First evaluation of the status of marine invertebrates in north Corsica ports

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Objectives:

- evaluate the chemical and ecological status of the littoral waters to reach/maintain a **good environmental status**.
- determine the status of several native molluscs in different ports in Corsica (France)
- develop a multi-biomarker biomonitoring approach for port areas

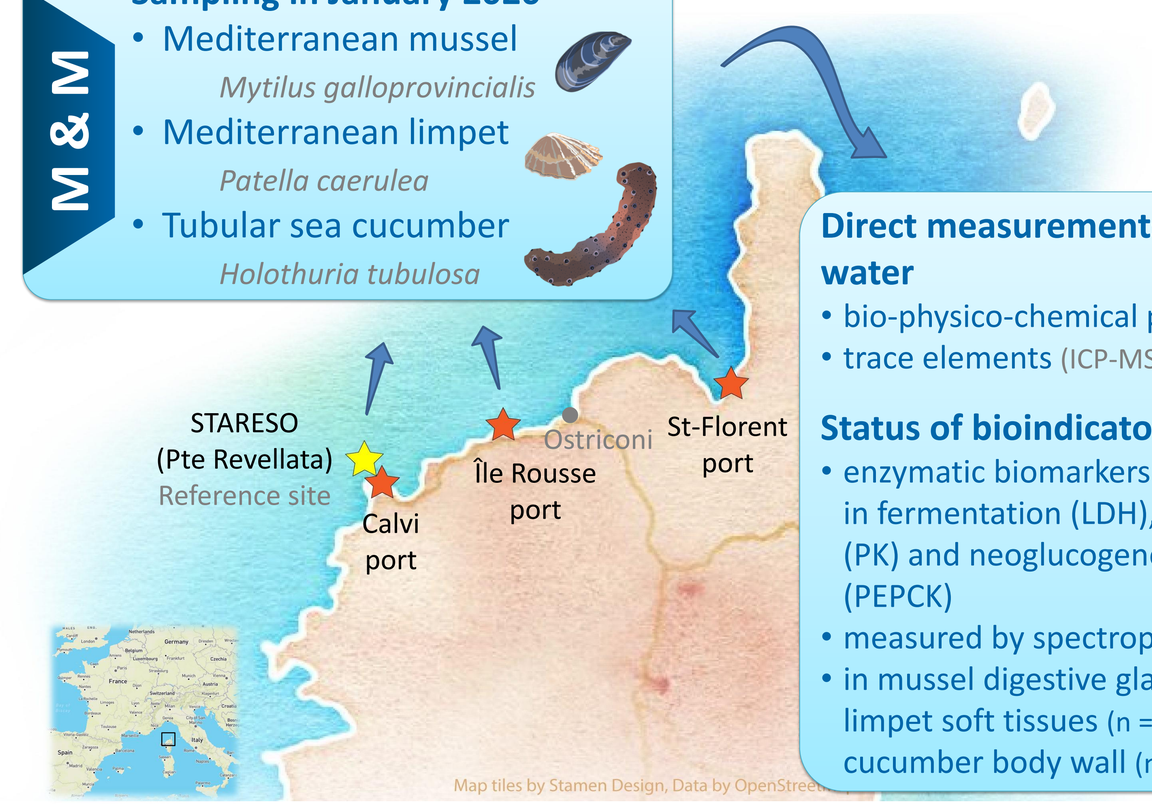
Introduction

- Port operations (antifouling, sacrificial anodes, hydrocarbon…) have a major impact on the water quality and the marine biodiversity.
- **Multi-biomarkers approach** provides keys to understanding the effects of chronic complex contamination.

M & M

Sampling in January 2020

- Mediterranean mussel
  Mytilus galloprovincialis
- Mediterranean limpet
  Patella caerulea
- Tubular sea cucumber
  Holothuria tubulosa



Direct measurements in water

- bio-physico-chemical parameters
- trace elements (ICP-MS & ICP-AES)

Status of bioindicator species

- enzymatic biomarkers involved in fermentation (LDH), glycolyse (PK) and neoglucogenese (PEPCK)
- measured by spectrophotometry
- in mussel digestive gland (n = 10), limpet soft tissues (n = 7) and sea cucumber body wall (n = 5-7)

Discussion

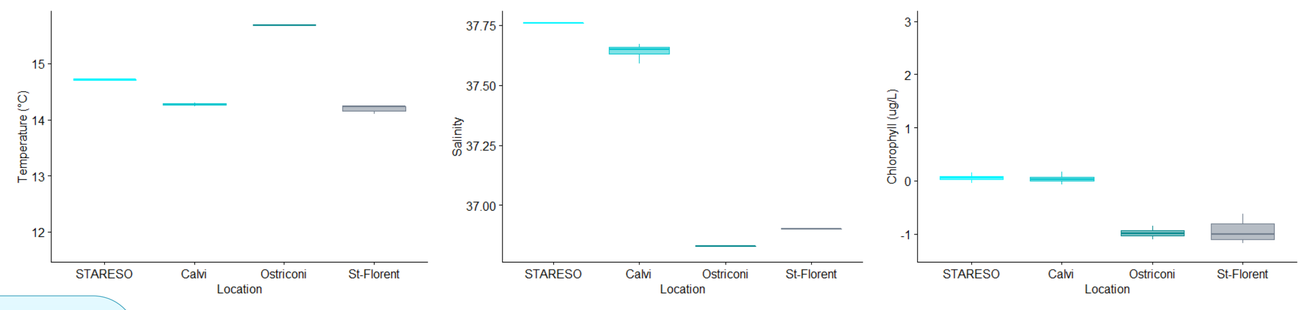
- Mussel is present only in St-Florent while limpet is absent in this port (sea cucumber is found everywhere).
- Limpet seems to be a **promising bioindicator species**
  - → higher enzymatic activity than *M. galloprovincialis*
  - → significant differences observed between sites
  - → easy sampling of individuals
- The status of marine organisms might be quite different between STARESO and Calvi ports, despite their close location.

First study, in Corsica, to compare the subcellular activity of 3 enzymes (LDH, PK, PEPCK), in mussel and 2 other marine species often used in the evaluation of water quality.

3-7 May 2020
Online

Results

Water bio-physico-chemical parameters



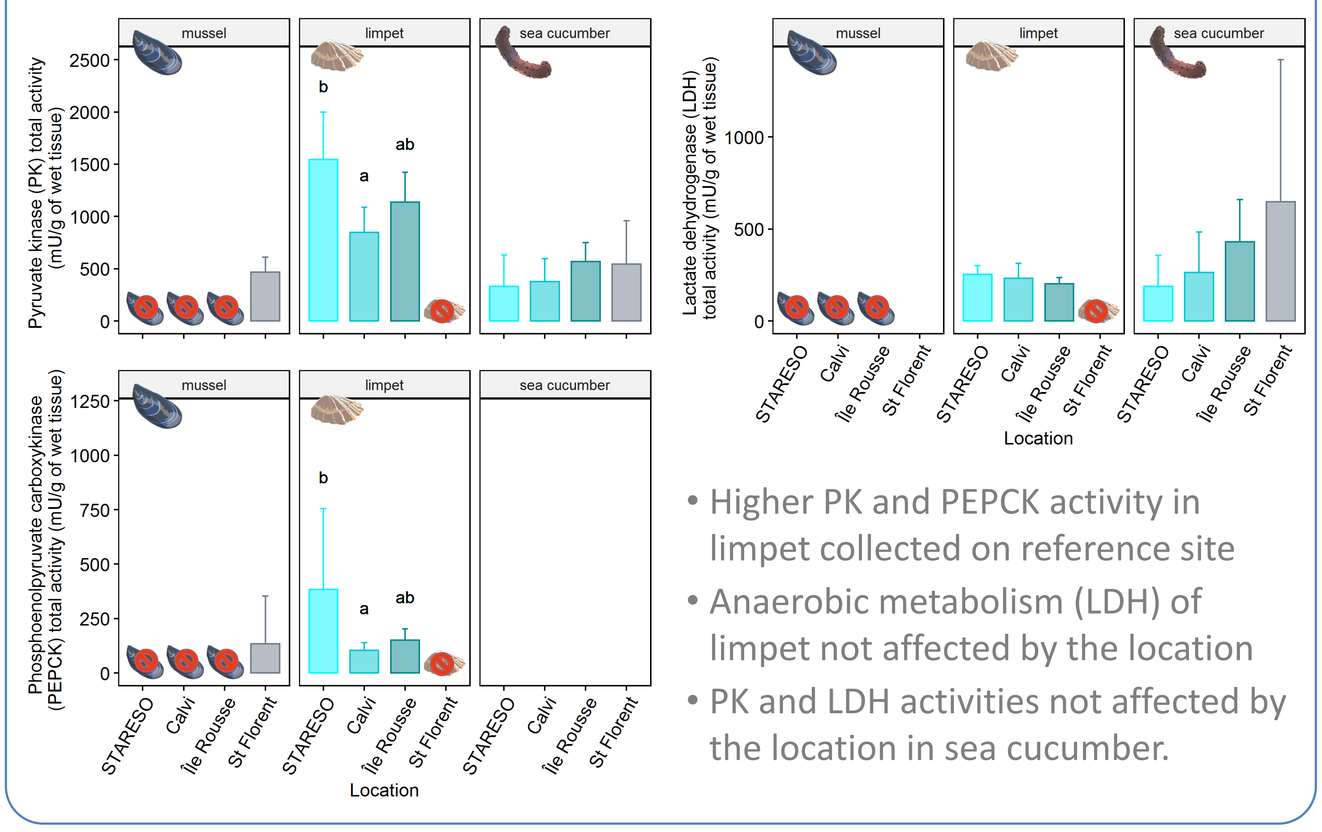
Trace elements contamination in water samples

(µg.L^{-1})	Co	Cu	Mn	Mo	Pb
Stareso	< 1	< 2	< 1	< 10	< 1
Calvi	1.0	2.6	< 1	12.7	< 1
Île Rousse	< 1	5.5	< 1	11.0	1.9
St-Florent	< 1	12.3	18.9	< 10	< 1

Ag, Al, As, Ba, Cd, Cr, Fe, Ni, Sb, Se, Sn, V, Zn below detection limit in all the locations

- All trace elements are below detection limit at STARESO
- St-Florent port presents higher Cu and Mn contamination

Biomarkers of effect (1-way ANOVA to test difference between location)



- Higher PK and PEPCK activity in limpet collected on reference site
- Anaerobic metabolism (LDH) of limpet not affected by the location
- PK and LDH activities not affected by the location in sea cucumber.

No Recordings or Photos

https://quampo.recherche.univ-lr.fr/