

Stable isotope analysis of small pelagics teleosts from the Tunisian coast

R. Lajnef, D. Bănaru, L. Ben Abdallah, L. Chouba et M. Pagano



Introduction

Material and methods

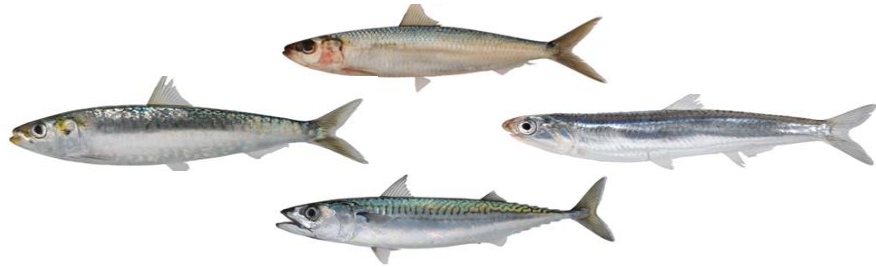
Results

Results

Discussion

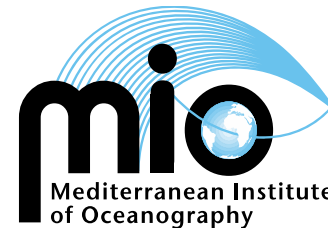
Conclusion

Small pelagic teleosts represent important exploited resources on the Tunisian coast.



Objective: the study of their trophic ecology using stable isotope ratios $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$.

This work is part of the MERITE-HIPPOCAMPE Mediterranean project between INSTM and IRD to identify the sources of organic matter and their transfer into pelagic food webs.



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Results

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- Sampling (Hannibal campaign)
- Morphological measurements (length, weight) and dissections (MIO)
- $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ analyses (MIO-LIENSs)

4 species:

Sardine - European pilchard (*Sardina pilchardus*)

N = 30

Round **sardinella** (*Sardinella aurita*)

N = 20

European **anchovy** (*Engraulis encrasicolus*)

N = 11

Atlantic **mackerel** (*Scomber scombrus*)

N = 22

N = number of analyses

Period: 30/04/2019 - 04/05/2019



Sardine



Sardinella

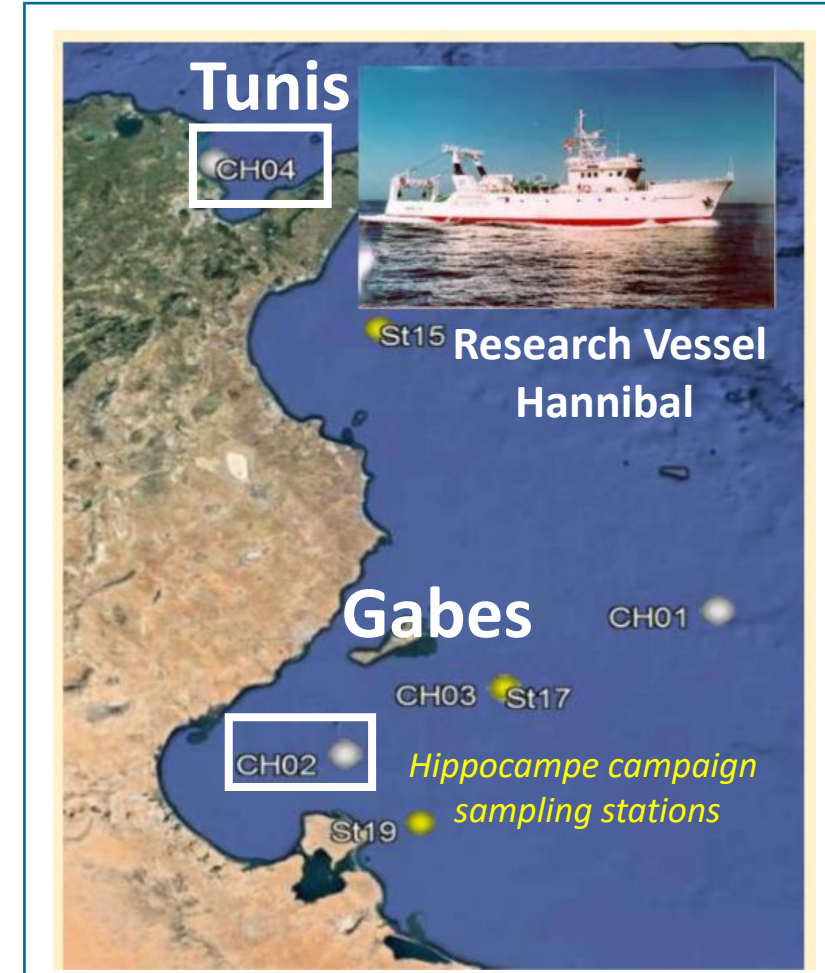


Anchovy



Mackerel

Photos source: Iglesias, 2012



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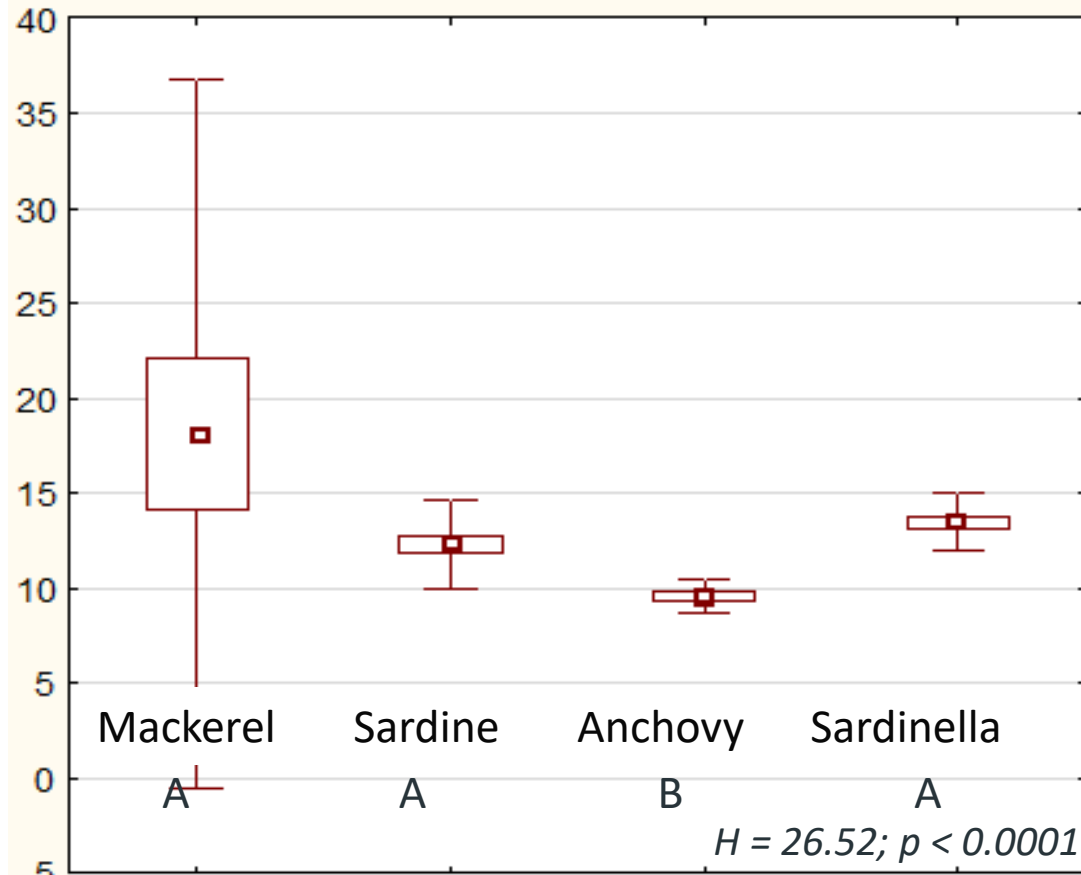
Results

Results

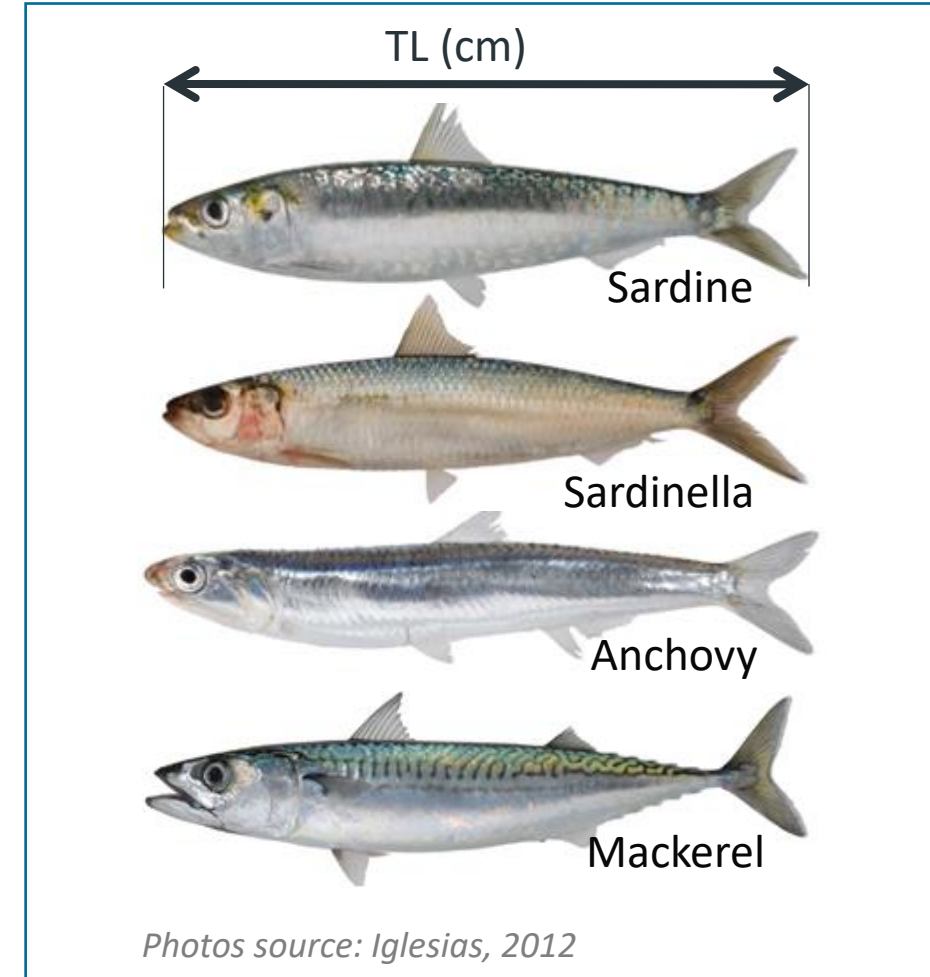
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Total length
(TL in cm)



Mean ± Ec. ty. 14.1 ± 2.2 12.3 ± 2.3 9.6 ± 0.9 13.5 ± 1.5 cm



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Discussion

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Differences in SIR between species :

$\delta^{13}\text{C}$ (***)

(Sardinelle = Mackerel) < Sardine < Anchovy

$\delta^{15}\text{N}$ (***)

(Sardinelle = Anchovy = Sardine) < Mackerel

Differences in SIR between areas :

Sardine : $\delta^{15}\text{N}$ (***)

Sardinella: $\delta^{15}\text{N}$ (***)

Mackerel: $\delta^{13}\text{C}$ (*) & $\delta^{15}\text{N}$ (***)

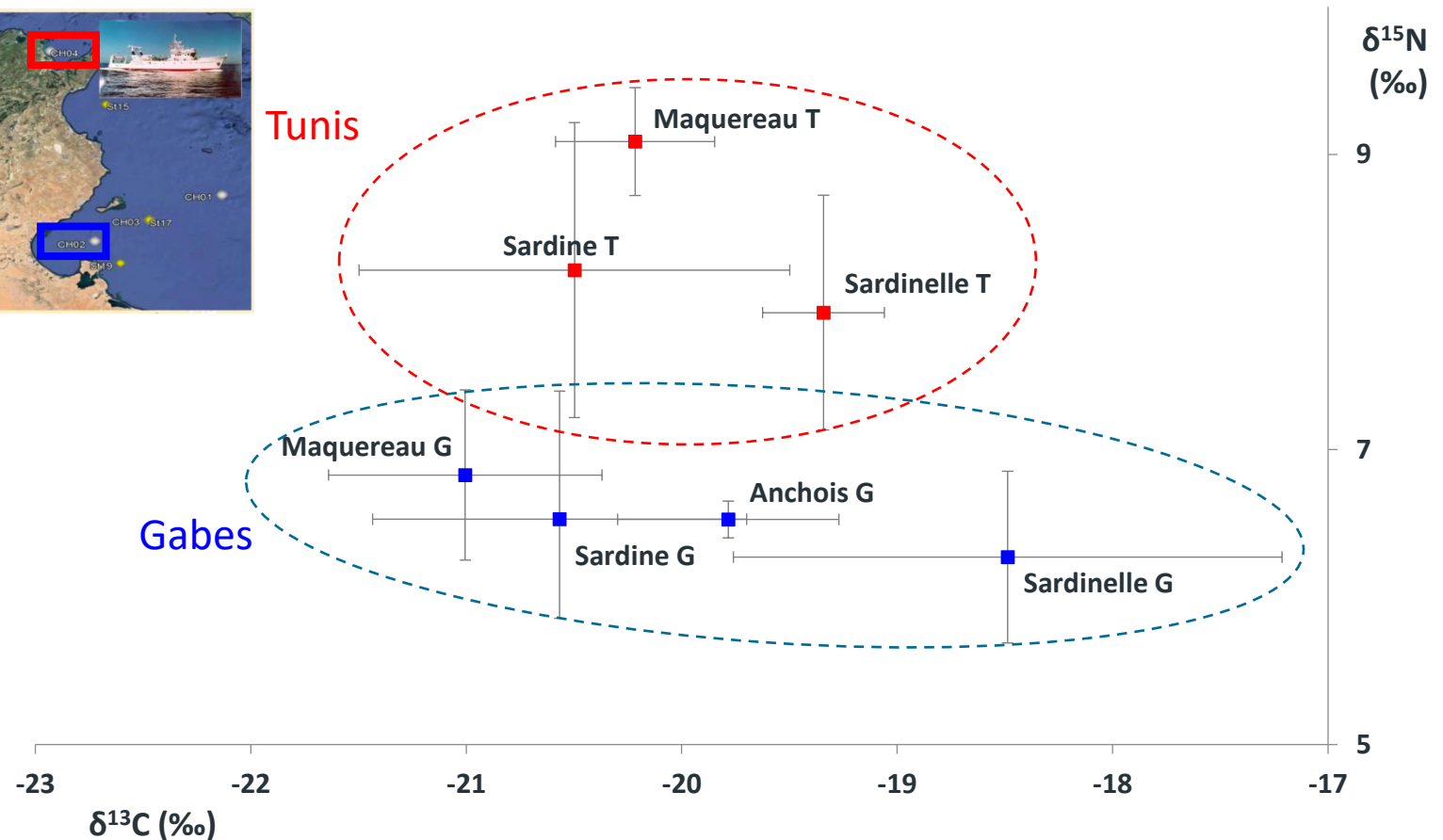
ANCOVA covariance & non param. Mann-Whitney

Stable isotopes ratios in the muscles the studied species



Tunis

Gabes



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Discussion

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Hannibal & Hippocampe campaigns

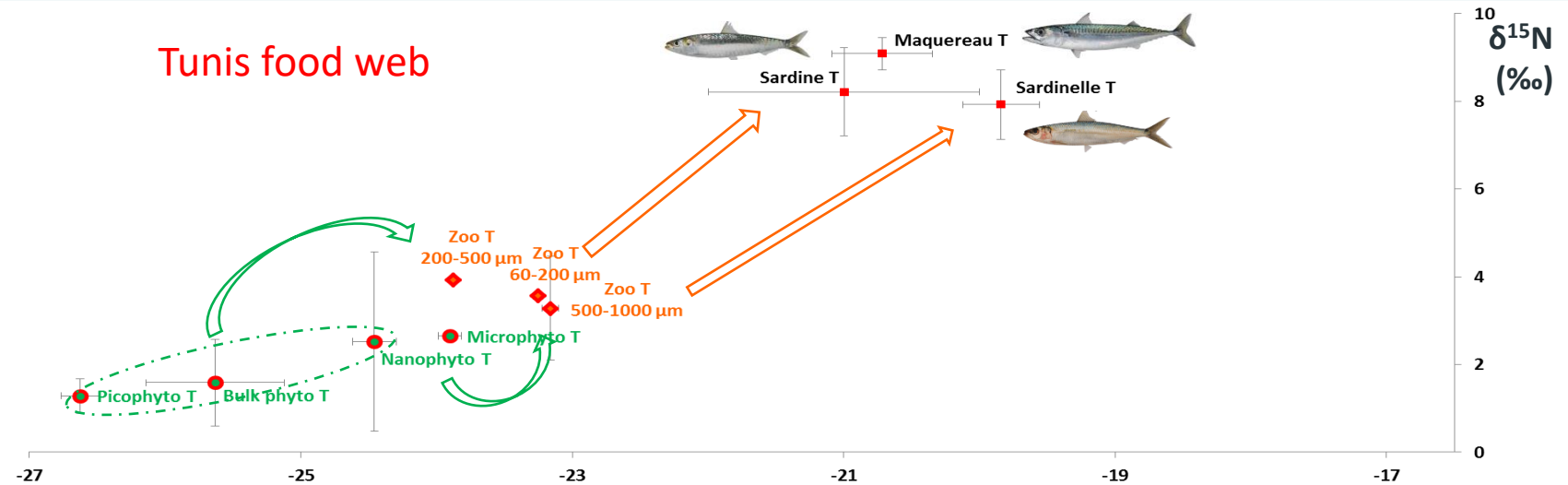
SIR teleosts : **Gabes** < **Tunis**

Similar food web structures but differences linked to:

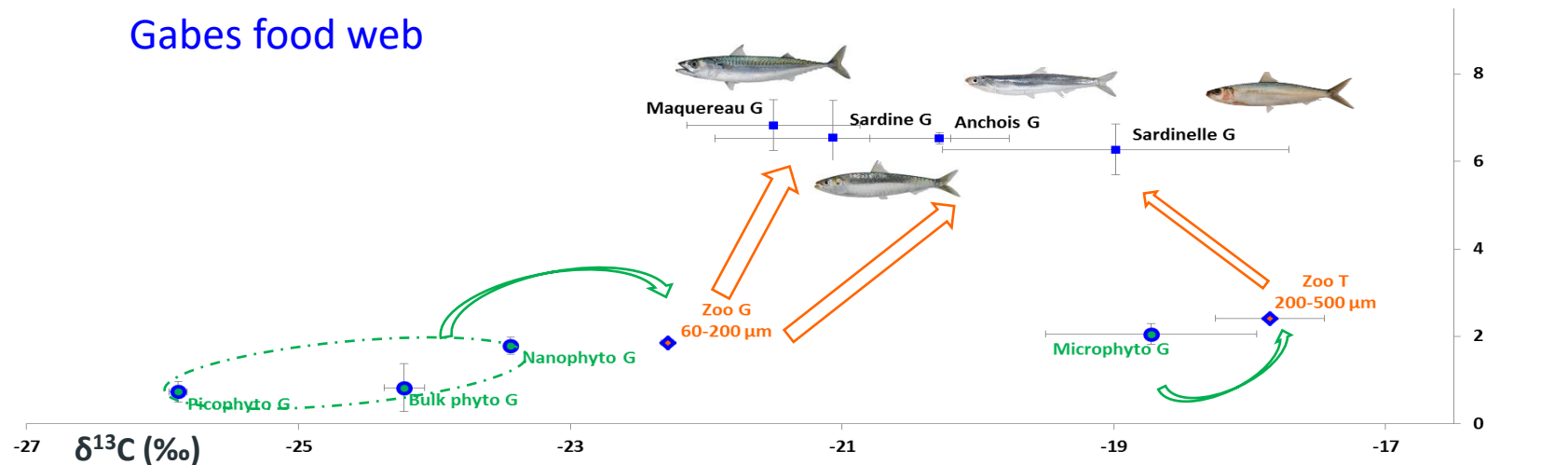
→ differences in SIR of the phytoplankton size classes at the basis of the food web

→ and/or species diet ?

Tunis food web



Gabes food web



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- Stable isotope ratios (SIR) of small pelagic teleost from the Tunisian coast showed differences in their diet and/or SIR at the basis of their food web
- Potential differences in their diet should be confirmed with analyses based on taxonomy of prey in their stomach contents
- Better relate food web sources, plankton food web functioning and teleost diet by taking into account their selectivity and the nutritional quality of their prey
- The comprehension of the teleosts diets and trophic interactions among them and with the zooplankton prey may allow to better understand their populations dynamics
- Explore links between Hannibal and Hippocampe campaigns results to better understand trophic dynamics and contaminants transfers to fisheries resources