



# Combined impact of plastics and parasites on the seabird population dynamics and disease emergence



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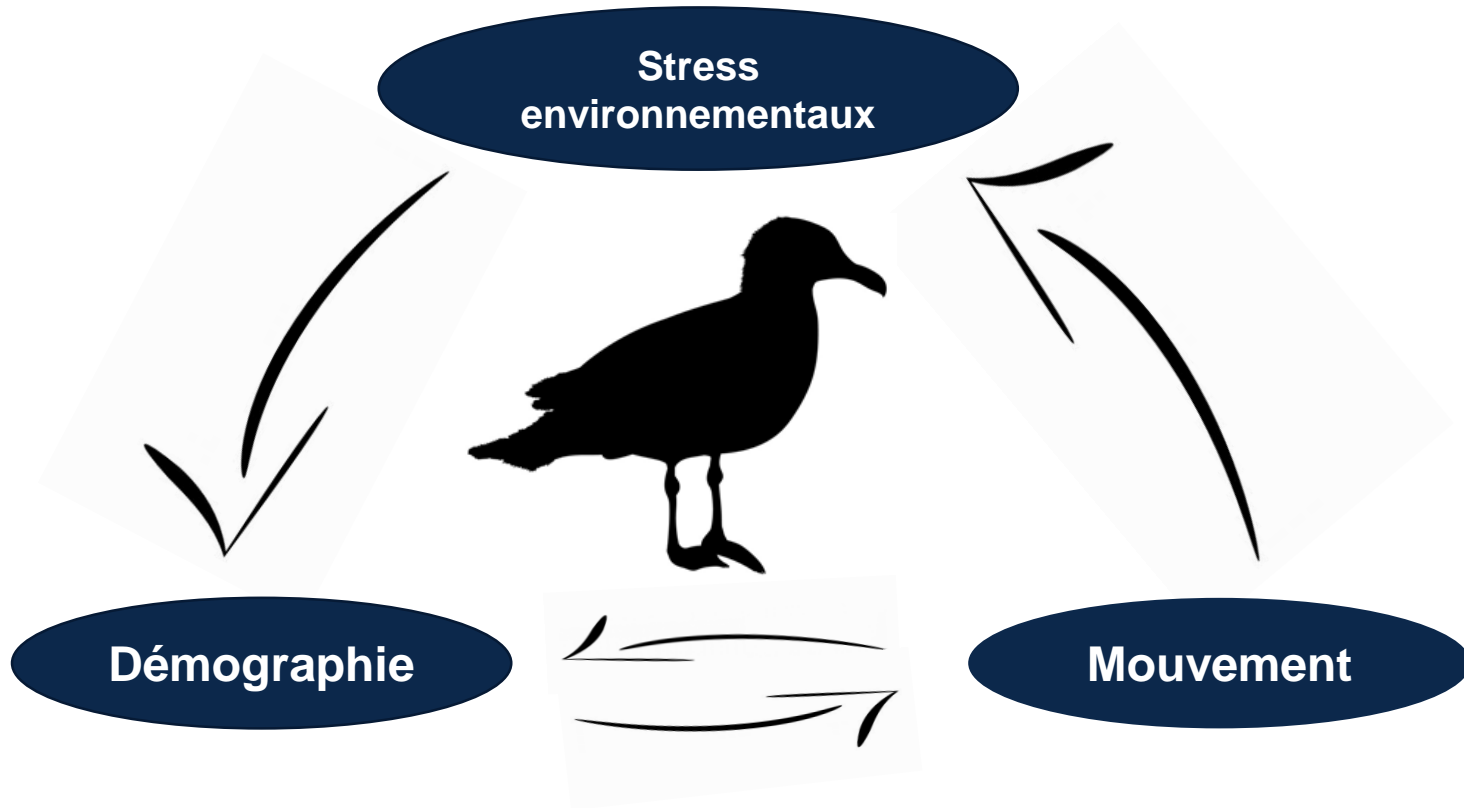
Co-supervisor : Marion Vittecoq



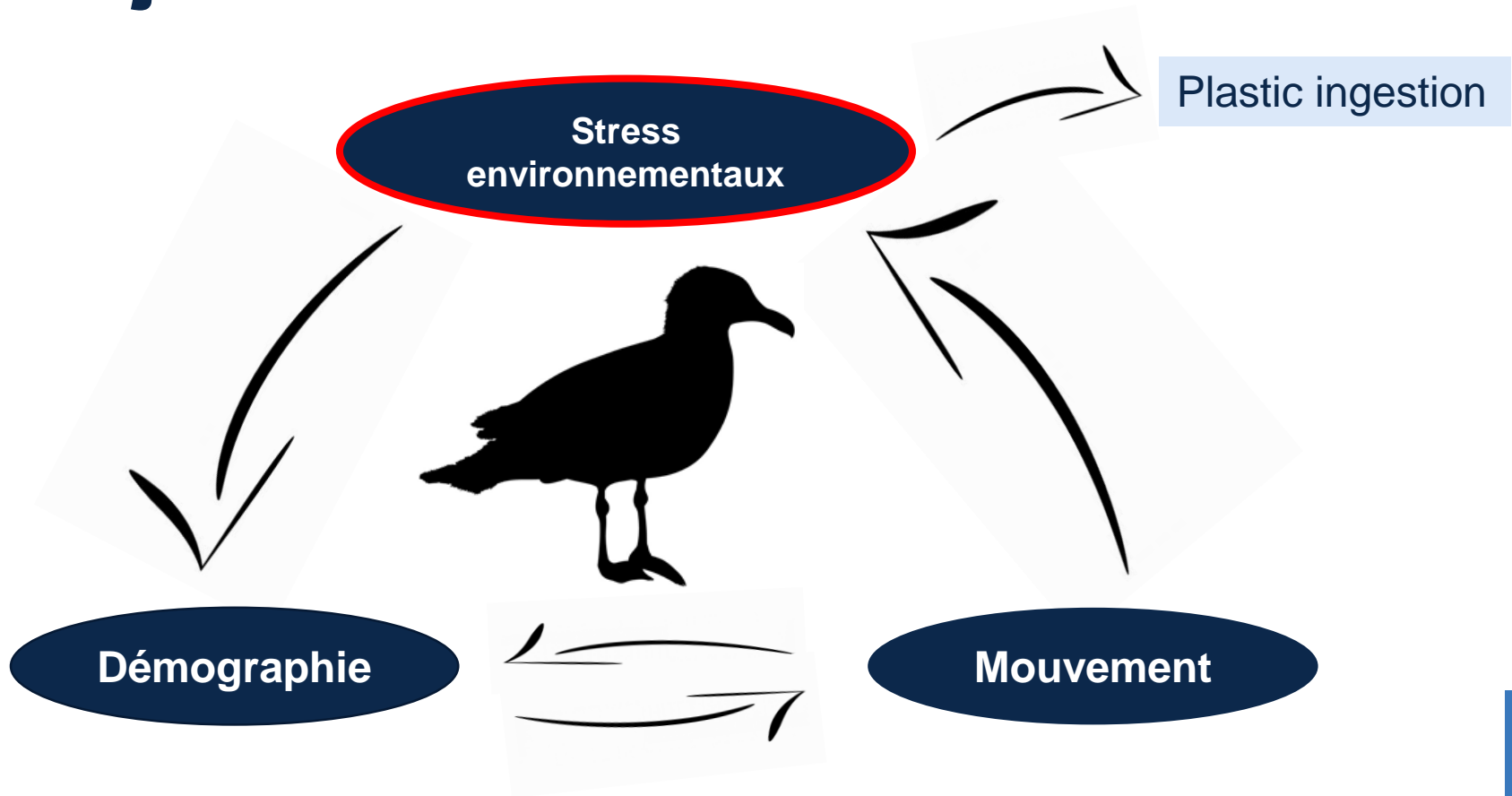
RESOM

23 – 24 mars 2023

# Projet EcoDIS



# Projet EcoDIS



**20 MILLION** new plastic items released every day



@ James Whitlow Delano

**33 billion tons  
by 2050**

Bond et al., 2021 ; Kain et al., 2016



# Over 200 seabird species interact with plastic



- Nutritional deprivation
  - Reduced mass body
  - Decreased fat deposition
  - Damage to obstruction of the gut
- Threat at population level

## Yellow-legged gull : *Larus michahellis*

- ❖ Large, dense colonies
- ❖ Long-lived top predator



# **Yellow-legged gull boluses**



**Does plastic exposure vary over the breeding season ?**





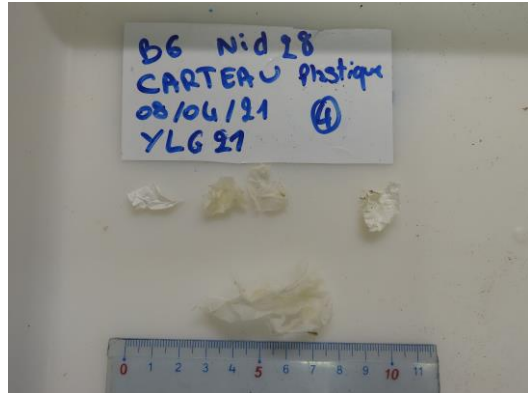
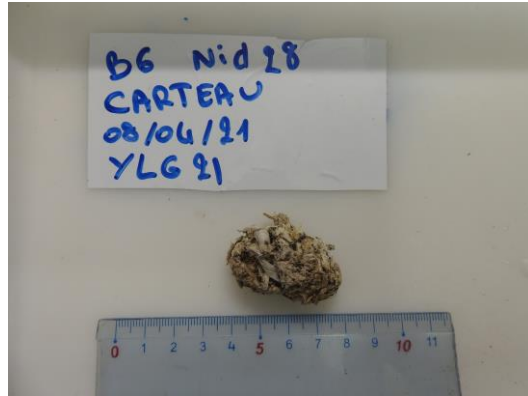
# Boluses collection during breeding season 2020



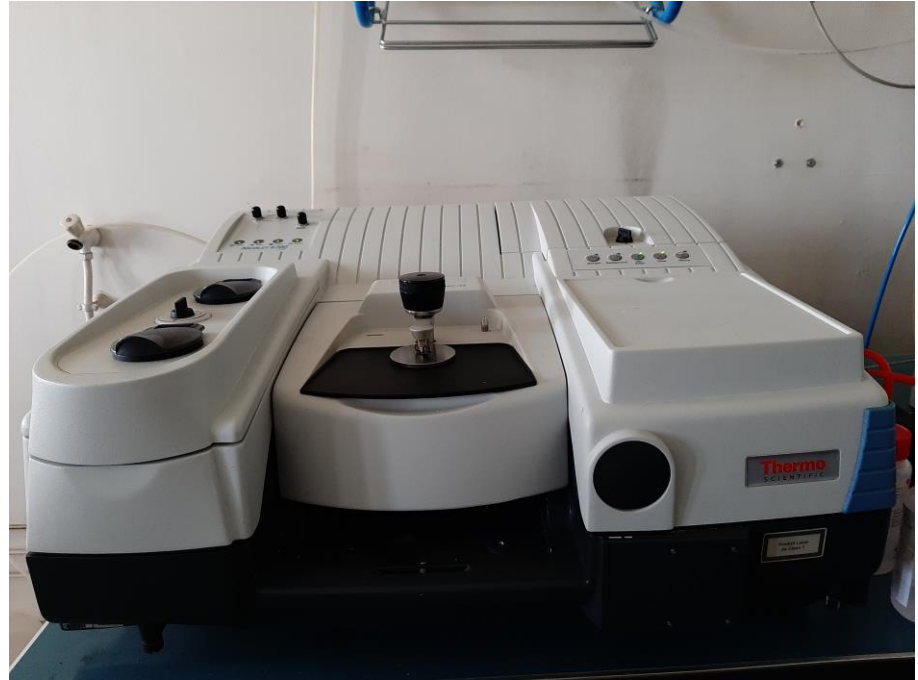
Boluses (n=143)



## Bolus analysis

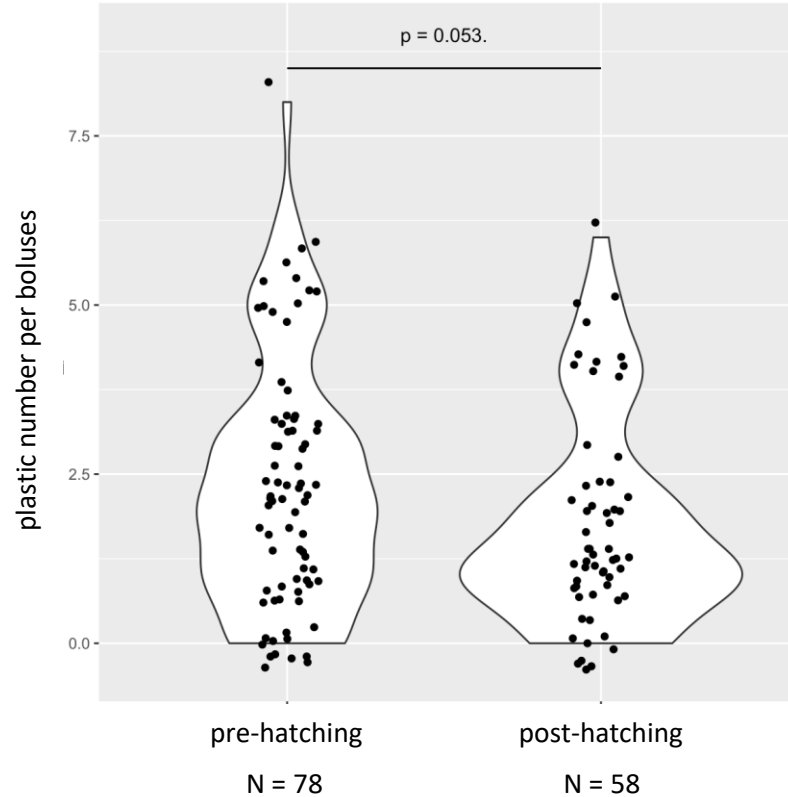


Tour du Valat



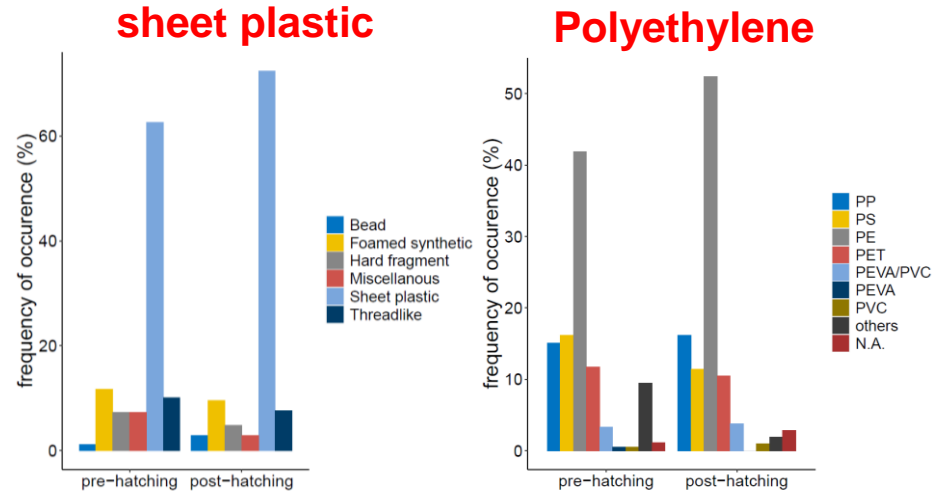
IMRCP Toulouse

# Slight decrease in the number of plastic items per boluses at chick hatching



# Plastic ingestion by yellow-legged gulls (*Larus michahellis*) over the breeding season 2020 at Carteau

- 83.9% of boluses with at least 1 plastic item



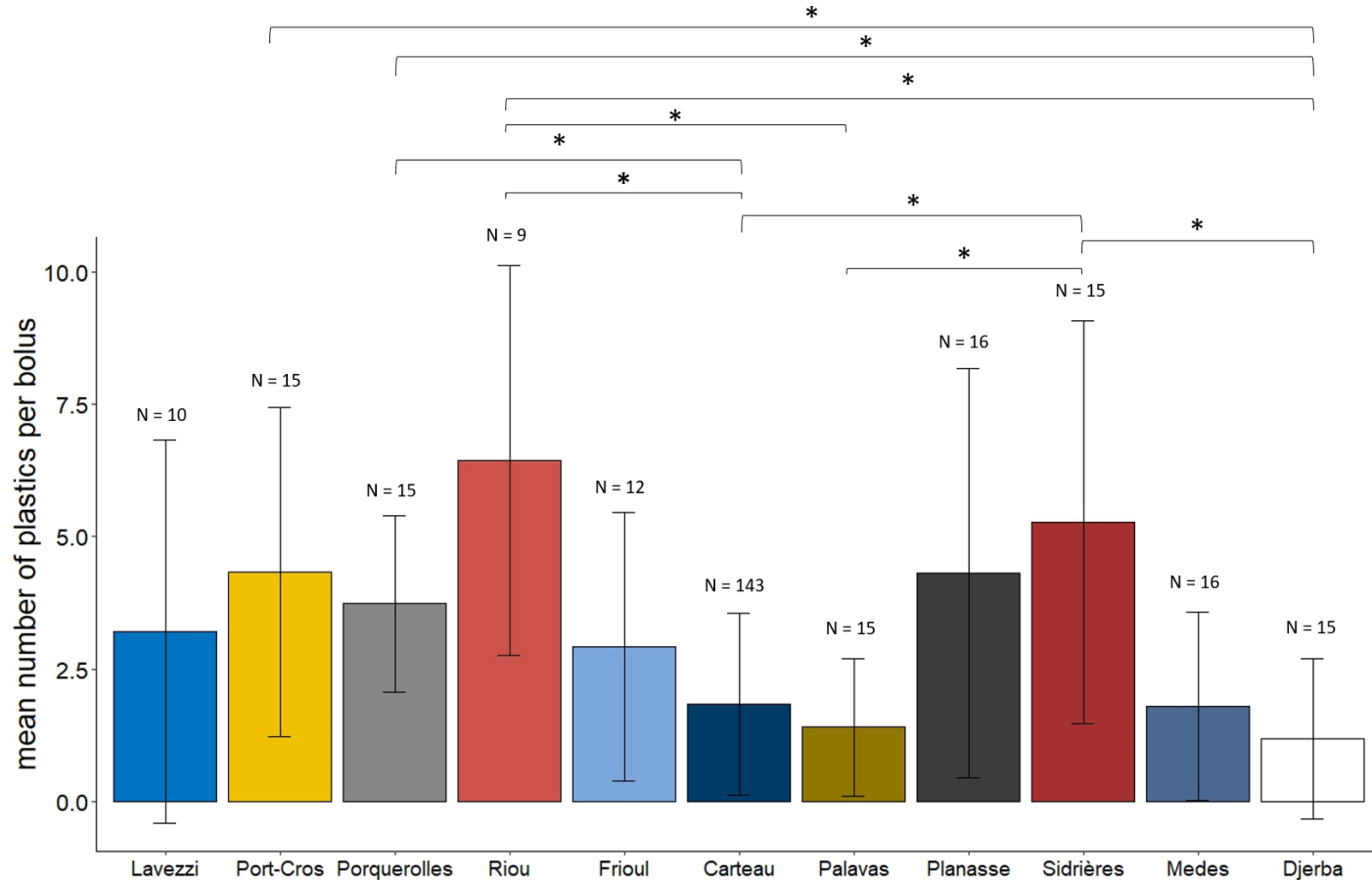
→ food packaging dominated both periods



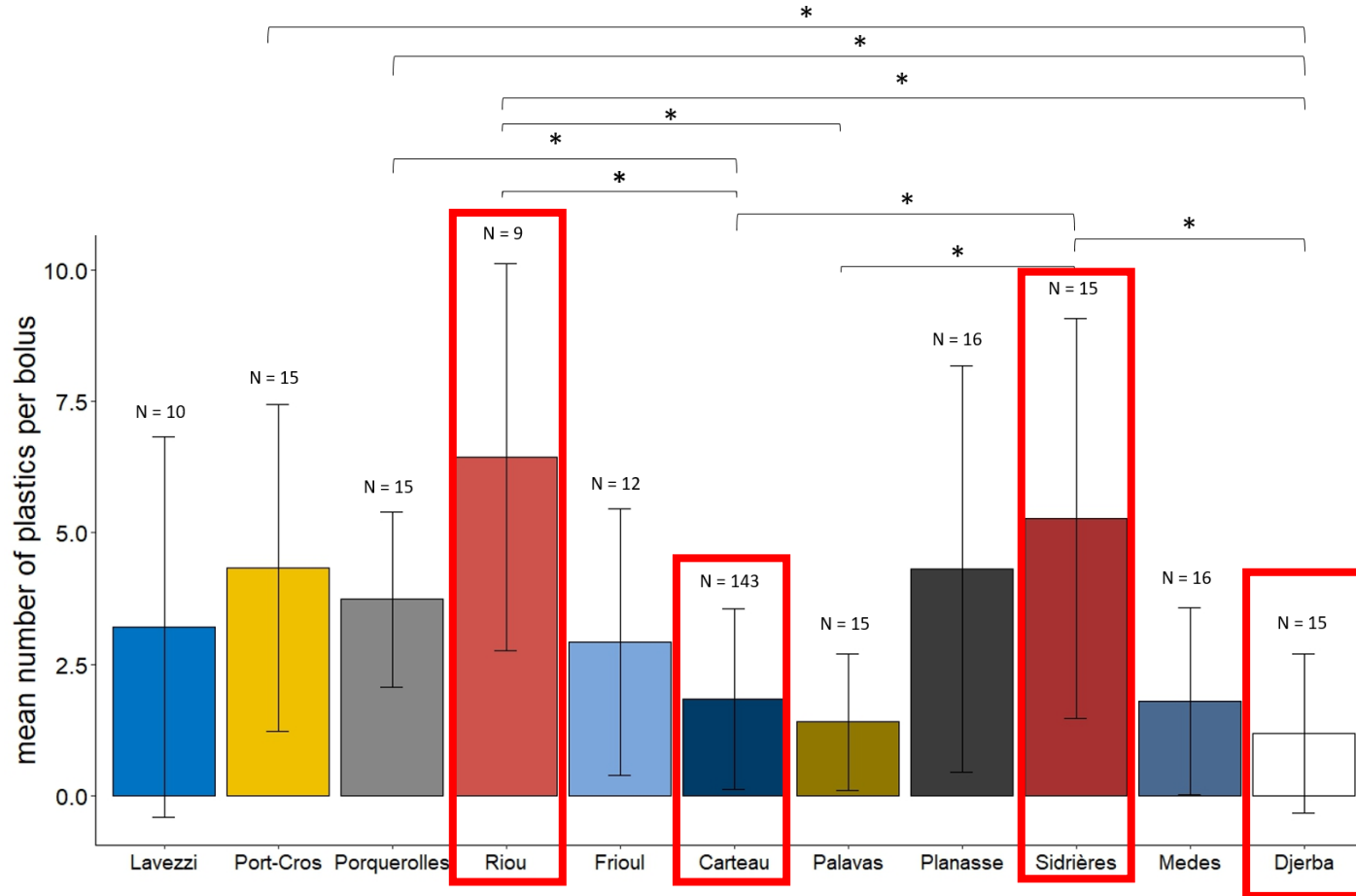
A map of the North Atlantic Ocean region, showing the eastern coast of North America, the British Isles, and the northern coast of Europe. Several red dots are placed along the northern and eastern coasts of North America, along the western coast of Europe, and on the island of Ireland, indicating sampling locations for plastic exposure studies. The text "Does plastic exposure vary spatially?" is overlaid in the center of the map.

**Does plastic exposure vary spatially ?**

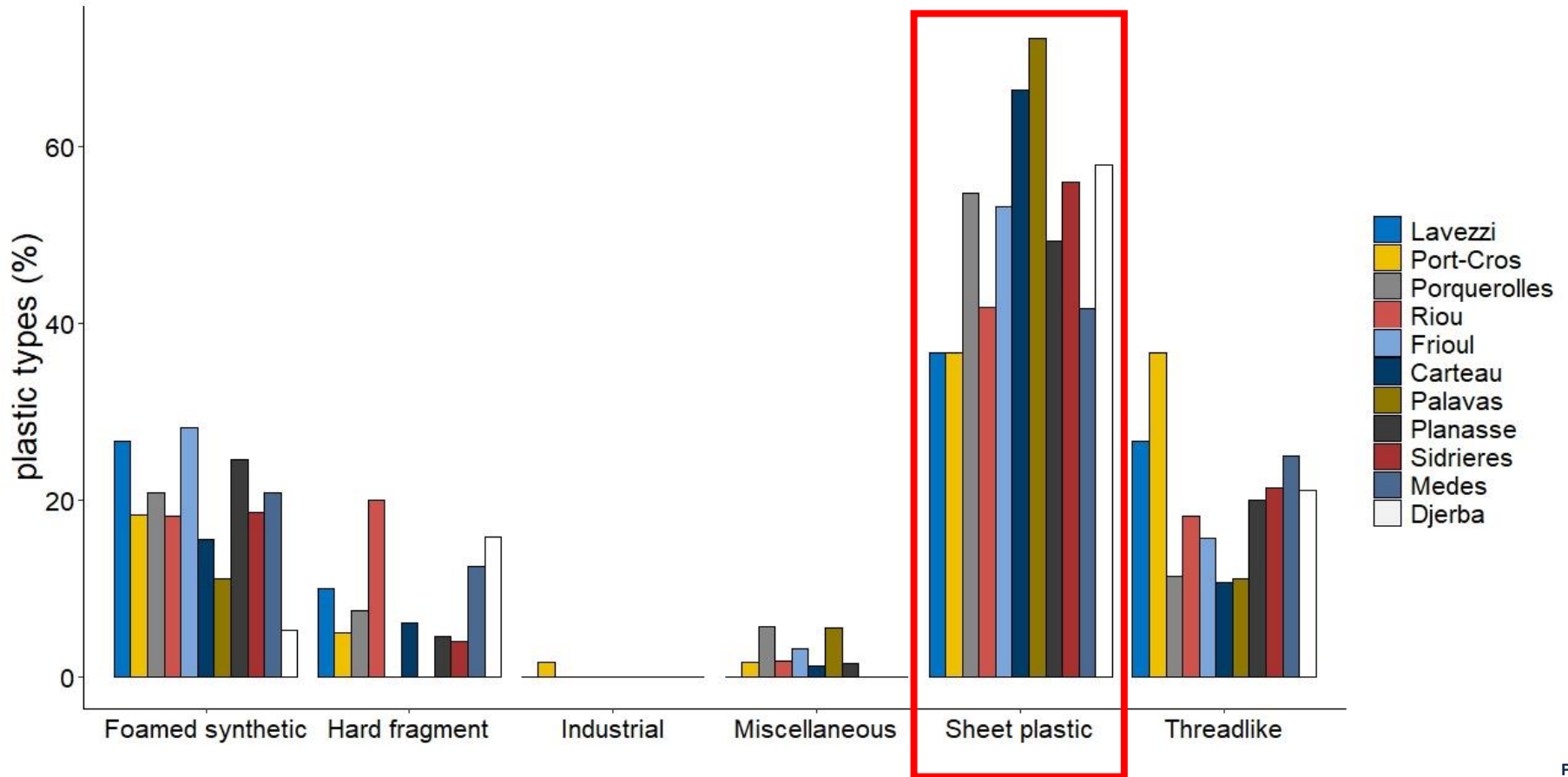
# 281 boluses collected over the breeding season 2021



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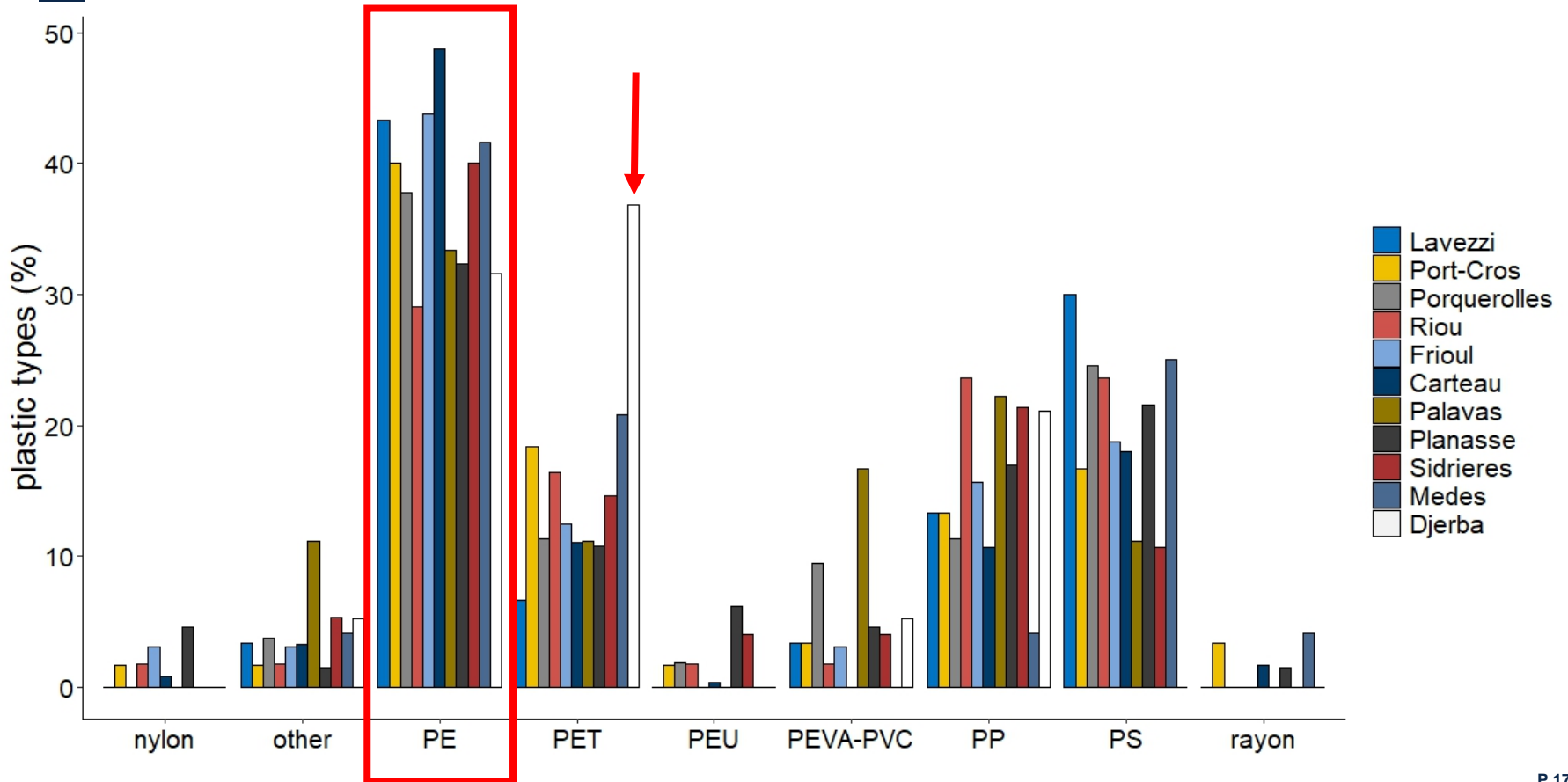


# 675 ingested plastics over the breeding season 2021





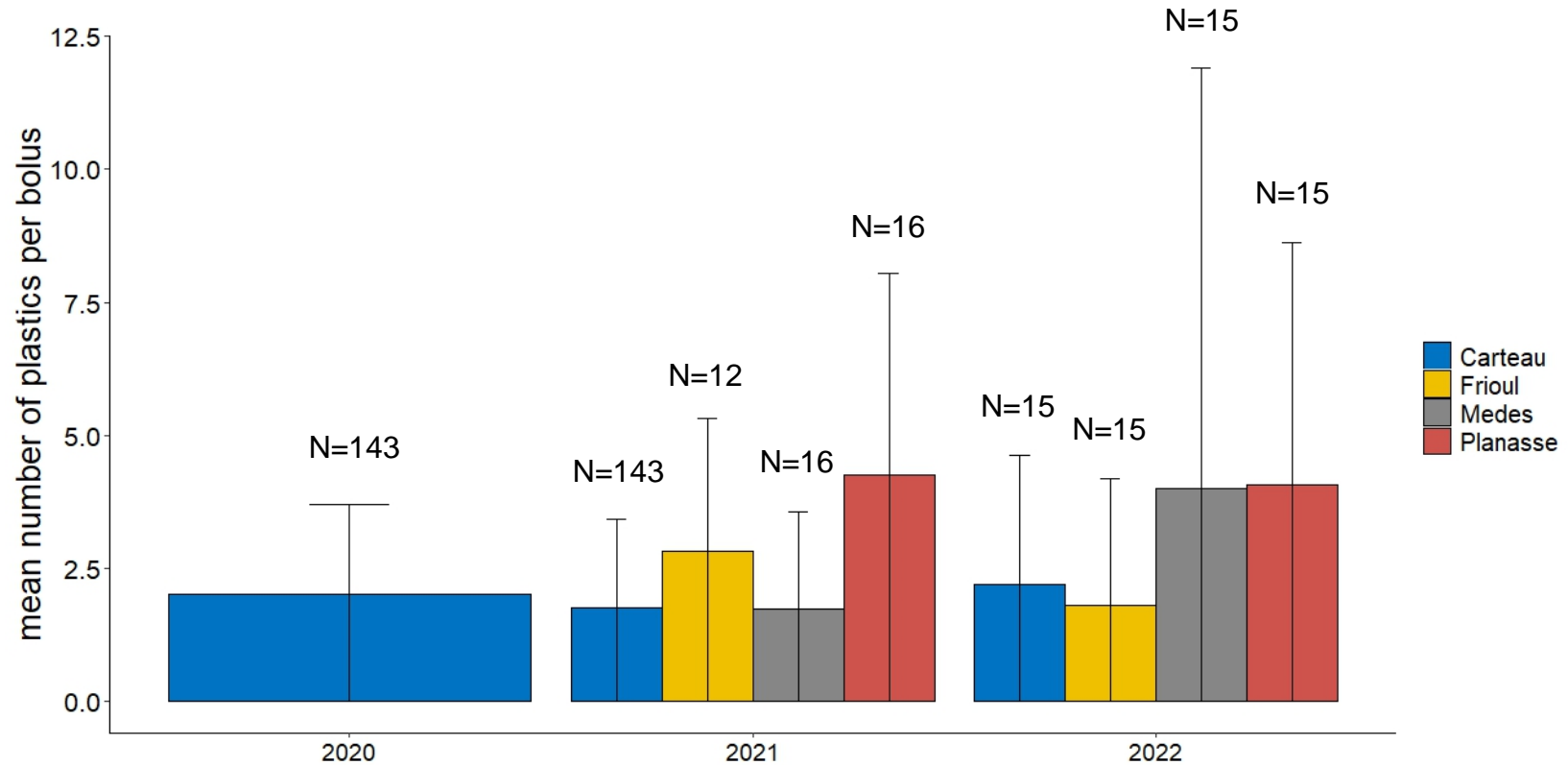
## 675 ingested plastics over the breeding season 2021



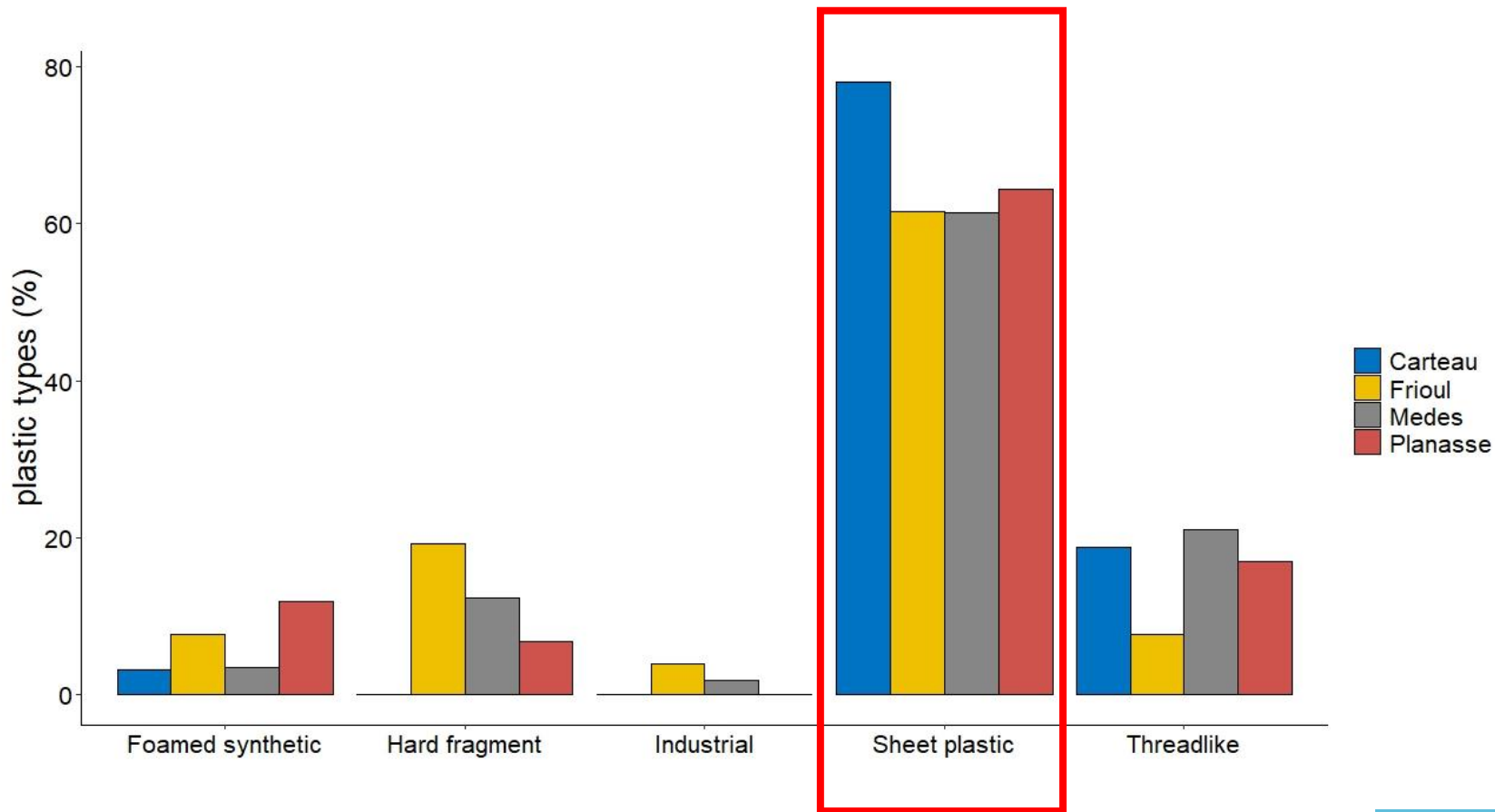


**Does plastic exposure vary temporally ?**

## Evolution of the number of plastic per bolus from 2020 to 2021

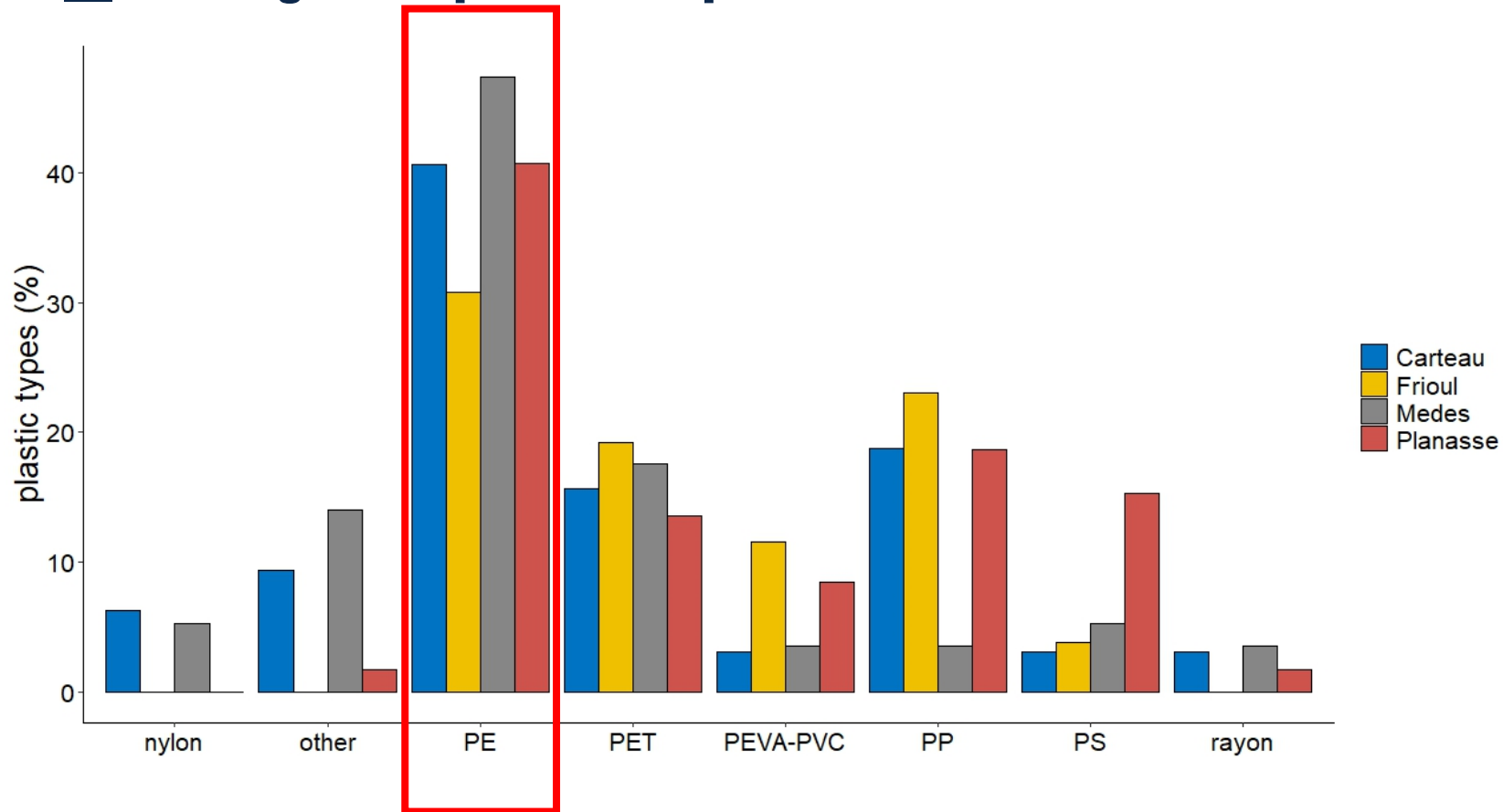


## Looking at the plastic type





## Looking at the plastic composition





**Opportunistic  
feeders**

# **Yellow-legged gull digestive tract**



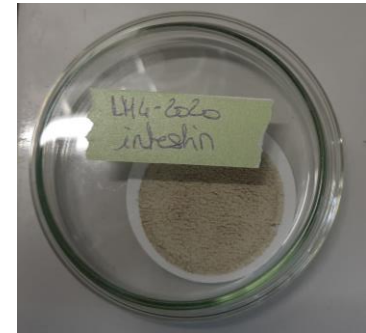


**What amount of plastics do gulls really ingest ?**



# Partnership with IMRCP (Toulouse)

- KOH digestion of the digestive tissue
- Filtration
- Filter grinding
- Pyrolysis gas chromatography - tandem mass spectrometry



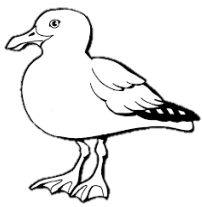
## First results

**8** digestive tracts

**0,69 ( $\pm$  0,96) mg** of plastic

→ **Mainly PE**

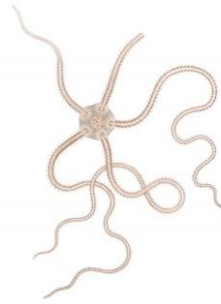




**30  $\mu\text{g/g dw}$**



**7780  $\mu\text{g/g dw}$**



**670 to 4000  
 $\mu\text{g/g dw}$**



**170  $\mu\text{g/g dw}$**

*Glandiceps talaboti*

*Amphiura* sp.

*Notomastus* sp.



**170  $\mu\text{g/g dw}$**



**460  $\mu\text{g/g dw}$**



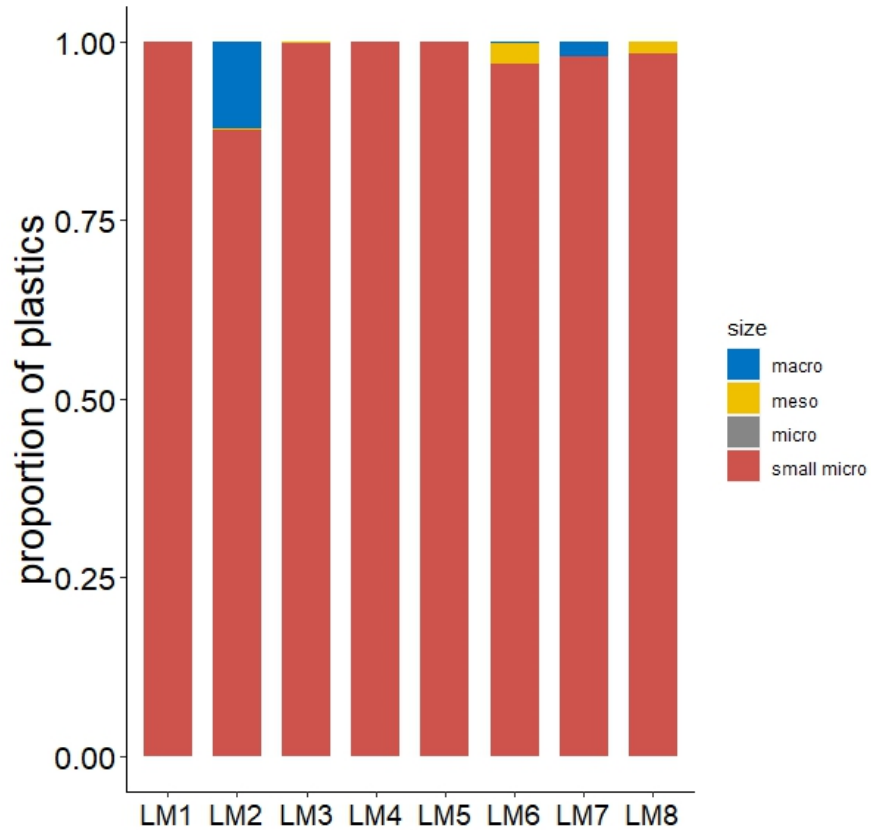
**105  $\mu\text{g/g dw}$**

*Acanthocardia* sp.

*Lanice conchilega*

*Fustiaria rubescens*

# First results



Thanks for your attention !



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