

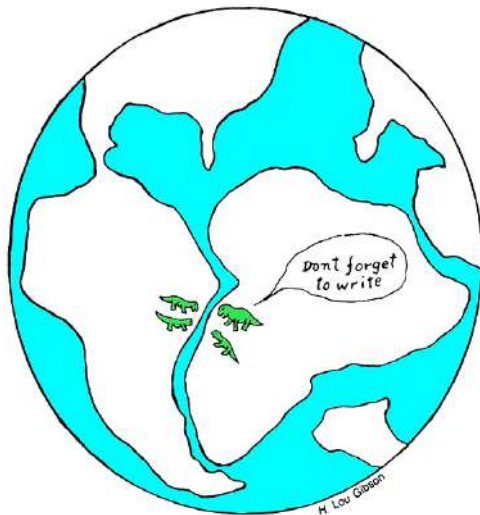
Atlântico-Mediterrâneo: consequências biológicas da história geológica

Rita Castilho
Centro de Ciências do Mar
Universidade do Algarve

Outline Atlântico-Mediterrâneo: consequências biológicas da história geológica

- Génese do Atlântico e do Mediterrâneo
- Eventos geológicos determinantes
- Background genético
- Impacto nos organismos marinhos
- Conclusões

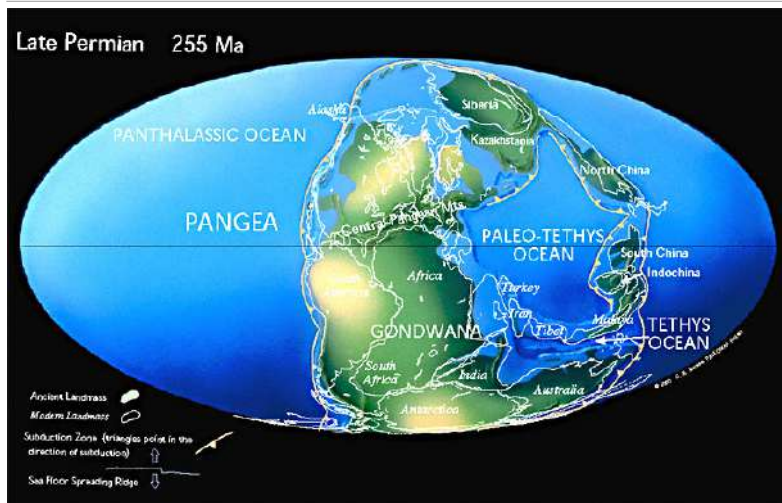
Génese do Atlântico e do Mediterrâneo



Génese do Atlântico e do Mediterrâneo

O Oceano Atlântico

Gênese do Atlântico e do Mediterrâneo



Gênese do Atlântico e do Mediterrâneo

220 MY



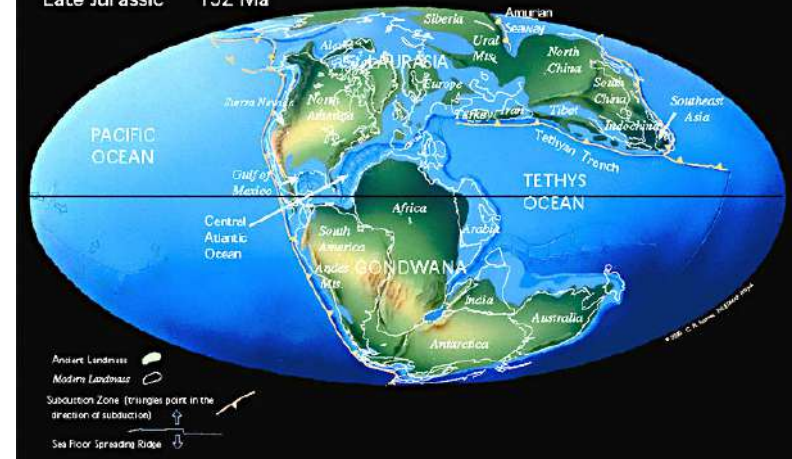
Gênese do Atlântico e do Mediterrâneo

200 MY

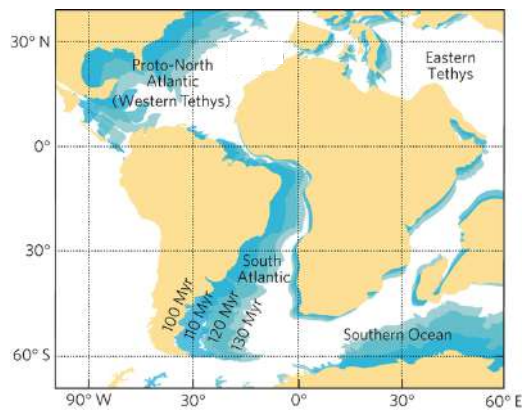


Gênese do Atlântico e do Mediterrâneo

Late Jurassic 152 Ma

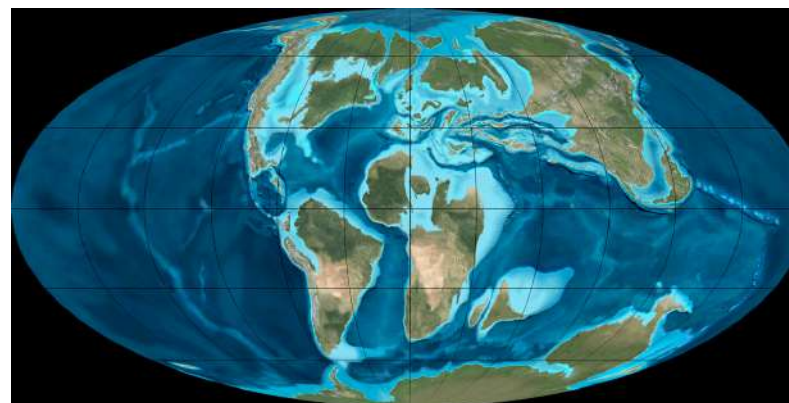


Génesse do Atlântico e do Mediterrâneo

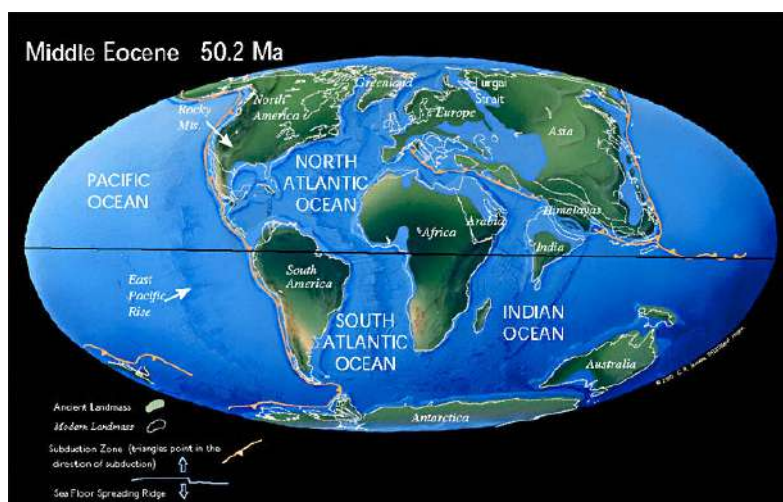


Génesse do Atlântico e do Mediterrâneo

138-65 MA



Génesse do Atlântico e do Mediterrâneo



Génesse do Atlântico e do Mediterrâneo



Génesse do Atlântico e do Mediterrâneo

O Mar Mediterrâneo

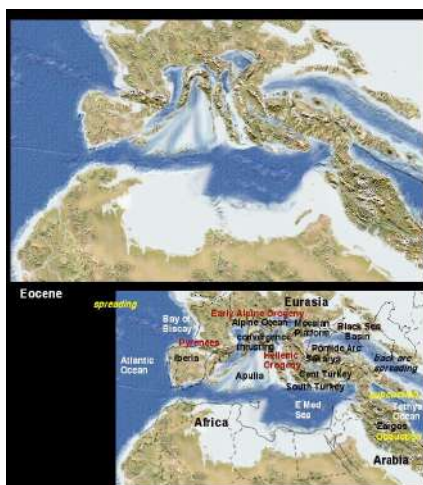
Génesse do Atlântico e do Mediterrâneo

130-85 MY



Génesse do Atlântico e do Mediterrâneo

57- 35 MY



Génesse do Atlântico e do Mediterrâneo

18 - 7 MY



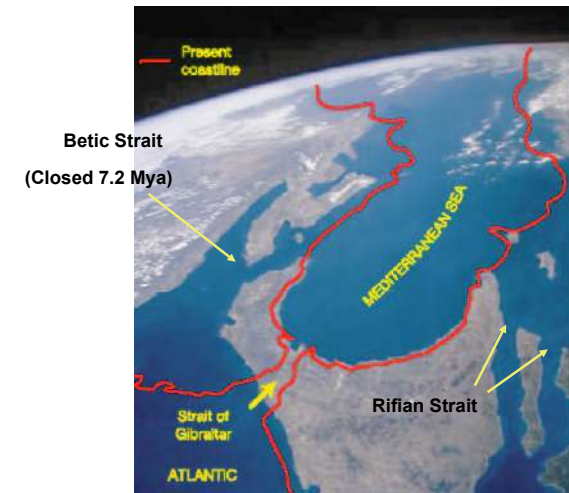
Génese do Atlântico e do Mediterrâneo

6-5 Mya



Génese do Atlântico e do Mediterrâneo

5.59 e 5.33 MY



Génese do Atlântico e do Mediterrâneo



Génese do Atlântico e do Mediterrâneo



Génese do Atlântico e do Mediterrâneo



http://www.geo.uu.nl/Research/Paleomagnetism/people/Wout/res_wout.htm

Génese do Atlântico e do Mediterrâneo



Ligação entre o Atlântico e o Mediterrâneo

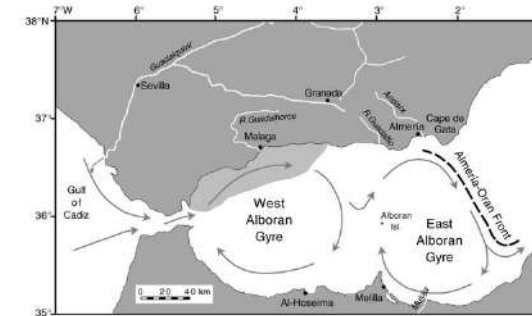
Ligação entre o Atlântico e o Mediterrâneo



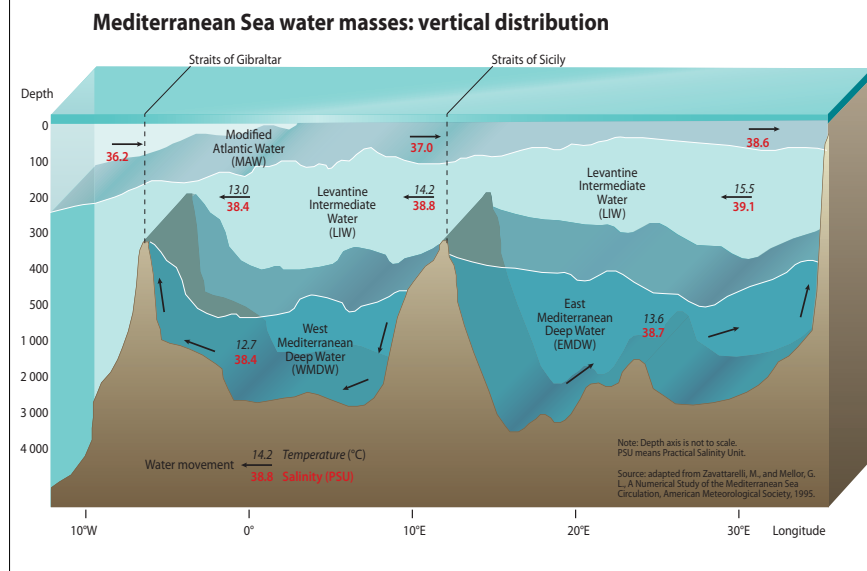
Ligação entre o Atlântico e o Mediterrâneo



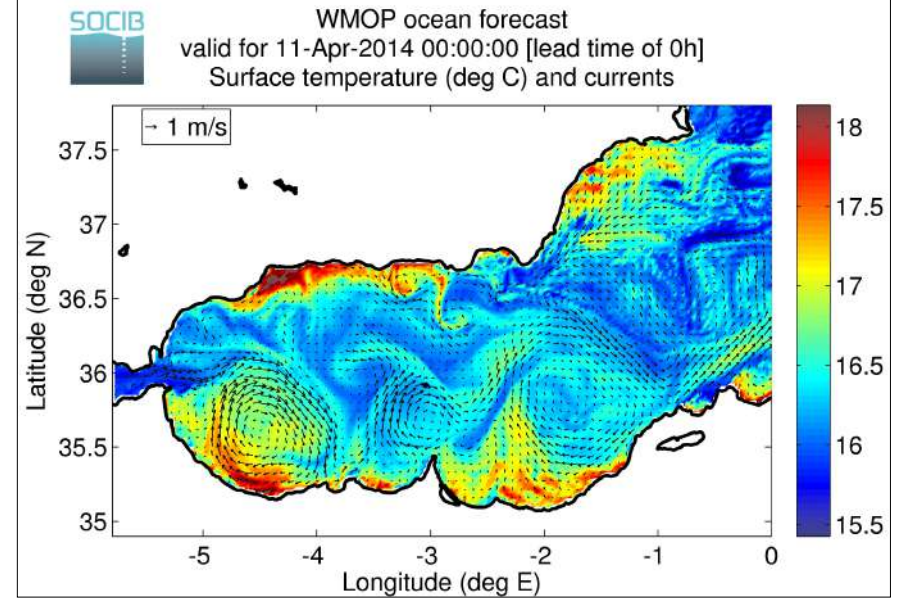
Ligação entre o Atlântico e o Mediterrâneo



Ligação entre o Atlântico e o Mediterrâneo

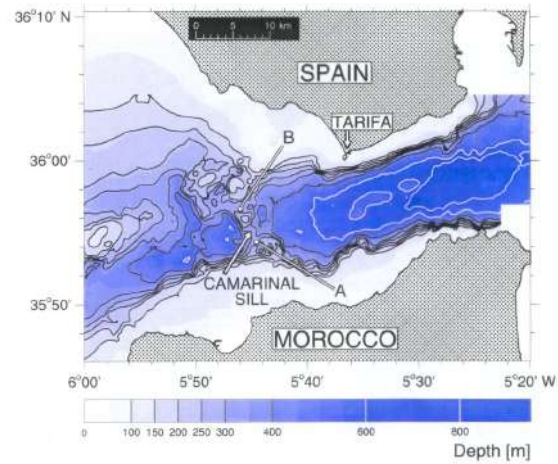


Ligação entre o Atlântico e o Mediterrâneo



Ligação entre o Atlântico e o Mediterrâneo

A possible Pleistocene “bridge”



Ligação entre o Atlântico e o Mediterrâneo

This exchange takes places through a very constraining topography (narrowest section -Tarifa- ~14 Km, shallowest sill -Camarinal- ~300 m), which generates very interesting and important internal processes



Cenários biogeográficos

Cenários biogeográficos

① A M

Cenários biogeográficos

②



Estreito de Gibraltar
ou
Mar de Alboran

Cenários biogeográficos

①



②



Cenários biogeográficos

③



Estreito Siculo-Tunisino
ou Estreito da Sicília

Cenários biogeográficos

①



③



②



Cenários biogeográficos



Examples

Salaria pavo



Salaria pavo

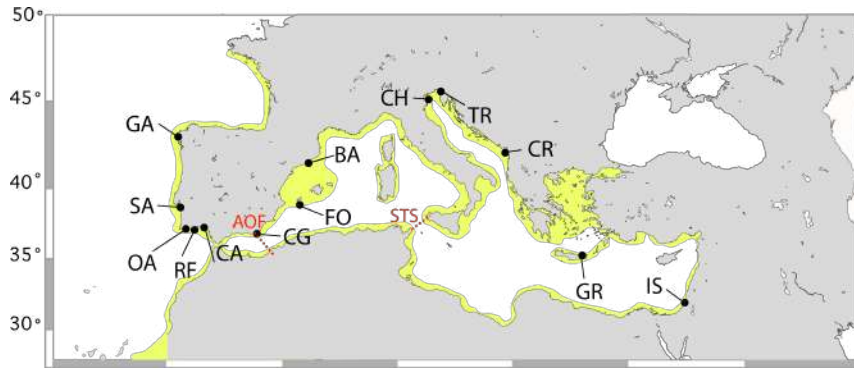
Distribuição



Intertidal

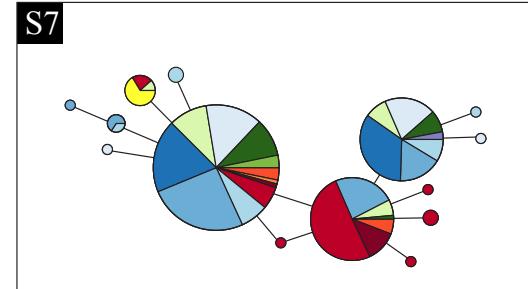


Salaria pavo



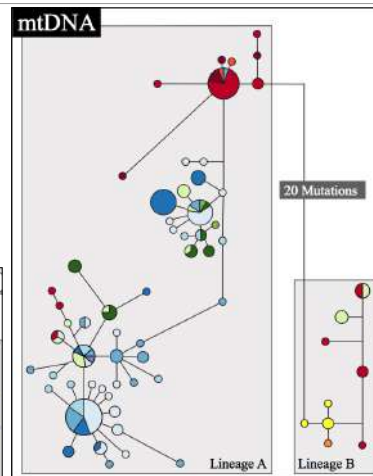
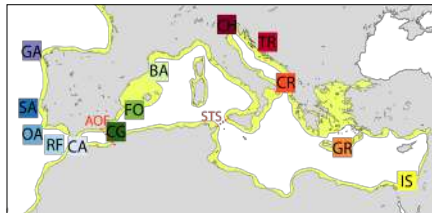
Salaria pavo

- Eastern**
 - Israel
 - Greece
 - Croatia
 - Trieste
 - Chioggia
- Mediterranean**
 - Barcelona
 - Formentera
 - Cabo Gata
- Atlantic**
 - Cadiz
 - Ria Formosa
 - Olhos d'Água
 - Sado
 - Galicia

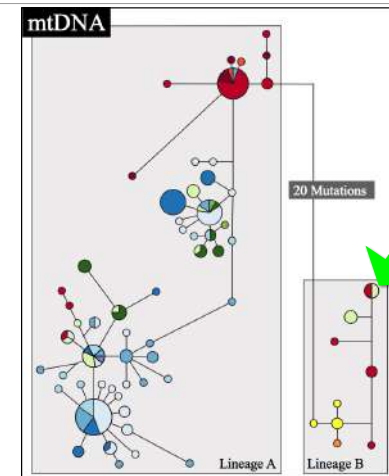


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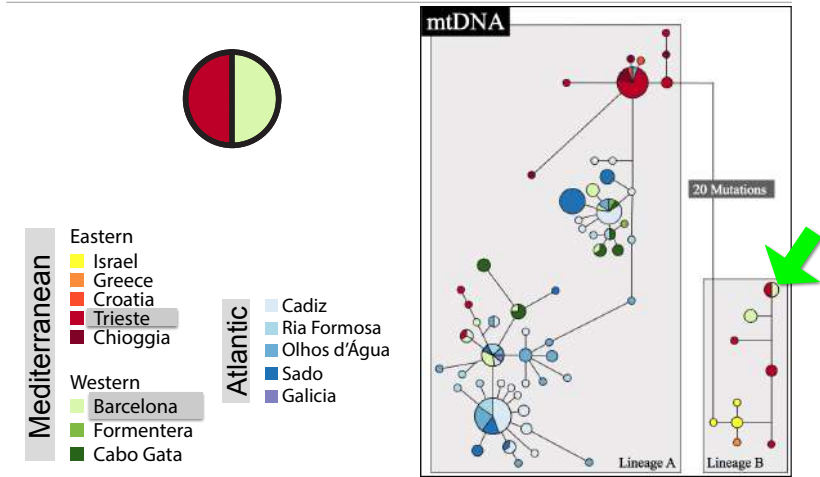
- Eastern**
 - Israel
 - Greece
 - Croatia
 - Trieste
 - Chioggia
- Mediterranean**
 - Barcelona
 - Formentera
 - Cabo Gata
- Atlantic**
 - Cadiz
 - Ria Formosa
 - Olhos d'Água
 - Sado
 - Galicia



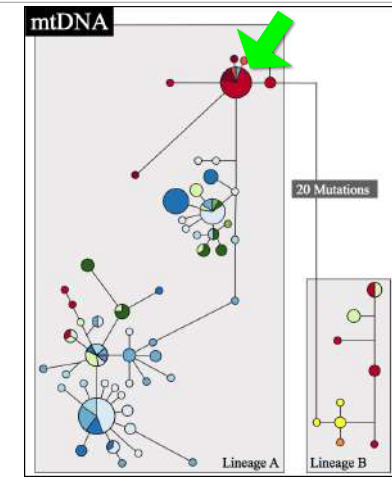
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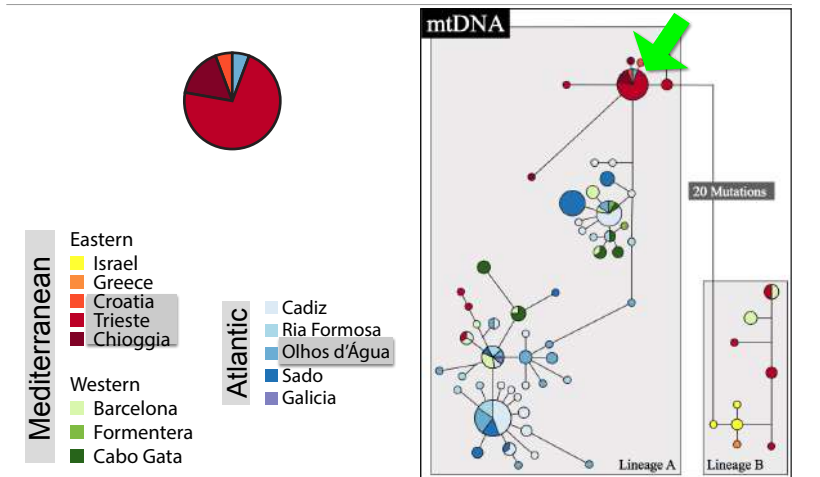
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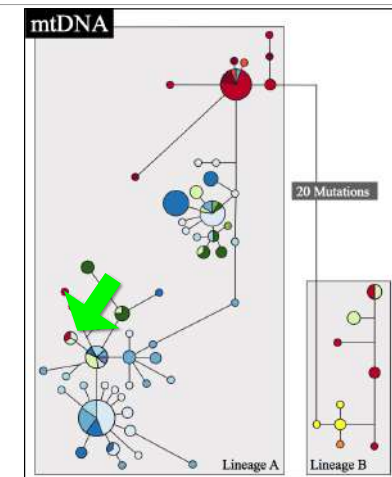
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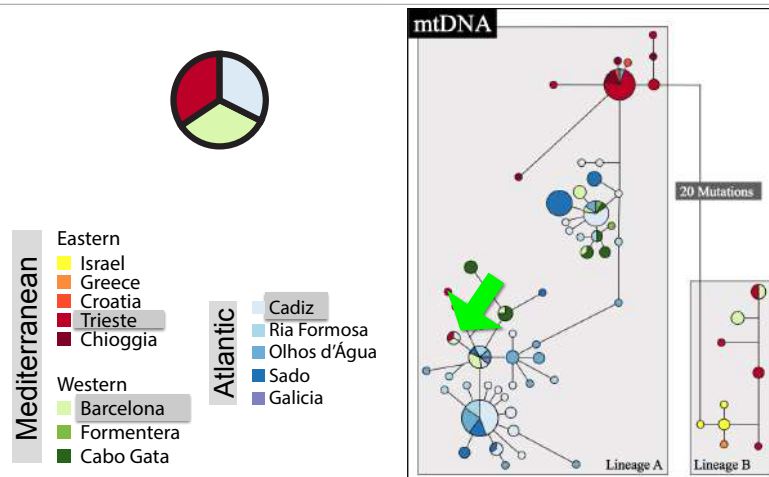
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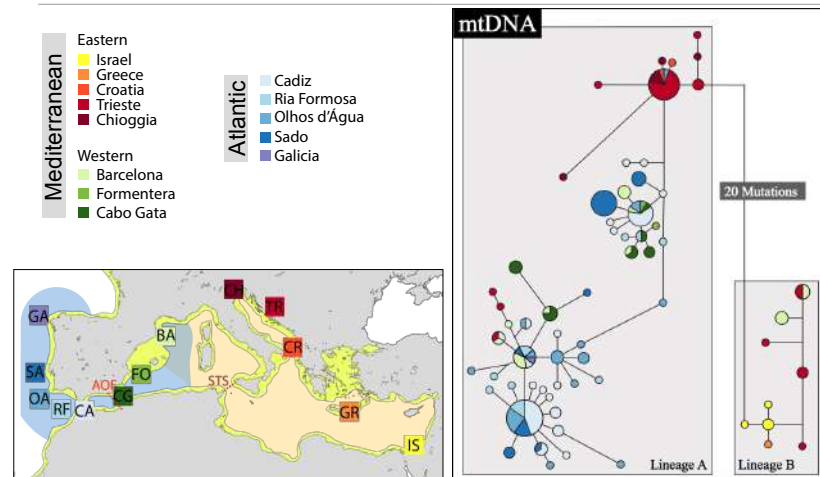
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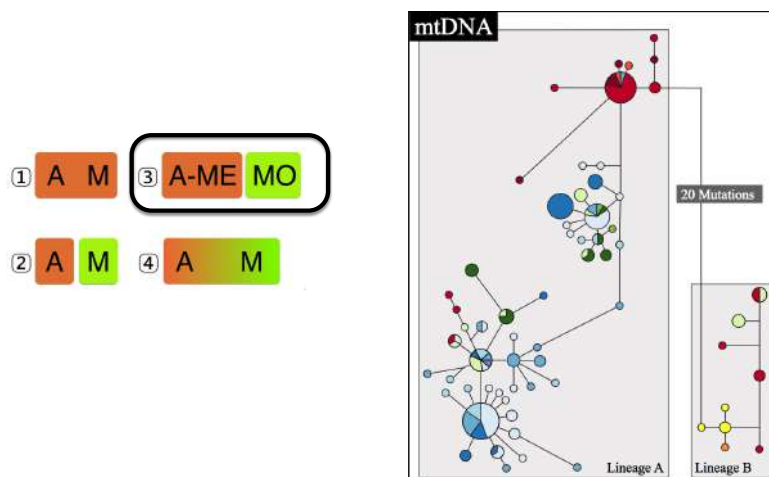
Salaria pavo



Salaria pavo



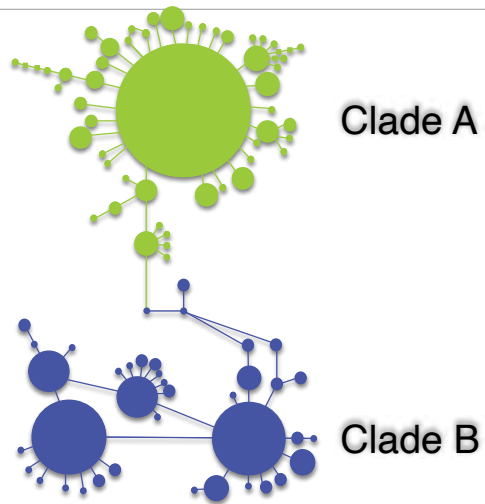
Salaria pavo



Engraulis encrasicolus

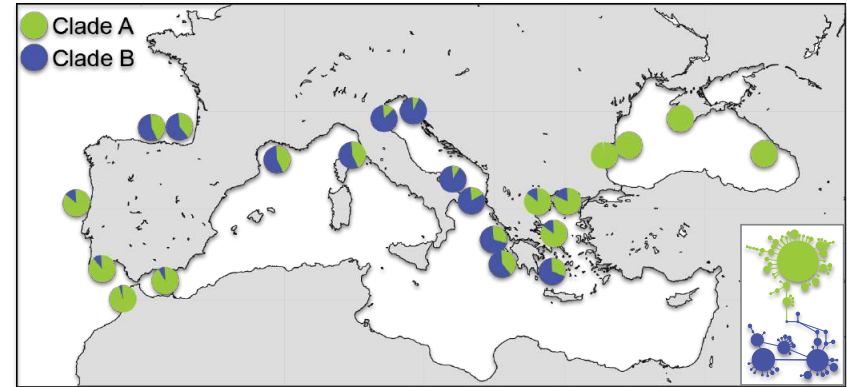


Engraulis encrasicolus



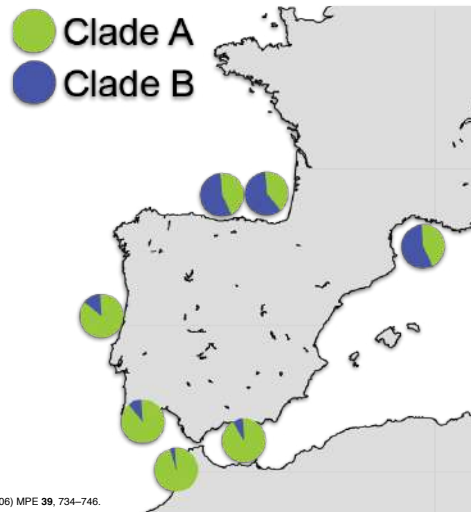
Magoulas et al. (2006) MPE 39, 734-746.

Engraulis encrasicolus



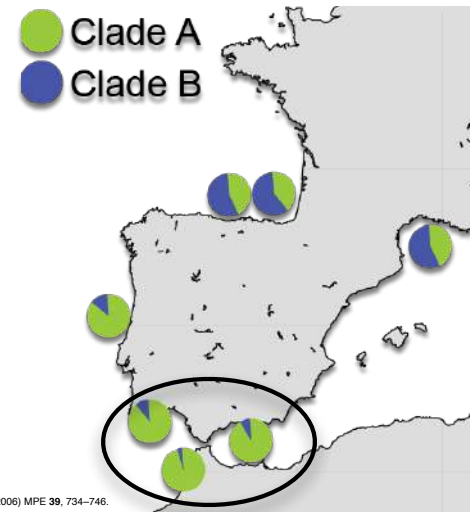
Magoulas et al. (2006) MPE 39, 734-746.

Engraulis encrasicolus



Magoulas et al. (2006) MPE 39, 734-746.

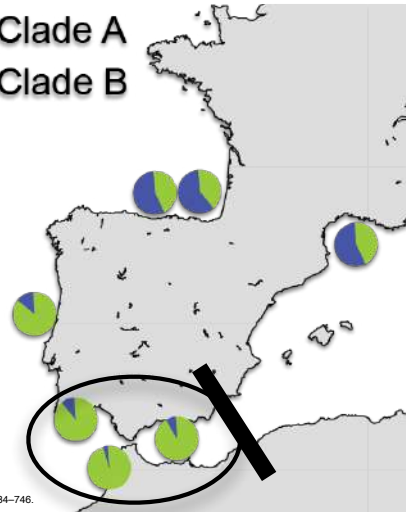
Engraulis encrasicolus



Magoulas et al. (2006) MPE 39, 734-746.

Engraulis encrasicolus

● Clade A
● Clade B

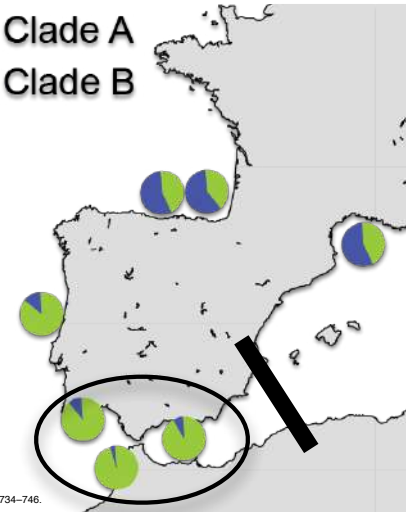


① A M ③ A-ME MO
② A M ④ A M

Magoulas et al. (2006) MPE 39, 734-746.

Engraulis encrasicolus

● Clade A
● Clade B

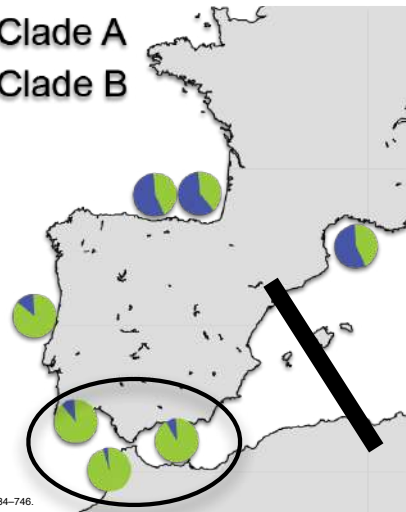


① A M ③ A-ME MO
② A M ④ A M

Magoulas et al. (2006) MPE 39, 734-746.

Engraulis encrasicolus

● Clade A
● Clade B



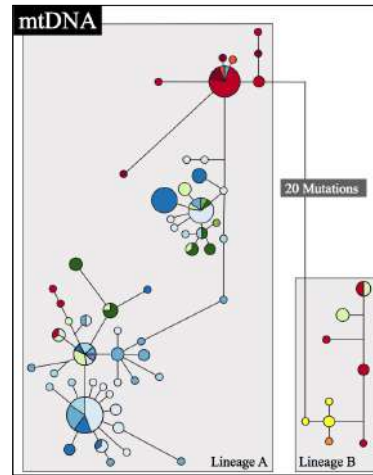
① A M ③ A-ME MO
② A M ④ A M

Magoulas et al. (2006) MPE 39, 734-746.

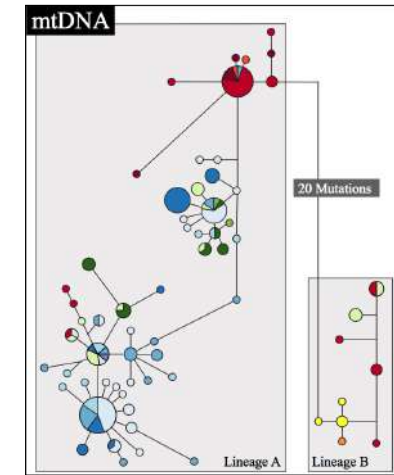
Salaria pavo



Salaria pavo

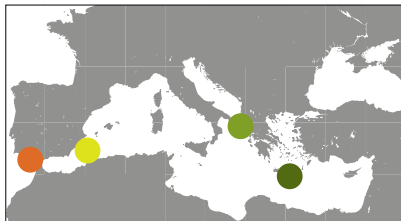


Salaria pavo



Sparidae

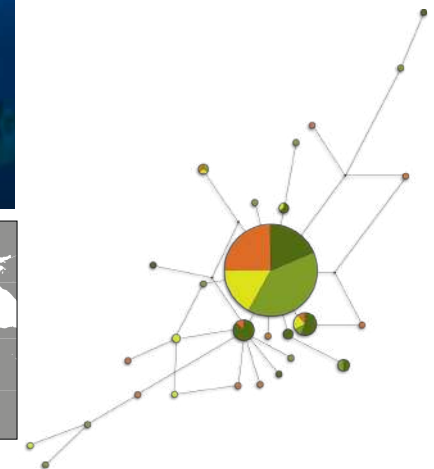
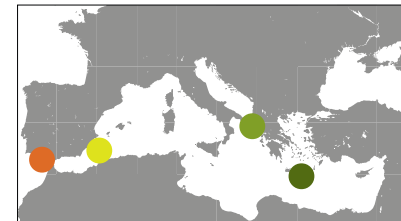
Diplodus sargus



Bargelloni et al. (2005) MPE, 36, 523-535.

Sparidae

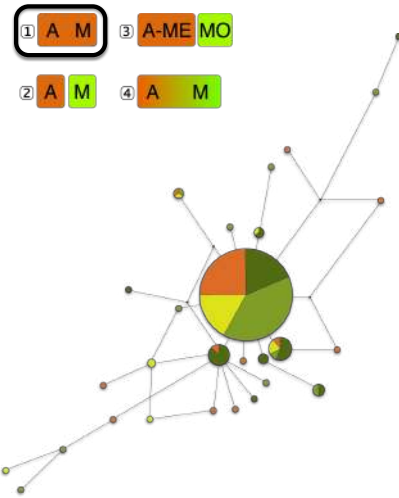
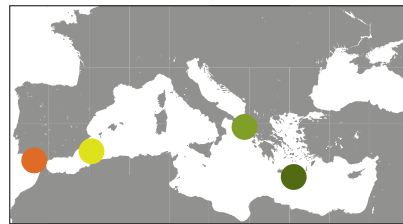
Diplodus sargus



Bargelloni et al. (2005) MPE, 36, 523-535.

Sparidae

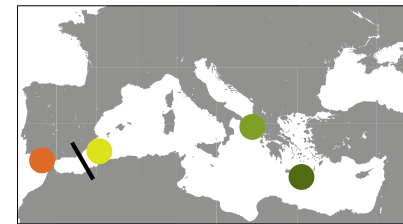
Diplodus sargus



Bargelloni et al. (2005) MPE, 36, 523-535.

Sparidae

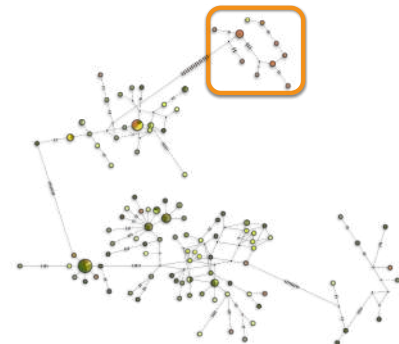
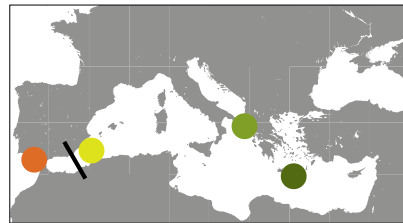
Diplodus puntazzo



Bargelloni et al. (2005) MPE, 36, 523-535.

Sparidae

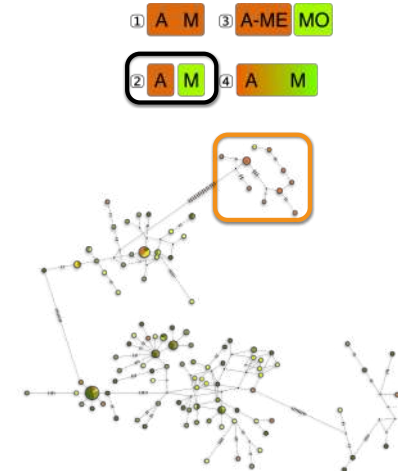
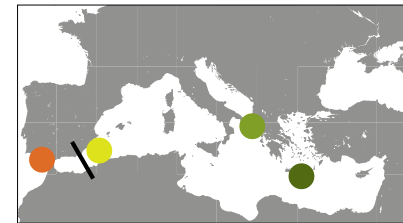
Diplodus puntazzo



Bargelloni et al. (2005) MPE, 36, 523-535.

Sparidae

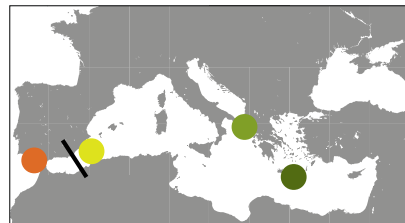
Diplodus puntazzo



Bargelloni et al. (2005) MPE, 36, 523-535.

Sparidae

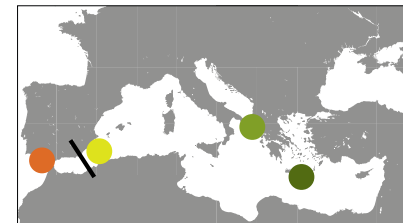
Spondyliosoma cantharus



Bargelloni et al. (2003) JEB, 16, 1149–1158.

Sparidae

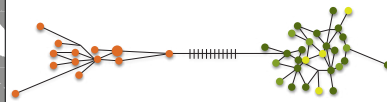
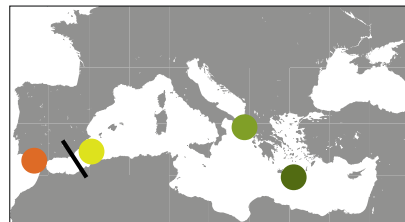
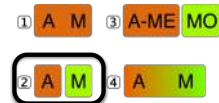
Spondyliosoma cantharus



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Sparidae

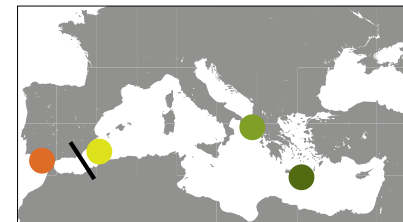
Spondyliosoma cantharus



Bargelloni et al. (2003) JEB, 16, 1149–1158.

Sparidae

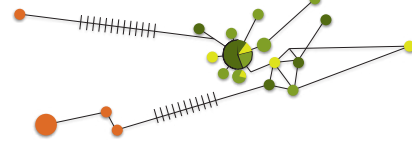
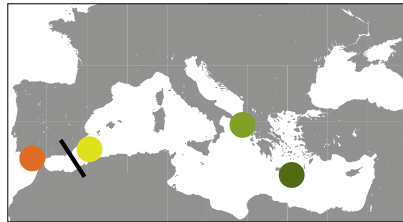
Dentex dentex



Bargelloni et al. (2003) JEB, 16, 1149–1158.

Sparidae

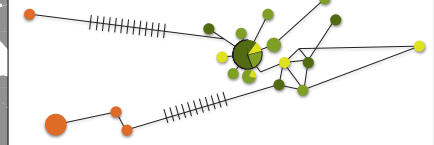
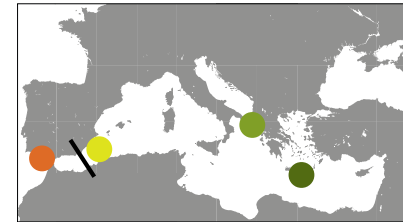
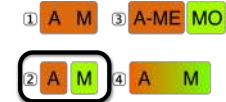
Dentex dentex



Bargelloni *et al.* (2003) JEB, 16, 1149–1158.

Sparidae

Dentex dentex



Bargelloni *et al.* (2003) JEB, 16, 1149–1158.

The End

The End

Cronologia da Teoria da Evolução
Evidências da Teoria da Evolução
Factores evolutivos
Consequências dos factores evolutivos
Equilíbrio de HW
Conceitos de espécie
Mecanismos de especiação
Modos de especiação

Espécies em anel
Filogeografia da Europa
Filogeografia do Mediterrâneo