



## Vivaldi Project

Open industry workshop to  
share results and assess  
stakeholders' interest

**REPORT**

04/10/2018

## EXECUTIVE SUMMARY

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On 29 August 2018, in the framework of the Congress of the World Aquaculture Society in Montpellier (Aqua 2018: <https://www.was.org/meetings/default.aspx?code=Aqua18>), the VIVALDI consortium organised an open workshop entitled “*Acting together to better prevent and mitigate farmed bivalve diseases*”. On that occasion, scientists from all over the world, industrials, farmers and international & European competent authorities shared their expertise, experience and views on the current threats to the shellfish industry. The aim was to share the mid-term results of the project and exchange with the different stakeholders involved in the shellfish industry at large, so as to assess their interest in the tools and approaches developed in the project. Recent findings, including many VIVALDI outcomes, were presented and discussed, as well as the expectations from the main stakeholders towards research.

The first keynote speaker, Melba Reantaso, from the Food and Agriculture Organisation (FAO) introduced a new concept to address aquatic disease problems: the Aquaculture Biosecurity Progressive Management Pathway. Some perspectives of collaboration emerged from this exchange. In addition to the panel presentations and round tables, a focus group discussion was organised at the beginning of the day. It aimed at exploring the attitudes and perceptions of stakeholders in the shellfish industry regarding disease control and prevention strategies, which are most suitable for their industries. The discussions that took place during the workshop brought some perspectives in terms of future research activities, within and beyond the scope of the VIVALDI project. Also, from this experience, some ideas have arisen on how the consortium could better involve stakeholders in the definition of some future major VIVALDI outputs, such as the manual for disease management and biosecurity, the guidelines with recommendations to reduce mortalities or the definition of optimal husbandry practices.

The World Aquaculture Congress, AQUA 2018, was chosen as a framework for organising the workshop as it gathers a very large and diversified number of aquaculture stakeholders at global level, up to 3000 this year.

The workshop was open to all the participants in the World Aquaculture Congress and gathered more than 75 stakeholders, from 14 different countries, 4 continents. 2/3 of the participants were coming from the research sphere. Industry representatives represented almost 25 % of the audience. Other categories such as the competent authorities, decision-makers and media were represented.

This event was supported by the European Union, via the VIVALDI project (H2020 Programme – Grant N°678589), IFREMER, The University of Montpellier (F) and CeMEB, the Mediterranean Centre for the Environment and biodiversity.



## 1. Focus group exercise

Participatory focus group discussions (FGDs) with members of stakeholder groups were conducted to explore their perceptions regarding the most suitable shellfish disease control and prevention strategies. A total of 11 FGDs were constituted, which took approximately 45 minutes. Participants belonged to different stakeholder categories: research organisations (17), hatchery/nursery (6), competent authorities (6), knowledge transfer (5), shellfish producers (4), training/education (3), shellfish industry representatives (2) and other categories (3). They worked with different shellfish species: oysters (29), mussels (16), clams (15), scallops (3), cockles (3) and abalone (1).

The participants were asked to rank and score a set of 13 specific preventive practices according to four sequential criteria: effectiveness, feasibility, cost and acceptability. Preliminary results of this participatory exercise showed that management of shellfish transfers, genetic disease-resistance and decrease of shellfish densities were perceived as the most effective measures to prevent diseases, which were quite feasible but having moderate levels of acceptability and potentially high cost (notably for genetic disease-resistance). Participants perceived monitoring water quality and testing for pathogens as very acceptable measures, quite effective and feasible but with a moderate cost. At the bottom of the ranking, the use of triploid shellfish was considered as non-effective and as one of the lowest acceptability measures.

This FDG approach will be extended to more stakeholder categories across Vivaldi-partner countries.

## 2. Workshop discussions

*All the presentations below are available on the VIVALDI website:*

<http://www.vivaldi-project.eu/Activities/Events/Great-success-for-the-stakeholders-workshop-29-August-2018-in-Aqua-2018>

[Introduction to the workshop](#), by Isabelle Arzul (Ifremer, F)

[Progressive management pathway for improving aquaculture biosecurity](#), by Melba Reantaso (FAO)

### 2.1 Session 1: Preventing the entry of diseases

[Main outcomes from the VIVALDI project](#), by Deborah Cheslett (Marine Institute, IE) & Christophe Stavrakakis (Ifremer, FR)

[Pathogenesis and molecular epidemiology of Ostreid herpesvirus 1 in China](#), by Changming Bai (Chinese Academy of Fishery Sciences)

[Ensuring the safety of shellfish for human consumption](#), by Corinne Audemard (Virginia Institute of Marine Science, USA)

[An overview of mollusc animal health controls in the EU](#), by Niall Gerlitz (Directorate-General for Health and Food Safety, European Commission)

#### **Round table discussions in a nutshell:**

Studying pathogen diversity is important not only to adapt the surveillance programmes but also to regulate more finely the movements of animals. Shellfish can be affected by diseases and can accumulate pathogens affecting humans. Effort of surveillance has to be optimised and should cover both aspects in the general “One health” framework

European regulation regarding animal diseases is currently being reviewed and there is room to adjust the new texts and take into consideration specificity of the shellfish production. The need for risk-ranking guidelines has been raised. This is something developed in VIVALDI. VIVALDI is also developing tools such as biosensors and passive sensors which are already used for the monitoring of chemical or algal bloom. The interest of using such approaches for the surveillance and monitoring of shellfish pathogens has been discussed.

## **2.2 Session 2: Establishing effective breeding and farming programs against mollusc diseases**

[Main outcomes from the VIVALDI project](#), Sylvie Lapègue (Ifremer, FR) and Luca Bargelloni (UNIPD, IT)

[“Genomic solutions for shellfish selective breeding”](#), Romain Morvezen (SYSAAF, FR) & Lucie Genestout (LABOGENA, FR)

[“Genomic approaches to understanding and improving disease resistance in Pacific oysters”](#), by Ross Houston (The Roslin Institute, UK)

[“A Production calendar based on water temperature, spat size and husbandry practices reduces herpesvirus impact on cultured Pacific oyster \*Crassostrea gigas\*, in the Ebro Delta”](#), by Noelia Carrasco Querol (IRTA, ES)

### **Round table discussions in a nutshell:**

The use of selected animals needs to be adjusted to each epidemiological situation. For example selected animals can contain undetectable level of OsHV-1 and displaying such animals in disease-free zones can represent a risk. Additionally, breeding programmes have to consider the diversity of pathogens and should thus be specific to each local situation.

Selective breeding is commonly used in animal production including fish production. Approaches developed in salmon for example could be applied for molluscs.

The main threat for the shellfish production will be emerging diseases, i.e. diseases that are not yet known. Beyond selecting against a specific disease, it is absolutely essential to set up strategies that can be quickly developed in the context of crisis.

Selective breeding programmes are not always welcome by the producers and the general public. Coordination is required between scientists and producers, based on good communication.

## **2.3 Session 3: Defining biosecurity measures**

[Main outcomes from the VIVALDI project](#), by Dolors Furones (IRTA, ES) and Ed Peeler (CEFAS, UK)

[Consequences of oyster mortality episodes on benthic-pelagic coupling of the Thau lagoon](#) (FR), by Marion Richard (UMR MARBEC, FR)

[Strategies to minimize risk of disease and to produce resilient quality oysters](#), by Achim Janke (Global Prospects / TOPS Oysters Consulting Ltd, NZ)

### **Round table discussions in a nutshell:**

Biosecurity measures are easier to implement in hatcheries and nurseries than in farms located in a shared environment. These measures require active surveillance, quarantine systems and should include:

- ⇒ Complete separation of broodstock and progeny;
- ⇒ Pathogen detection in animals that are to be moved;
- ⇒ Checking water at entrance and release.

Water treatments such as UV, bleaching and ozone are today commonly used in entrance of hatcheries, nurseries, depuration units. The efficiency of these treatments has not yet been scientifically validated. Given the risk of spreading pathogens from these categories of farms, the released water should be systematically treated and the efficacy of these treatments validated, especially when it comes to protozoan parasites, for which there is no data available so far.

Training programmes are needed so as to spread biosecurity measures to the largest possible public.

## GENERAL CONCLUSION AND PERSPECTIVES

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Over these past years, the shellfish production has faced a series of disease outbreaks. This frequency and intensity increase could be related to the climatic evolution and to increasing animal movements. In this context of global change and world scale trade, VIVALDI aims at developing tools and proposing strategies to prevent and mitigate farmed mollusc diseases.

At the ecosystem level, the key challenges are:

- ⇒ To maintain a balance between farmed and wild animals. Farmed mollusc species are maintained in open areas and share the same ecosystem as wild mollusc animals. Maintaining healthy ecosystem with healthy wild populations is compulsory for a sustainable aquaculture;
- ⇒ To favour diversity, encourage the development of local endemic species rather than exotic ones and avoid immoderate movements of animals.

The EU regulations now encompass public and animal health within a unique “One health” framework. Optimising detection tools and surveillance approaches regarding both public and animal health is now expected and should be cost effective.

The main threat is coming from what we do not yet know: one key challenge is to be able to early identify and control emerging diseases. In this context, Vivaldi develops tools including biosensors and passive sensors to early identify emerging pathogens. VIVALDI partners also work on the development of risk-based surveillance model that will help to focus surveillance effort on most risky farming areas.

VIVALDI has now reached its mid-term and it is time to work all together to identify recommendations regarding disease management measures, design a manual of best practices and more generally prepare the future. Developing tools and designing strategies must be done by taking into account stakeholders’ perception and by bringing everyone in building a biosecurity plan. Shellfish diseases are not only a concern for European producers but also for producers worldwide. VIVALDI is building an international network on shellfish diseases which includes members of the advisory expert panel and which is regularly enriched with new members notably during event such as the open industry workshop.

Stakeholders and members of the international network on shellfish diseases will be invited to participate in designing a biosecurity plan and to join the final VIVALDI meeting, which should take place in Brest (France) at the end of 2019.



## ANNEXES

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Programme  
Final list of participants  
Pictures  
Poster abstracts  
Oral and poster presentations in Aqua 2018

