

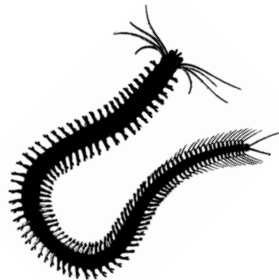


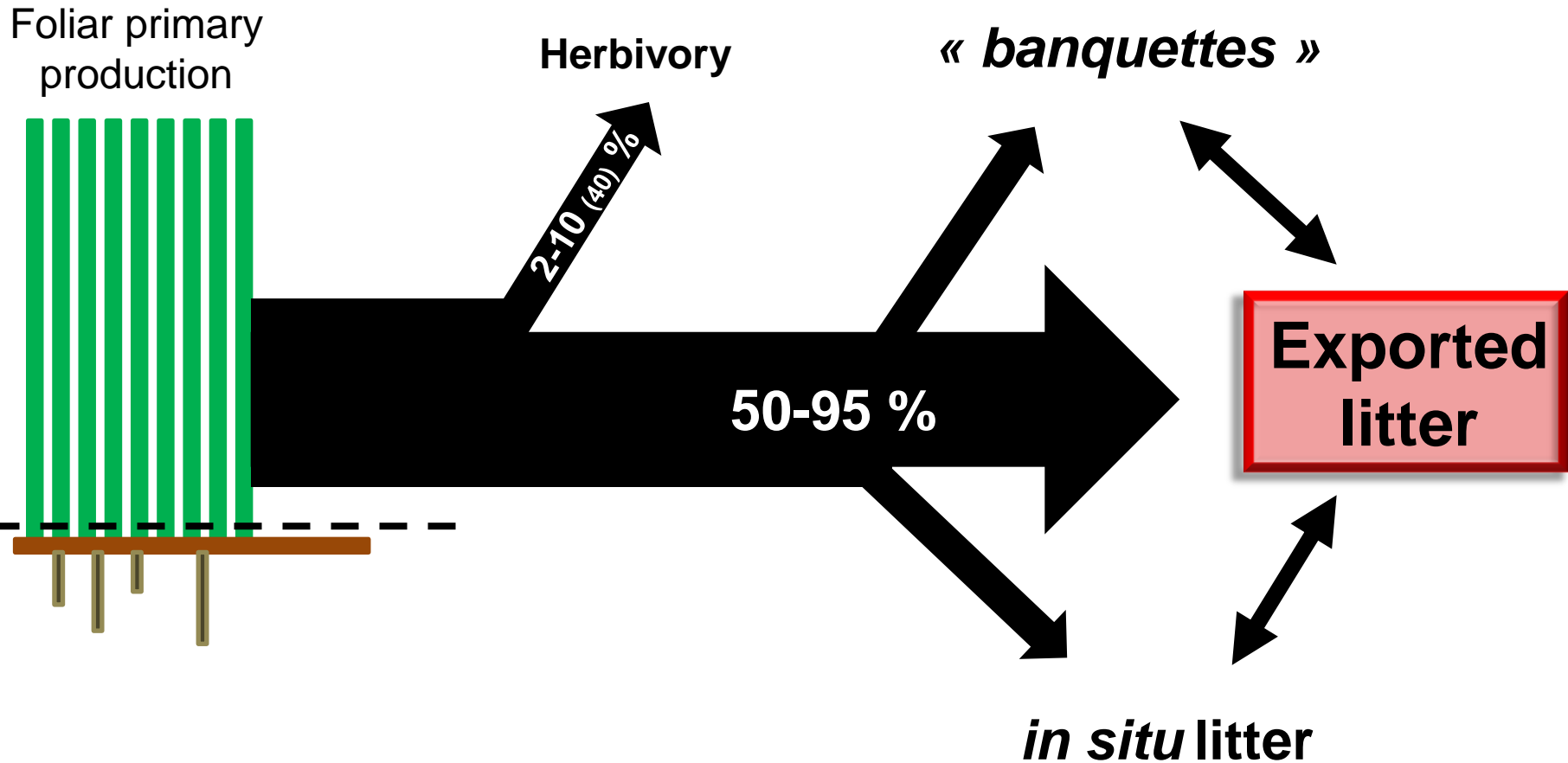
## Who would want to live in there?

A history of *Posidonia oceanica* detritus accumulations, the associated invertebrate community, and its food web...

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What is exported *P. oceanica* litter ?



**Exported litter  
accumulation**



**Exported litter  
accumulation**

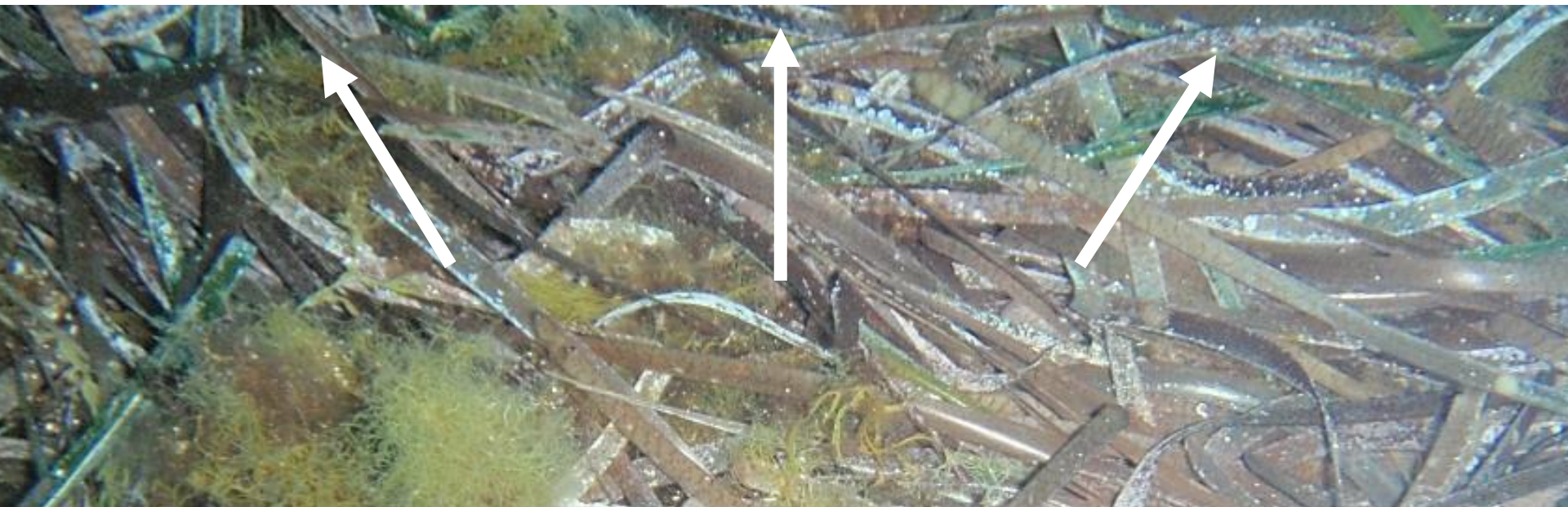
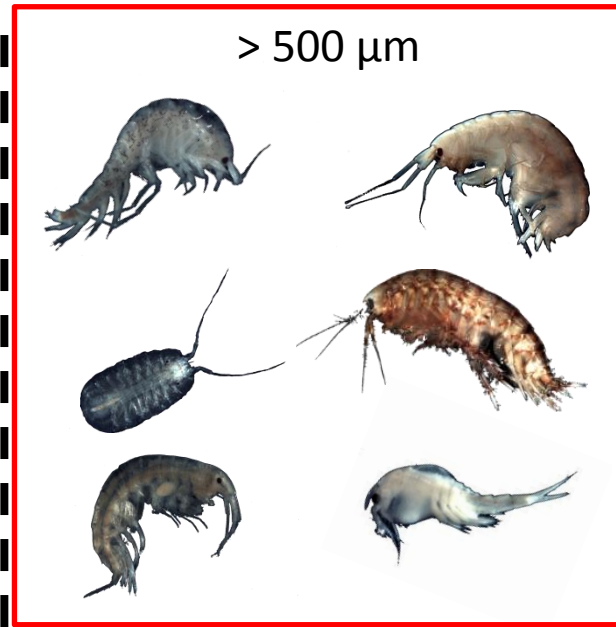
1m

# What lives in *P. oceanica* litter?

> 38  $\mu\text{m}$

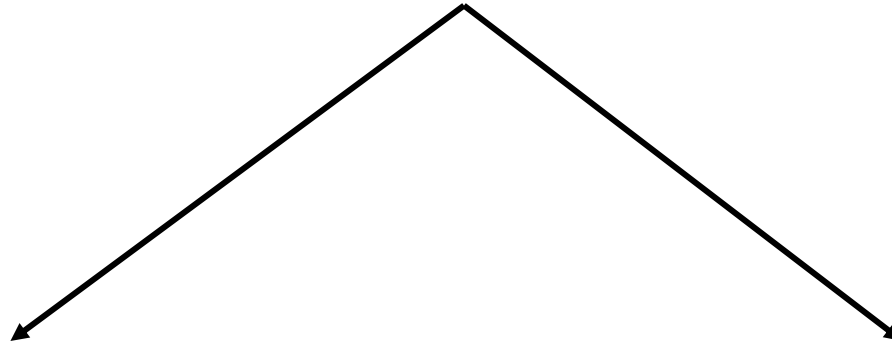
> 500  $\mu\text{m}$

> 10 cm



## General objective:

characterize the exported *P. oceanica* litter macrofauna community, assess its dynamics and trophic ecology in Calvi Bay

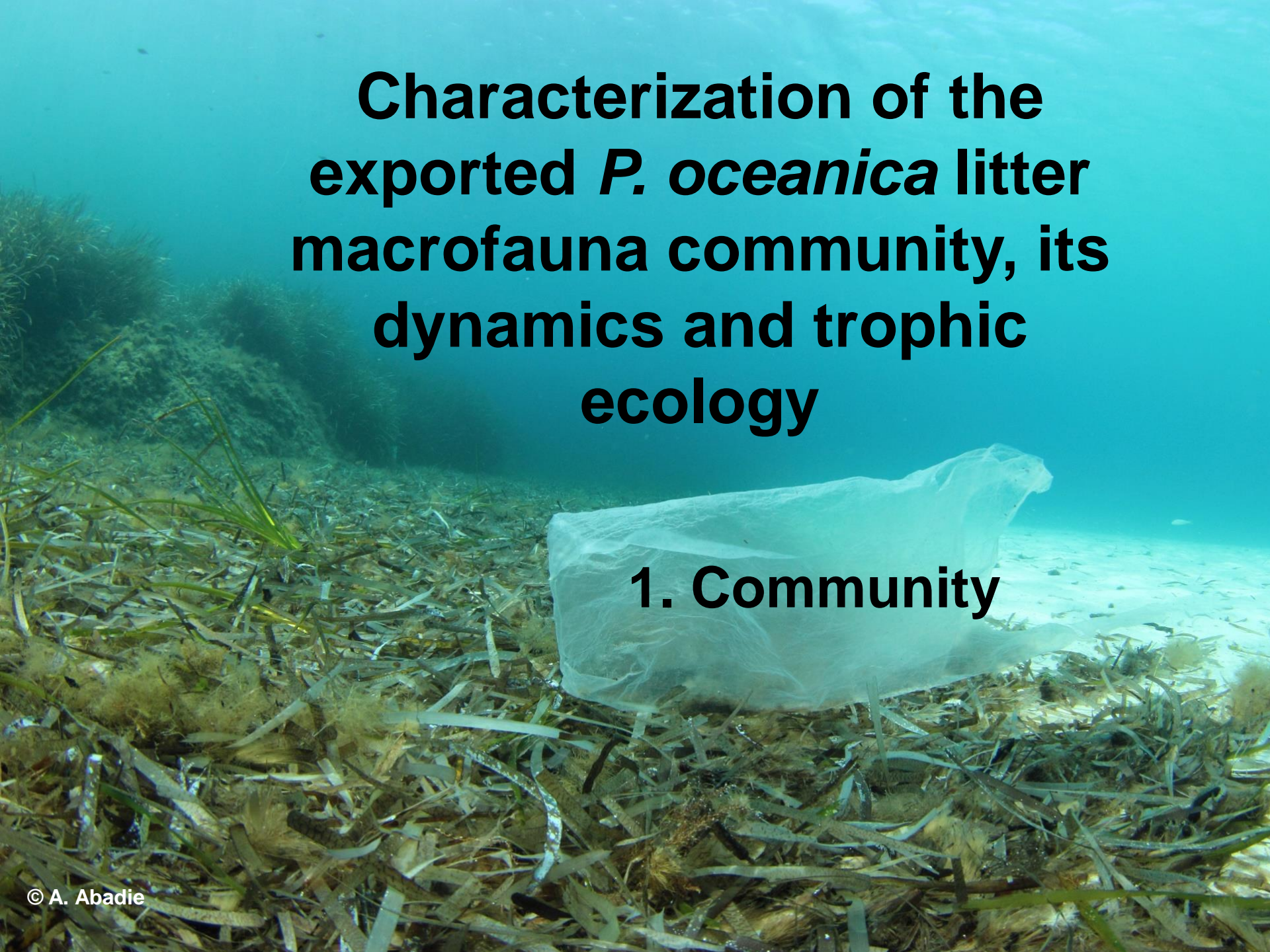


### Community characterization

- General patterns
- Seasonal variation
- Environmental parameters

### Trophic web characterization

- General patterns
- Seasonal variation
- GUT + ISOTOPES

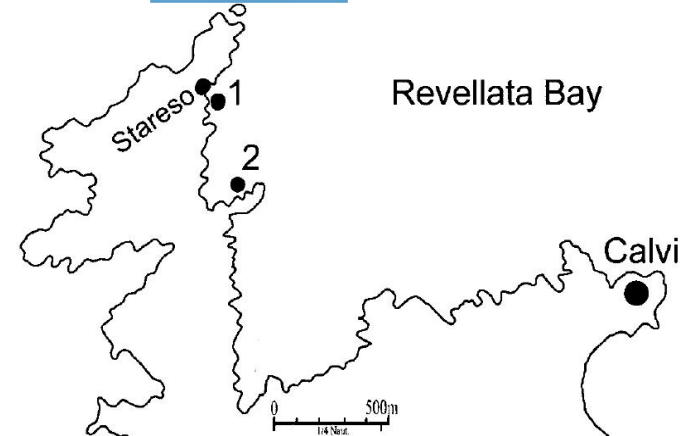
An underwater photograph showing a white plastic bag lying on a bed of seagrass. The water is clear and blue, and the seagrass is green and brown. The bag is the central focus of the image.

# Characterization of the exported *P. oceanica* litter macrofauna community, its dynamics and trophic ecology

## 1. Community

## Community characterization:

- 2010-2012: seasonal sampling at 2 sites
- Standardized sampling
- Identification to the specific level

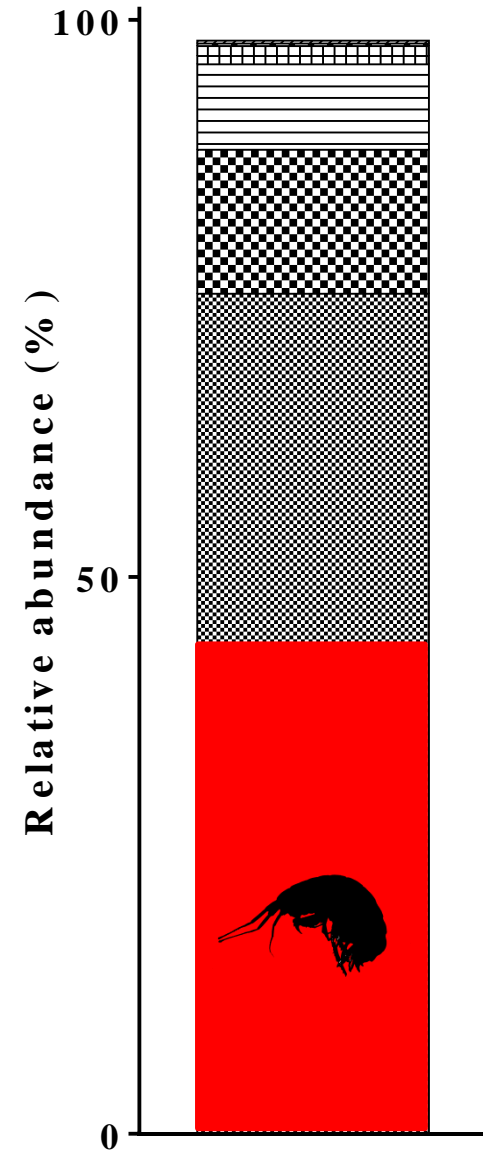


## General community pattern:

- ~20.000 identified individuals
- 115 species (→ 1/3x meadow)
- High abundance (up to 5100 ind.m<sup>-2</sup> → 2x meadow)
- Arthropods (especially amphipods) are highly dominant
- Important dominance : 19 species = 90%
- One species to remember : *Gammarella fucicola* (~40%)



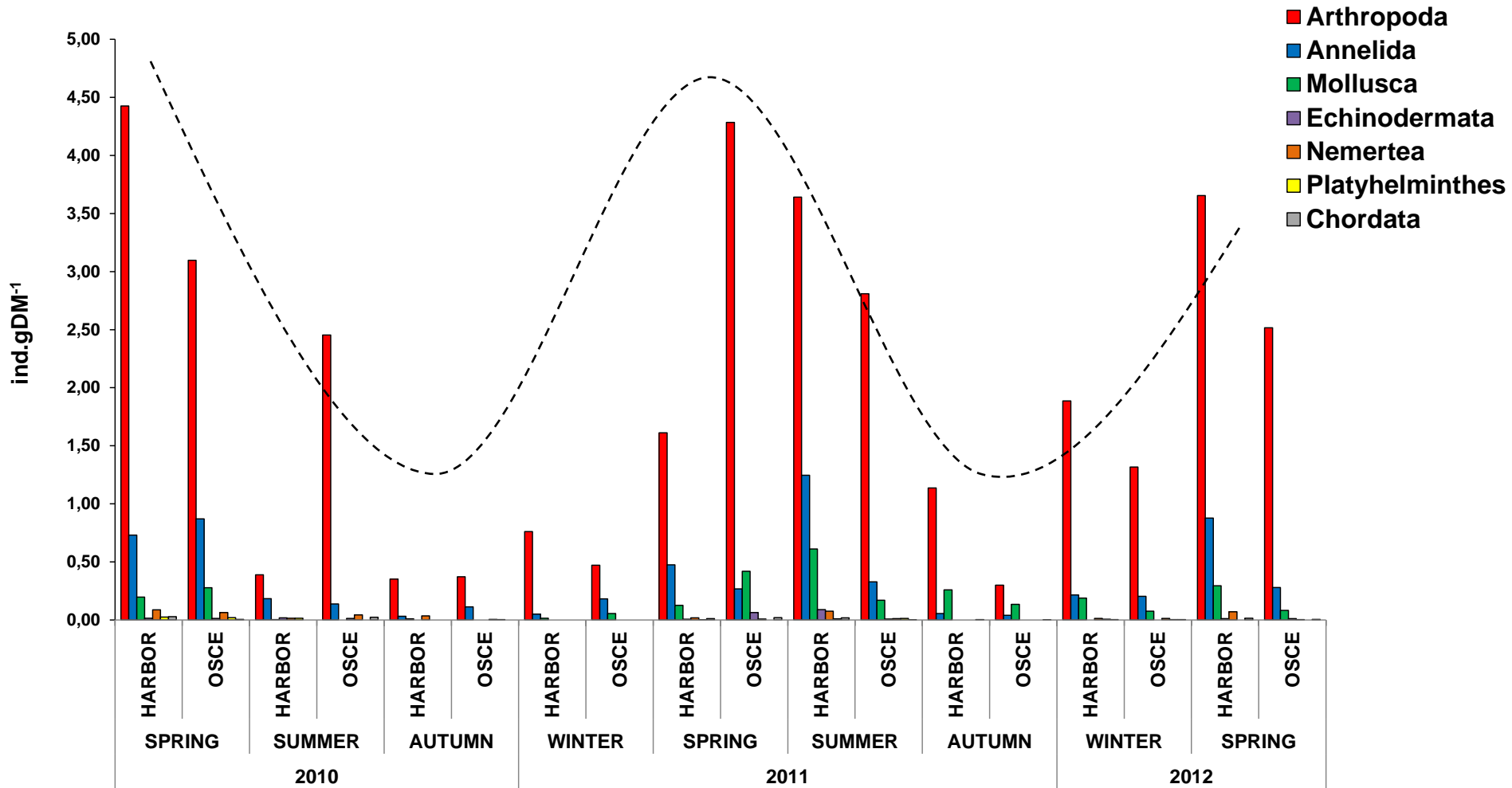
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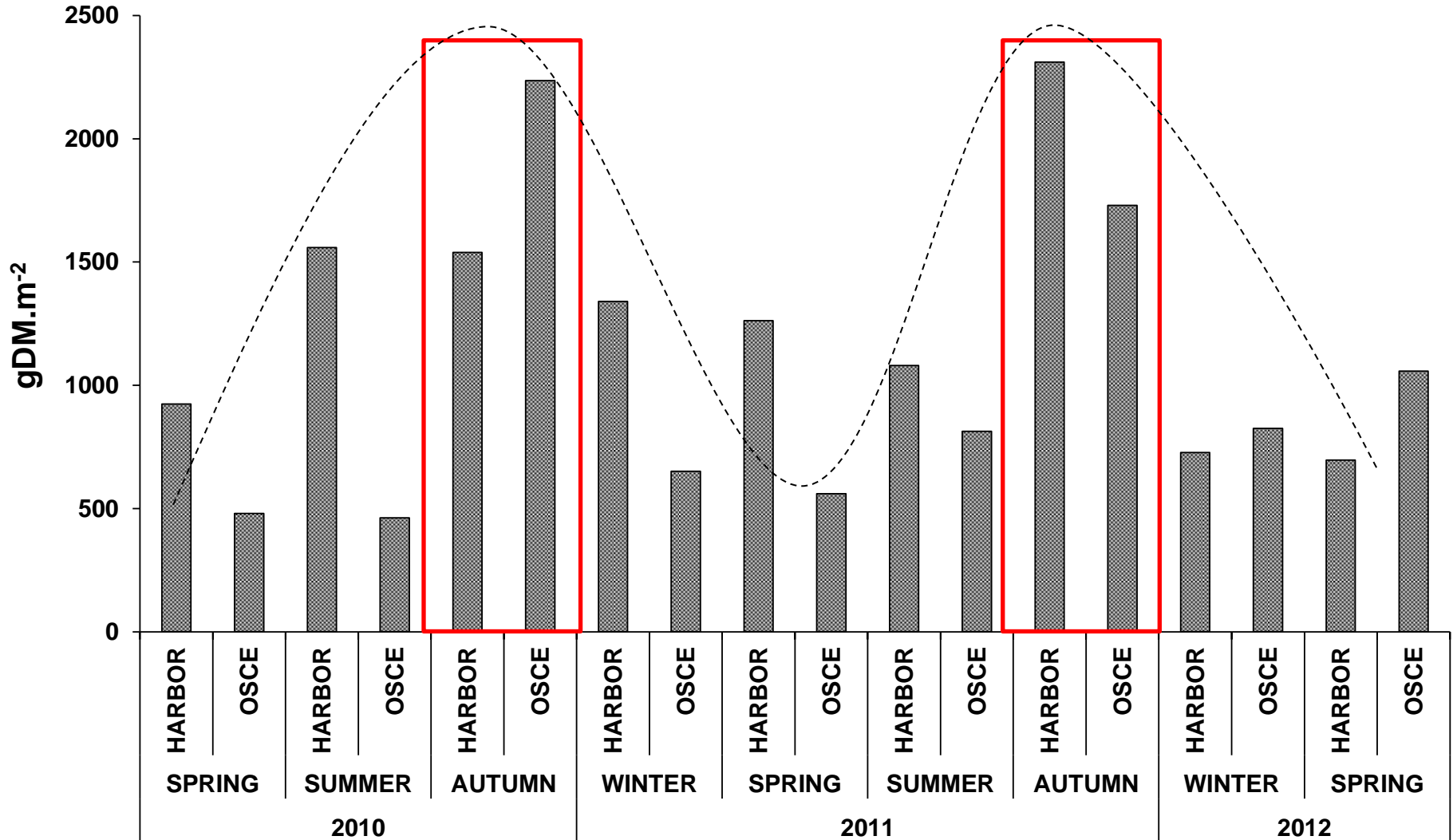


## General community pattern:

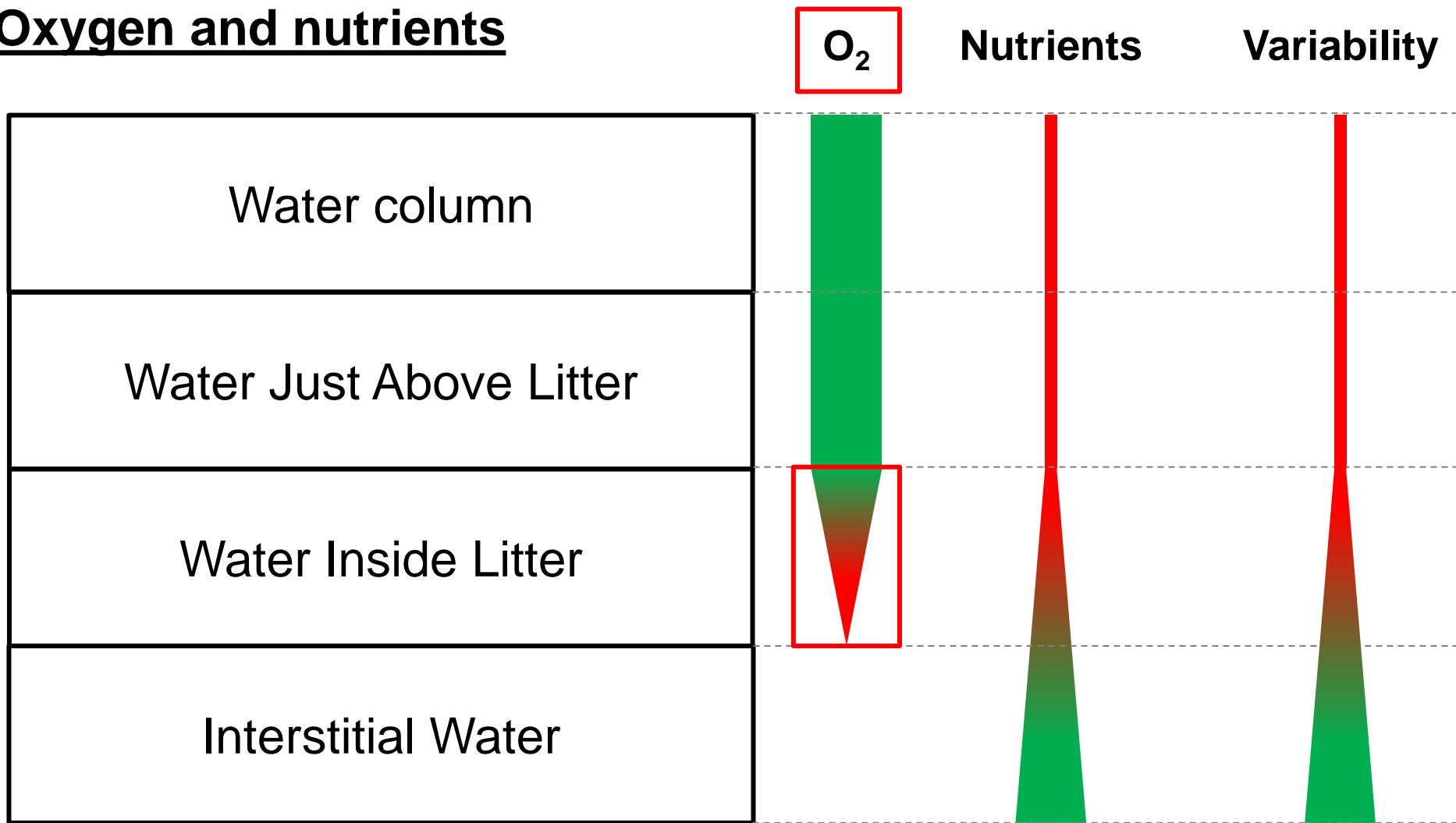
Temporal variations



## A variable habitat: litter biomass



## Oxygen and nutrients

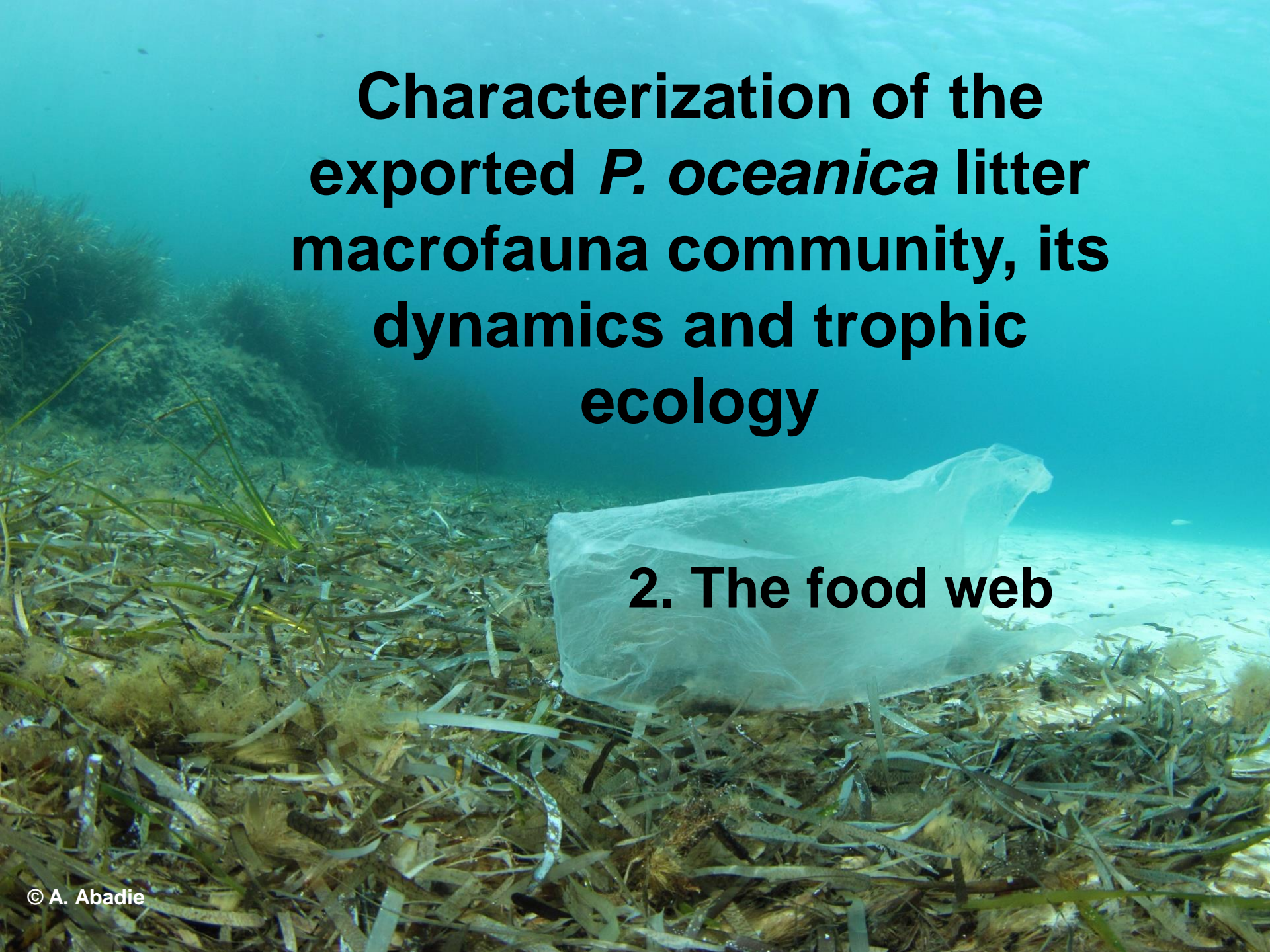


**O<sub>2</sub> is not the only influencing parameter, but is a very interesting one**

## Summary

- Seasonal variations : community **AND** environment
- Community → not diverse but abundant and dynamic
- Litter biomass / composition → seasonal pattern
- Seasonal changes in **O<sub>2</sub> concentration** **inside** the litter

**Litter accumulations are highly dynamic habitats supporting an abundant and variable community of macro-invertebrates**

An underwater photograph showing a white plastic bag lying on a bed of seagrass. The water is clear and blue, and the seagrass is green and brown. The bag is the central focus of the image.

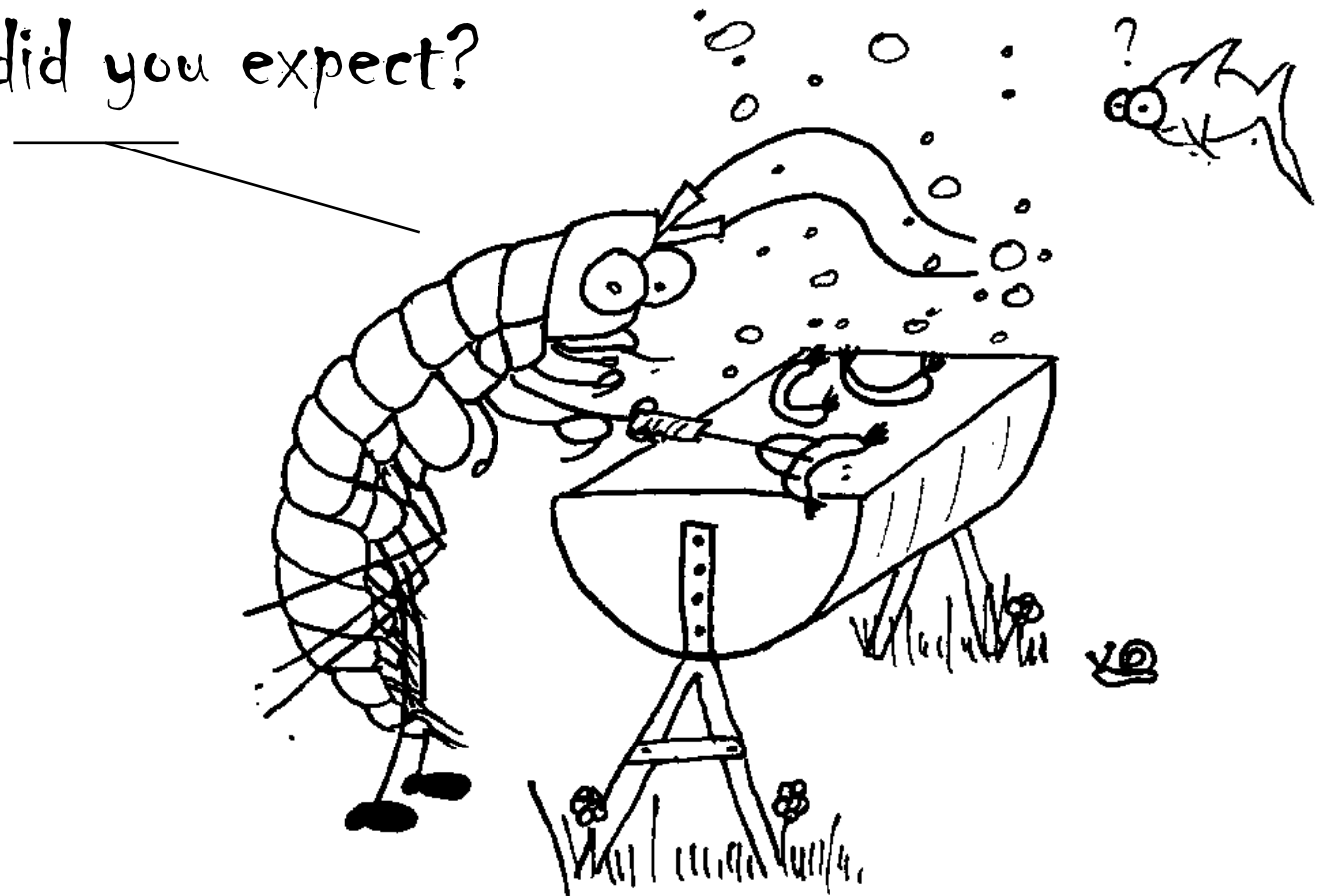
# Characterization of the exported *P. oceanica* litter macrofauna community, its dynamics and trophic ecology

## 2. The food web

# What about dietary habits?

Eating detritus?

Hey...what did you expect?



## Trophic ecology: two different approaches.

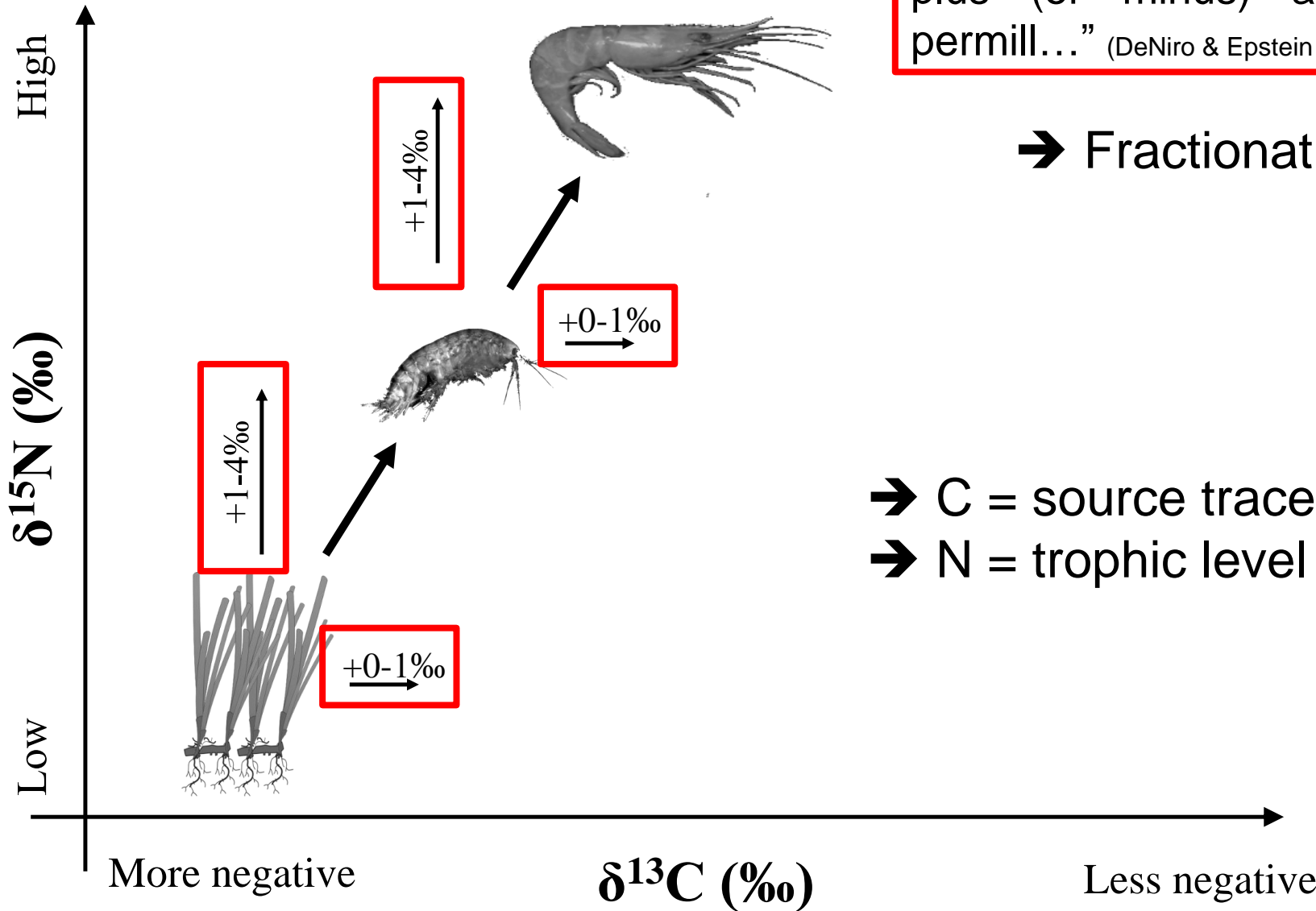
### ➤ Gut content examination

- **Pros:** easy, fast, visual observation
- **Cons:** snapshot, ingestion  $\neq$  assimilation, identification

### ➤ Stable isotopes

- **Pros:** long term integration, assimilation, trophic level
- **Cons:** time (and money) consuming, isotopic separation, need the sources

# What use in trophic ecology?



“You are what you eat, plus (or minus) a few permill...” (DeNiro & Epstein 1976)

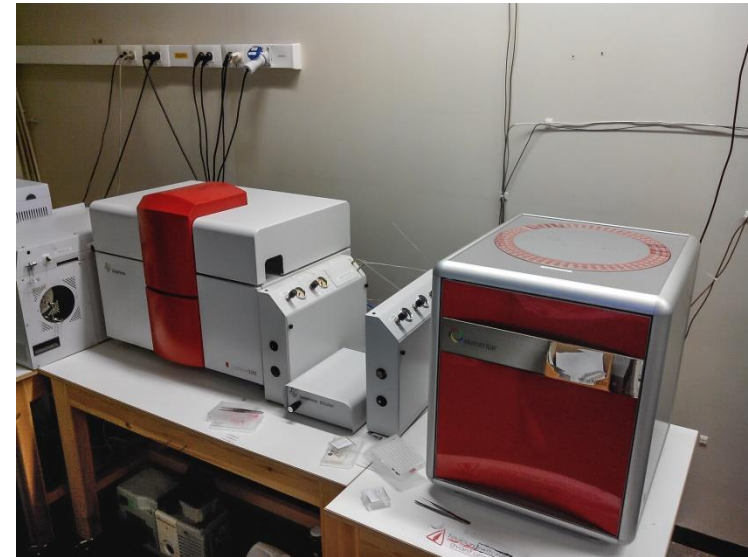
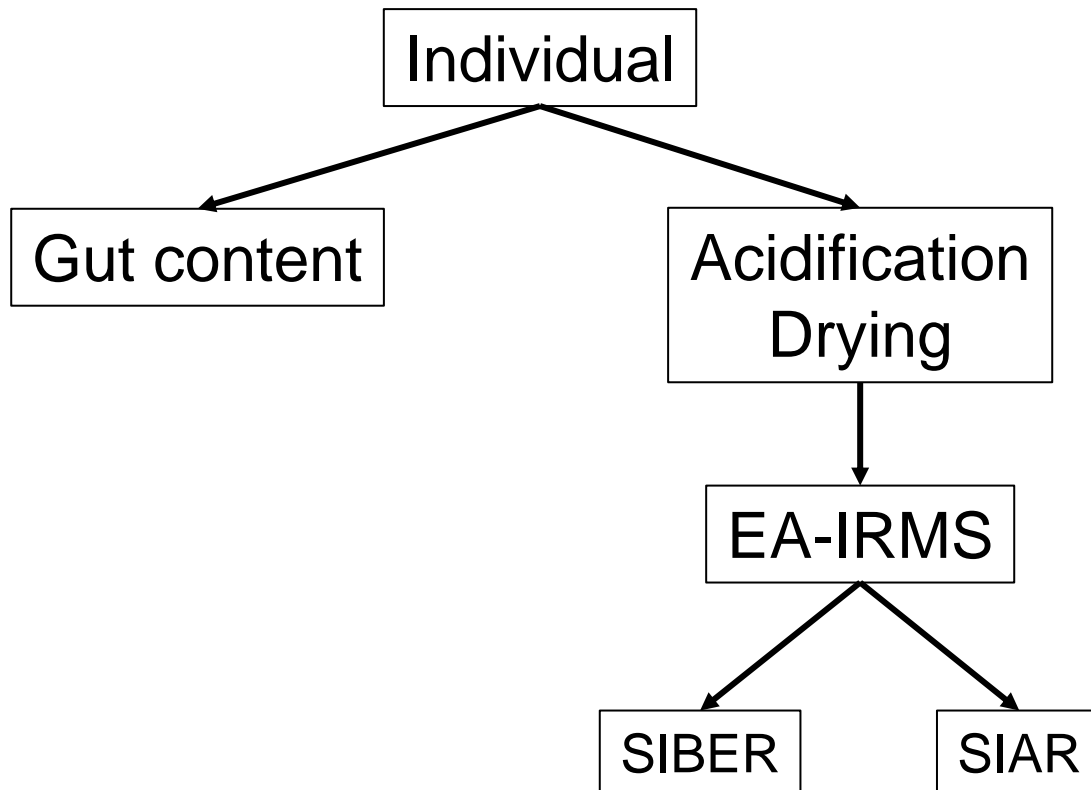
→ Fractionation

- C = source tracer
- N = trophic level



## Food web characterization:

- 2011-2012: seasonal sampling at the 2 sites
- Non-standardized hand sampling (50L sealed bags)
- Identification to the specific level



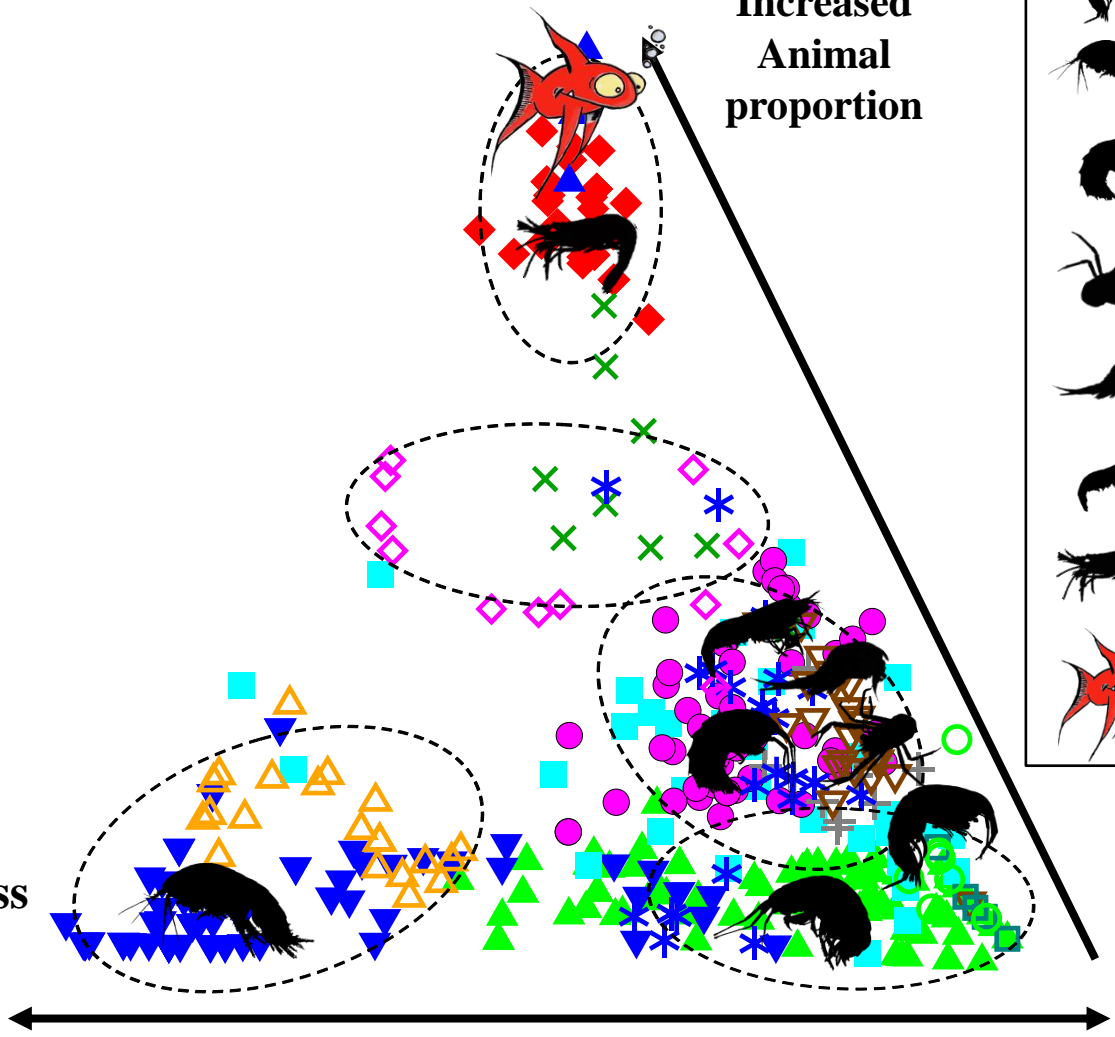
## Gut contents










nm-MDS  
+  
ANOSIM

Dead seagrass  
dominance

Increased  
Animal  
proportion

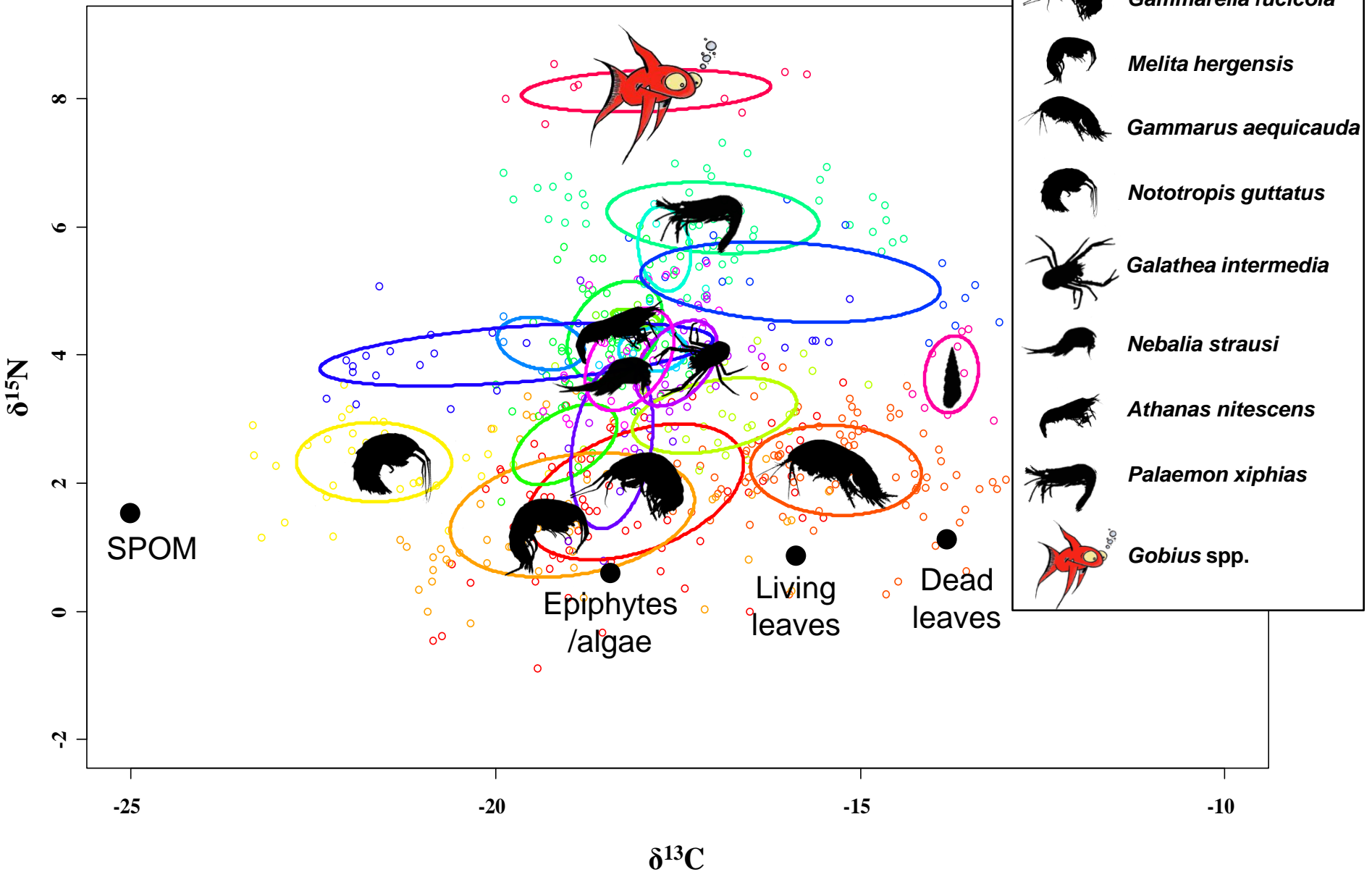
Algal  
dominance



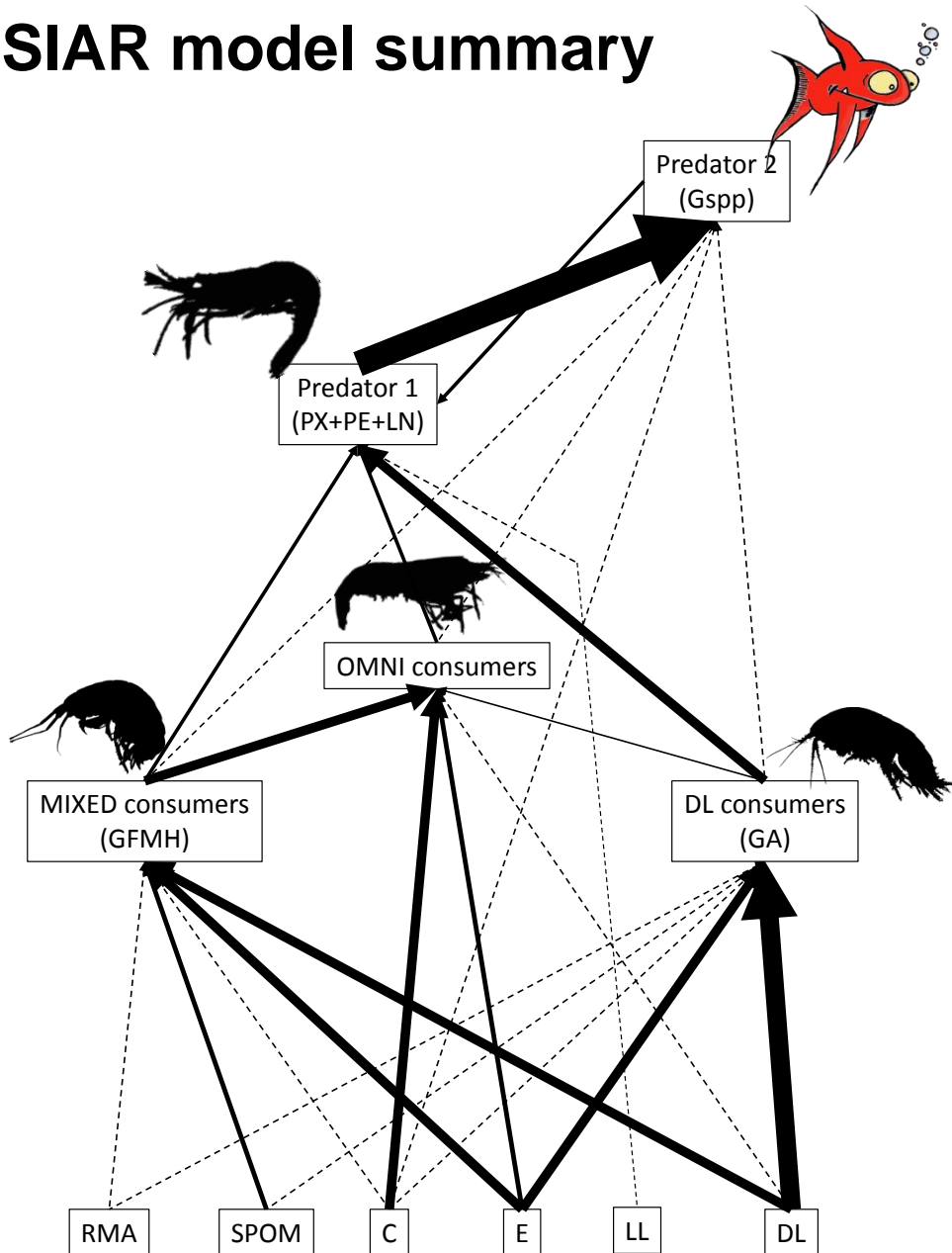
-  *Gammarella fucicola*
-  *Melita hergensis*
-  *Gammarus aequicauda*
-  *Nototropis guttatus*
-  *Galathea intermedia*
-  *Nebalia strausi*
-  *Athanas nitescens*
-  *Palaemon xiphias*
-  *Gobius spp.*

# Food sources dynamics influence the macrofauna

## SIBER ellipses



## SIAR model summary



## Global food web:

- Different trophic levels
- Different dietary preferences
- Dead leaves « signal » transferred to the top of the food web

➔ Litter macrofauna are litter fragmenters, consumers and assimilators

## Synthesis

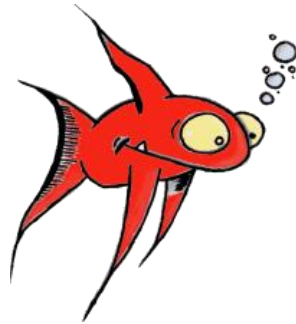
- Macrofauna food web → 3-4 trophic levels with different diets
- Detritus are a non-negligible food source

## **BUT...**

- Isotopic compositions of are highly variable seasonally
- Sometimes linked to diet modification (sometimes only baseline shift...)
- Impact of food source availability



# Thank you for your attention



The authors warmly thank the STARESO field station staff for their support during the sampling campaign.

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