A long term study of bonamiosis in Quiberon bay, France

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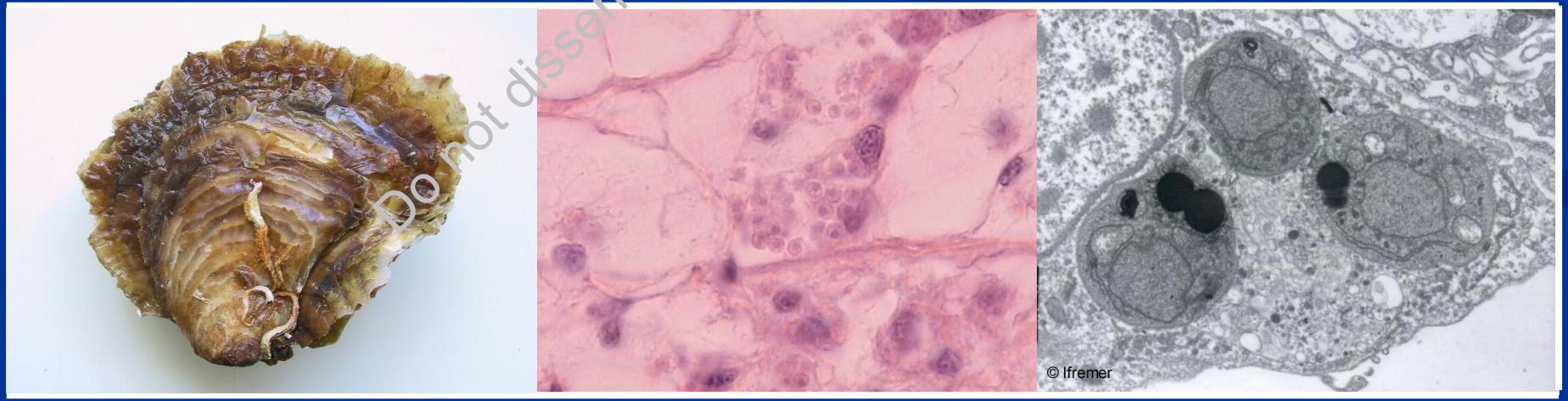
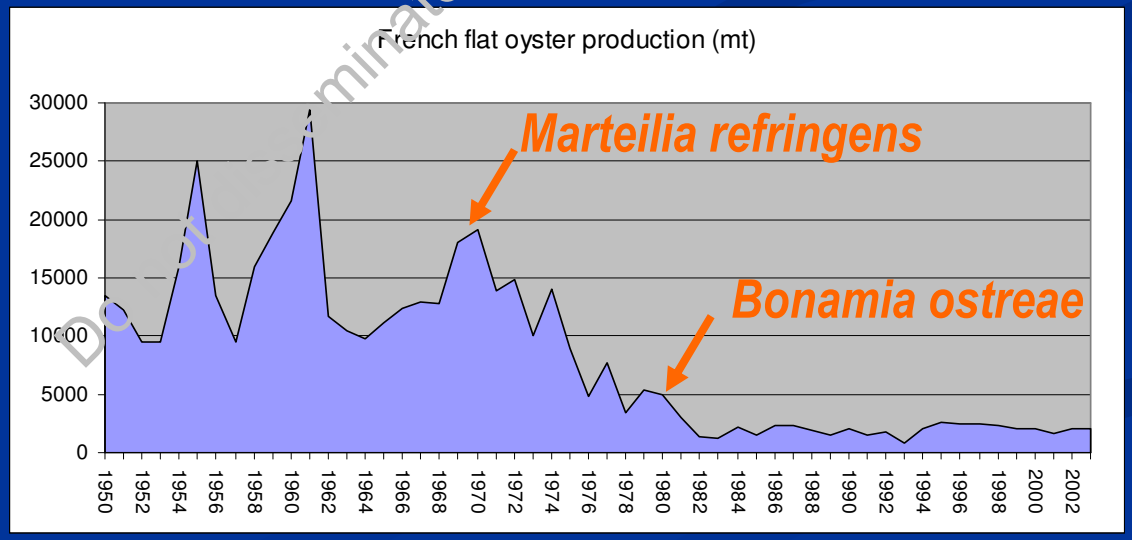
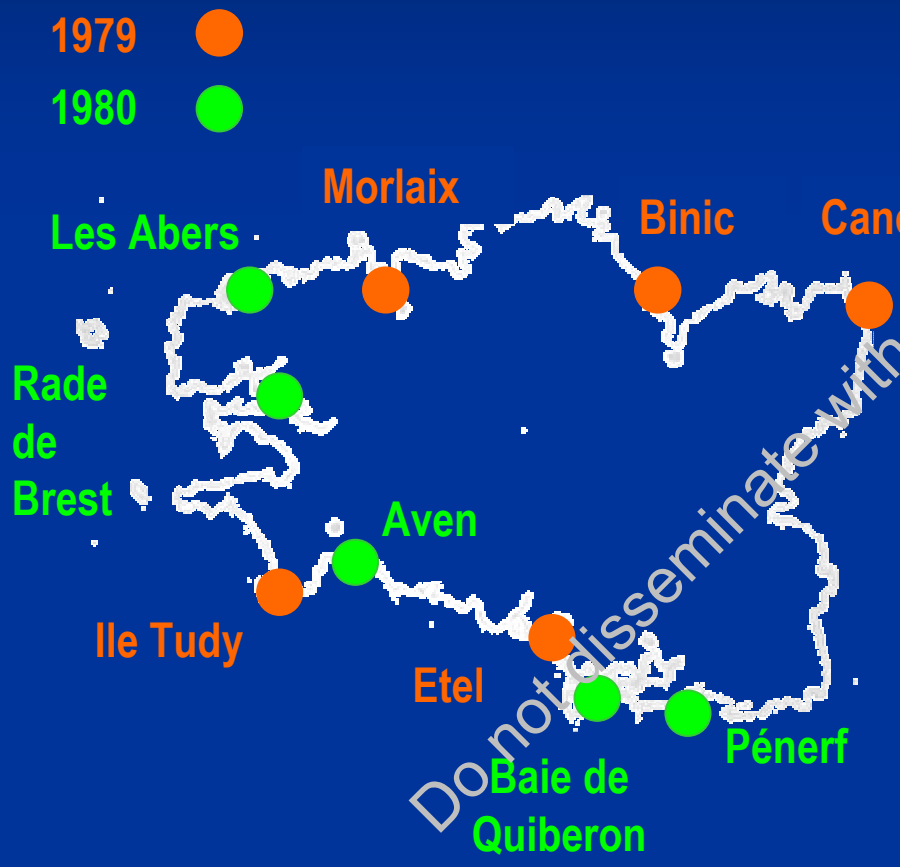


Introduction

- The flat oyster *Ostrea edulis* was the flagship of the Breton oyster production until two diseases due to the protozoans *Bonamia ostreae* and *Marteilia refringens* spread in the 1970's.
- These diseases drastically reduced the flat oyster production from nearly 20,000 t per year in 1970 to less than 2,000 t nowadays.
- Losses were estimated at about 20% of employment, 240 millions US$ of turn over and 200 millions US$ of added value between 1980 and 1983.



Introduction



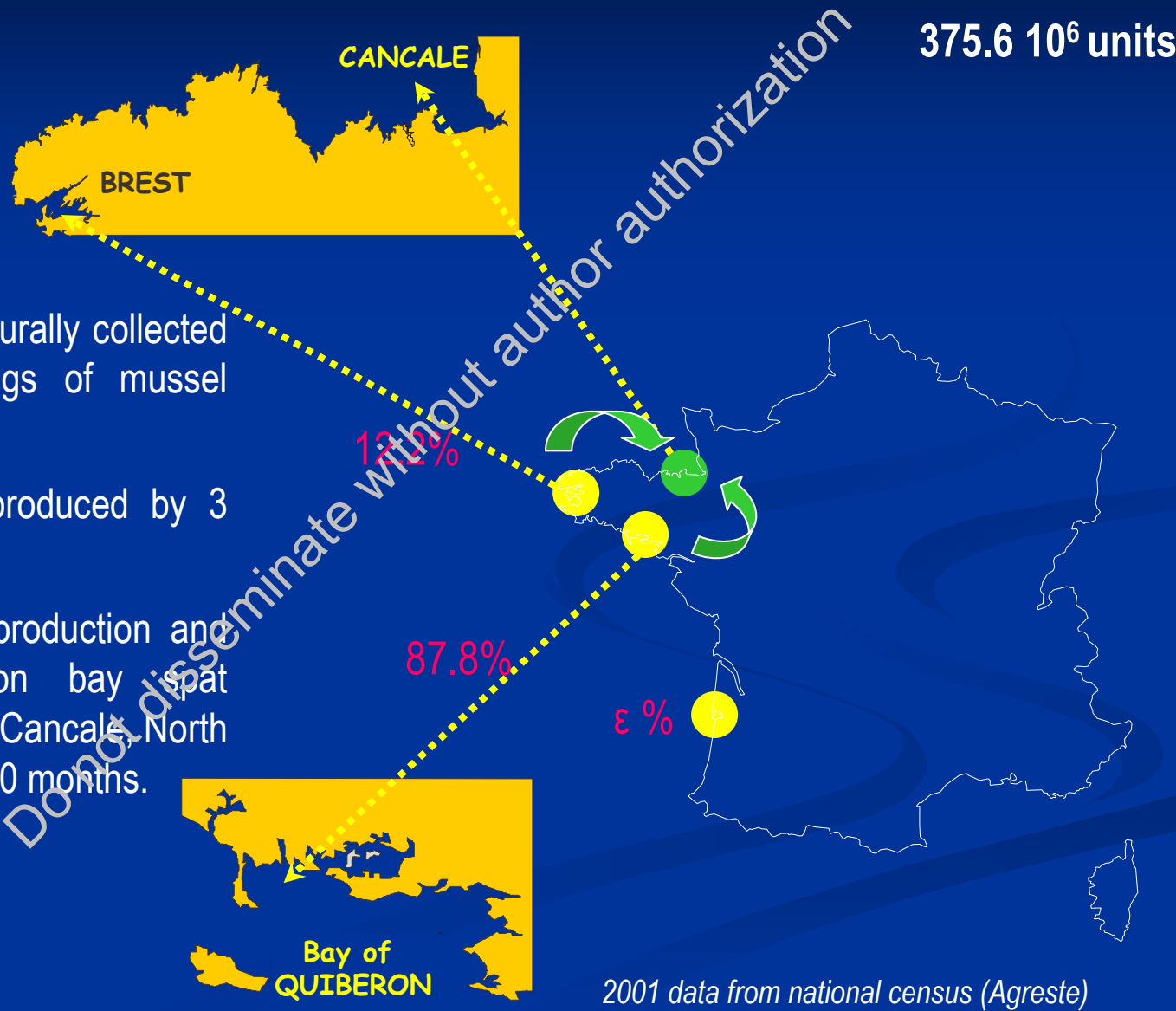
- The protozoan *Bonamia ostreae* was first reported in June 1979, in oyster farms of Tudy Island, Brittany, in association with abnormal mass mortalities (80-90%) (Pichot et al., 1979).
- During the following months, the same parasite was detected in all the Brittany farming centres and then has rapidly spread to most European oyster stocks (both reared and wild).
- The introduction is believed to have occurred with transfers of flat oysters, *Ostrea edulis* moved from California to France and Spain.

Aims of the study

- To draw an updated and dynamic picture of the French flat oyster production from data collected during the national shellfish culture census carried out in 2002 in France.

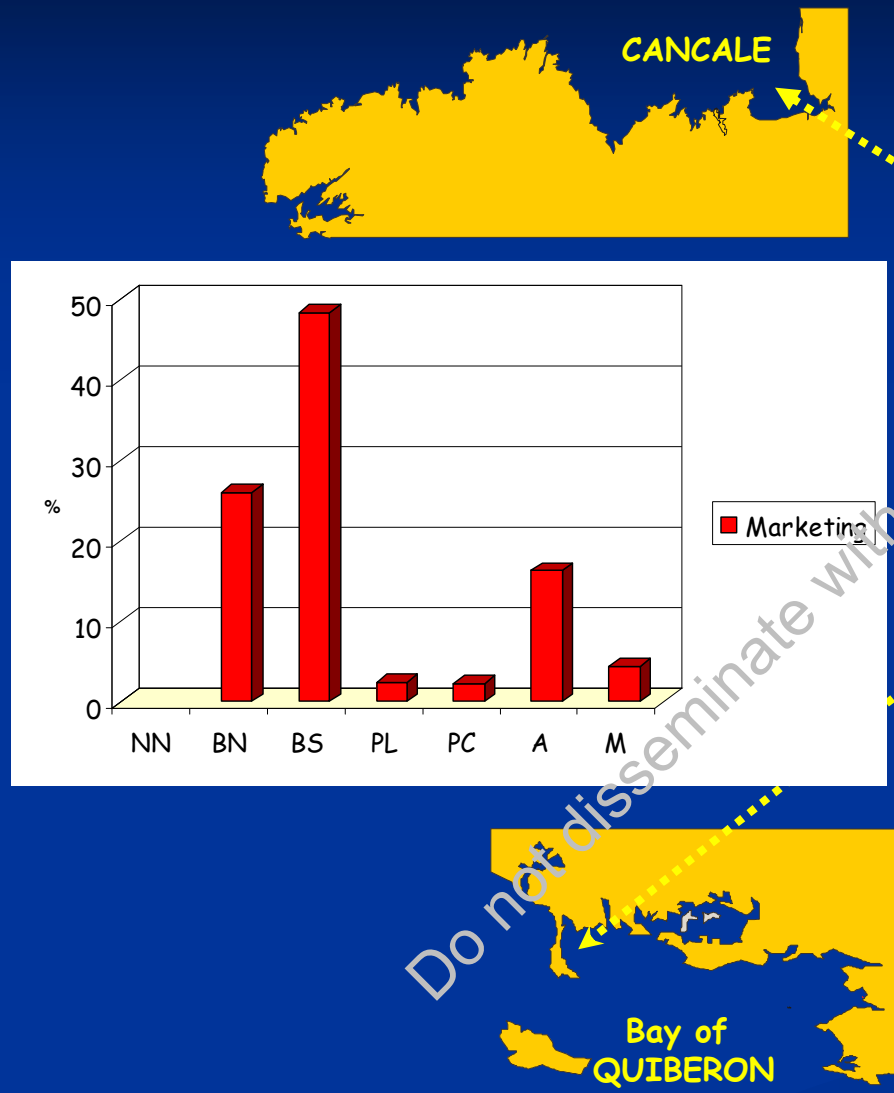
- To study the evolution of the disease in an endemic area (Quiberon Bay, Brittany) from pathological data collected between 1980 and 2004.

Flat oyster spat production (2000):



- 99.4% of spat is naturally collected on limed tiles or bags of mussel shells.
- 2.2 10^6 units are produced by 3 hatcheries in 2000.
- All the Brest spat production and 1/3 of the Quiberon bay spat production is moved to Cancale, North Brittany, when spat is 10 months.

Flat oyster marketing (2001):



2001 data from national census (Agreste)

French flat oyster production nowadays

The French flat oyster production is located in few specialised areas:

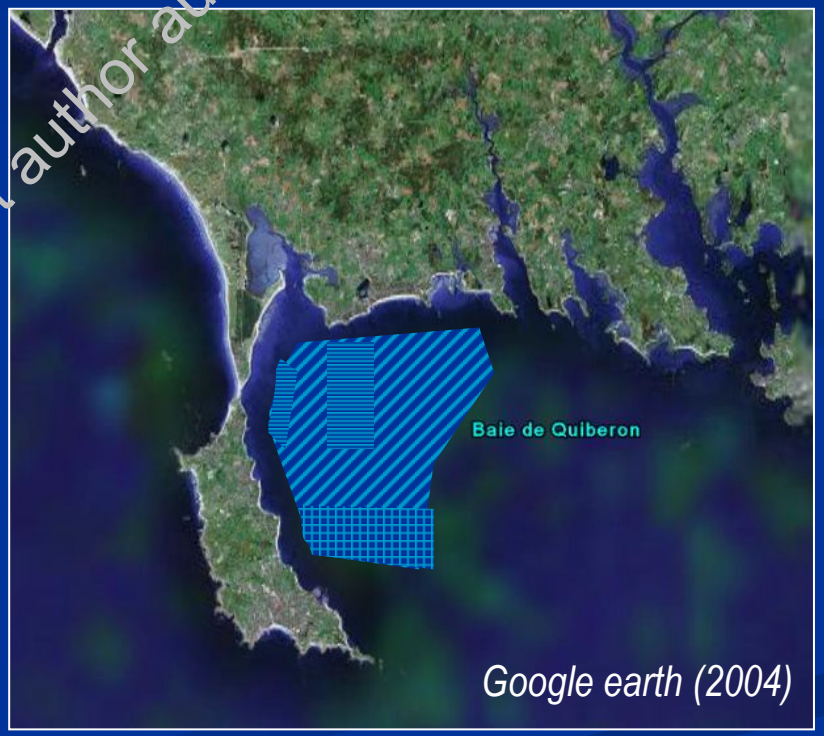
- 2 spat collection areas: Brest and Quiberon bays
- 2 growth areas: Quiberon and Cancale
- 4 main marketing areas: Cancale, Belon, Golfe du Morbihan and Arcachon

The French flat oyster production implies transfers:

- Spat is moved from Brest or Quiberon bays to Cancale for growth
- 83% of adults are moved from a farm to another before marketing

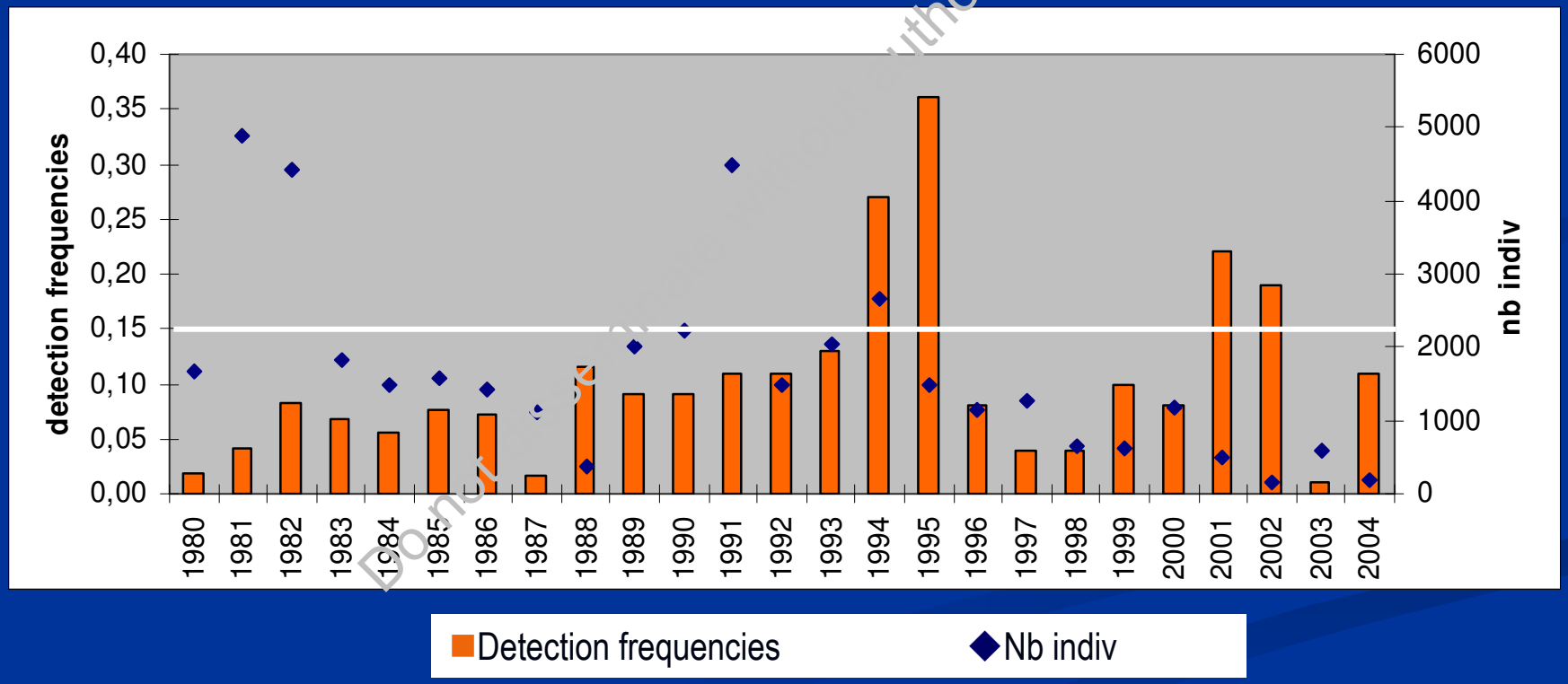
Quiberon study: material and methods

- About 41 425 pathological data were collected in Quiberon Bay for different purposes with different sampling strategies on the period 1980-2004.
- Diagnostic analysis were performed by tissue imprints (heart or gill) or less frequently by histology.
- Data were analysed by year, season and age and compared with some from other important production areas.



Quiberon study: Results (1)

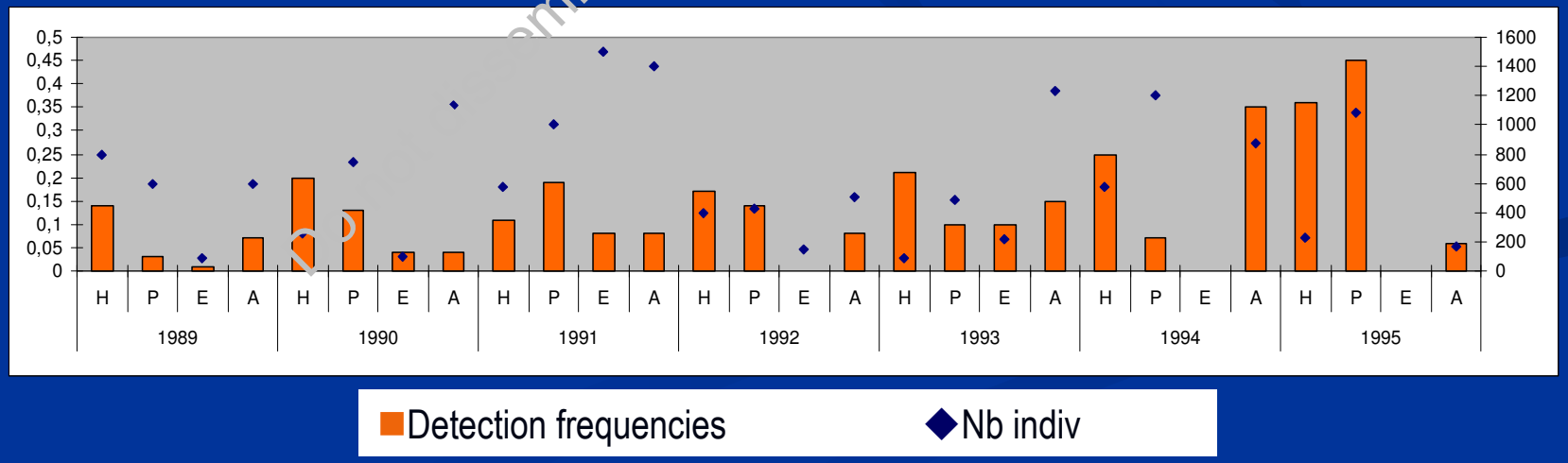
- Evolution of the detection frequencies/year (1980-2004)



Quiberon study: Results (2)

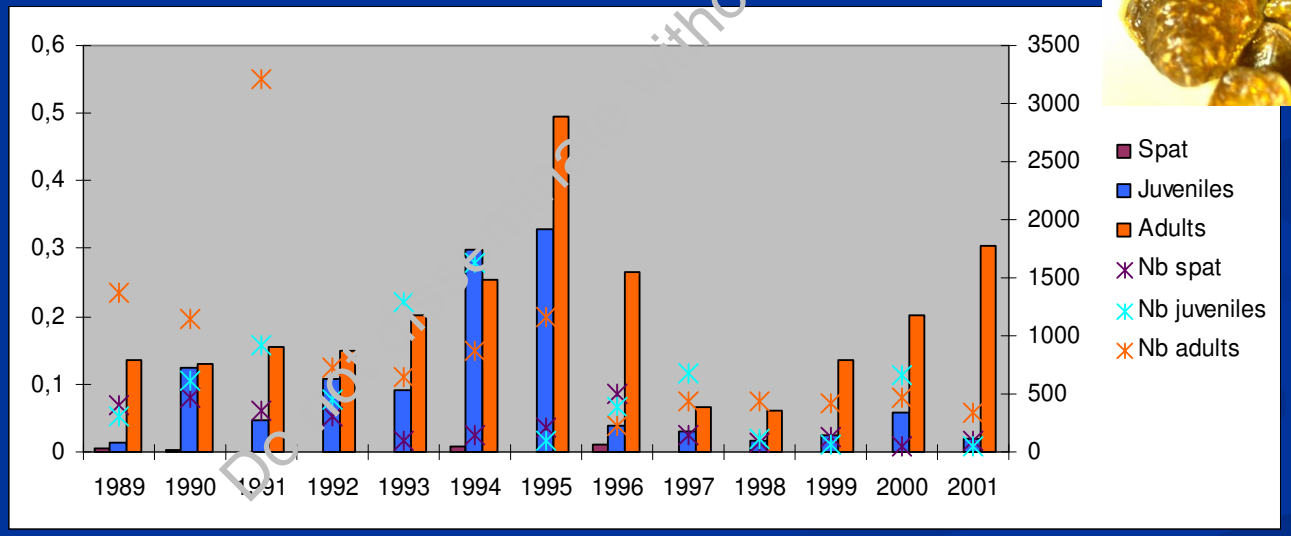
- Evolution of the detection frequencies/season (1989-2004)

	Positive	Total	Detection frequencies
Winter	610	4663	0,13
Spring	1104	6908	0,16
Summer	179	2919	0,06
Autumn	1031	8201	0,13



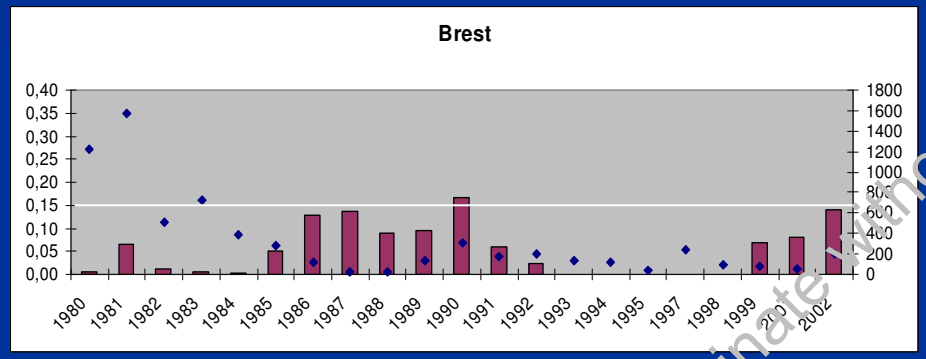
Quiberon study: Results (3)

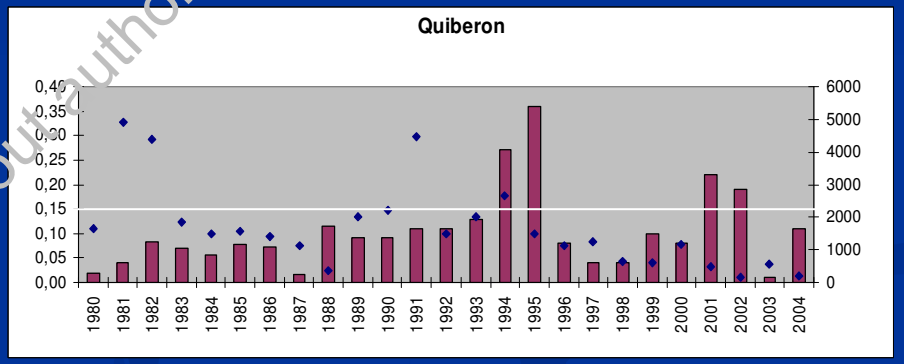
- Evolution of the detection frequencies/age (1989-2004)

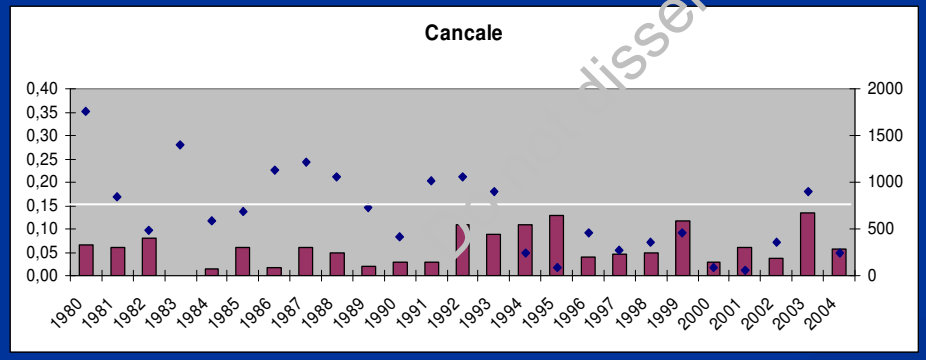


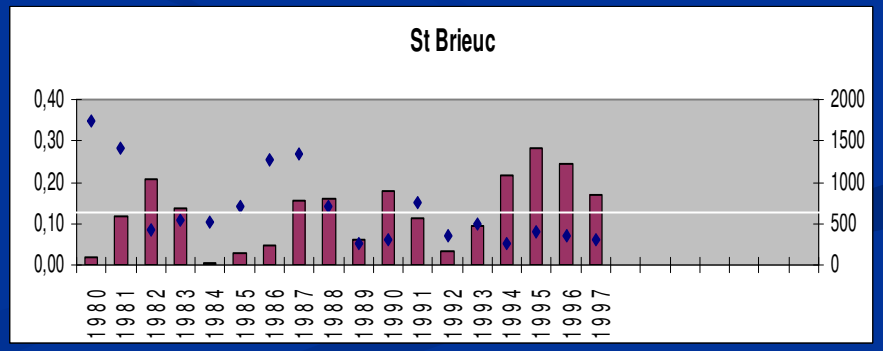
Quiberon study: Discussion (1)

- Comparison with other production areas



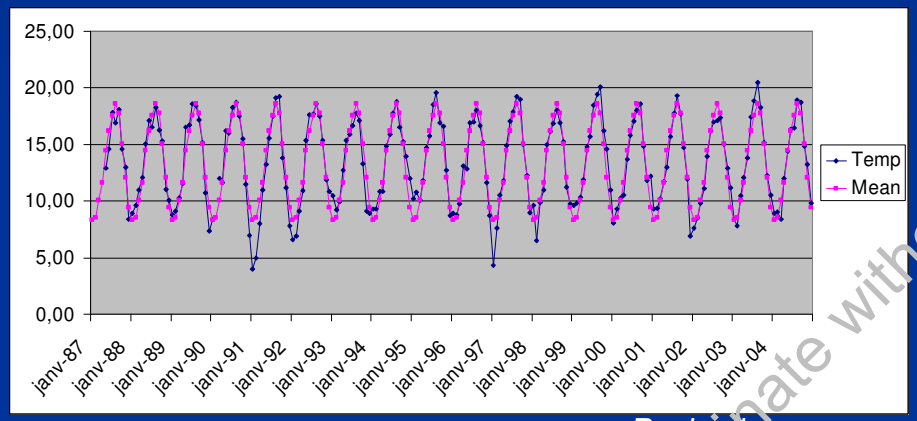




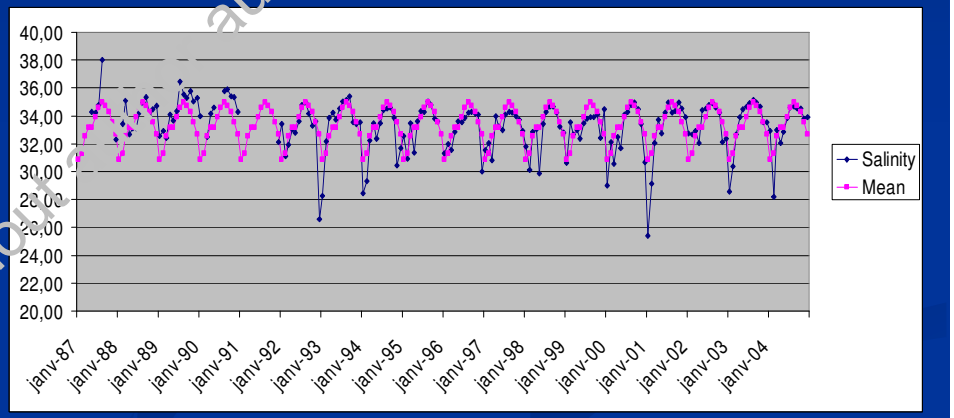


Quiberon study: Discussion (2)

- Potential impact of temperature and salinity?



Rephy data



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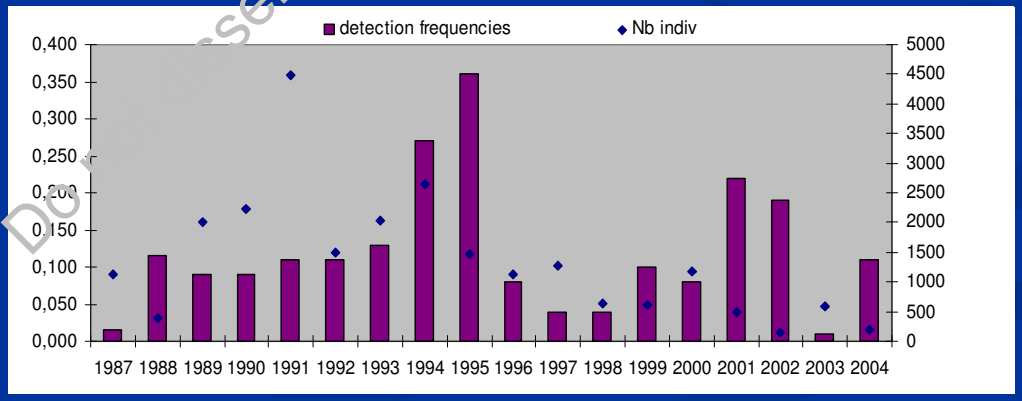
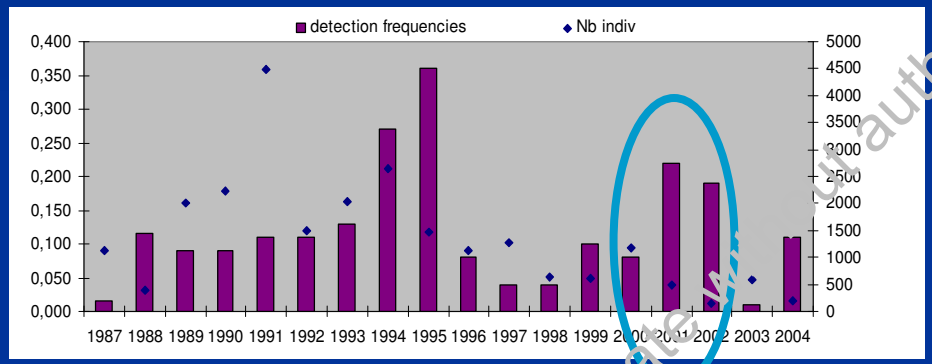
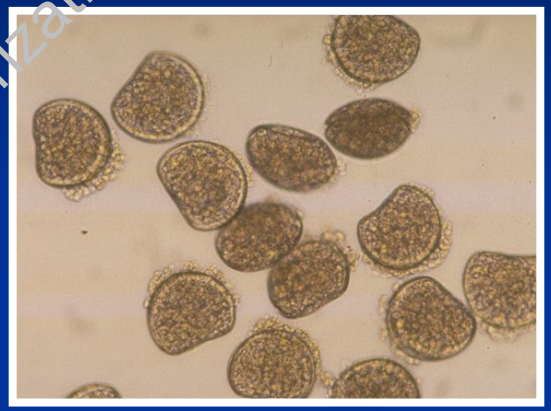
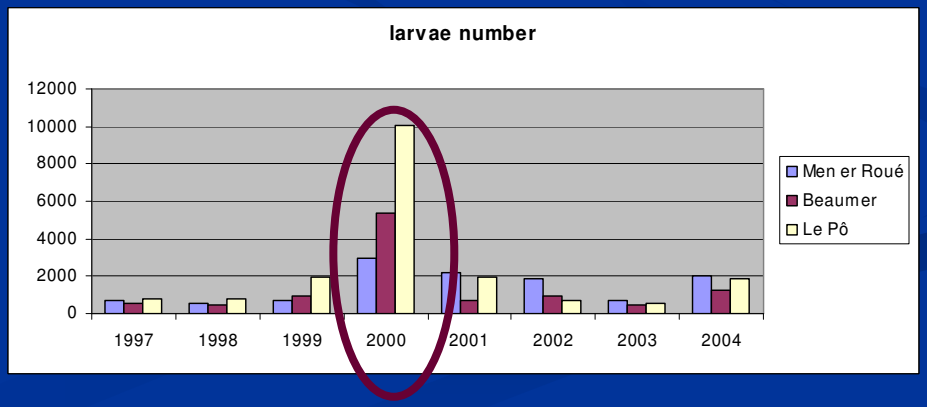


Quiberon study: Discussion (3)

- Larvae production and detection frequencies







Conclusions

- The history of bonamiosis in France highlights the risks related to transfers of live molluscs.
- However the French flat oyster production still relies on many transfers of spat and of adults before marketing.
- *Bonamia ostreae* is present in Quiberon Bay since 1980 with prevalence usually lower than 0.15. Detection frequencies present fluctuations on the studied period and seasonal fluctuations within a year.
- The host-parasite system appears stable: since 25 years, *Bonamia ostreae* seems to have adapted itself to the flat oyster production, inducing less outbreaks than in the past. The flat oyster in endemic areas seems to have developed a relative natural tolerance to the parasite.
- Data are still needed to understand the evolution and distribution of the disease...

- Thanks for your attention
- Aknowledgements:

  Anne-Geneviève Martin & Aimé Langlade