptidão



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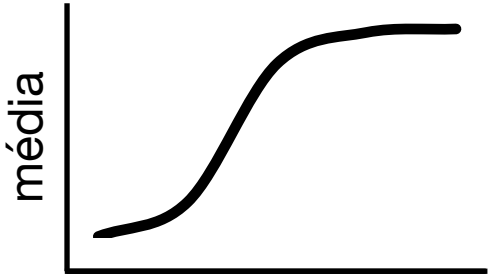


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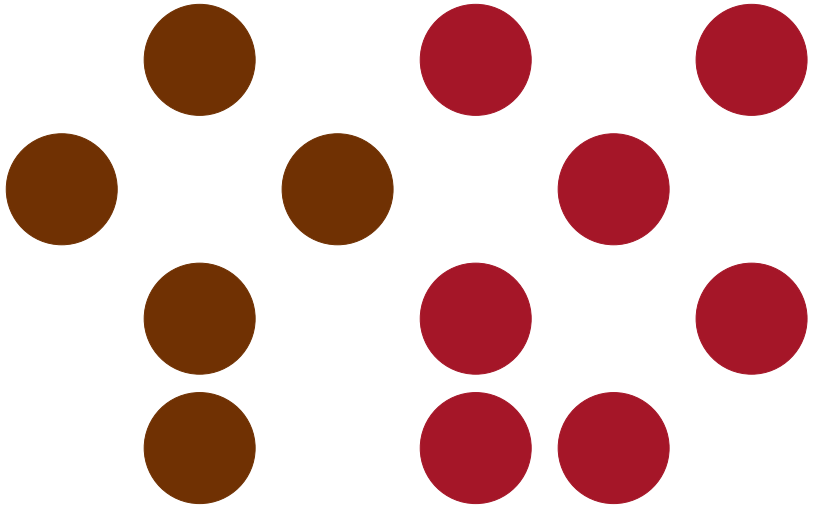

# seleção natural

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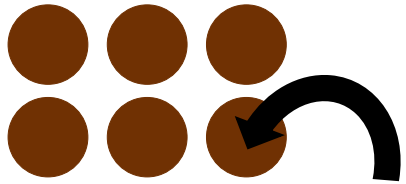

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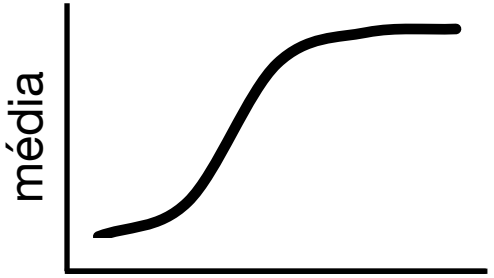
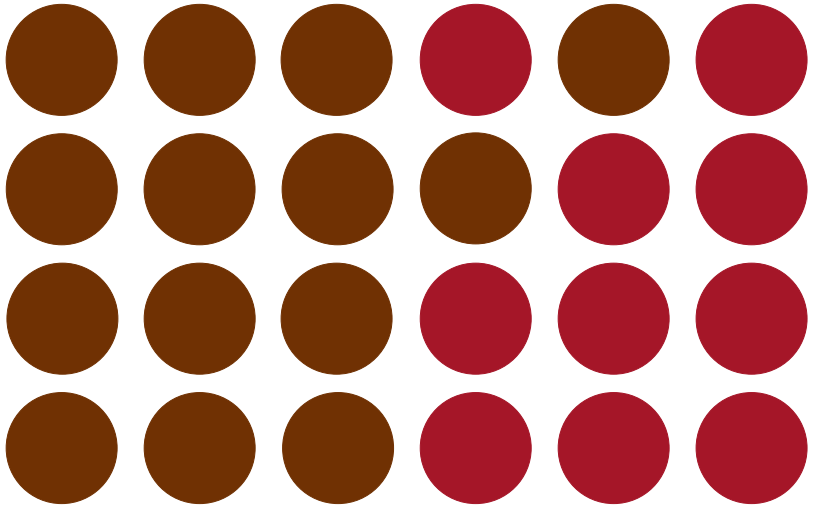



banco

x 112

x 20



# seleção natural

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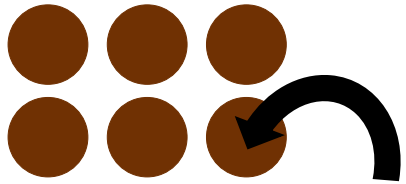

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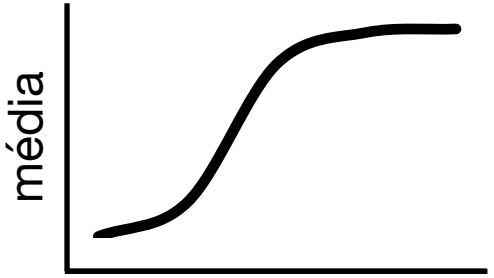


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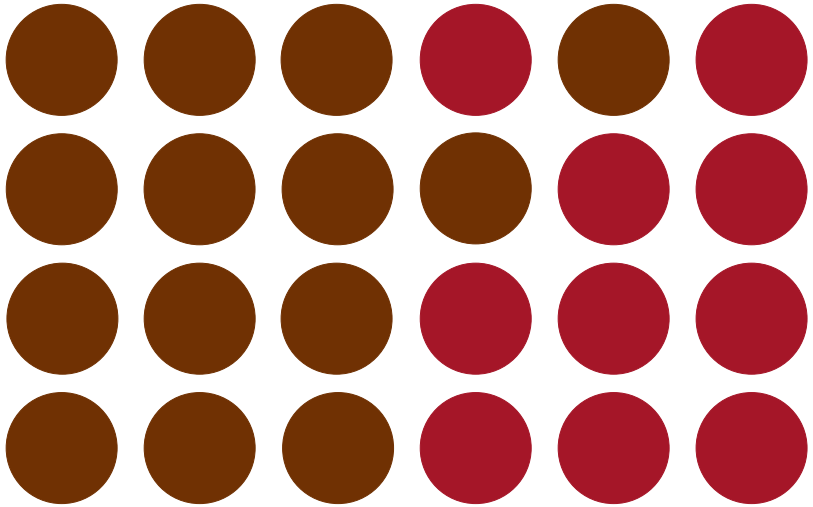
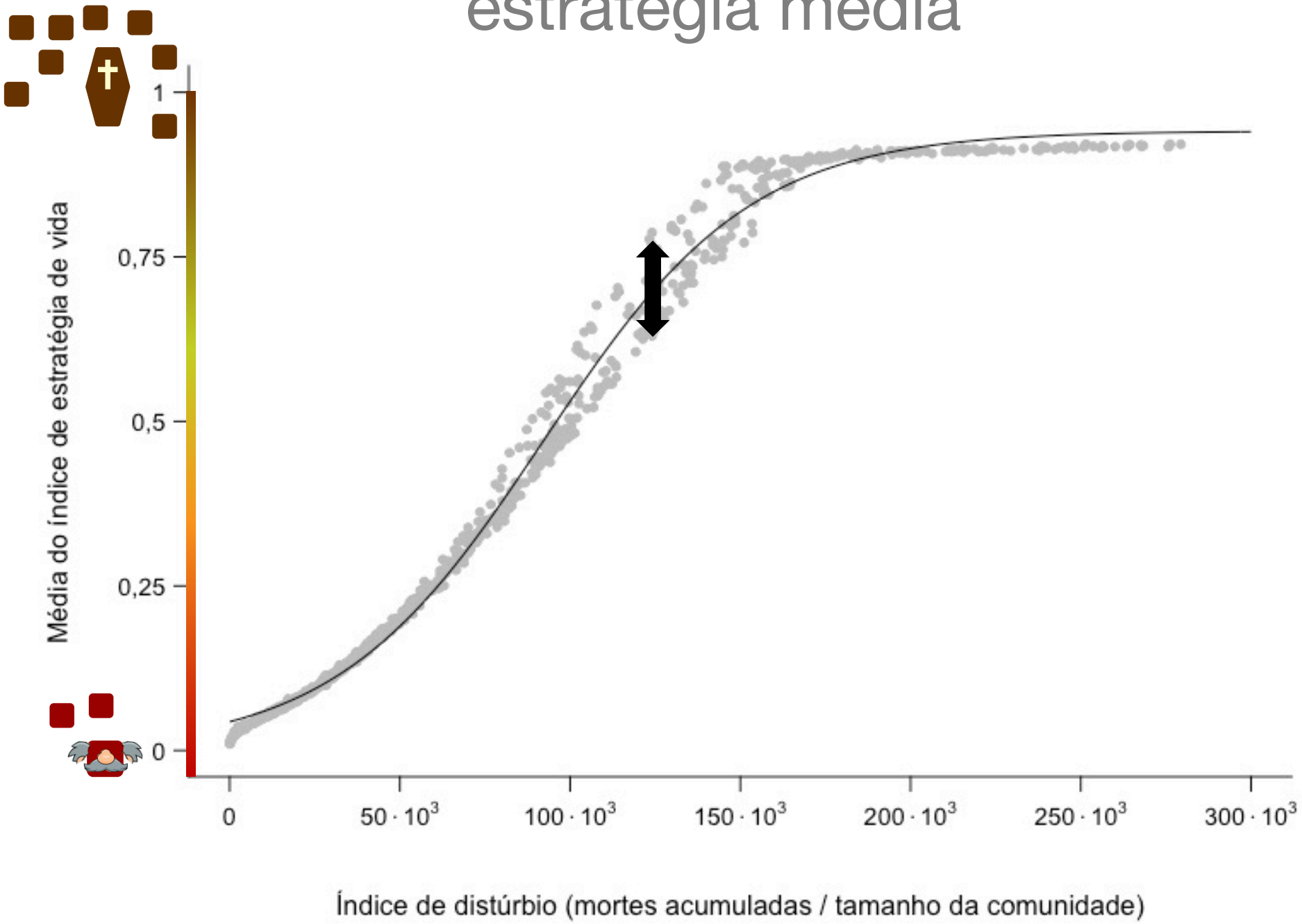
x 112

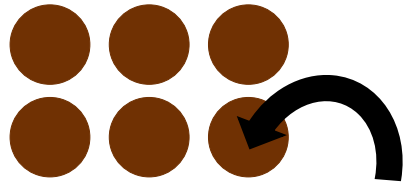
x 20



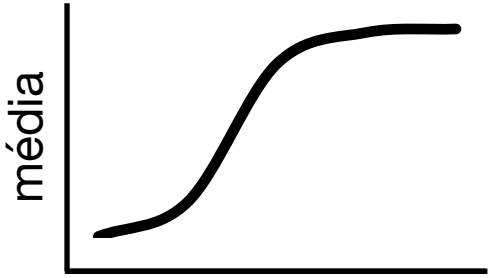
estratégia de maior fecundidade mais apta

# estratégia média

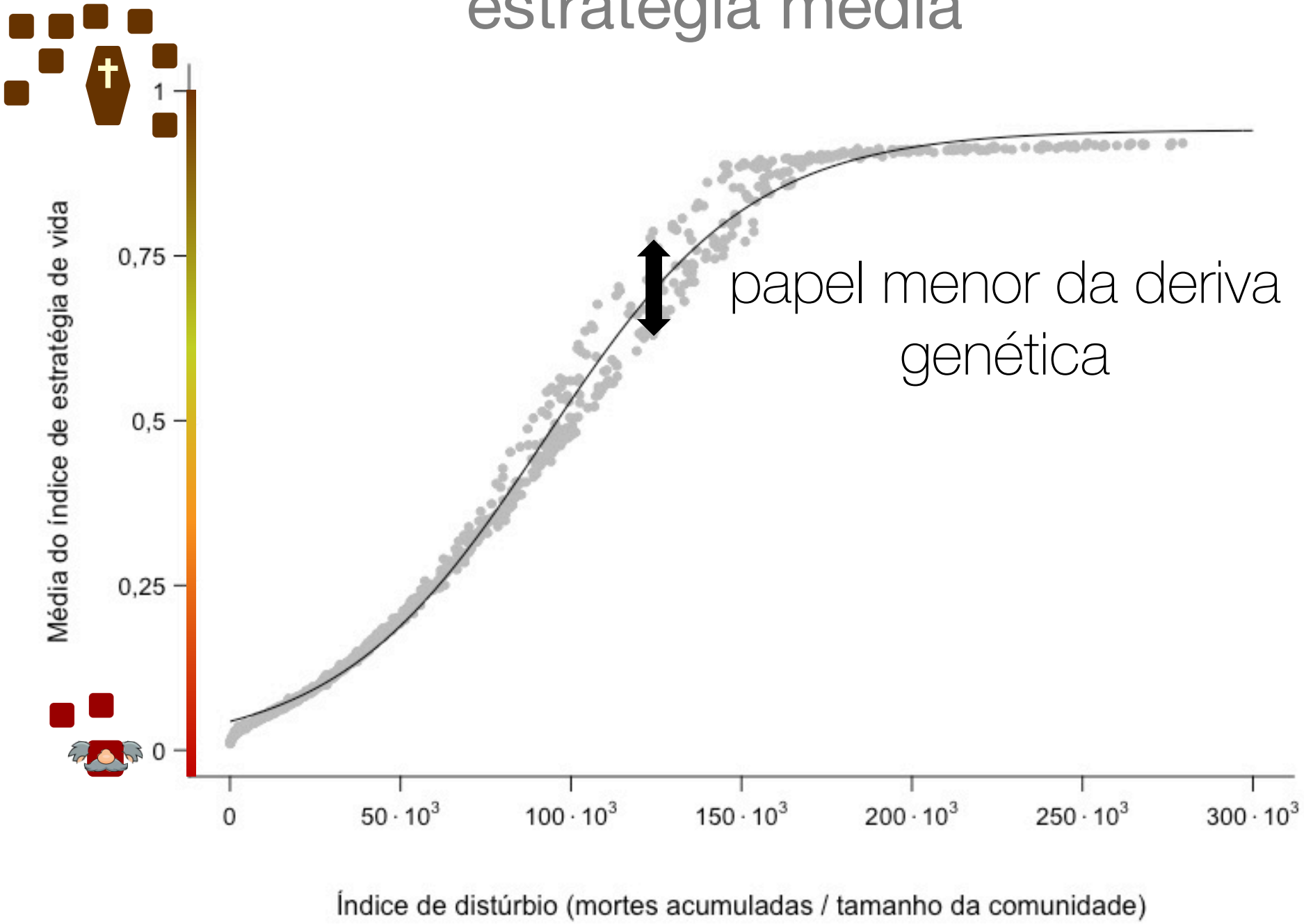


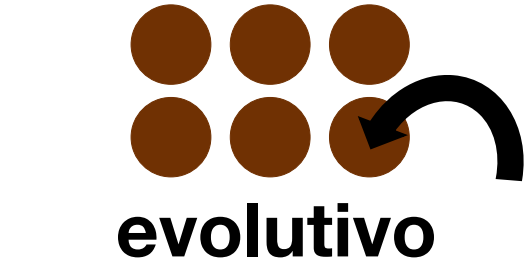



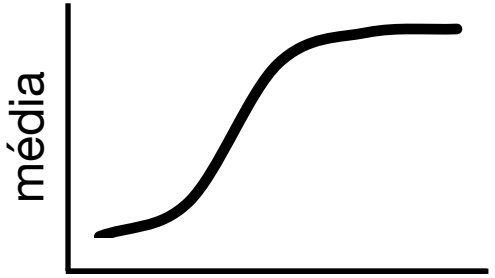
**evolutivo**

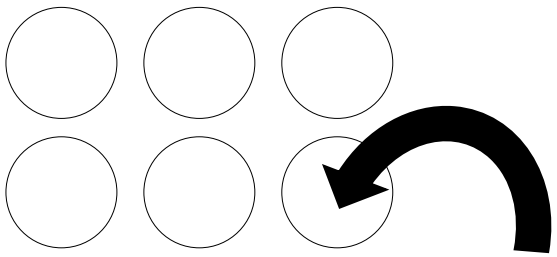
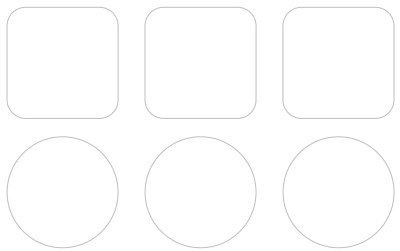
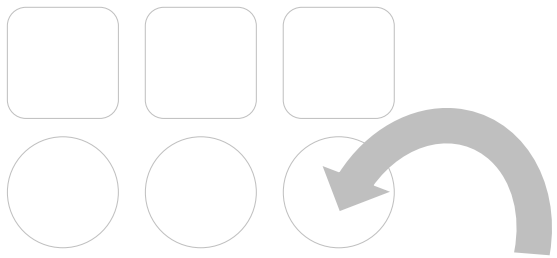


# estratégia média



| evolutivo | ecológico | eco-evolutivo |
|---|---|---|
|  |  |  |
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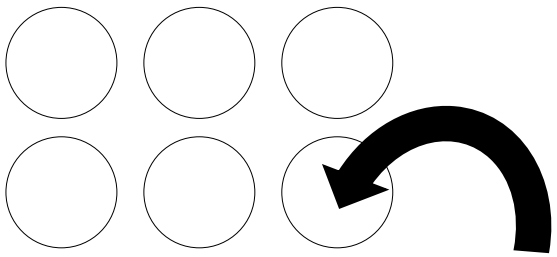
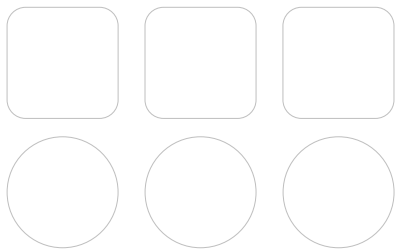
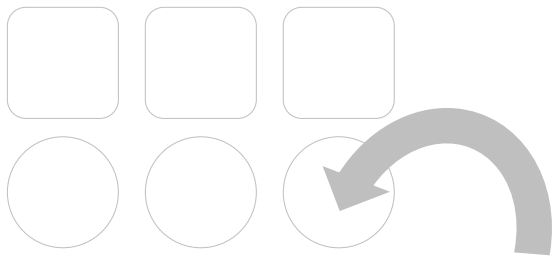
| diversidade de estratégias | diversidade de estratégias | diversidade de estratégias |
| - | heterogeneidade interespecífica de estratégias | heterogeneidade interespecífica de estratégias |

| evolutivo | ecológico | eco-evolutivo |
|---|---|---|
|  |  |  |
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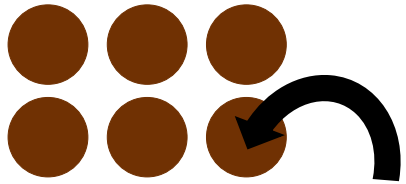
| diversidade de estratégias | diversidade de estratégias | diversidade de estratégias |
| - | heterogeneidade interespecífica de estratégias | heterogeneidade interespecífica de estratégias |

# diversidade de estratégias



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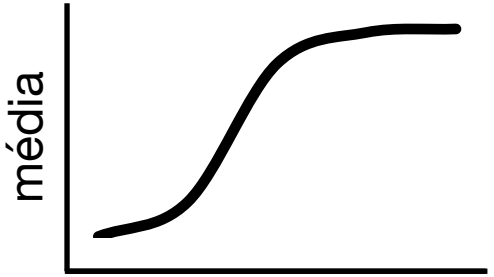

# diversidade de estratégias

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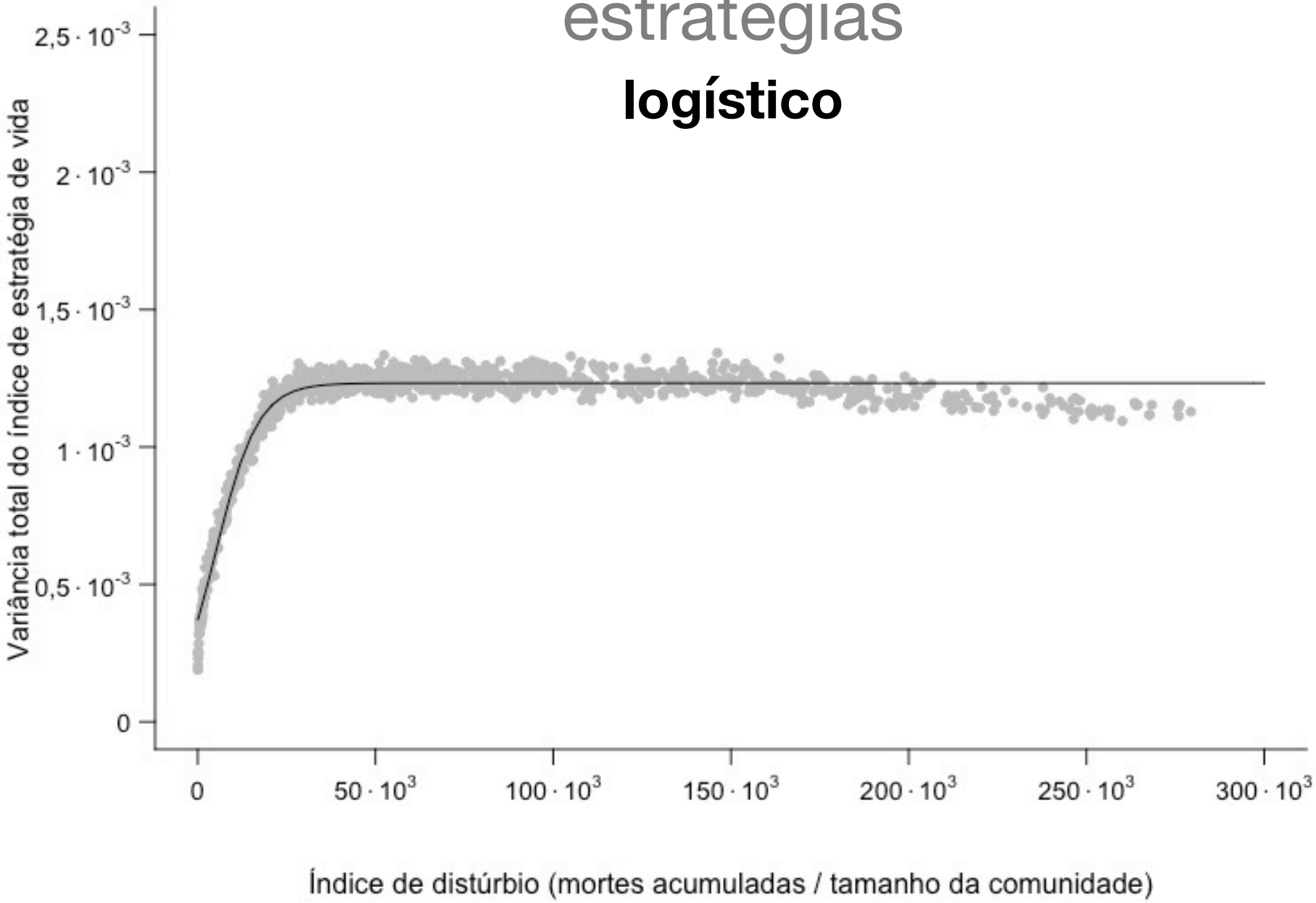


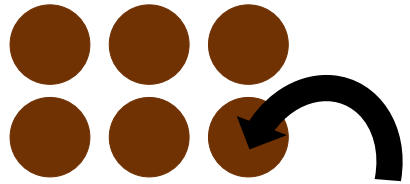

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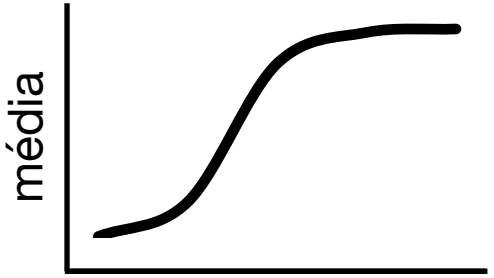
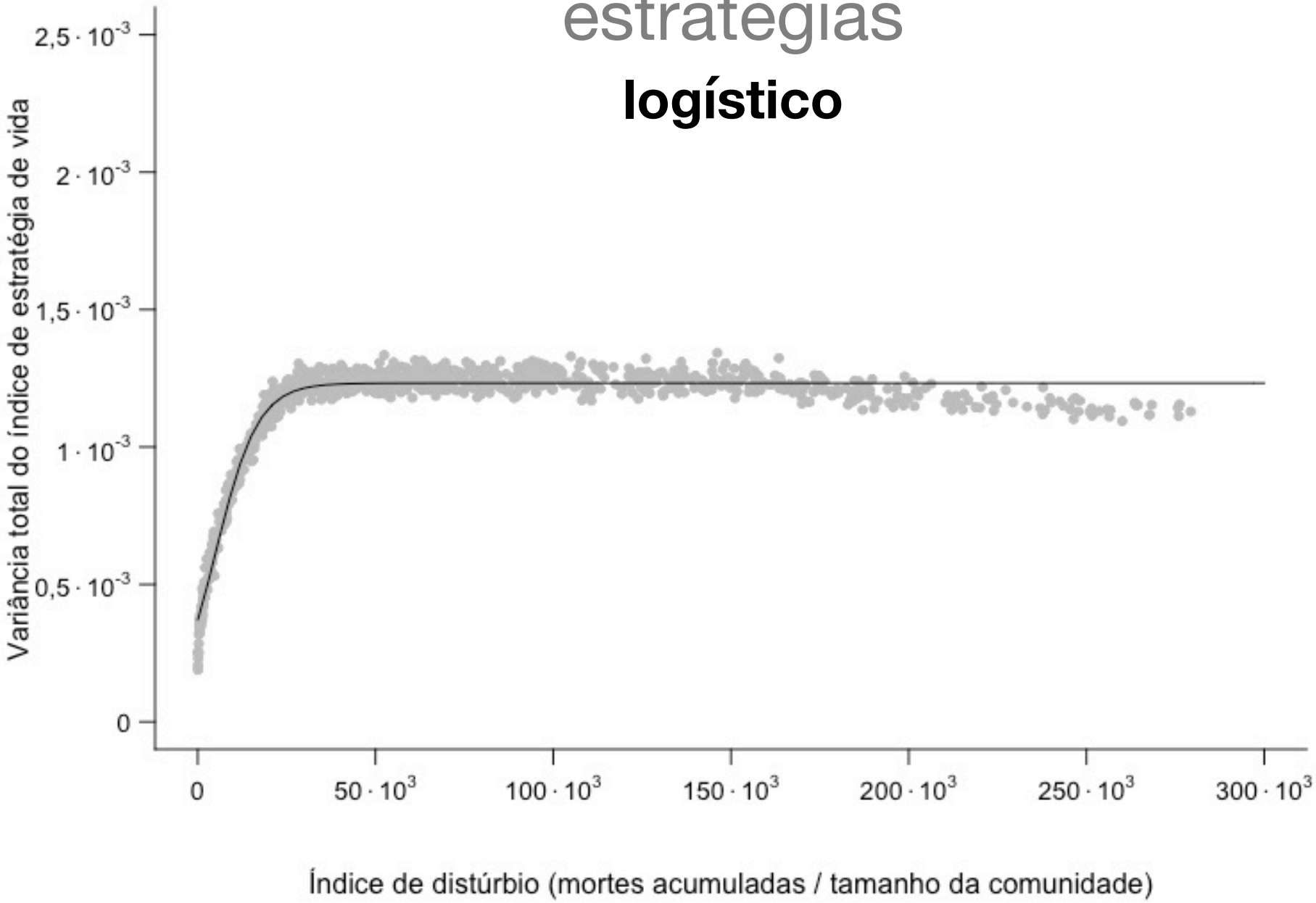
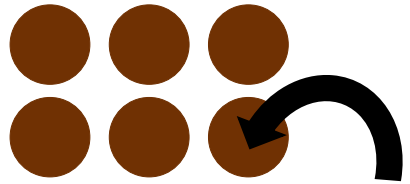


# diversidade de estratégias

## logístico



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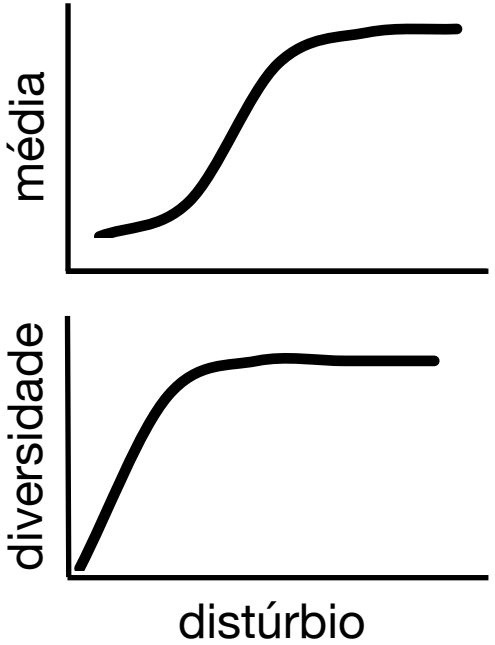
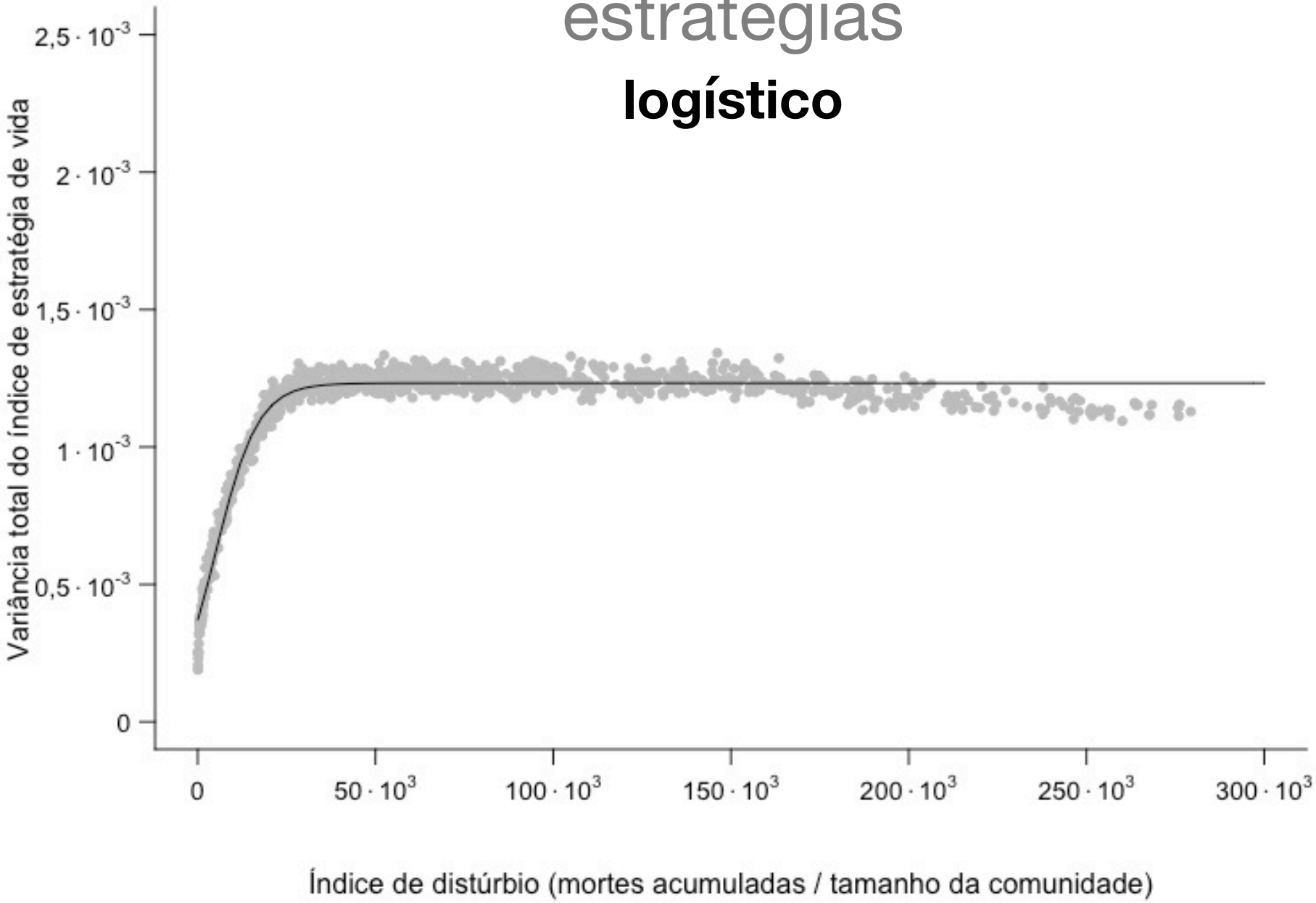
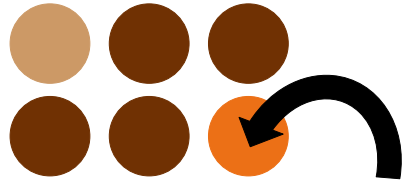


# diversidade de estratégias

## logístico



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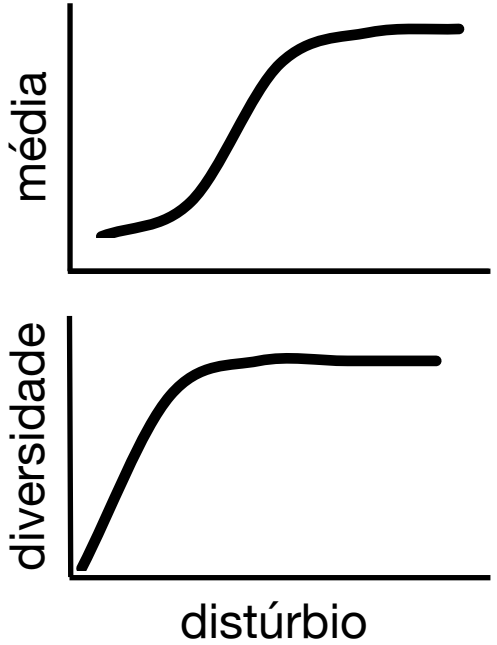

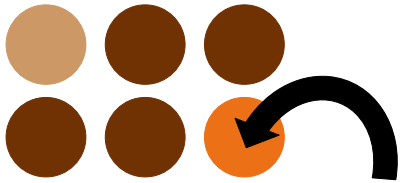

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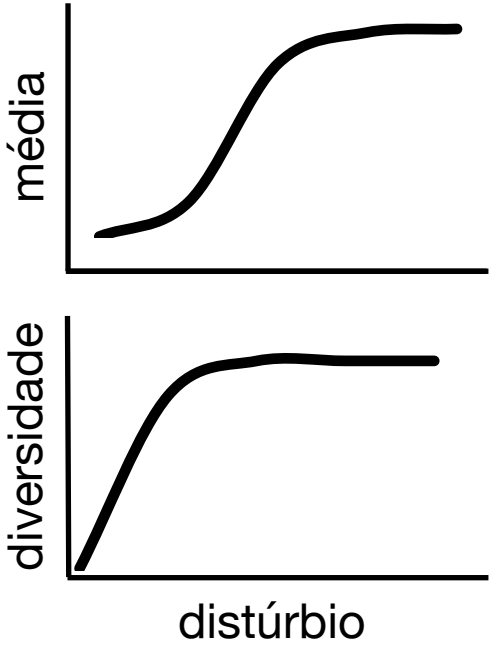
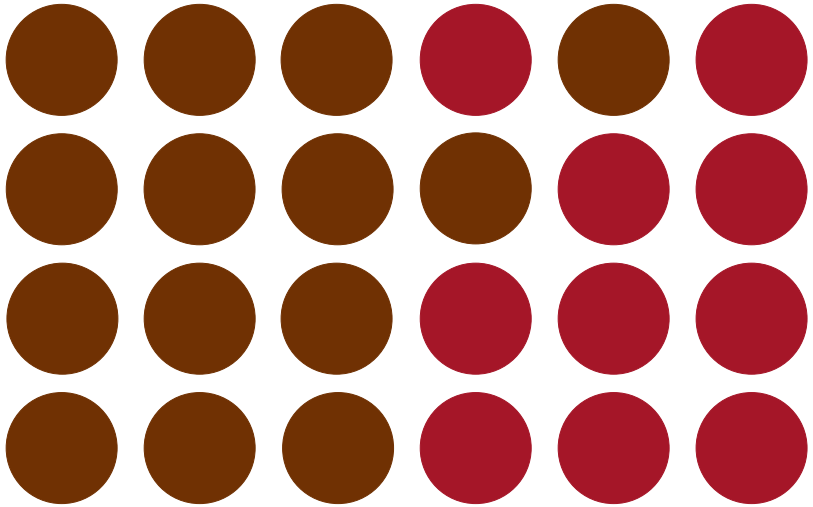
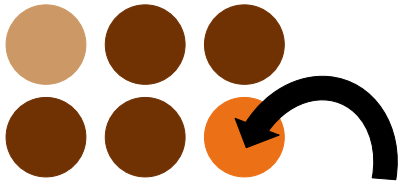



banco

x 112

x 20





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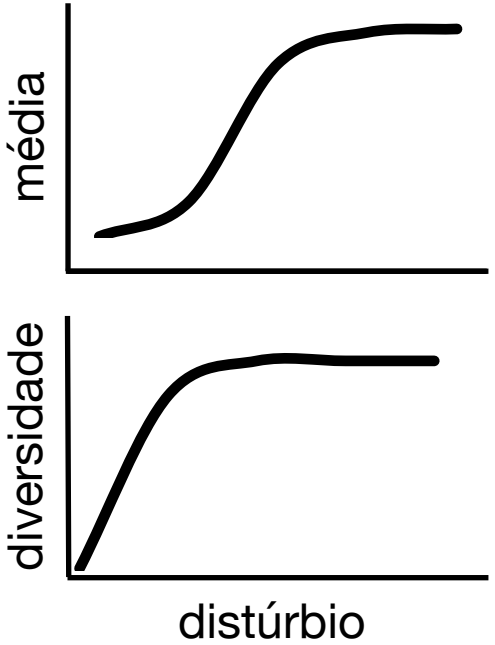
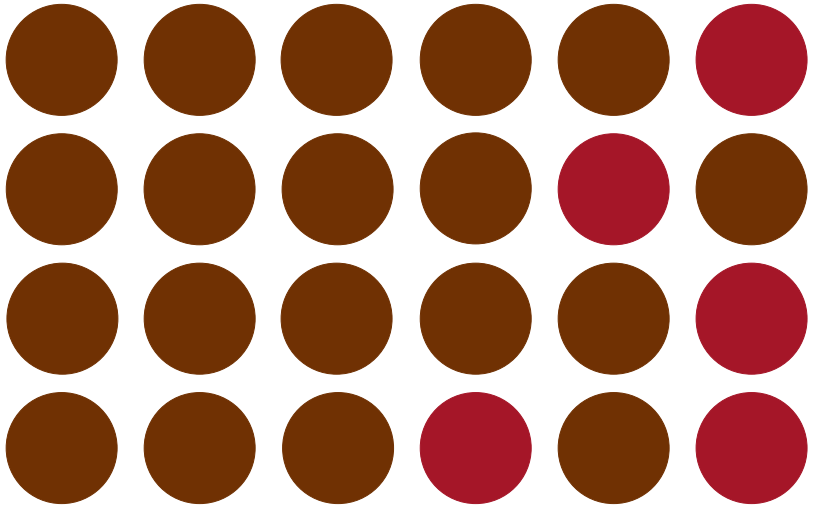
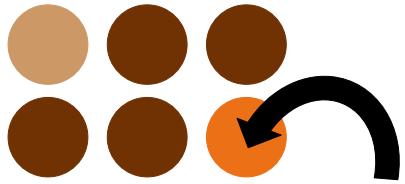



banco

x 152

x 10





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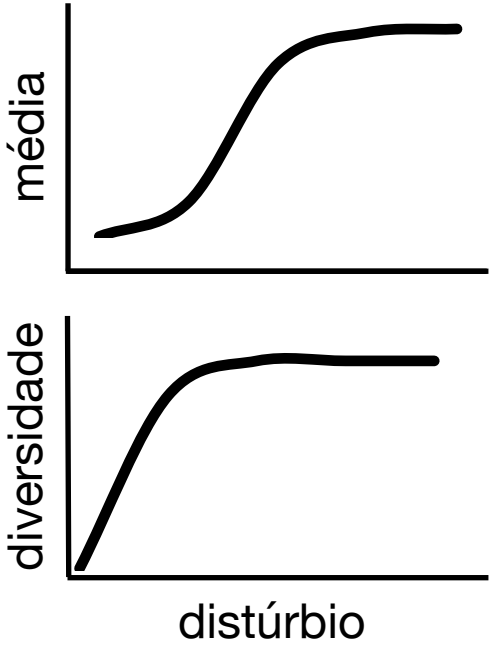


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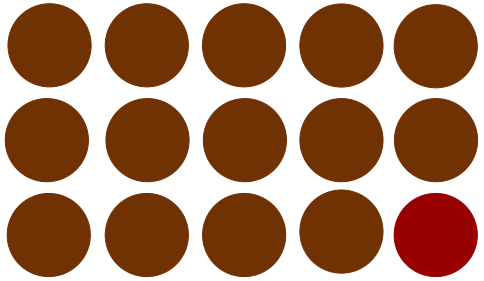

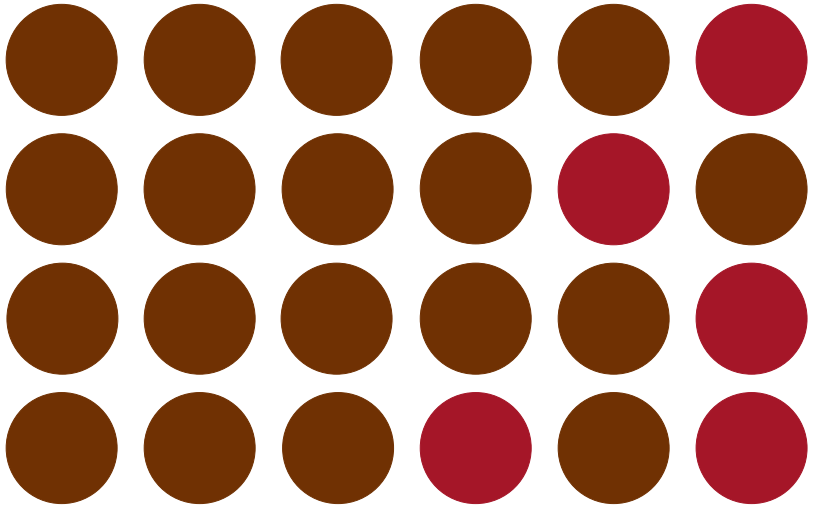

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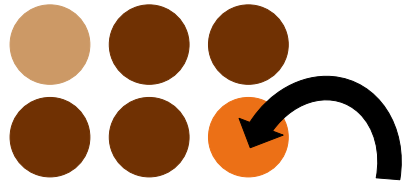

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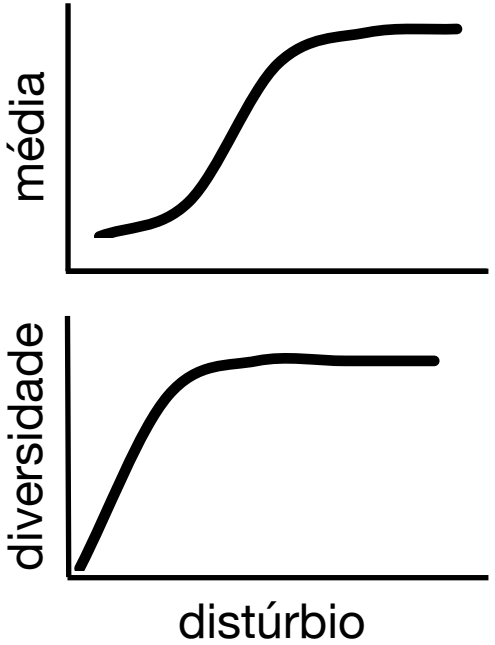


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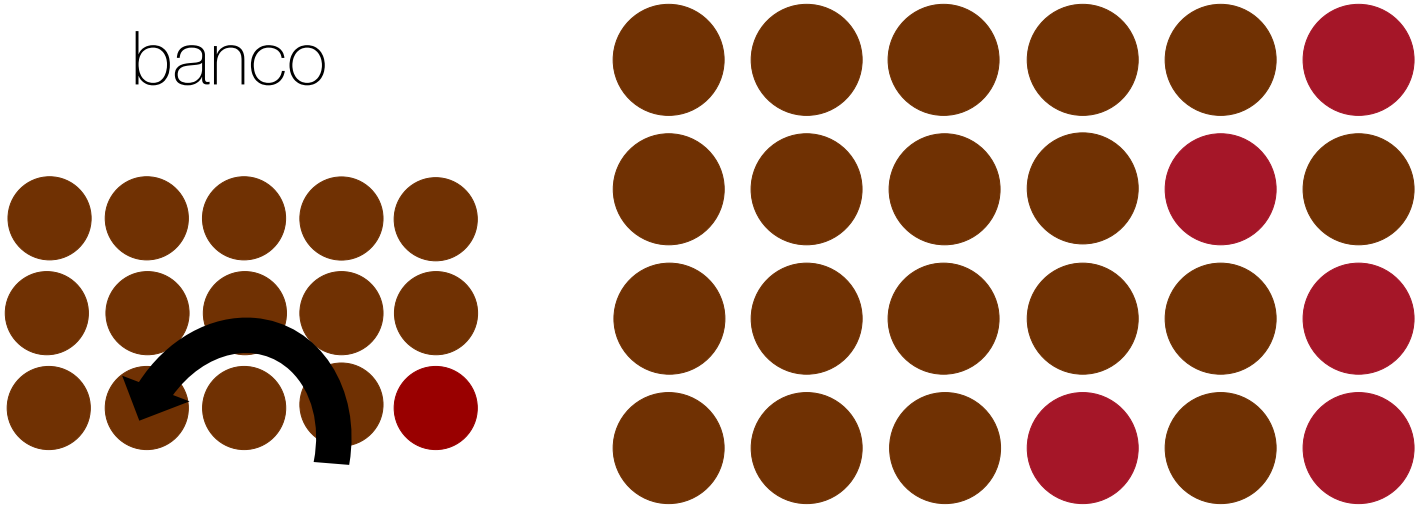

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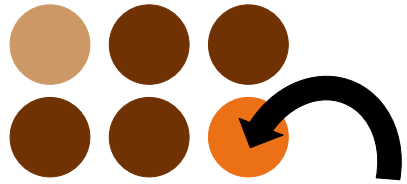

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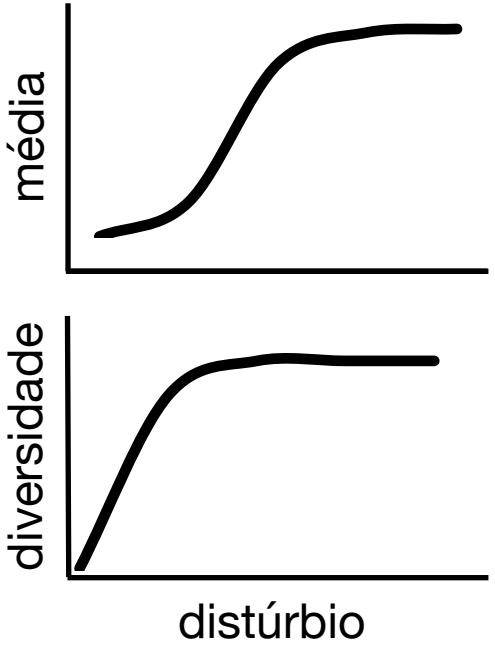


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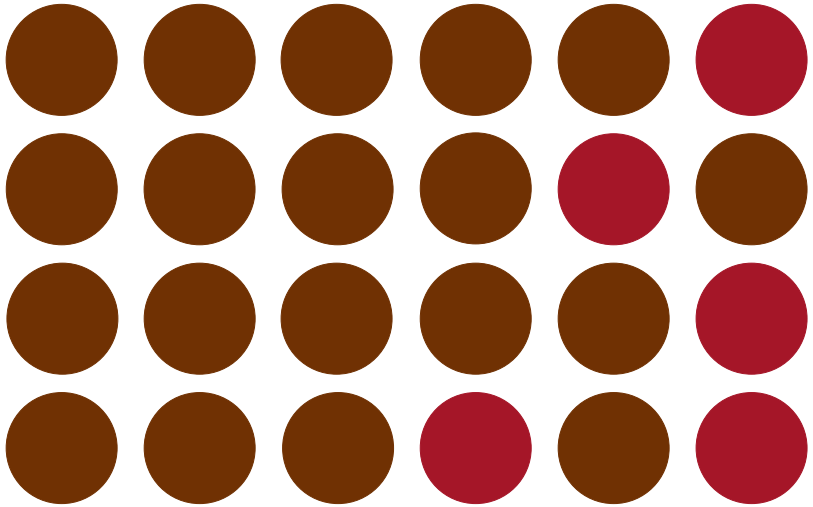

# mutação

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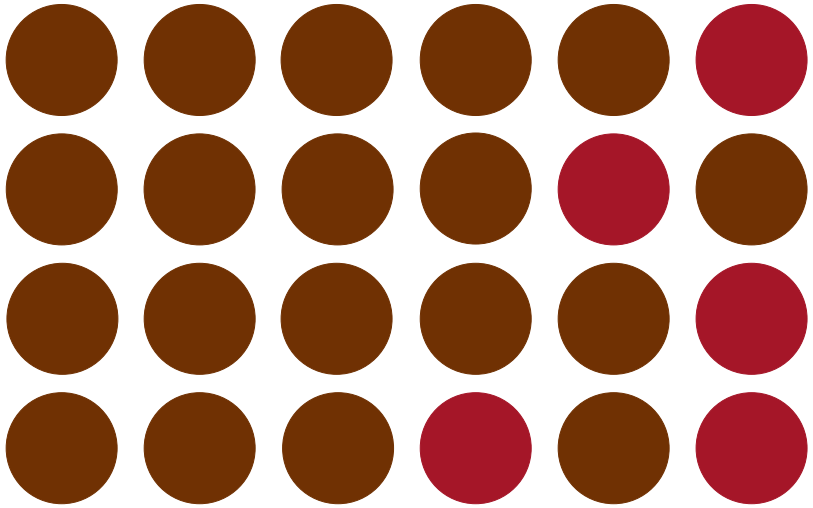

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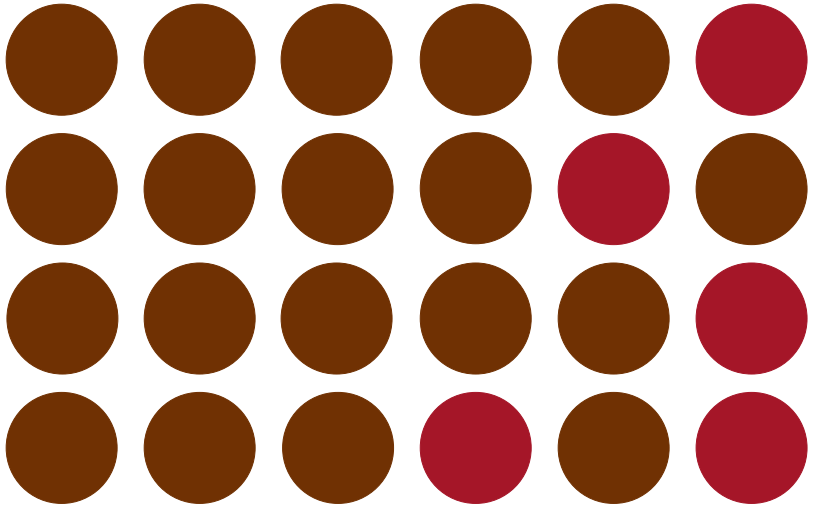

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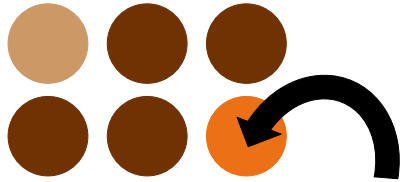

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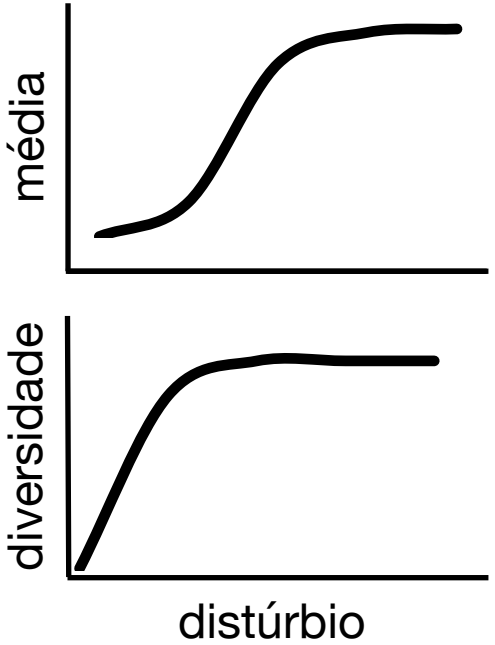

# mutação

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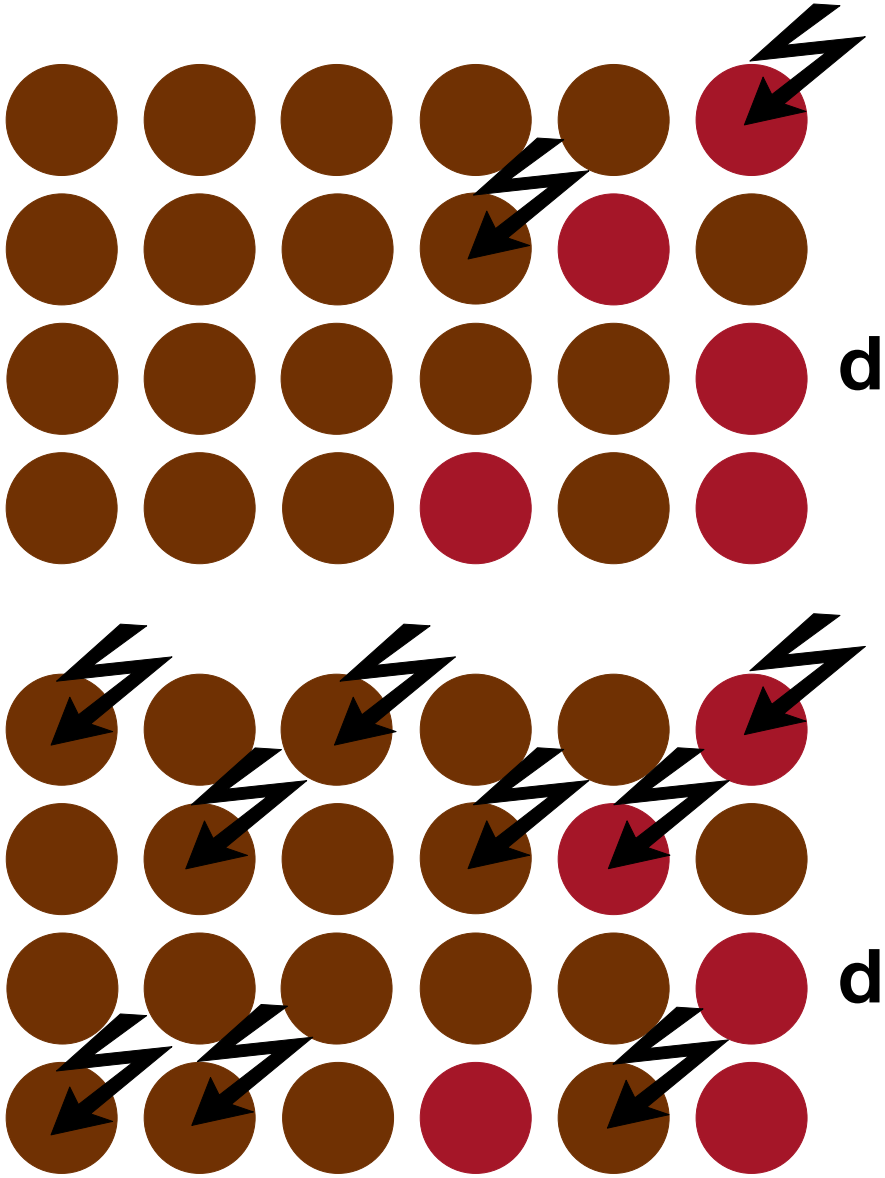

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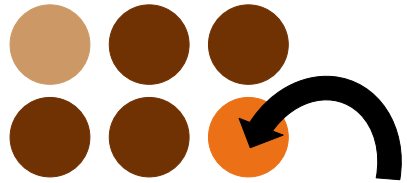
**distúrbio**



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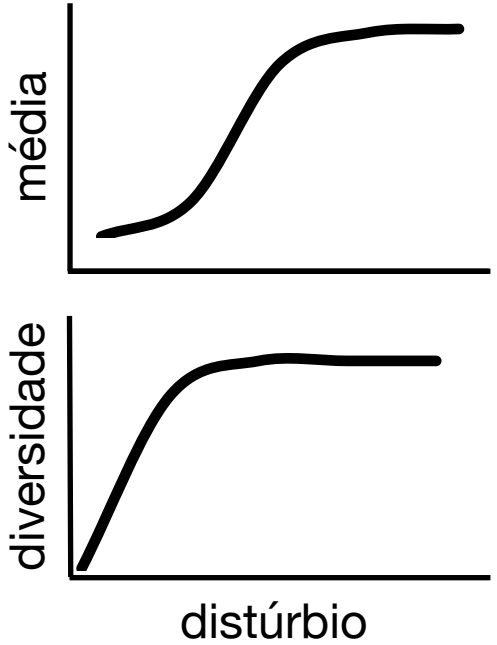

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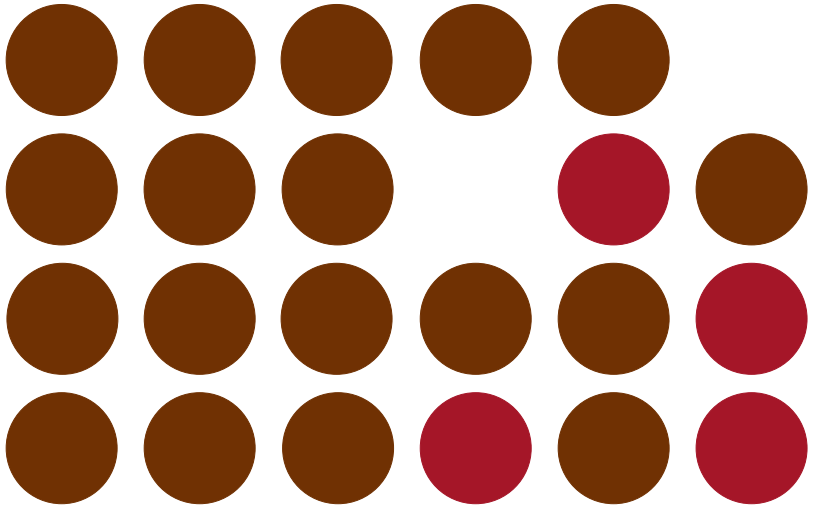

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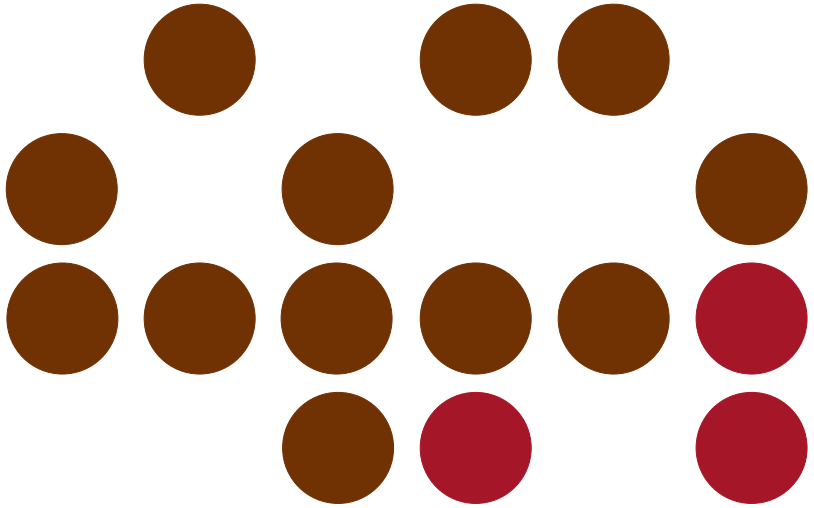

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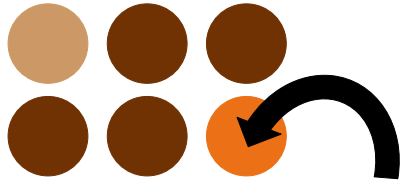

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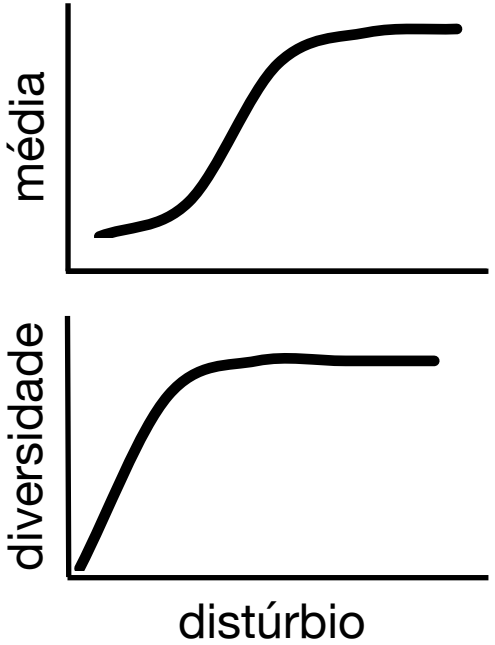

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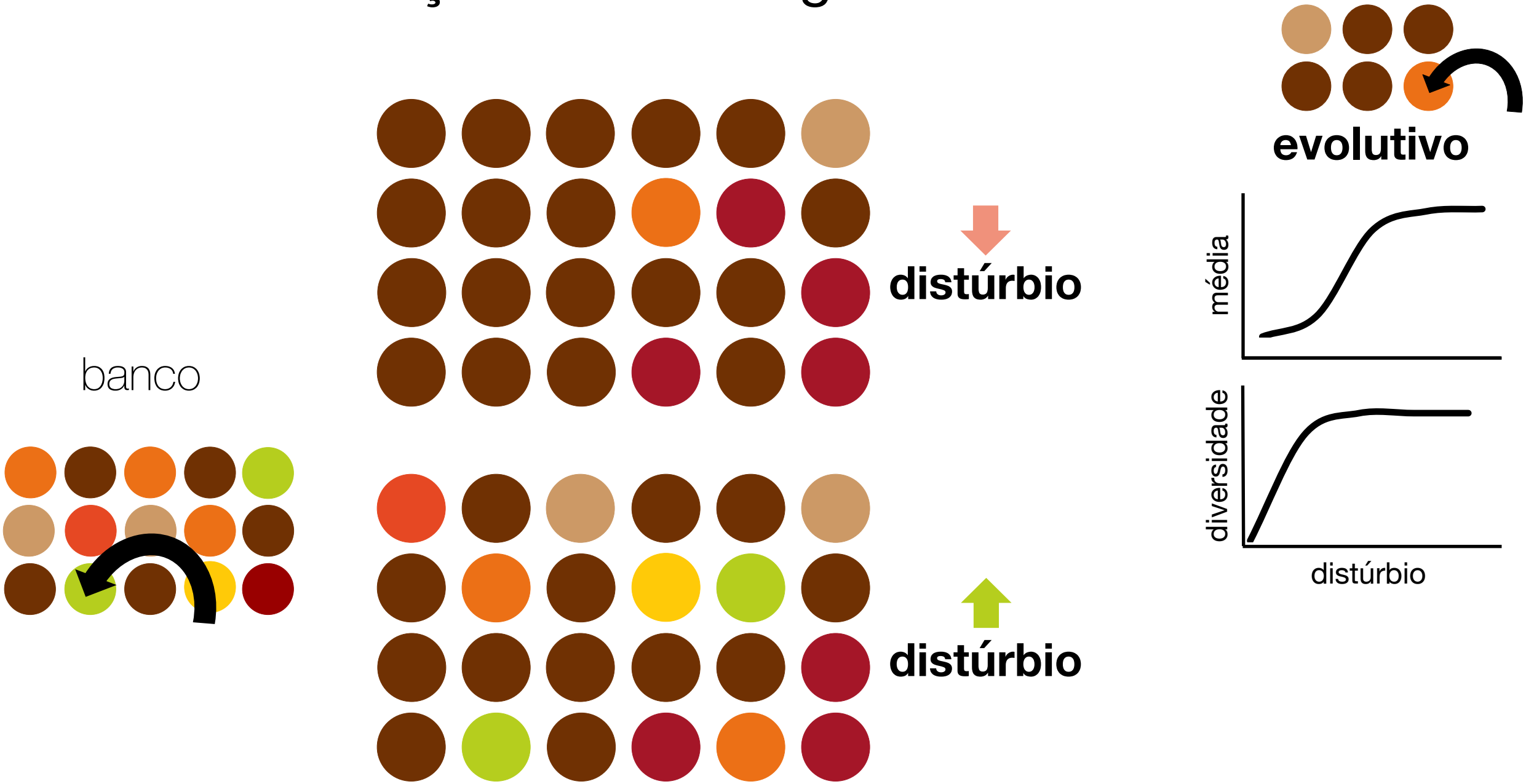
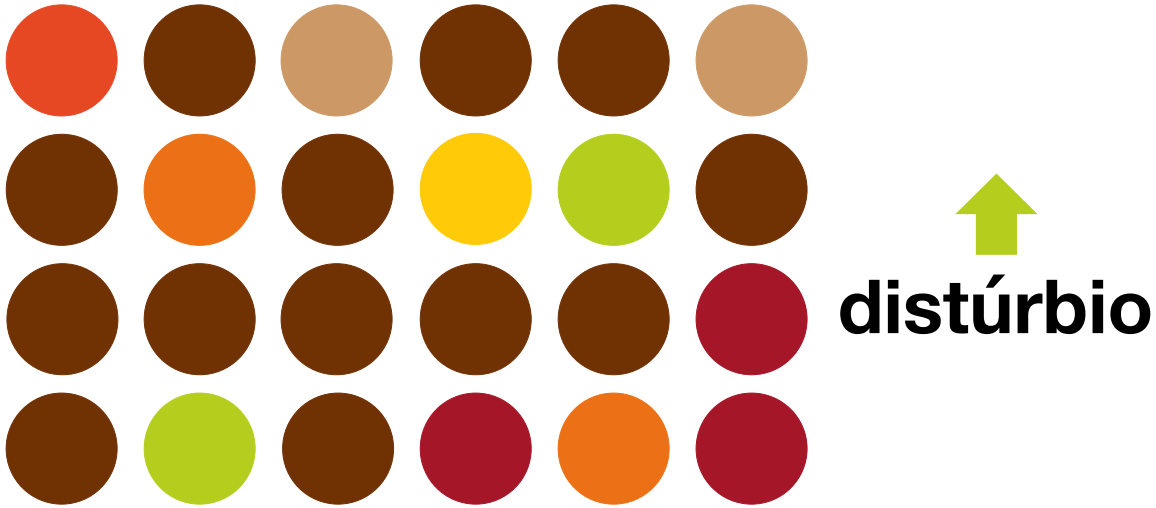
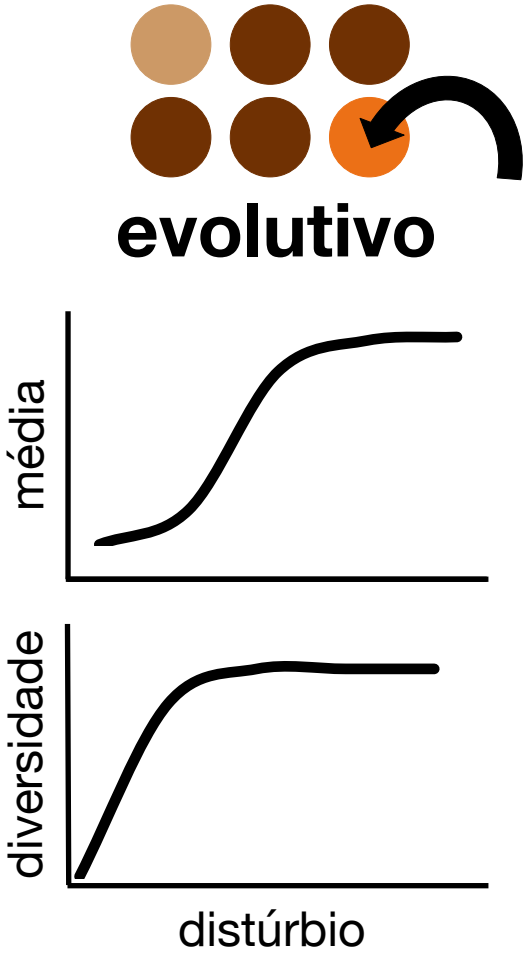


# mutação + amostragem



| evolutivo | ecológico | eco-evolutivo |
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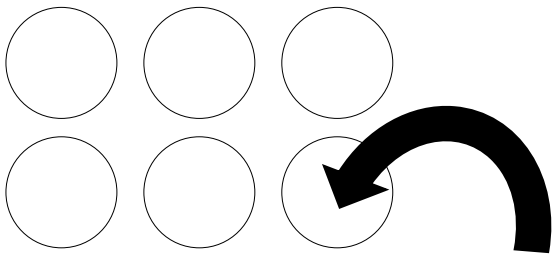
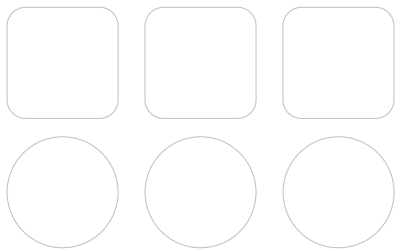
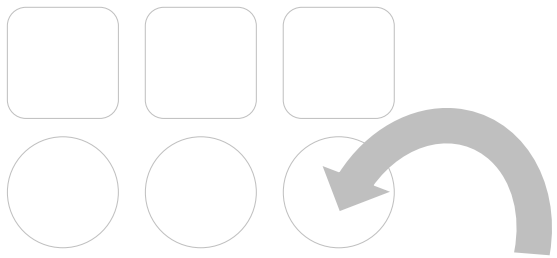
|  |  |  |
| estratégia média | estratégia média | estratégia média |
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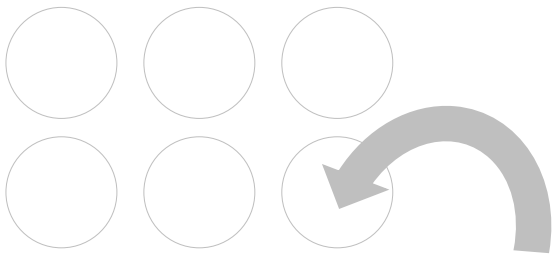
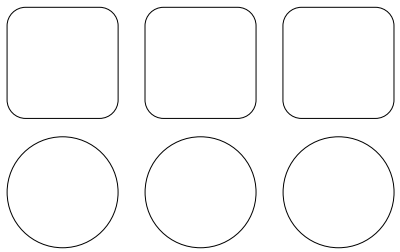
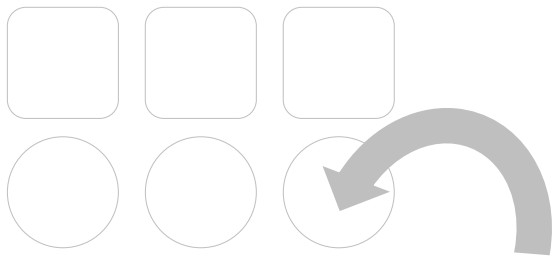
|  |  |  |
| estratégia média | estratégia média | estratégia média |
| diversidade de estratégias | diversidade de estratégias | diversidade de estratégias |
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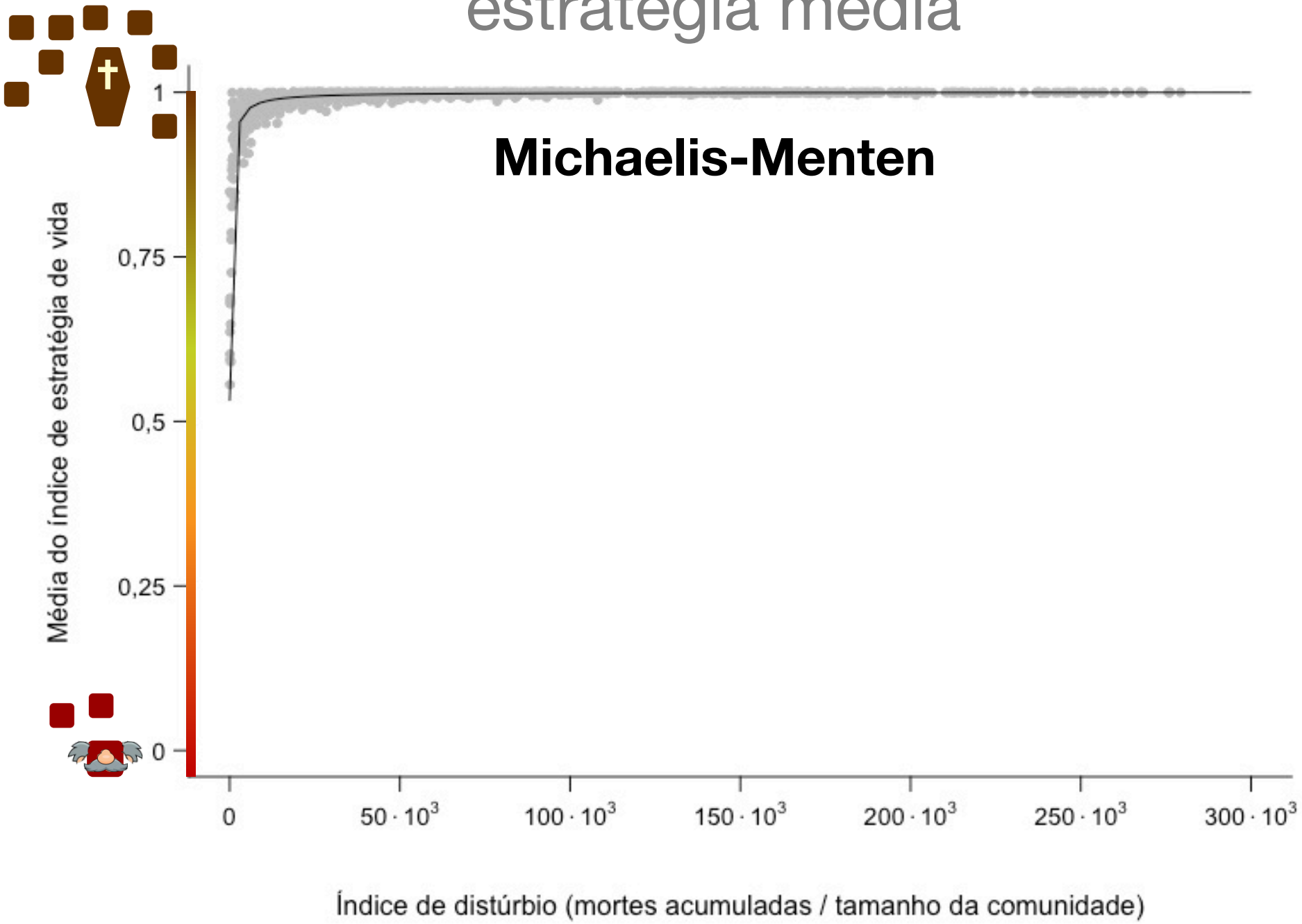
# estratégia média

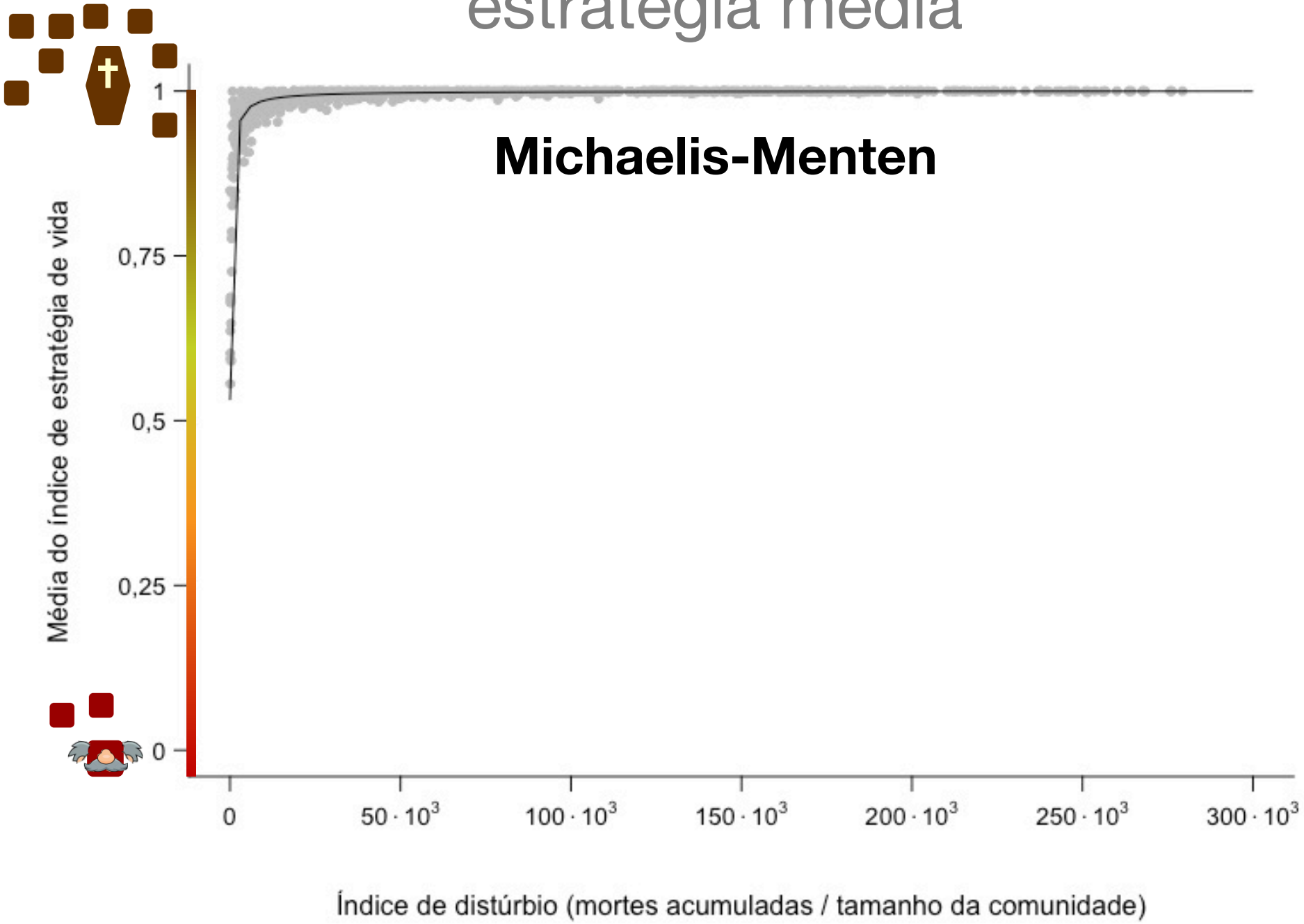
ecológico

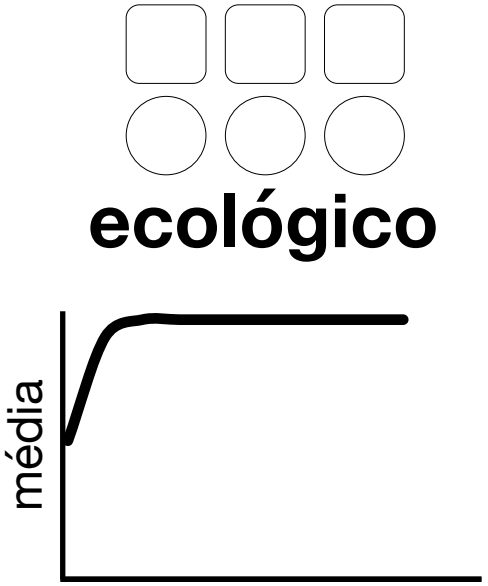
# estratégia média



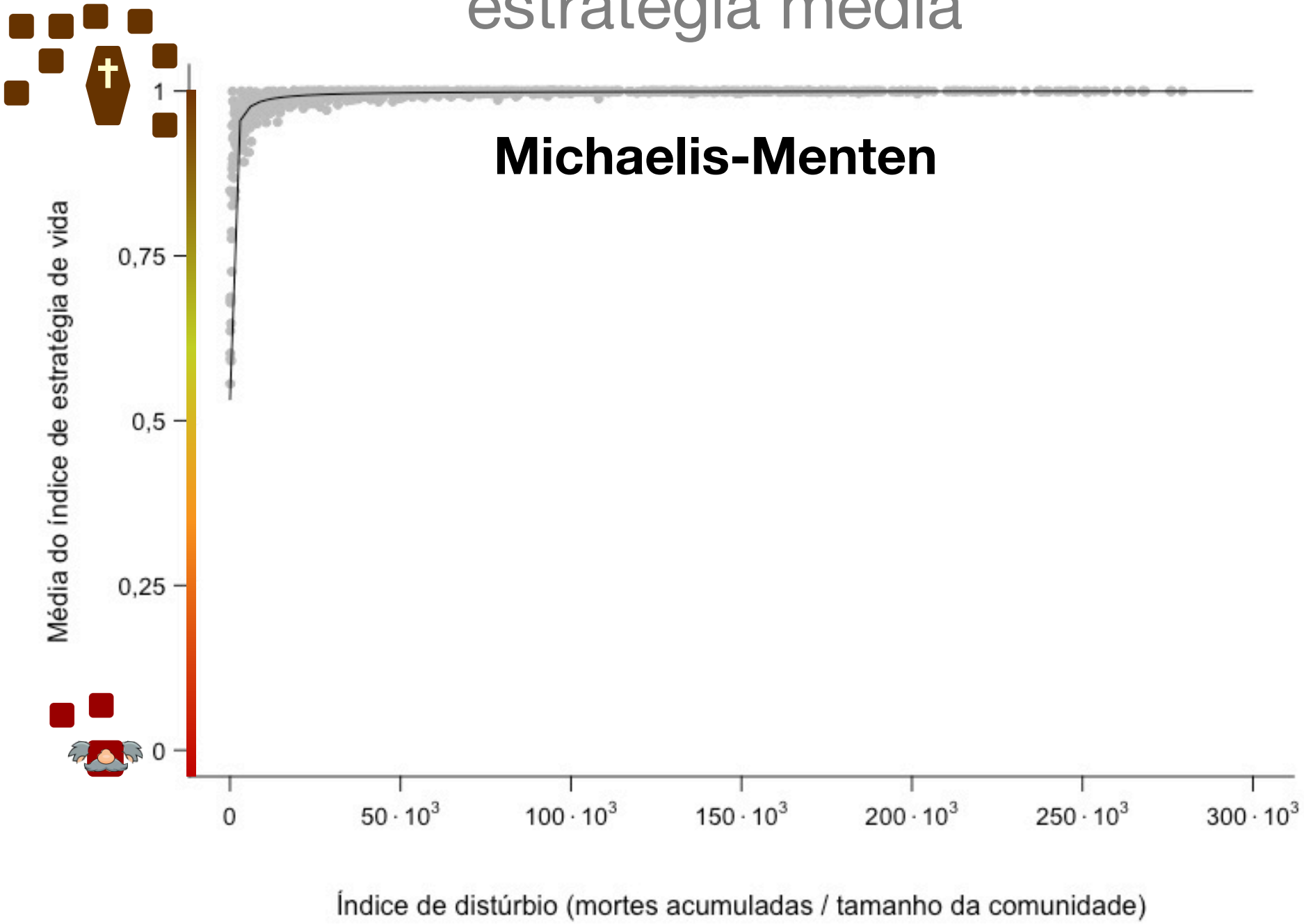

**ecológico**

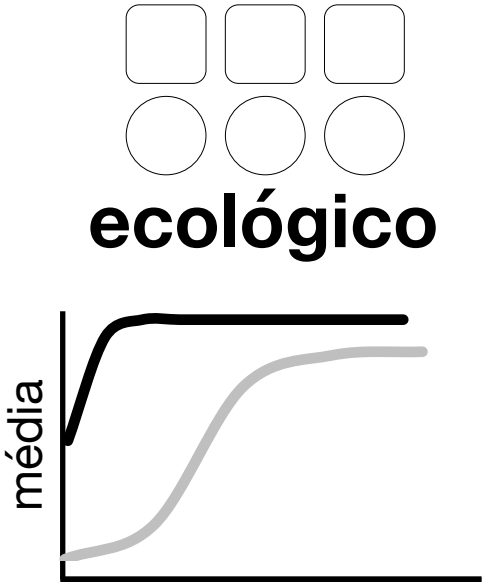
# estratégia média



# estratégia média



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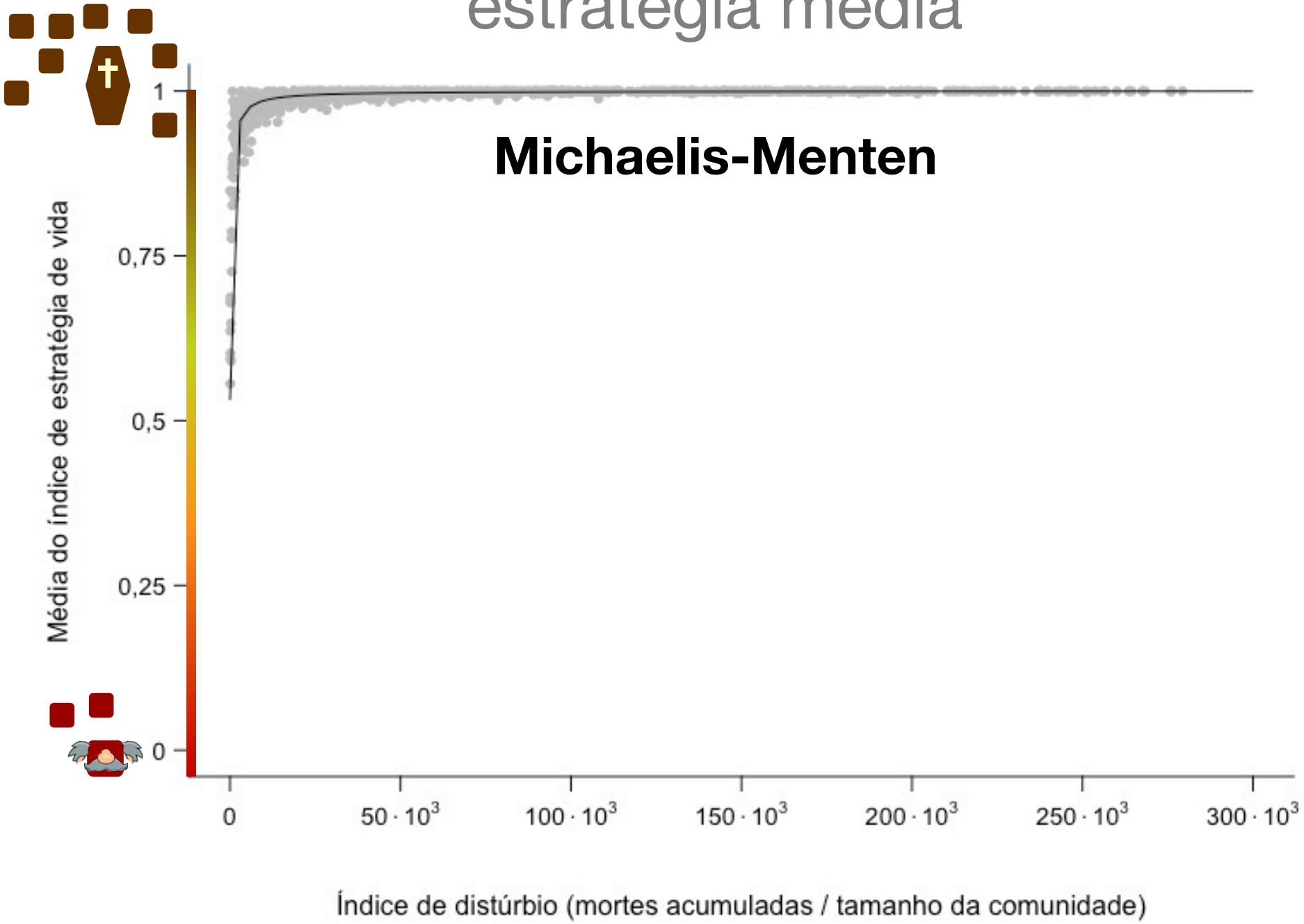


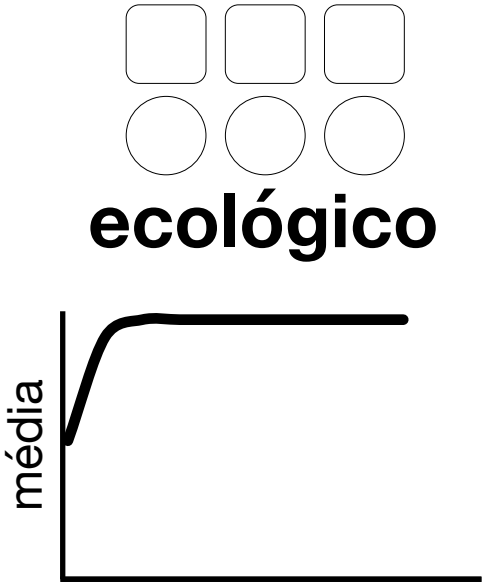

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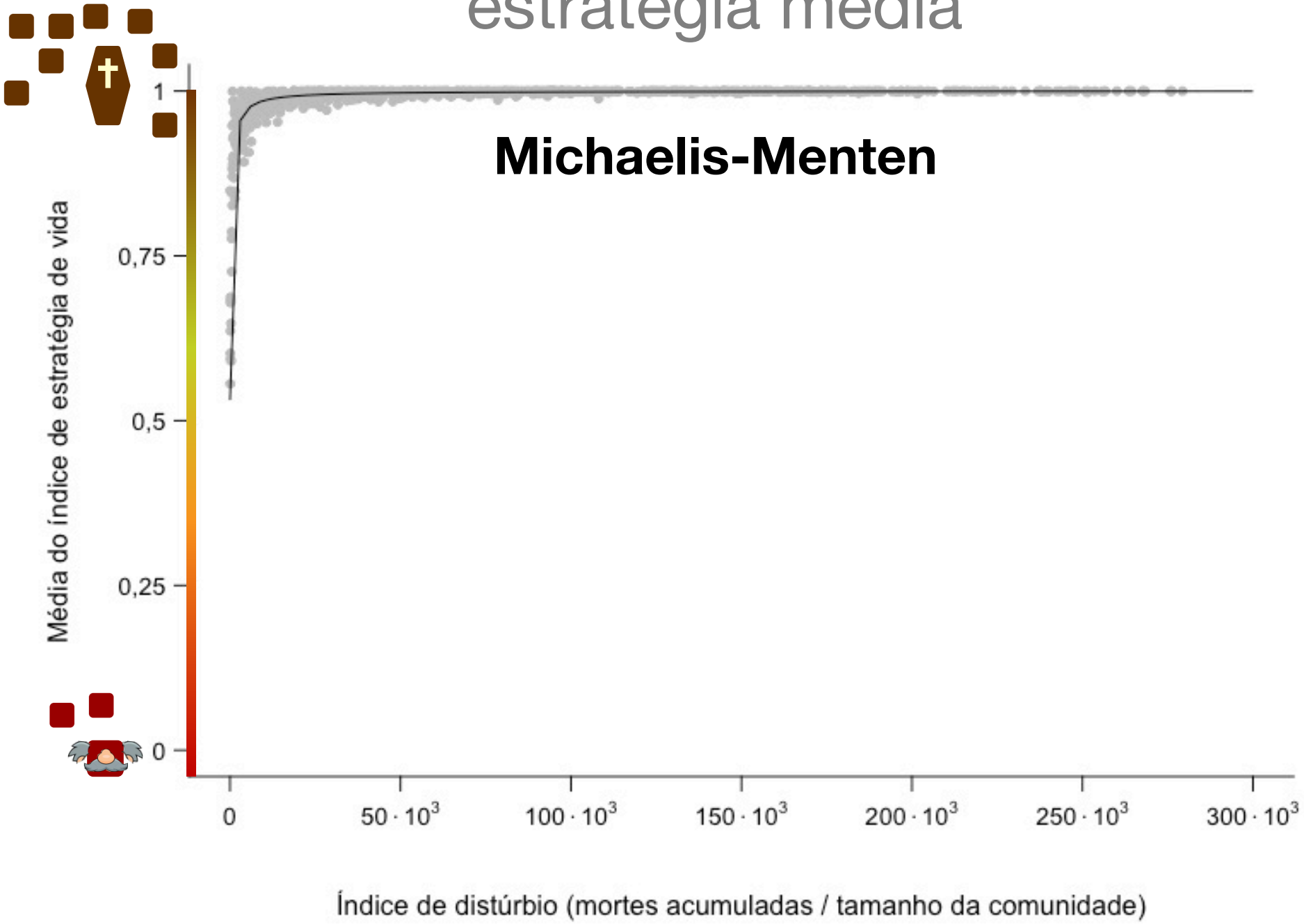
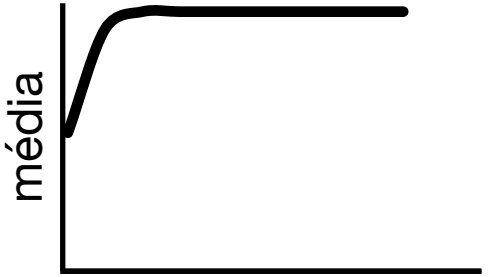
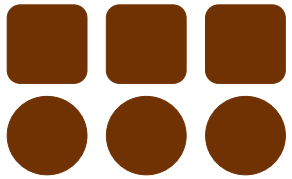



**ecológico**



# exclusão competitiva de espécies



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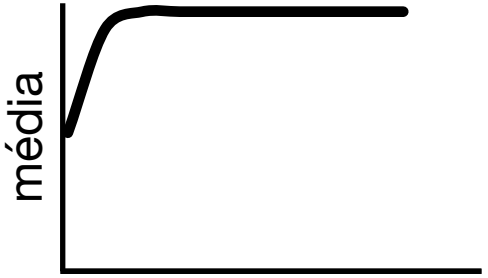
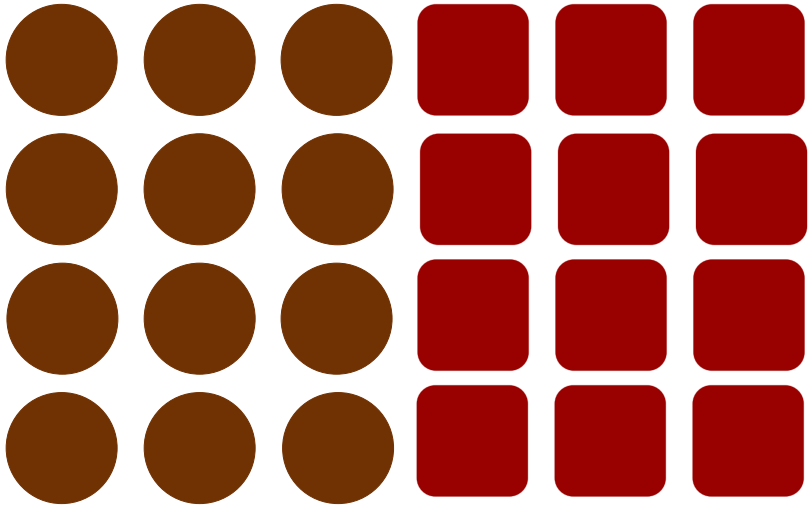


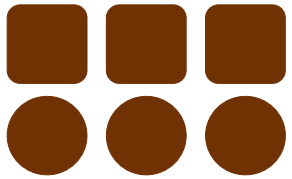

banco

x 96

x 24



# exclusão competitiva de espécies



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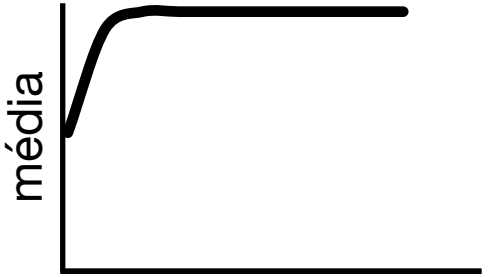
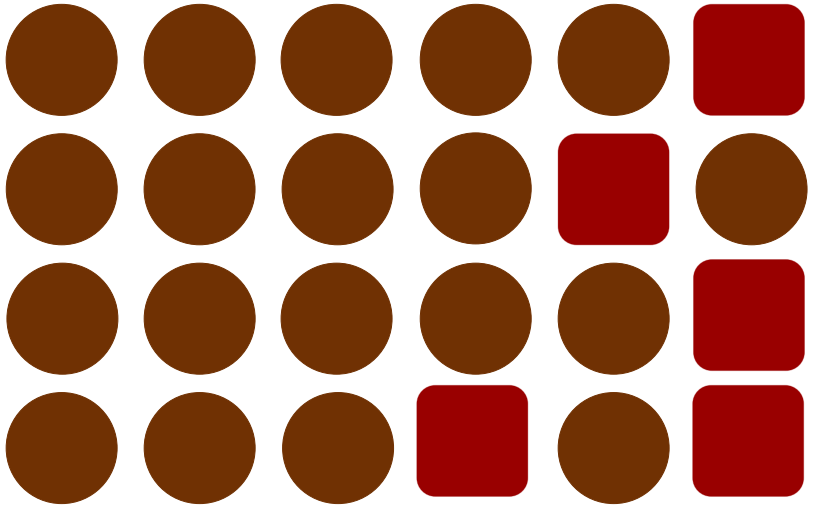



banco

x 152

x 10



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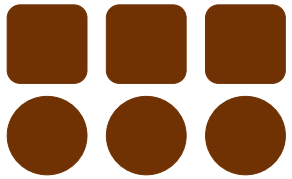

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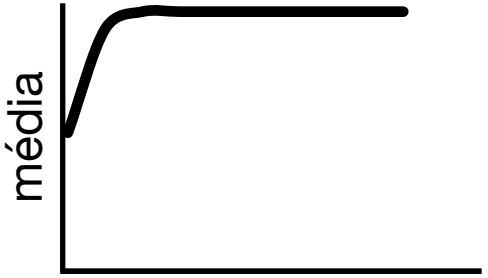
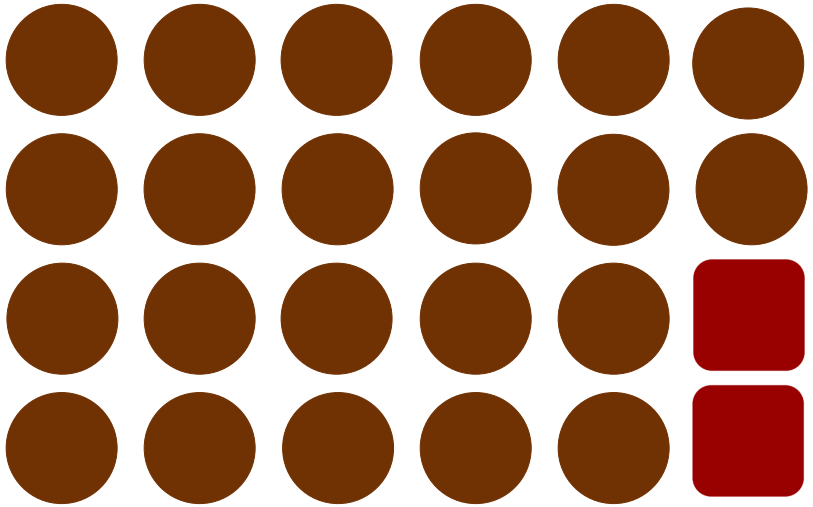



banco

x 176

x 4



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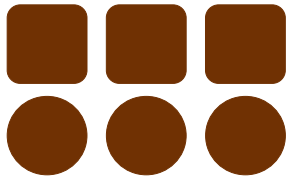

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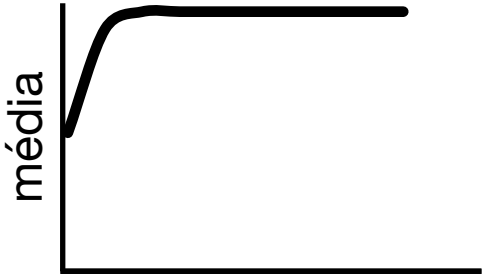
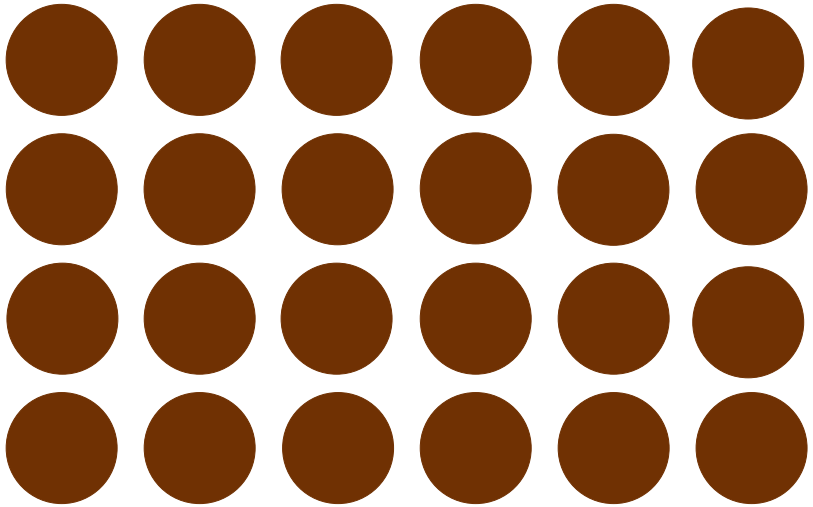



banco

x 176



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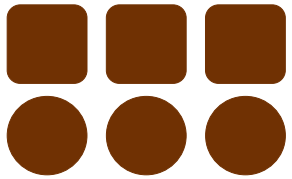
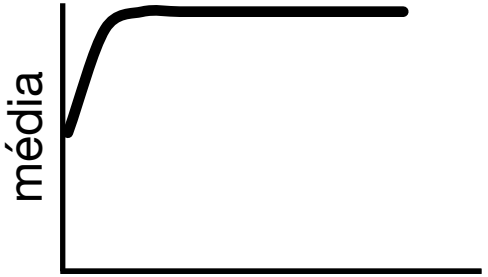
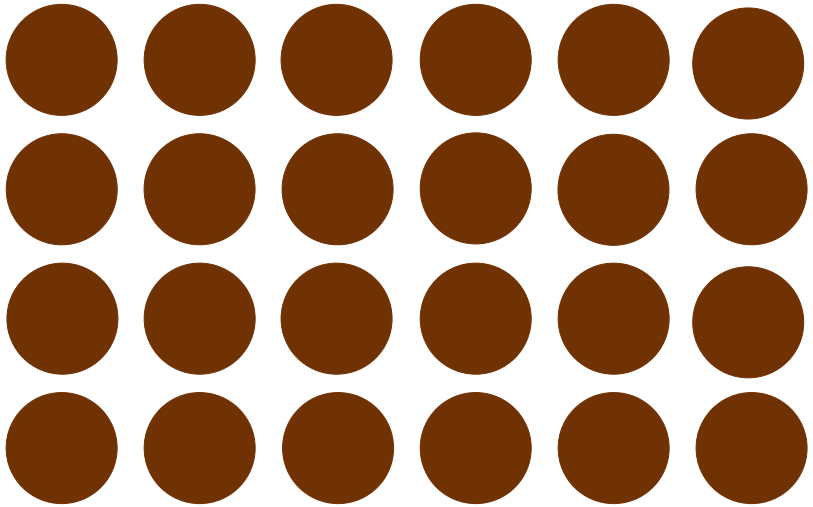


**ecológico**



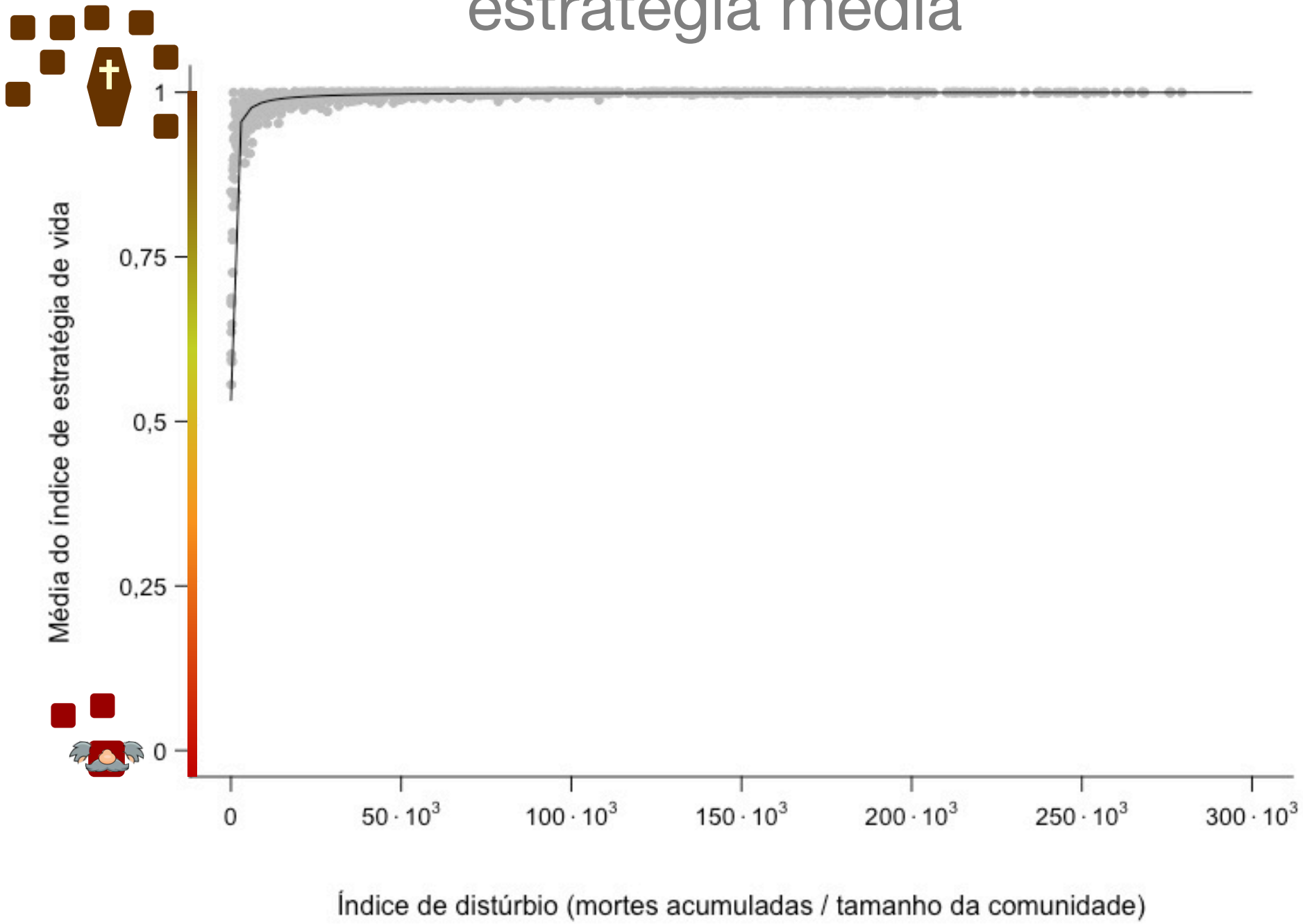

banco

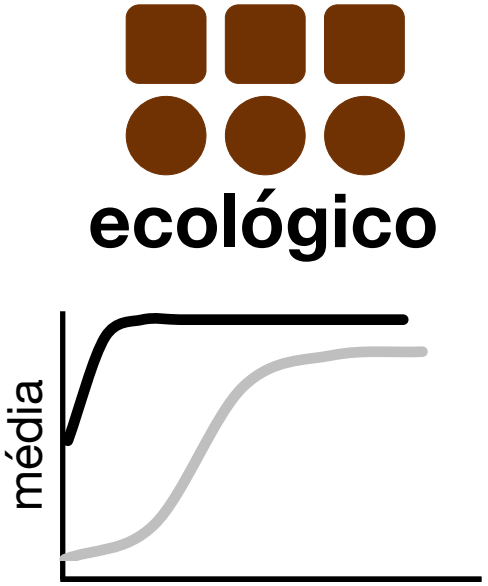
x 176



estratégia de maior fecundidade melhor competidora

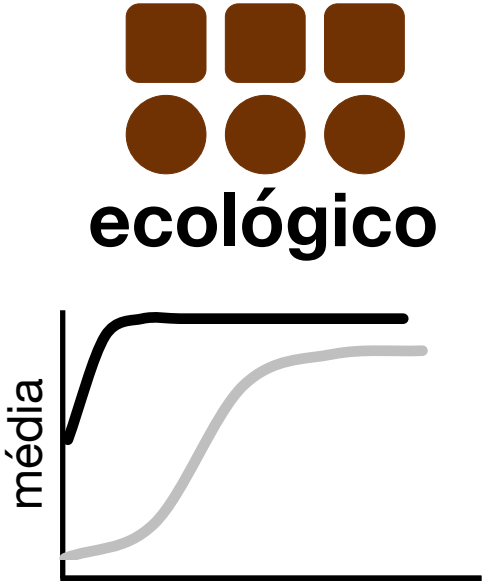
# estratégia média



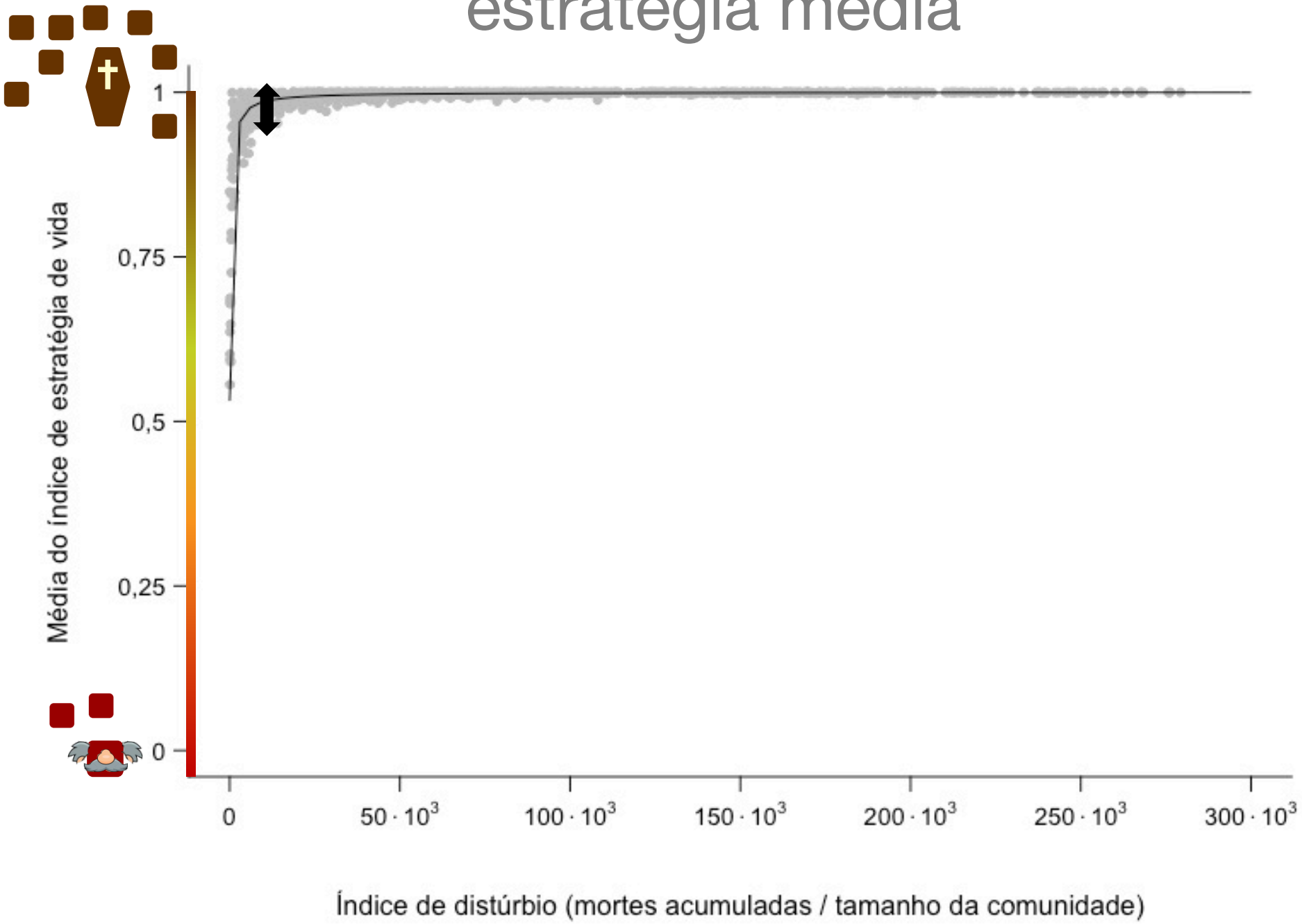



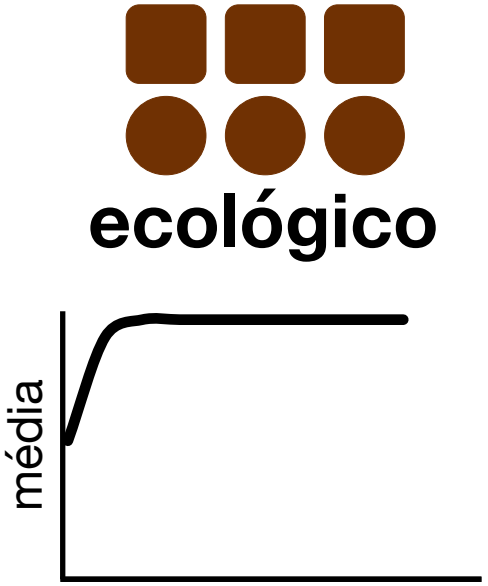
# estratégia média

ausência de mutação



# estratégia média



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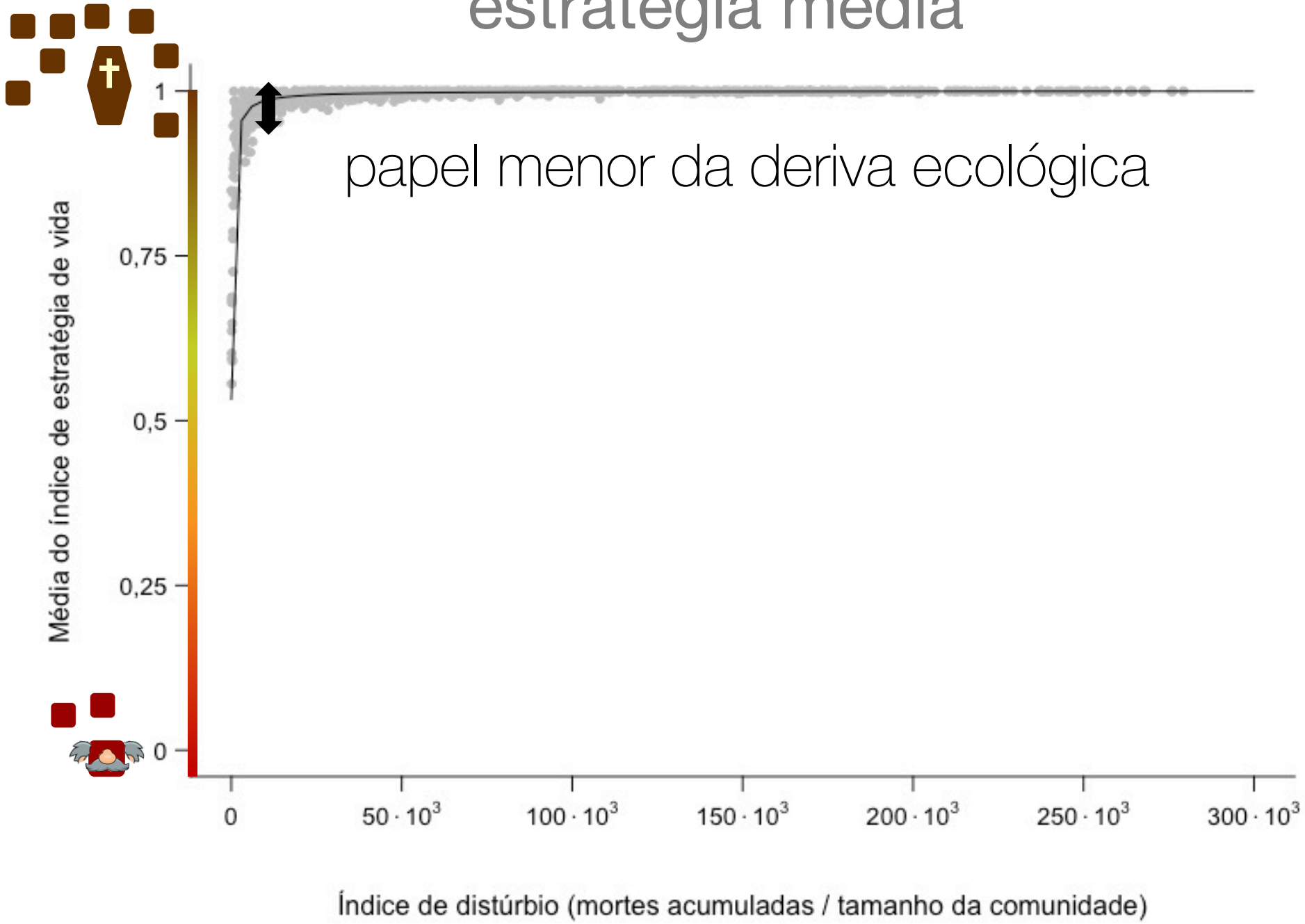
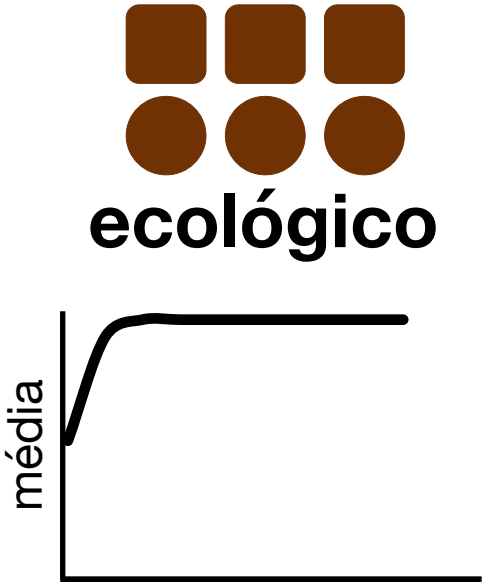
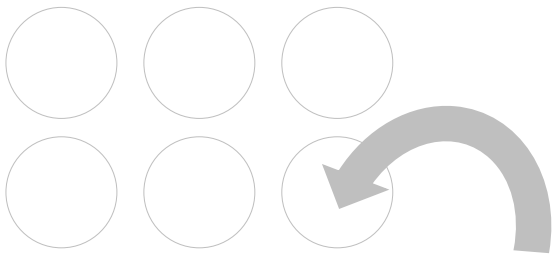
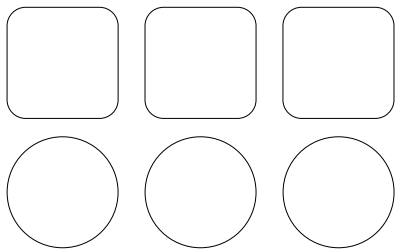
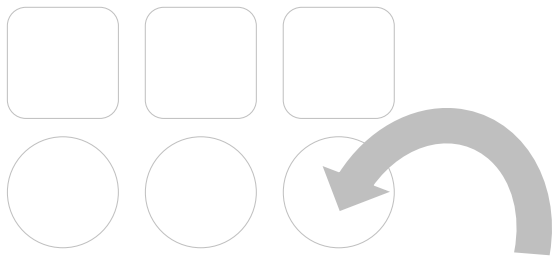


| evolutivo | ecológico | eco-evolutivo |
|---|---|---|
|  |  |  |
| estratégia média | estratégia média | estratégia média |
| diversidade de estratégias | diversidade de estratégias | diversidade de estratégias |
| - | heterogeneidade interespecífica de estratégias | heterogeneidade interespecífica de estratégias |

| evolutivo | ecológico | eco-evolutivo |
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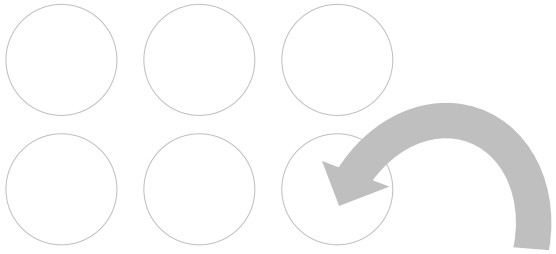
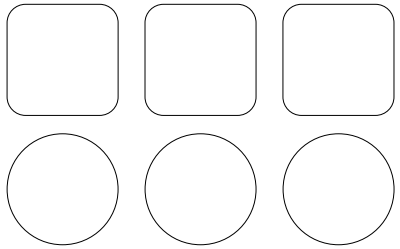
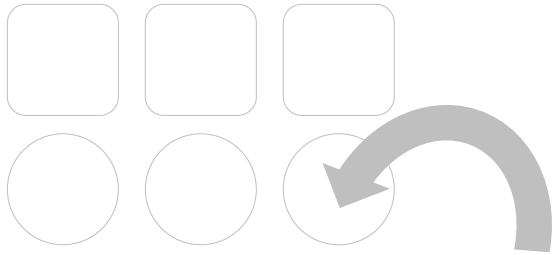
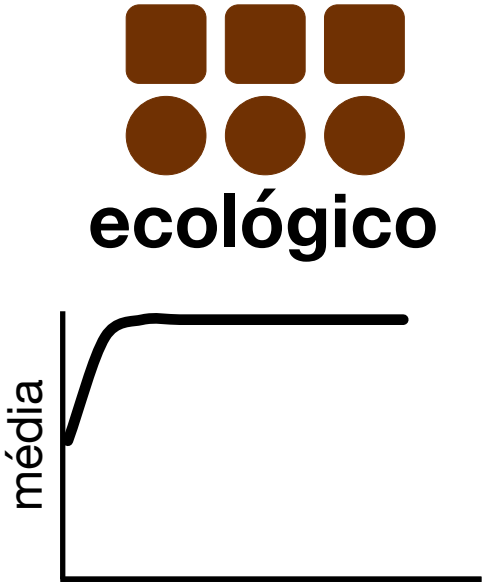
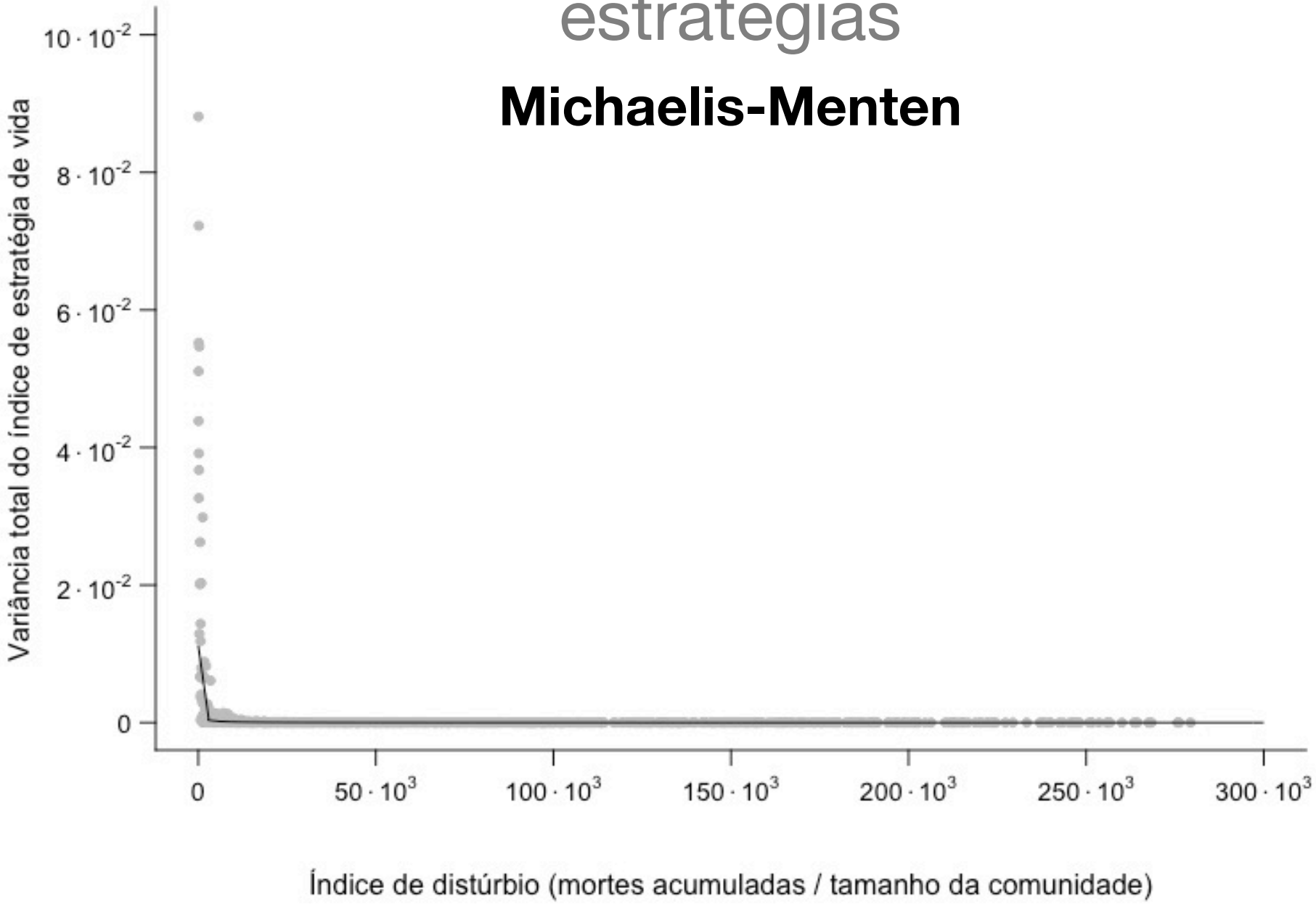
|  |  |  |
| estratégia média | estratégia média | estratégia média |
| diversidade de estratégias | diversidade de estratégias | diversidade de estratégias |
| - | heterogeneidade interespecífica de estratégias | heterogeneidade interespecífica de estratégias |

# diversidade de estratégias



# diversidade de estratégias

## Michaelis-Menten

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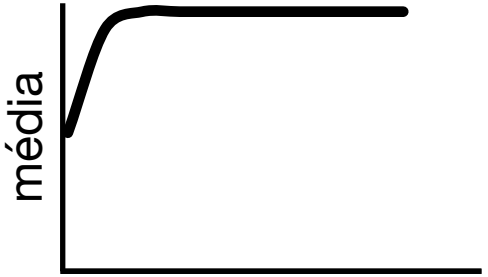
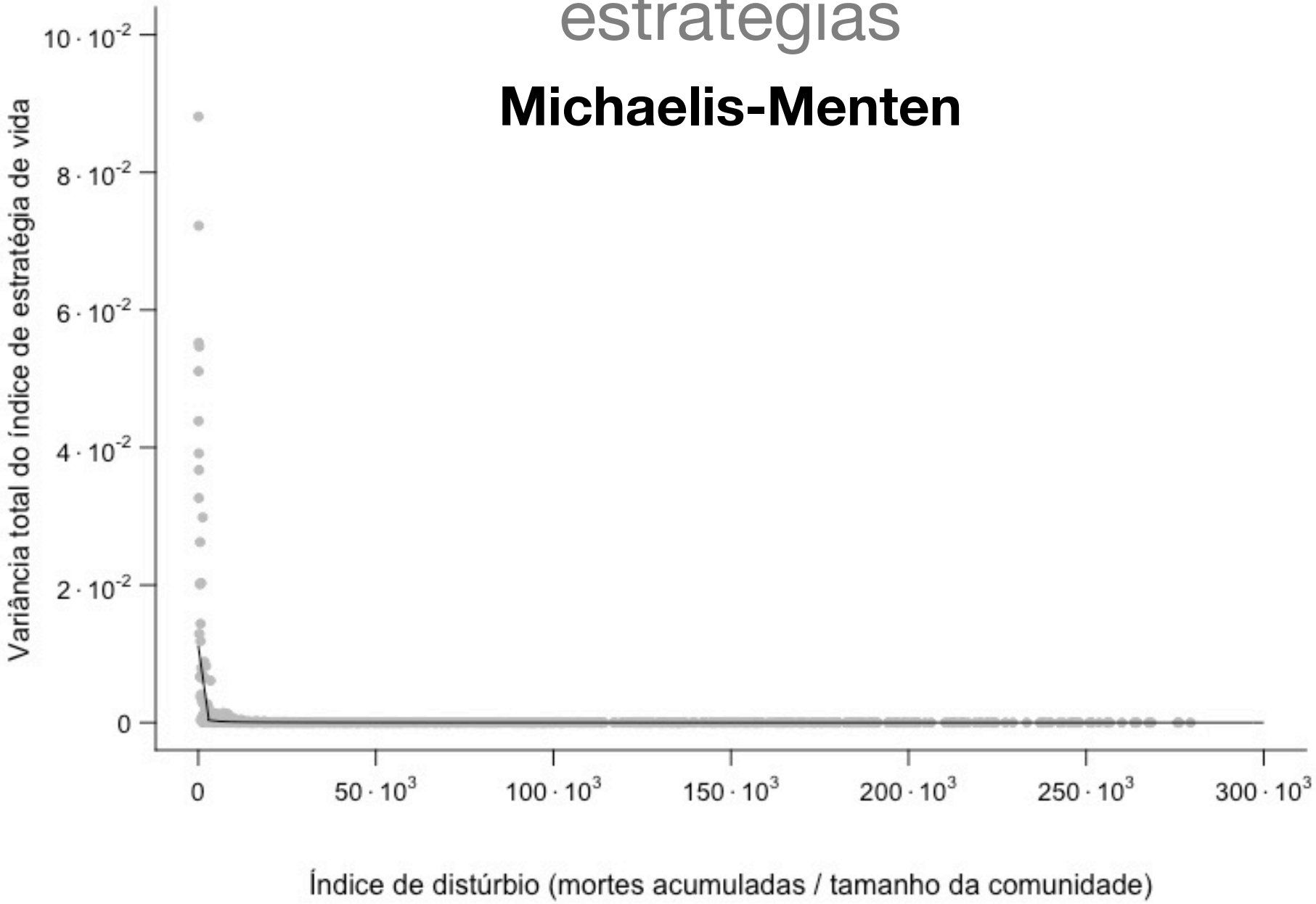


# diversidade de estratégias

## Michaelis-Menten

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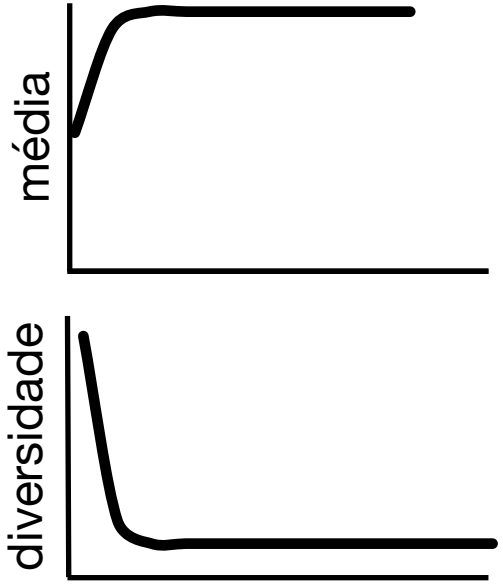
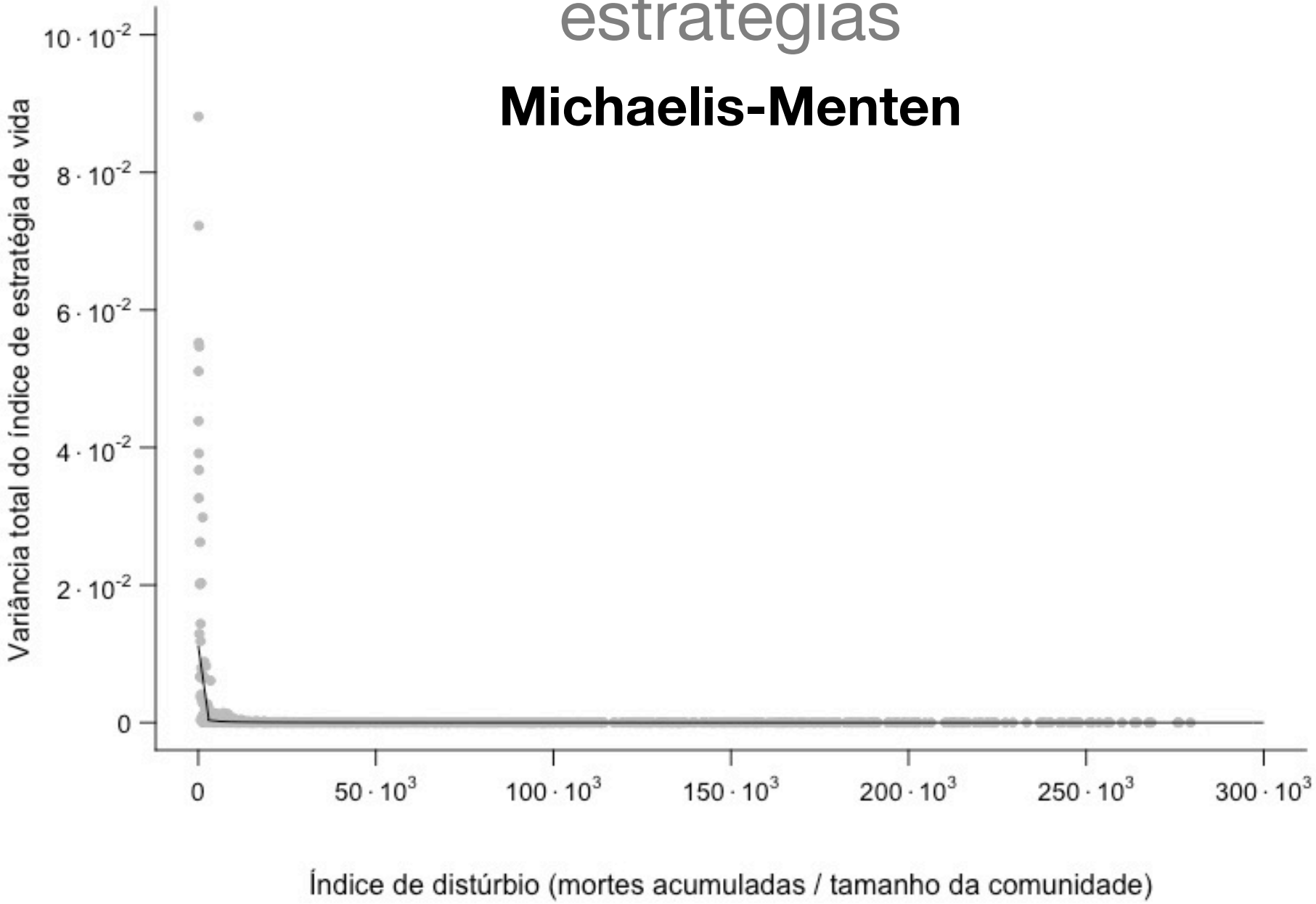


# diversidade de estratégias

## Michaelis-Menten

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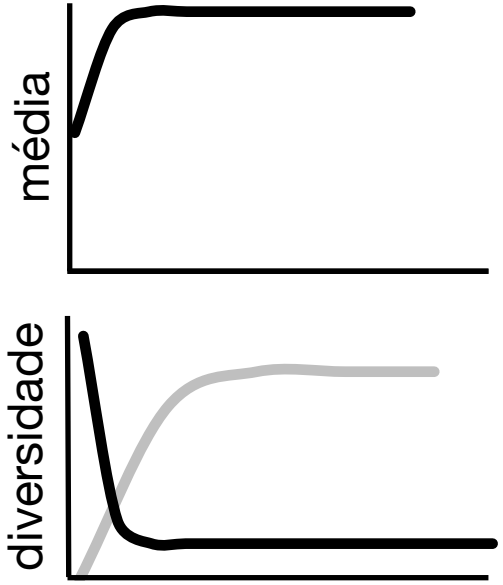
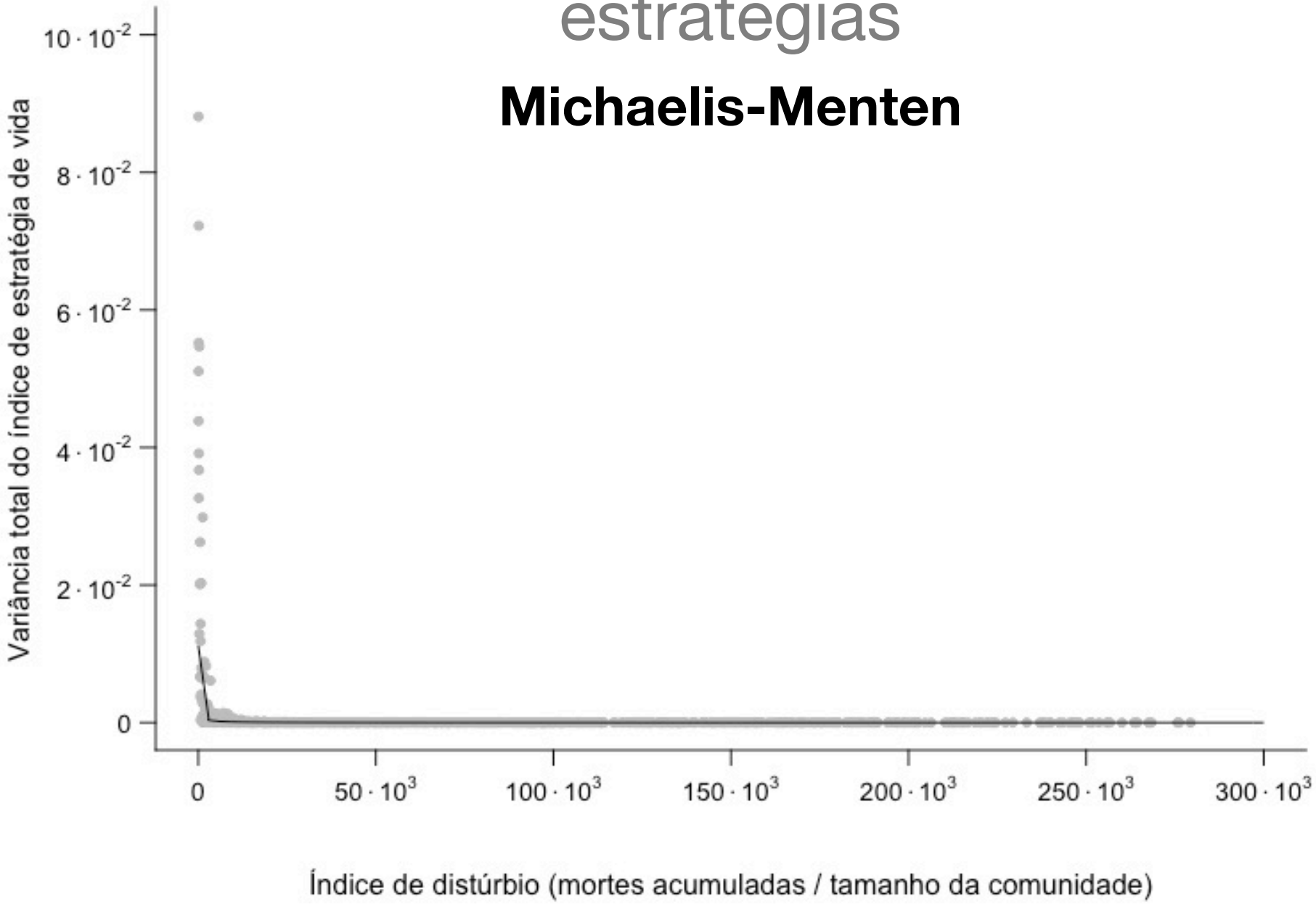


# diversidade de estratégias

## Michaelis-Menten

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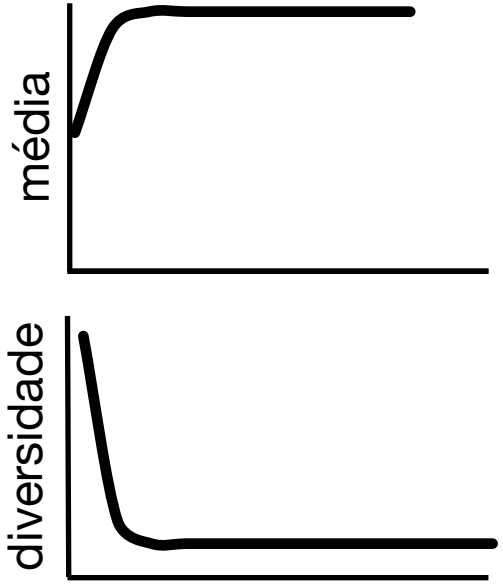
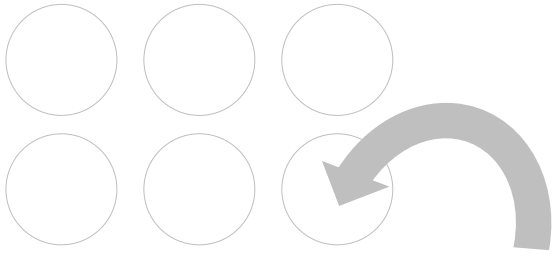
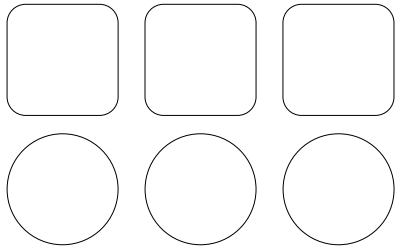
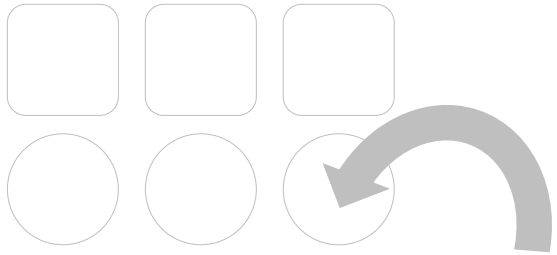
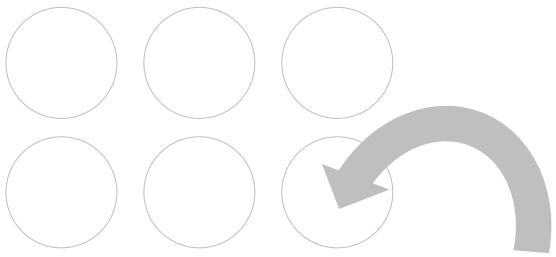
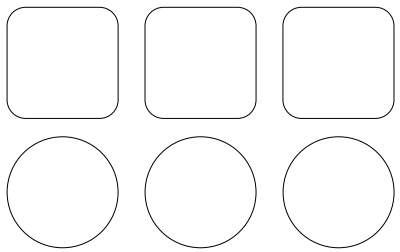
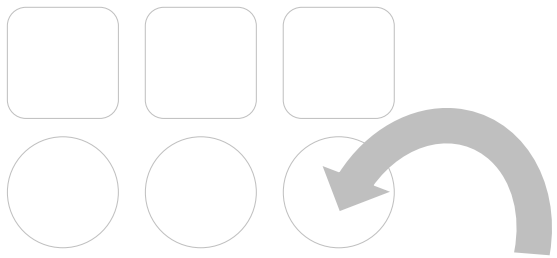
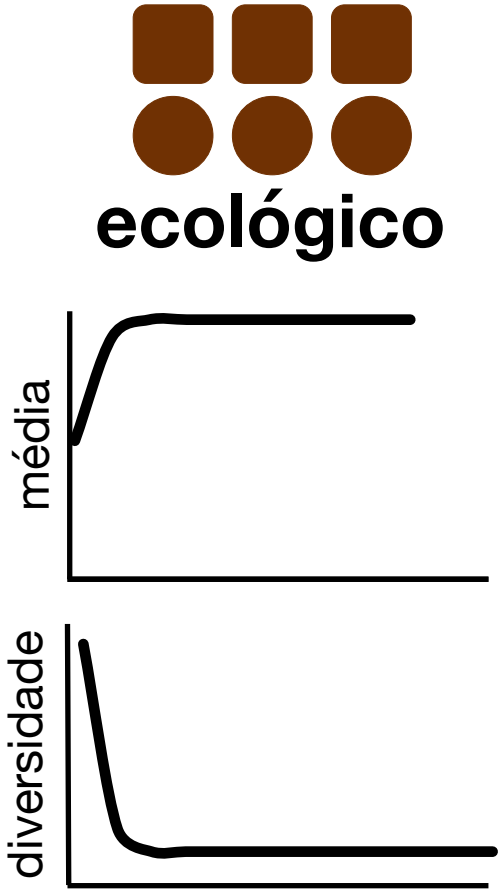


| evolutivo | ecológico | eco-evolutivo |
|---|---|---|
|  |  |  |
| estratégia média | estratégia média | estratégia média |
| diversidade de estratégias | diversidade de estratégias | diversidade de estratégias |
| - | heterogeneidade interespecífica de estratégias | heterogeneidade interespecífica de estratégias |

| evolutivo | ecológico | eco-evolutivo |
| --- | --- | --- |
|  |  |  |
| estratégia média | estratégia média | estratégia média |
| diversidade de estratégias | diversidade de estratégias | diversidade de estratégias |
| - | heterogeneidade interespecífica de estratégias | heterogeneidade interespecífica de estratégias |

# heterogeneidade interespecífica de estratégias



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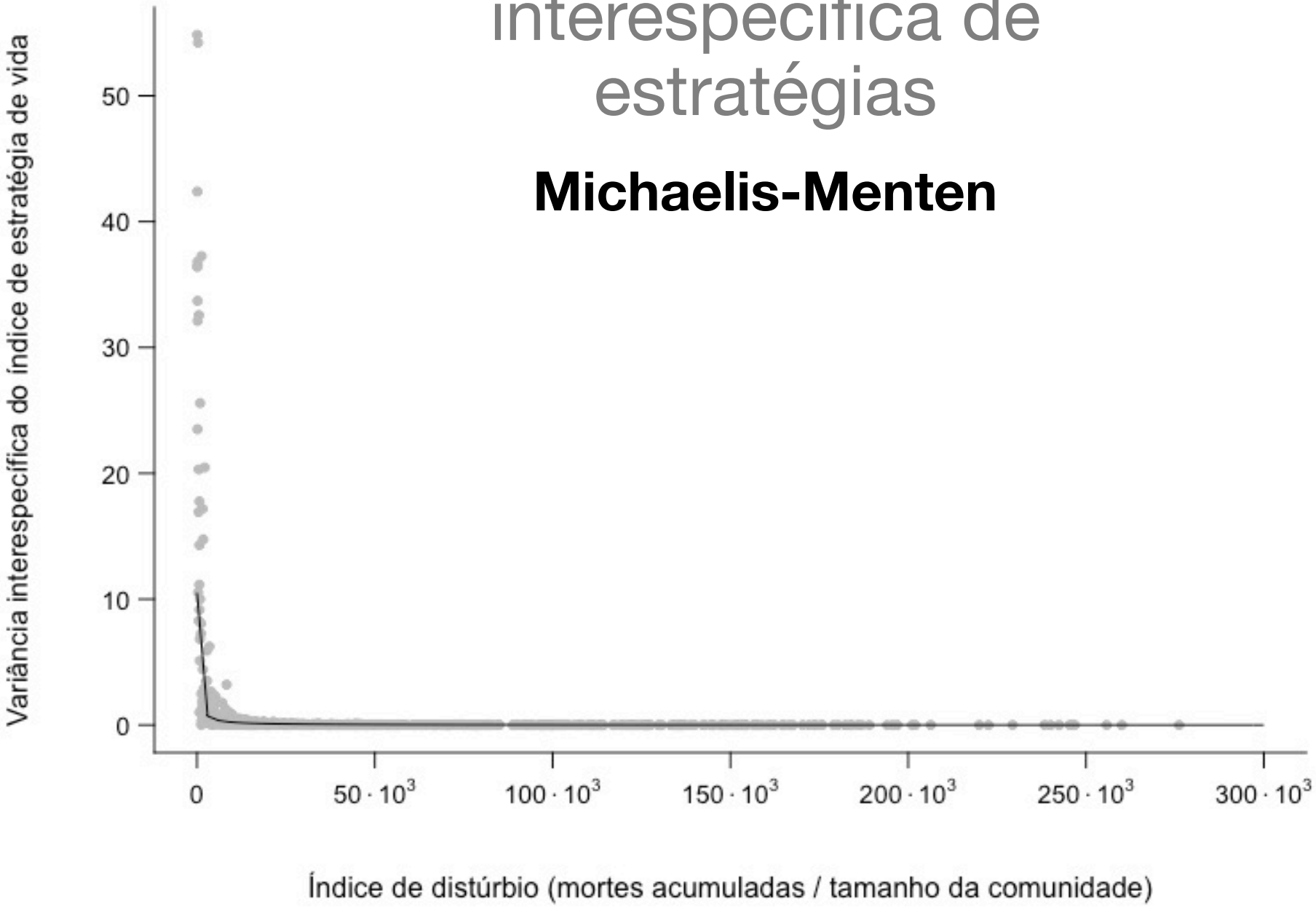


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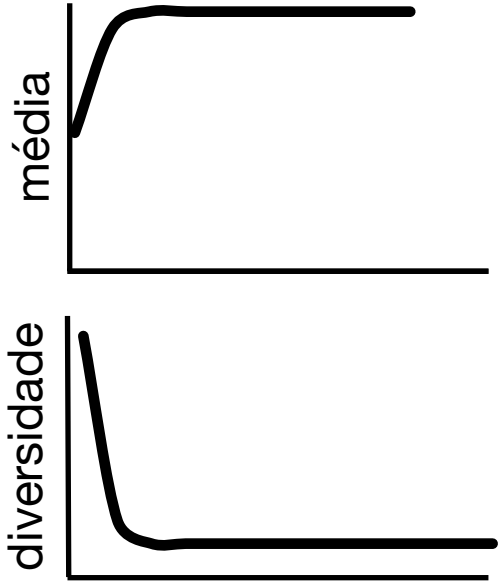

# heterogeneidade interespecífica de estratégias

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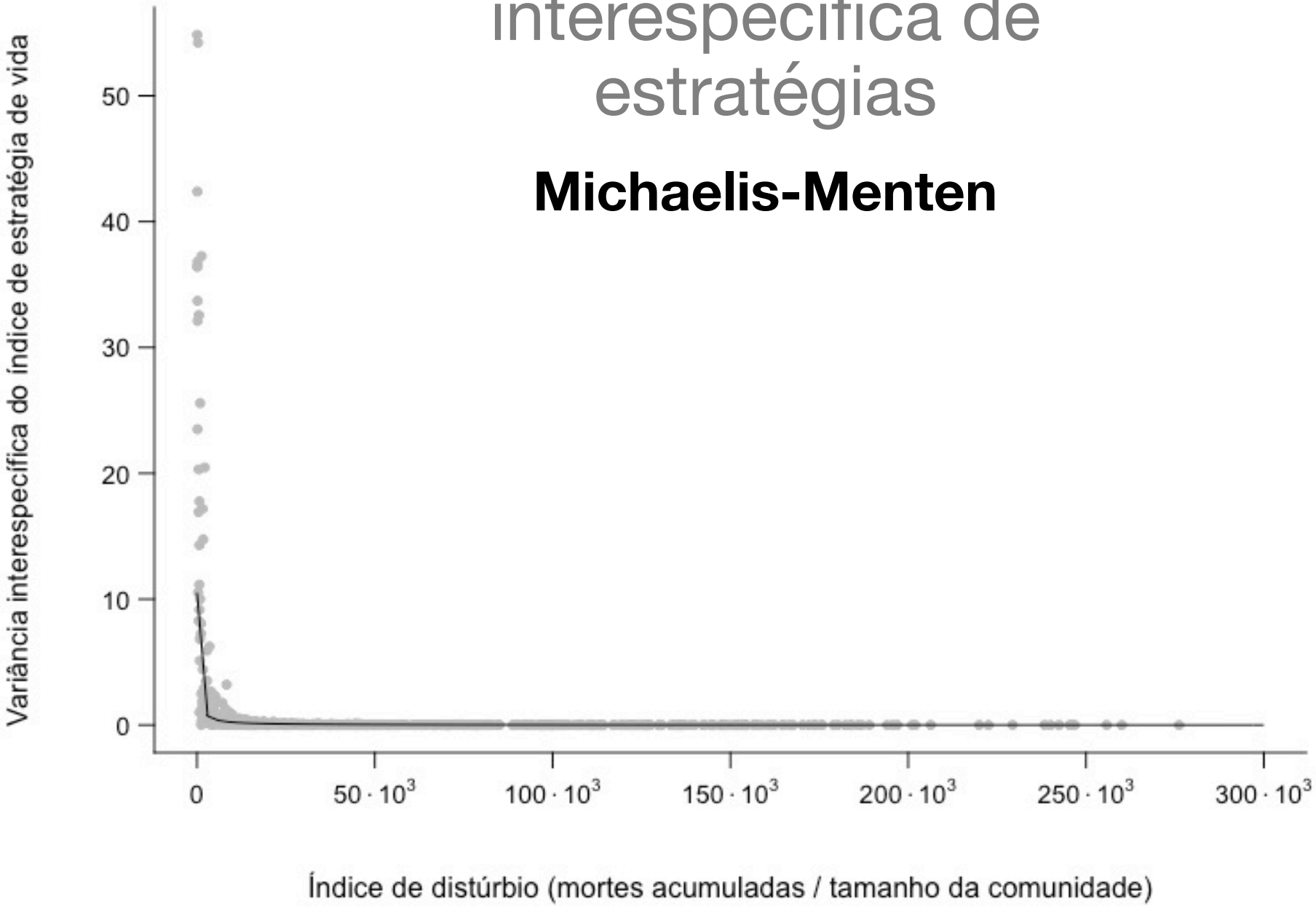


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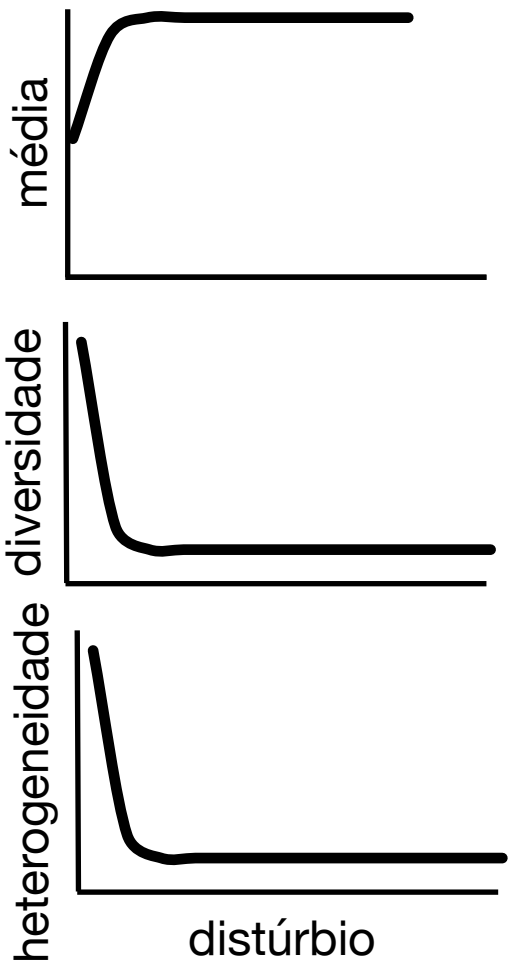

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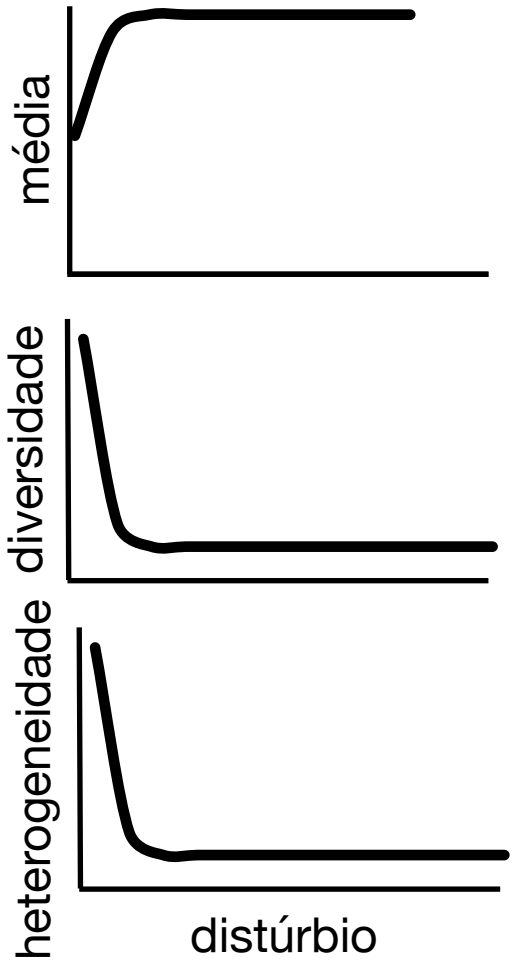

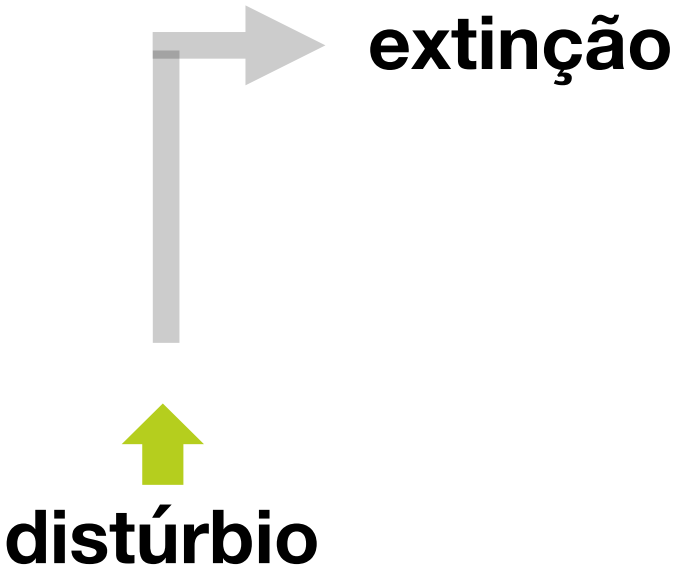
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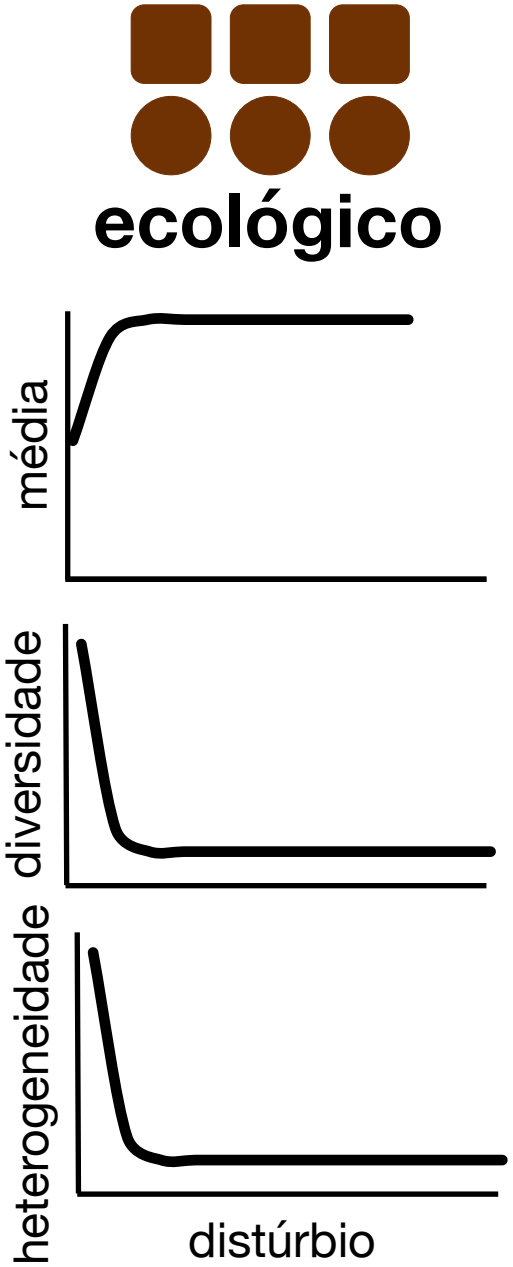
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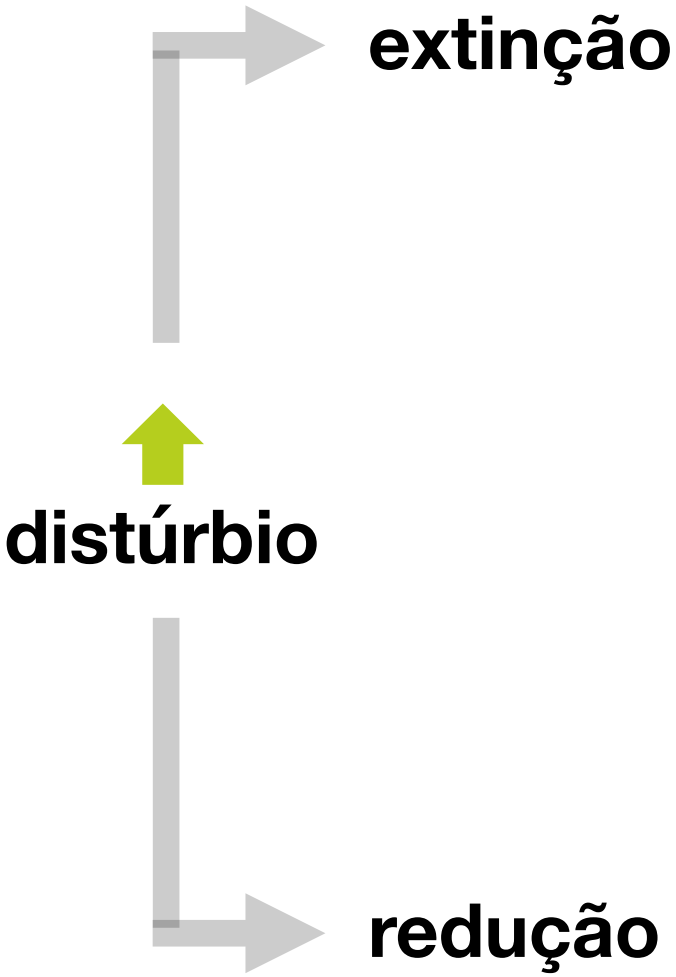
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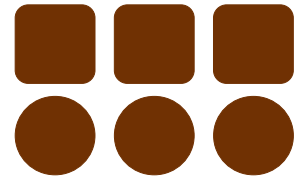

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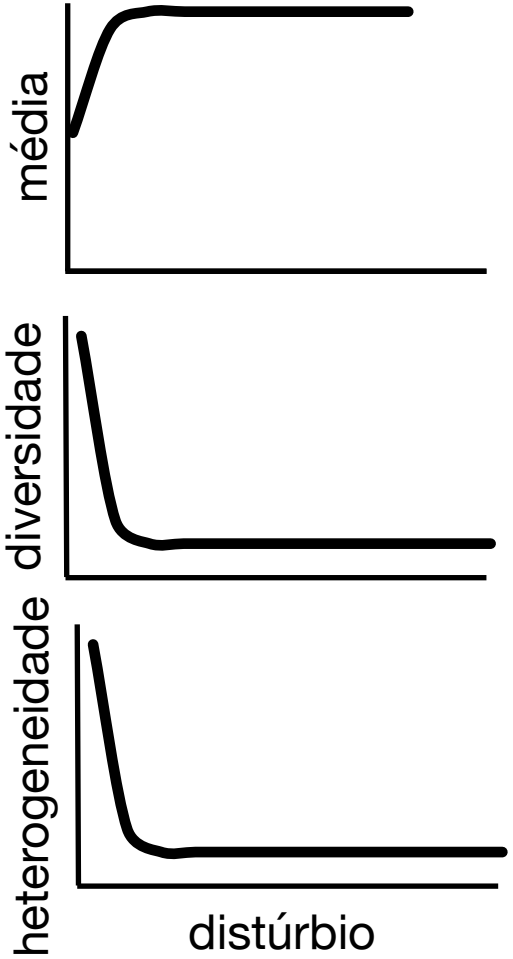
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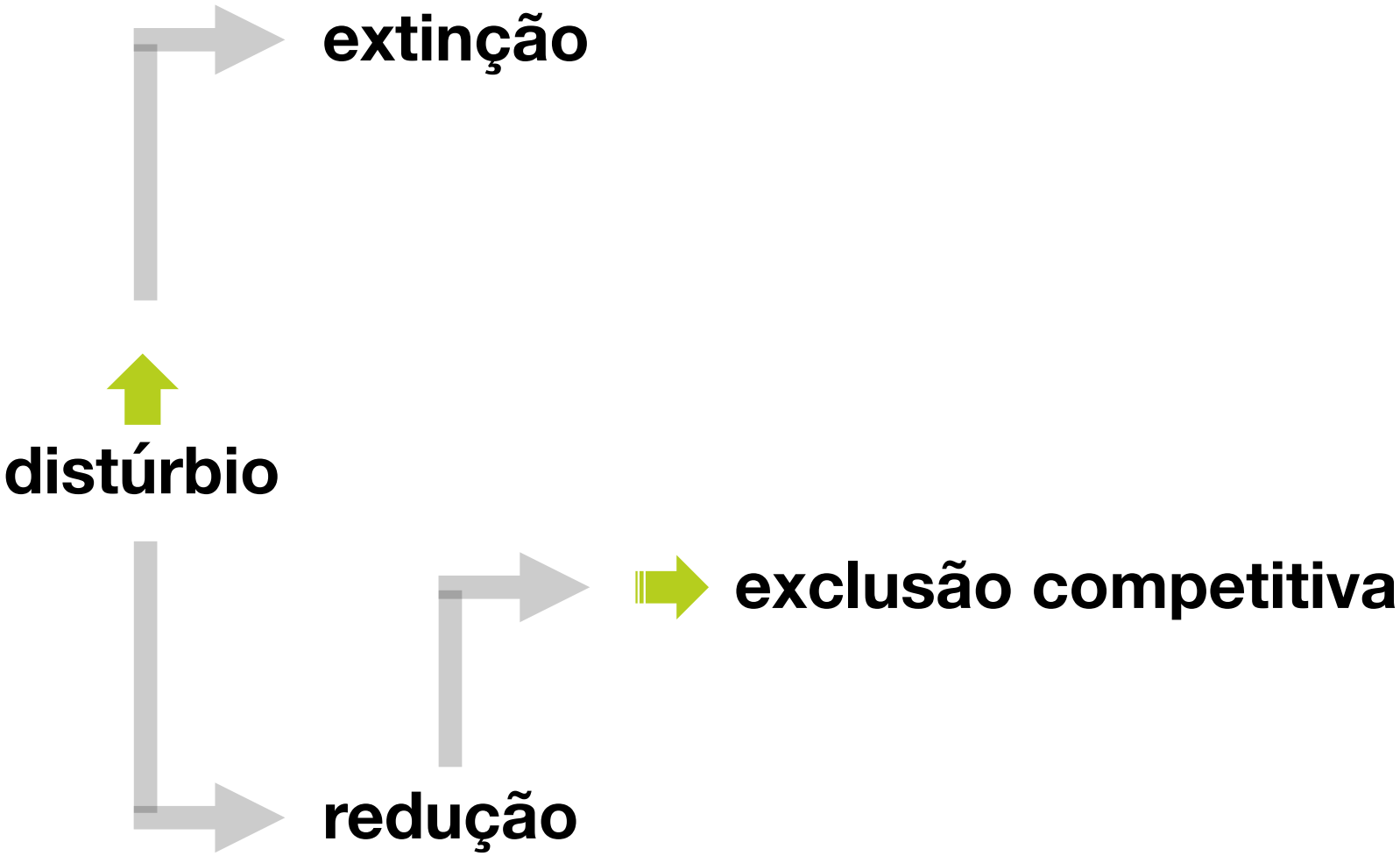
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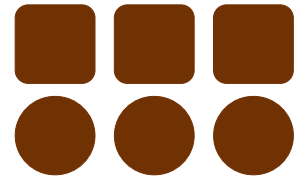

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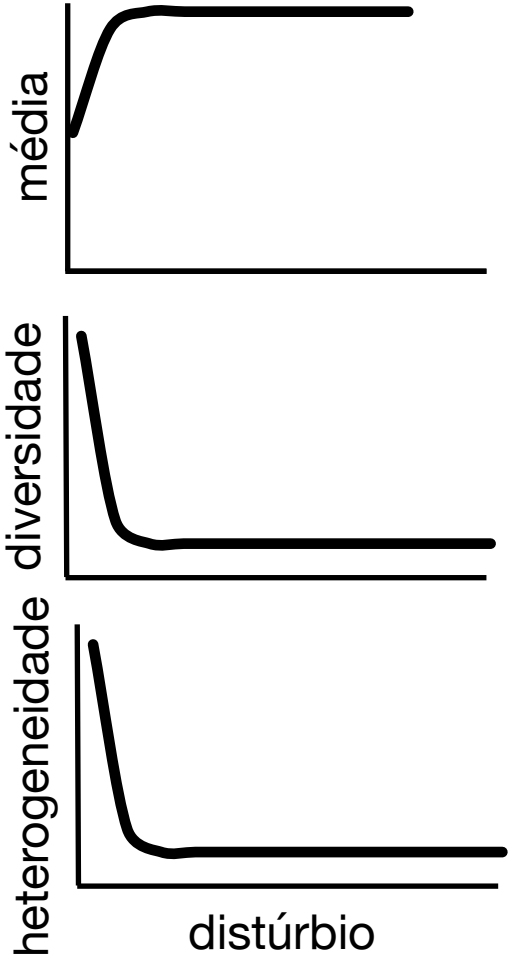
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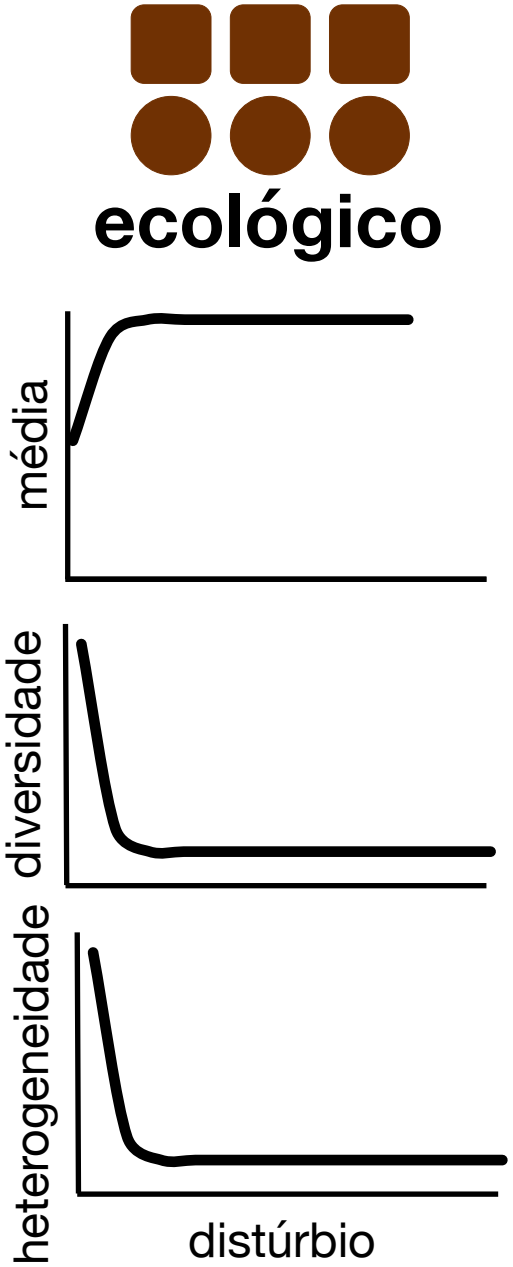
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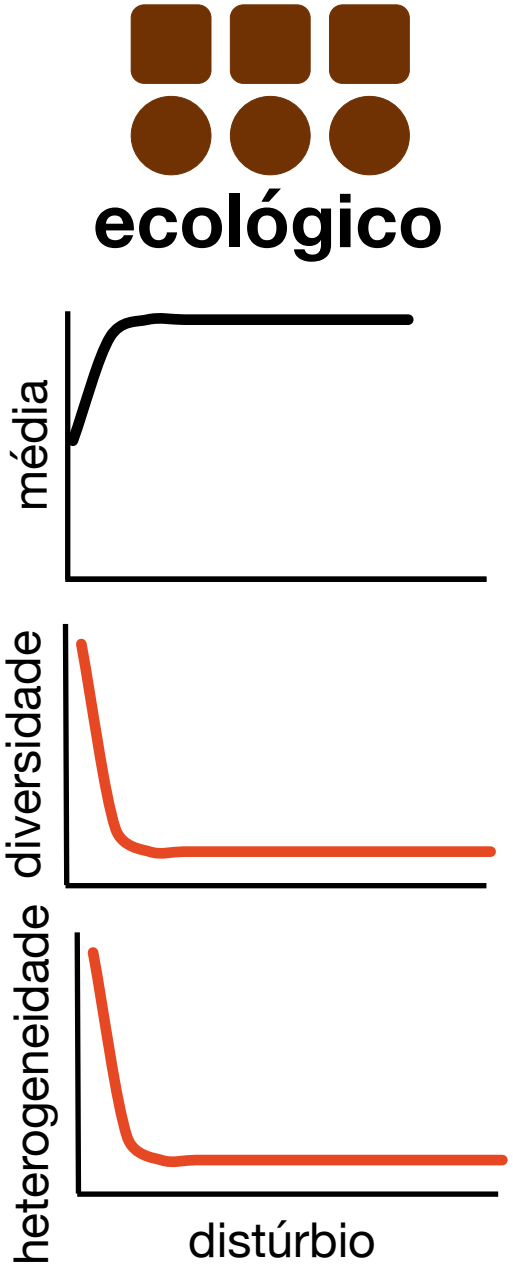
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| evolutivo | ecológico | eco-evolutivo |
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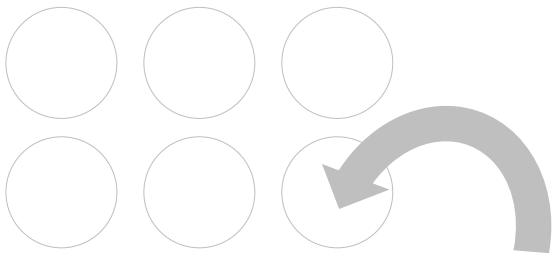
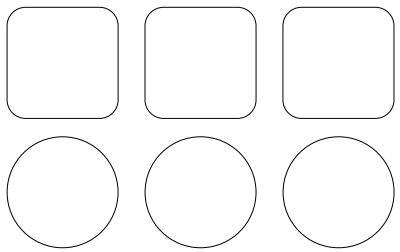
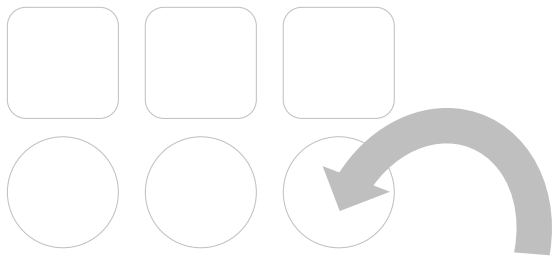
|  |  |  |
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| evolutivo | ecológico | eco-evolutivo |
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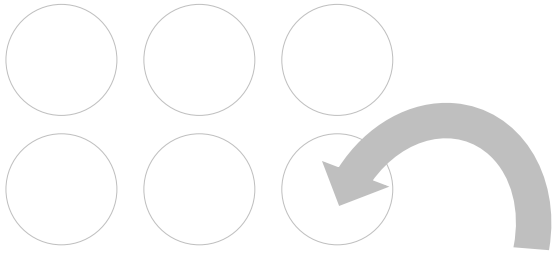
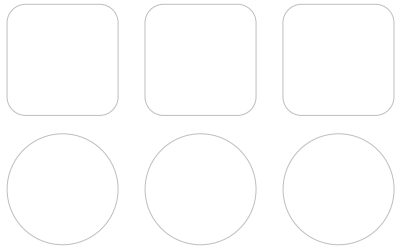
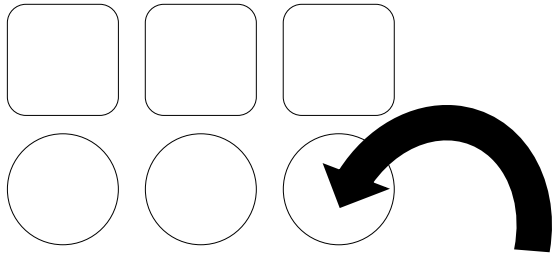
|  |  |  |
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# estratégia média

eco-evolutivo

# estratégia média

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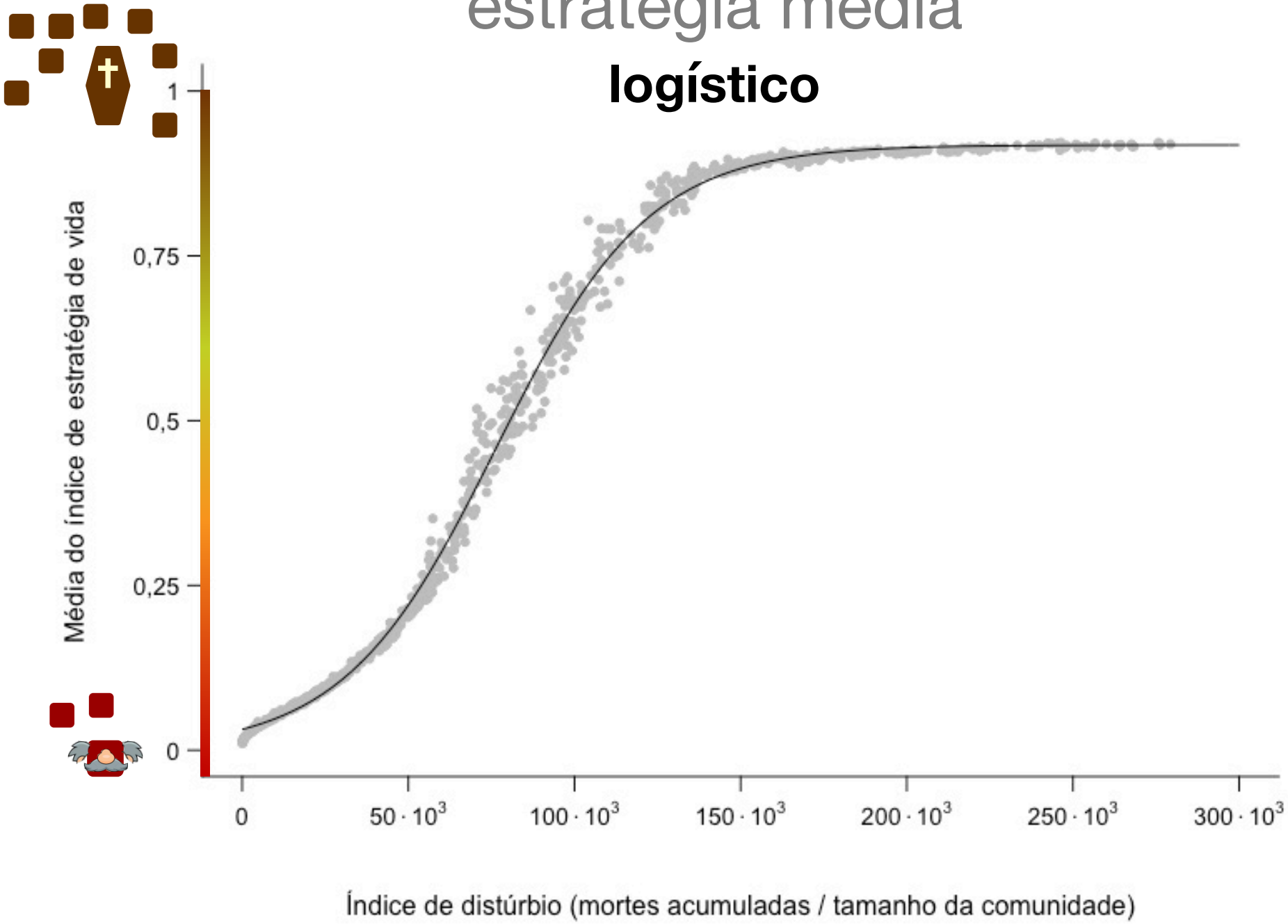
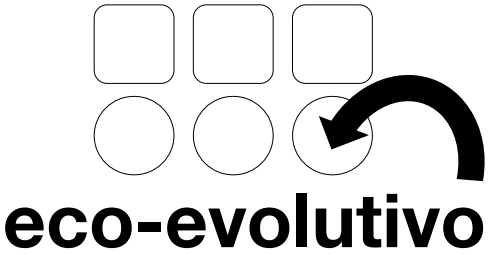
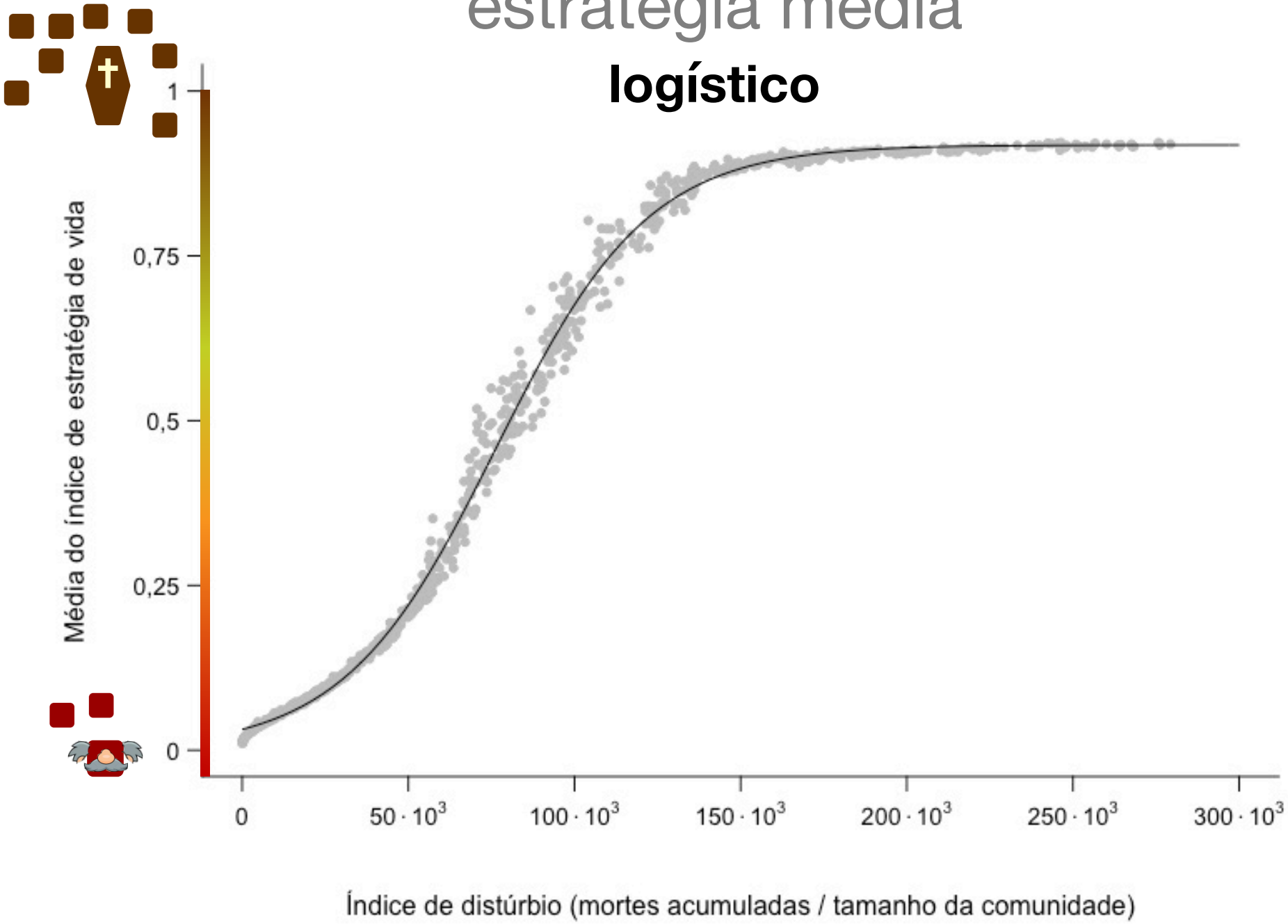
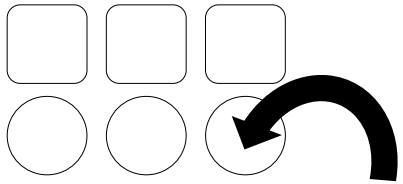


# estratégia média

## logístico



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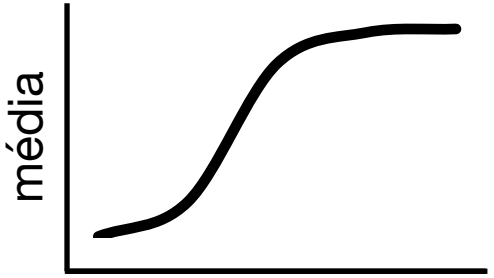
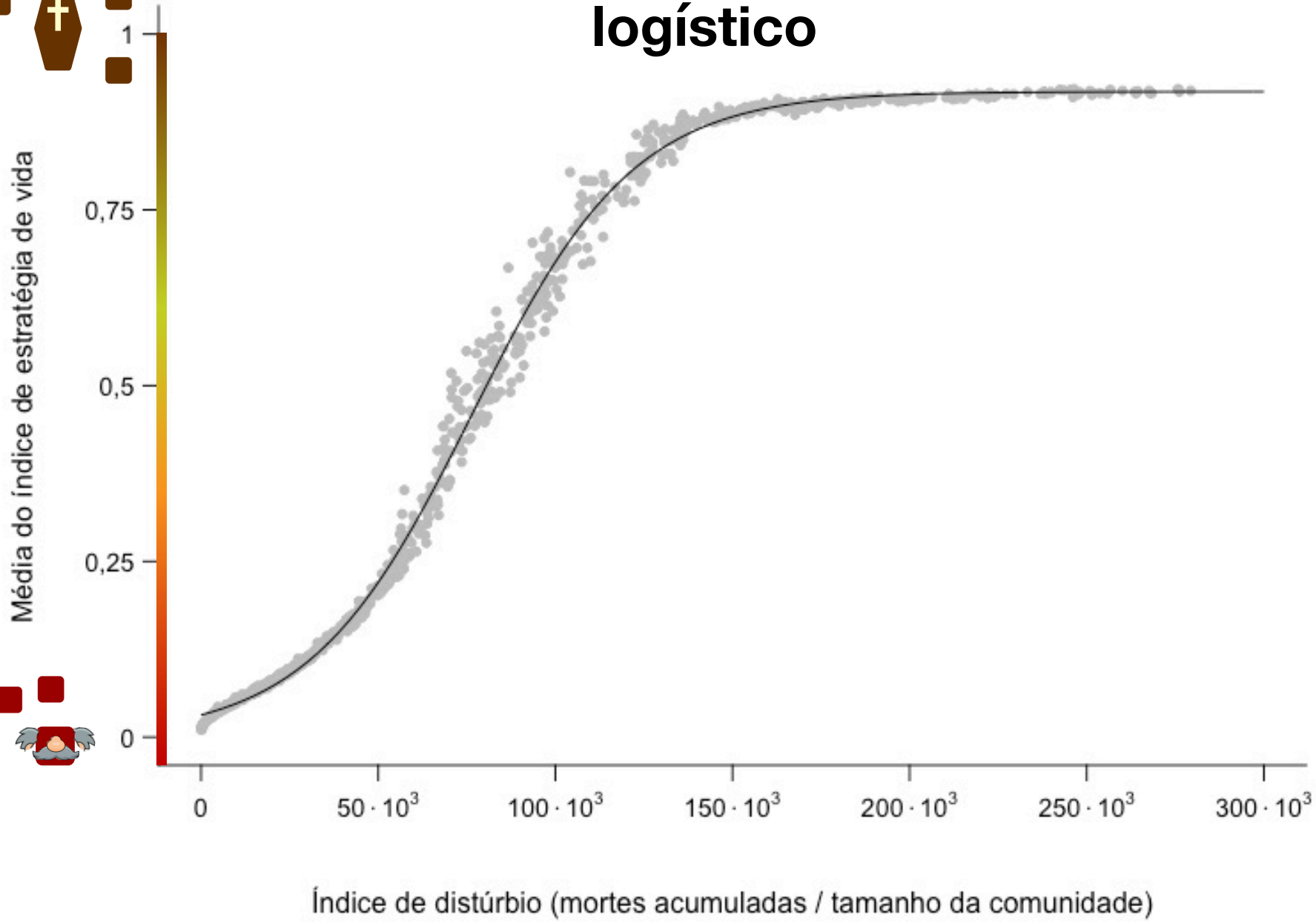
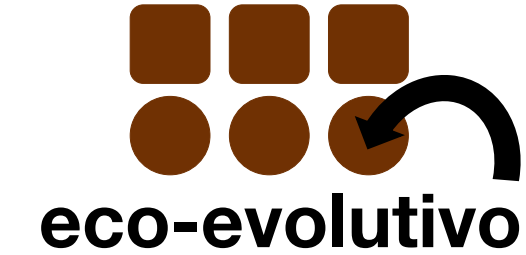
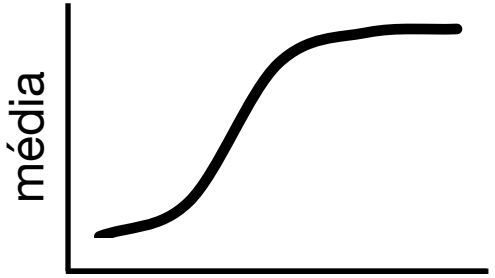


# estratégia média

## logístico



# estratégia média

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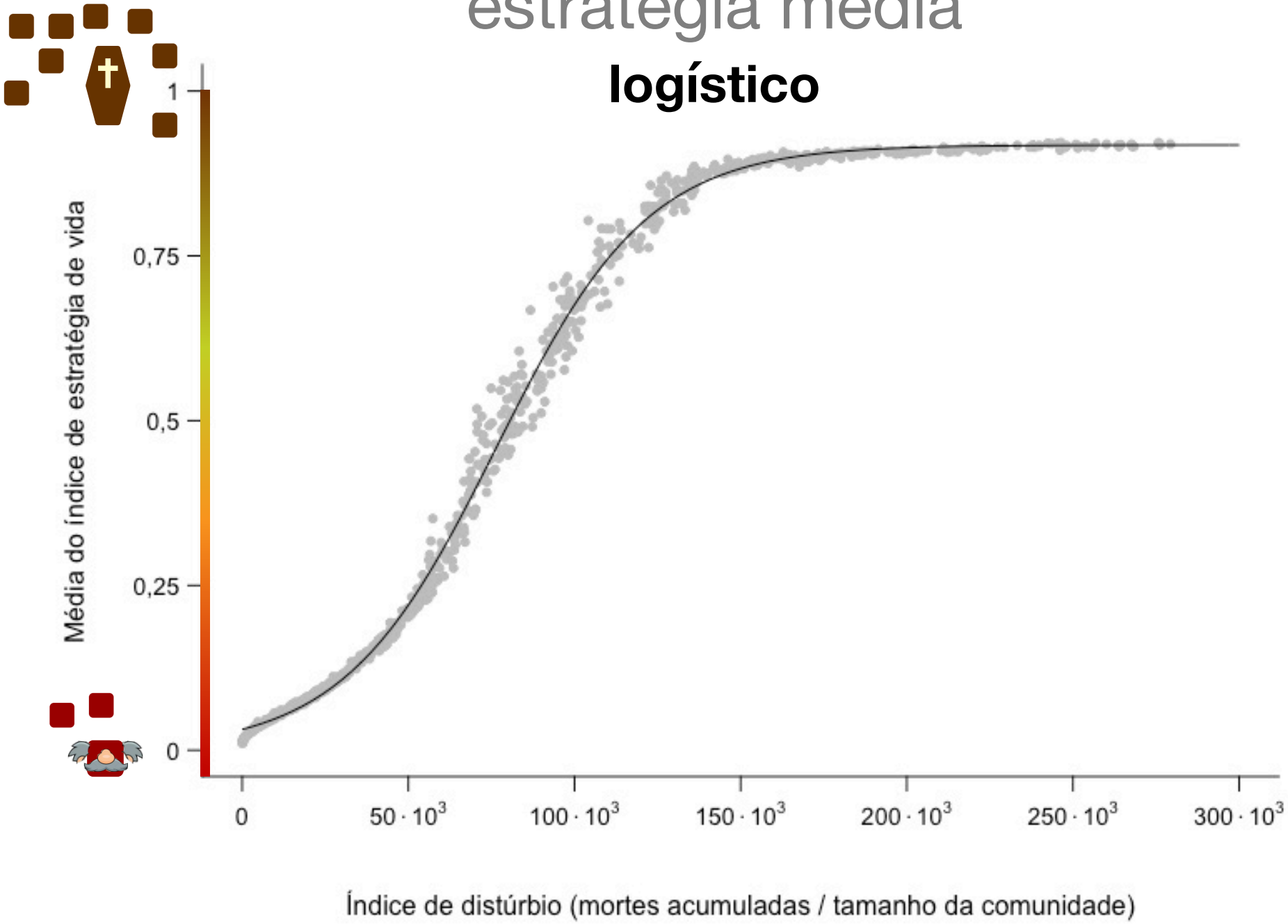


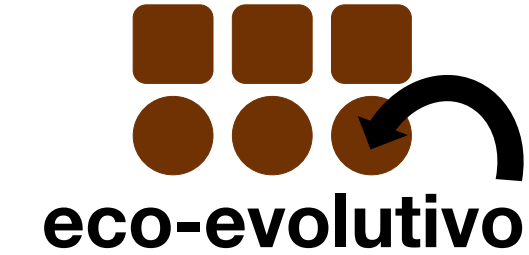

**eco-evolutivo**

# estratégia média

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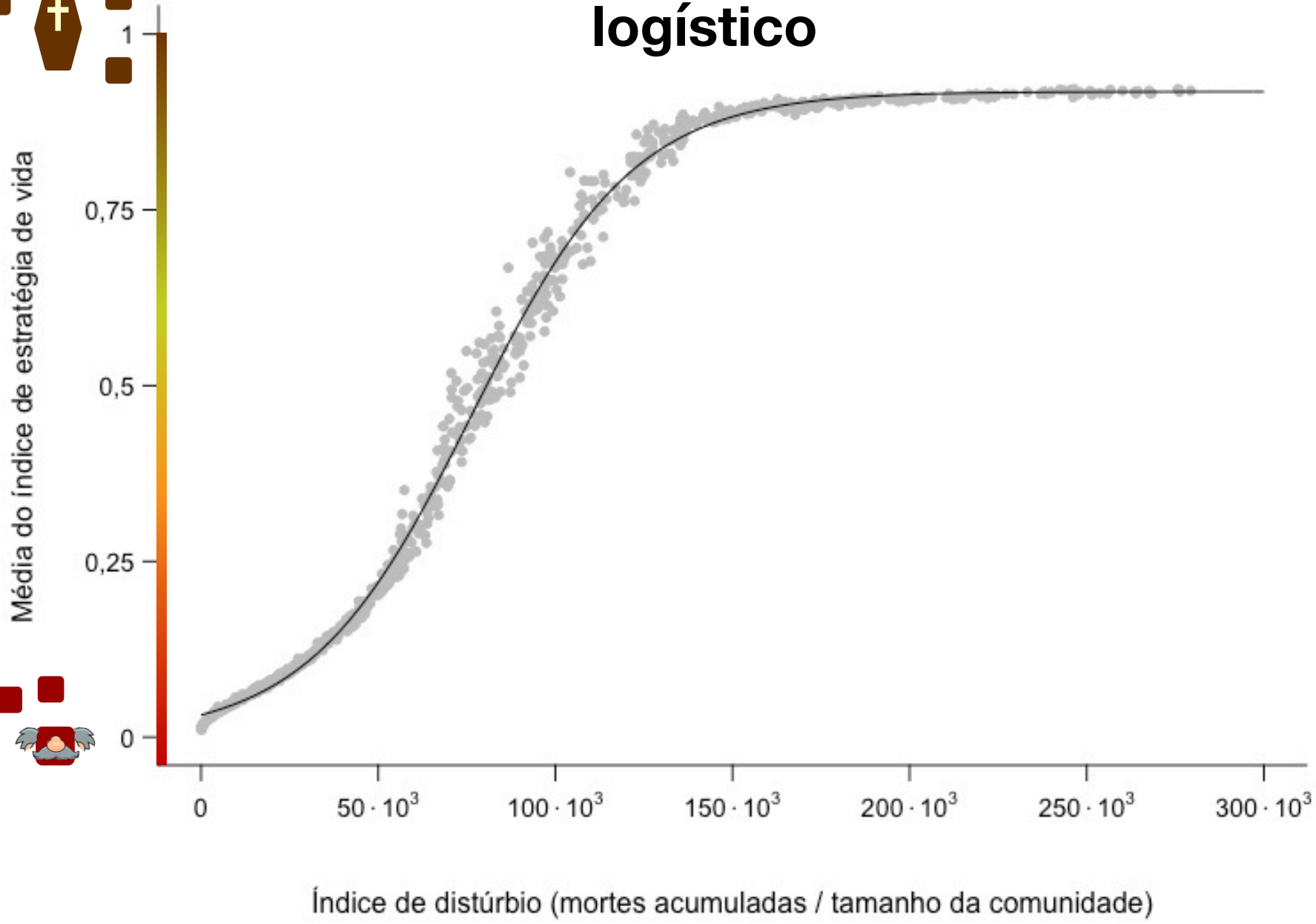


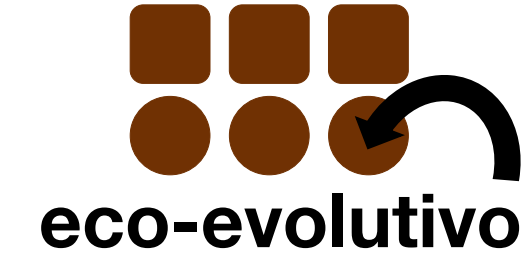


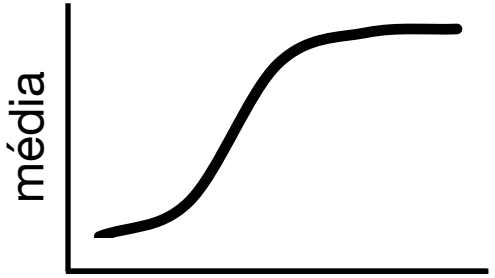

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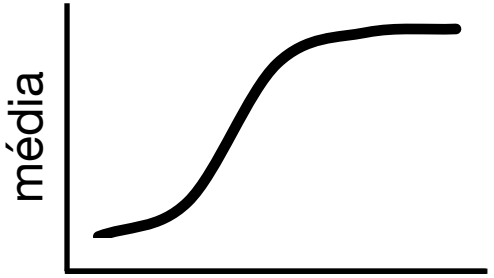
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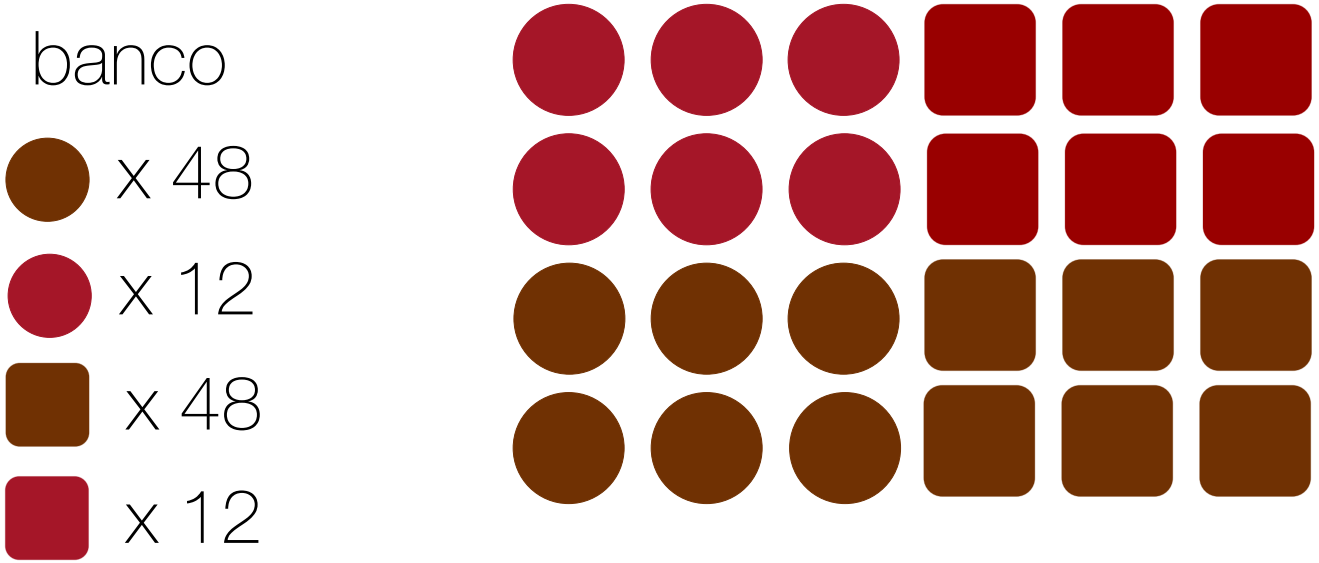
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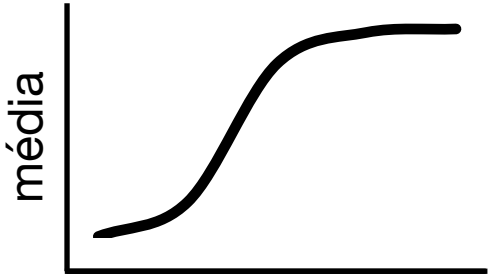
x 12
x 48
x 12

eco-evolutivo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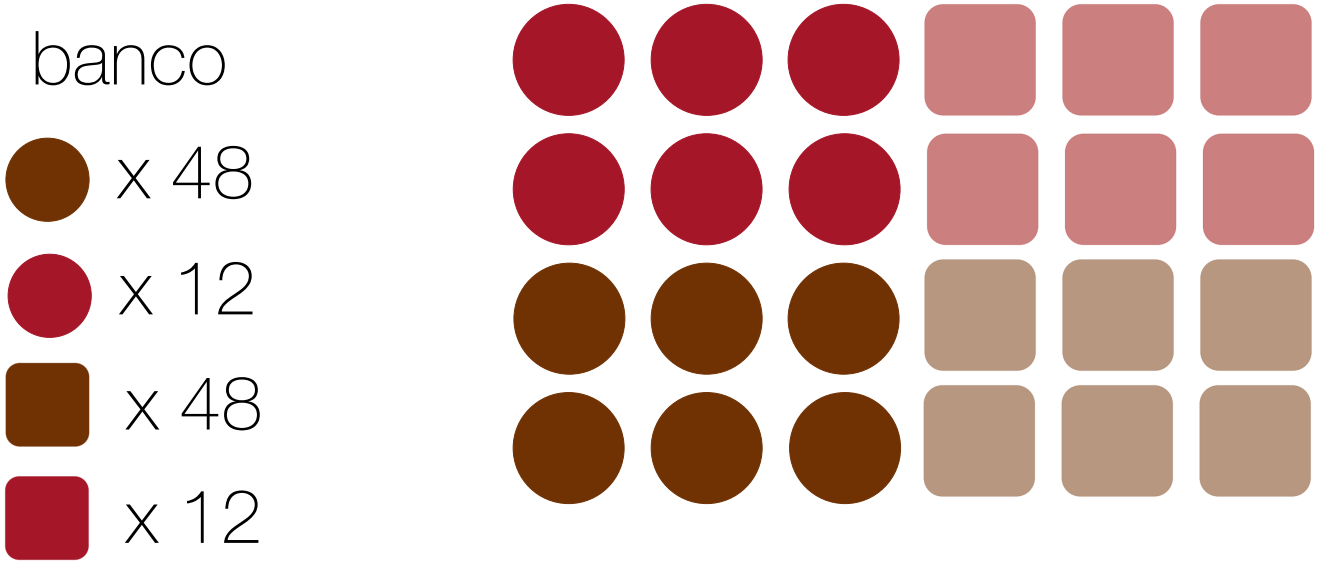
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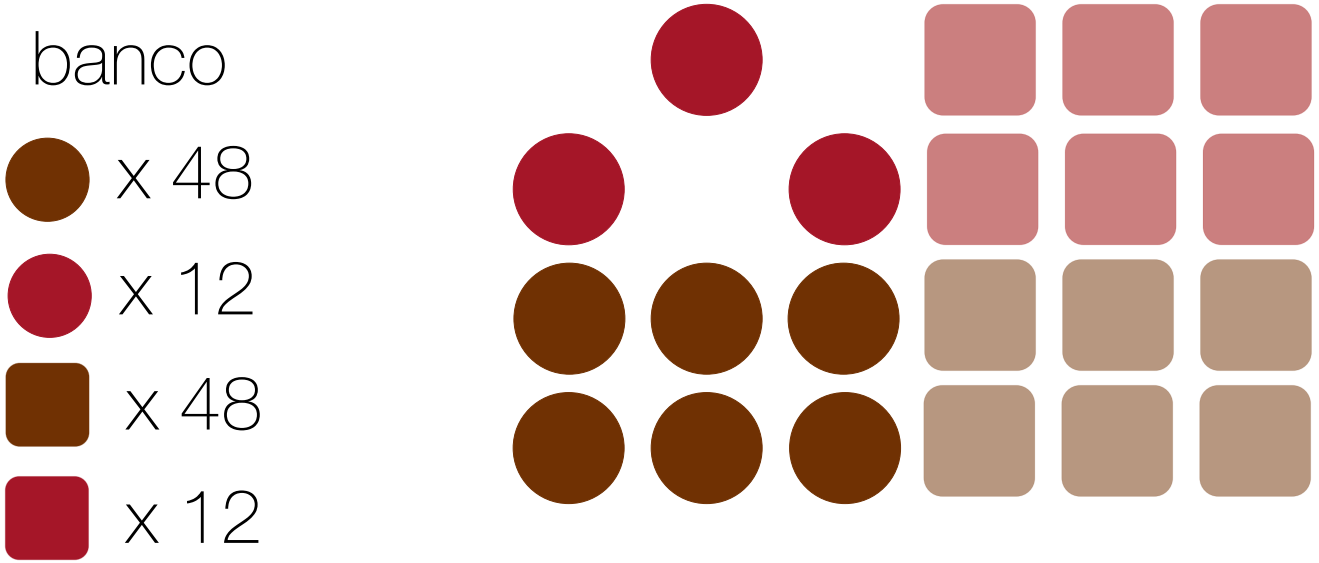


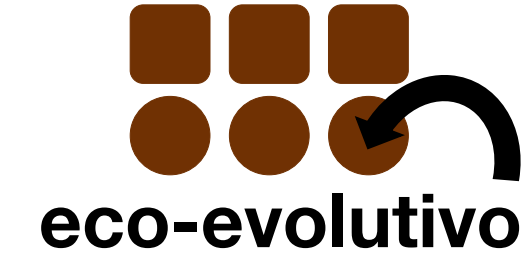


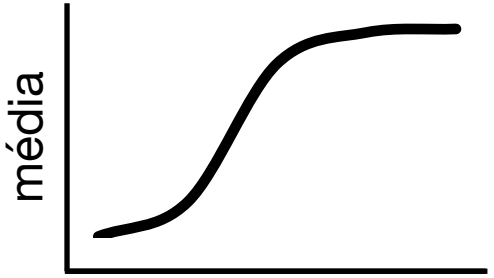

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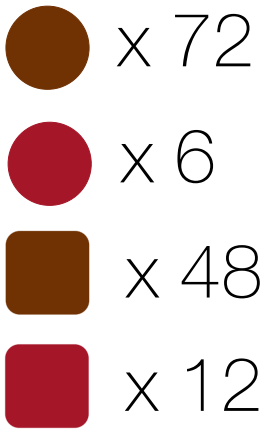


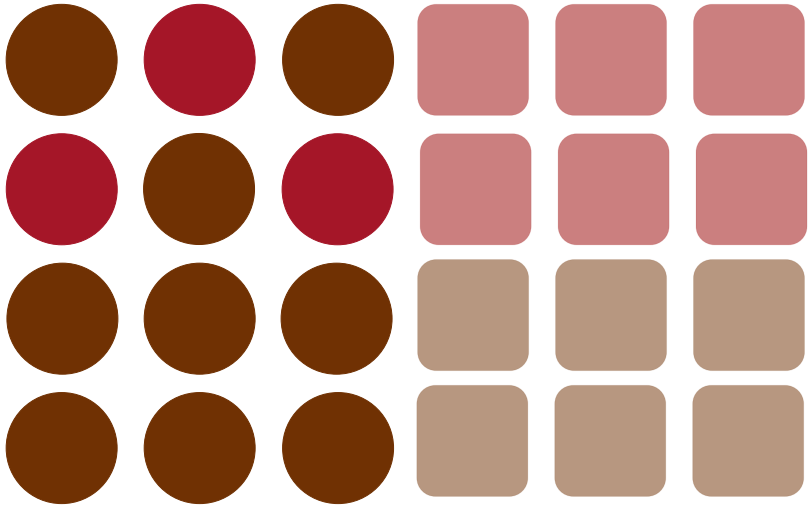

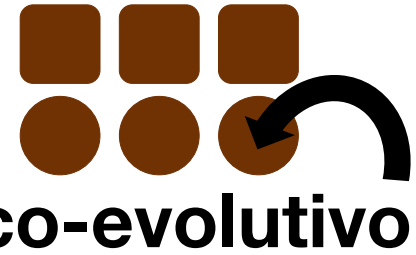


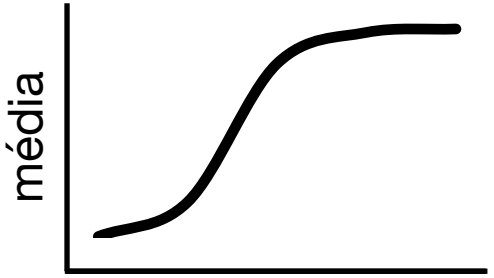

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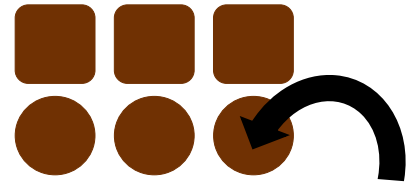
# exclusão competitiva de espécies



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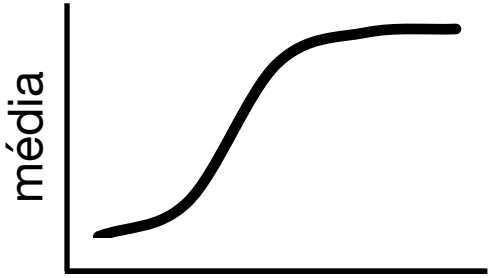


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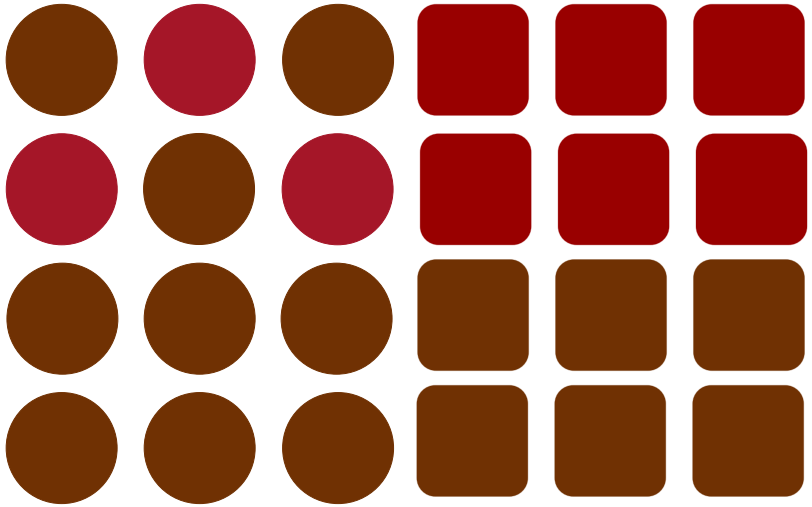
x 72

x 6

x 48

x 12



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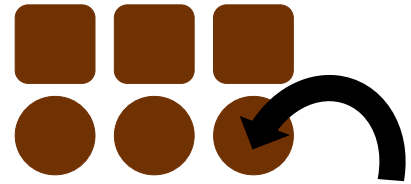
# exclusão competitiva de espécies



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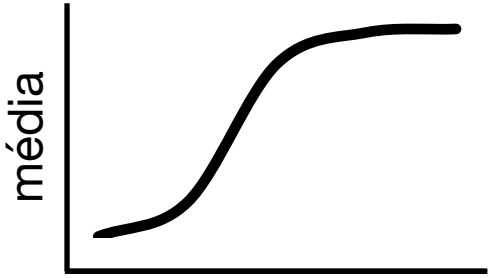


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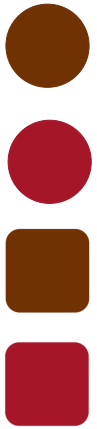
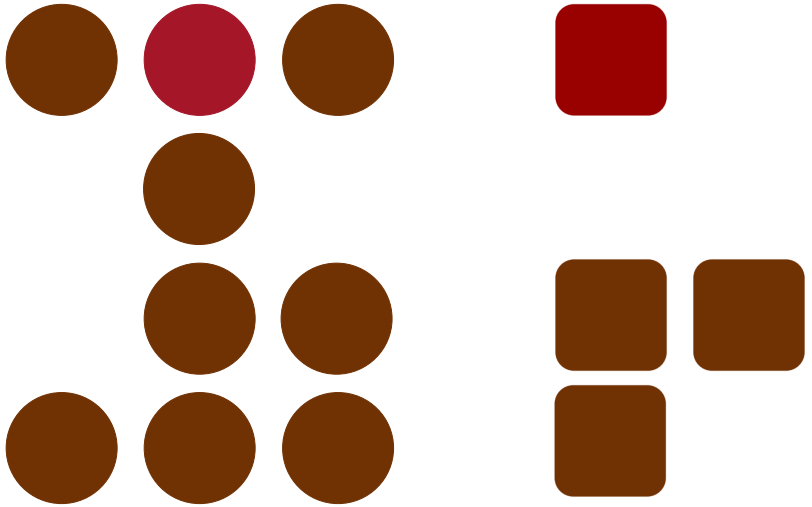


x 72

x 6

x 48

x 12



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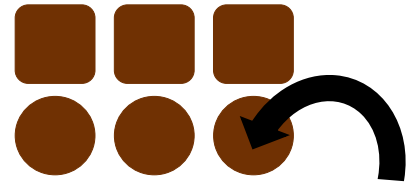
# exclusão competitiva de espécies



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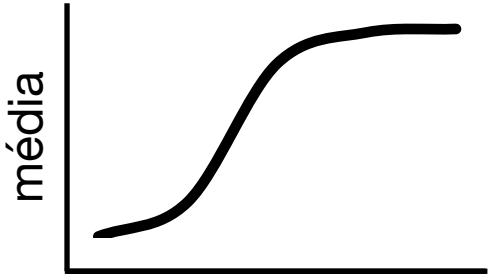


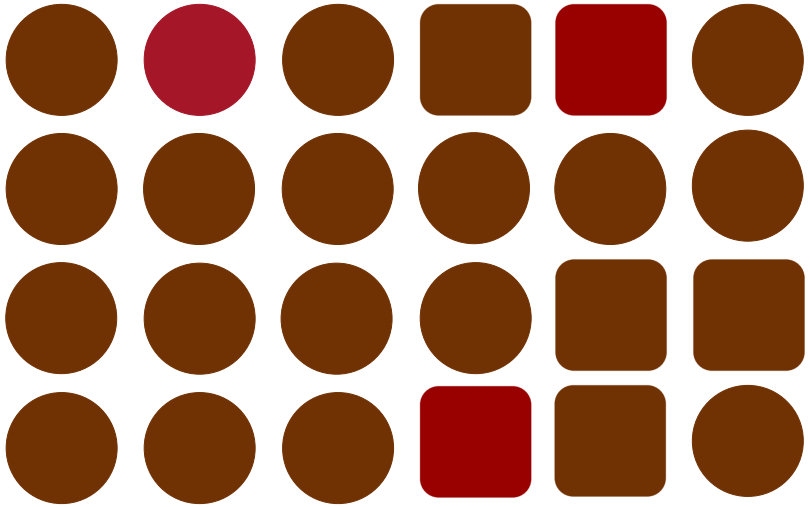

banco

x 136

x 2

x 32

x 4



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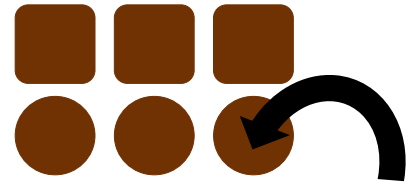

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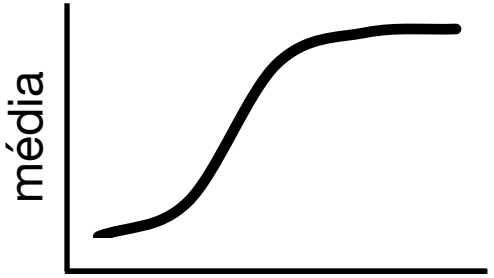


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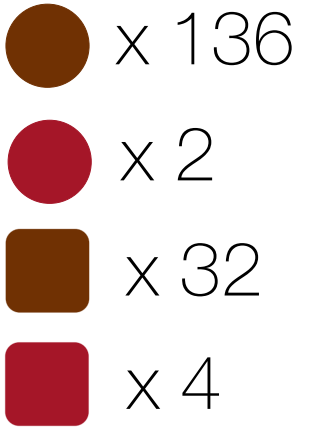


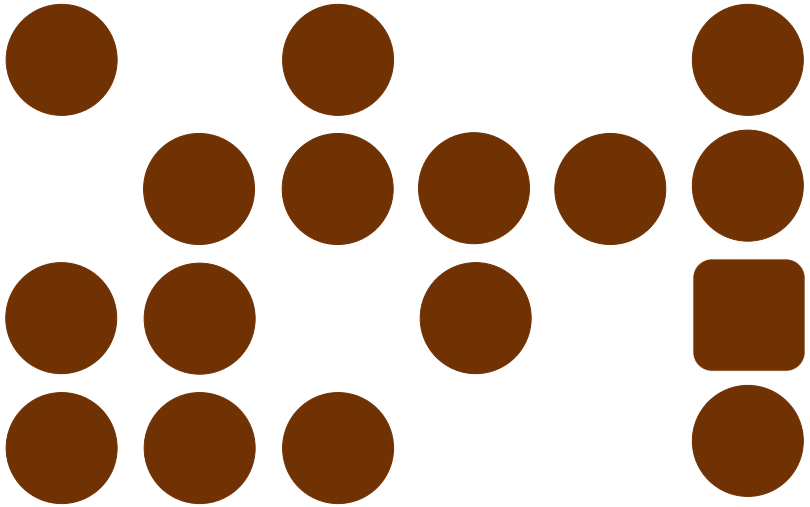

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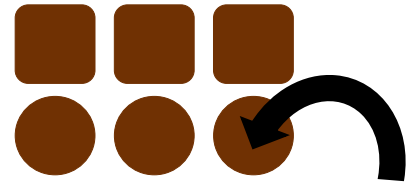

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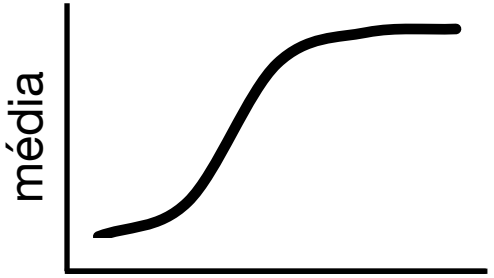
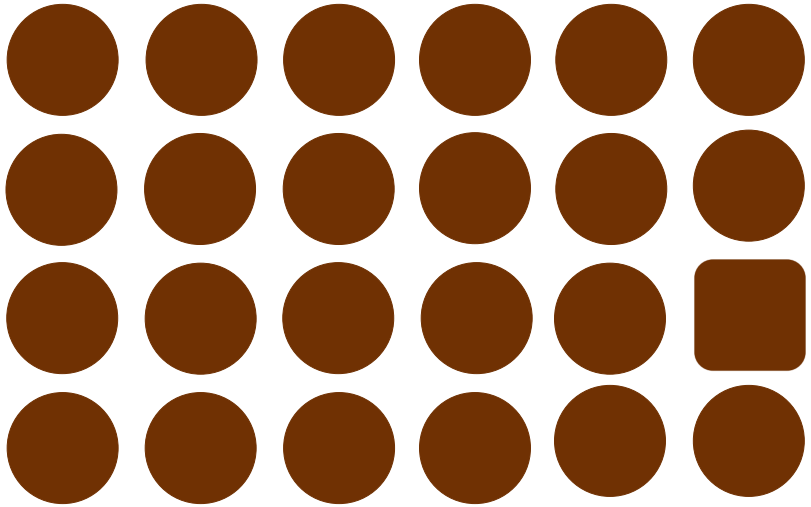



banco

x 184

x 8



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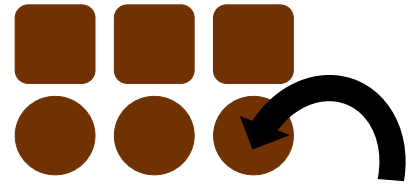

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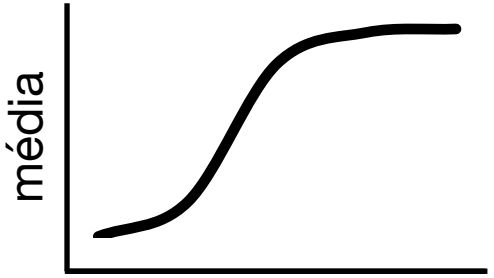
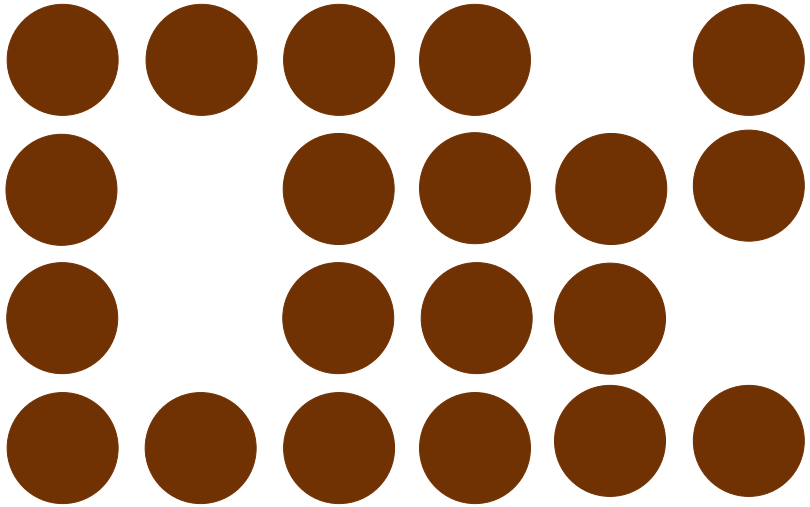



banco

x 184

x 8



# seleção natural
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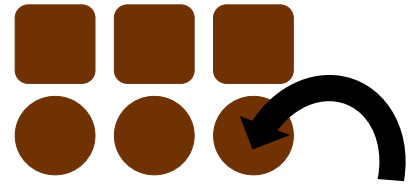

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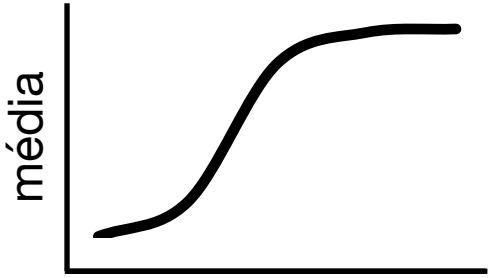
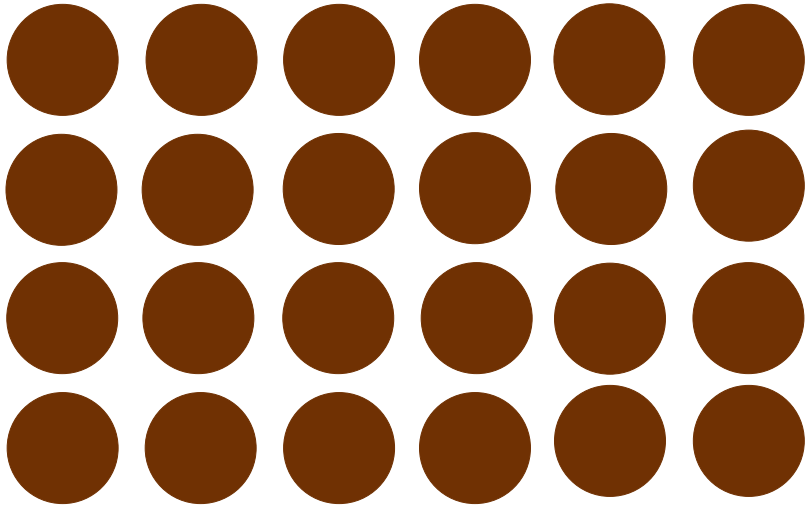



banco

x 192



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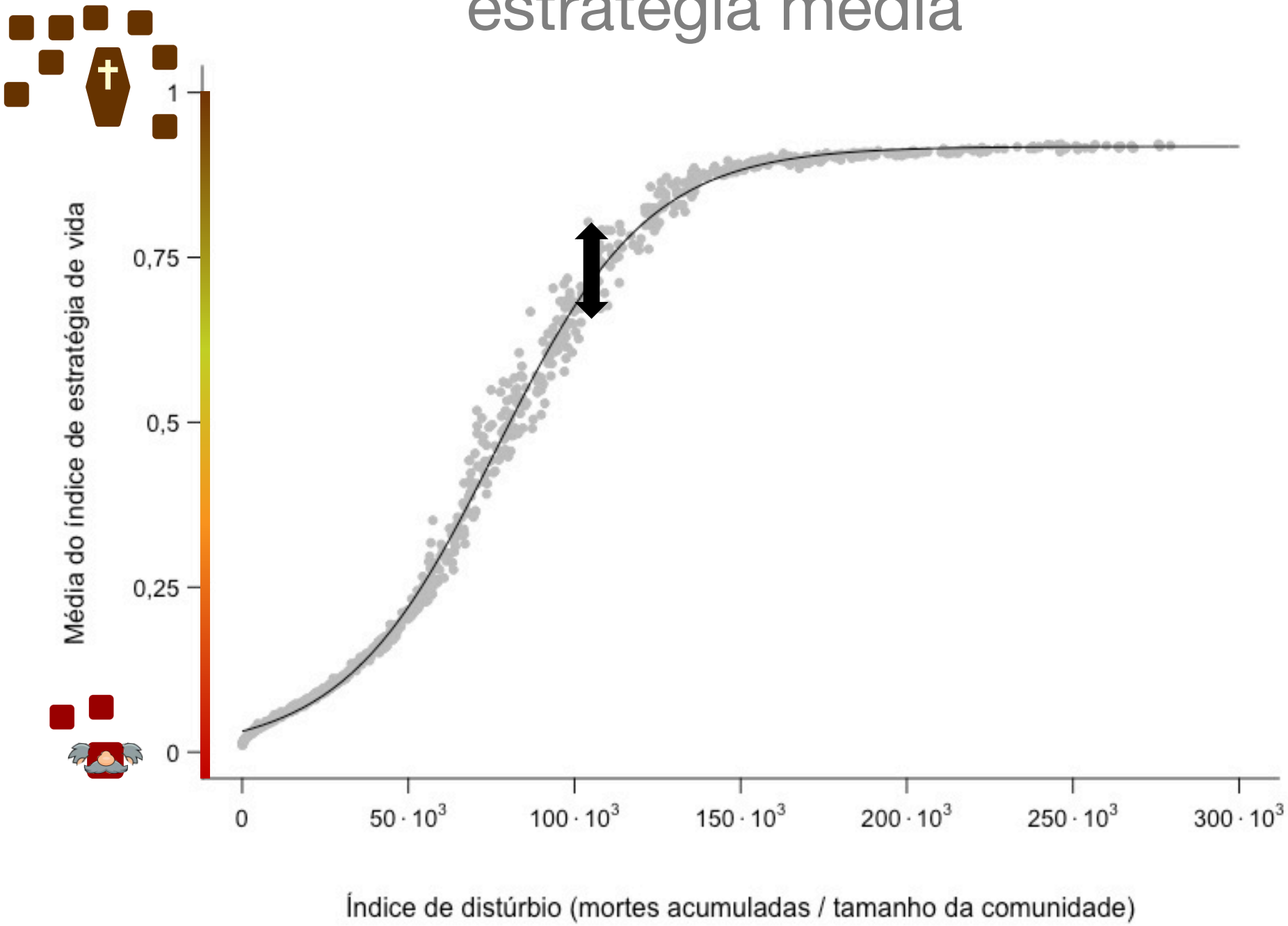
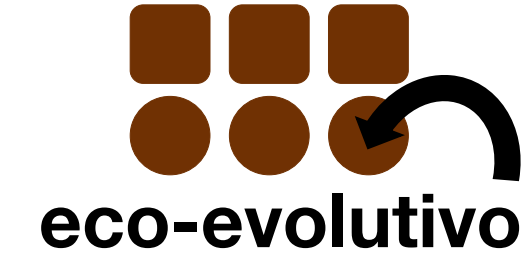
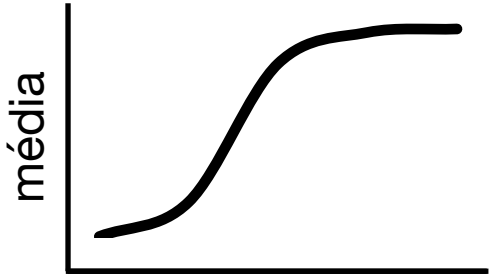
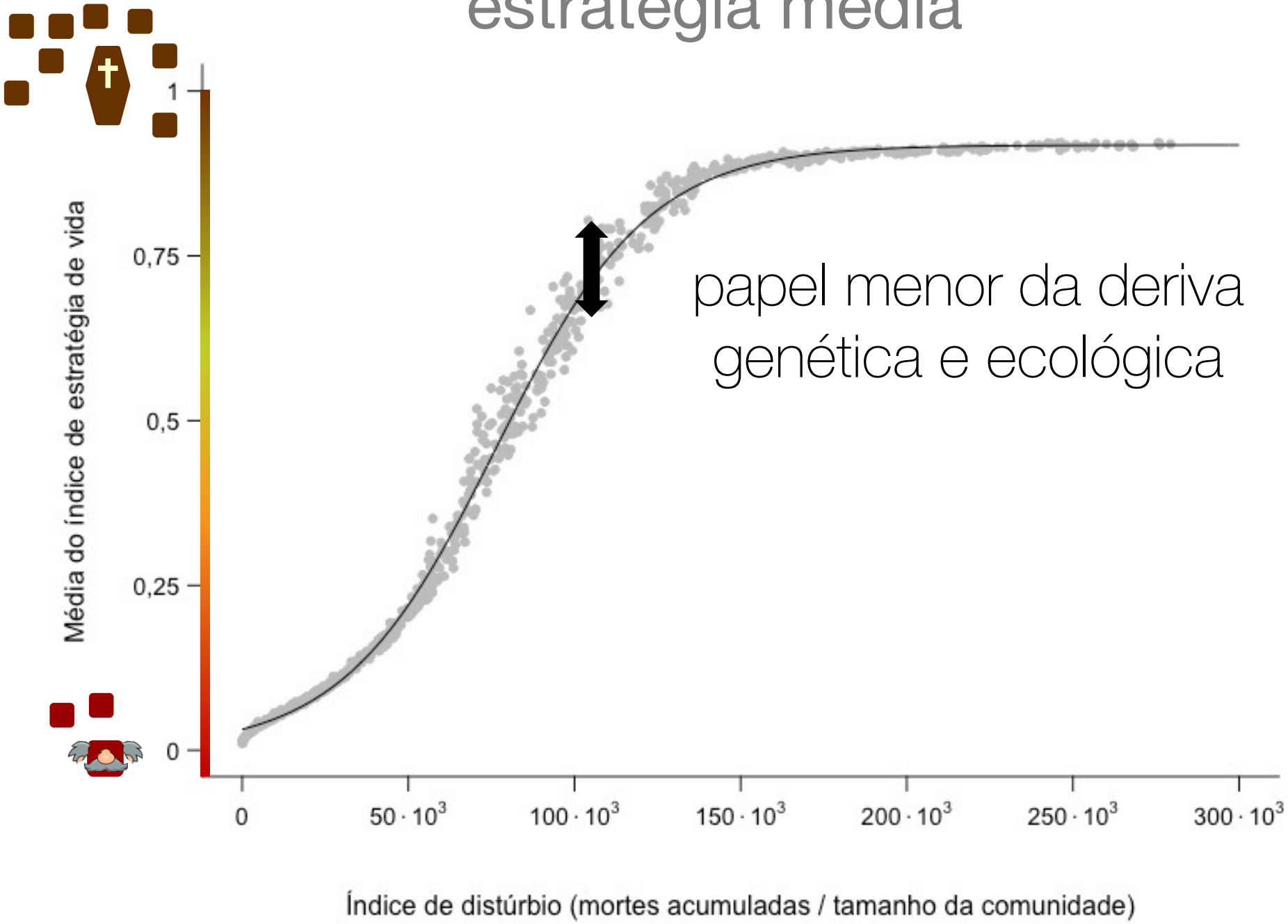
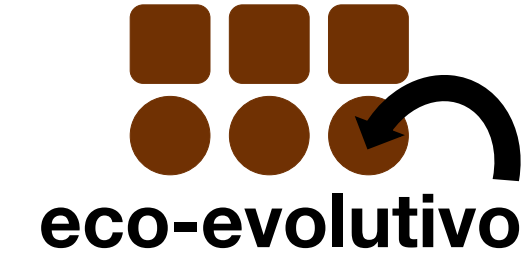


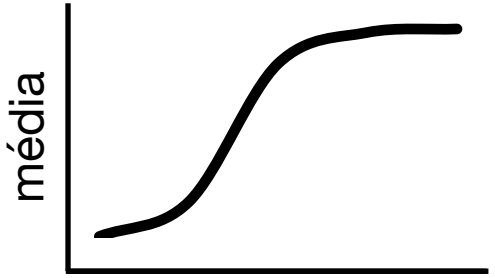



# estratégia média



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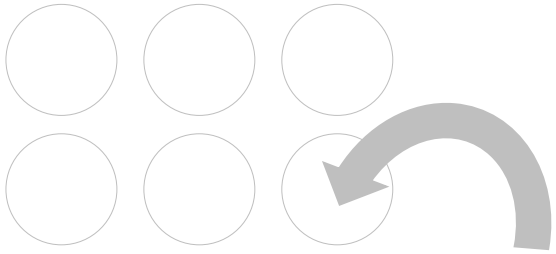
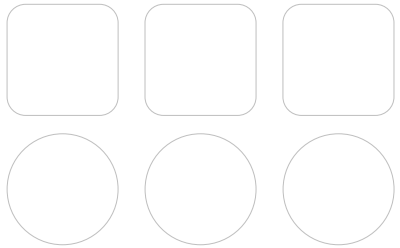
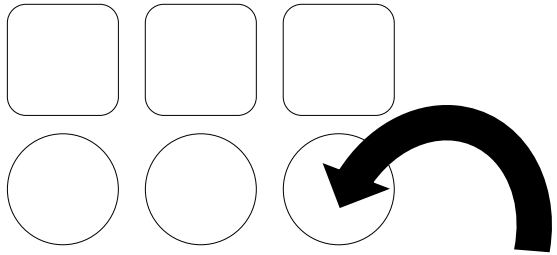
| --- | --- | --- |
|  |  |  |
| estratégia média | estratégia média | estratégia média |
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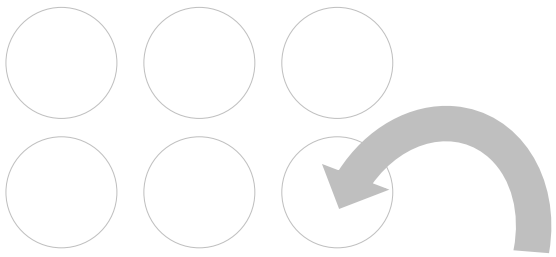
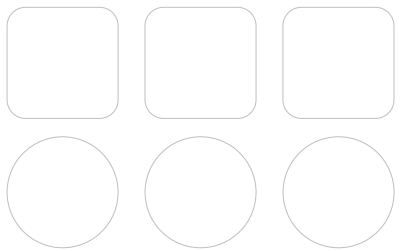
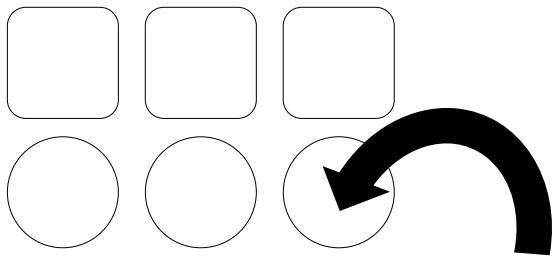
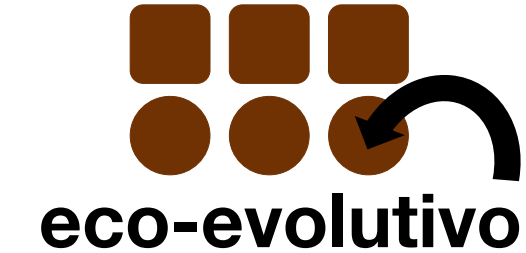
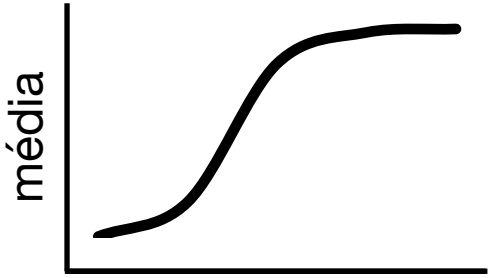
|  |  |  |
| estratégia média | estratégia média | estratégia média |
| diversidade de estratégias | diversidade de estratégias | diversidade de estratégias |
| - | heterogeneidade interespecífica de estratégias | heterogeneidade interespecífica de estratégias |

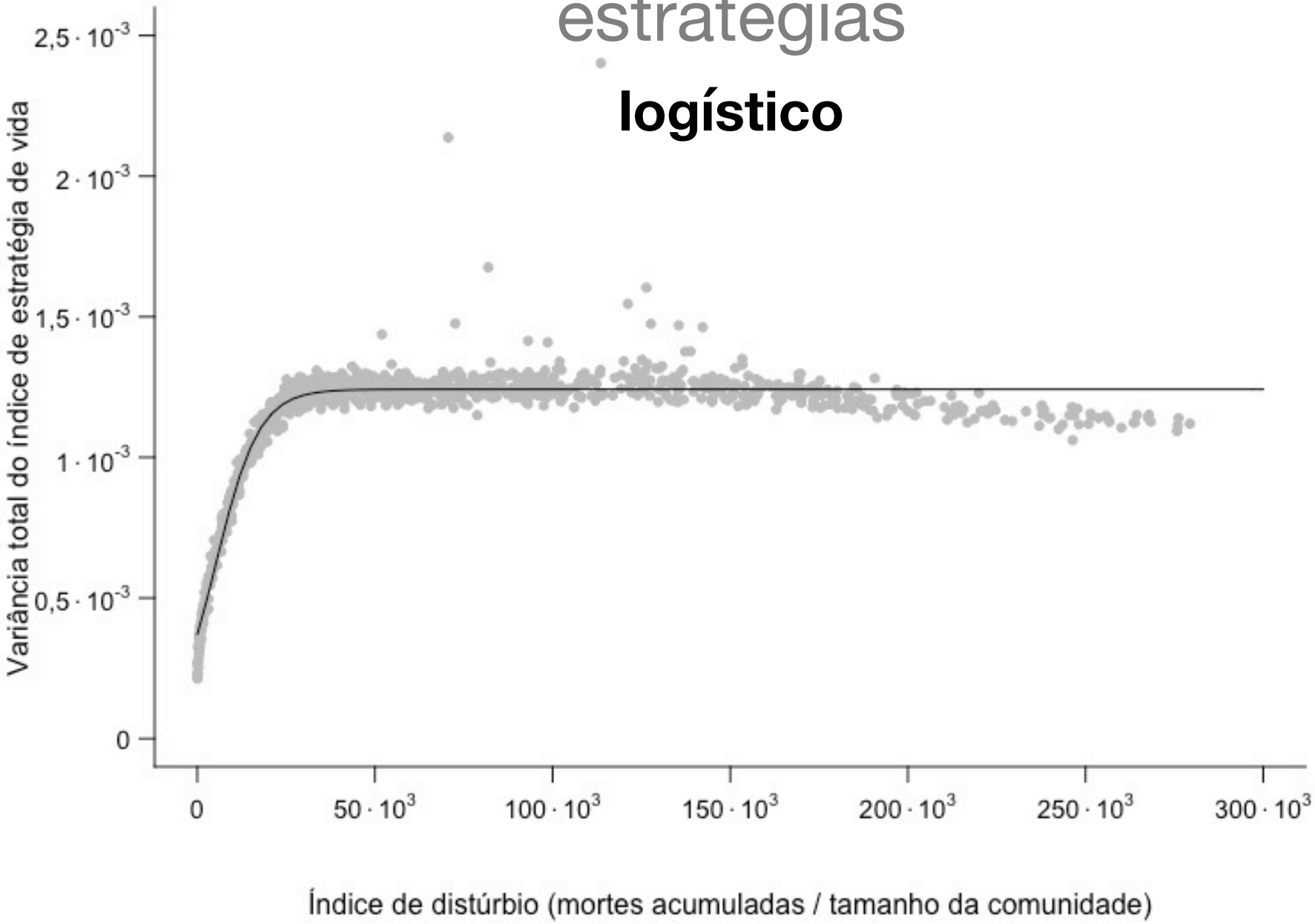
# diversidade de estratégias

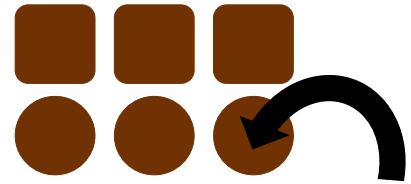


# diversidade de estratégias

**logístico**



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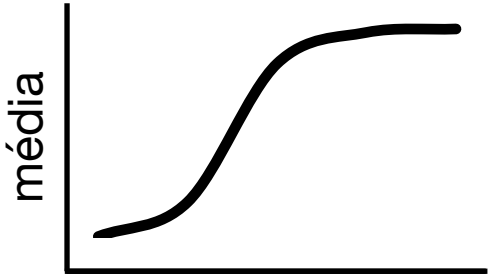
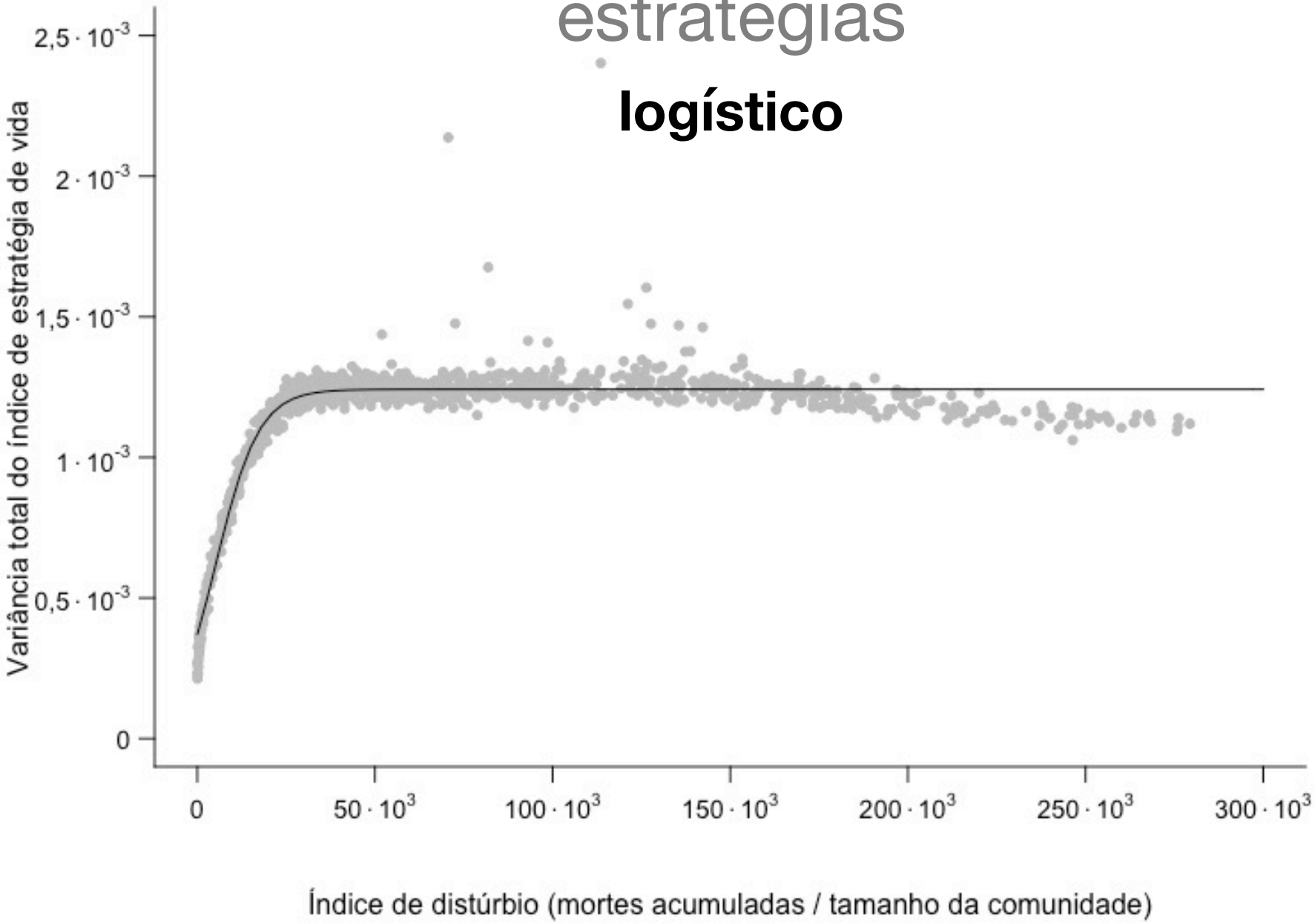
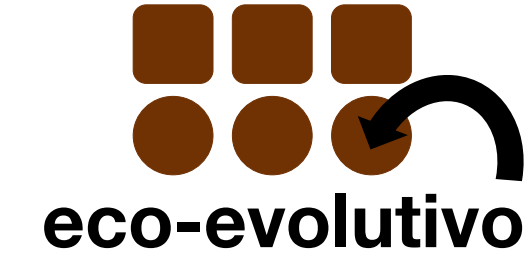
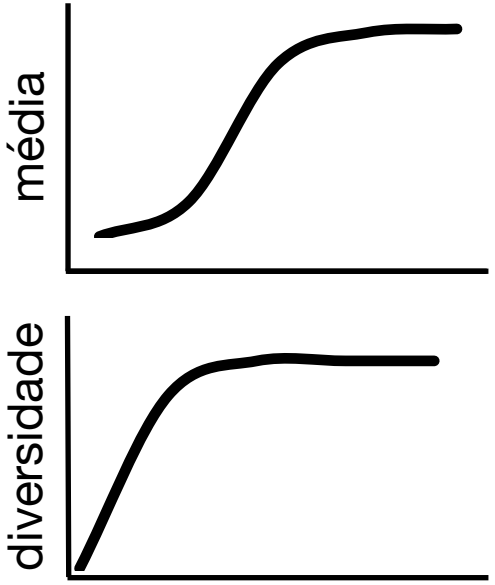


# diversidade de estratégias

## logístico

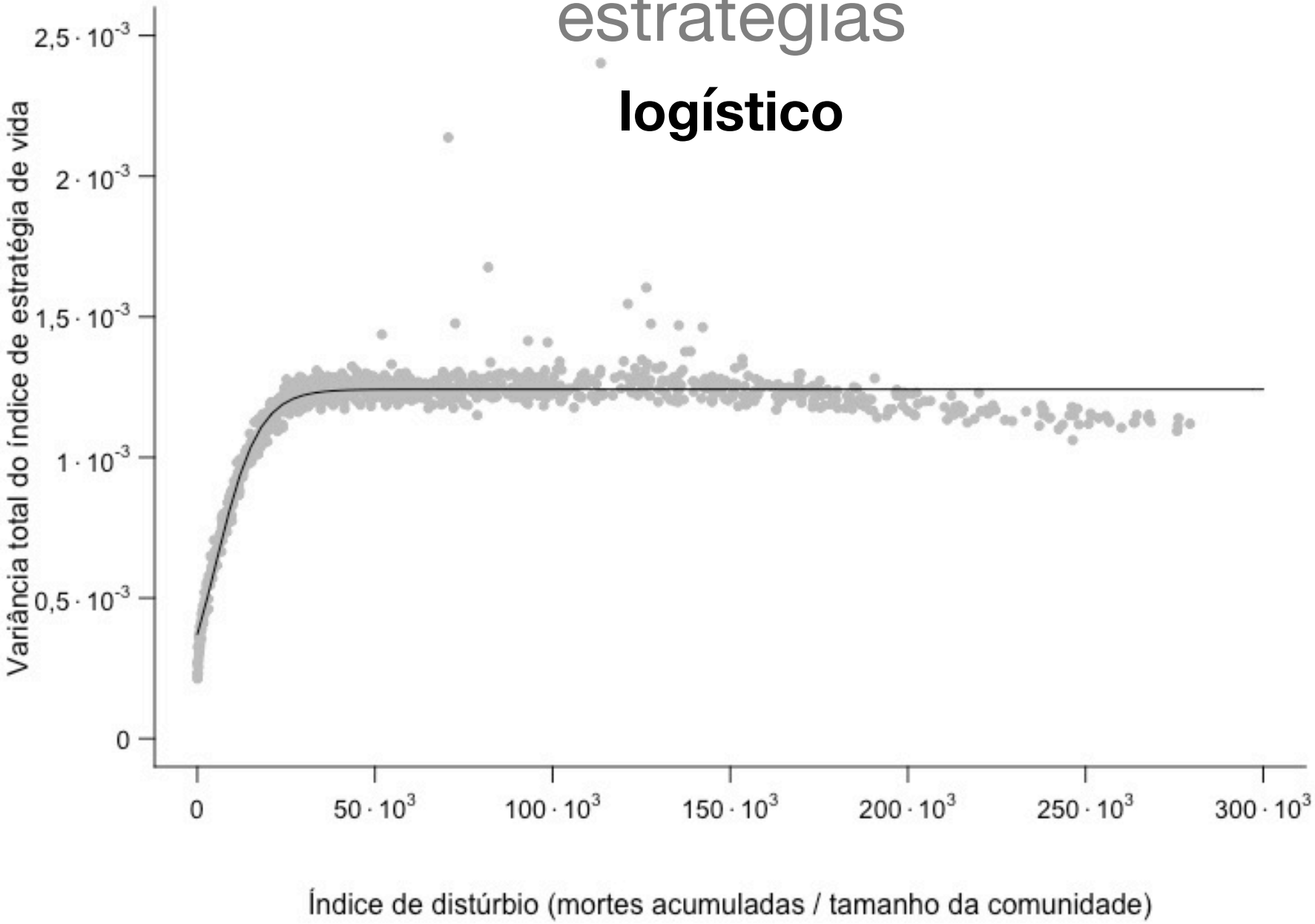


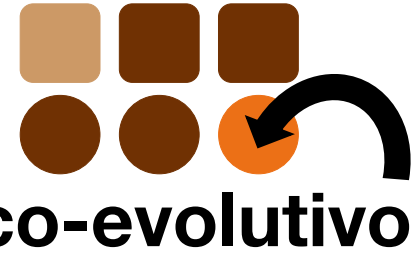



# diversidade de estratégias

## logístico



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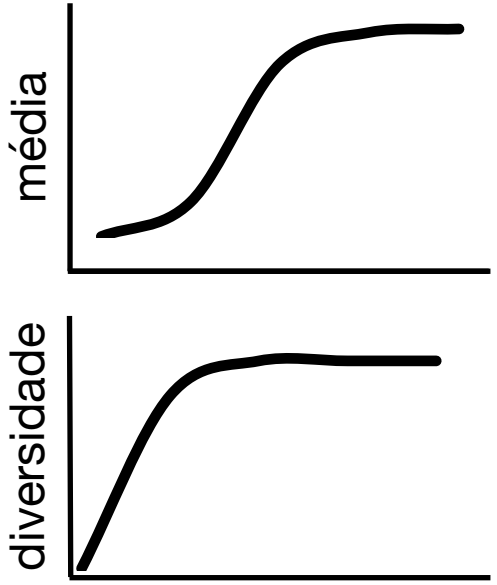
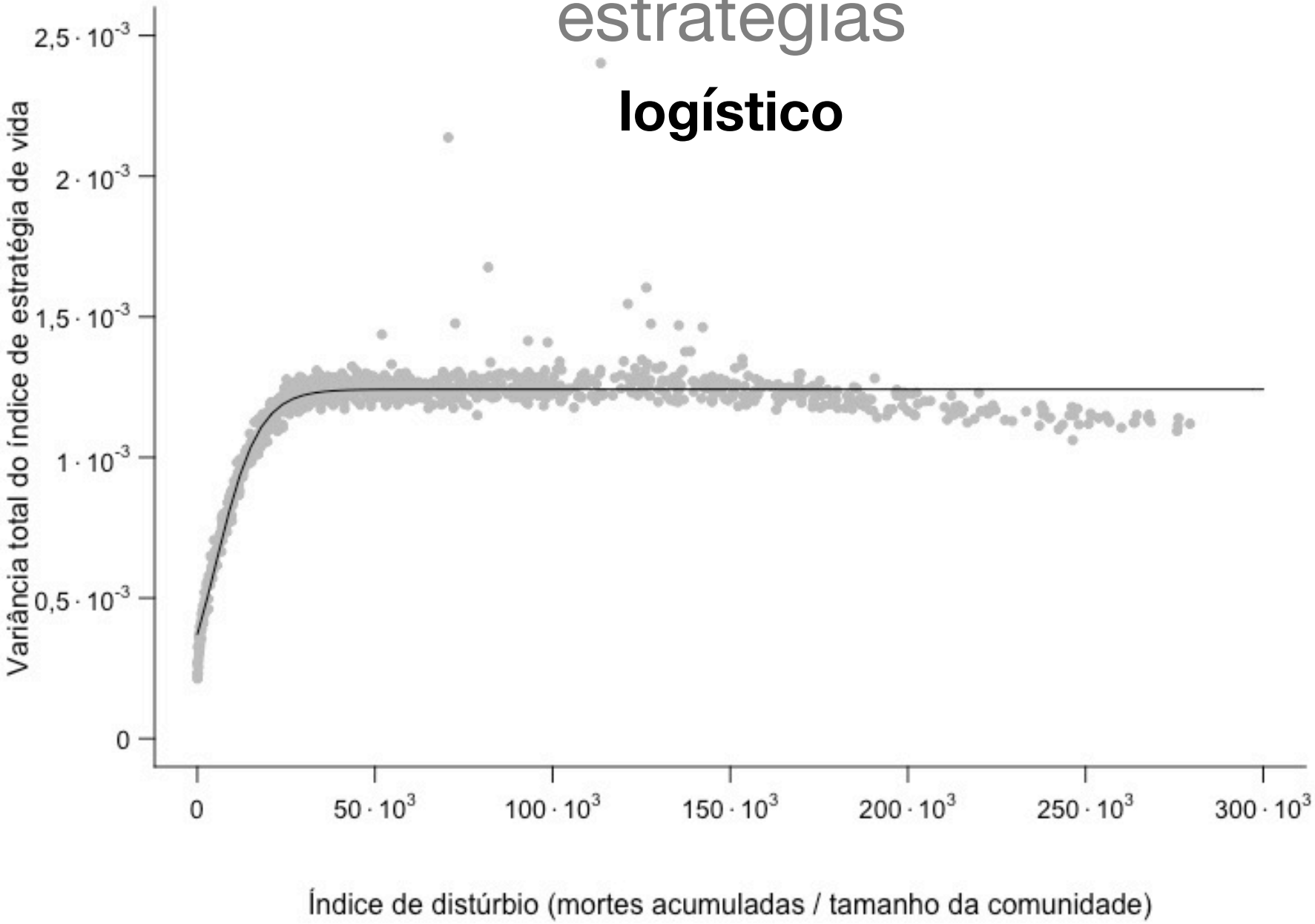
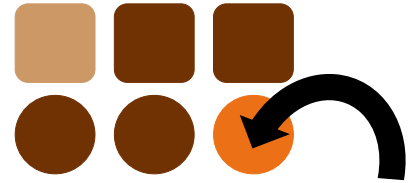


# diversidade de estratégias

## logístico



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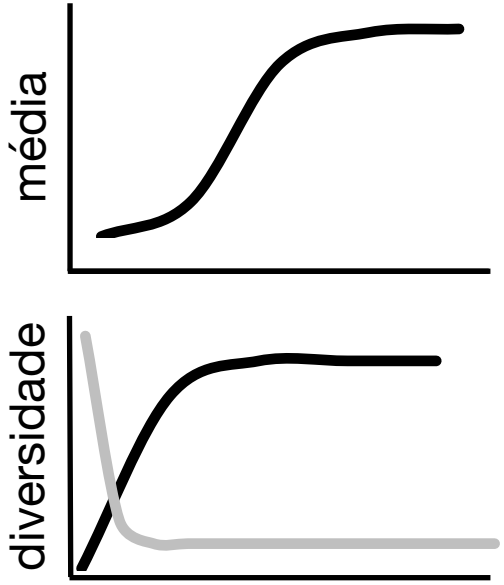
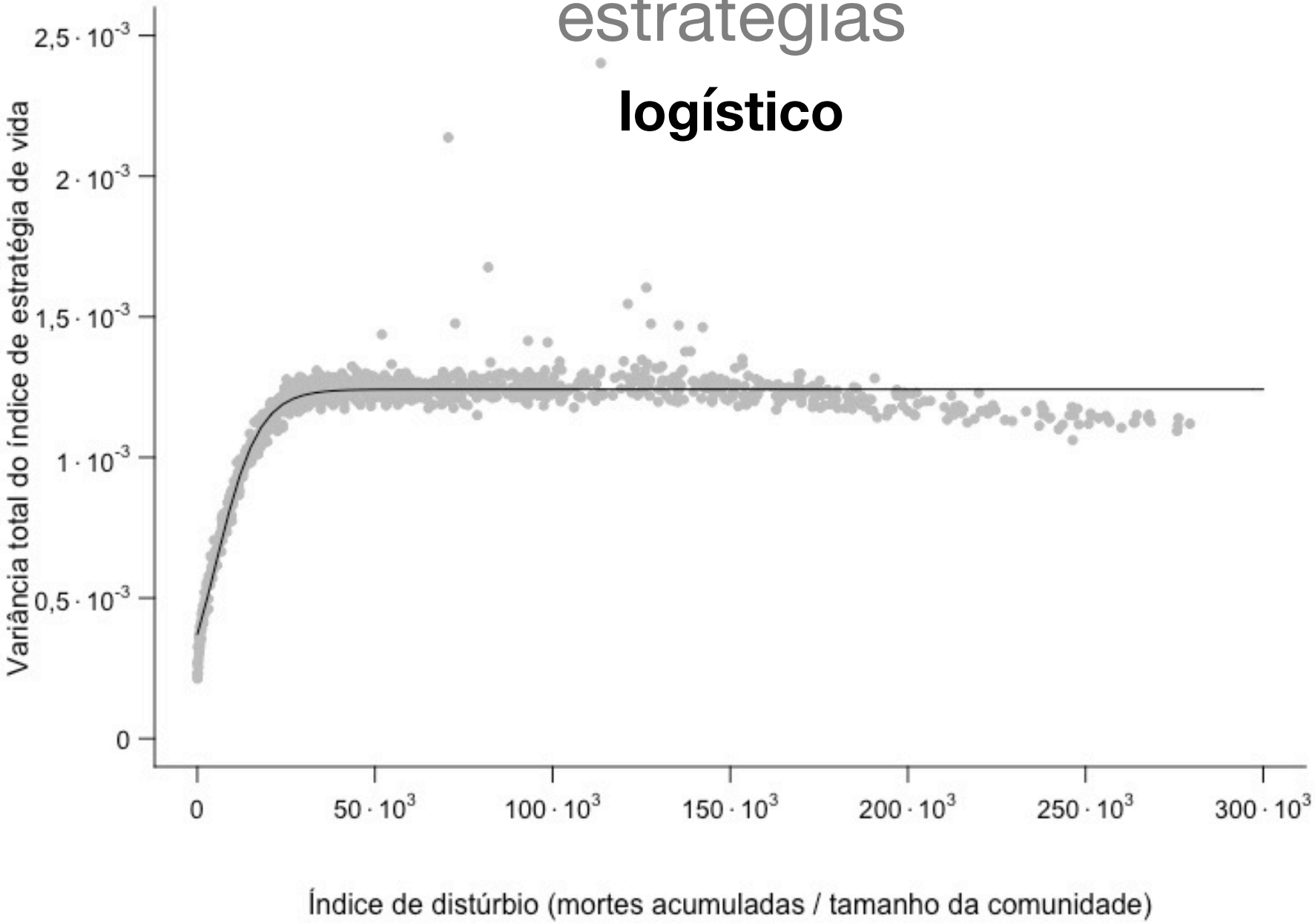
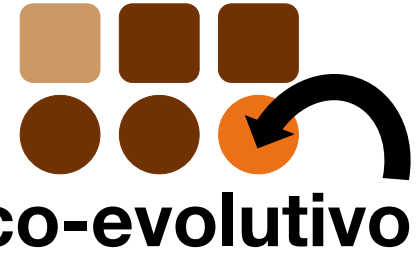


# diversidade de estratégias

## logístico



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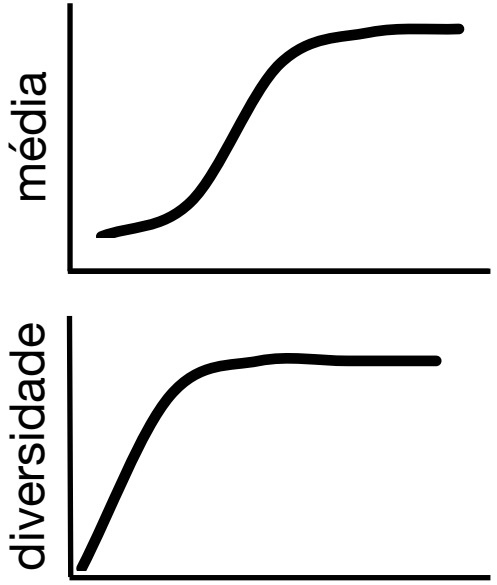

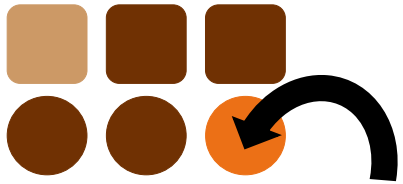

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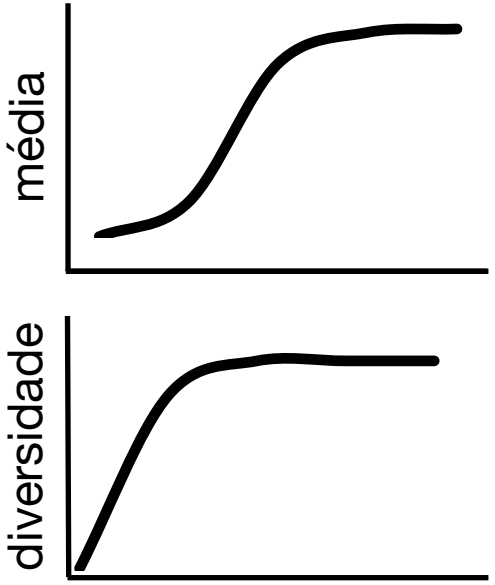


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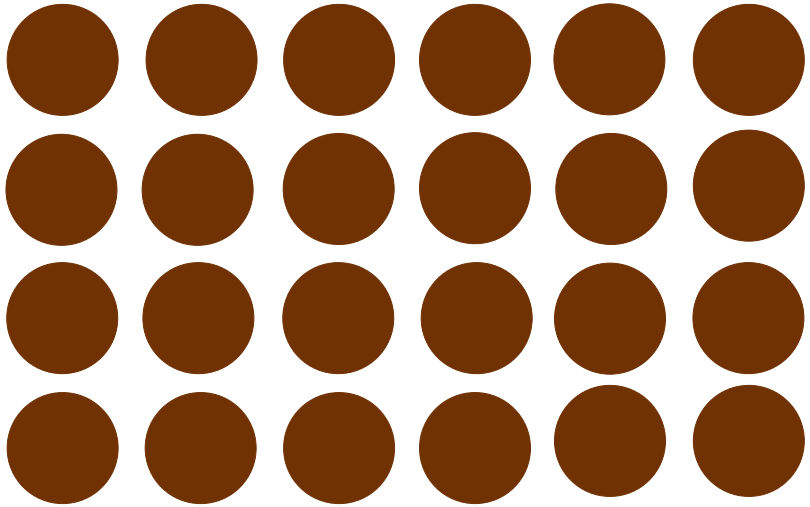
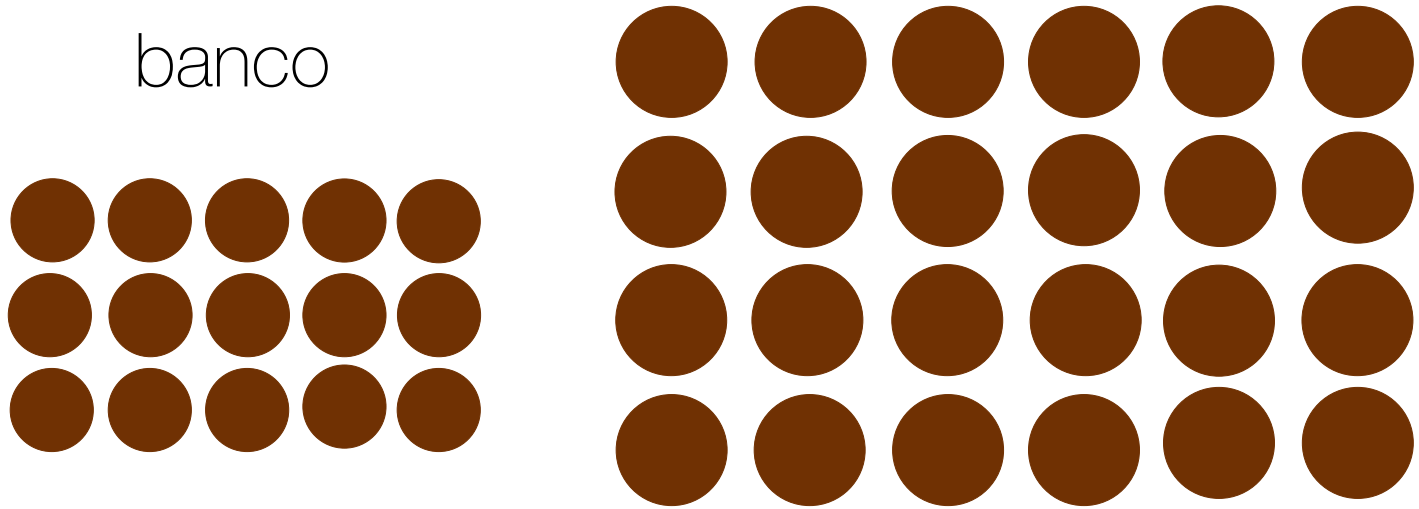
x 192

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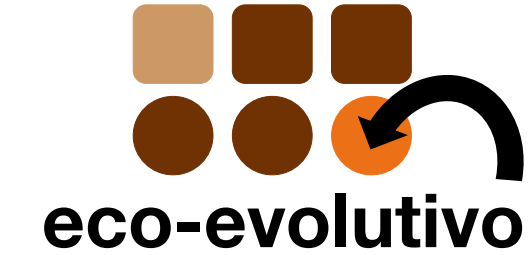
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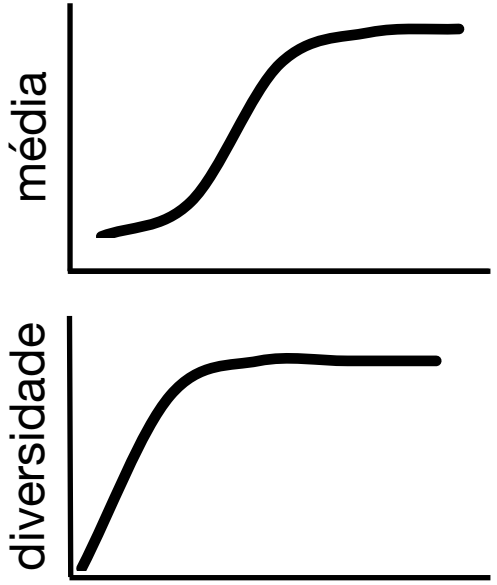
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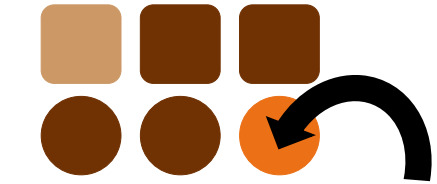

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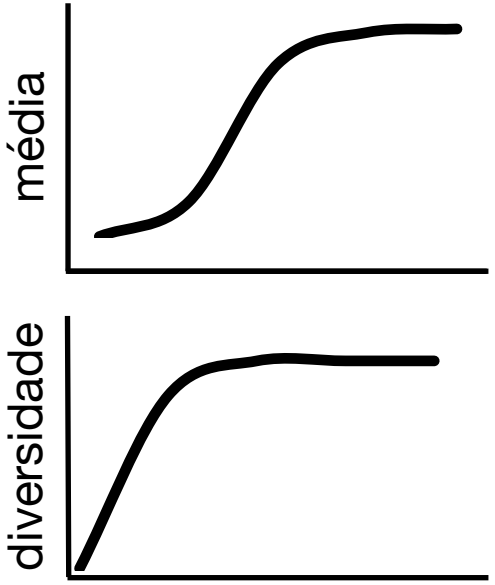


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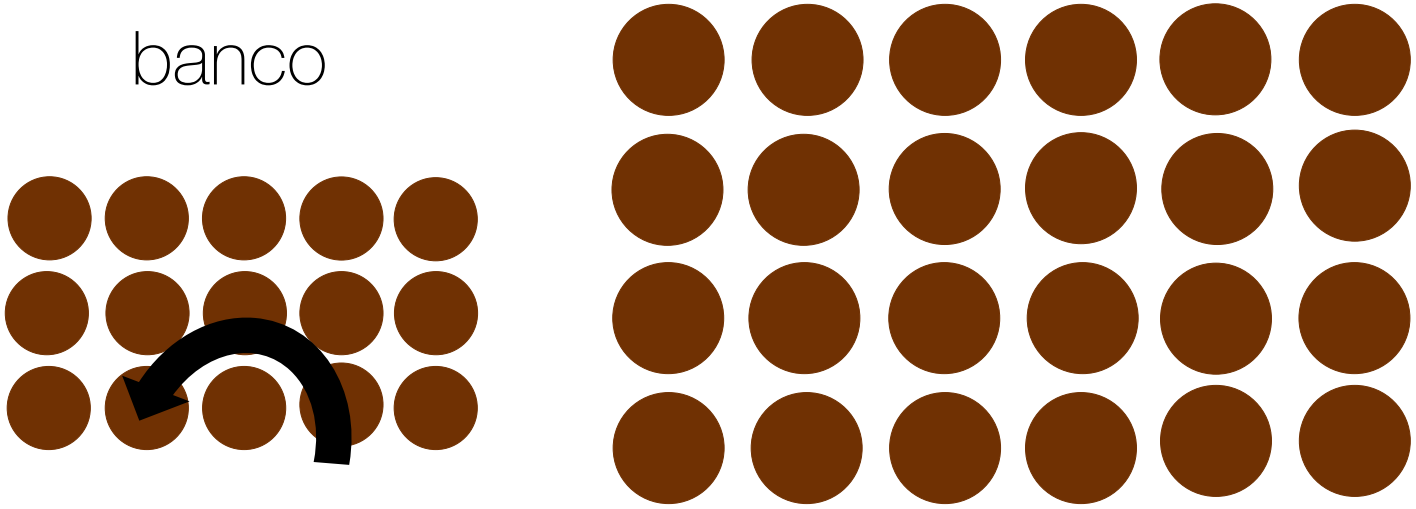

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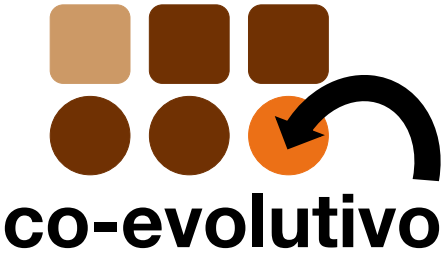


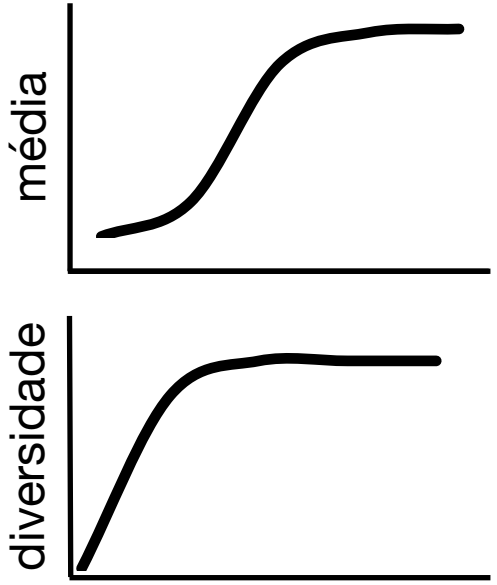


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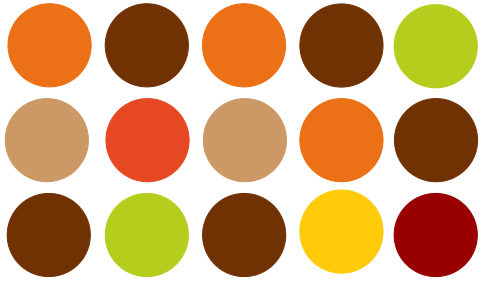

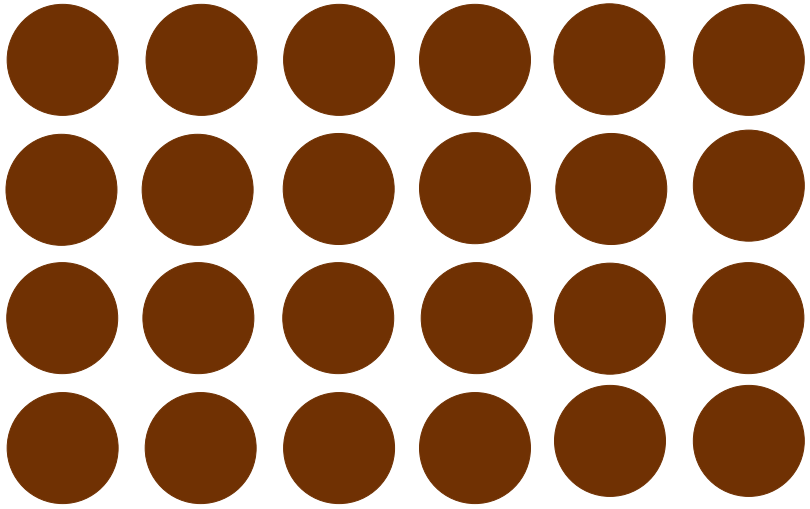

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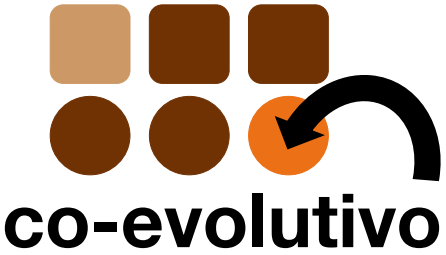


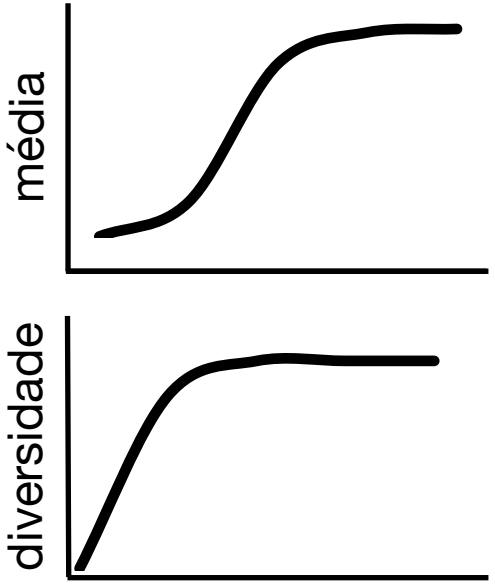


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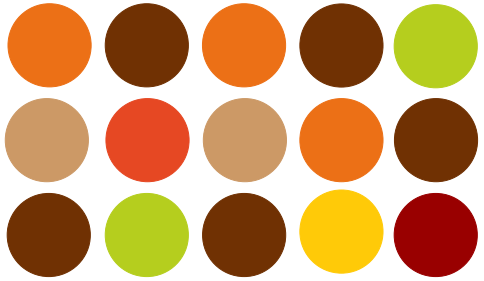

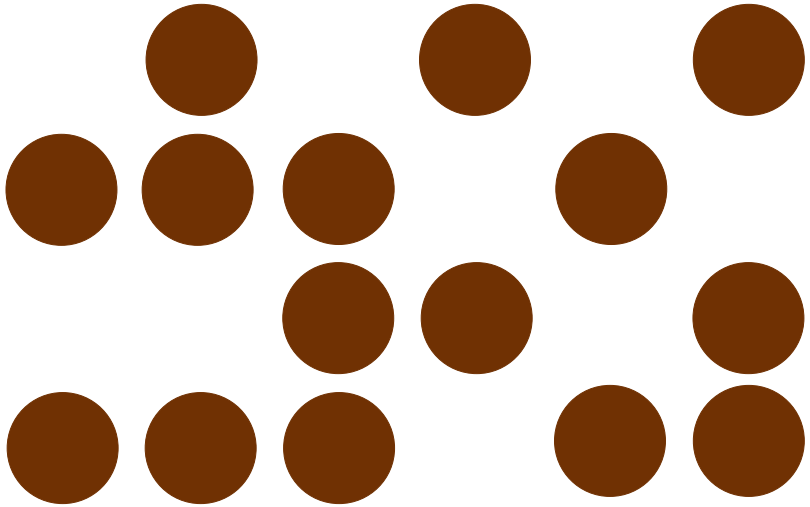

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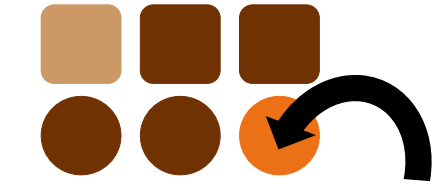

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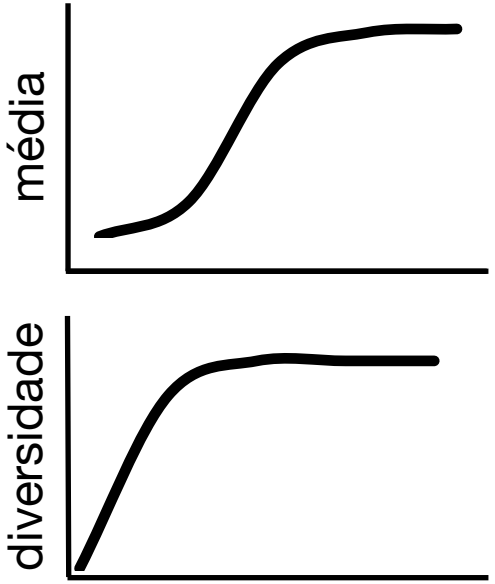


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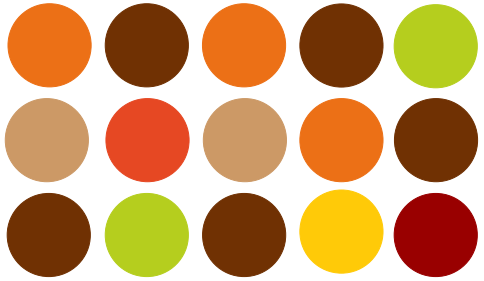

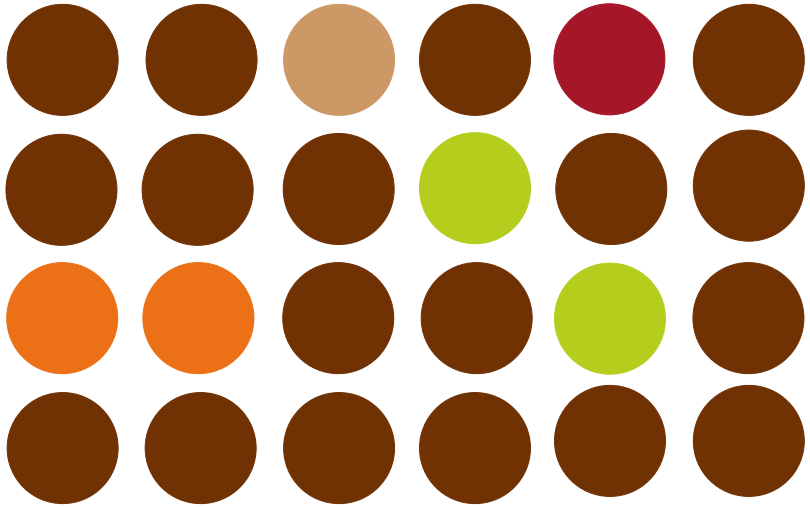

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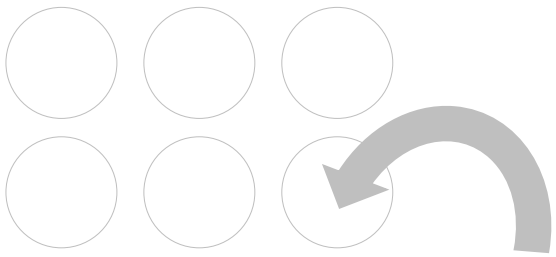
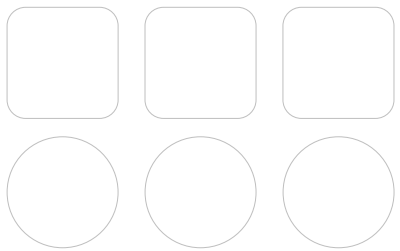
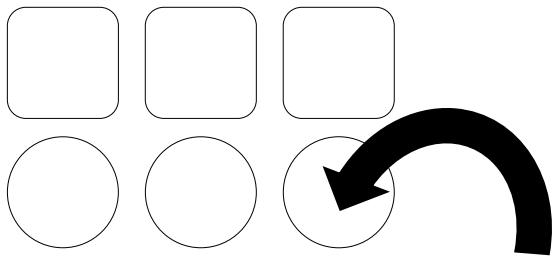
|  |  |  |
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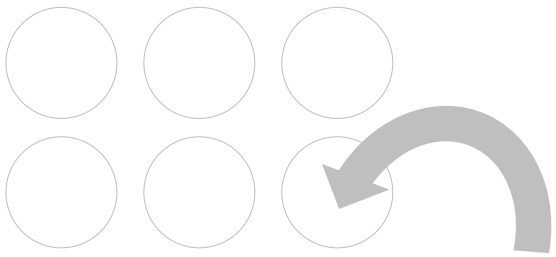
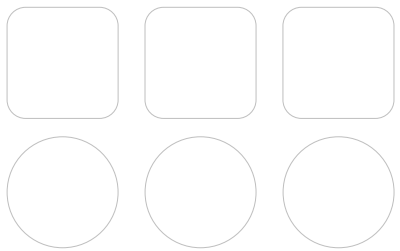
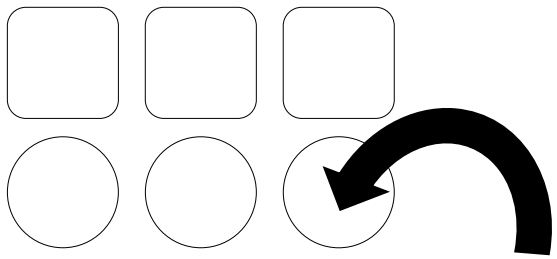
|  |  |  |
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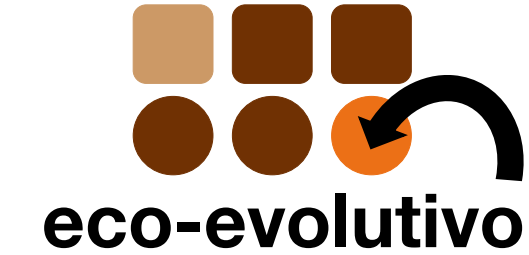
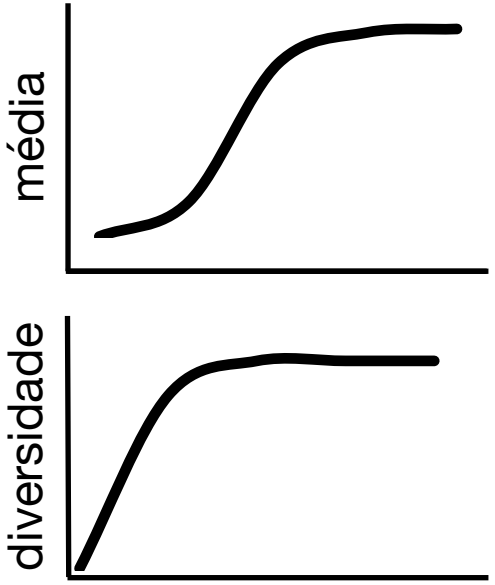
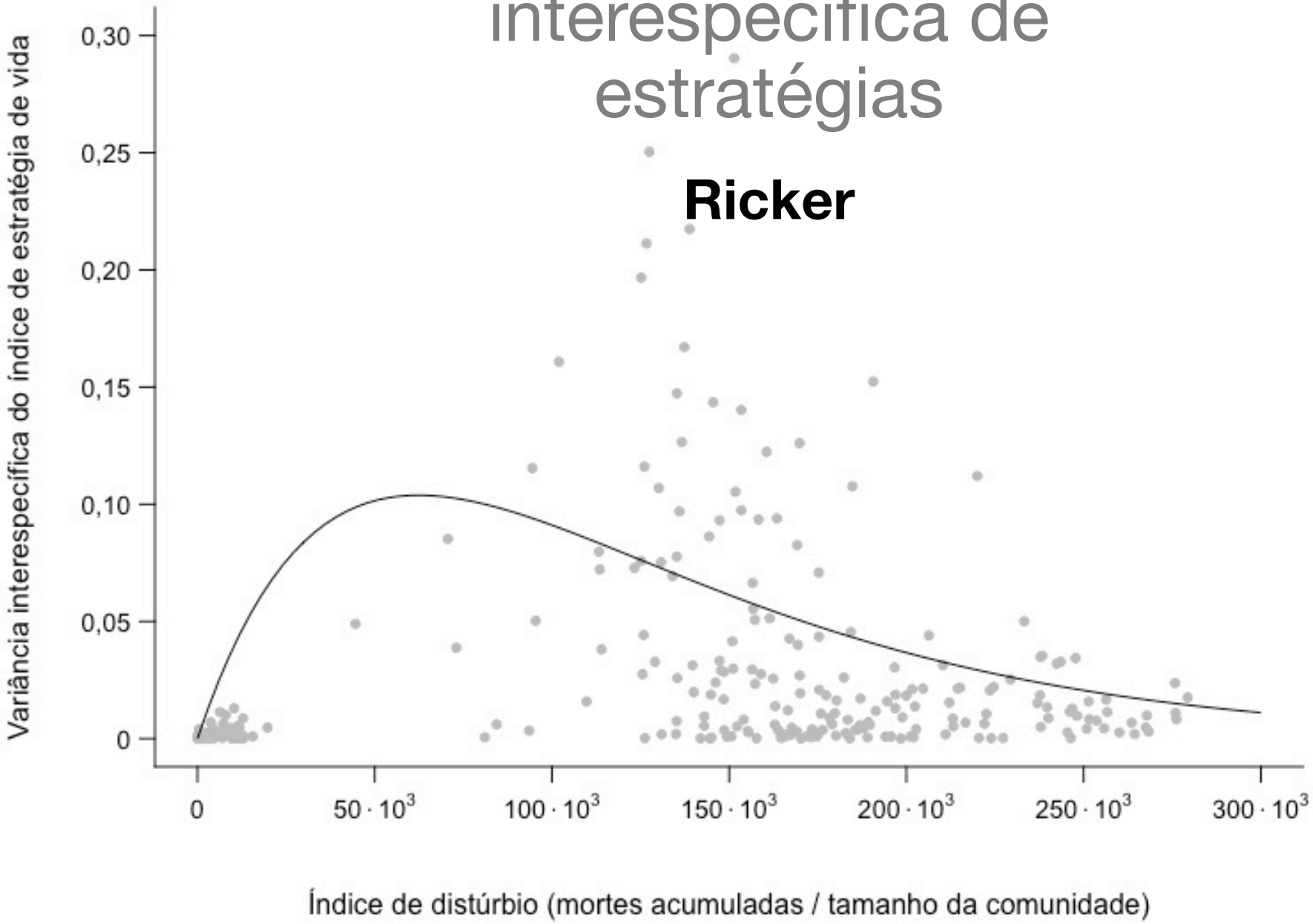
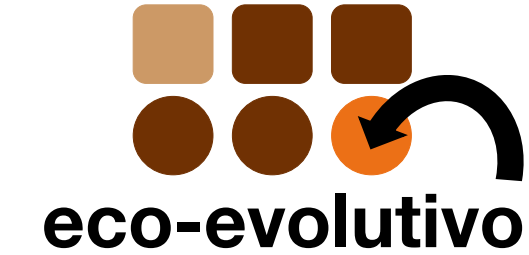
# heterogeneidade interespecífica de estratégias

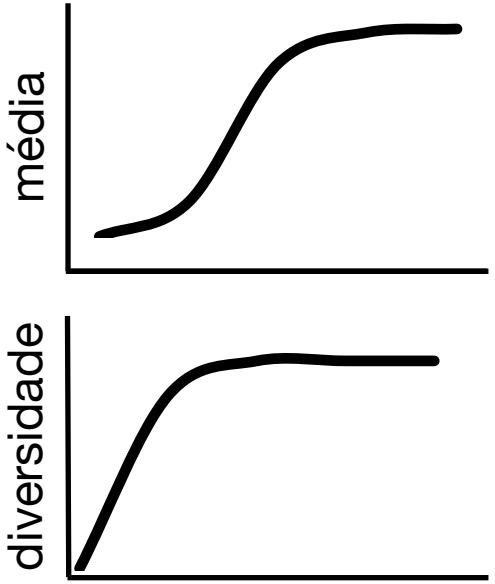


# heterogeneidade interespecífica de estratégias



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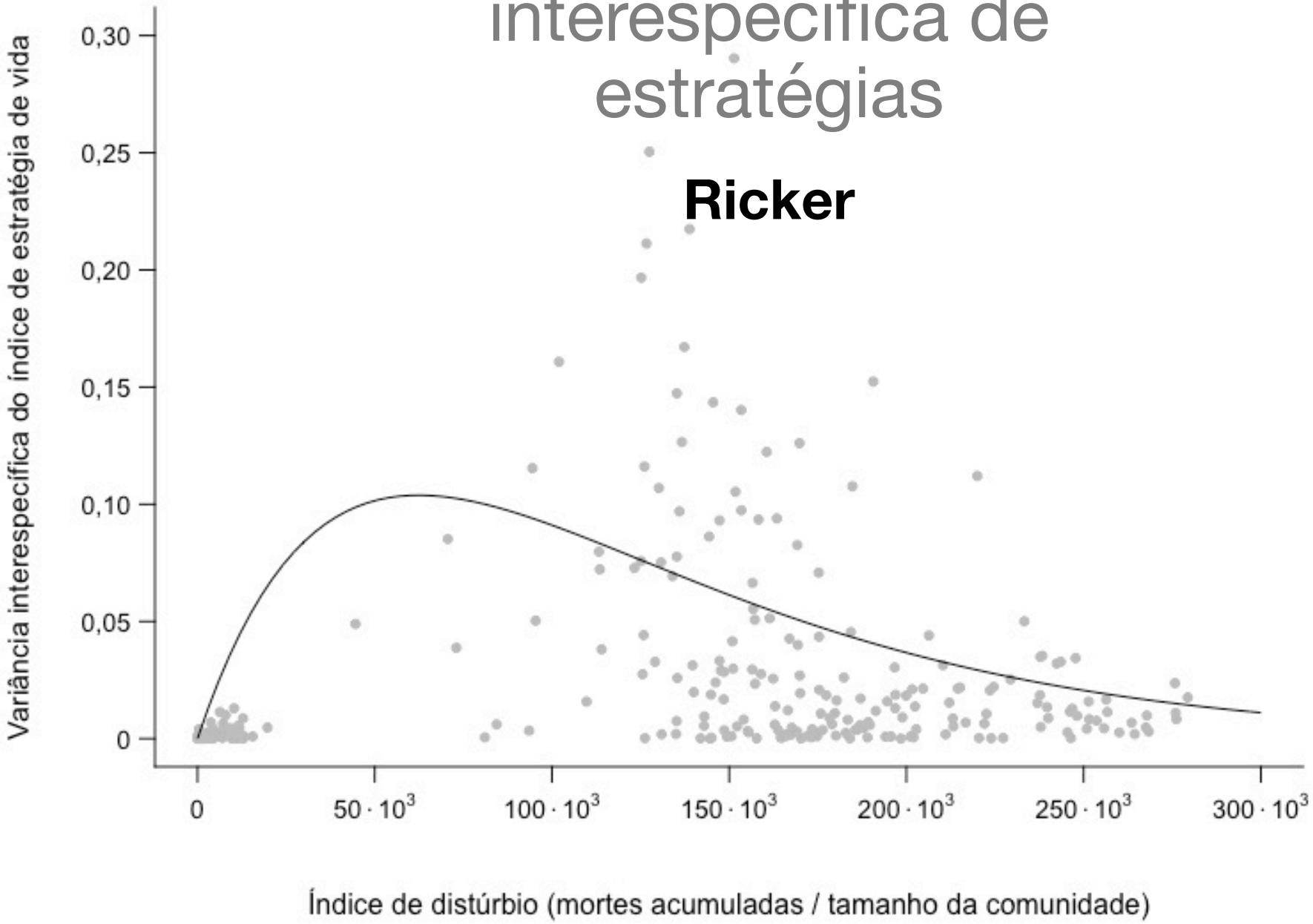


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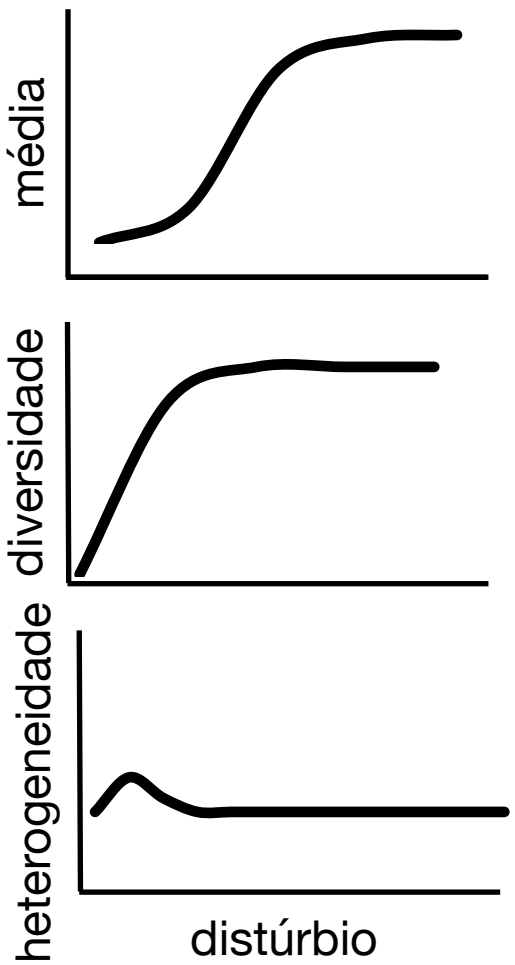

# heterogeneidade interespecífica de estratégias

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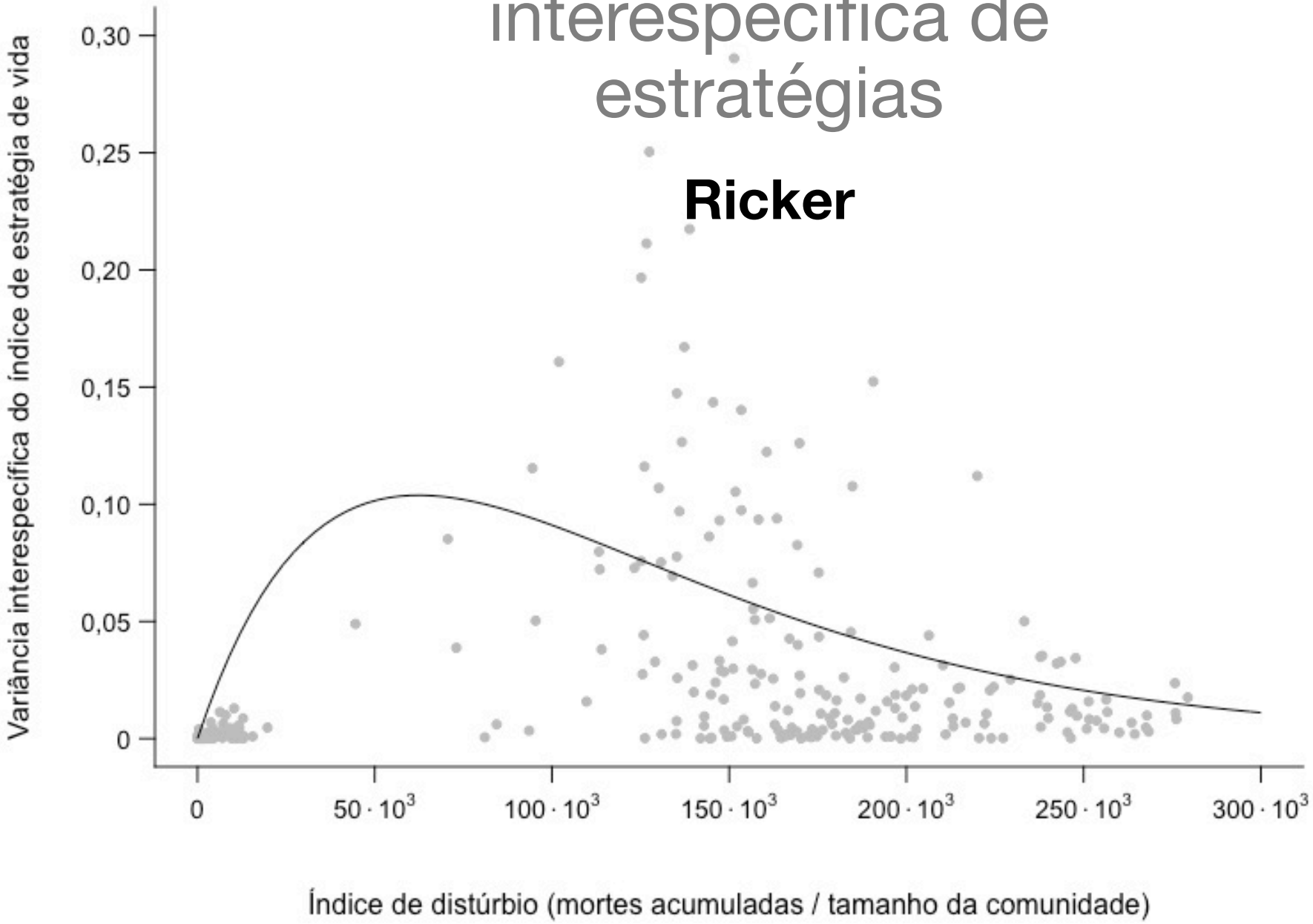


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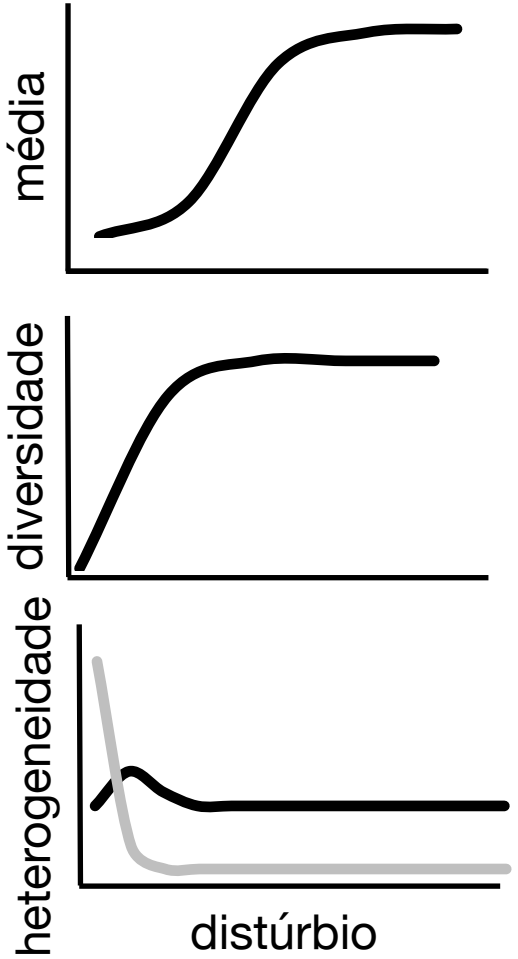

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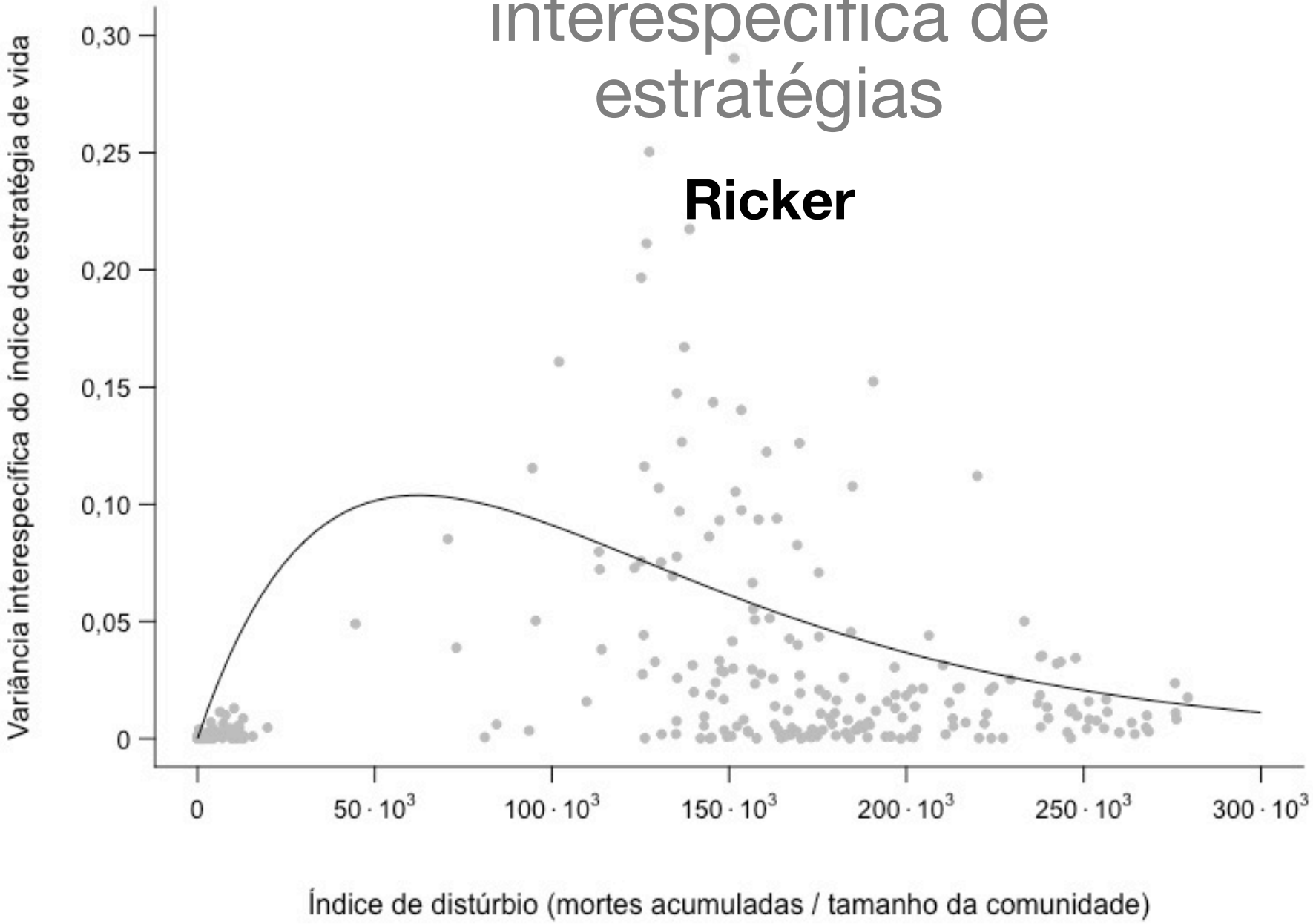


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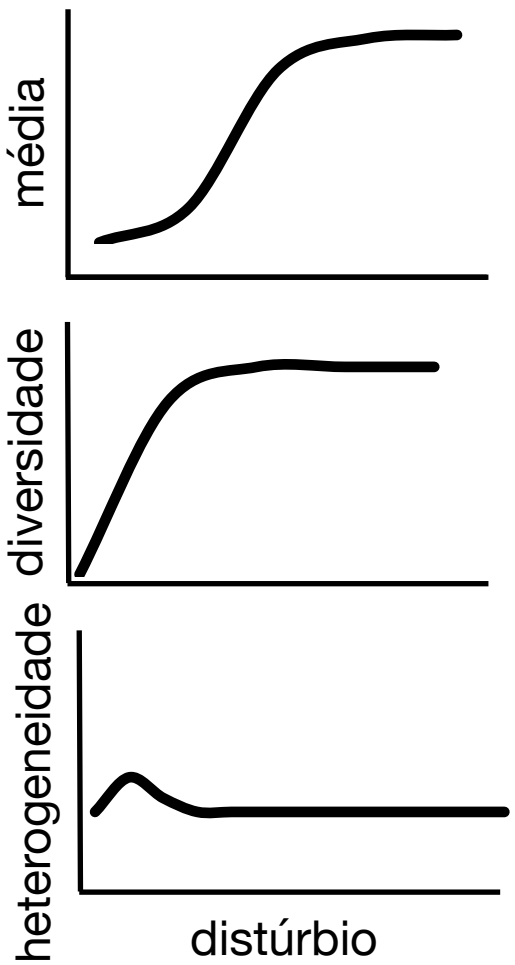

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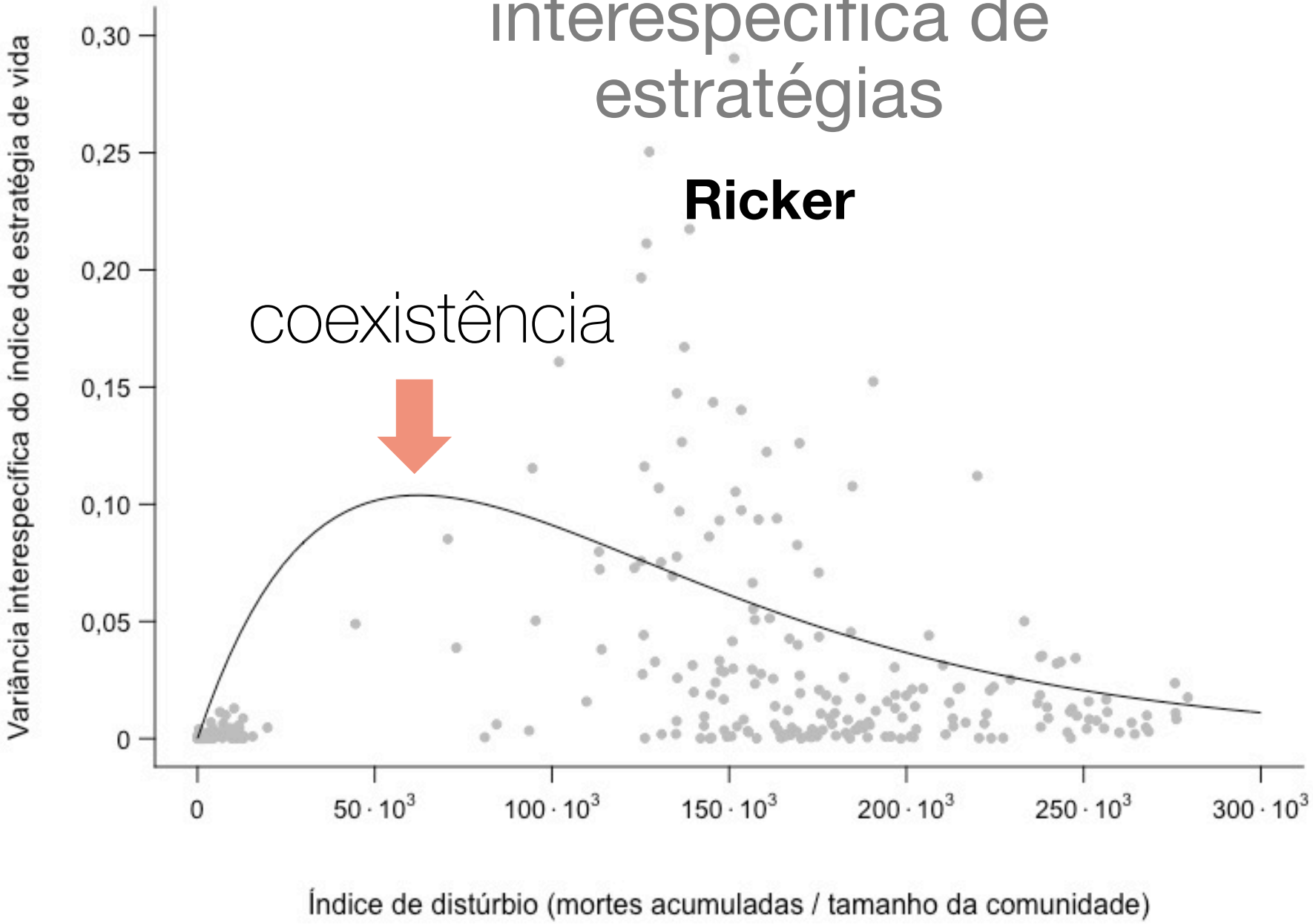


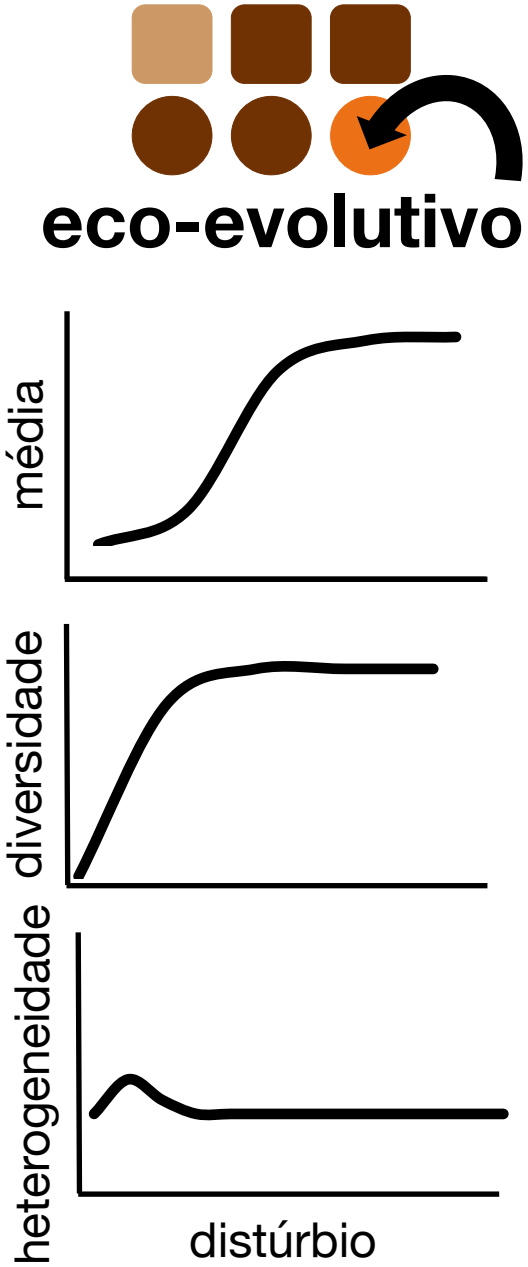

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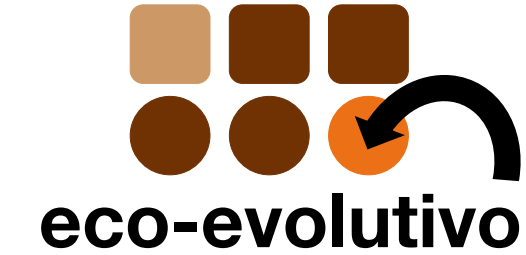


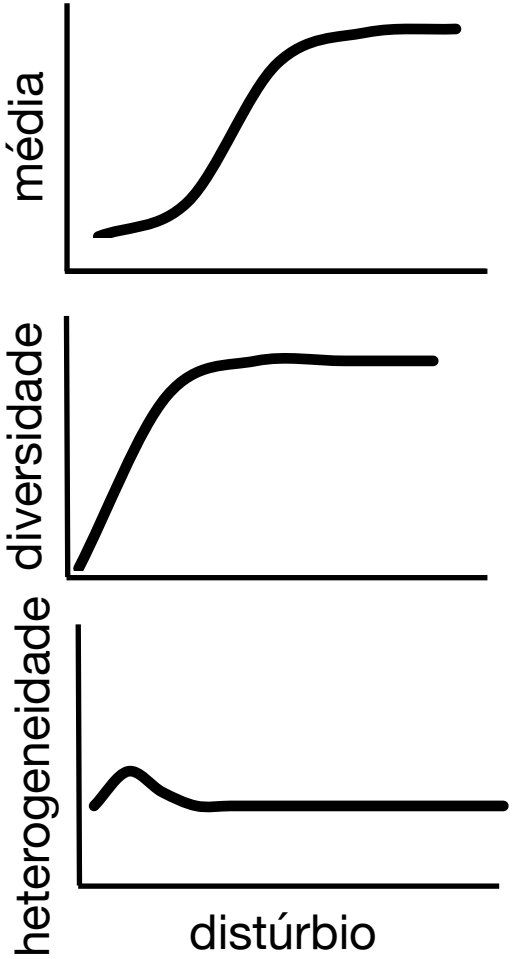

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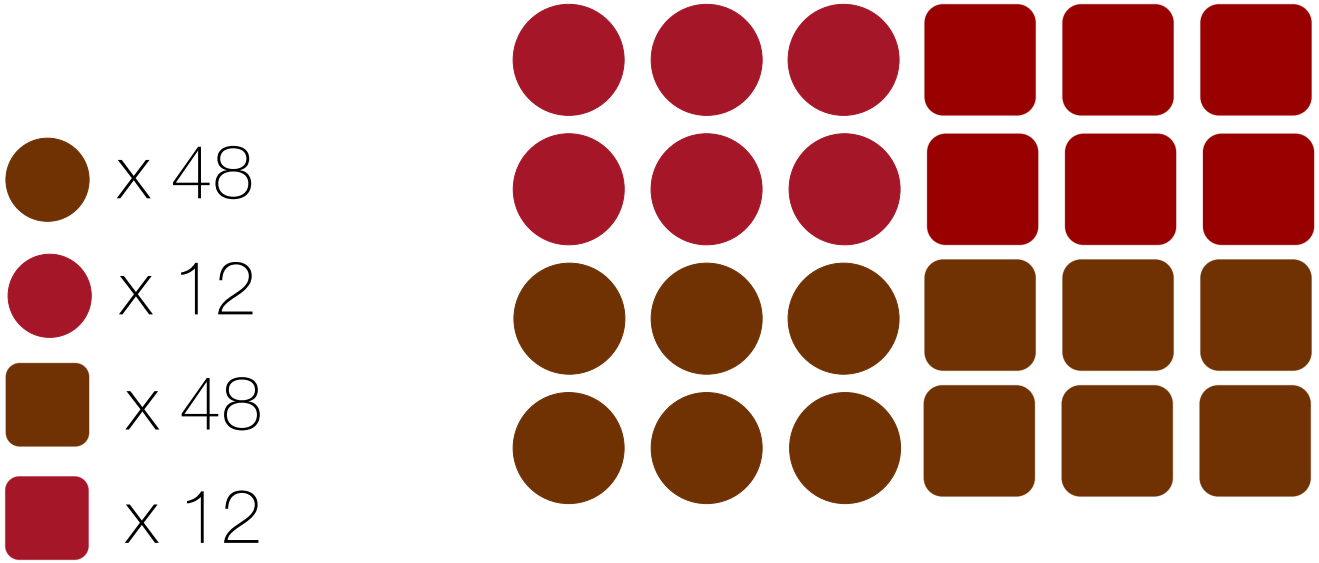


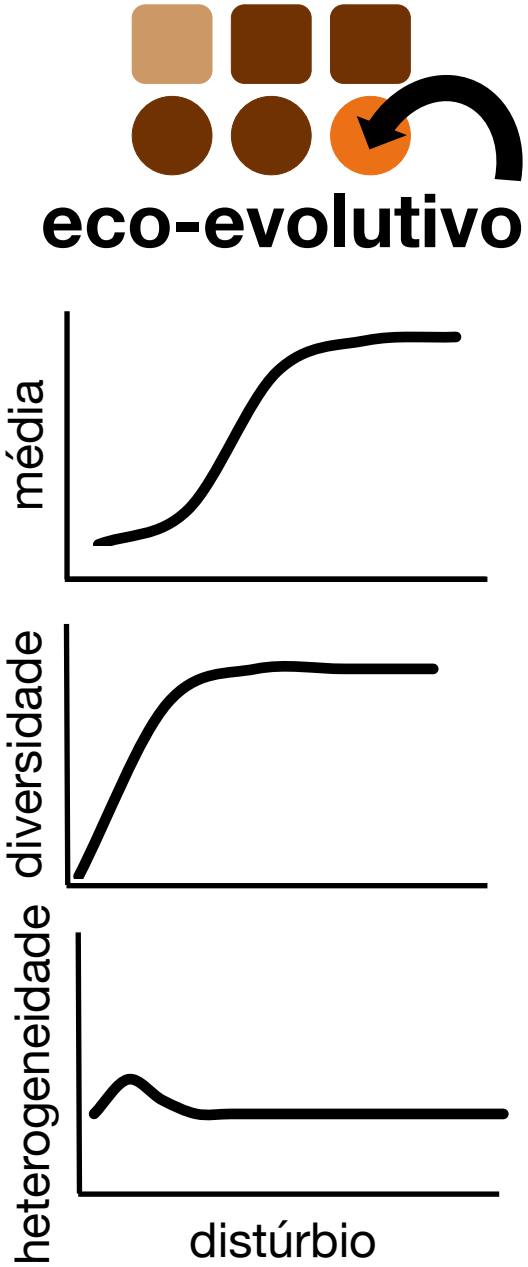

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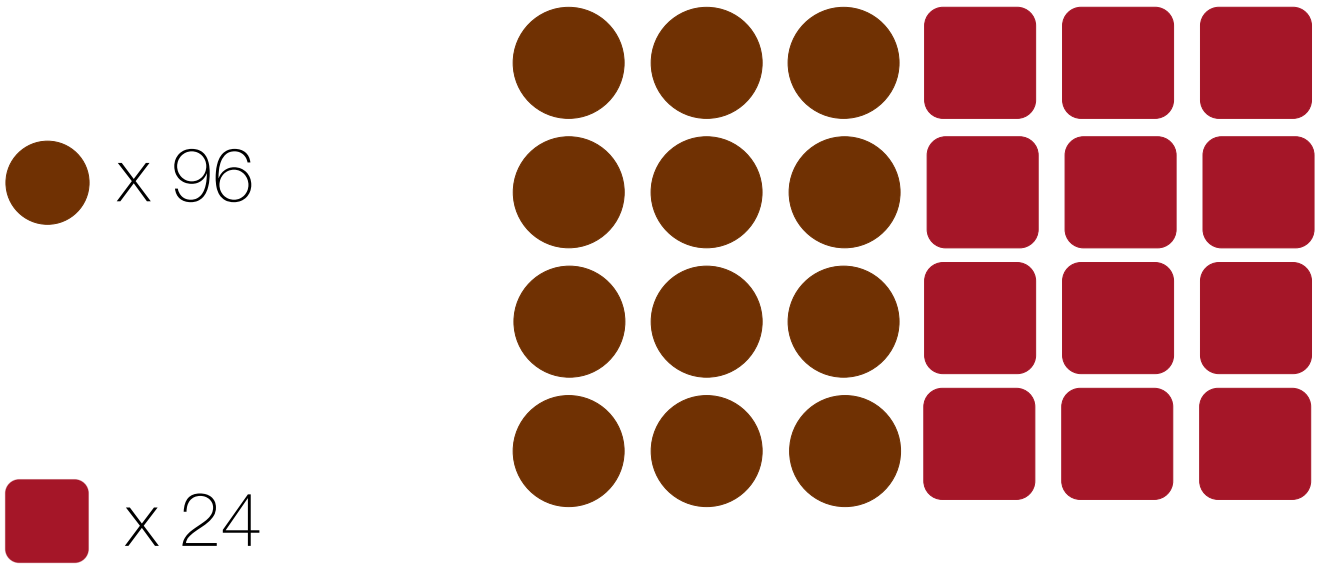


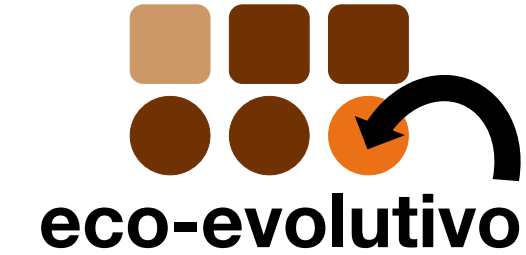


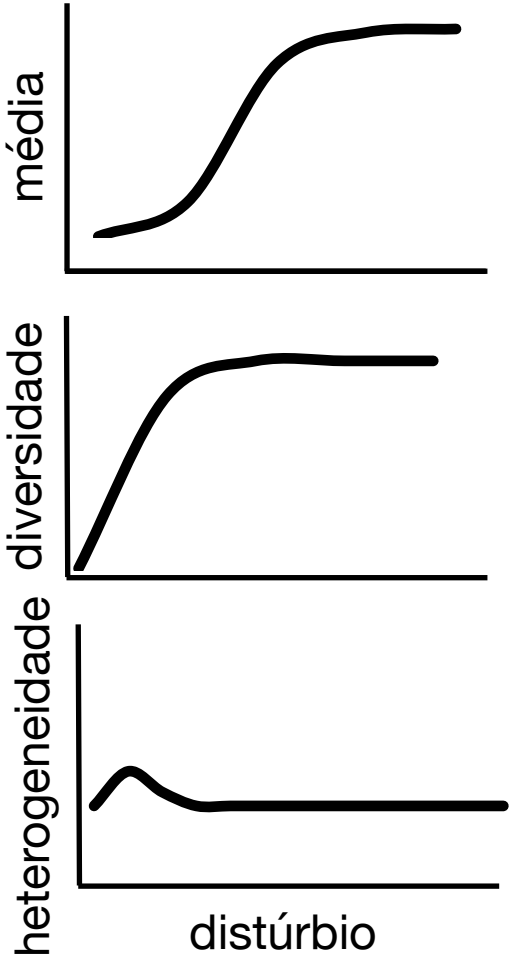

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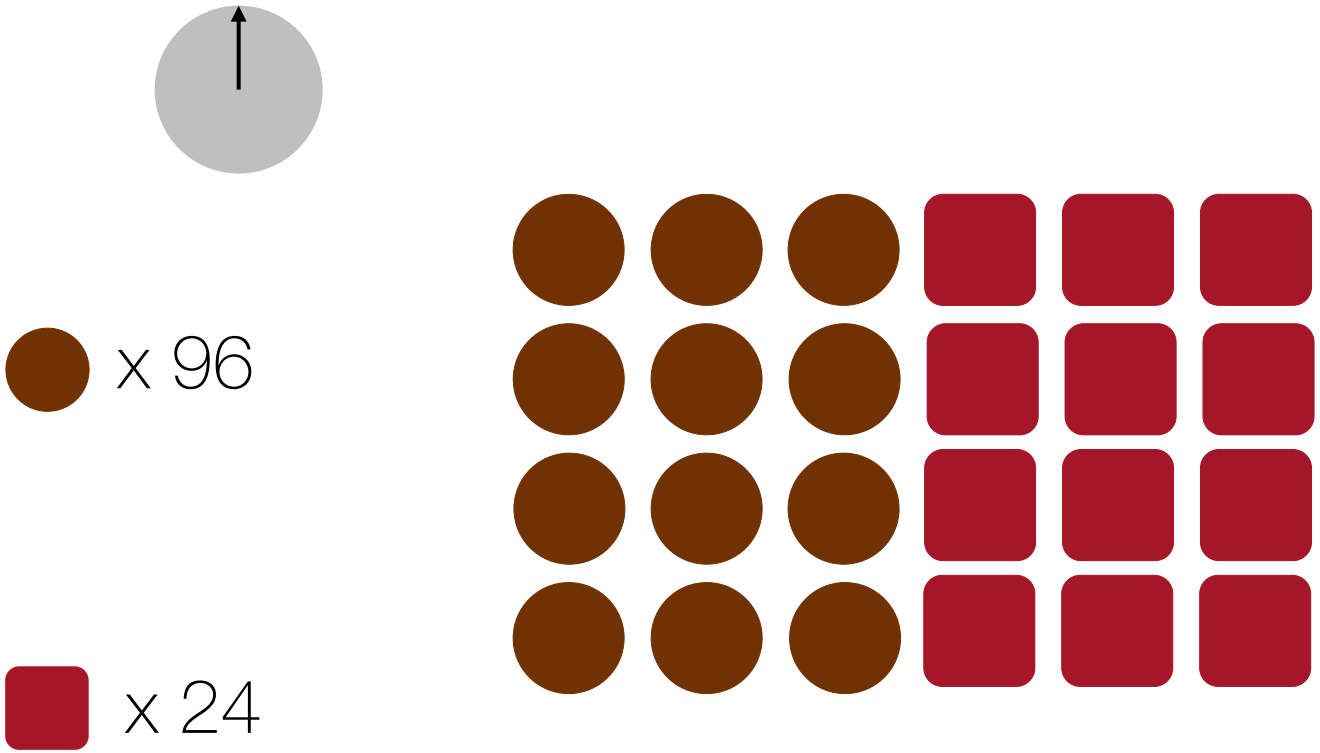


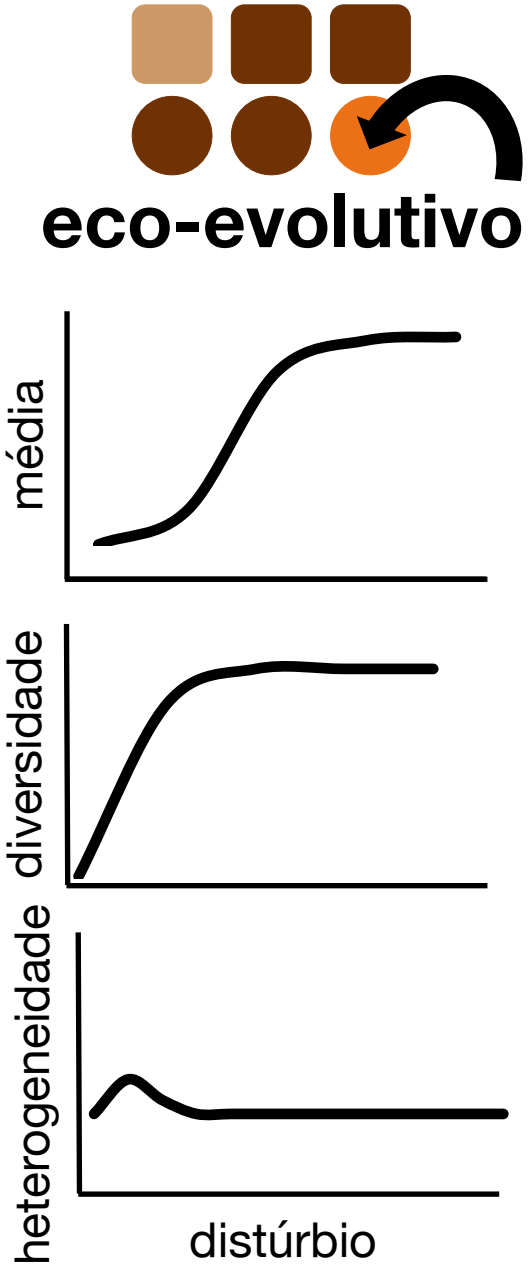

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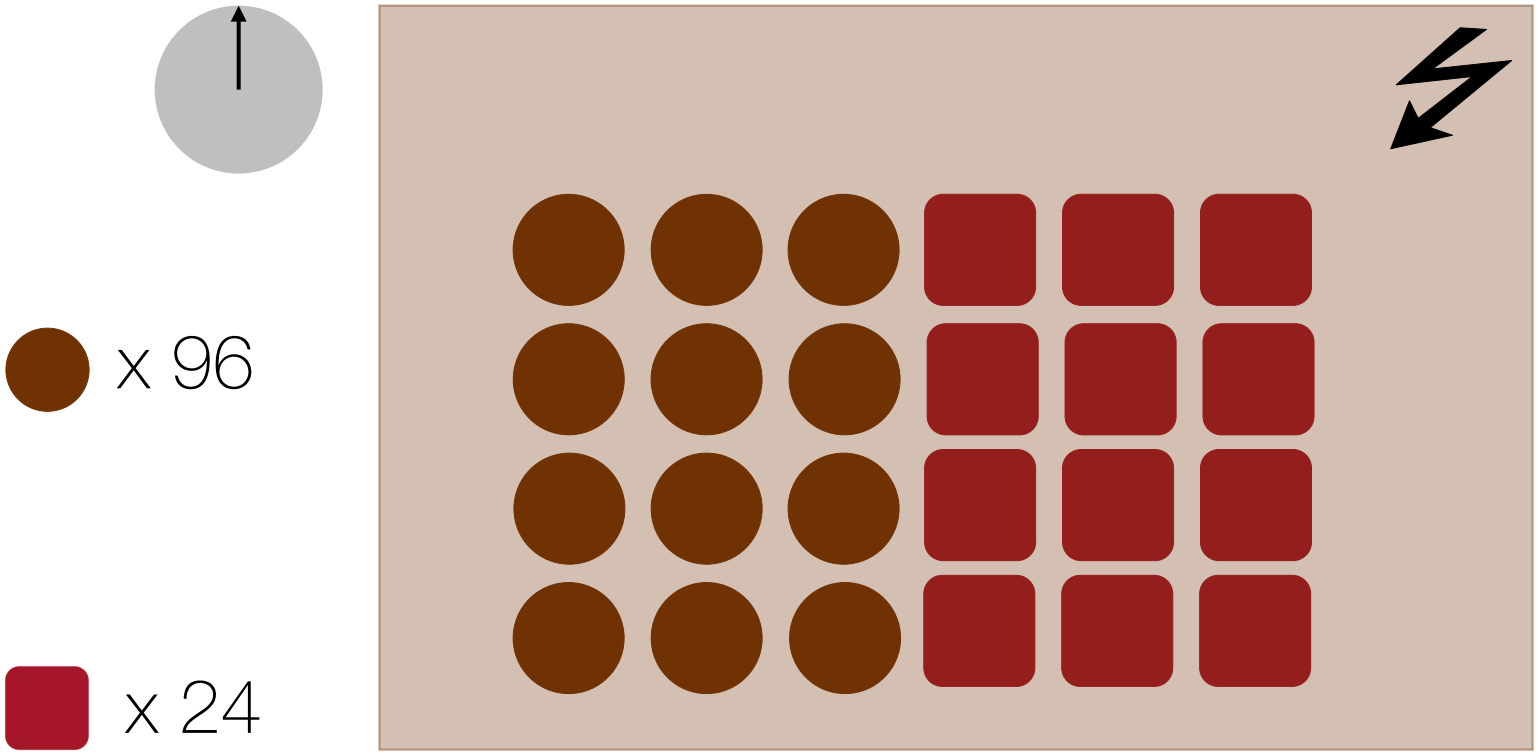


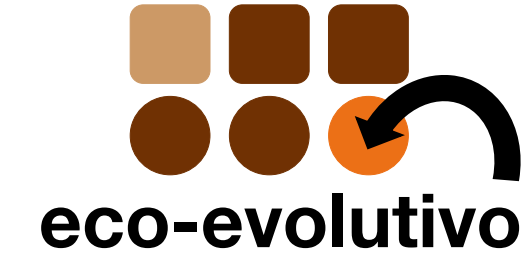


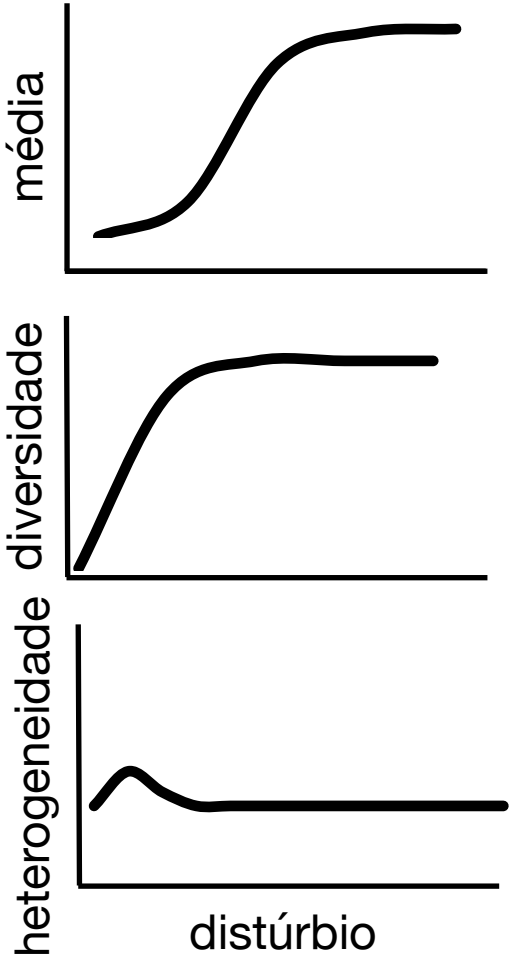

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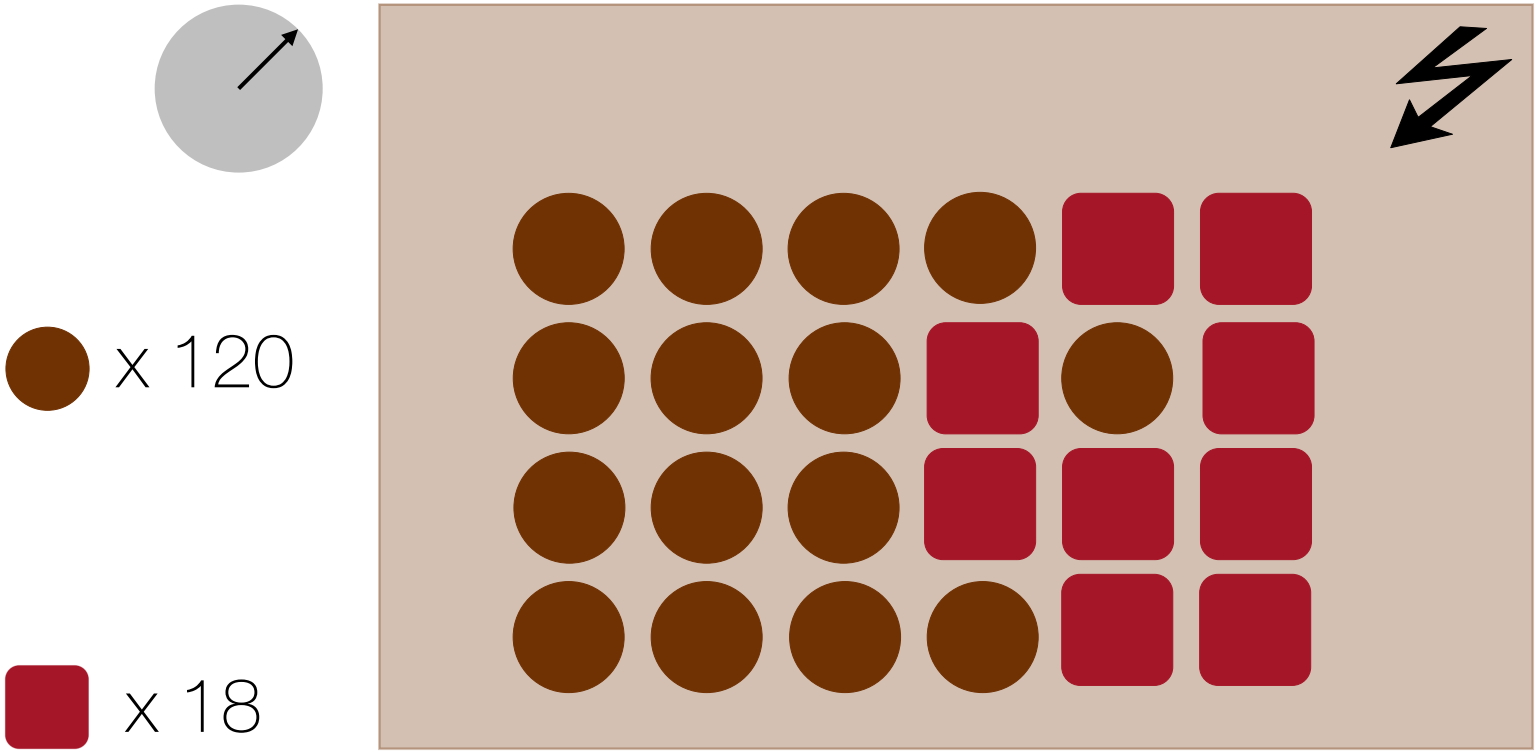


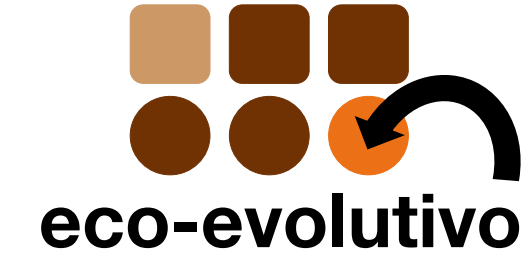


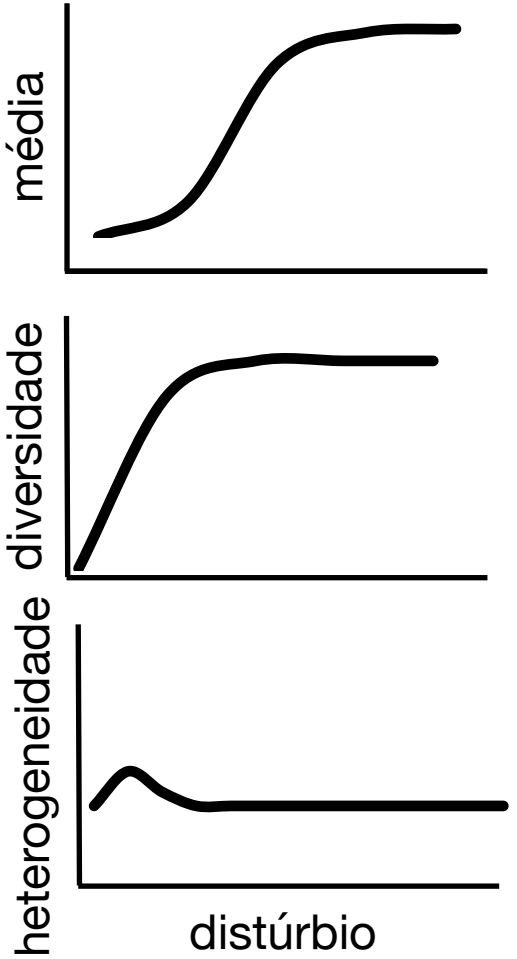

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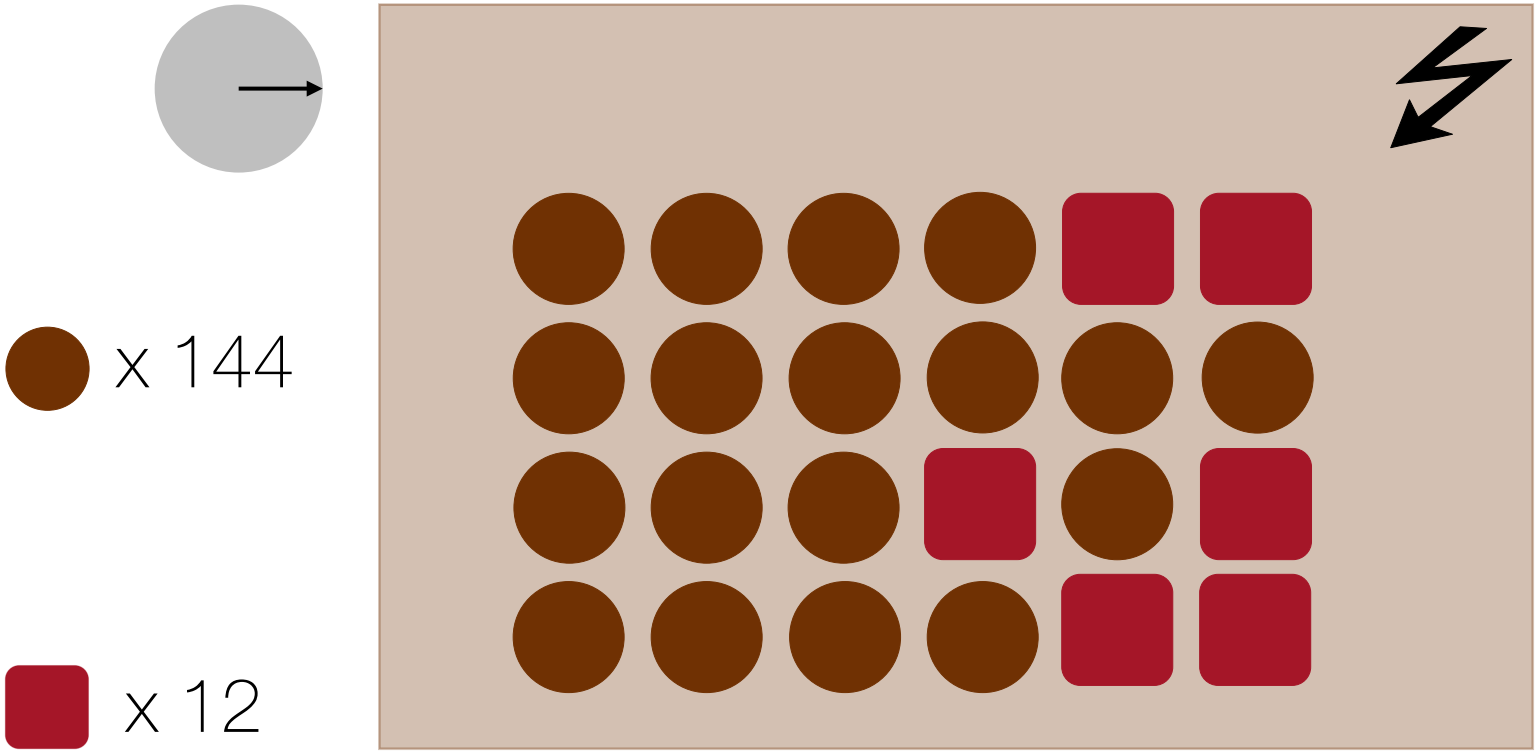


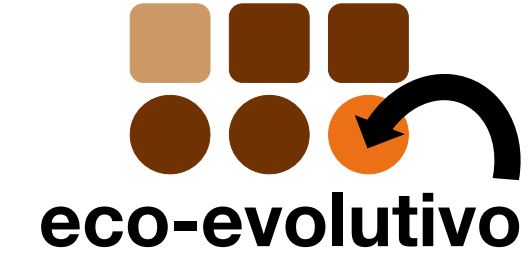


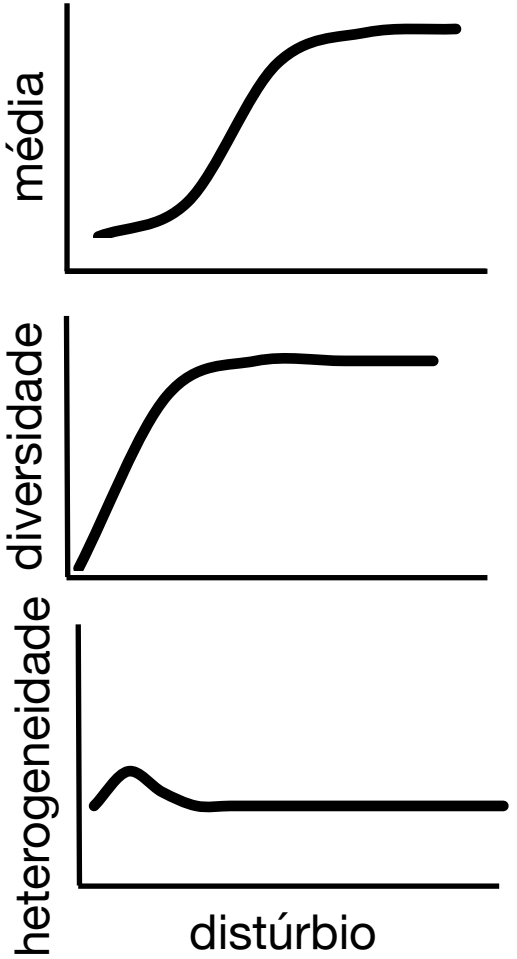

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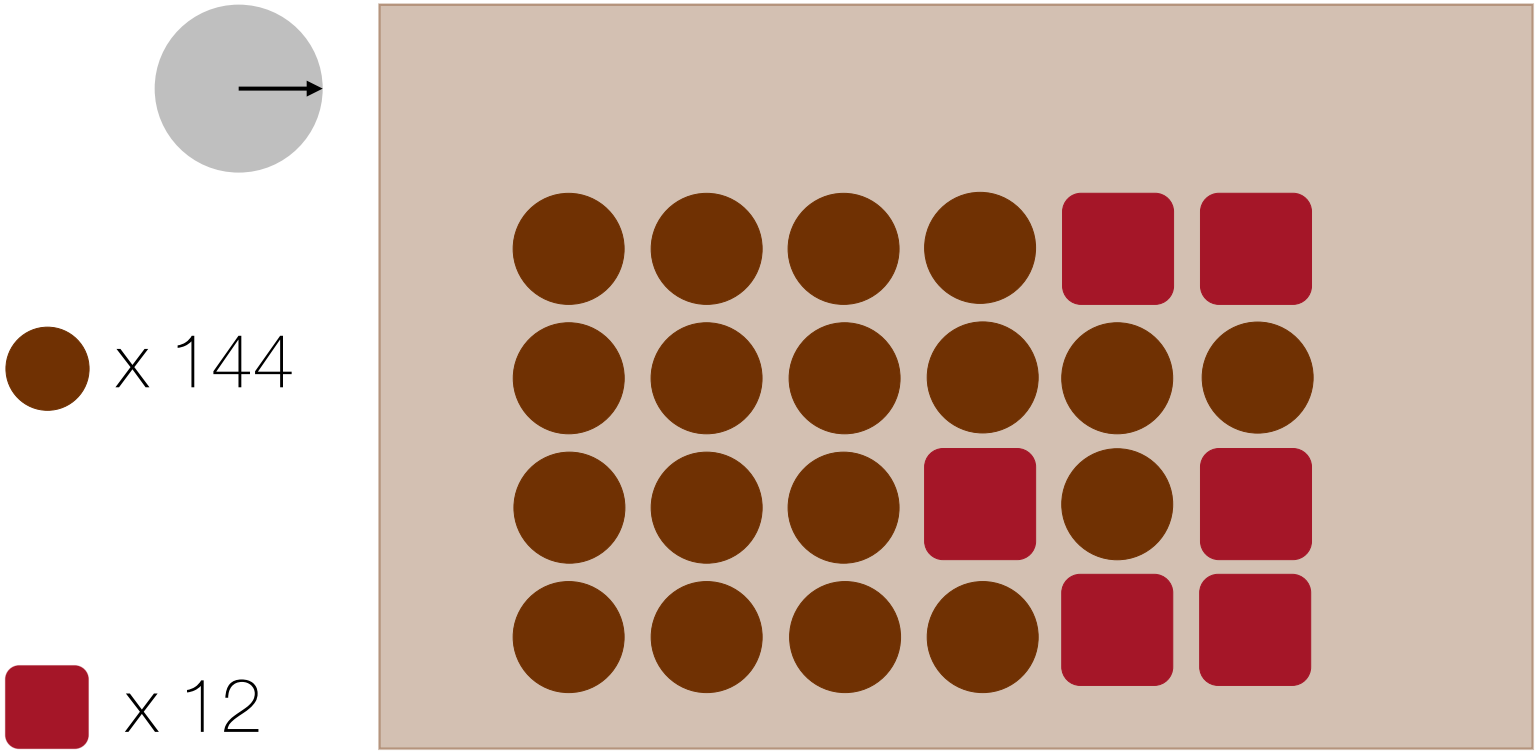


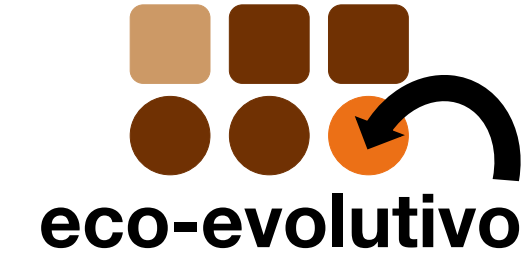


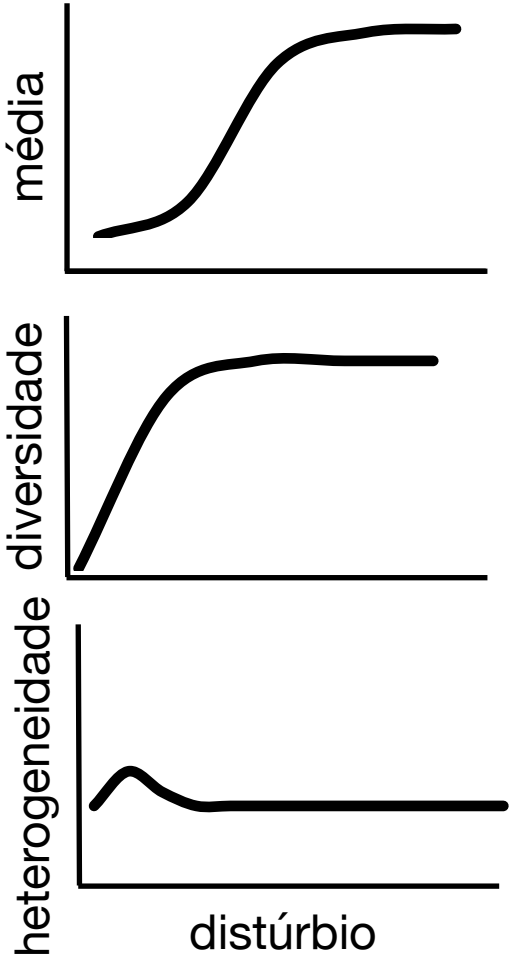

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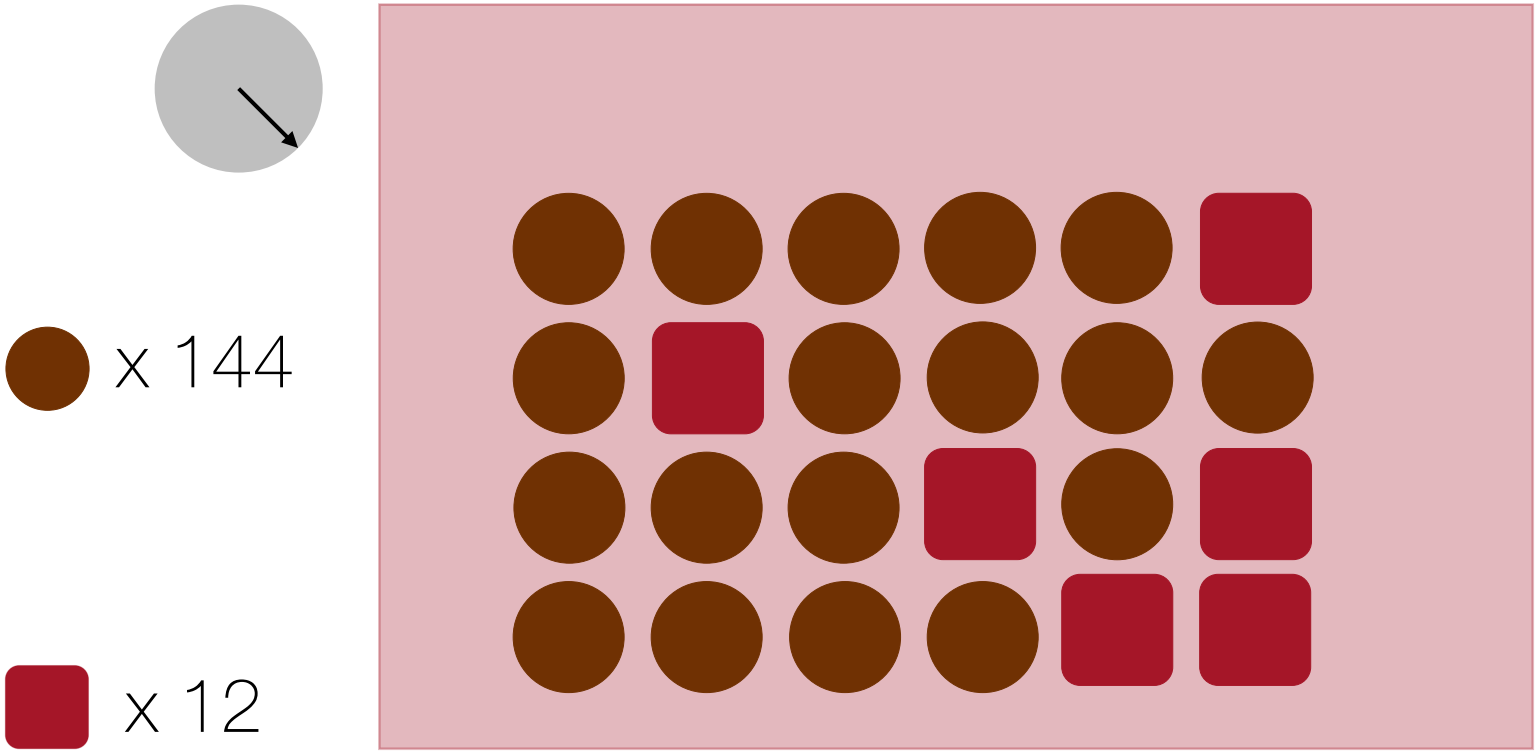


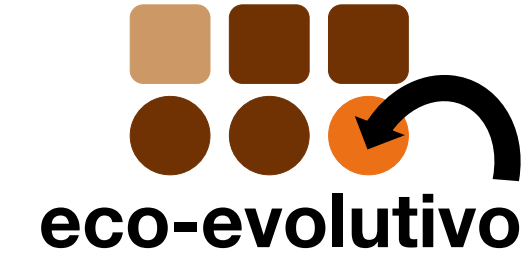


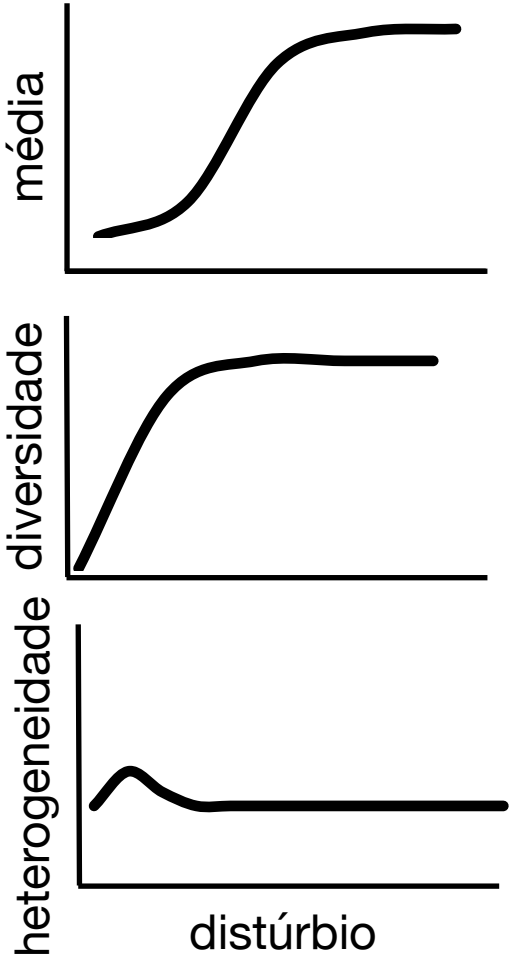

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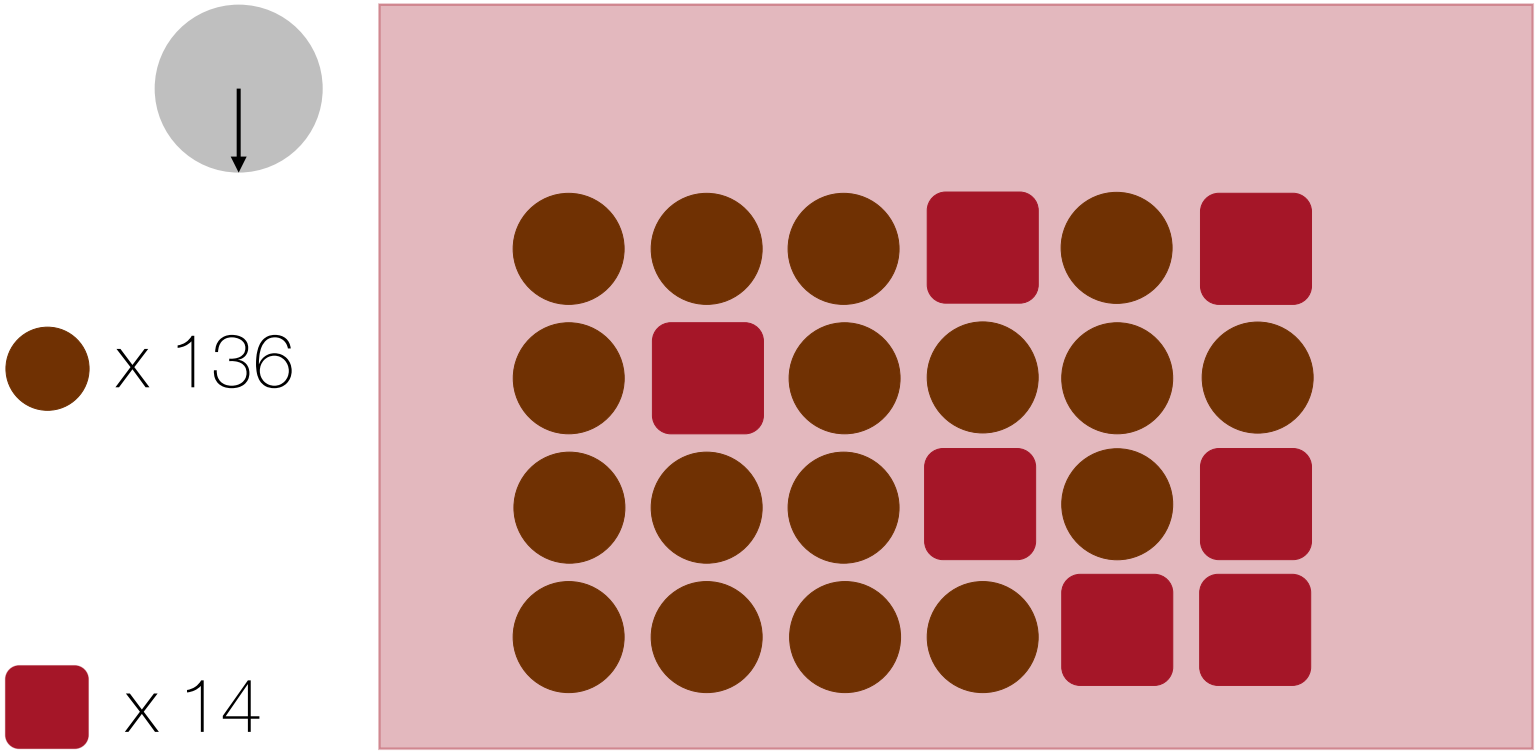


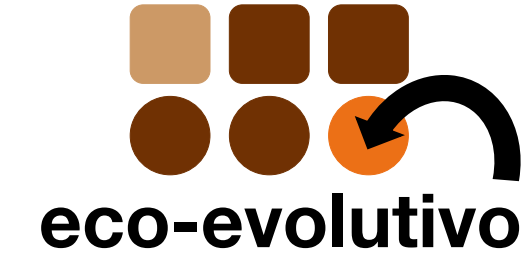


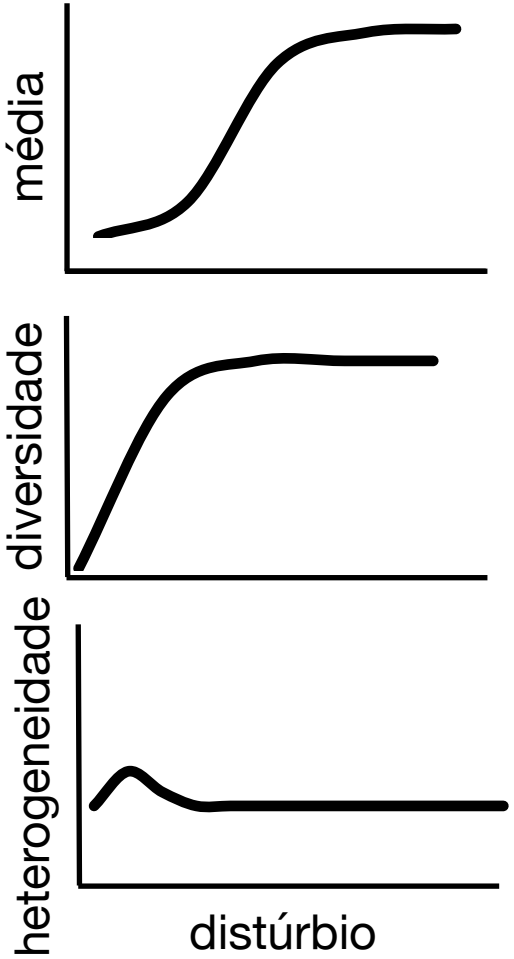

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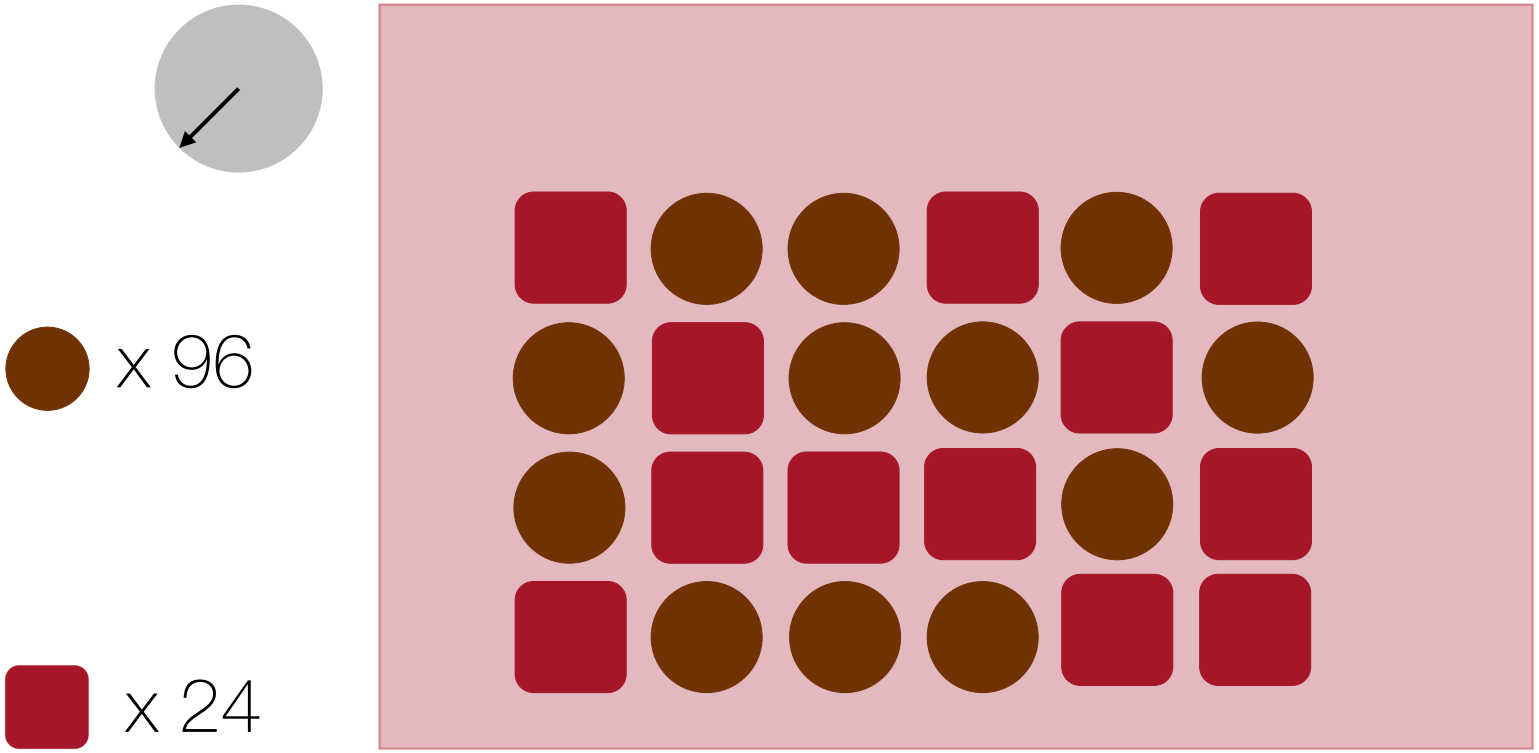


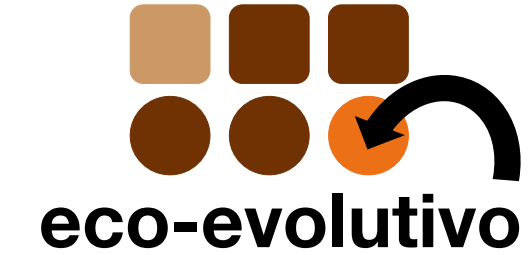


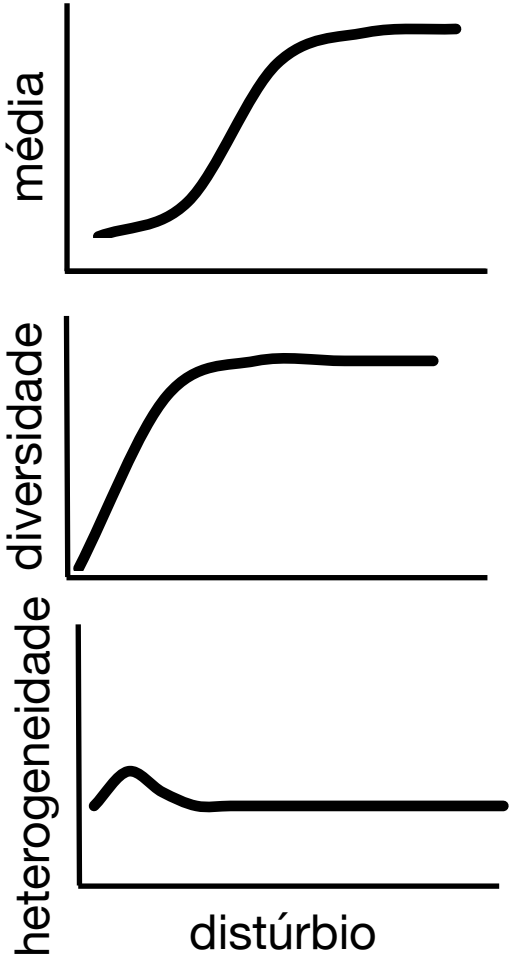

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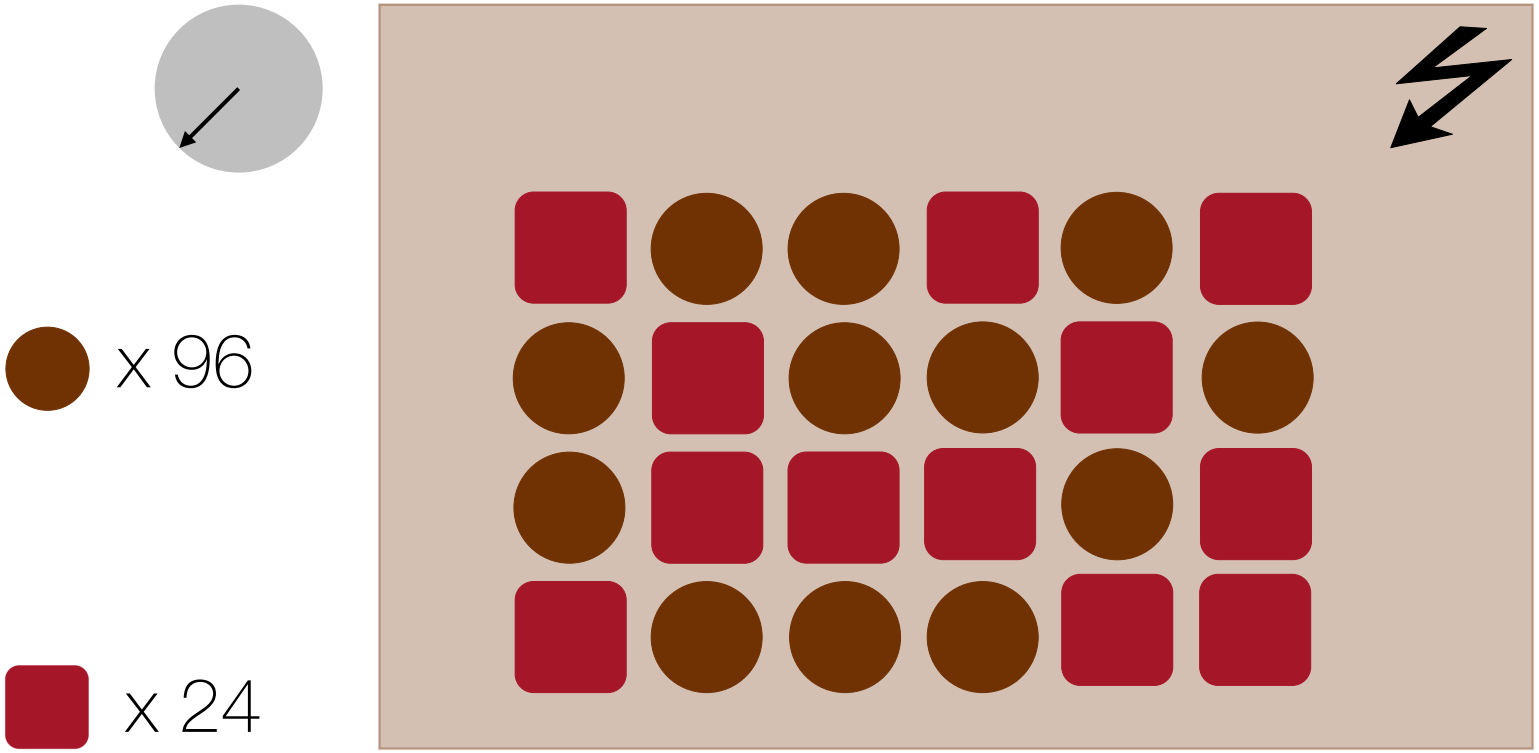


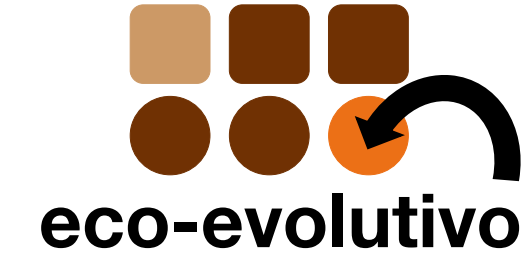


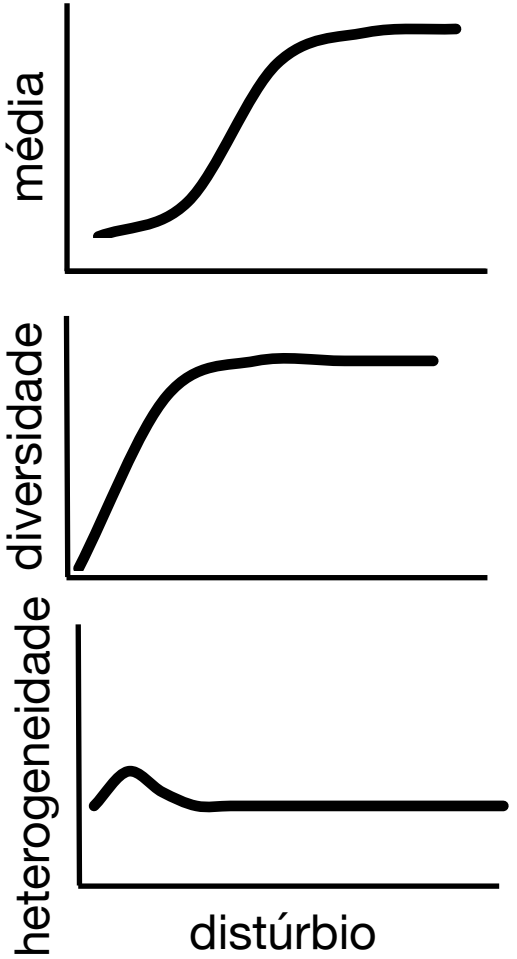

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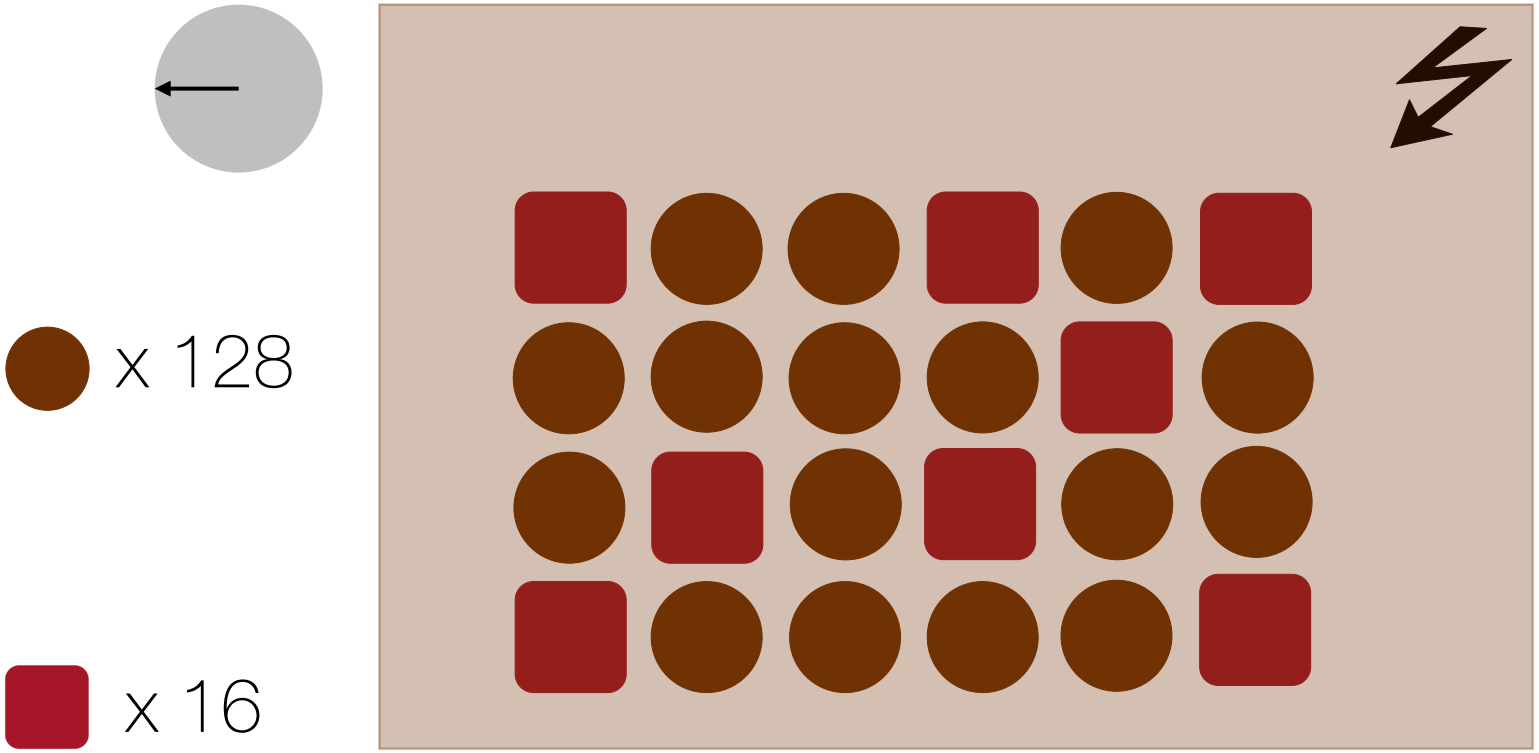


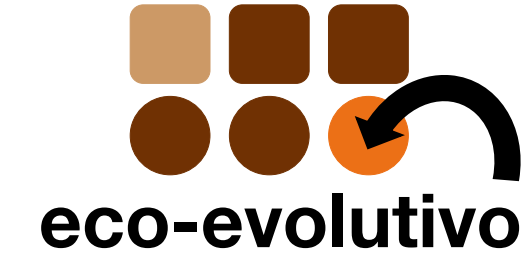


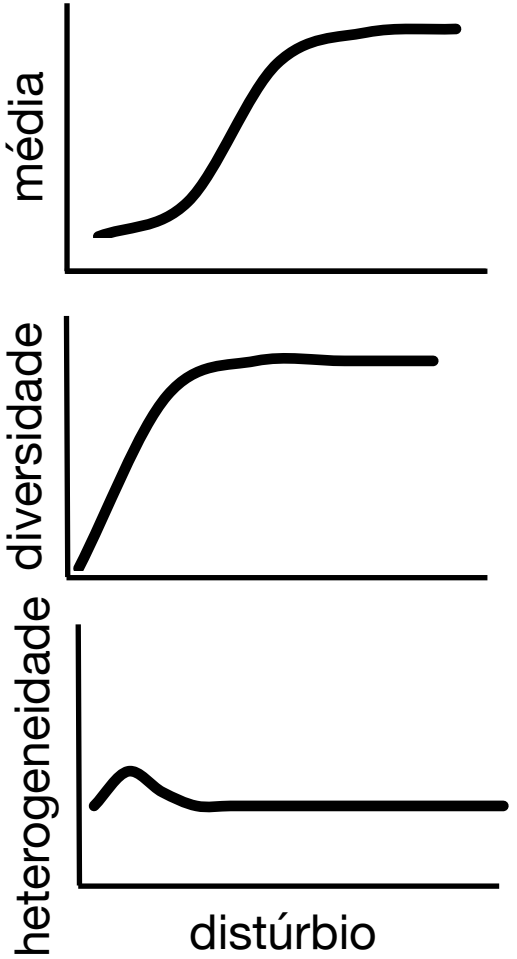

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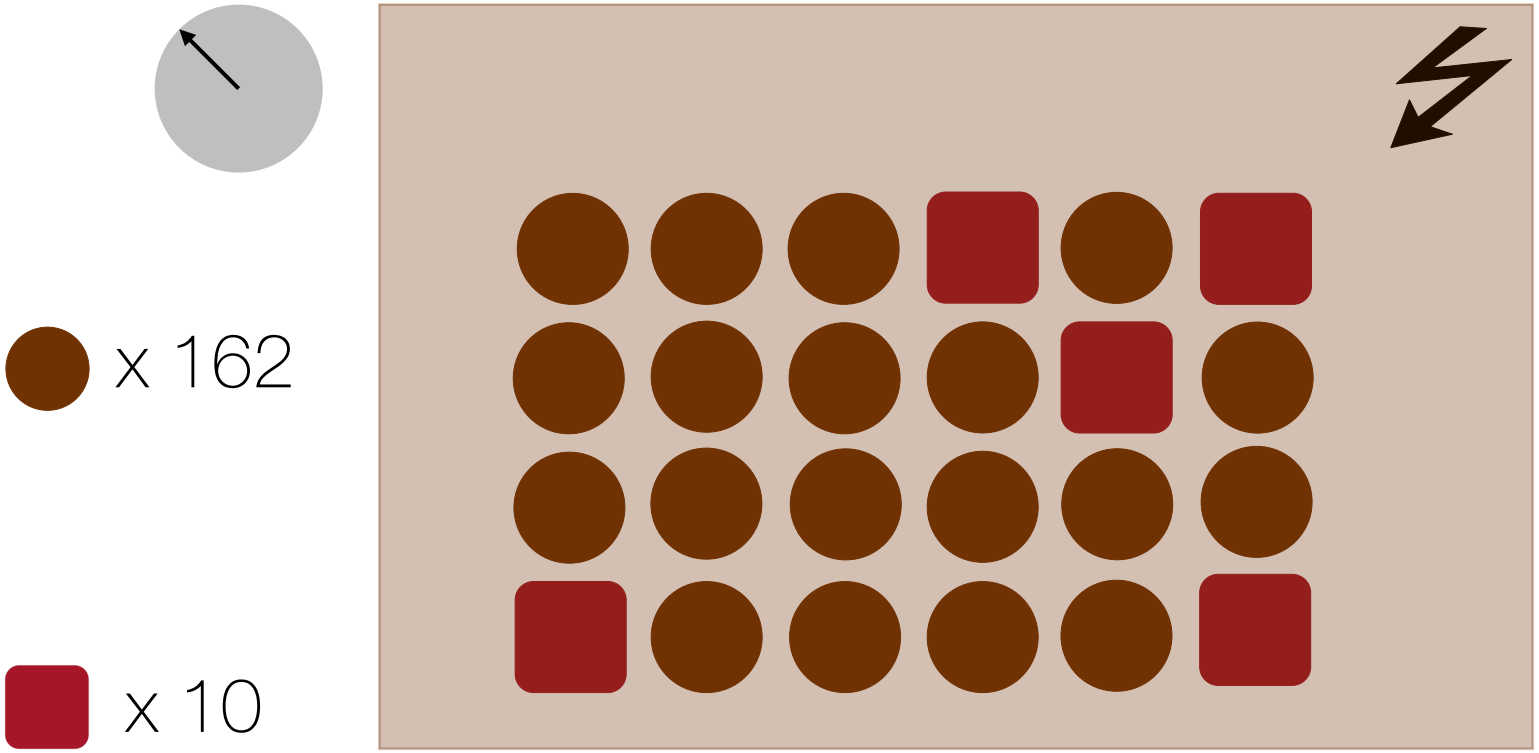


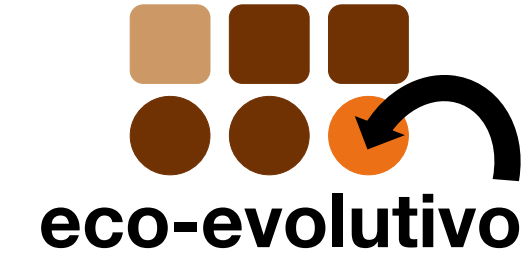


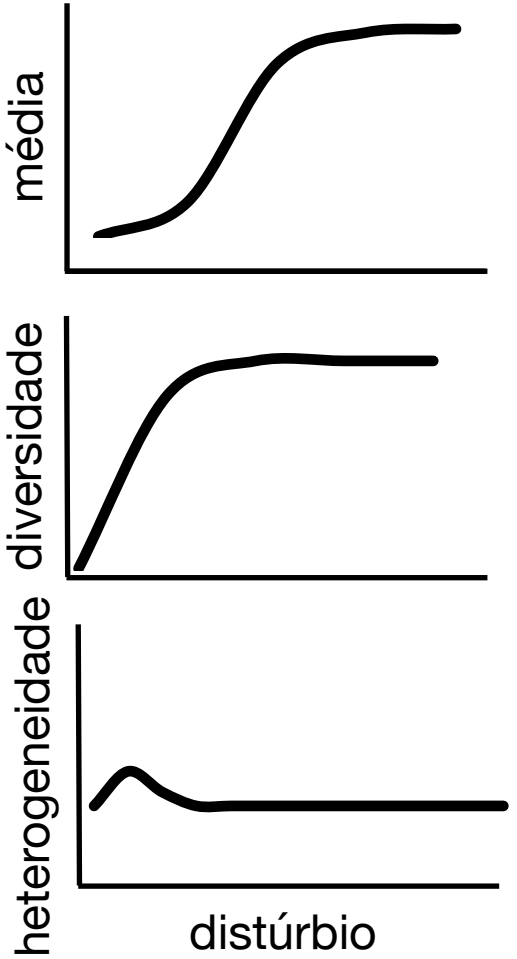

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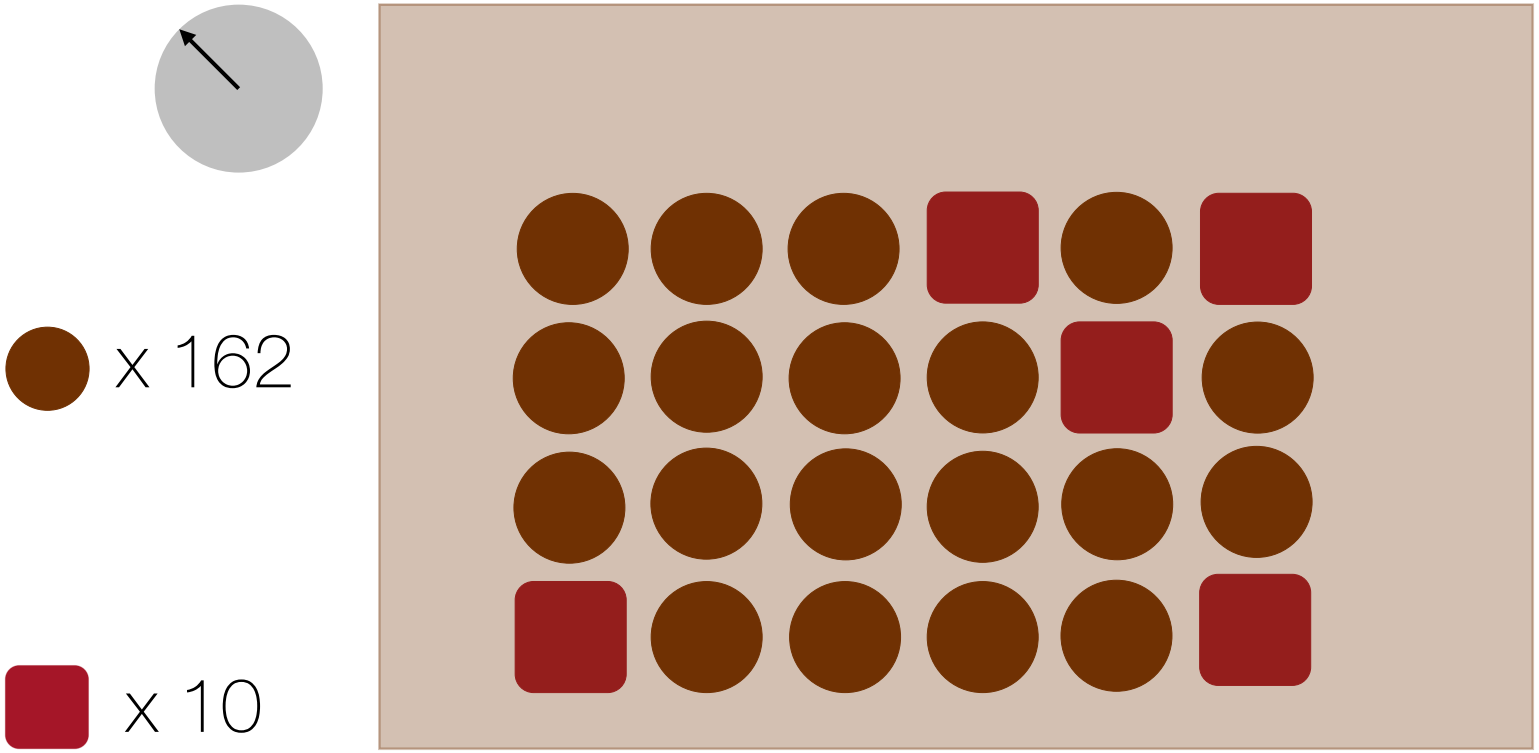


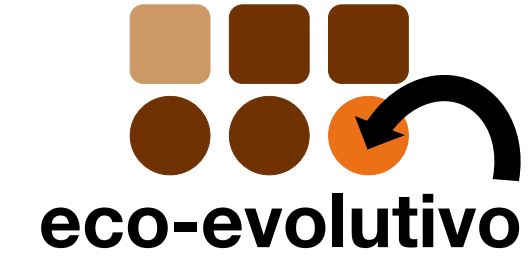


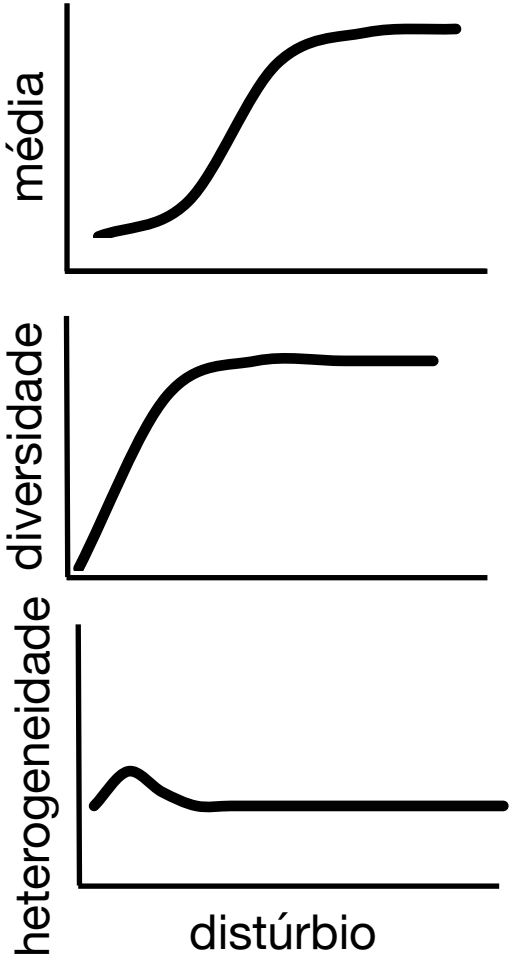

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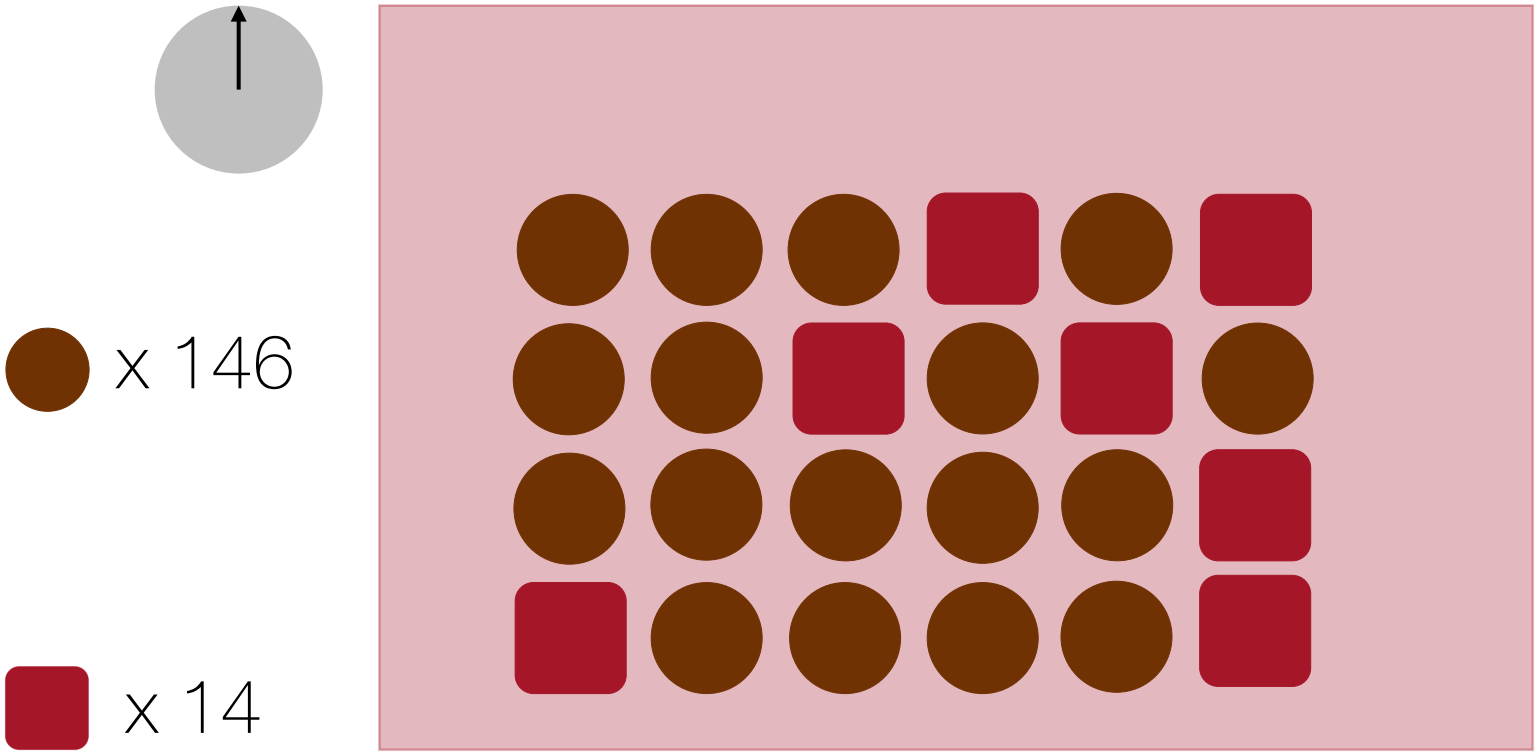


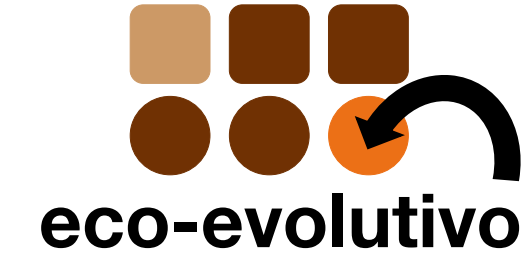


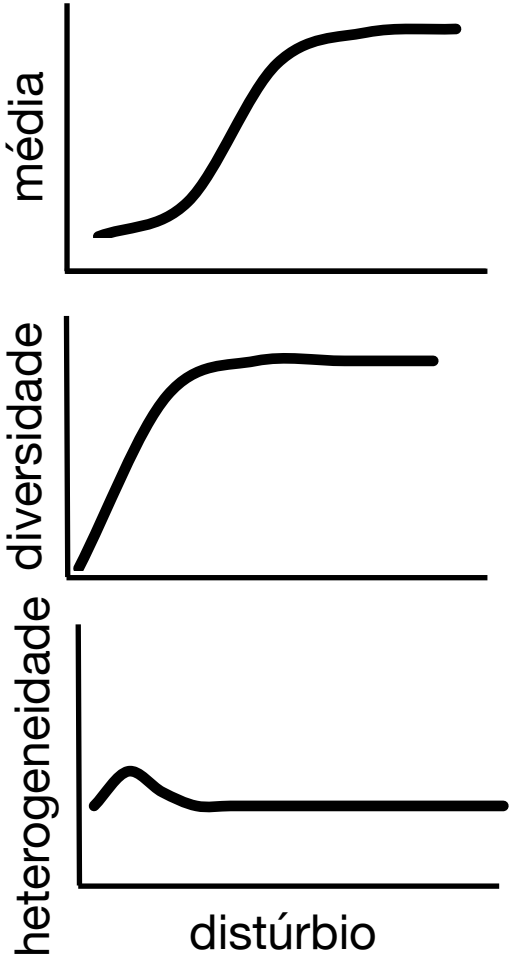

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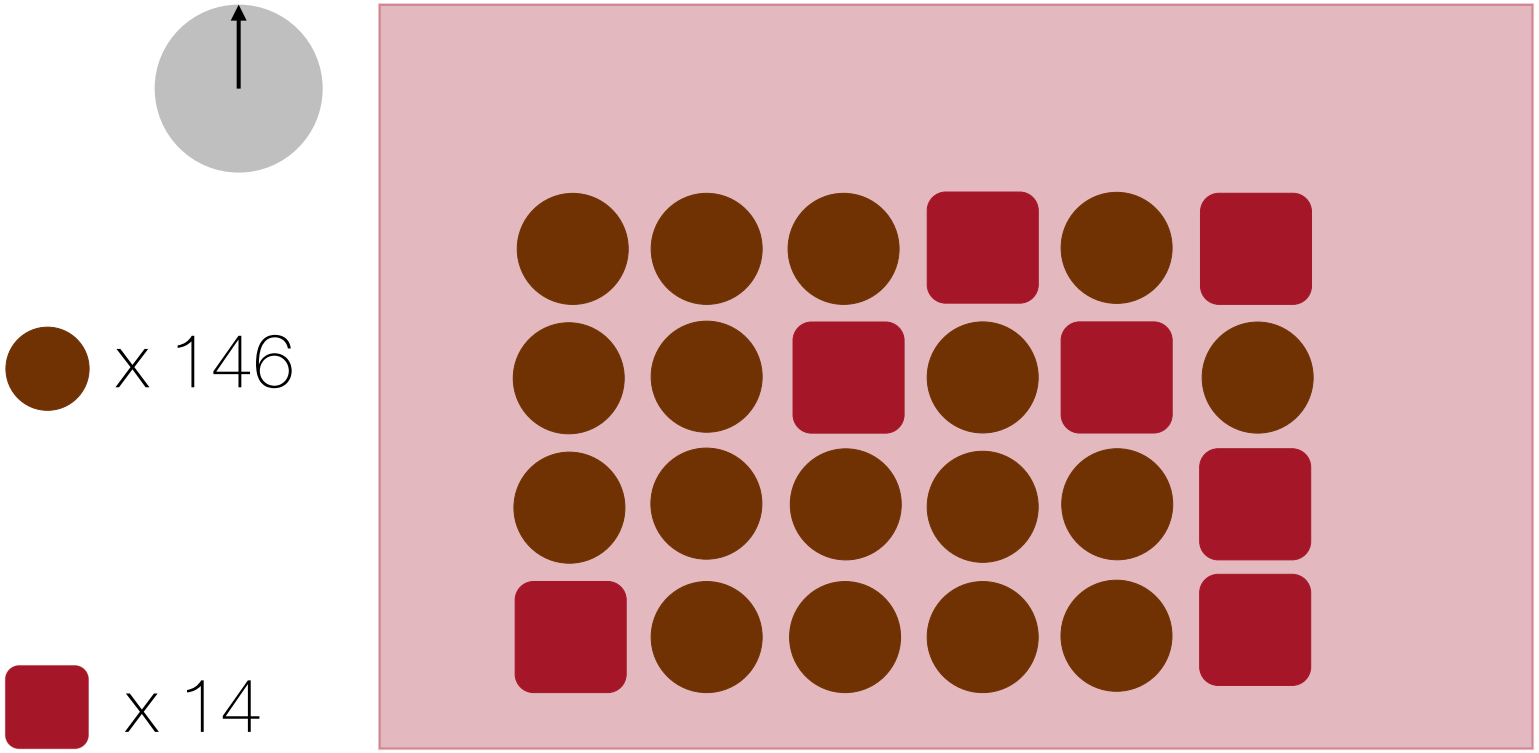
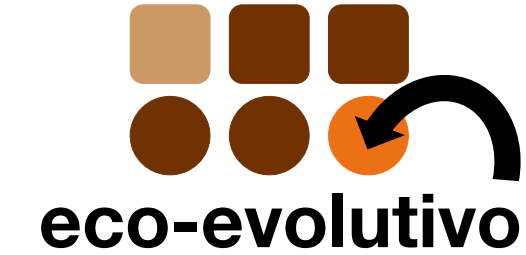
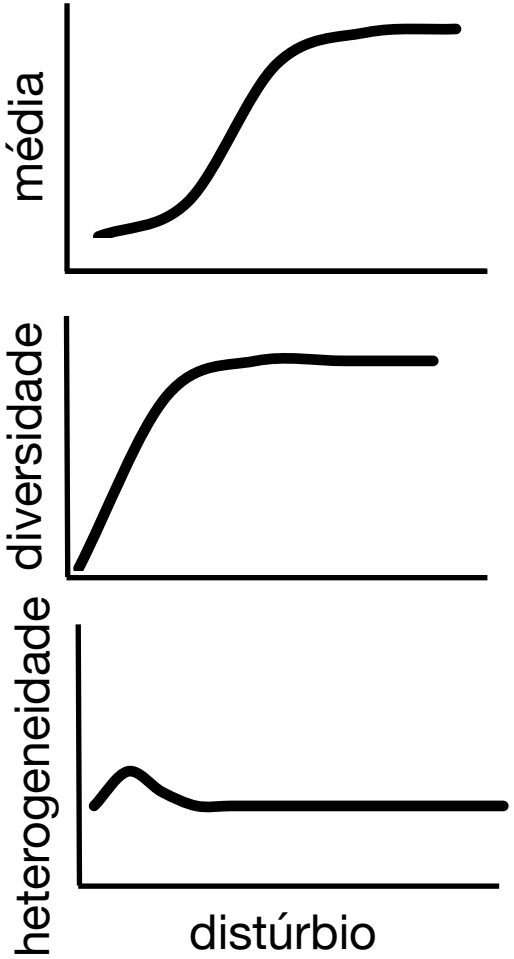



coexistência de especialistas



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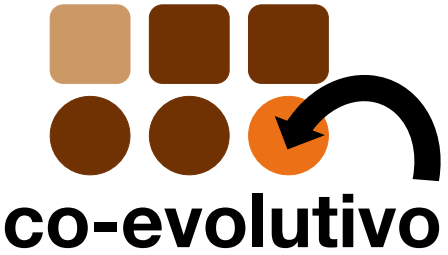
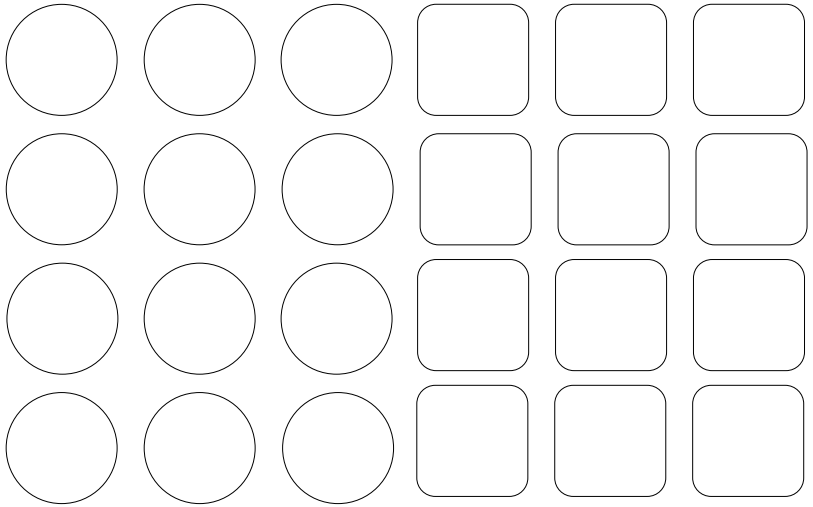
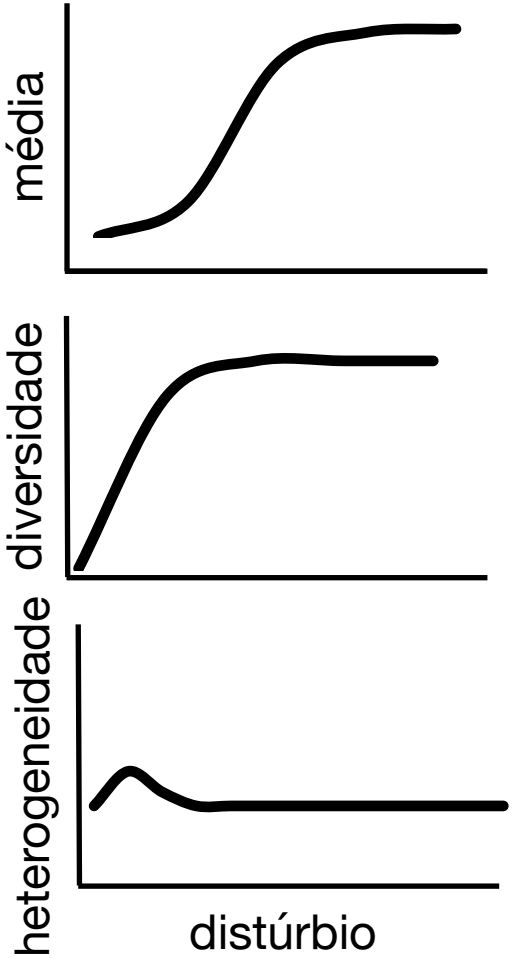



cenário eco-evolutivo = isolamento reprodutivo





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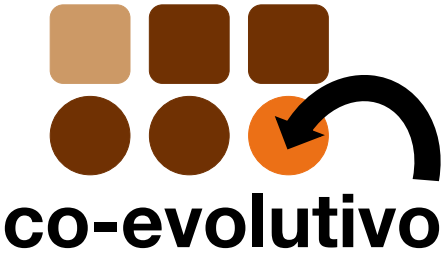
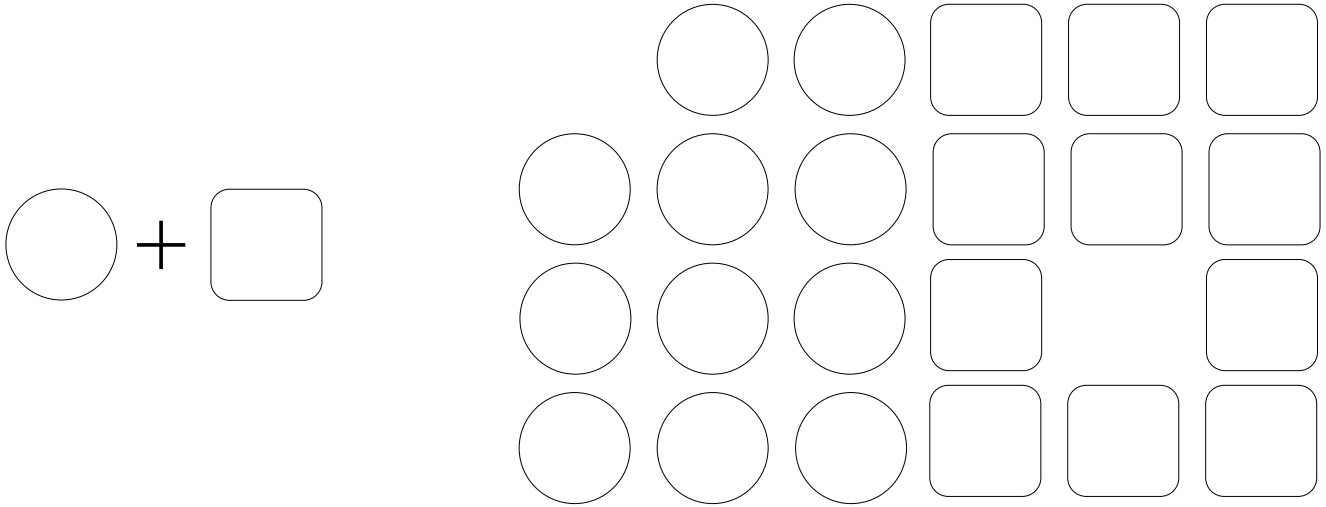
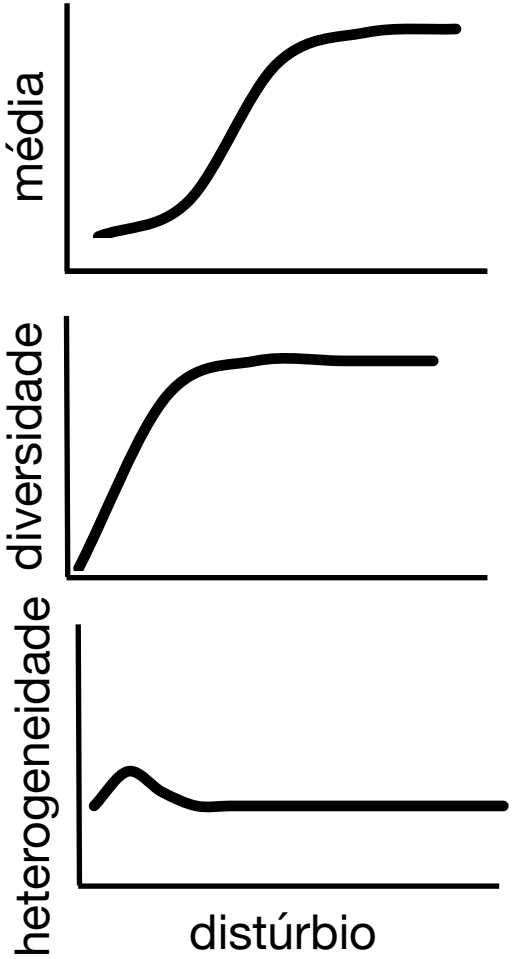


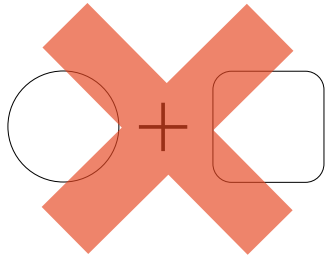

cenário eco-evolutivo = isolamento reprodutivo

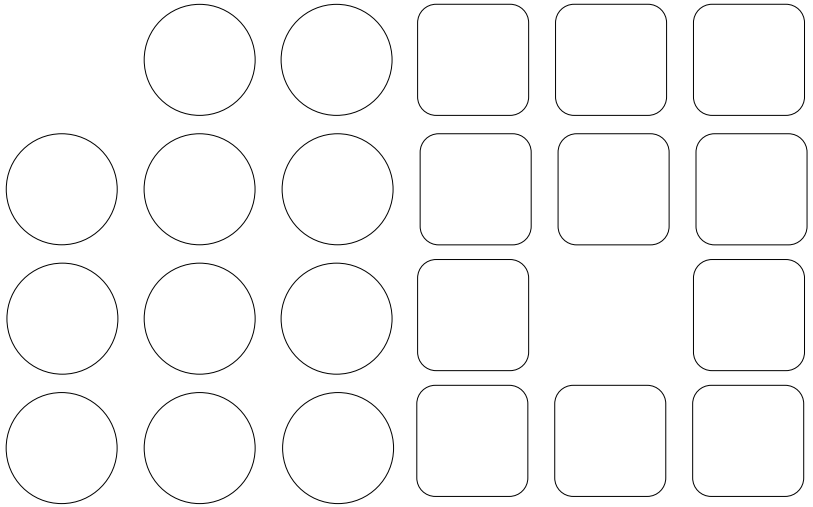


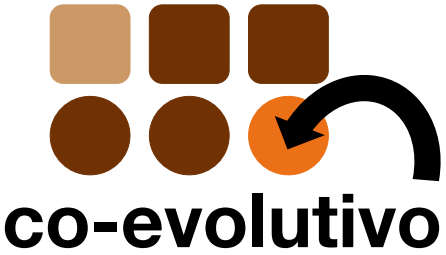


# coexistência de estratégias mediada pelo distúrbio

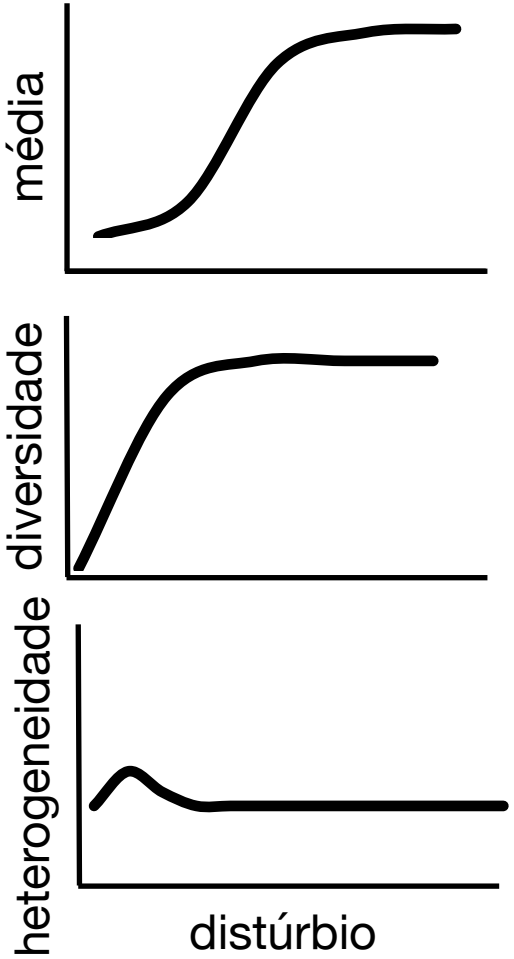
cenário eco-evolutivo = isolamento reprodutivo







**eco-evolutivo**



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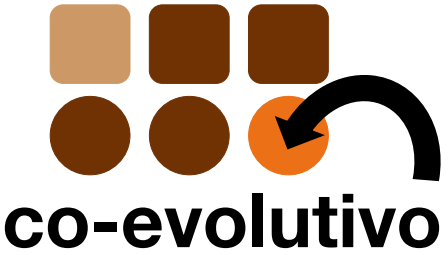
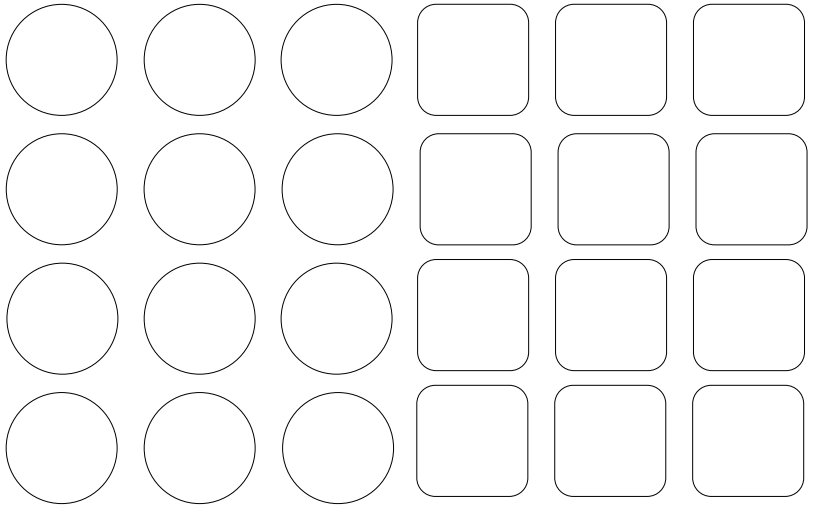
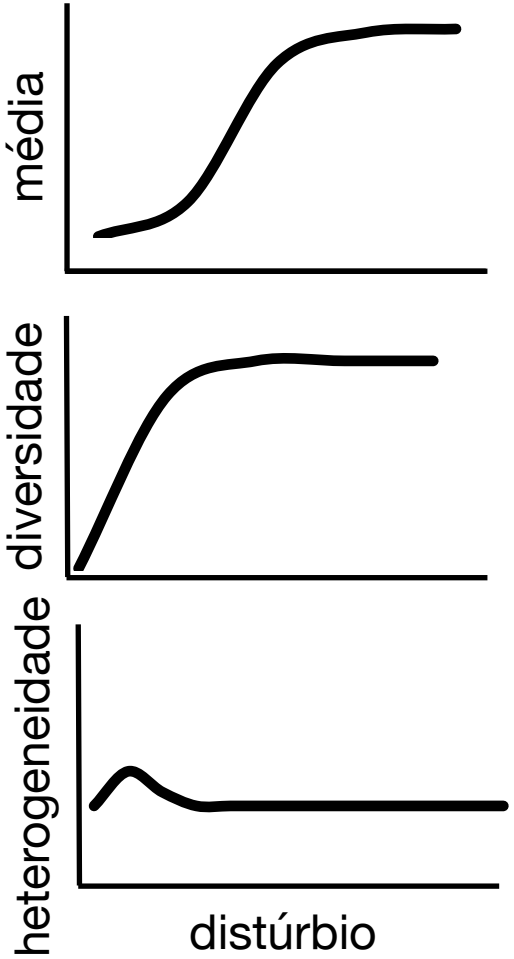


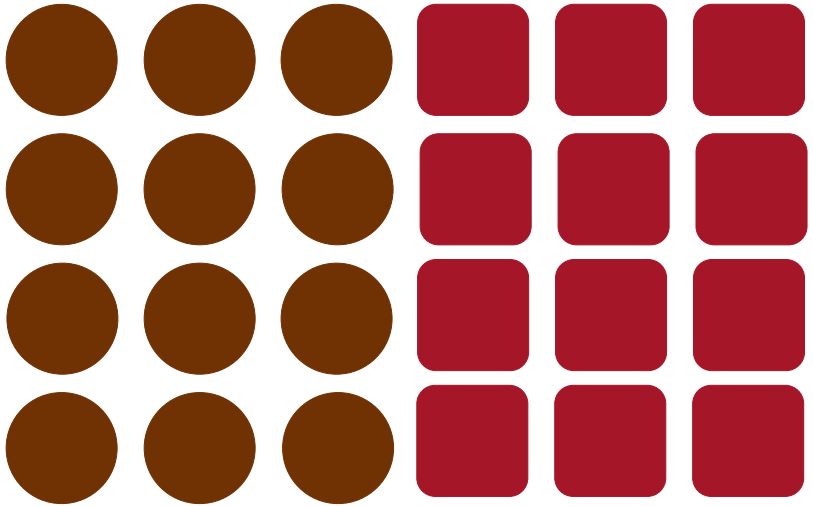

cenário eco-evolutivo = isolamento reprodutivo

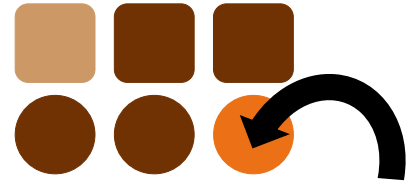




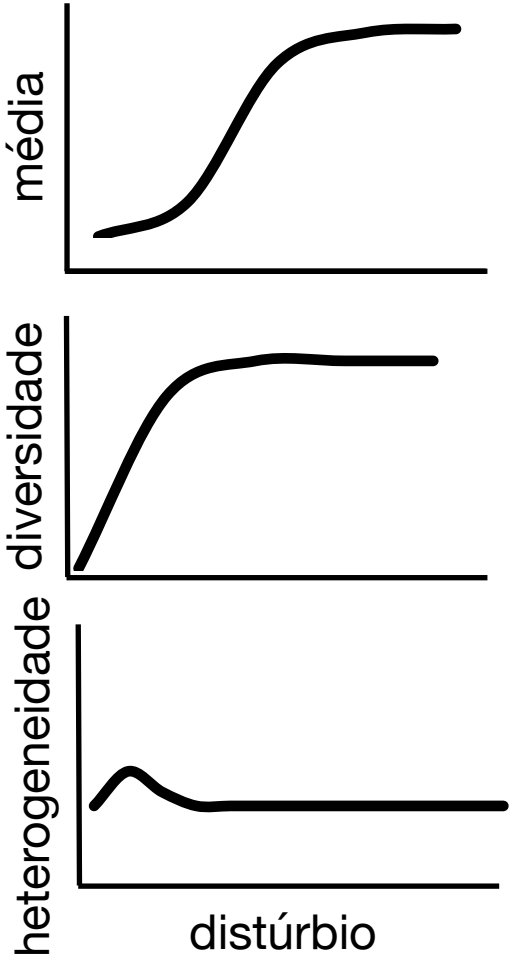
# coexistência de estratégias mediada pelo distúrbio

cenário eco-evolutivo = isolamento reprodutivo



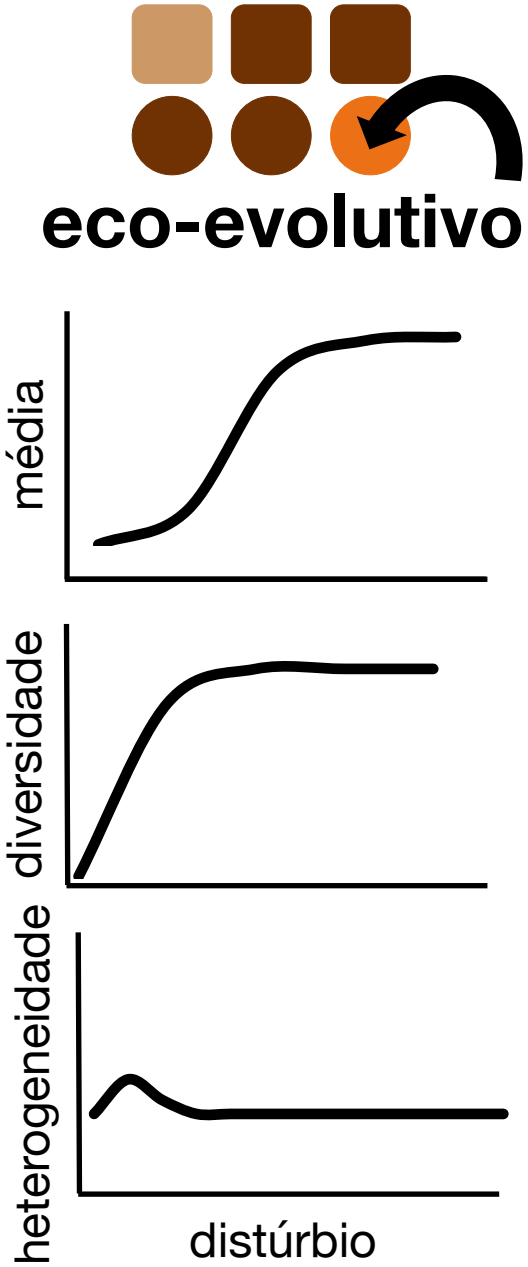


**eco-evolutivo**

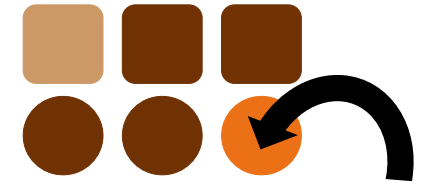


# coexistência de estratégias mediada pelo distúrbio

cenário eco-evolutivo = mutação

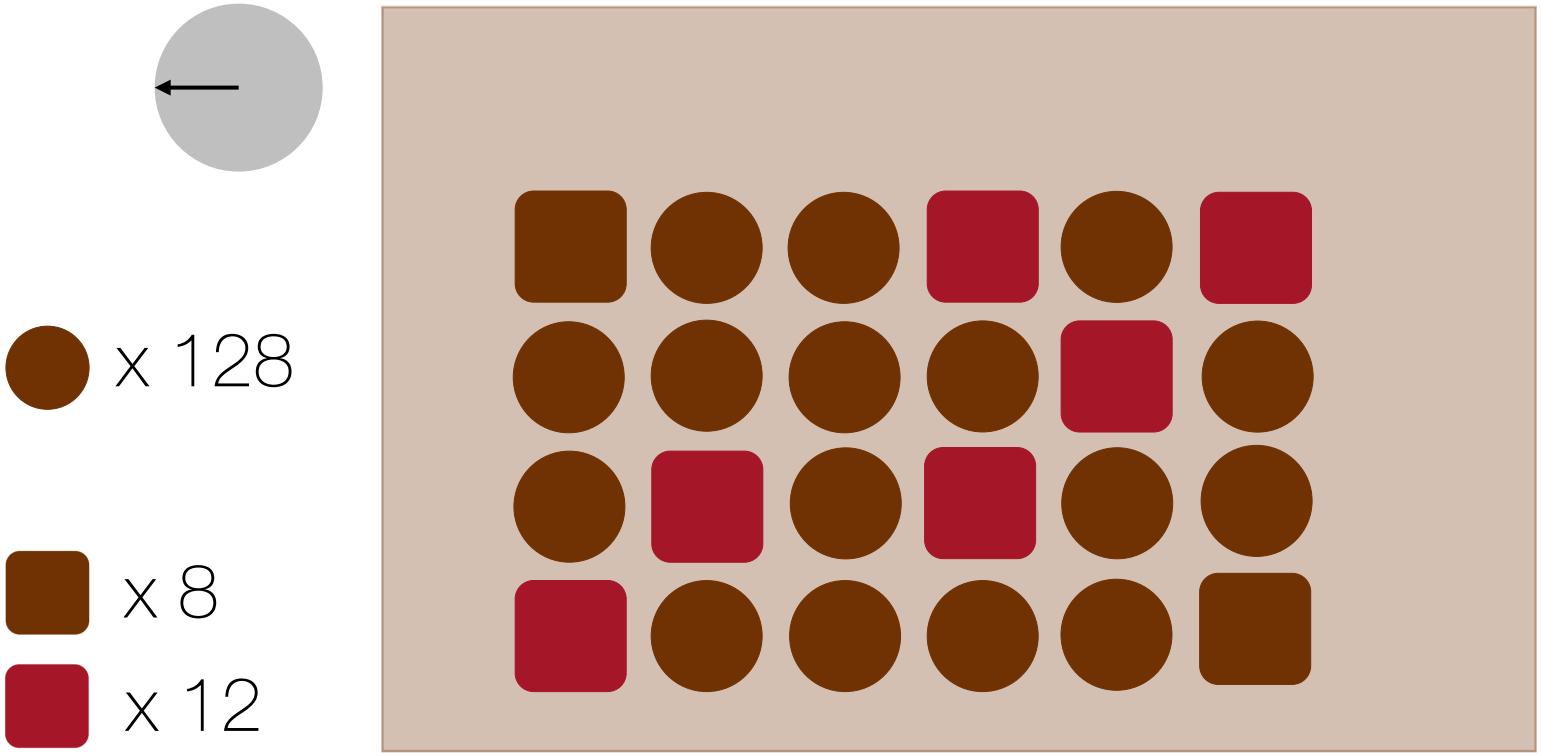


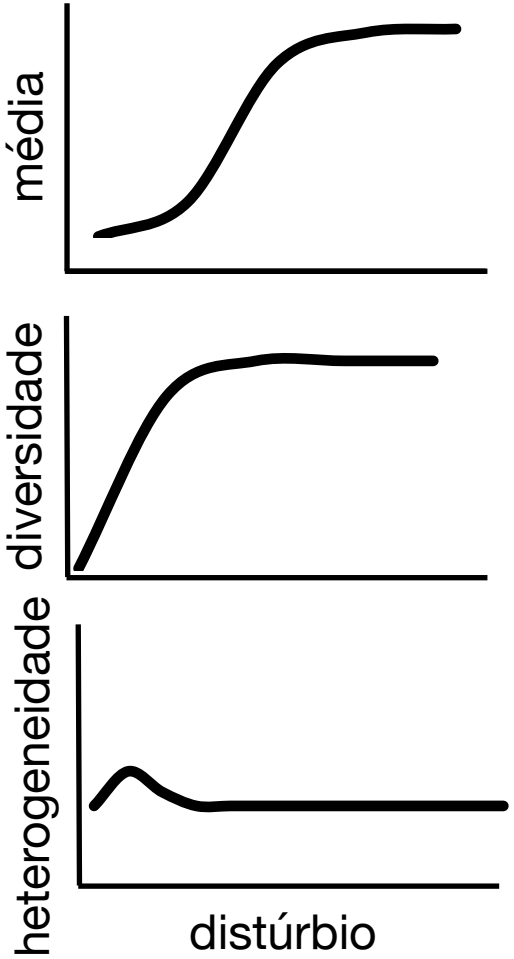
# coexistência de estratégias mediada pelo distúrbio



**eco-evolutivo**

cenário eco-evolutivo = mutação



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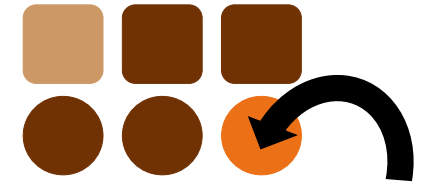
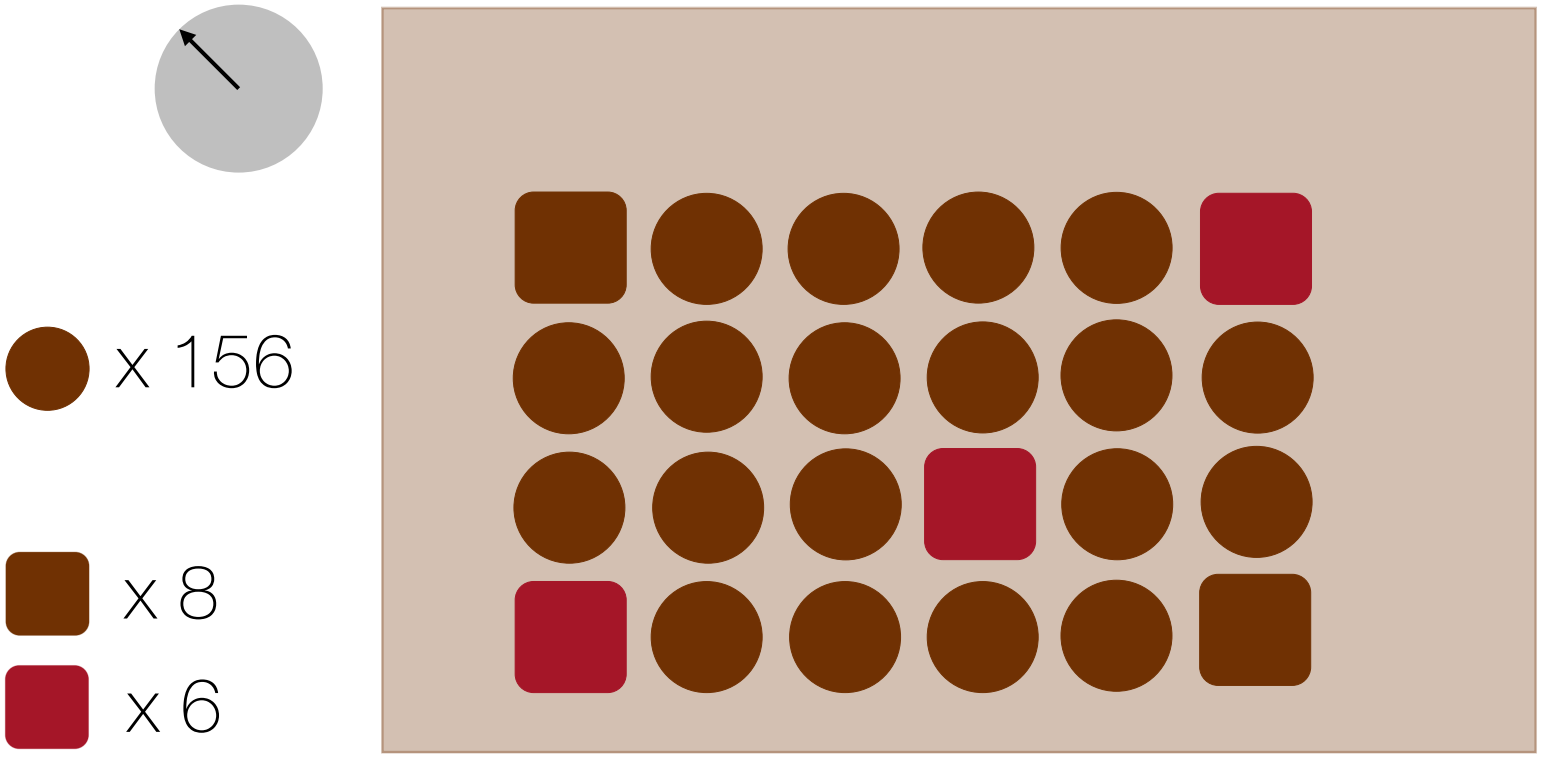
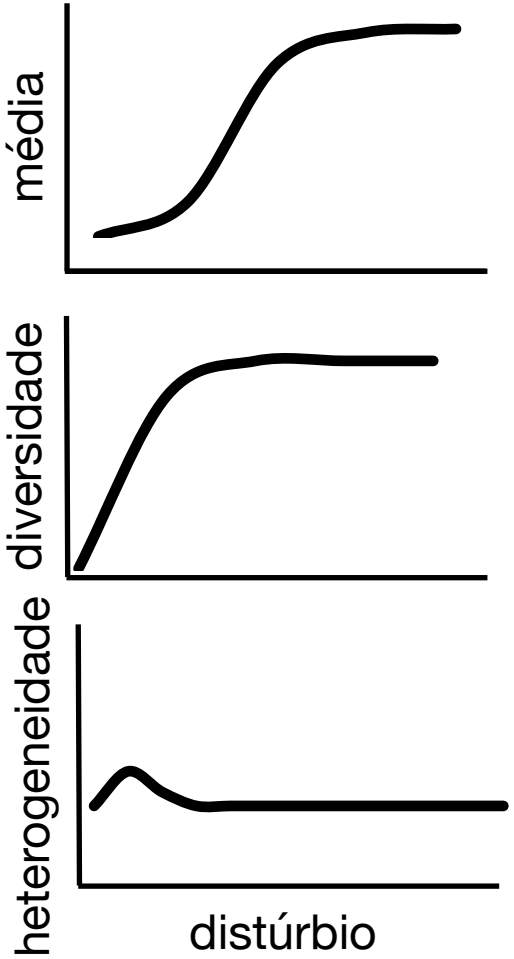


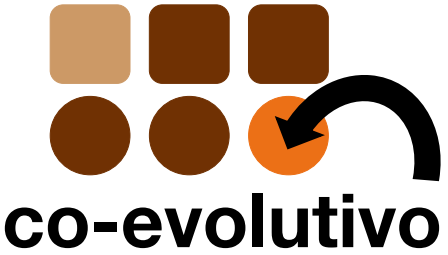
**eco-evolutivo**

cenário eco-evolutivo = mutação

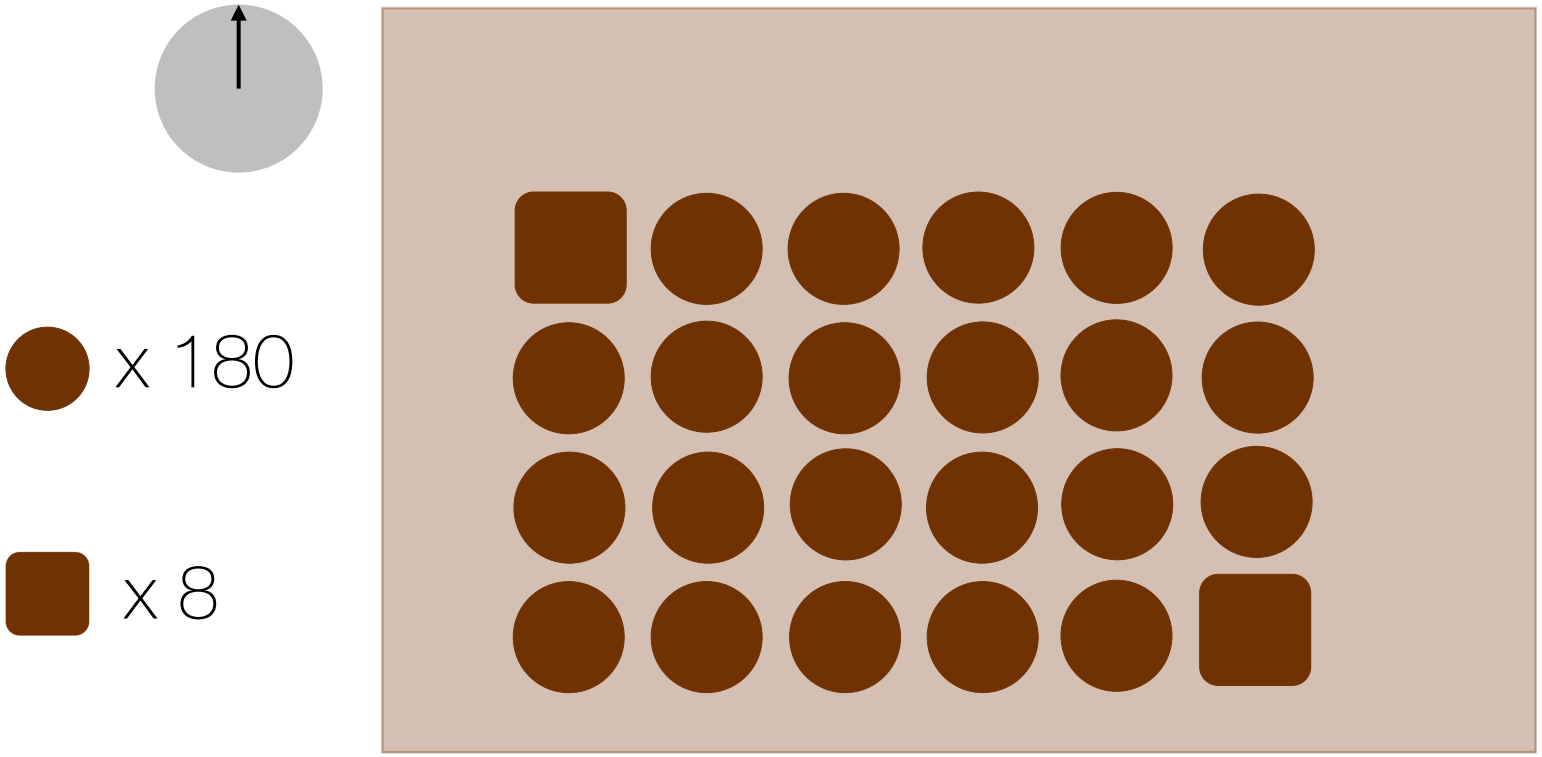


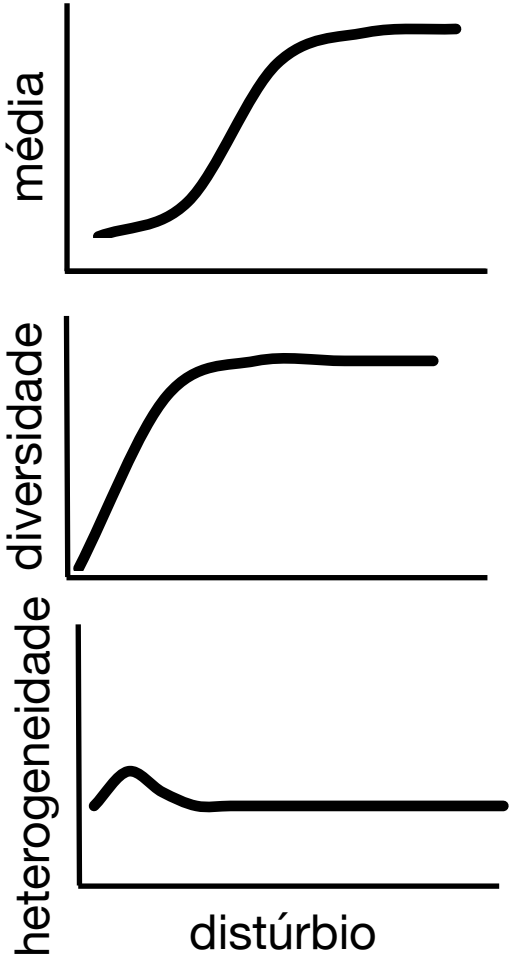



# coexistência de estratégias mediada pelo distúrbio




cenário eco-evolutivo = mutação



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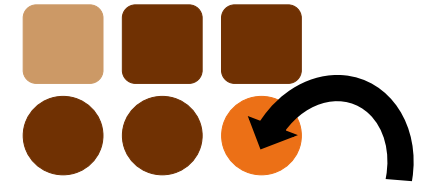
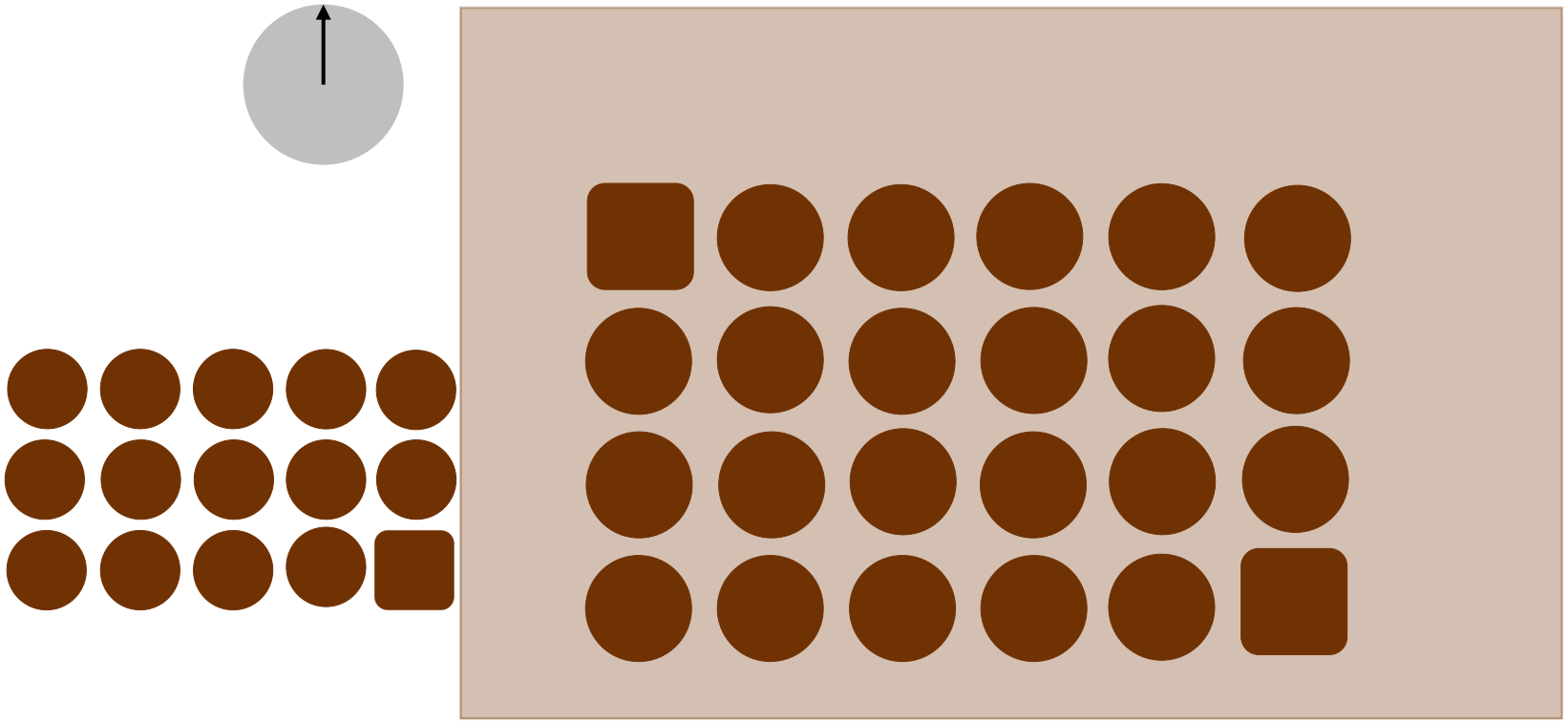
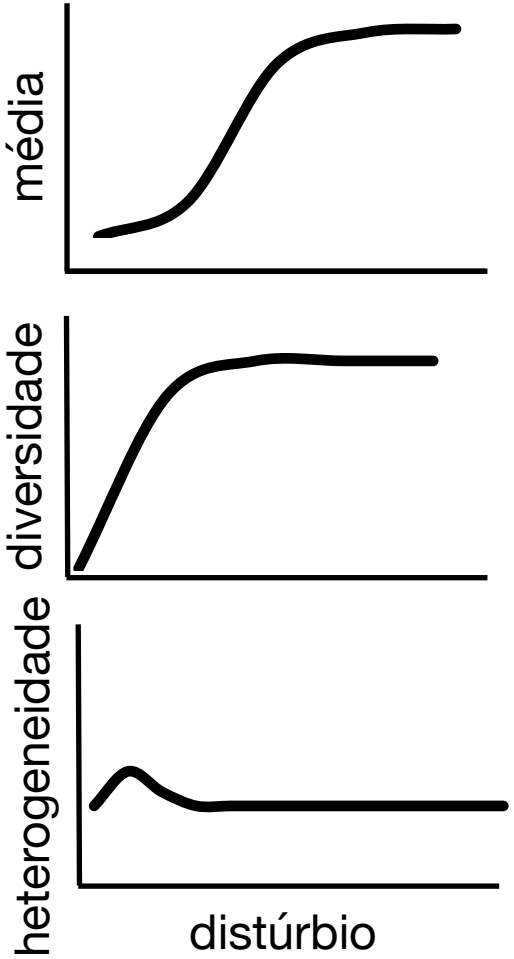


**eco-evolutivo**

cenário eco-evolutivo = mutação





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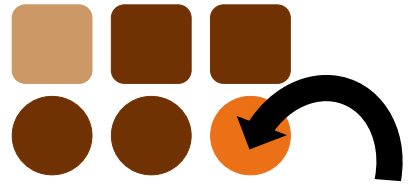
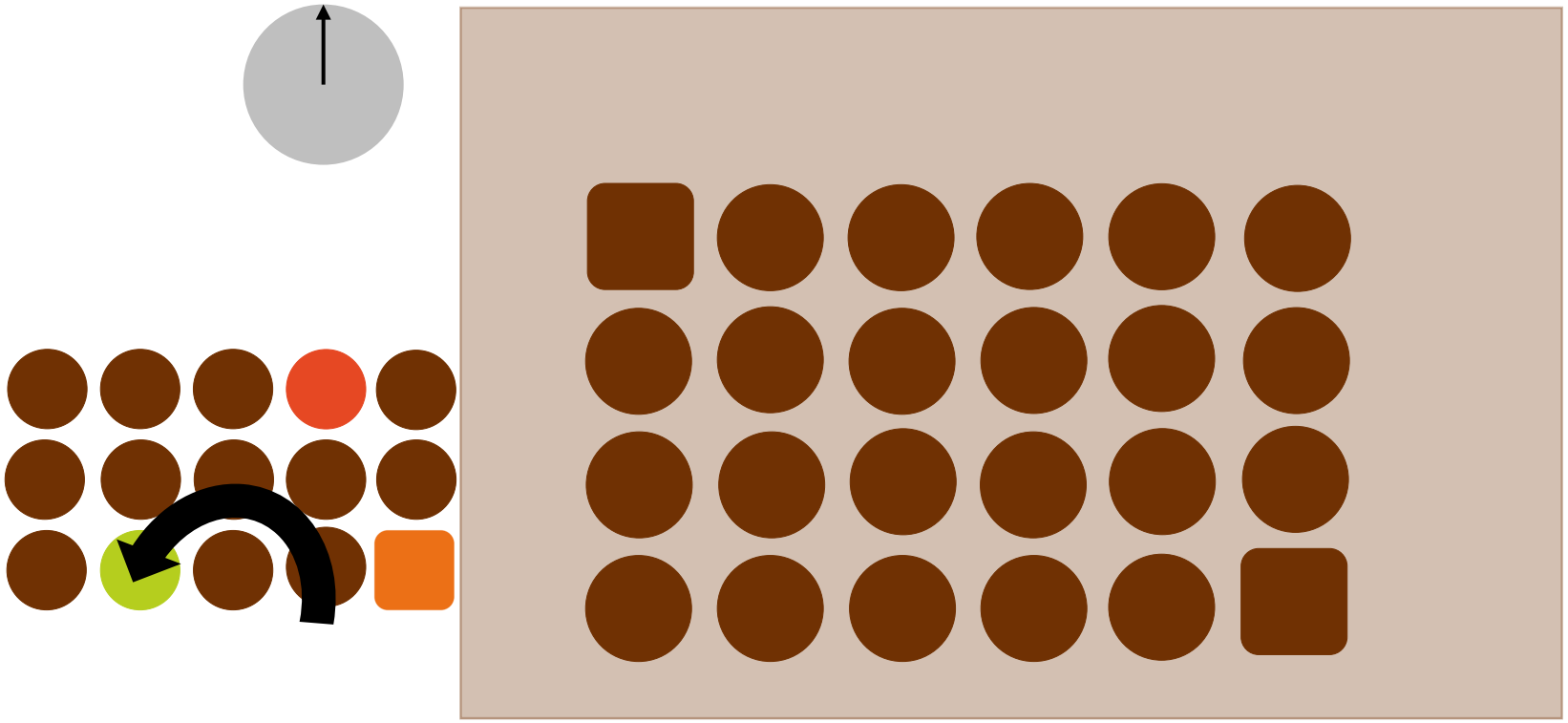
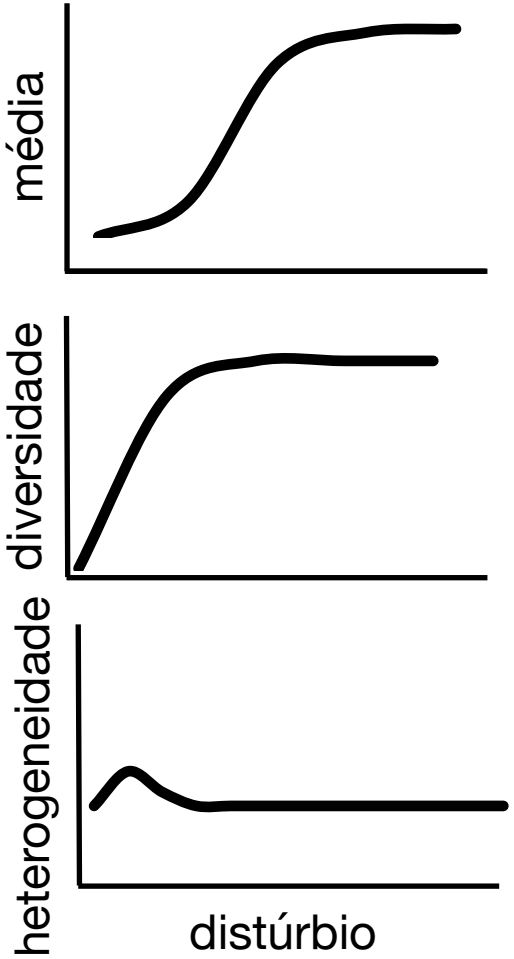


**eco-evolutivo**

cenário eco-evolutivo = mutação





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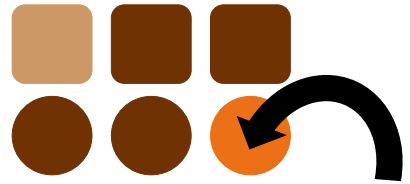
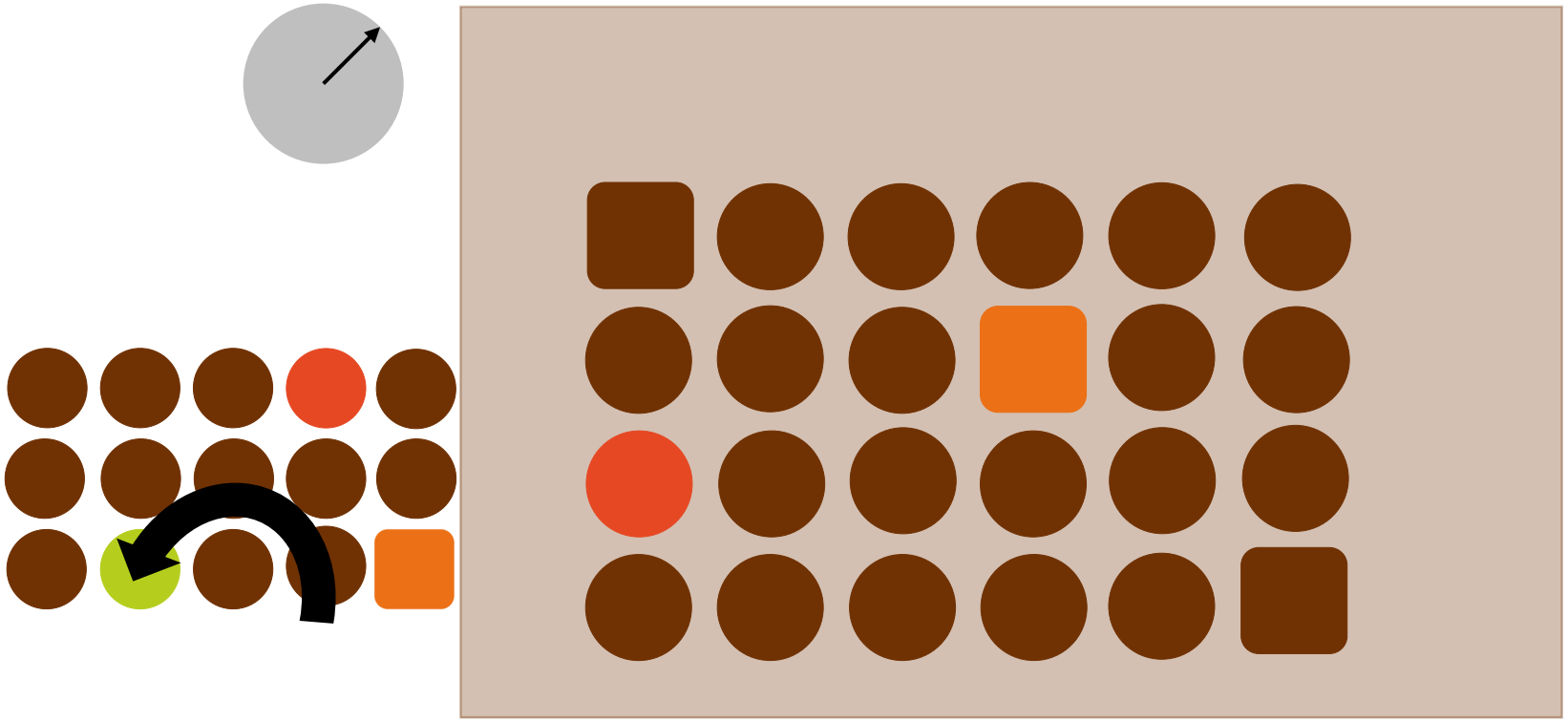
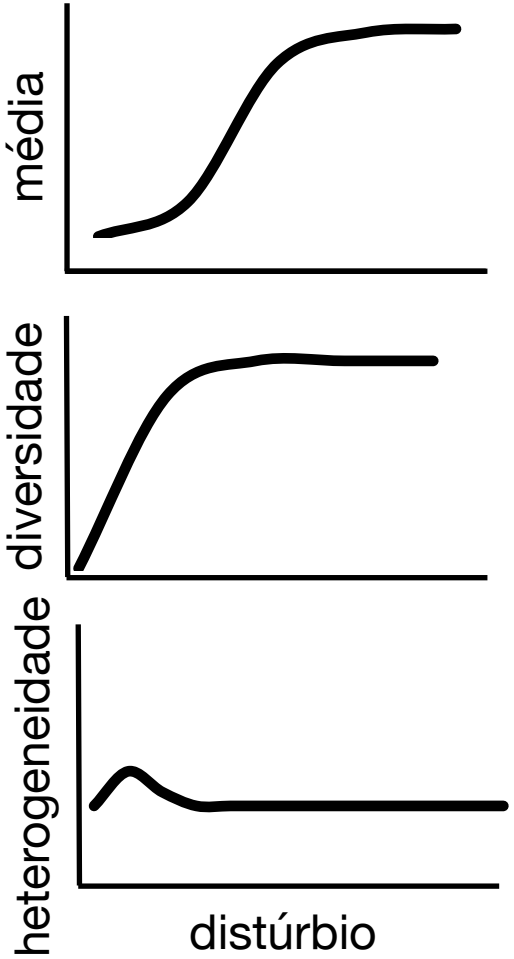


**eco-evolutivo**

cenário eco-evolutivo = mutação





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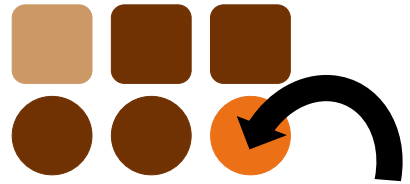
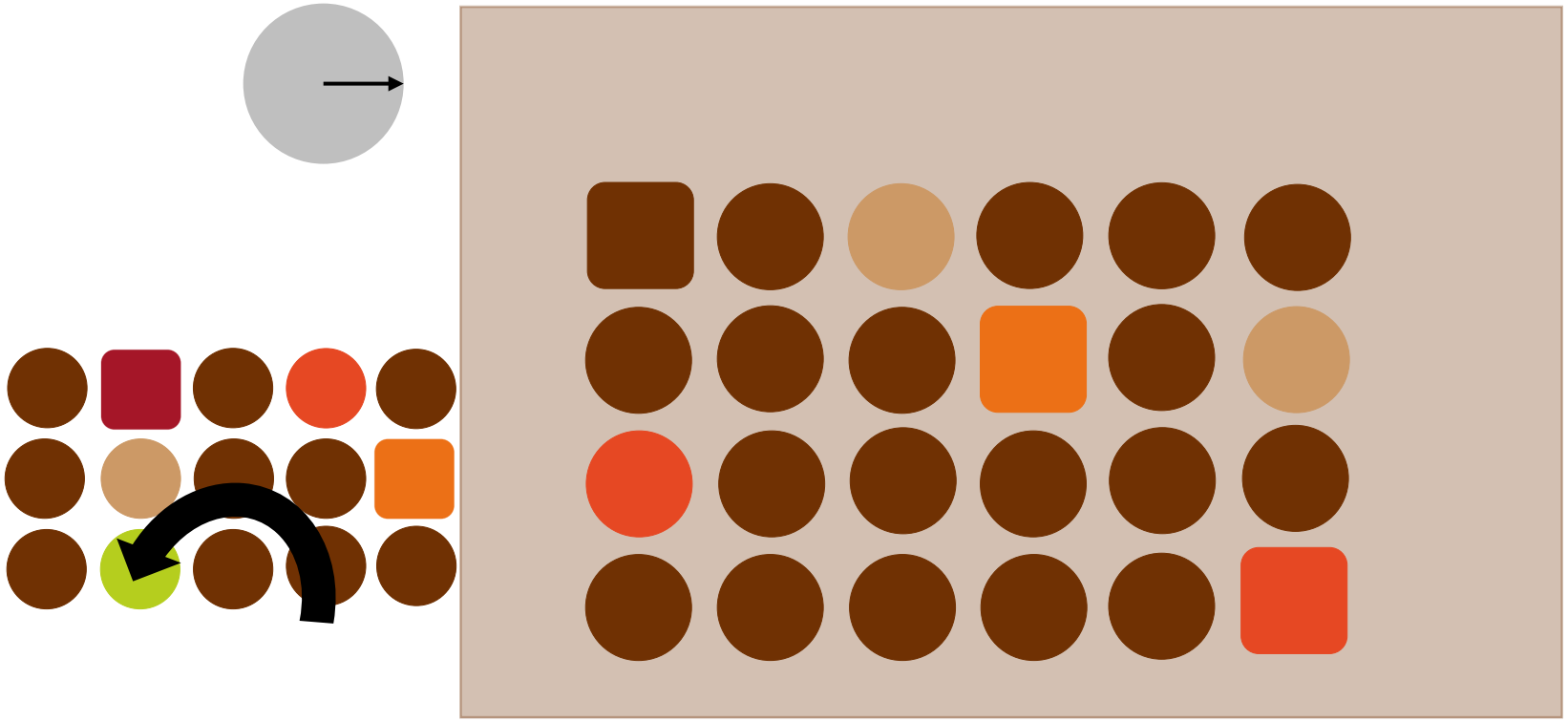
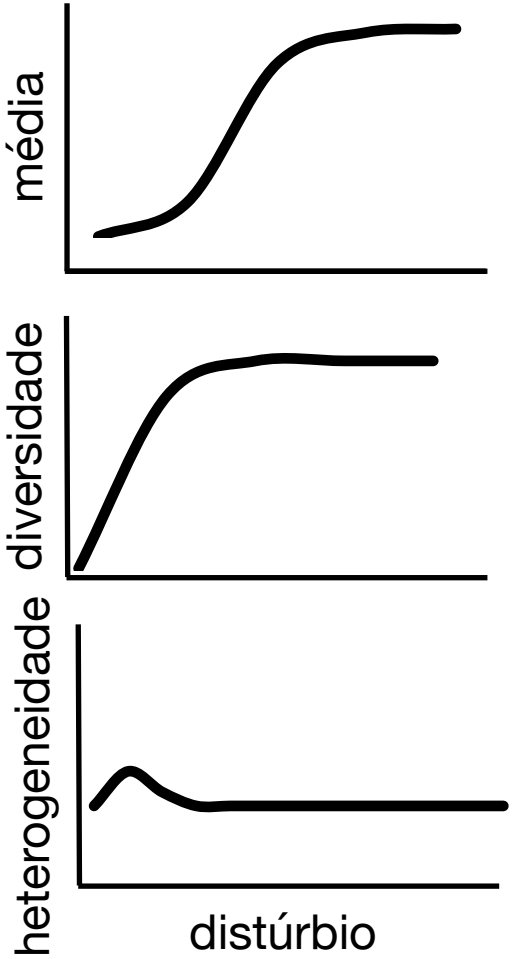


**eco-evolutivo**

cenário eco-evolutivo = mutação

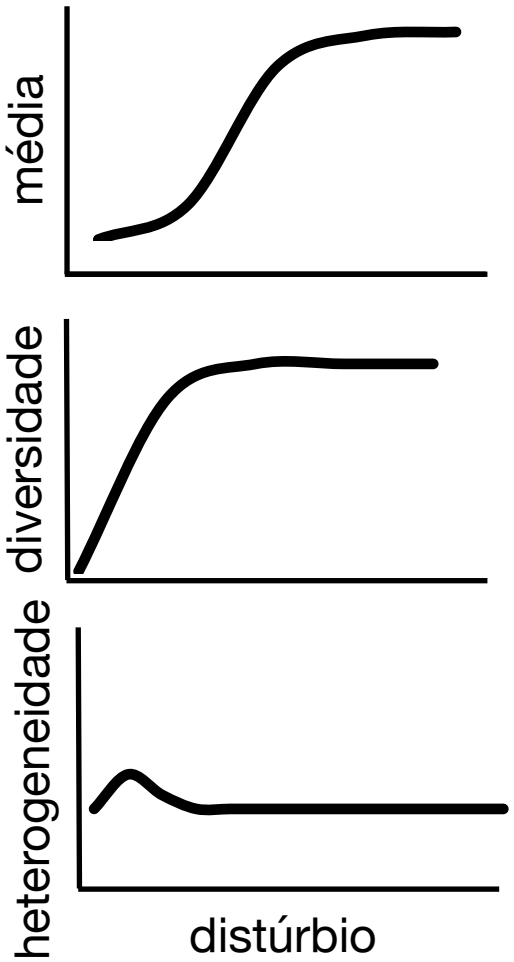




# coexistência de estratégias mediada pelo distúrbio

eco-evolutivo

*storage effect*:

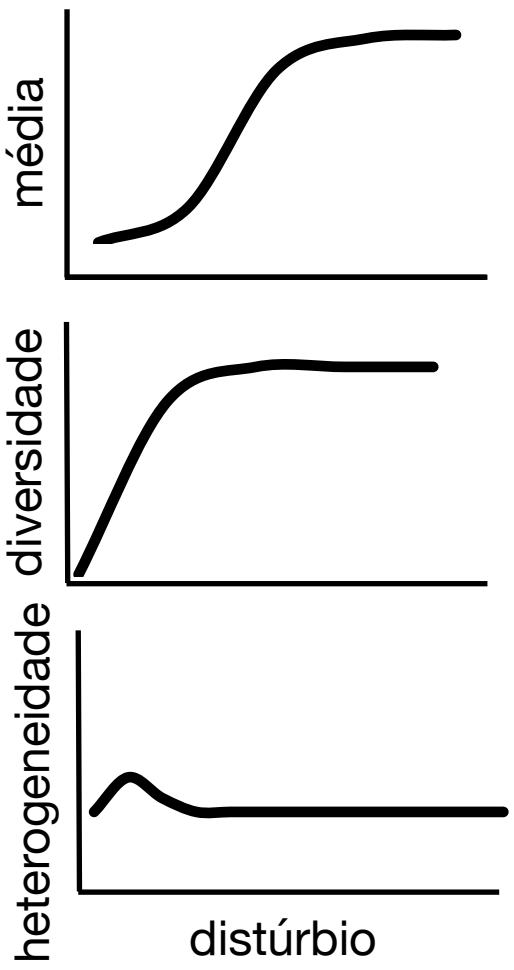


# coexistência de estratégias mediada pelo distúrbio

eco-evolutivo

*storage effect*:

- diferença na reposta ao ambiente

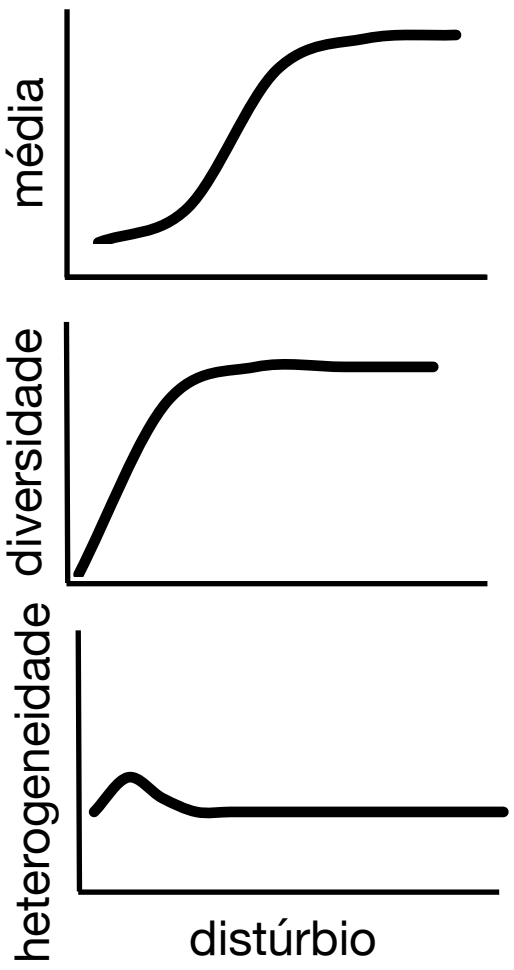


# coexistência de estratégias mediada pelo distúrbio

eco-evolutivo

*storage effect*:

- diferença na reposta ao ambiente
- crescimento populacional tamponado



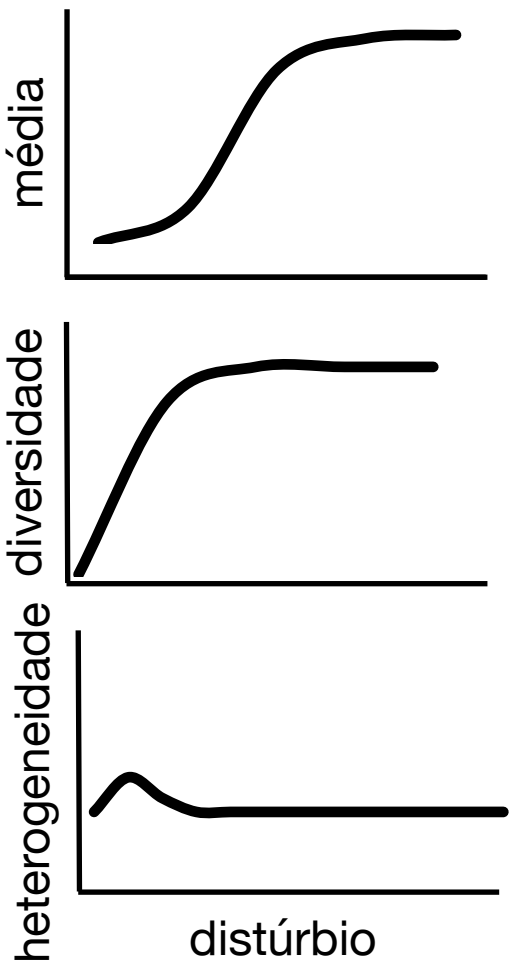
# coexistência de estratégias mediada pelo distúrbio

eco-evolutivo

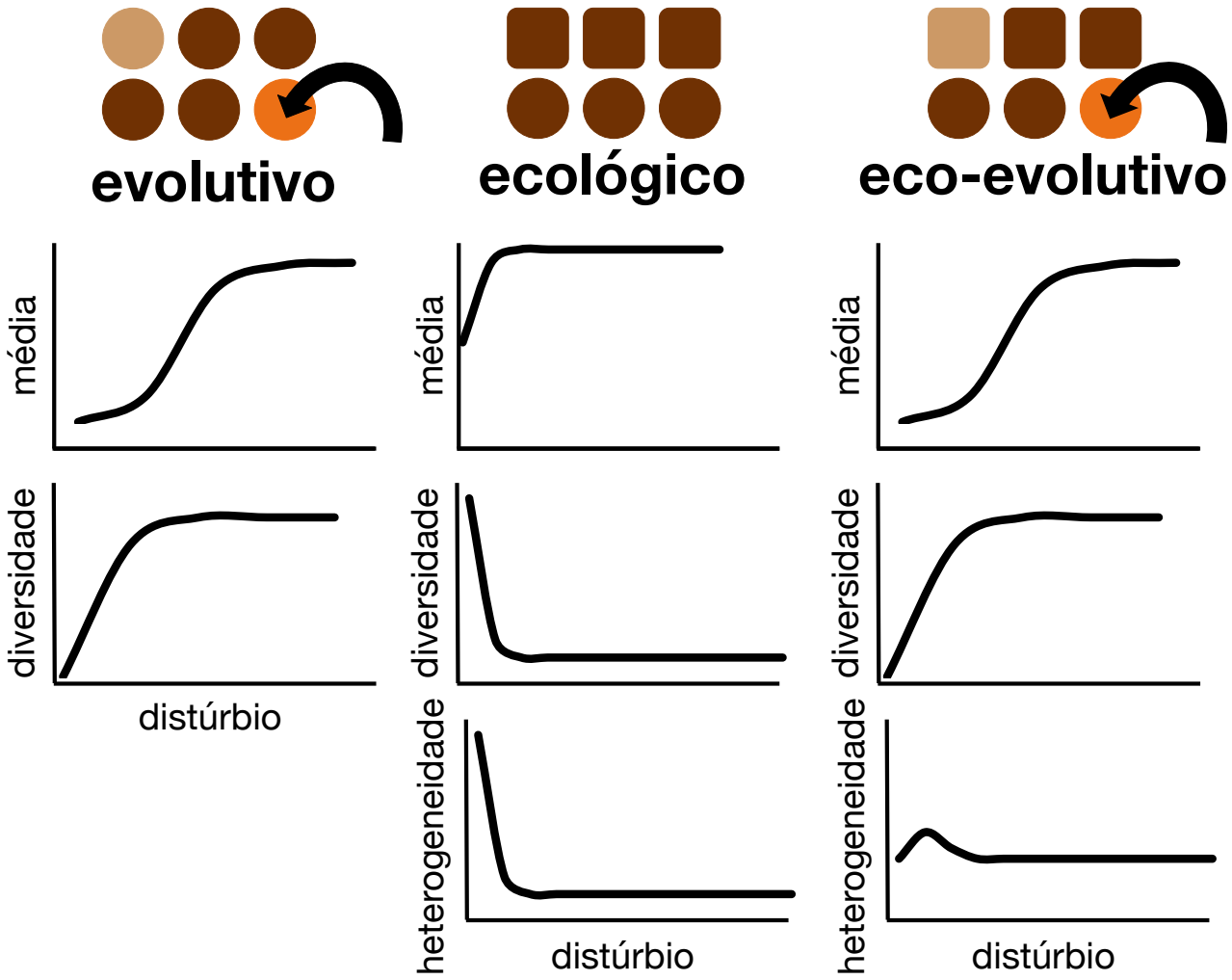
*storage effect*:

- diferença na reposta ao ambiente
  (= isolamento reprodutivo das espécies)

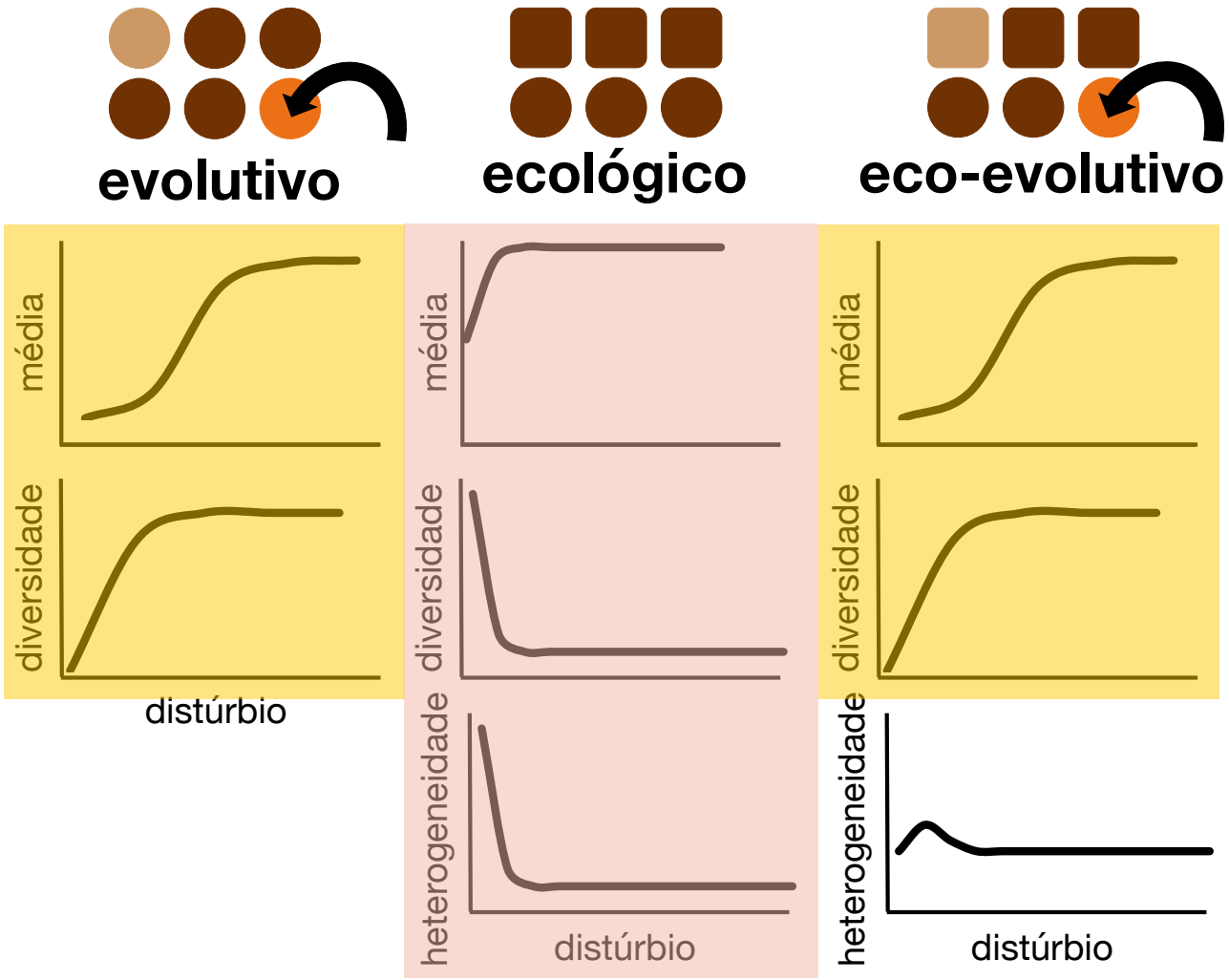
- crescimento populacional tamponado
  (= mutação)



# cenários


evolutivo
ecológico
eco-evolutivo
média
diversidade
distúrbio
média
diversidade
heterogeneidade
distúrbio
média
diversidade
heterogeneidade
distúrbio

# cenários


evolutivo
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diversidade
heterogeneidade
distúrbio
média
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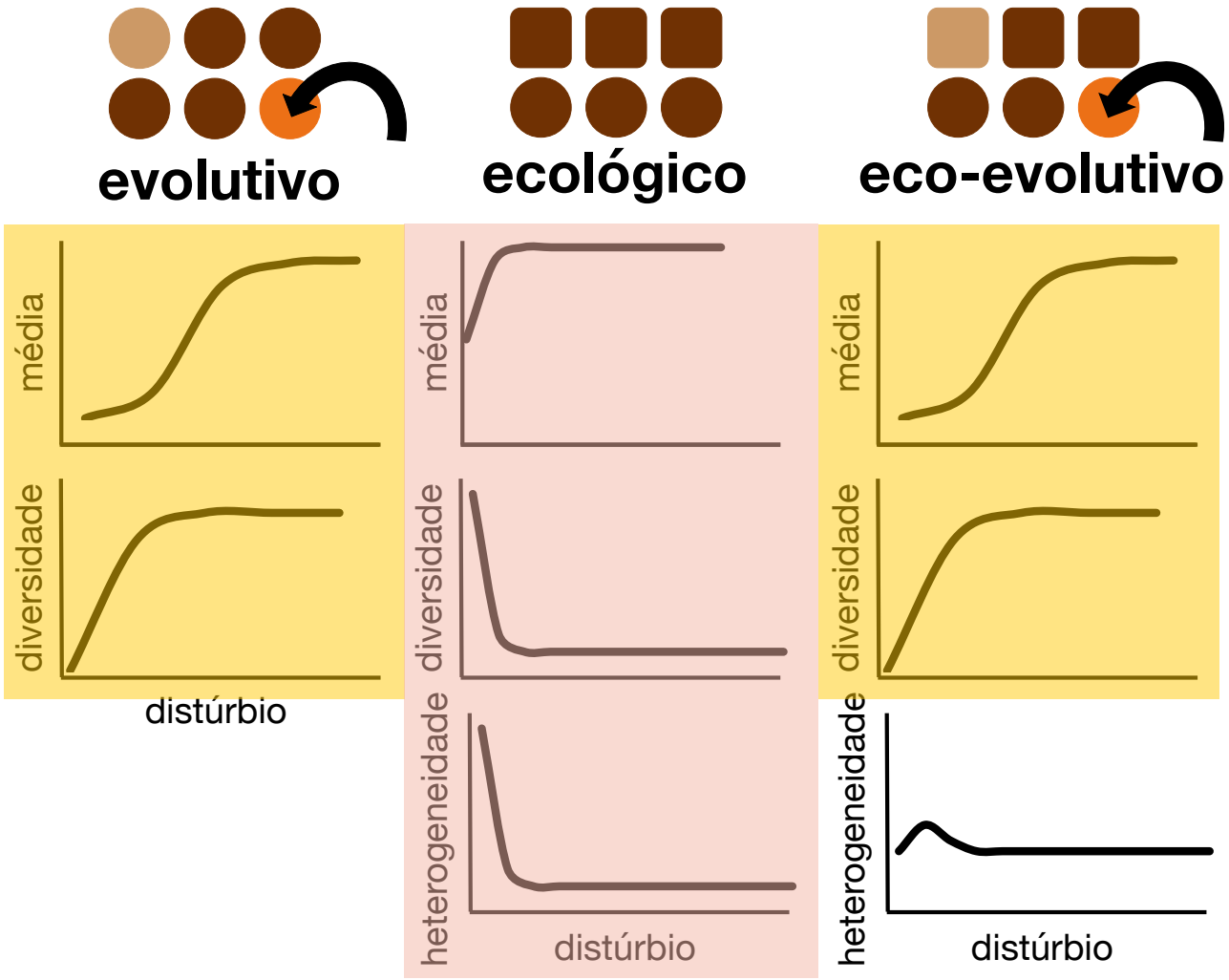
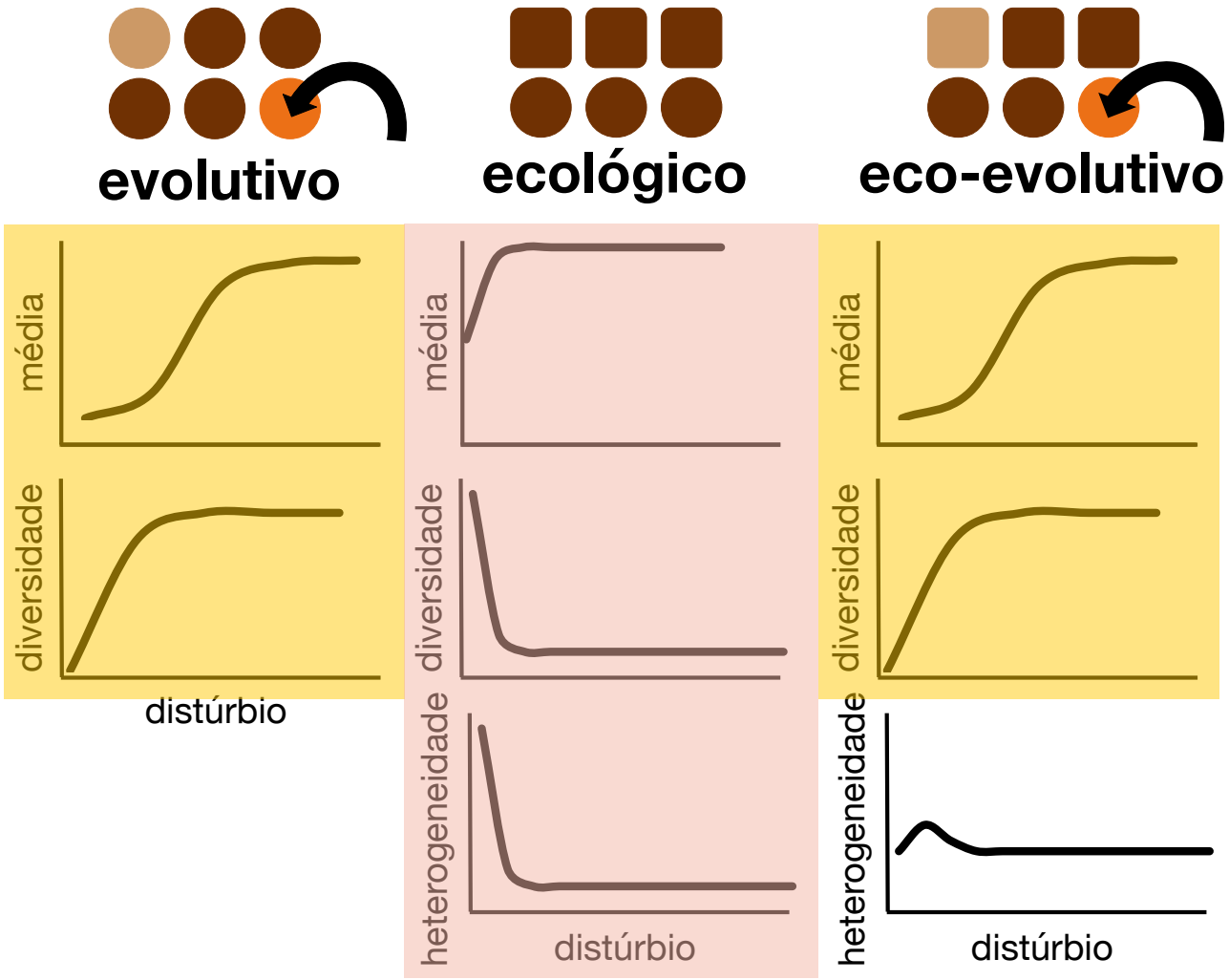
distúrbio

# cenários




# mutação

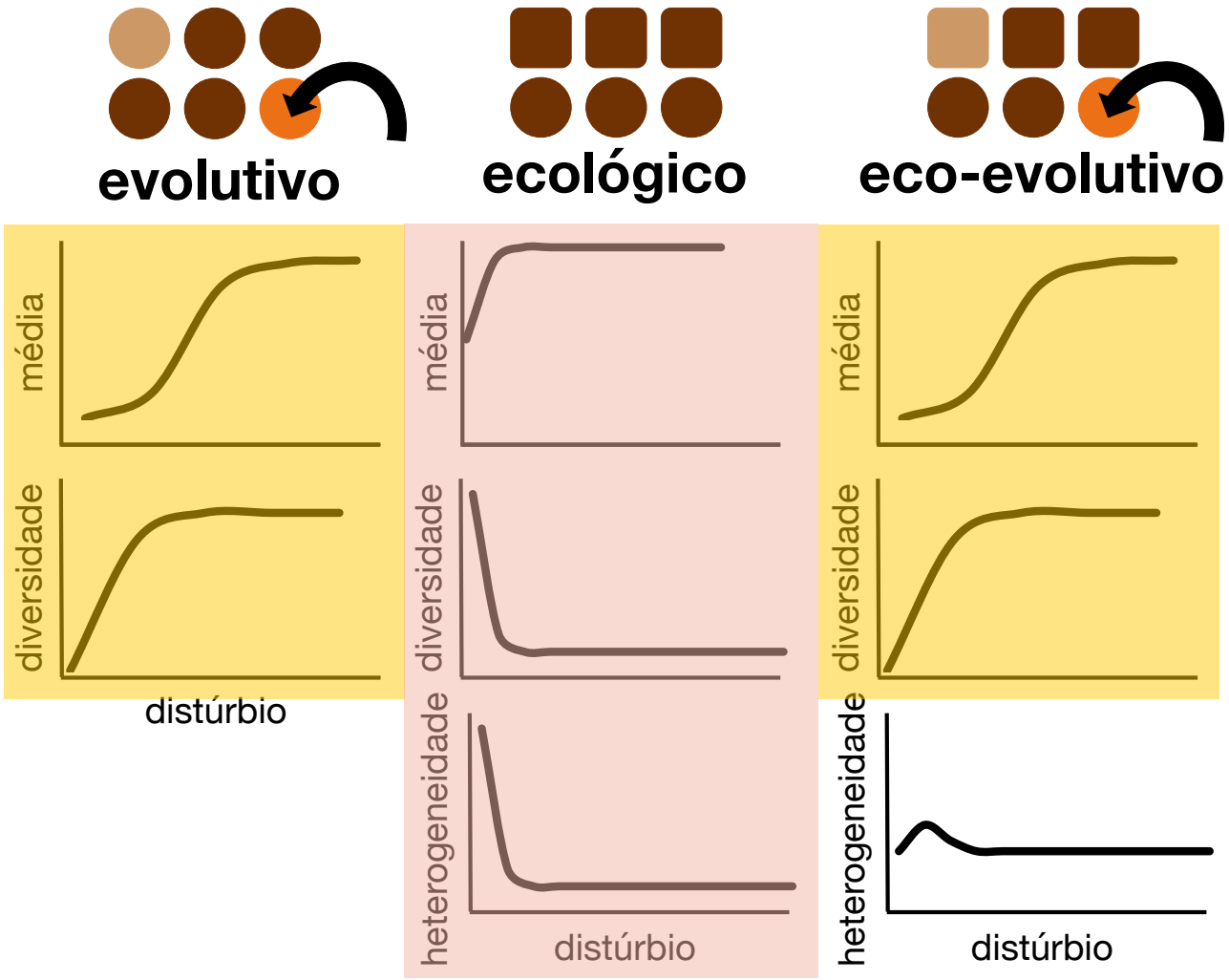
## cenários




## mutação

- é o único processo de entrada de variação (vs. exclusão competitiva e seleção e vs. deriva)

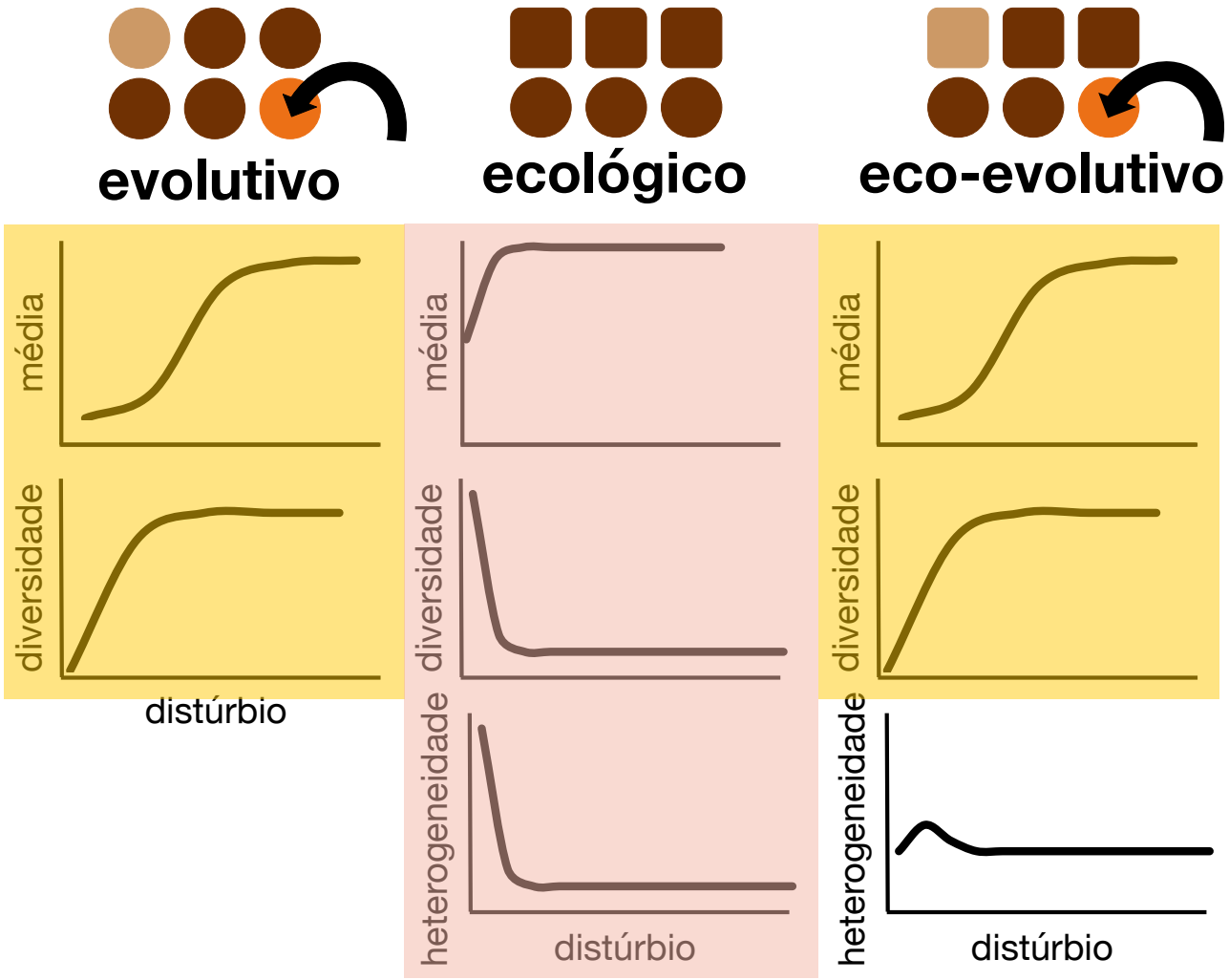
## cenários




## mutação

- é o único processo de entrada de variação (vs. exclusão competitiva e seleção e vs. deriva)
- cria novas estratégias e pode resgatar estratégias extintas ou quase extintas

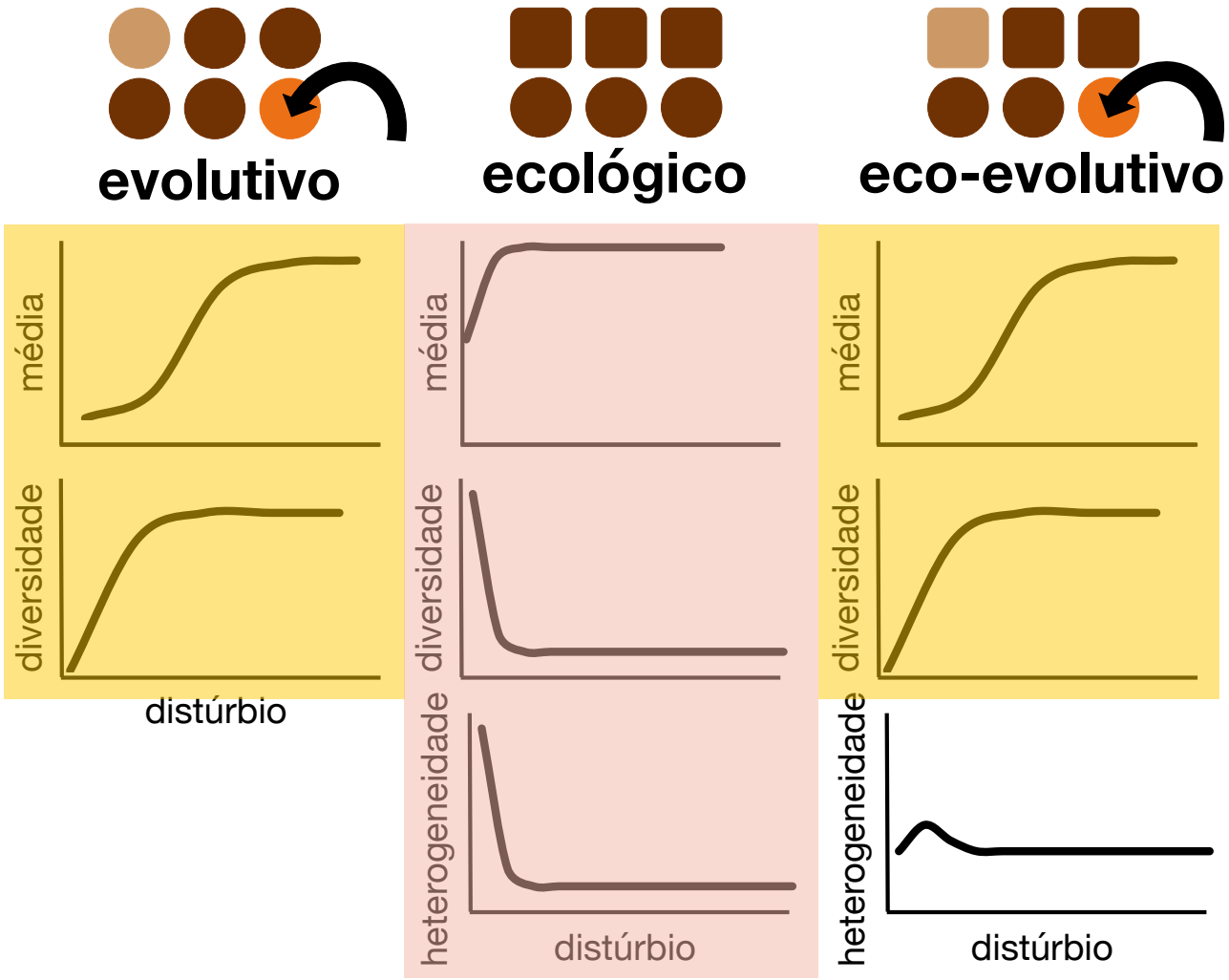
## cenários




## mutação

- é o único processo de entrada de variação (vs. exclusão competitiva e seleção e vs. deriva)
- cria novas estratégias e pode resgatar estratégias extintas ou quase extintas
- permite resposta contínua às pressões variadas ao longo do tempo

# cenários


evolutivo
ecológico
eco-evolutivo
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distúrbio
média
diversidade
heterogeneidade
distúrbio
média
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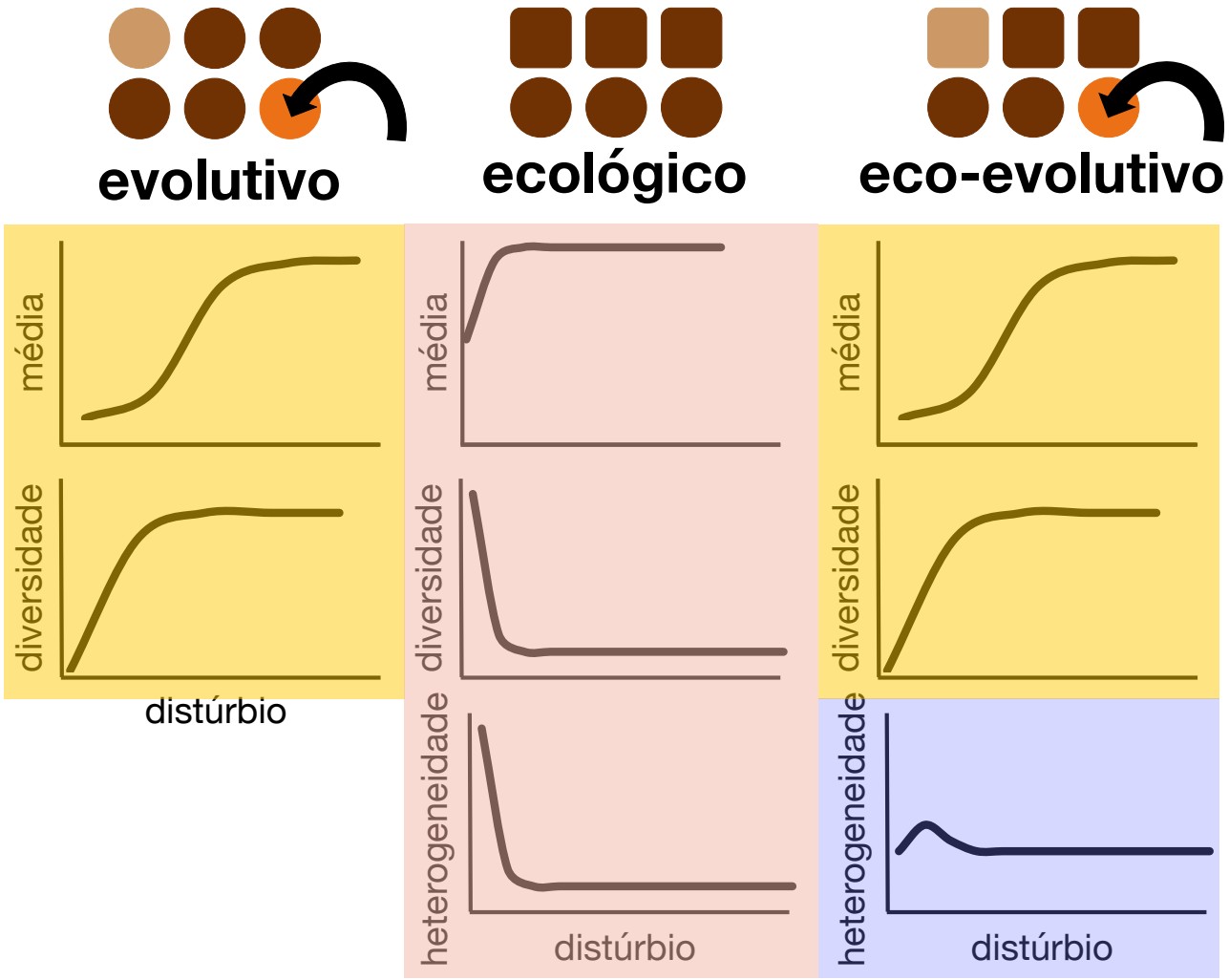
heterogeneidade
distúrbio

# cenários


evolutivo
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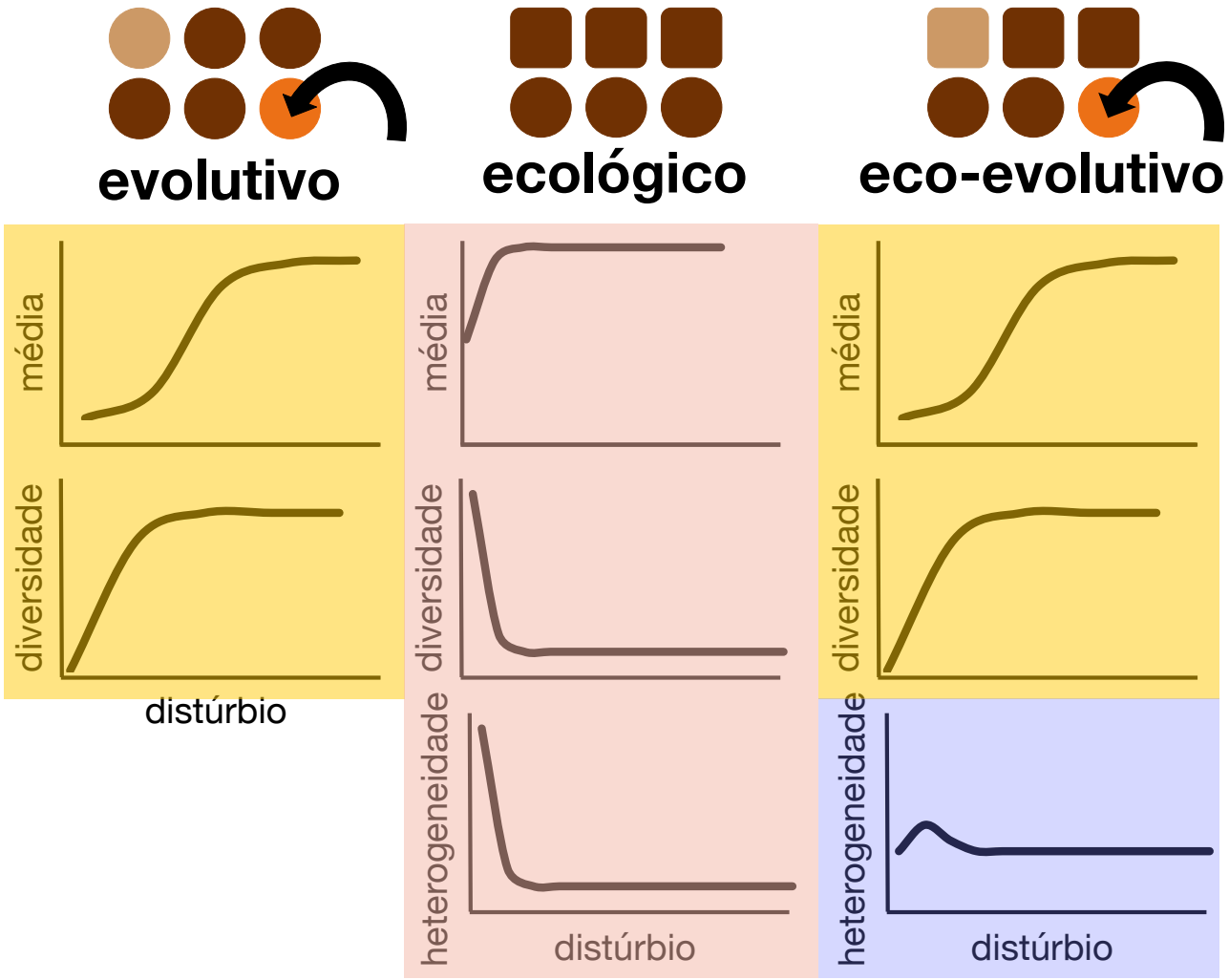
diversidade
distúrbio
média
diversidade
heterogeneidade
distúrbio
média
diversidade
heterogeneidade
distúrbio

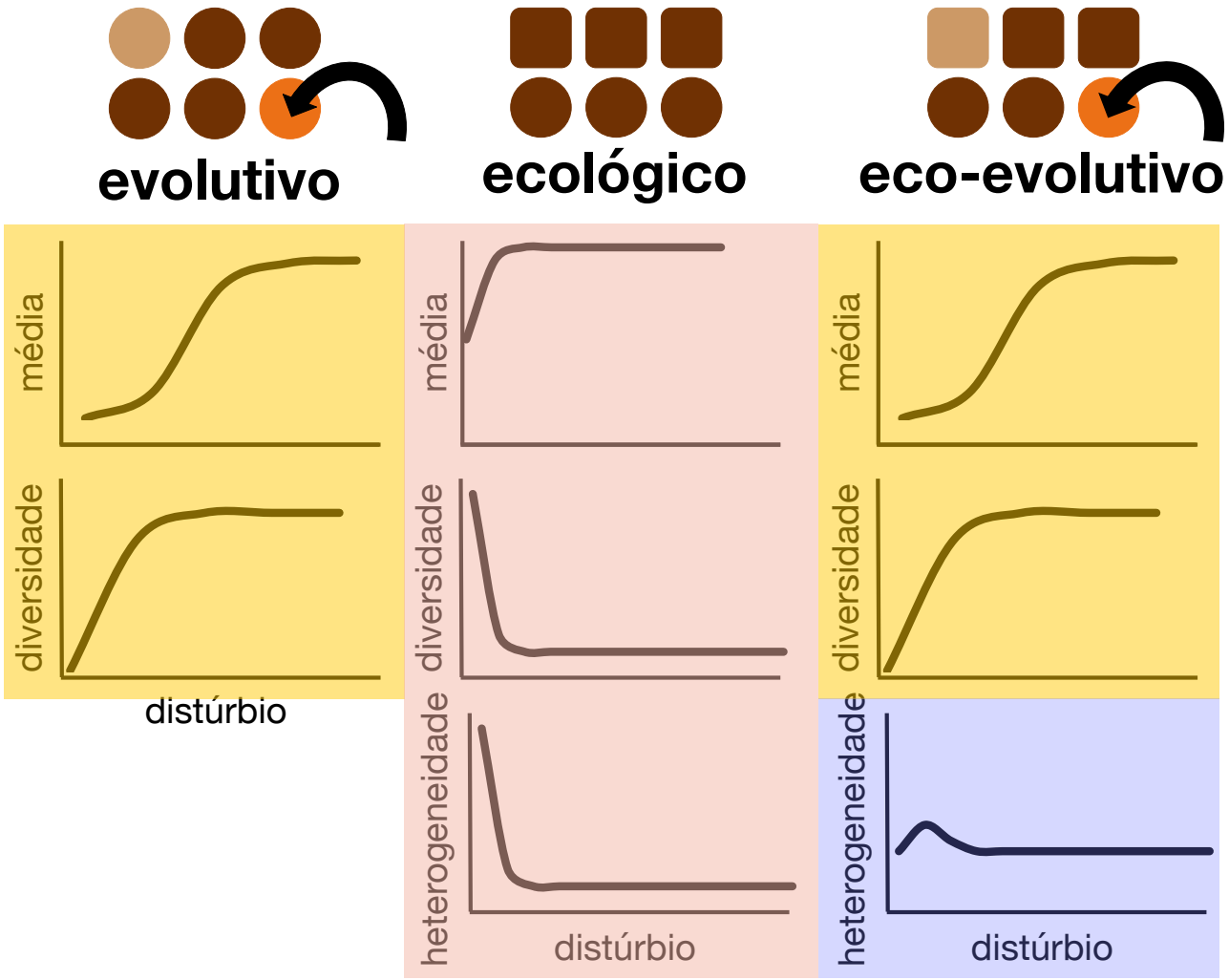
# interação eco-evo

## cenários



# interação eco-evo

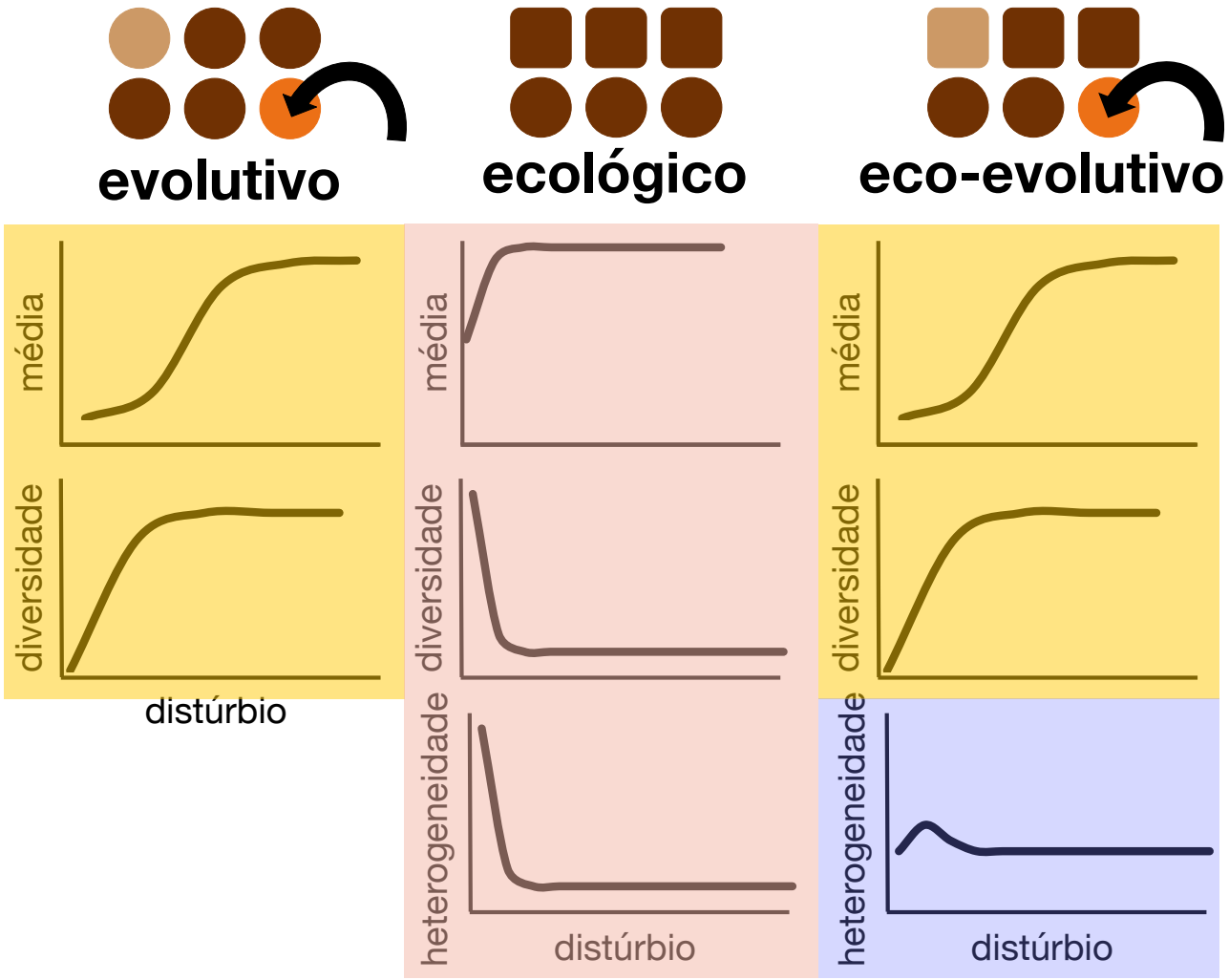
## cenários




- entrada de variação por mutação
- competição entre linhagens isoladas (espécies diferentes)

# interação eco-evo

## cenários




- entrada de variação por mutação
- competição entre linhagens isoladas (espécies diferentes)
- coexistência de estratégias distintas mediadas por distúrbio

# ainda assim…

## Ecologia

- desconsidera adaptação

- possíveis consequências:
  - gerar predições erradas quanto à diversidade
  - relacionar padrões a processos equivocados

# ainda assim…

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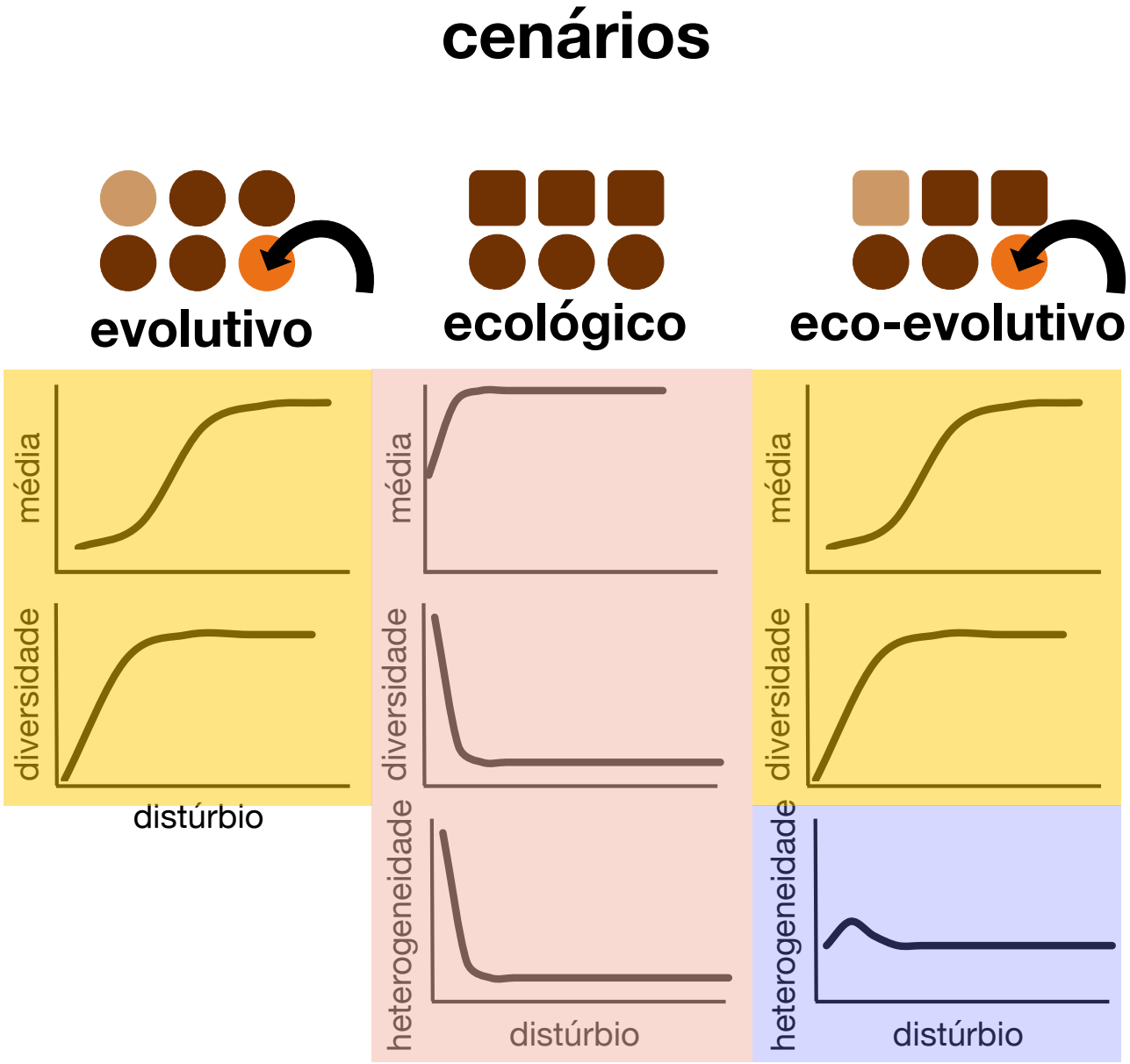
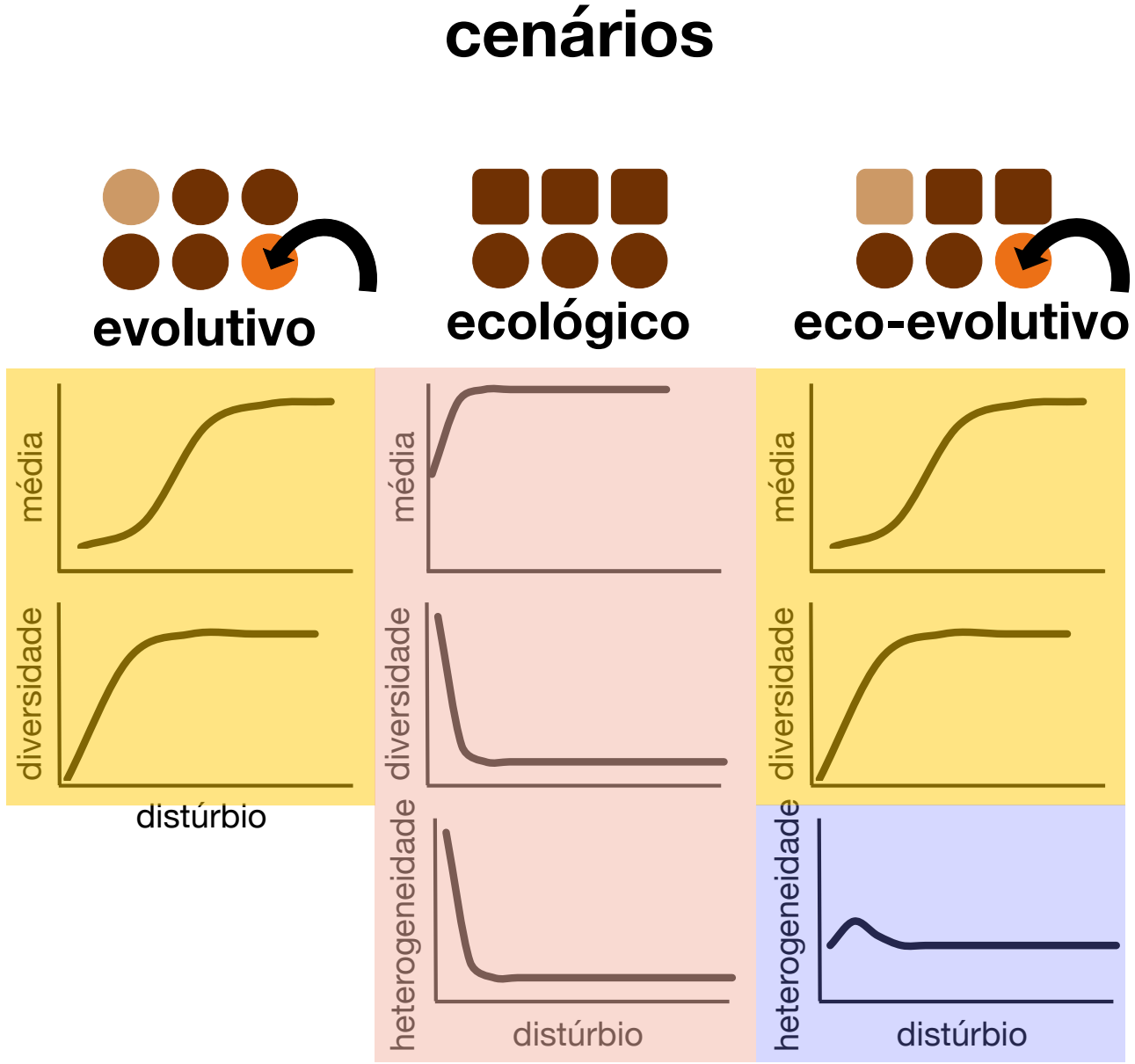


# ainda assim…

## Biologia Evolutiva

- desconsidera contexto multiespecífico
- possíveis consequências:
  - gerar predições erradas quanto à estratégia média das populações
  - não acessar padrões que emergem em escalas maiores

# ainda assim…




## Biologia Evolutiva

- desconsidera contexto multiespecífico
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# conclusões

- 
- 
- 

# conclusões

- efeito do **distúrbio** é *diferente* comparando dinâmicas **ecológicas** e **evolutivas**

-

-

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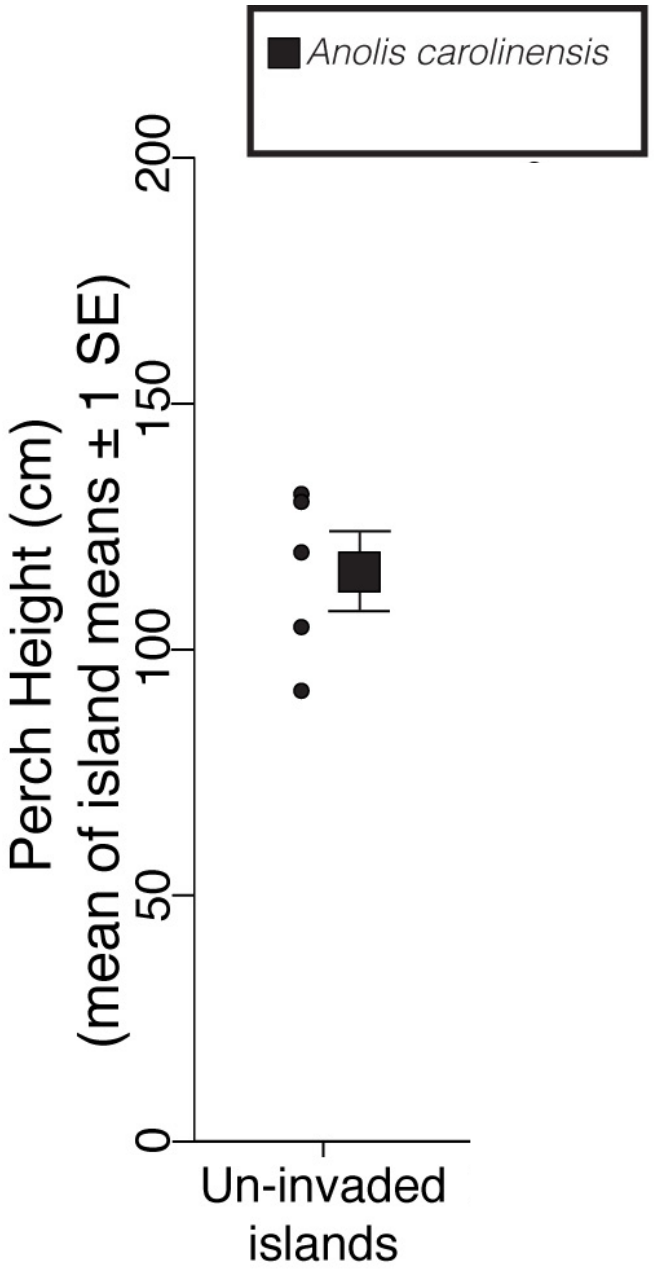
- efeito do **distúrbio** é *diferente* comparando dinâmicas **ecológicas** e **evolutivas**
- há padrões que emergem *apenas* em dinâmicas **eco-evolutivas**
-

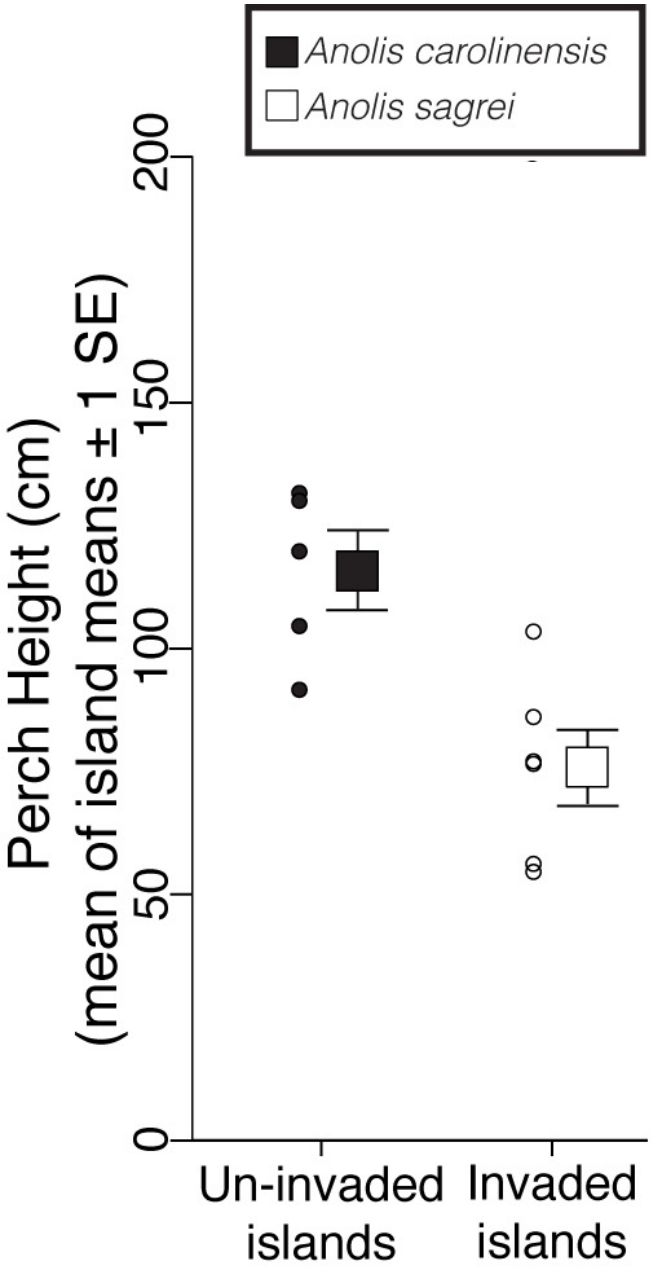
# conclusões

- efeito do **distúrbio** é *diferente* comparando dinâmicas **ecológicas** e **evolutivas**
- há padrões que emergem *apenas* em dinâmicas **eco-evolutivas**
- o **distúrbio** deve ser estudado em dinâmicas **eco-evolutivas**

# logo…


Anolis carolinensis
Perch Height (cm)
(mean of island means ± 1 SE)
0
50
100
150
200
Un-invaded
islands

# logo…


Anolis carolinensis
Anolis sagrei
Perch Height (cm)
(mean of island means ± 1 SE)
0
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100
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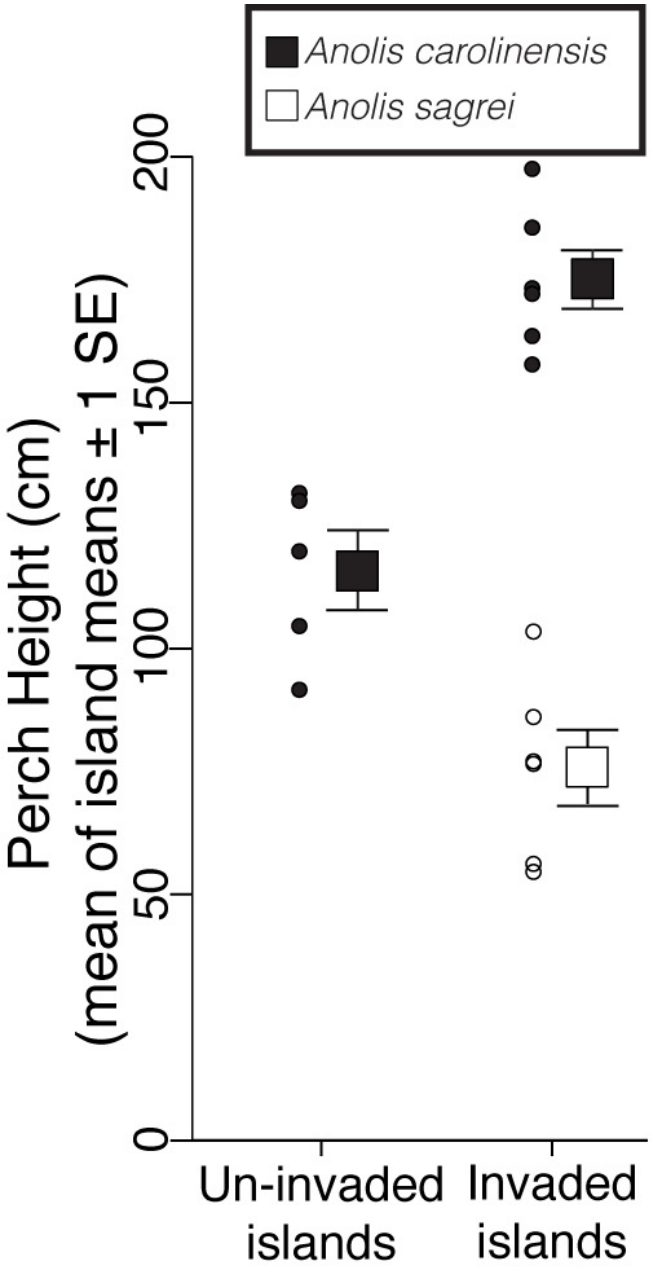
Invaded islands

# logo…


Anolis carolinensis
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