eDNA based approach to investigate *Marteilia refringens* and *Bonamia ostreae* lifecycle

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VIVALDI
Preventing and mitigating farmed bivalve diseases

Objective

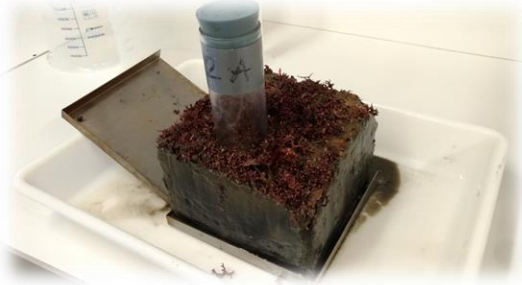
- ❑ Study the distribution of *M. refringens* and *B. ostreae* in **sediment**, **seawater**, **plankton** and **benthic fauna** regarding their development in **flat oysters**

- Use previously developed eDNA approaches in a field study

- Take the opportunity of a natural site infected by both parasites and associated with long-term context data

- Analyze results regarding environmental data

Method



Seasonal sampling of 5 environmental compartments (Rade of Brest, Brittany, France)

- *Sediment*
- *Seawater < 20 µm*
- *Plankton > 20 µm*
- *Benthic fauna*
- *Bivalves* (including flat oysters)

DNA extraction using dedicated extraction kits

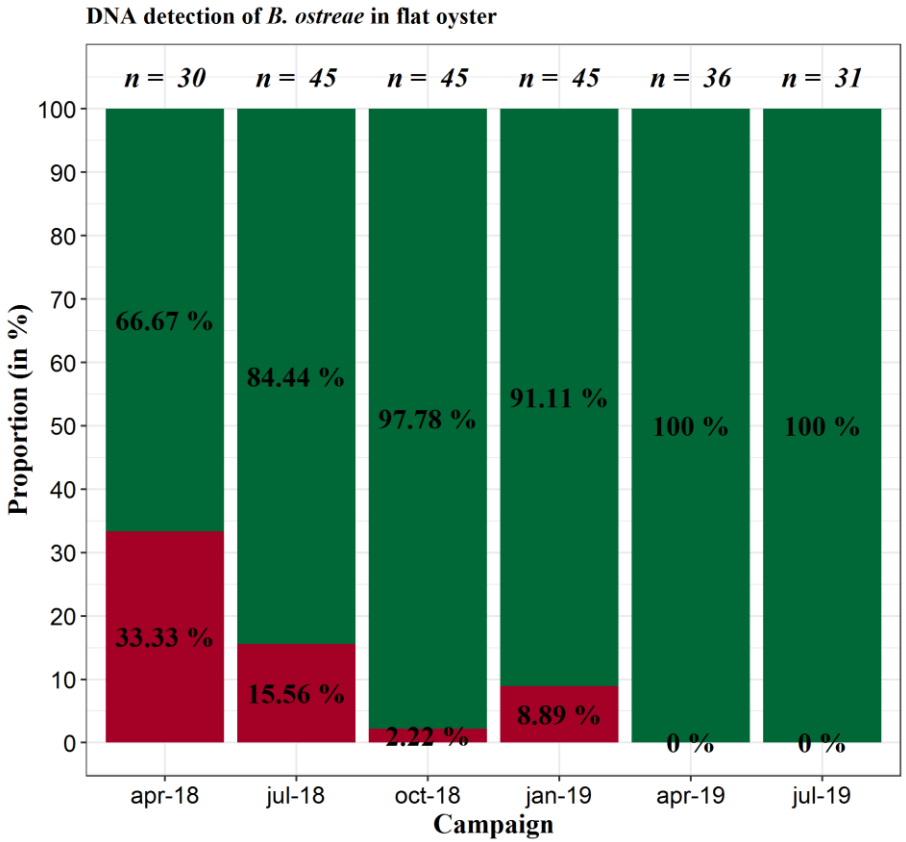
Real-time PCR analysis

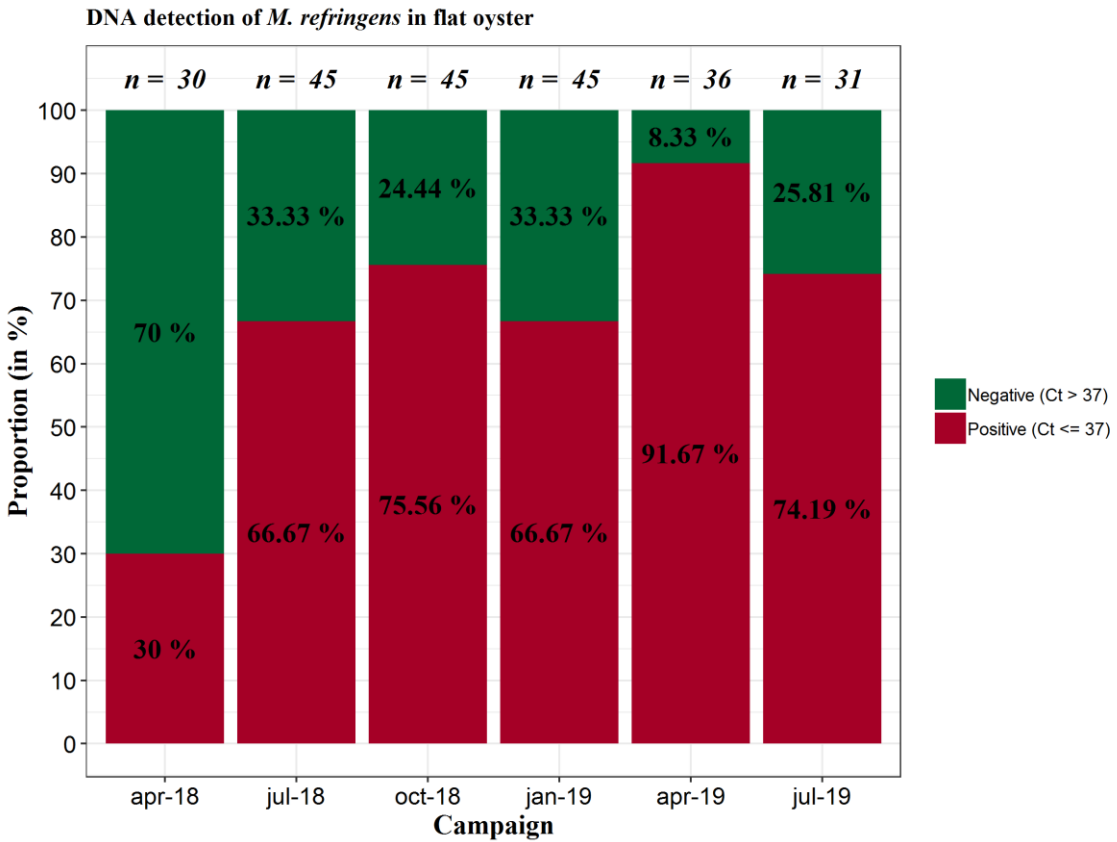
- TaqMan ® multiplex *Bonamia sp.* / *Marteilia refringens* real-time PCR

Results

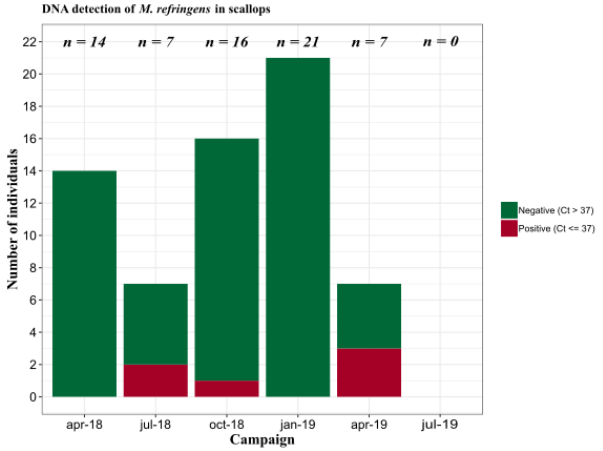
- *Quantitative* → Seawater < 20 µm, sediment
- *Qualitative* : Positive (Ct <= 37) / Negative (Ct < 37) → other compartments

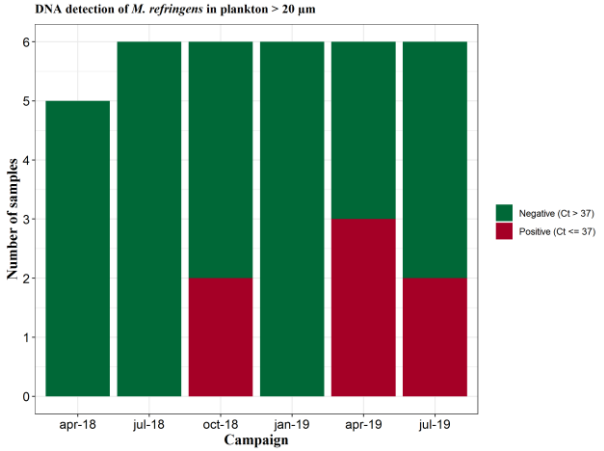
Results : Parasites DNA detection in flat oysters

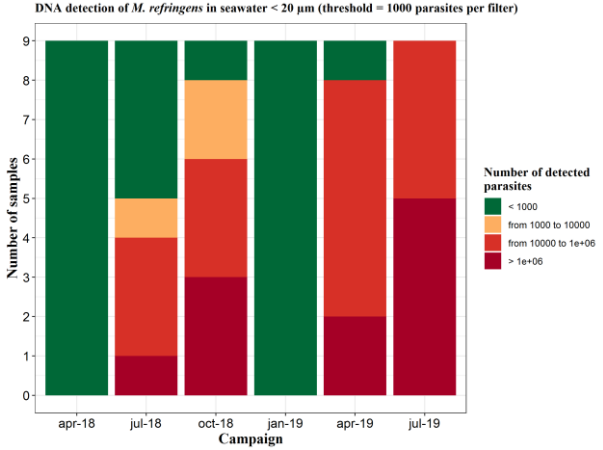


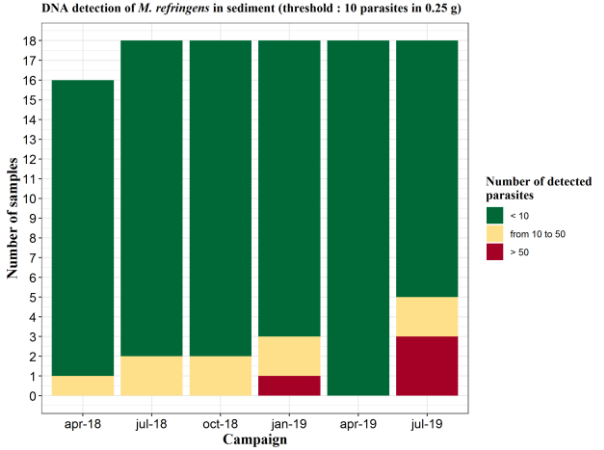


Results : DNA detection of *M. refringens* in other compartments



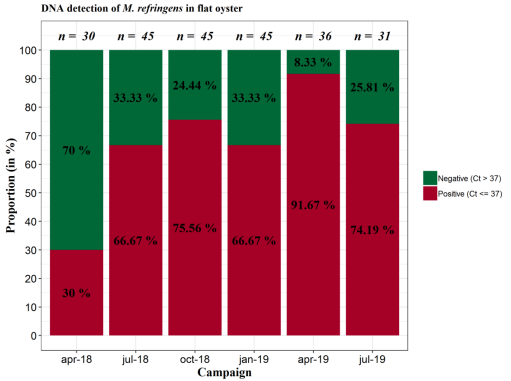




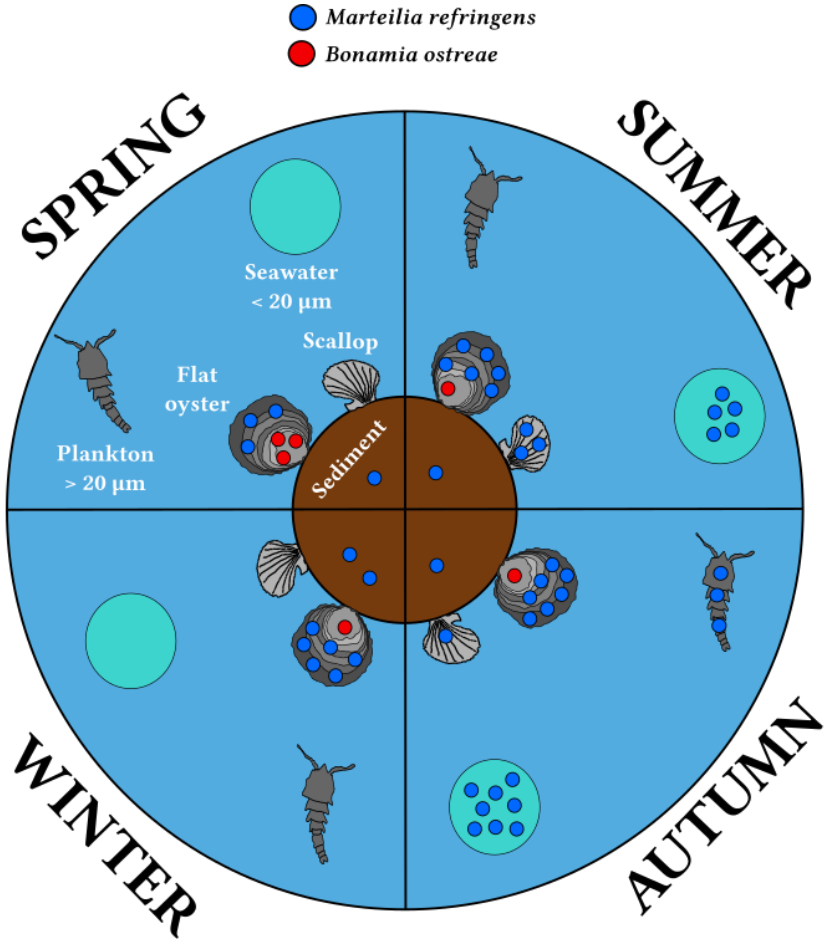


- DNA detection of *M. refringens* in environmental compartments globally follows its development in flat oyster

- **January 2019** : DNA is no longer detected in scallops, plankton and seawater contrary to sediment where DNA detection is maximal



Conclusions



Perspectives

- 2 last campaigns to analyze (Oct. 2019) and to perform (Jan. 2020)

- Compare 2018-2019 vs 2019-2020 results

- Analyze global dataset regarding
    - Other monitoring data of parasites prevalence in flat oysters
    - Environmental context (temperature, salinity, chlorophyll a)

- Complete results for positive detections of *M. refringens* :
    - RNA analyzes (seawater and sediment): characterize parasite status
    - *In Situ* Hybridization (plankton, benthic metazoans): localize the parasite

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