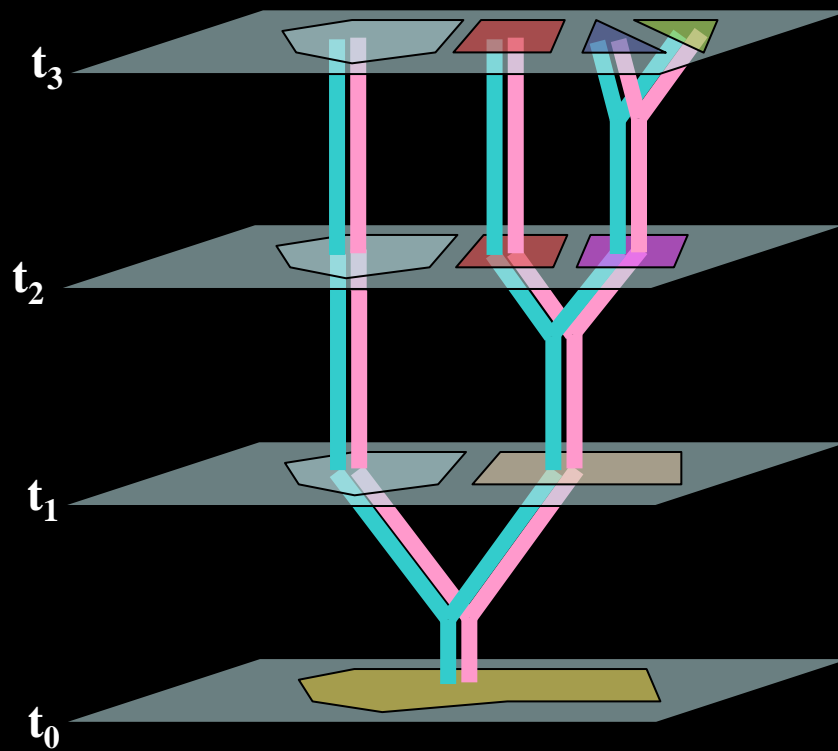


# EXERCÍCIO DE BIOGEOGRAFIA



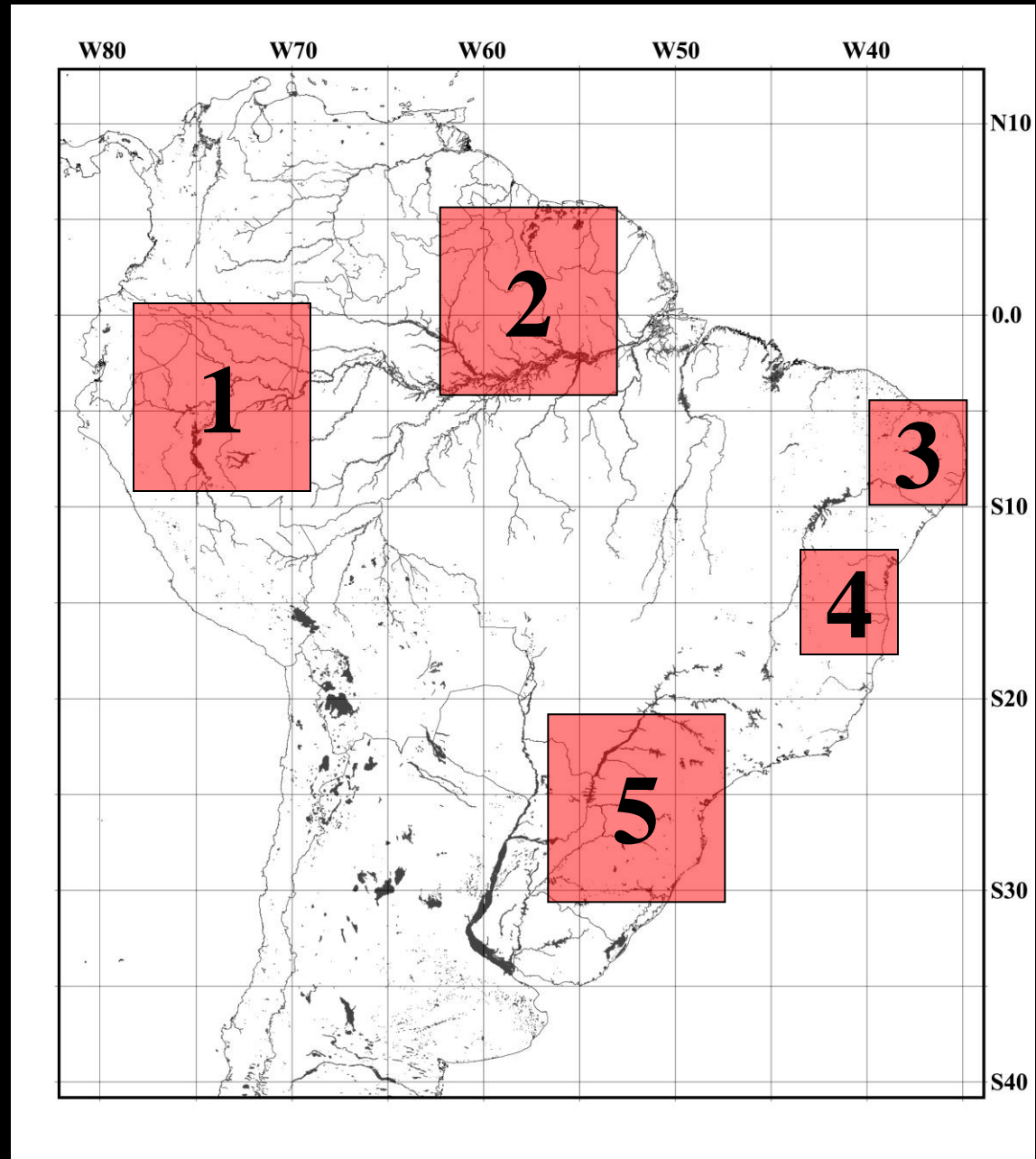
# Exercício 9

## Comparação dos traçados individuais

Áreas de ocorrência das espécies dos gêneros *Grus* e *Punctipetalum*

*Grus maculatus*  
*Grus longimanus*  
*Grus nambiguasu*  
*Grus bicornutus*

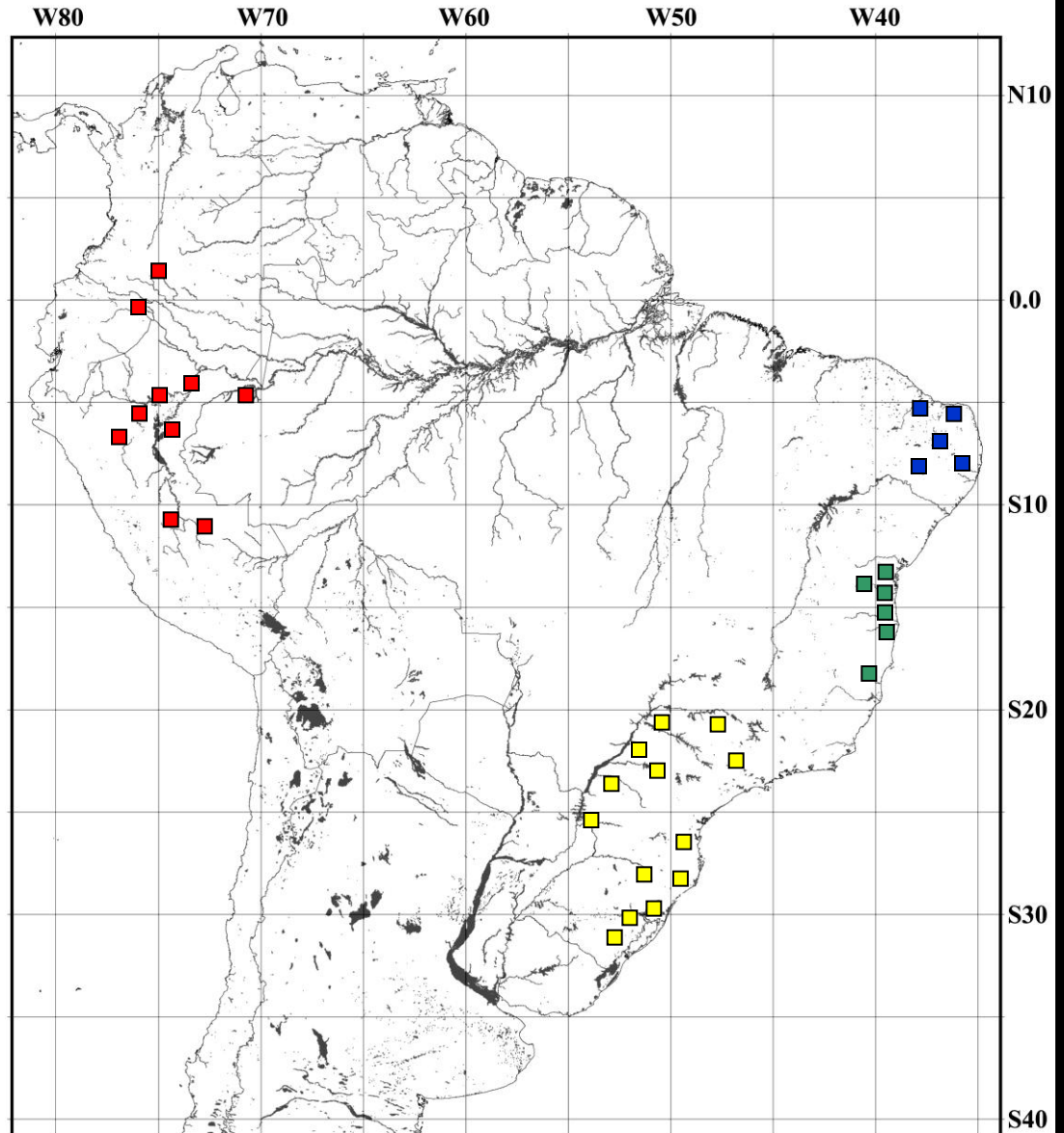
*Punctipetalum tuberosum*  
*P. rubrum*  
*P. dentatum*  
*P. brasiliense*



# Exercício 9

## Distribuição das espécies do gênero *Grus*

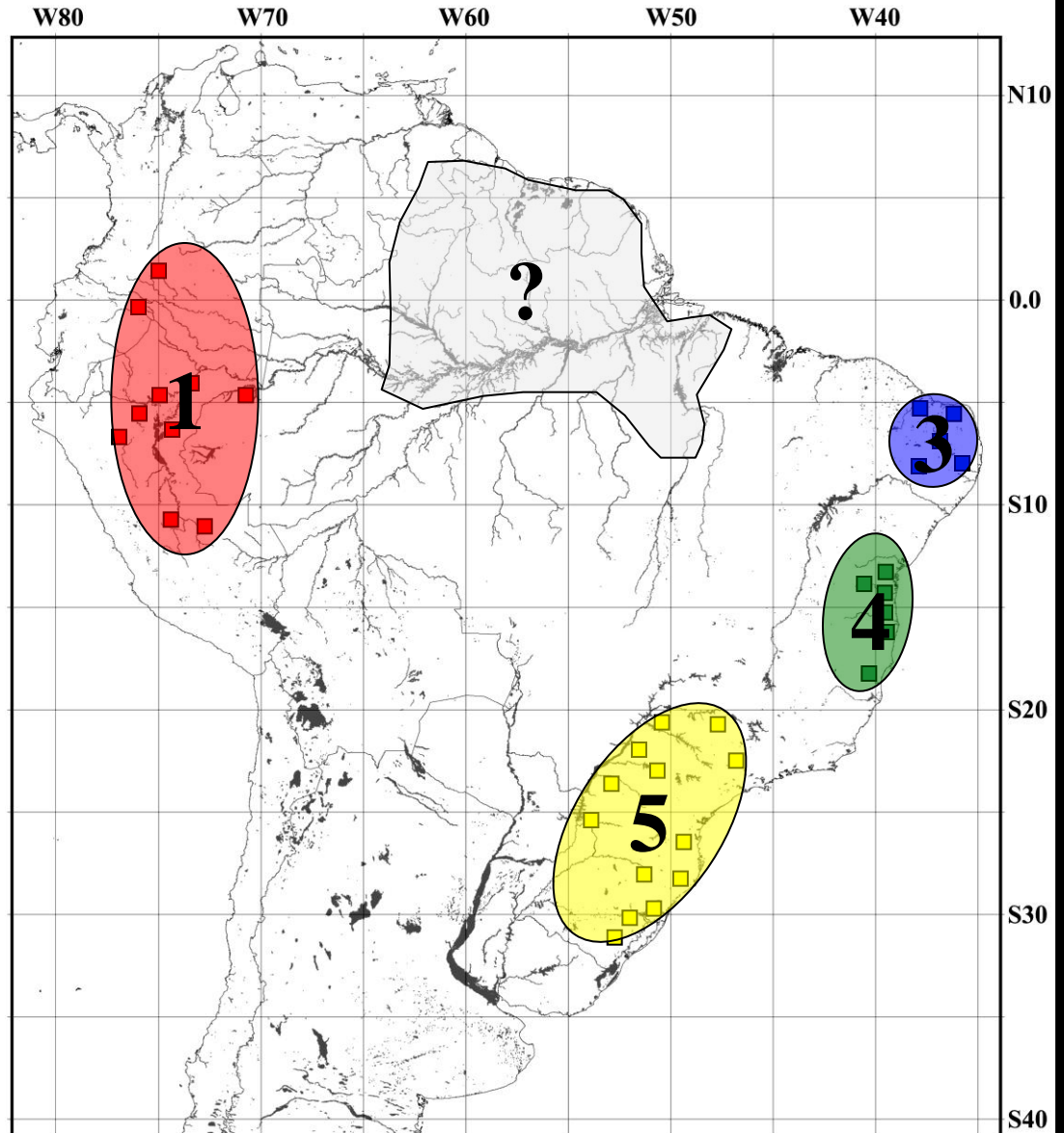
- *Grus maculatus*
- *Grus longimanus*
- *Grus nambiguasu*
- *Grus bicornutus*



# Exercício 9

Traçados individuais  
das espécies do gênero  
*Grus*

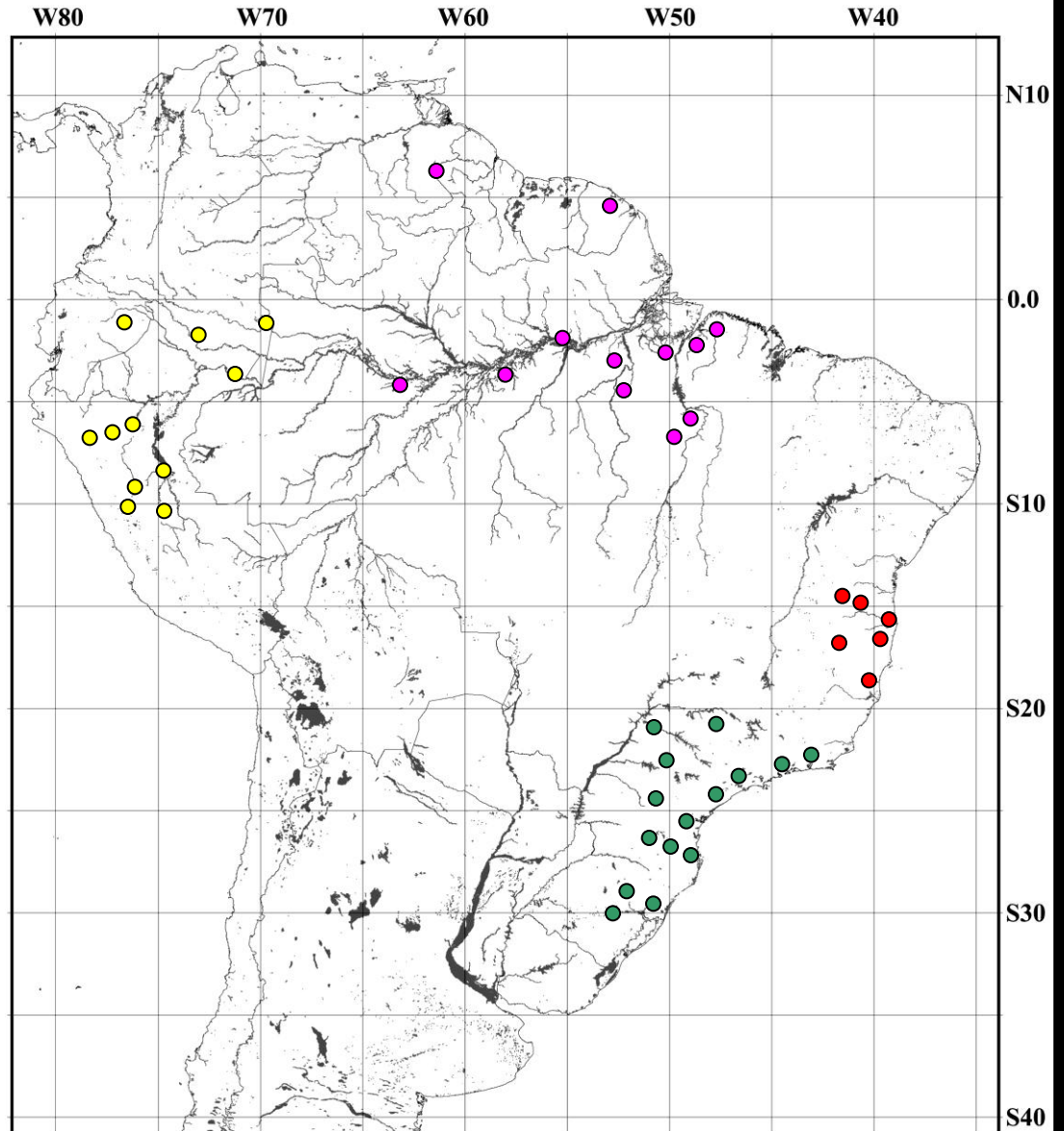
- *Grus maculatus*
- *Grus longimanus*
- *Grus nambiguasu*
- *Grus bicornutus*



# Exercício 9

## Distribuição das espécies do gênero *Punctipetalum*

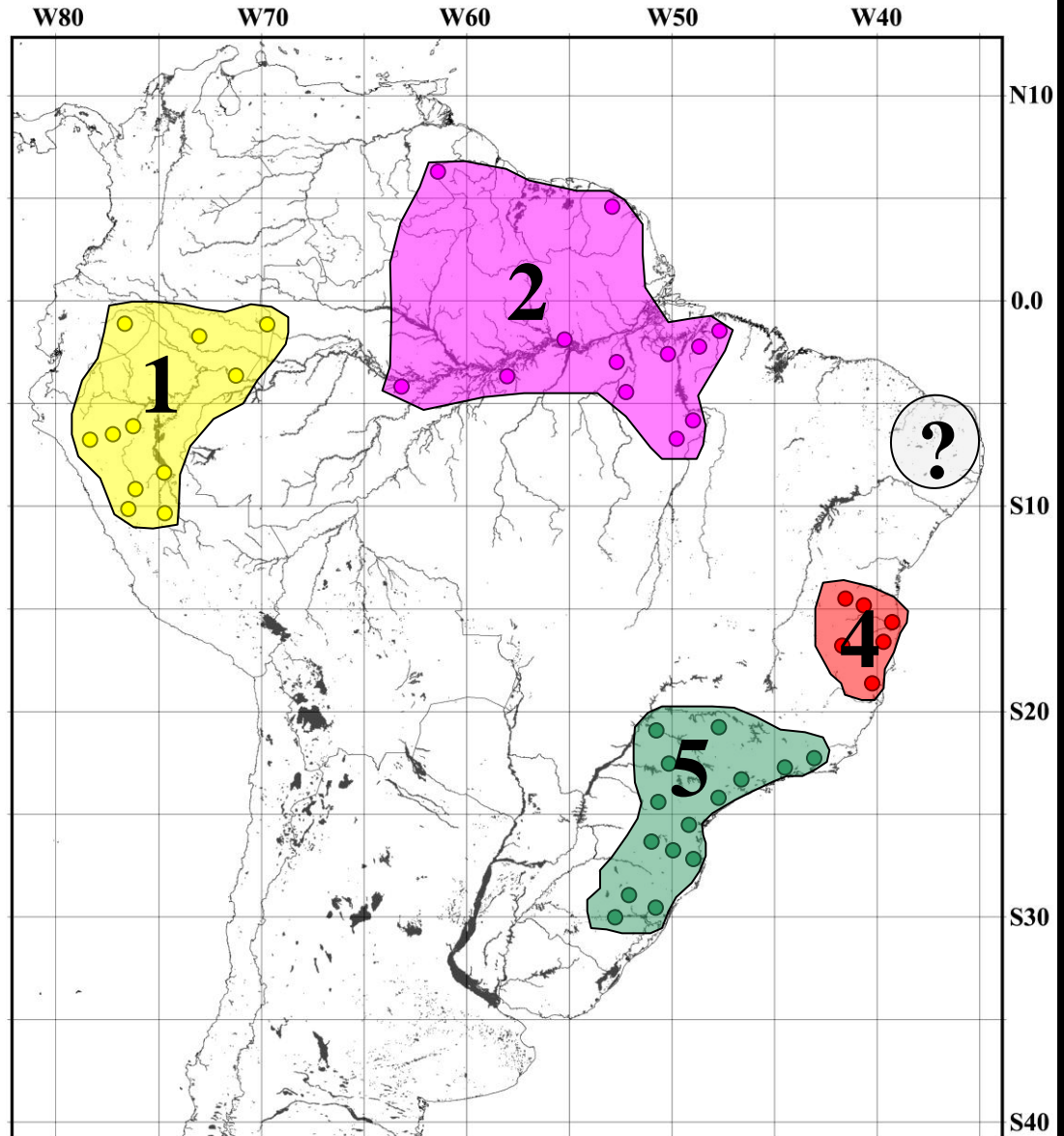
- *P. tuberosum*
- *P. rubrum*
- *P. dentatum*
- *P. brasiliense*



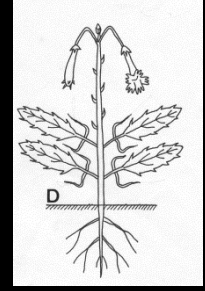
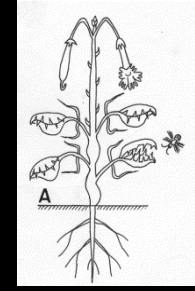
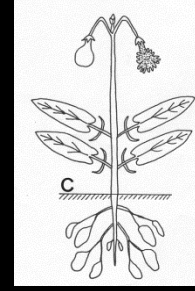
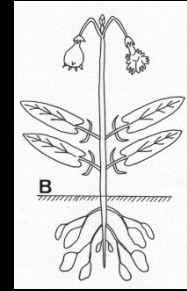
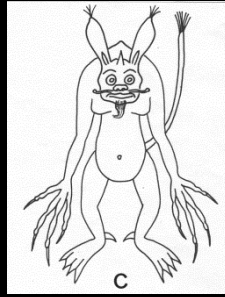
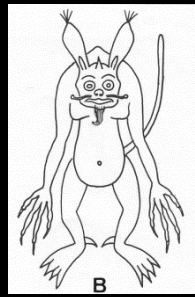
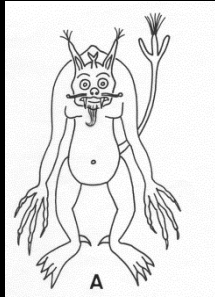
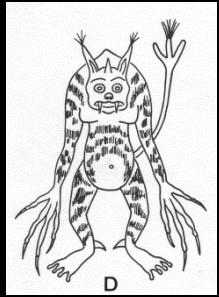
# Exercício 9

Traçados individuais  
das espécies do gênero  
*Punctipetalum*

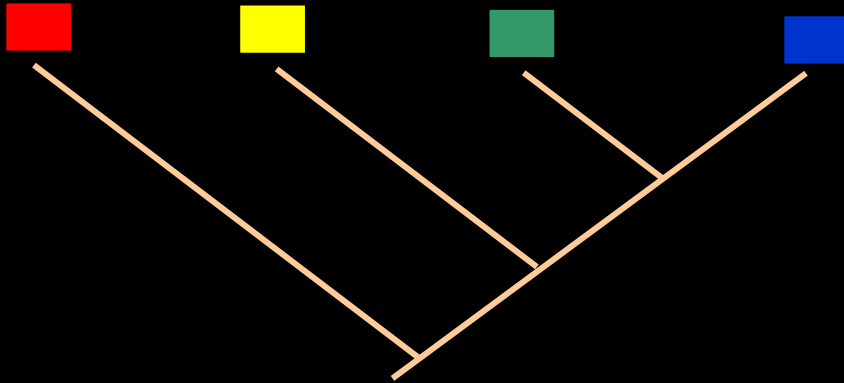
- *P. tuberosum*
- *P. rubrum*
- *P. dentatum*
- *P. brasiliense*



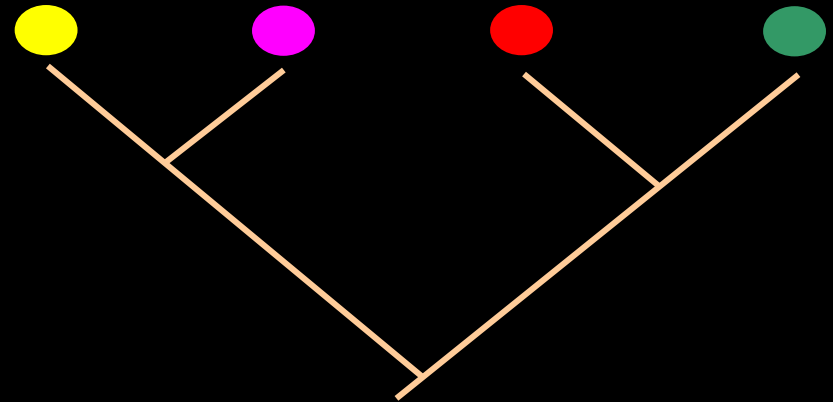
# Exercício 10



*G. maculatus*   *G. bicornutus*   *G. nambiguasu*   *G. longimanus*   *P. tuberosum*   *P. rubrum*   *P. dentatum*   *P. brasiliense*



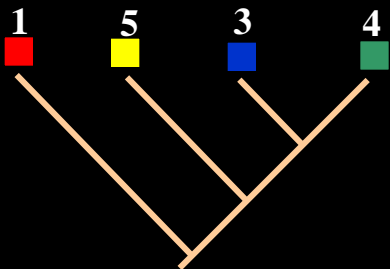
*Grus*



*Punctipetalum*

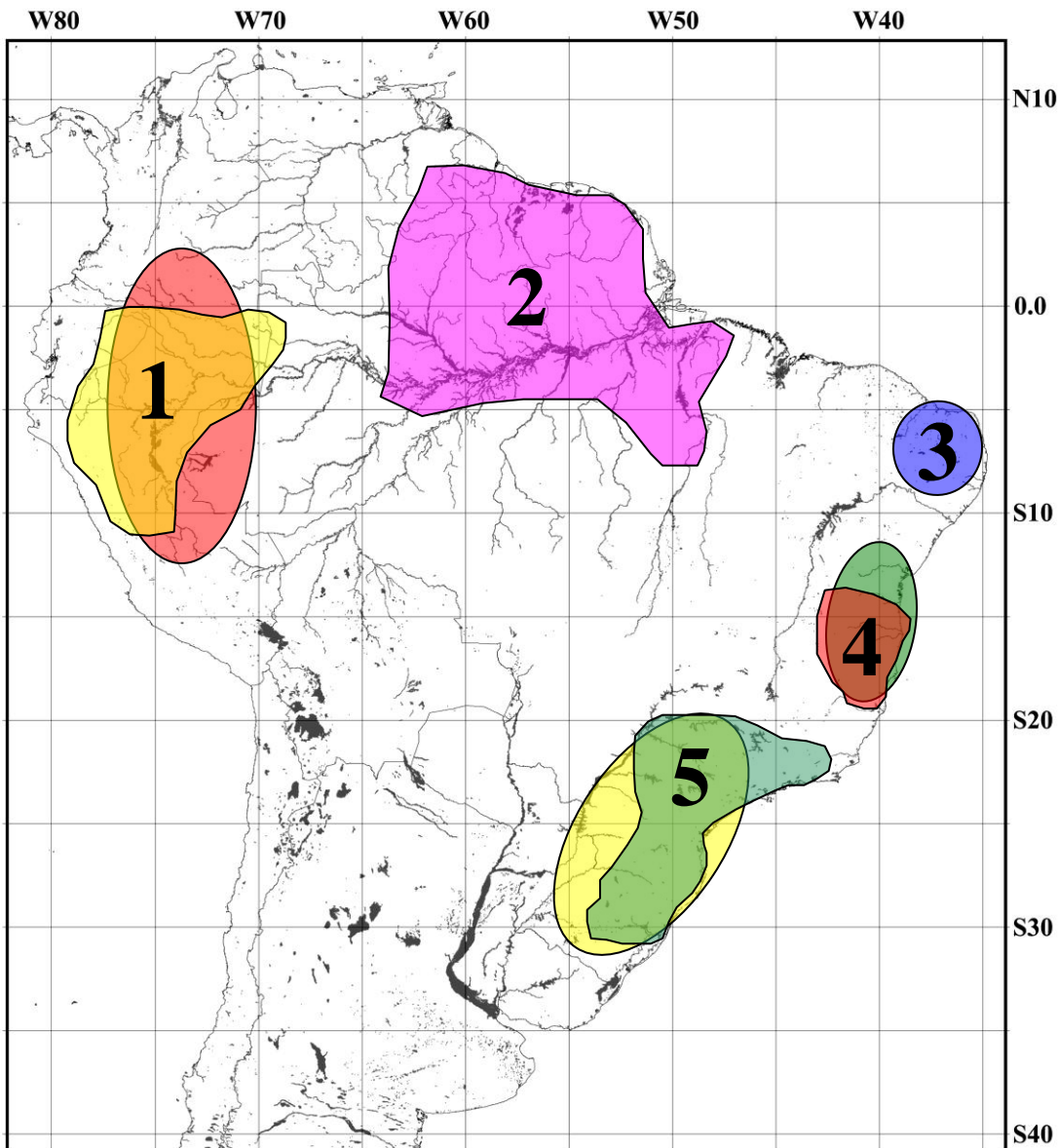
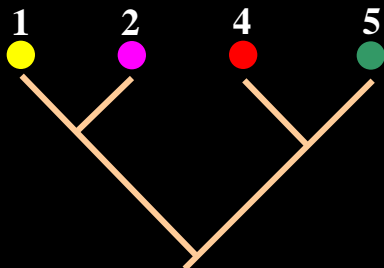
# Exercício 10

- *Grus maculatus*
- *Grus longimanus*
- *Grus nambiguasu*
- *Grus bicornutus*



Cladogramas de área

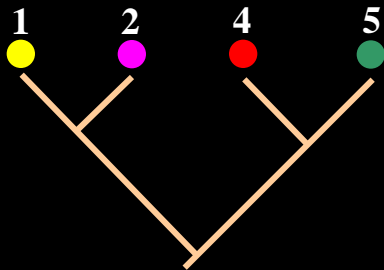
- *P. tuberosum*
- *P. rubrum*
- *P. dentatum*
- *P. brasiliense*



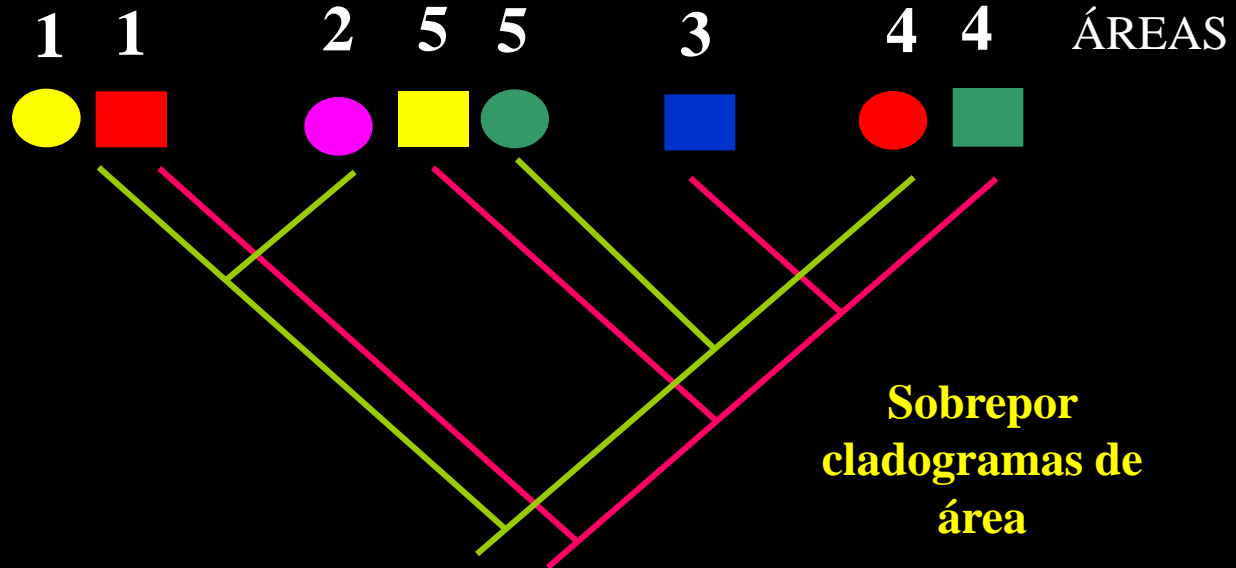
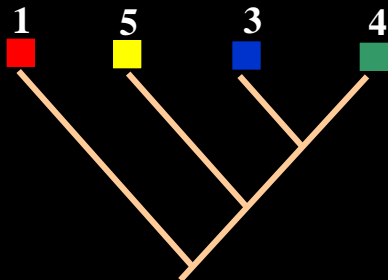


# Exercício 10: CLADOGRAMA REDUZIDO DE ÁREA

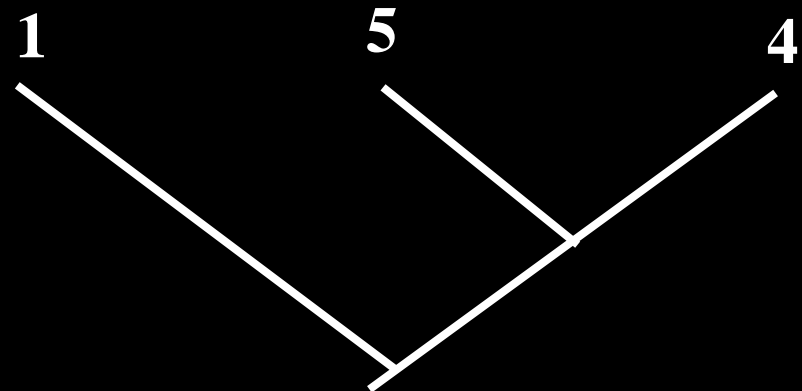
- *P. tuberosum*
- *P. rubrum*
- *P. dentatum*
- *P. brasiliense*



- *Grus maculatus*
- *Grus longimanus*
- *Grus nambiguasu*
- *Grus bicornutus*



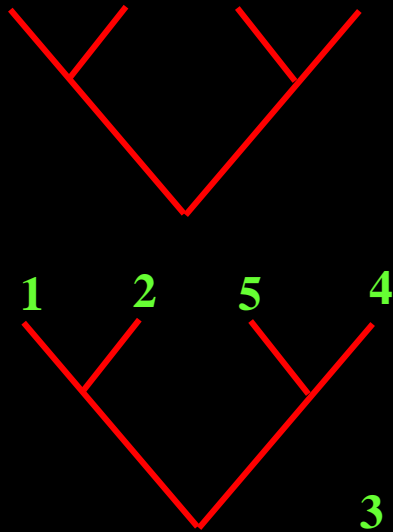
**Retirar elementos incongruentes 2 e 3**  
 Cladograma reduzido de área



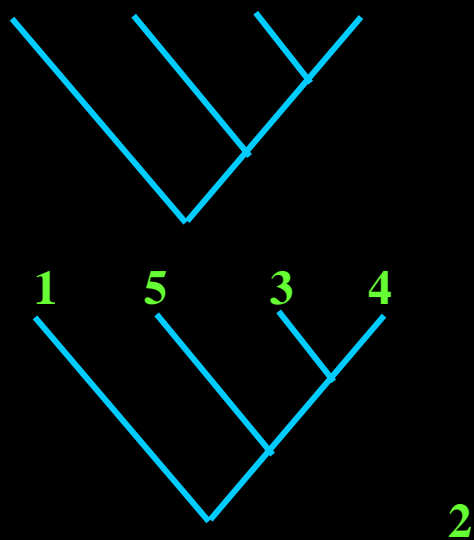
# Exercício 10 ANÁLISE DE COMPONENTES

1. Substituir nomes dos terminais pela áreas de ocorrência dos gêneros *Punctipetalum* e *Grus*.

*P.tub* *P.rub* *P.bra* *P.den*

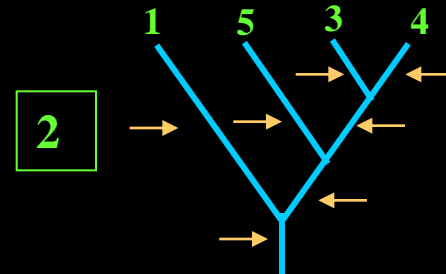
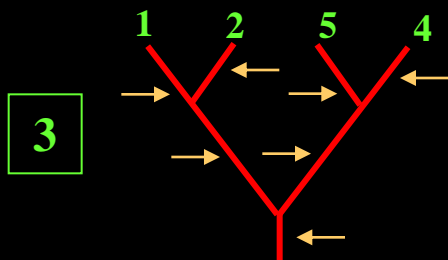


*G.mac* *G.bic* *G.nam* *G.lon*



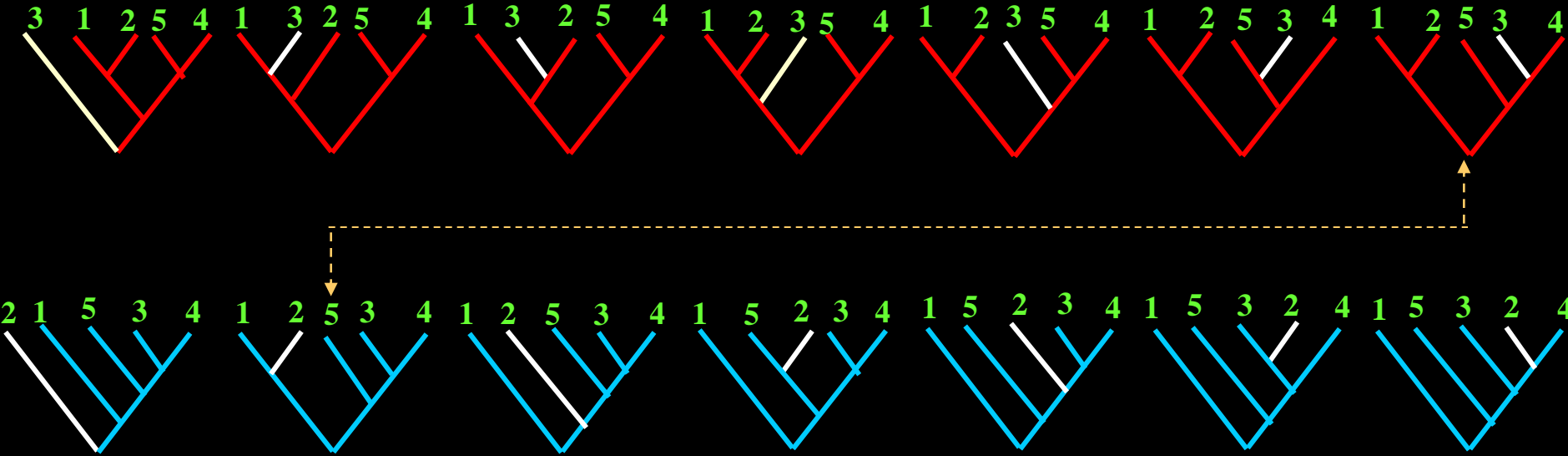
2. Anotar as áreas ausentes em cada cladograma: 2 e 3

3. Verificar onde podem ser inseridas as áreas ausentes

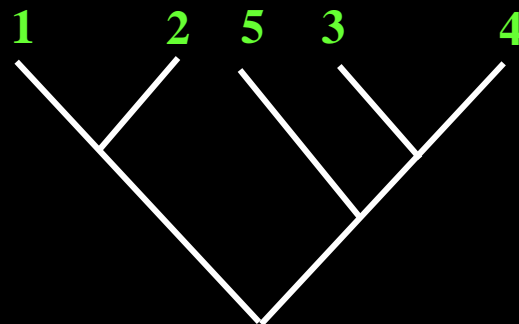


# Exercício 10 ANÁLISE DE COMPONENTES

## 4. Construir os cladogramas individuais possíveis

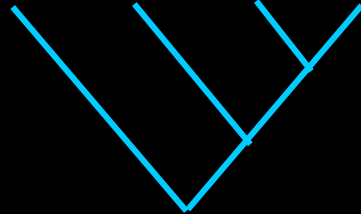


**5. O Cladograma Geral de Área será aquele que representar a intersecção dos cladogramas individuais**

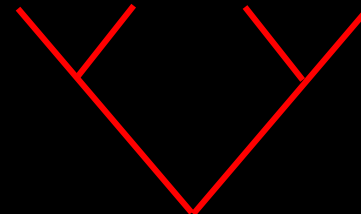


# Exercício 10 ANÁLISE DE PARCIMÔNIA DE BROOKS - BPA

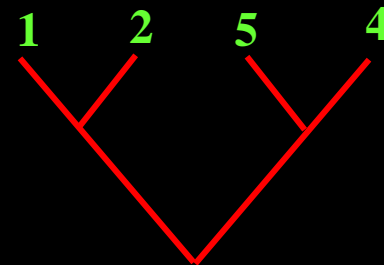
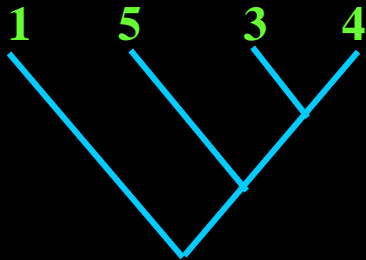
*G.mac* *G.bic* *G.nam* *G.lon*



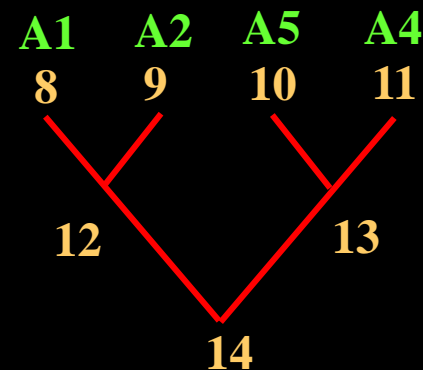
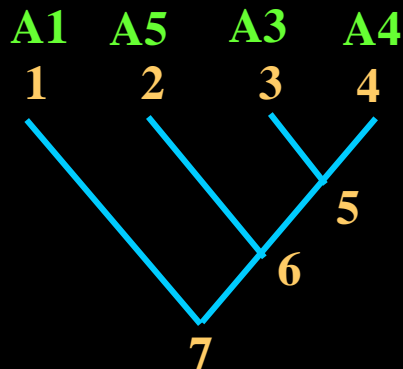
*P.tub* *P.rub* *P.bra* *P.den*



1. Substituir os nomes dos terminais pelos códigos das áreas onde ocorrem

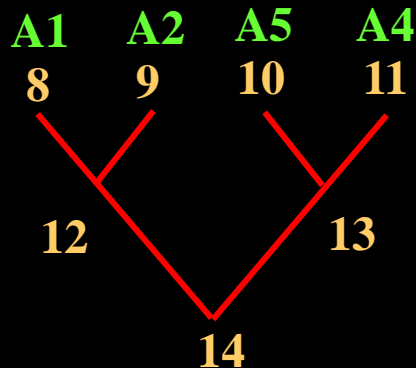
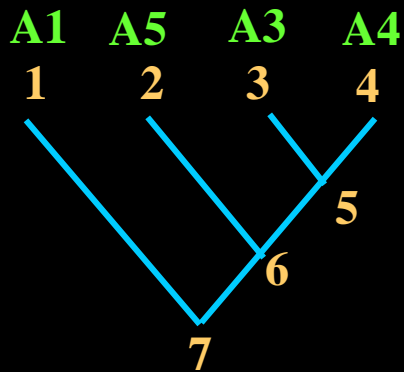


2. Enumerar todos os ramos internos e externos (grupos monofiléticos)



# Exercício 10 ANÁLISE DE PARCIMÔNIA DE BROOKS - BPA

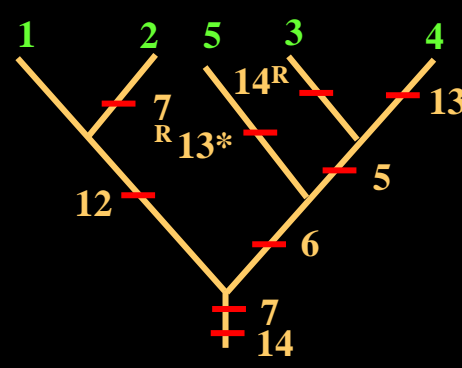
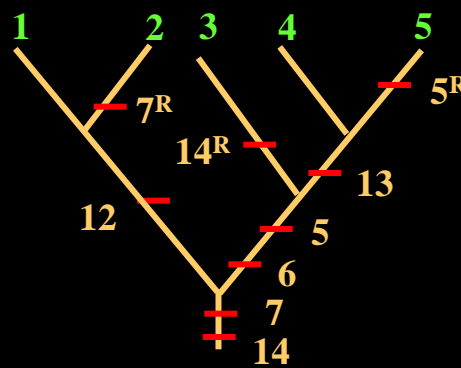
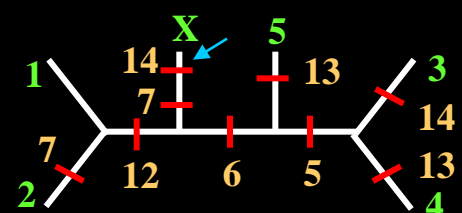
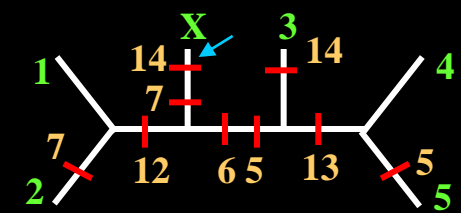
3. Construir uma matriz de representação com base na informação fornecida pelos cladogramas de área: presença (1) ou ausência (0).



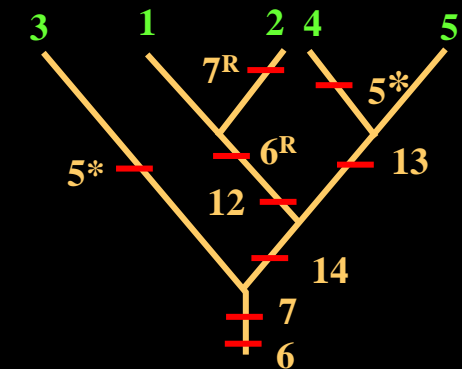
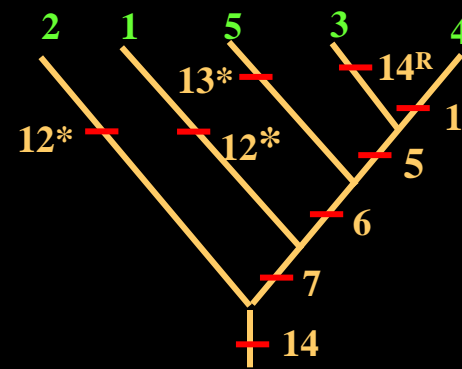
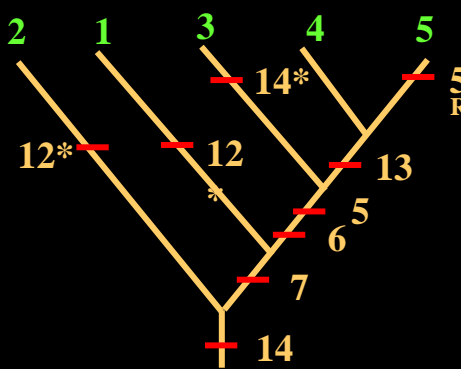
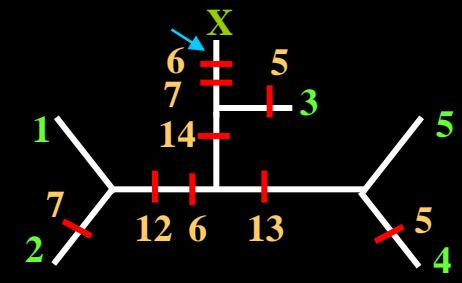
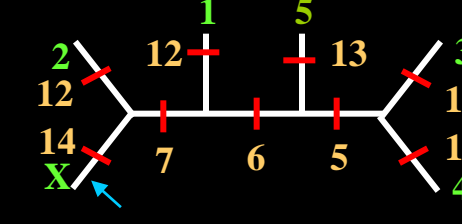
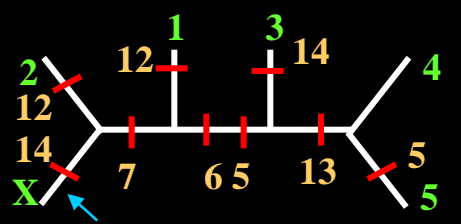
	5	6	7	12	13	14
A1	0	0	1	1	0	1
A2	0	0	0	1	0	1
A3	1	1	1	0	0	0
A4	1	1	1	0	1	1
A5	0	1	1	0	1	1
X	0	0	0	0	0	0
	34	345	1345	12	45	1245

4. Análise cladística com base na matriz de representação

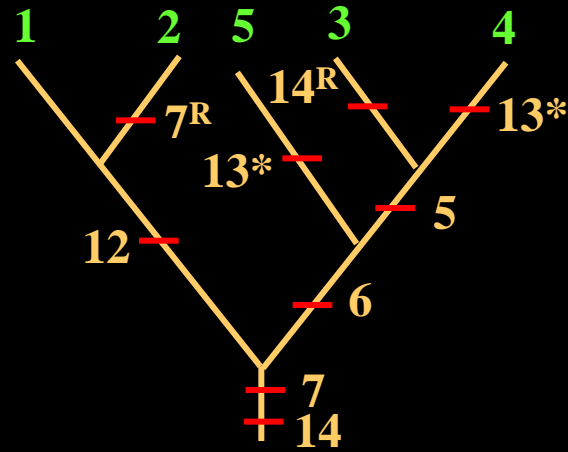
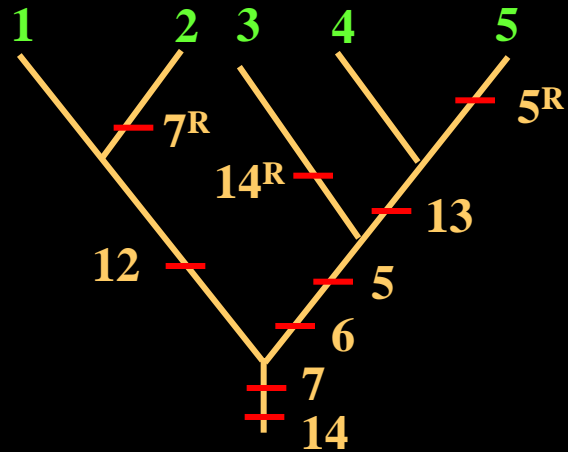
# EX. 10 - BPA 4. Análise cladística com base na matriz de representação



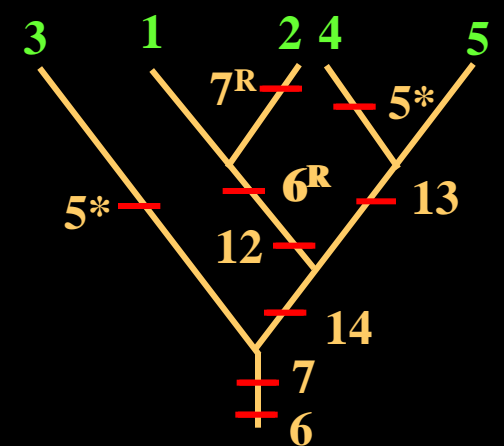
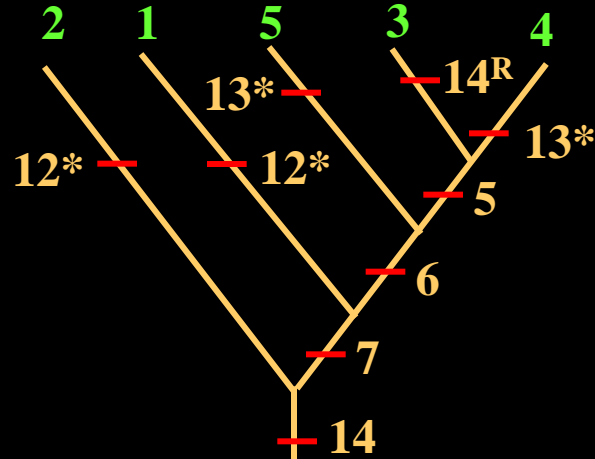
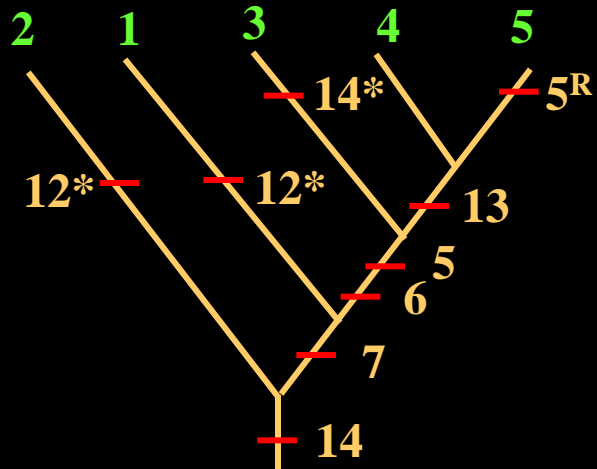
	5	6	7	1	1	1
				2	3	4
<b>A1</b>	0	0	1	1	0	1
<b>A2</b>	0	0	0	1	0	1
<b>A3</b>	1	1	1	0	0	0
<b>A4</b>	1	1	1	0	1	1
<b>A5</b>	0	1	1	0	1	1
<b>X</b>	0	0	0	0	0	0
	<b>34</b>	<b>345</b>	<b>1345</b>	<b>12</b>	<b>45</b>	<b>1245</b>



# EX. 10 - BPA 4. Análise cladística com base na matriz de representação

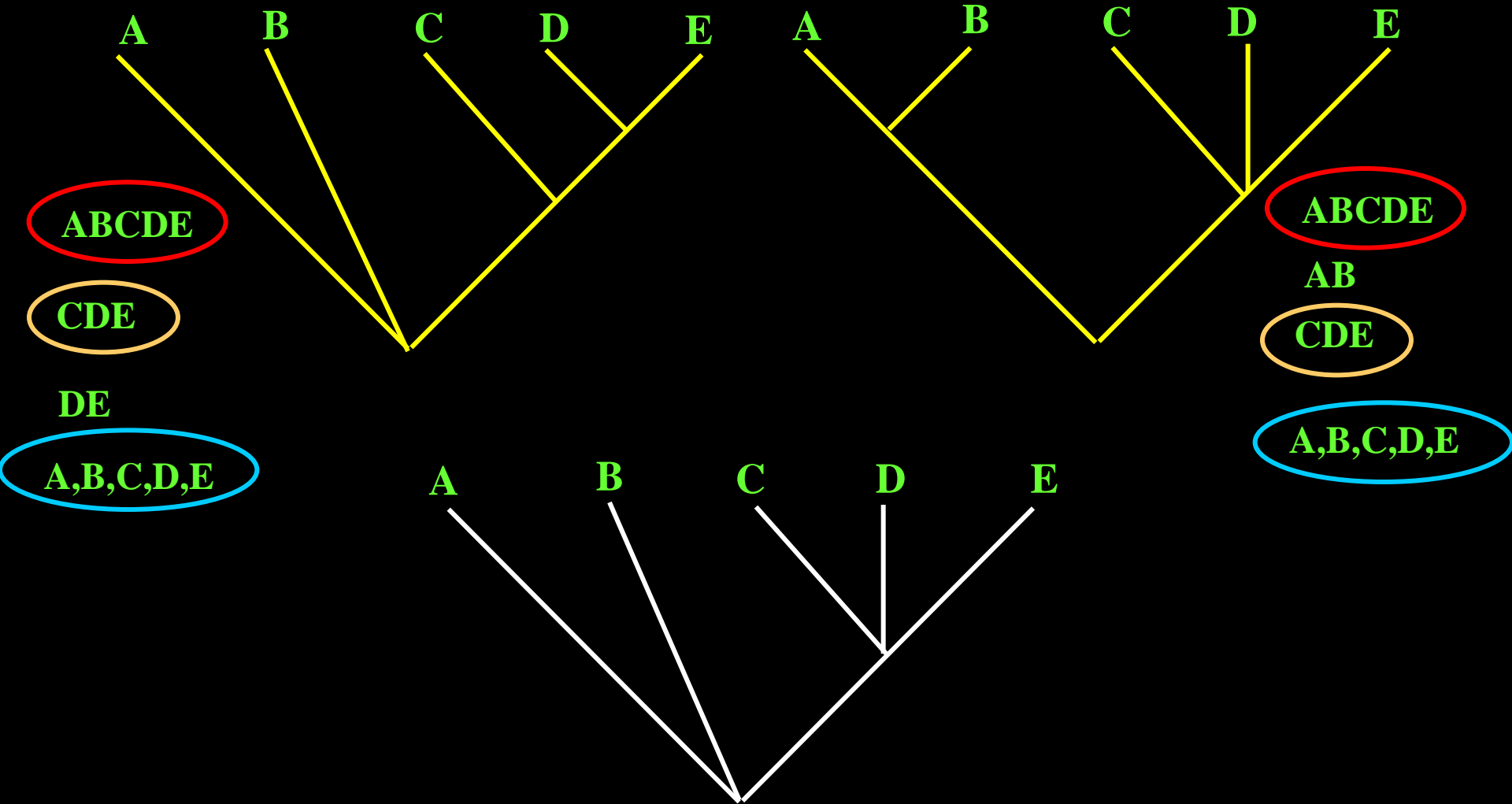


	5	6	7	1	1	1
				2	3	4
A1	0	0	1	1	0	1
A2	0	0	0	1	0	1
A3	1	1	1	0	0	0
A4	1	1	1	0	1	1
A5	0	1	1	0	1	1
X	0	0	0	0	0	0
	34	345	1345	12	45	1245



# CONSENSO

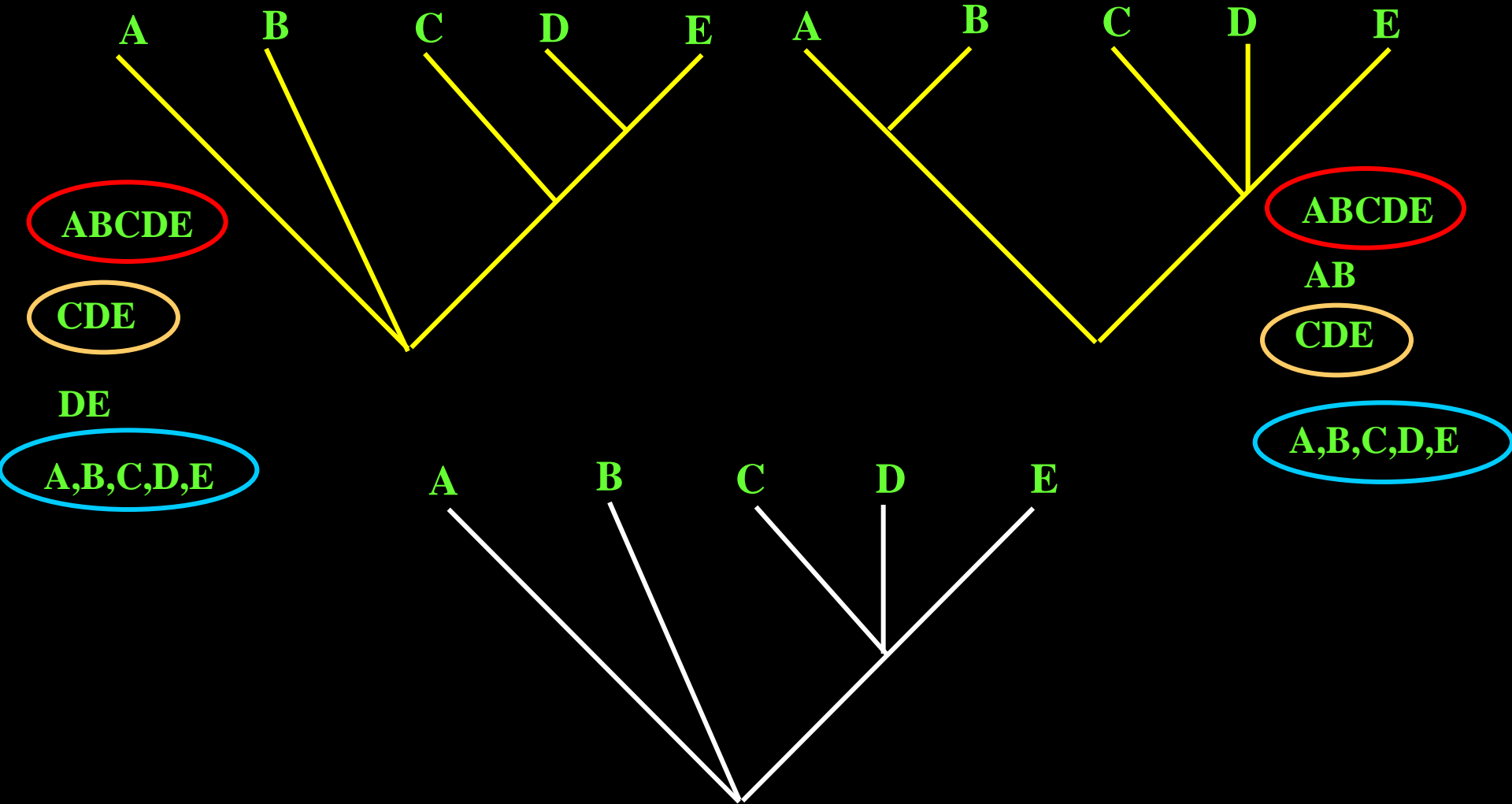
## CONSENSO ESTRITO





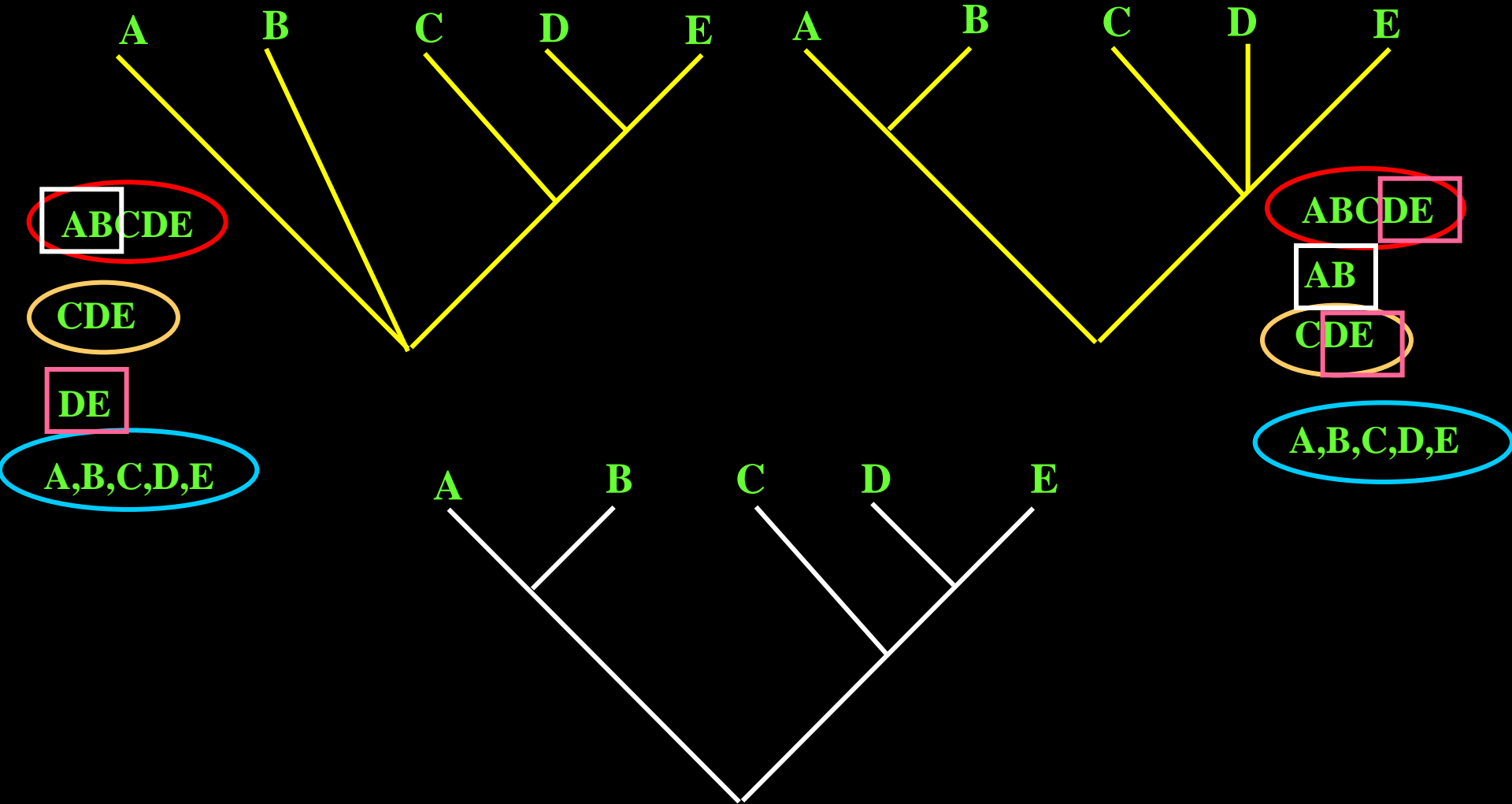
# CONSENSO

## CONSENSO ESTRITO



# CONSENSO

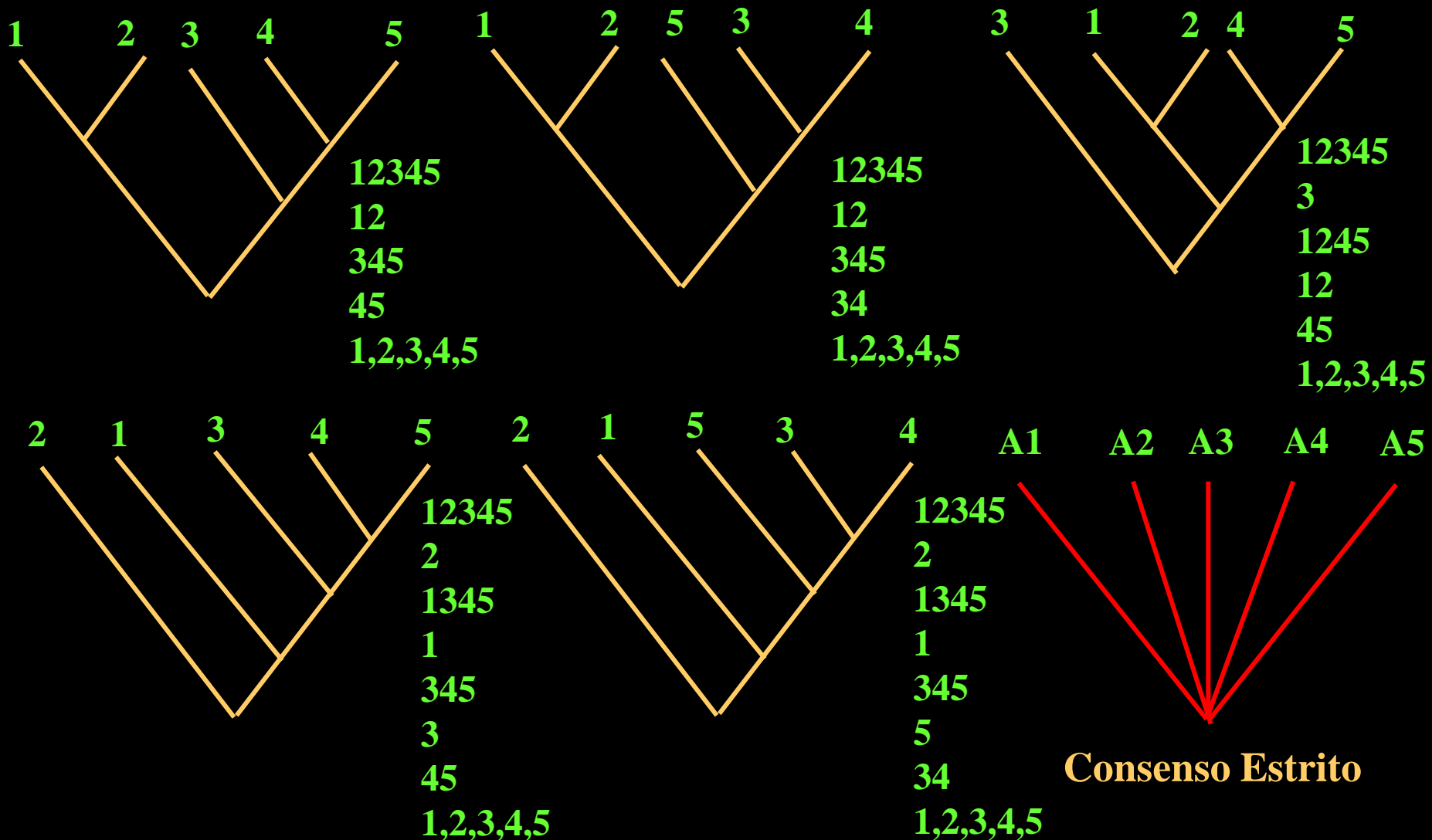
## CONSENSO SEMI-ESTRITO



# Exercício 10: ANÁLISE DE PARCIMÔNIA DE BROOKS - BPA

## 5. Consenso

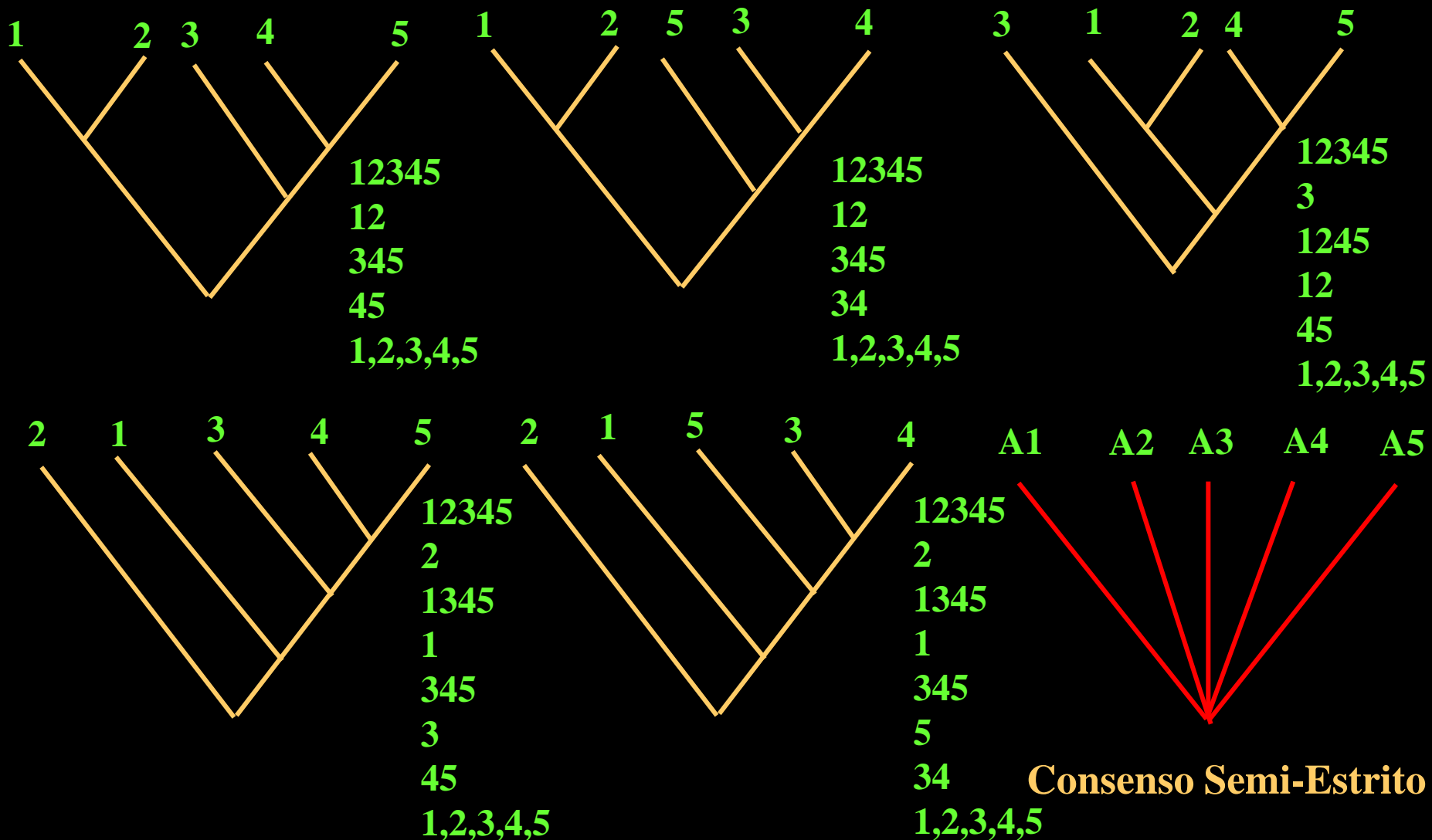
### Consenso Estrito



# Exercício 10: ANÁLISE DE PARCIMÔNIA DE BROOKS - BPA

## 5. Consenso

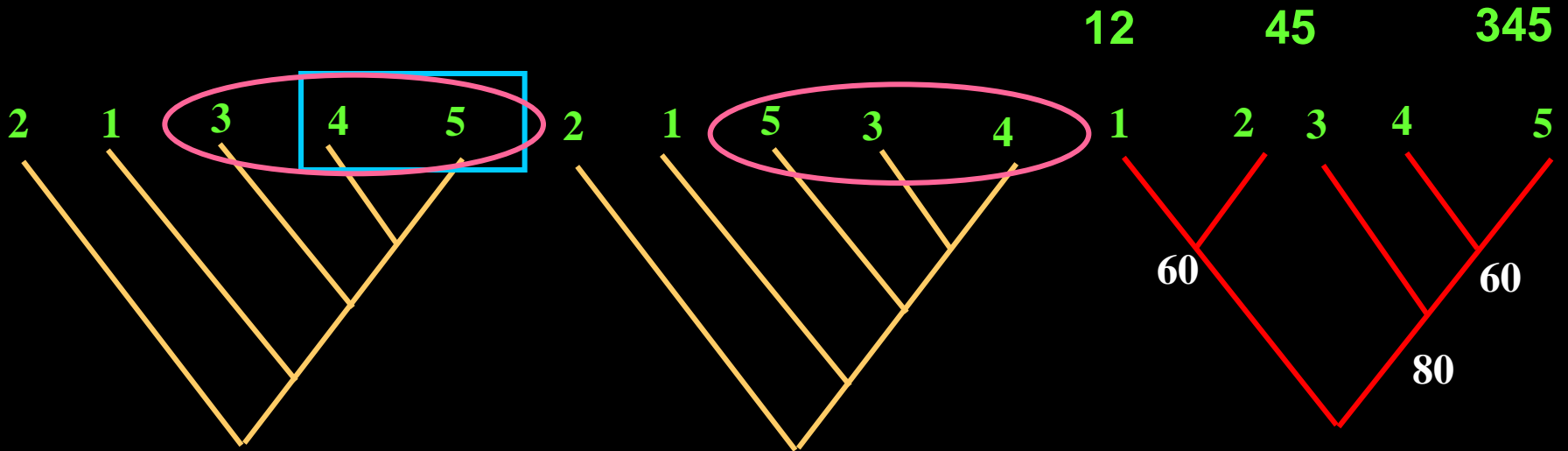
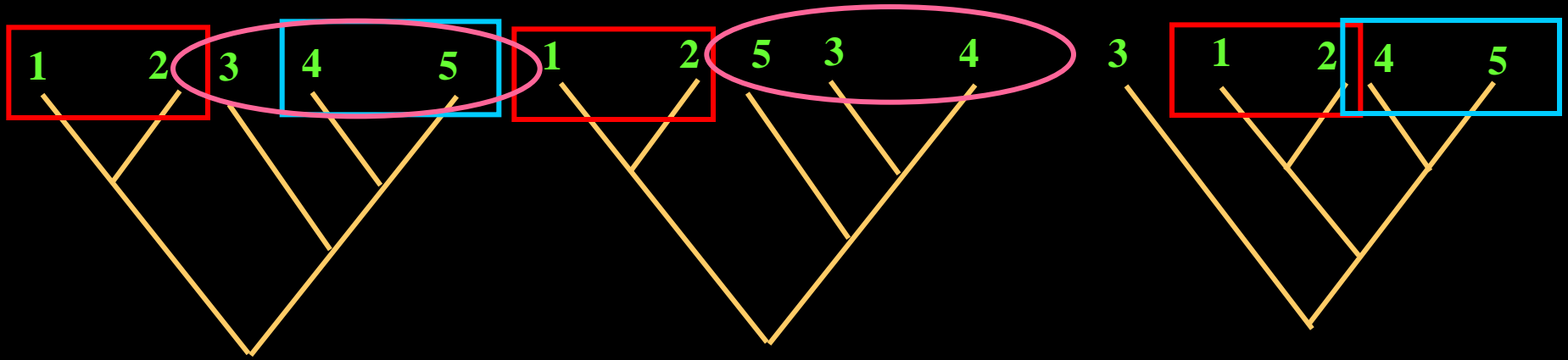
### Consenso Semi-Estrito



# Exercício 10: ANÁLISE DE PARCIMÔNIA DE BROOKS - BPA

## 5. Consenso

### Consenso de Maioria



12 45 345

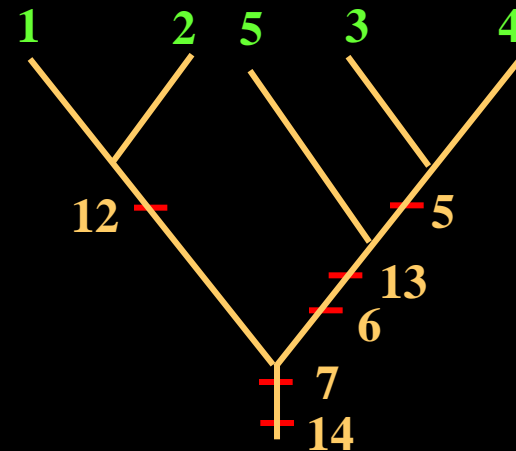
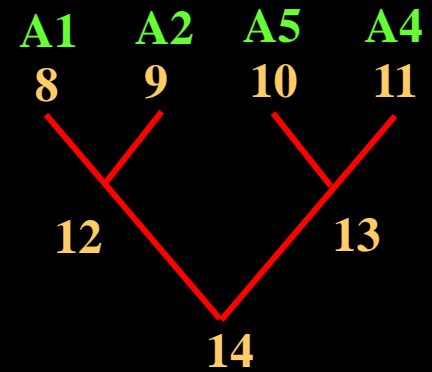
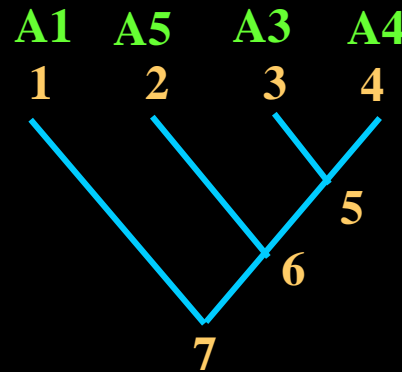
60 60

80

## Exercício 10.3: ANÁLISE DE PARCIMÔNIA DE BROOKS - BPA

6. Refazer a matriz de representação com base na informação fornecida pelos cladogramas de área: presença (1), ausência (0) e (?) quando a área estiver ausente no cladograma.

	5	6	7	1	1	1
				2	3	4
<b>A1</b>	0	0	1	1	0	1
<b>A2</b>	?	?	?	1	0	1
<b>A3</b>	1	1	1	?	?	?
<b>A4</b>	1	1	1	0	1	1
<b>A5</b>	0	1	1	0	1	1
<b>X</b>	0	0	0	0	0	0

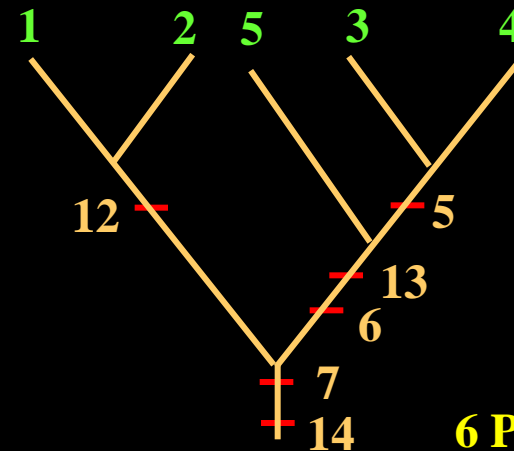
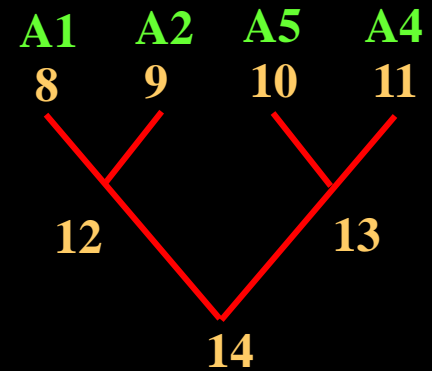
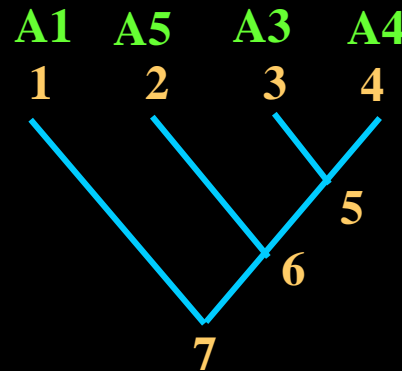


7. Análise cladística com base na matriz de representação, realizada por programa de computador.

## Exercício 10.3: ANÁLISE DE PARCIMÔNIA DE BROOKS - BPA

6. Refazer a matriz de representação com base na informação fornecida pelos cladogramas de área: presença (1), ausência (0) e (?) quando a área estiver ausente no cladograma.

	5	6	7	1	1	1
				2	3	4
A1	0	0	1	1	0	1
A2	0	0	1	1	0	1
A3	1	1	1	0	1	1
A4	1	1	1	0	1	1
A5	0	1	1	0	1	1
X	0	0	0	0	0	0

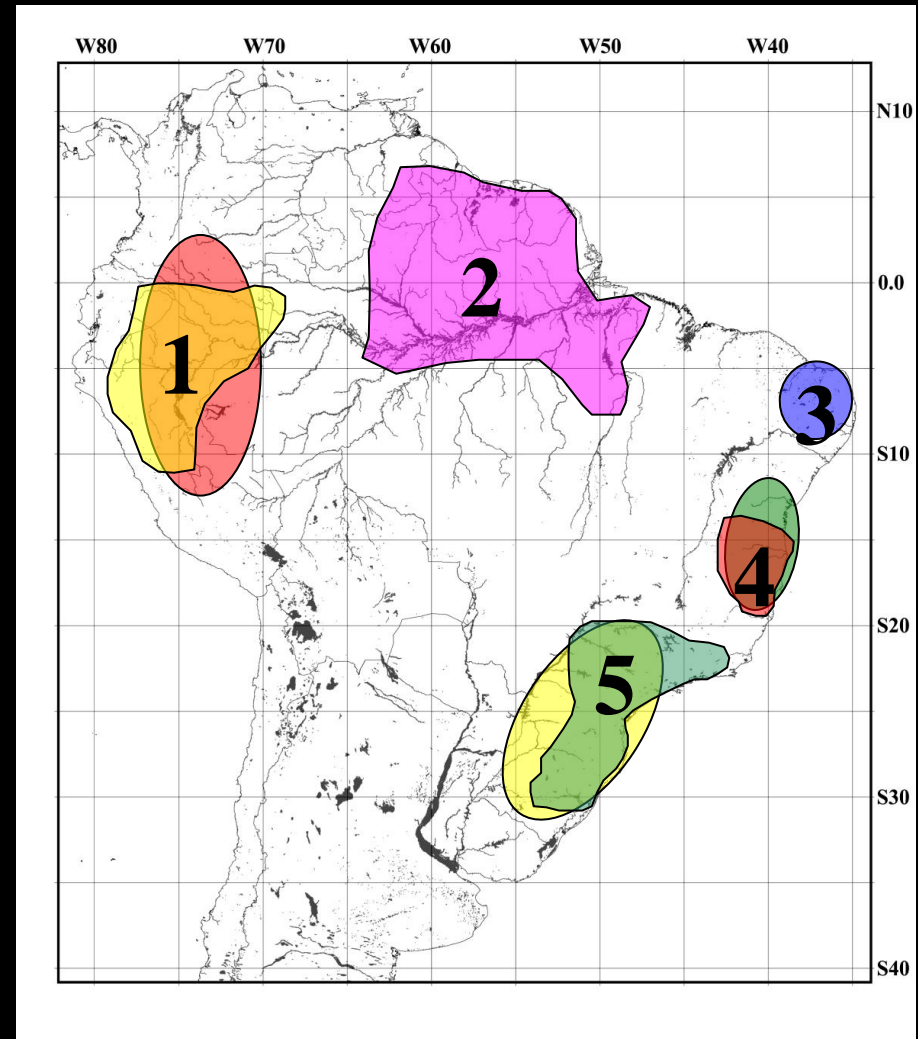
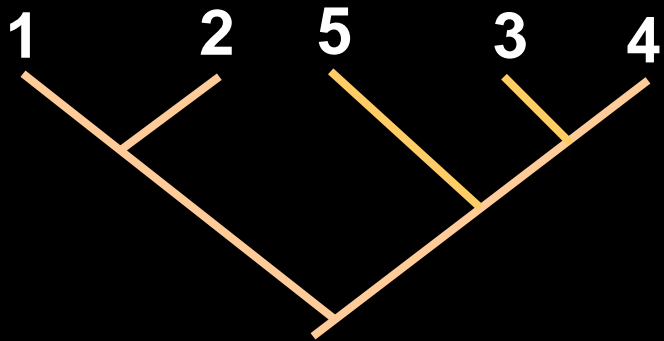


6 PASSOS

7. Análise cladística com base na matriz de representação, realizada por programa de computador. Algoritmo trata os dados ausentes (?) como (0) ou (1), dependendo da solução mais parcimoniosa.

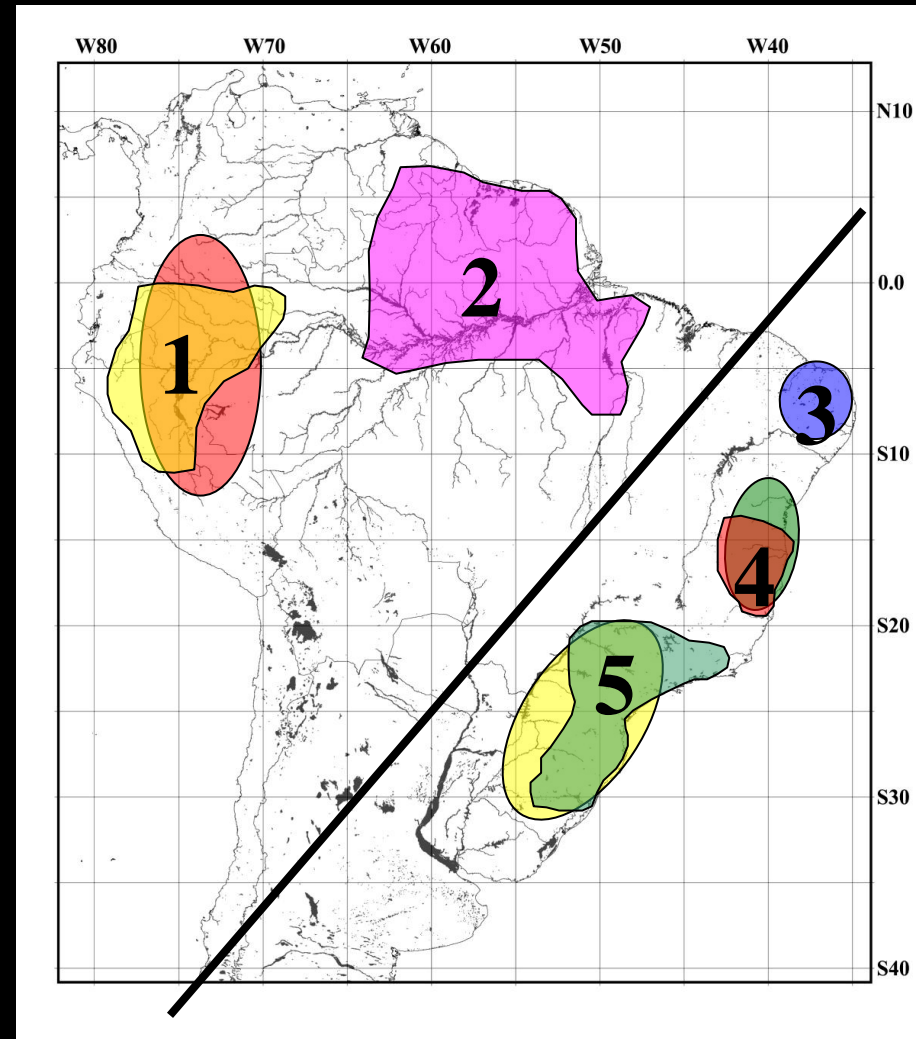
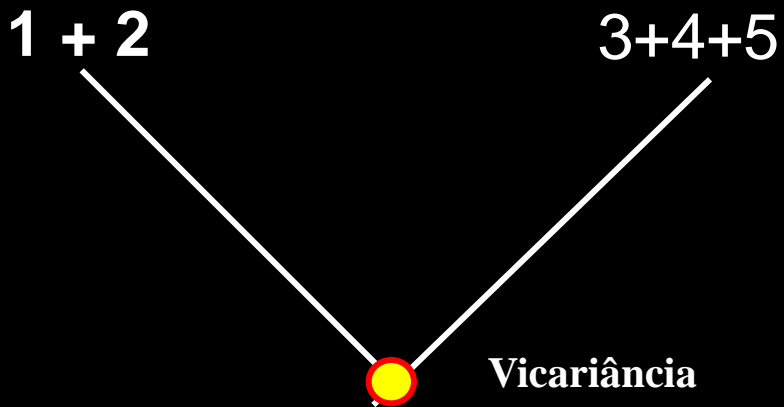
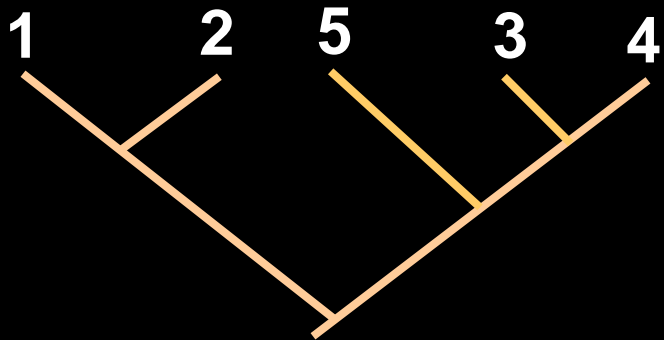
# Exercício 10

## Cladograma Geral de Área

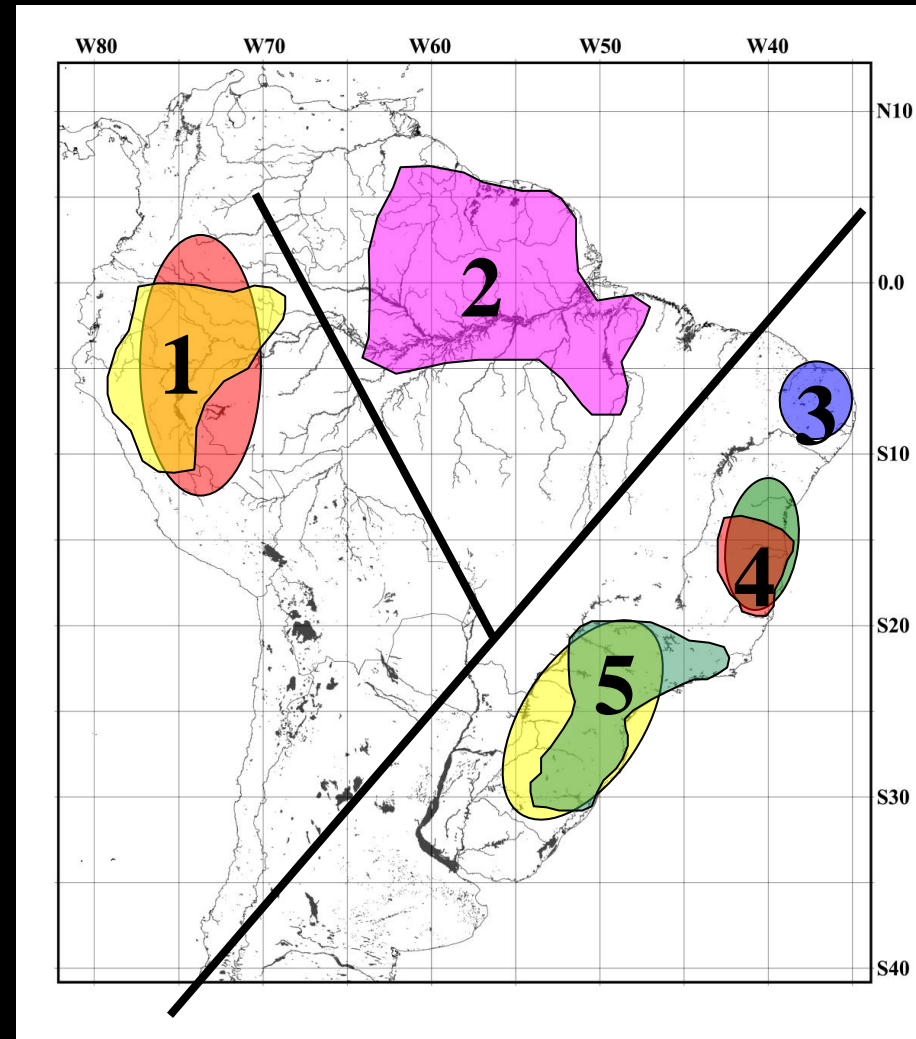
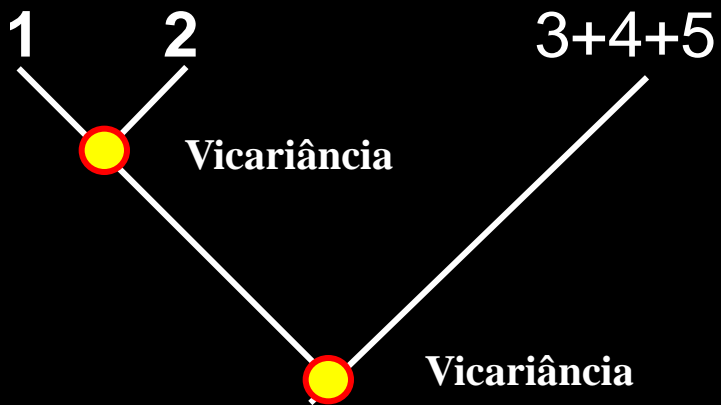
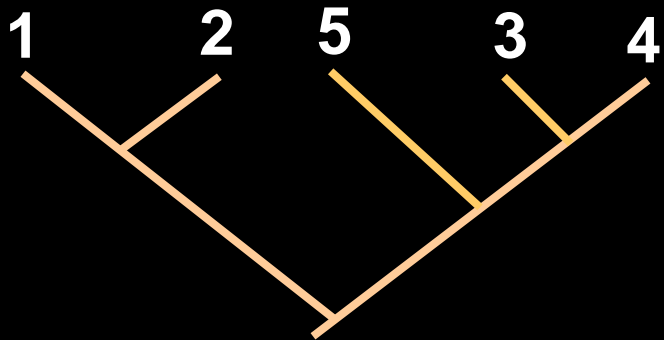




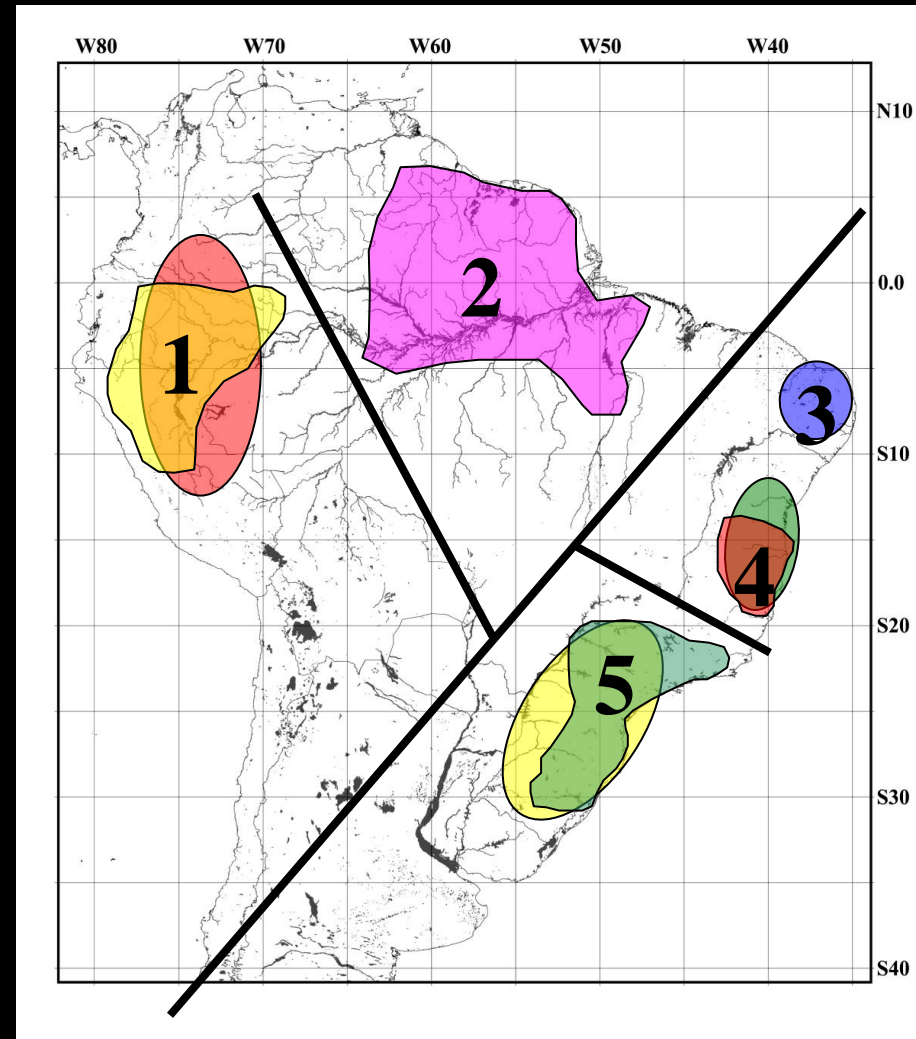
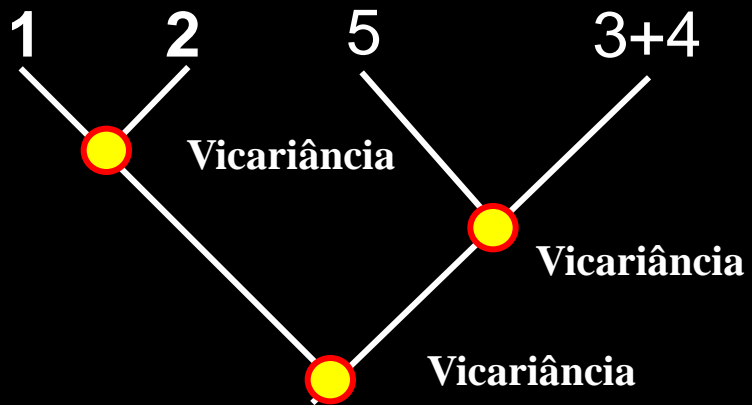
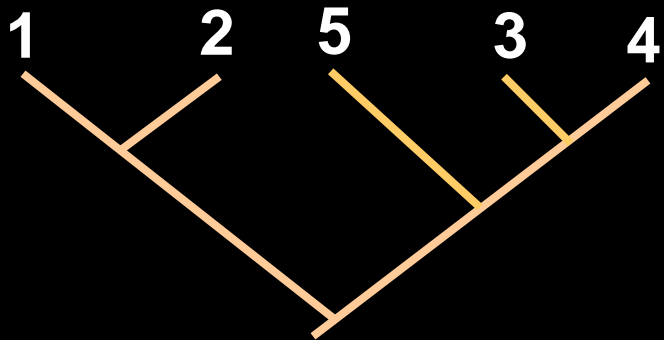
# Exercício 10



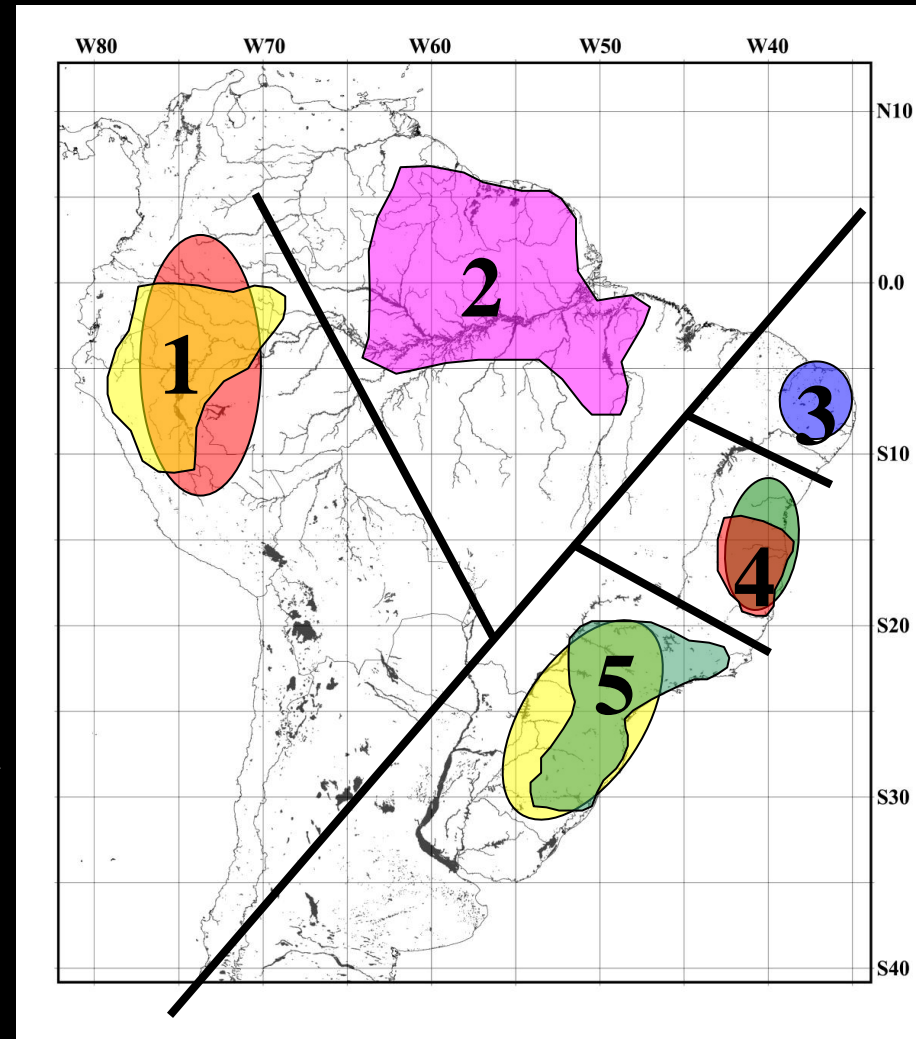
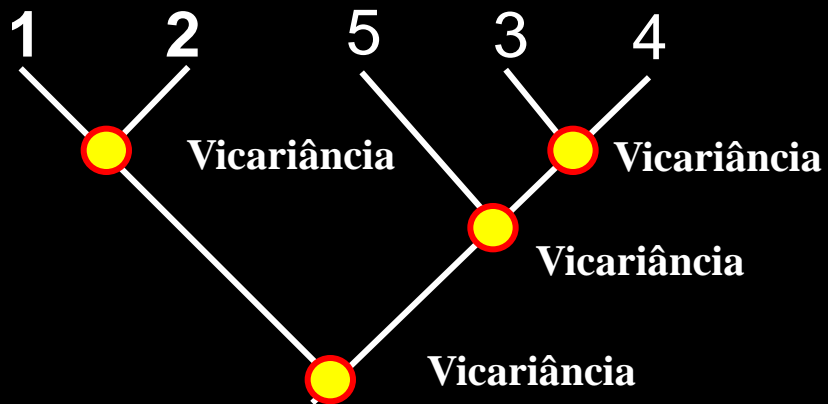
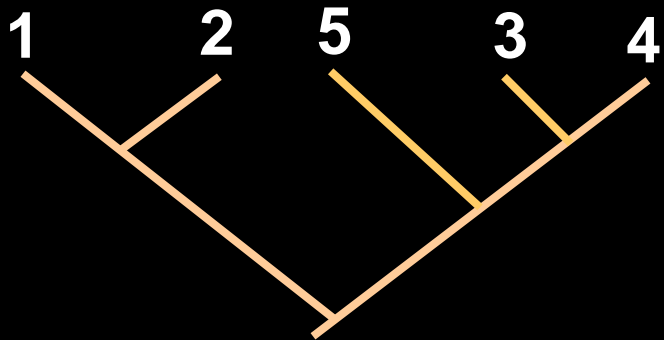
# Exercício 10



# Exercício 10



# Exercício 10

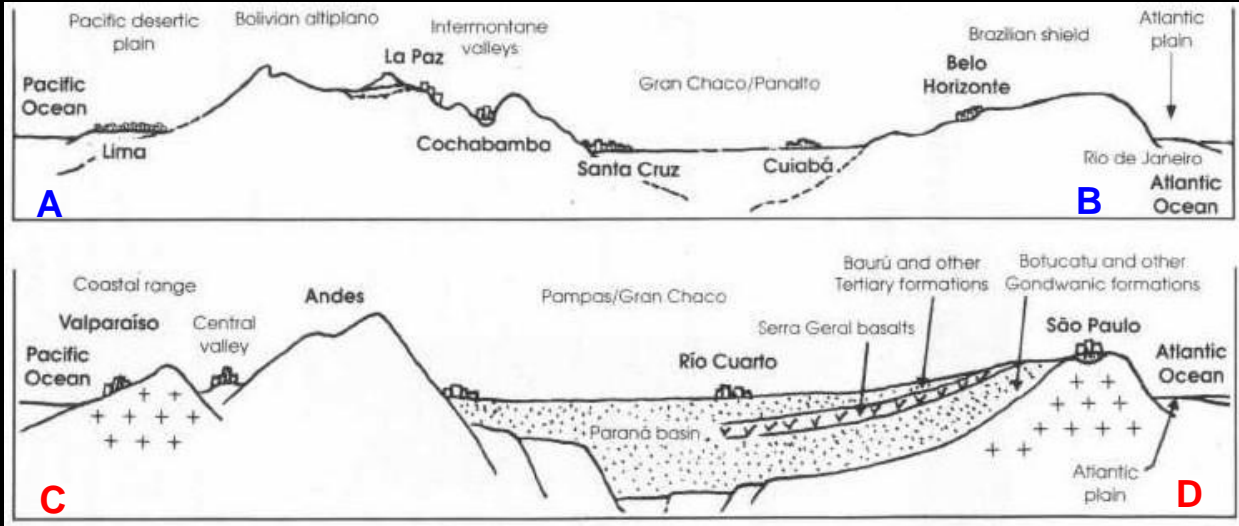
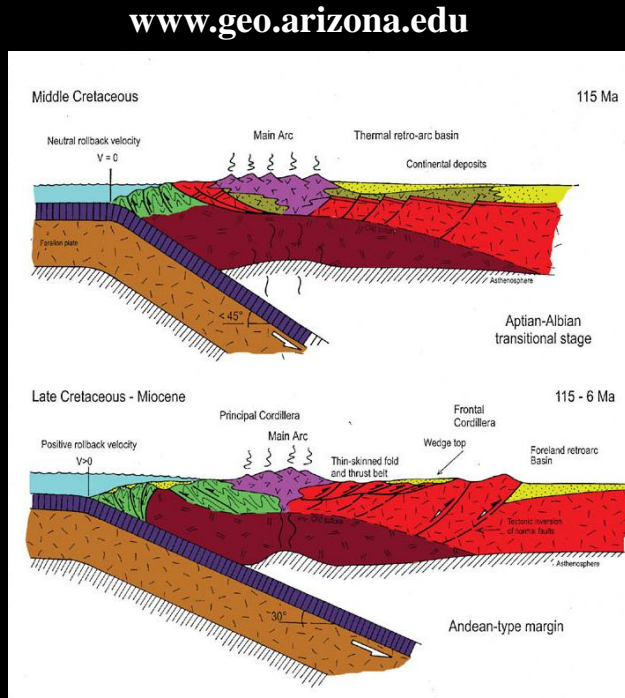


# Exercício 10

## Datação de evento vicariante

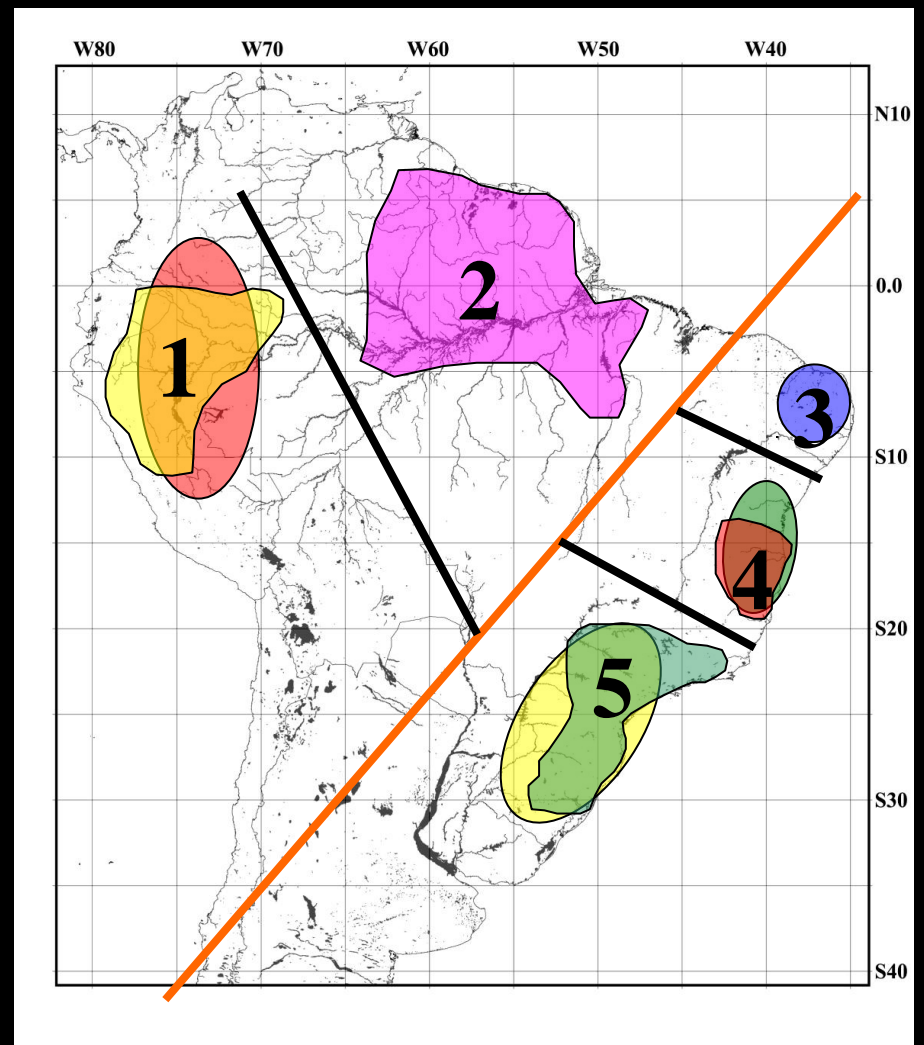
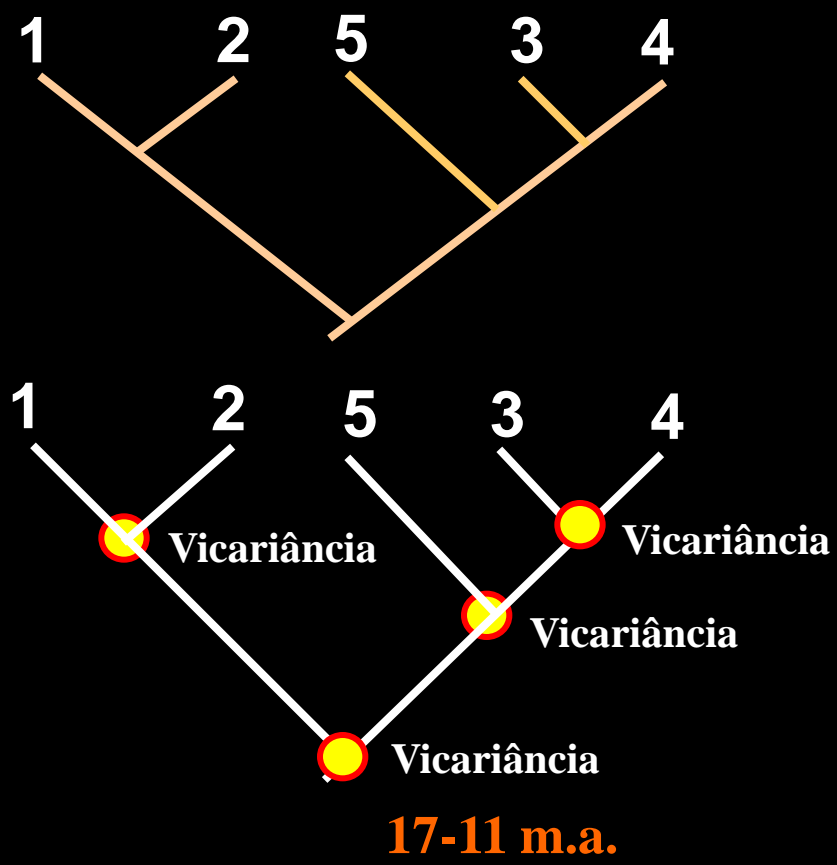
No Mioceno Médio (17-11 m.a.), o soerguimento dos Andes passou a modificar o clima do continente, acarretando a formação de uma faixa seca, a Diagonal Aberta, onde se situam o Chaco (Argentina, Paraguai e Bolívia), os Cerrados do Brasil Central e a Caatinga.

Antes, o clima era mais úmido e as florestas eram contínuas em boa parte da América do Sul. A faixa seca fragmentou a floresta ao norte e ao sul

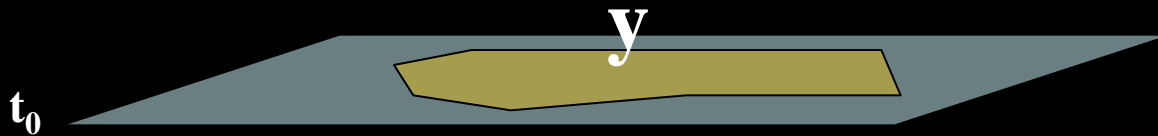


# Exercício 10

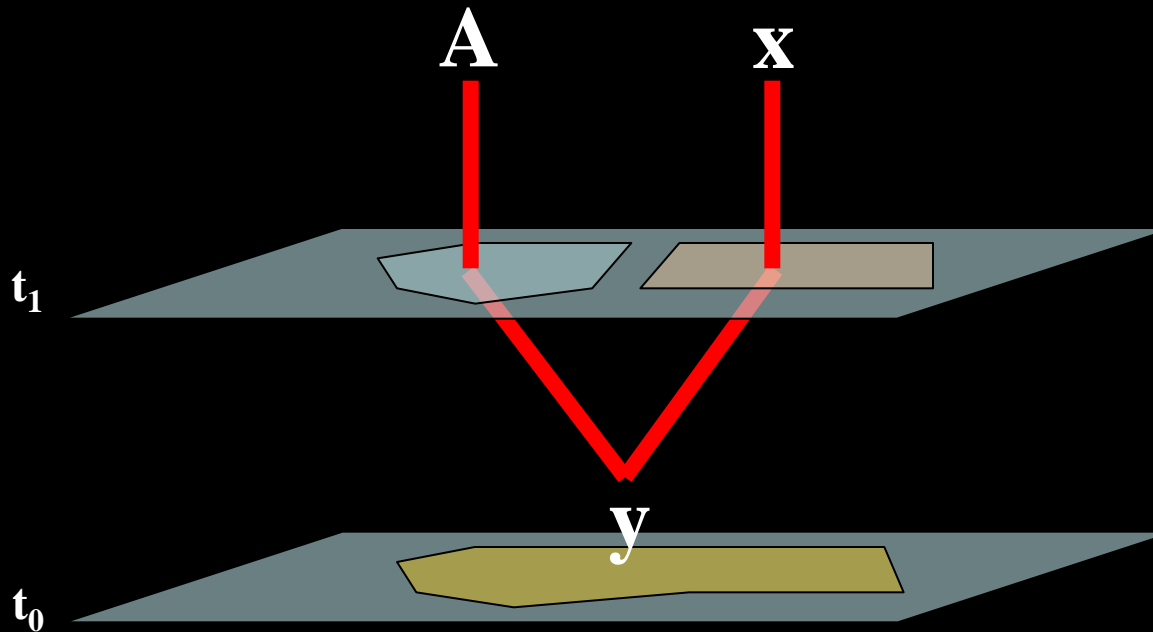
## Datação de evento vicariante



# *Espaço, tempo e forma: áreas e organismos*

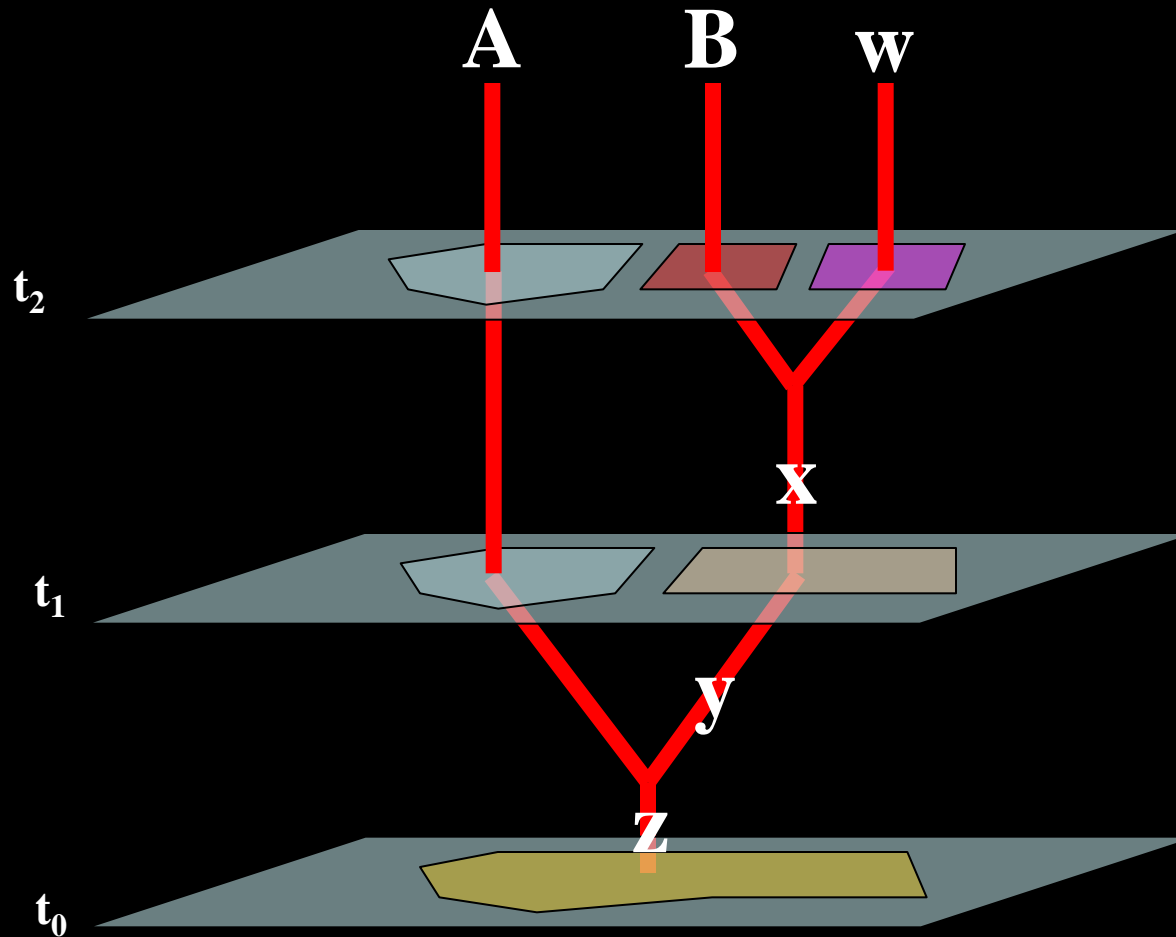


# *Espaço, tempo e forma: áreas e organismos*

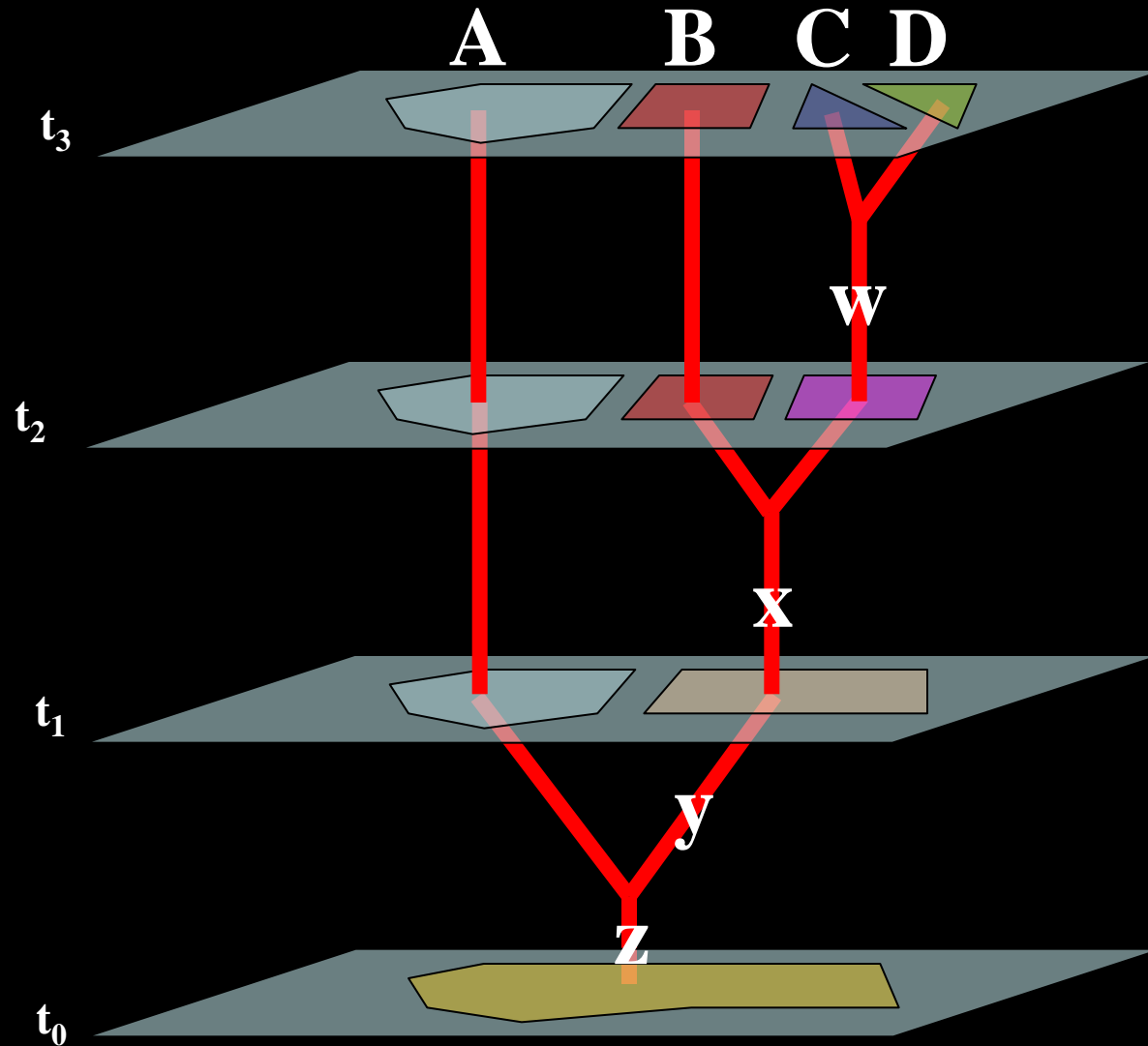




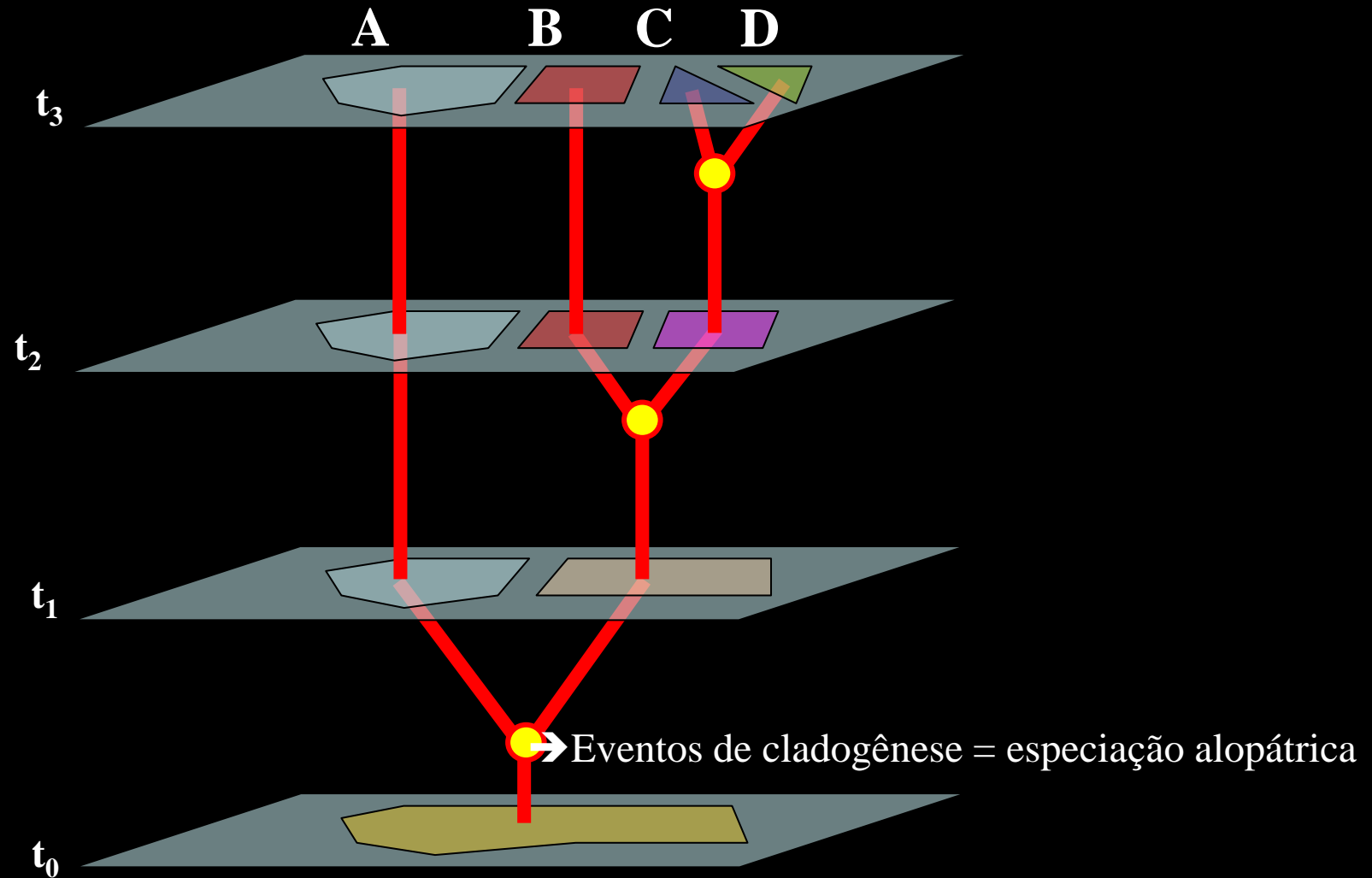
# *Espaço, tempo e forma: áreas e organismos*



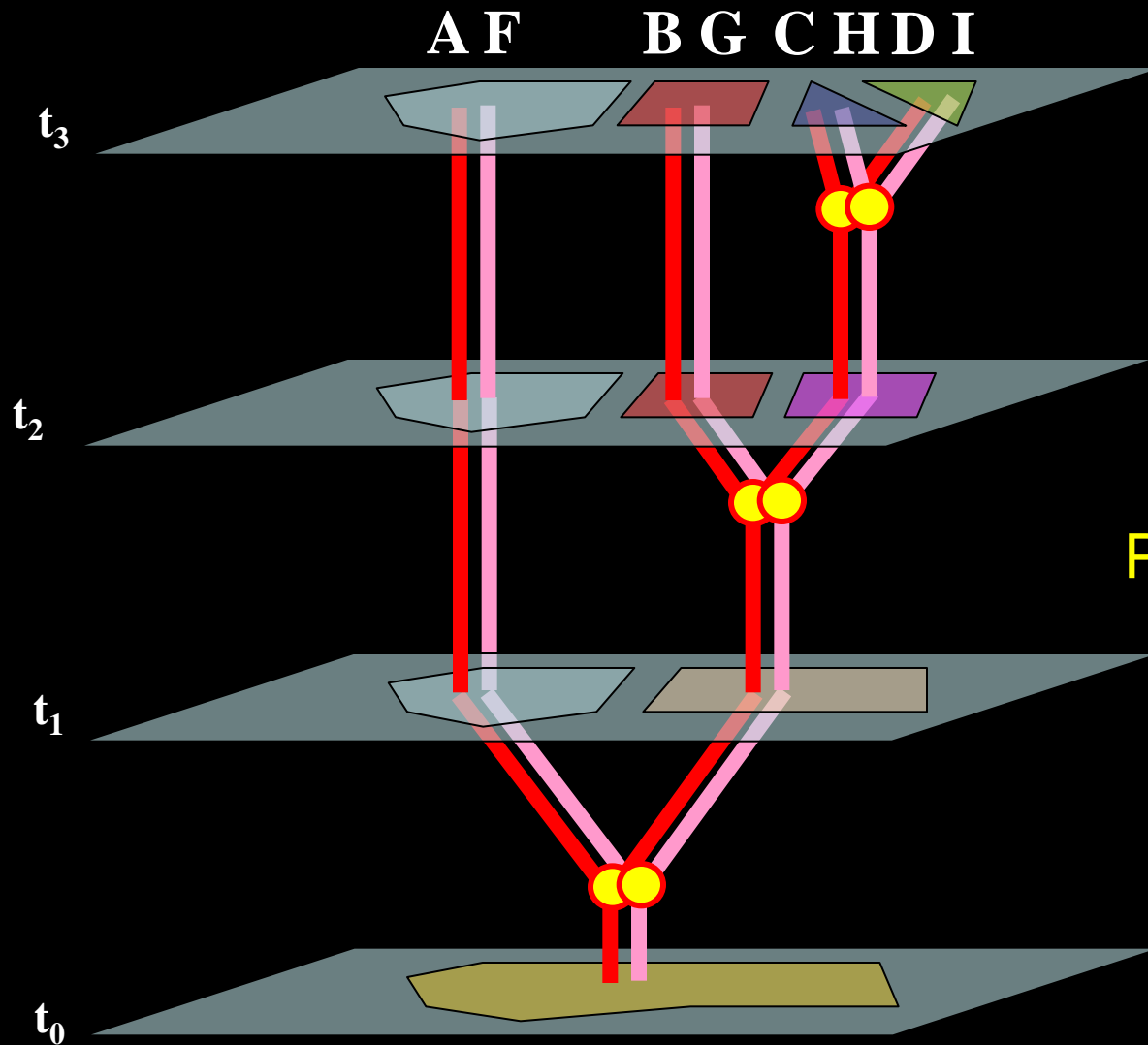
# *Espaço, tempo e forma: áreas e organismos*



# *Espaço, tempo e forma: áreas e organismos*



# *Espaço, tempo e forma: áreas e organismos*



**VICARIÂNCIA**  
Replicação de  
Padrões filogenéticos