



Bivalife



Improving European mollusc aquaculture: disease detection and management

Deliverable D6.3 Organisation of a workshop

**THEME [KBBE.2010.1.2-08]
[Improving European mollusc aquaculture: disease detection and management - Call: FP7-KBBE-2010-4]**

Project acronym: BIVALIFE

Project full title: " Controlling infectious diseases in oysters and mussels in Europe "

Grant agreement no: 266157



WP6. Dissemination and exploitation

WP 6 - T1: Dissemination activities beyond the consortium: publications, conferences, workshops and web-based activities aimed at disseminating the knowledge and technology produced

A workshop have been planned (Year 1, m12) in order to present the objectives of Bivalife project and to disseminate results. This workshop have been planed to be devoted to producer representatives (EU shellfish Associations including EMPA, ISA (Irish Shellfish Association), the Dutch oyster producers organisation and CNC (Comité Nationale de la Conchyliculture), FEPRMODEL (Federation of Shellfish producers of the Delta Ebro), regulatory and management agencies.

A dedicated workshop has not been organised as previously planned. Indeed, negotiation in order to include the European Molluscs' Producers Association (EMPA) as a new beneficiary to the consortium took more time than expected. The involvement of EMP requested by the Commission services needed necessary quite long discussions in order to determine with the EMPA their potential involvement and with all beneficiaries possible allocation of a reasonable budget for EMPA's tasks (60,000 Euros) without changing the total EU requested contribution (2,995,636.00 Euros). To support overall Bivalife objectives, EMPA is expected to contribute substantially to the organisation of this workshop for dissemination of information and results towards European shellfish farmers mainly through their representatives.

However, as it has been discussed during the course of the kick off meeting in April 2011, some Bivalife participants joined meetings organised by local shellfish farmer associations in order to present the Bivalife project and its main objectives (ISA meeting in Kinsale Cork, in Ireland in October 2011; ISPRA meeting in Rome in November 2011; EMPA meeting in association to AQUAINNOVA in Bordeaux 15th February 2012). Moreover, information on the Bivalife project was also reported in journals dedicated to shellfish farmers (see Annex I).

Several Bivalife participants also joined the BioTriangle initiative launched at Nantes in June 2012 in the context of the International Bio-based Economy Forum and organised by the DG Research and Innovation. The workshop entitled "Diseases mitigation and prevention in mollusc aquaculture" was a collaborative initiative between the EU, Australia, Canada and New Zealand aiming cooperation on diagnosis and epidemiology of main pathogens and mitigation of related diseases affecting aquatic farmed mollusc species. The specific objectives were to conduct a review of the state of the art, to share haring lessons learned, to identifying the gaps and research needs, to explore putative twinning of on-going or new projects and to identify possible joint research activities.

Moreover, as suggested by the European Commission services, Tristan Renault as the coordinator of the project joined the AQUA2012 congress (World Aquaculture Society and European Aquaculture Society), held in Praha at the beginning of September 2012 in order to present the Bivalife project during a specific EU session (see Annex II: summary and presentation).



ANNEX I

The Grower — 15

Bivalife

by T. Renault (coordinator of the project)

Bivalife is a 3 year EU funded project (FP7) including 12 participants representing 7 countries (France, Ireland, Italy, Spain, Netherlands, UK, Israel). The two core objectives of Bivalife are (i) to provide innovative knowledge related to pathogens infecting oysters and mussels and (ii) to develop practical approaches for the control of infectious diseases and resulting mortality outbreaks these pathogens induce.

The project addresses a major issue identified by the European Commission (i.e. detection and management of infectious diseases in oysters and mussels) at the EU level since the increase in international and intra EU trade and exchanges of animals increases the risk of pathogen transfer and infectious disease outbreak occurrence.

The project focuses on three mollusc species, namely the Pacific cupped oyster *Crassostrea gigas* and two mussel species *Mytilus edulis* and *M. galloprovincialis*, the most important species in terms of European production. Interestingly, Pacific oysters and mussels display different levels of susceptibility to diseases. The targeted pathogens will be the virus OsHV-1, *Vibrio* species including *V. splendidus* and *V. aestuarianus*, as well as the parasite *Marteilia refringens* and the bacterium *Nocardia crassostreae*.

During the first year of the project (1st February 2011 to 1st February 2012):

(i) techniques for pathogen (OsHV-1, *Vibrio splendidus*, *V. aestuarianus* and *Nocardia crassostreae*) detection have been transferred to the participating laboratories;

(ii) an interlaboratory comparison assay has been carried out using the transferred techniques using reference biological materials;

(iii) the targeted pathogens have been sought in oyster and mussel samples collected in 2011 at different times and location in Spain, France, Ireland, Italy and Netherlands);

(iv) around 45 Pacific oyster families have been produced and their susceptibility to OsHV-1, *Vibrio splendidus*, *V. aestuarianus* and *V. harveyi* tested through experimental trials;

(v) finally, the efficacy of UV treatment on OsHV-1 has been tested.

We will hope to hear the follow up on this project but further information can also be accessed at the project web site at <http://www.ifremer.fr/bivalife>



Tristan Renault, Doctor in Veterinary Medicine is the head the Laboratory of Genetics and Pathology (Ifremer, France). He has 20 years' experience as a practising researcher on marine organism diseases

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ANNEX II




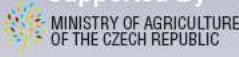










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AQUA 2012

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Prague, Czech Republic Sep 1-5, 2012



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Welcome to AQUA 2012 and to Prague

Thank you for joining the European Aquaculture Society (EAS) and the World Aquaculture Society (WAS) at this conference and exposition. Our joint events occur every six years. This week the Czech Republic follows in the tradition of the great WAS-EAS meetings hosted by France (Aqua 2000, Nice) and Italy (Aqua 2006, Florence) by warmly welcoming you to Prague.

Our events have several important functions, including exchanging the latest aquaculture research and commercial information, seeing and purchasing the latest equipment, feedstuffs, pharmaceuticals, publications and other products in the seafood market, and networking with colleagues and friends, old and new. The members of our Steering Committee (whose names are listed elsewhere in this directory) have worked very hard to bring you an exciting and comprehensive series of activities. We have two excellent plenary speakers, Petter Arnesen and Geoff Allan, who will be addressing our conference theme – **global aquaculture: securing our future** - from the perspectives of industry and science. Programme Co-Chairs Marco Saroglia, Jose Polanco and Zdeněk Adámek have designed a terrific four-day scientific programme – thirteen concurrent sessions of oral presentations, together with a large display of posters on the balcony overlooking our trade show. A glance at this directory will quickly demonstrate that you have a very wide range of topics, covering all types of marine and freshwater aquaculture and all forms of knowledge development, to choose from this week. At the time of writing the presentation of over 1,200 oral and poster papers have been confirmed. In addition there are several workshops and farmers' sessions to attract your attention.

As always, the trade show is an essential and important component of our event. Over 100 booths have been organised by Mario Stael to bring you the opportunity to see and discuss aquaculture products and services from Europe, the Americas and Asia, all with a global impact on the future commercial success of our industry. Post-conference, on 6 September, two farm tours will provide you with the opportunity to see Czech carp and trout farming at first hand and to enjoy some good food and beer.

AQUA 2012 would not be possible without the enthusiastic cooperation of our hosts, the University of South Bohemia, Faculty of Fisheries and Protection of Waters, together with the support of the Ministry of Agriculture of the Czech Republic. We are also grateful to our sponsors, which include BioMar, Novus, Alltech, MSD, Sintef, Biomin and our media sponsors. The Cooksey family (including Mario Stael), as always, ensure the smooth logistics of our meetings. This year we expect to welcome a new member of their team – Asher, who at 7 weeks old has to be one of the youngest participants ever in an aquaculture conference! Both EAS and WAS recognise that the future success of our Societies and of aquaculture generally is in the hands of our young colleagues and our students, so let this be a good omen. Let's not forget the hard-working teams in the Home Offices of WAS and EAS – take an opportunity to meet with Alistair Lane & Linda Aspeslagh from EAS and Carol Mendoza & Judy Andrasko from WAS this week.

While you are in Prague, one of the most beautiful capitals of Europe, take the opportunity to see the sights. Your choice is endless but a "must-see" is the largest ancient (9th Century) castle in the world. Home to Bohemian Kings, Holy Roman Emperors and now the seat of the Czech President, its site includes several superb palaces, churches, museums and gardens, together with the best city views. You can see the castle on the horizon from our conference facilities and you can get there by metro or by walking over the Charles Bridge - the oldest stone bridge on the river Vltava. Climb the tower of the Old Town Hall in the heart of the old city and wonder at its famous astronomical clock. Experience tasty Czech food (if you are not weight-watching!) and relax with a Budweiser Budvar or a Pilsner Urquell. Prague is also full of cultural opportunities. I could continue extolling the pleasures that await you here but space does not permit...

I hope you enjoy AQUA 2012 and your visit to this country and I look forward to meeting you during the conference, in the trade show, and at our social events - especially at SaSaZu on Tuesday evening!

Michael New, OBE
Chairman AQUA 2012
Past-President, EAS (2002-2004)
Past-President, WAS (1997-1998)



Bivalife - Management of infectious diseases in oysters and mussels in Europe

T. Renault (coordinator of the project)

Ifremer - Laboratoire de Génétique et Pathologie - 17390 La Tremblade - France. Bivalife is a 3 year EU funded project (FP7) including 12 participants representing 7 countries (France, Ireland, Italy, Spain, Netherlands, UK, Israel). The two core objectives of Bivalife are (i) to provide innovative knowledge related to pathogens infecting oysters and mussels and (ii) to develop practical approaches for the control of infectious diseases and resulting mortality outbreaks these pathogens induce. The project addresses a major issue identified by the European Commission (detection and management of infectious diseases in oysters and mussels) at the EU level since the increase in international and intra EU trade and exchanges of animals increases the risk of pathogen transfer and infectious disease outbreak occurrence.

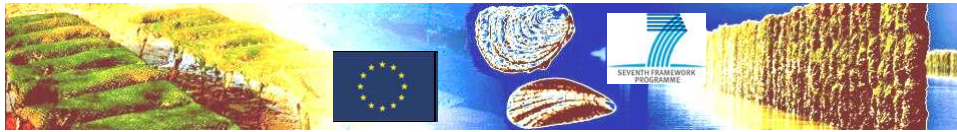
The project focuses on three mollusc species, namely the Pacific cupped oyster *Crassostrea gigas* and two mussel species *Mytilus edulis* and *M. galloprovincialis*, the most important species in terms of European mollusc production. Interestingly, Pacific oysters and mussels display different levels of susceptibility to diseases. The targeted pathogens are the virus OsHV-1, *Vibrio* species including *V. splendidus* and *V. aestuarianus*, as well as the parasite *Marteilia refringens* and the bacterium *Nocardia crassostreae*.

Bivalife addresses the core objectives through 4 scientific work packages:

- (i) Detection and identification of relevant pathogens and associated risk factors
- (ii) Mechanisms allowing concerned pathogens to survive outside the host
- (iii) Relevant pathogens: identification of intrinsic virulence factors and effects on host defence mechanisms
- (iv) Pathogen control and eradication with development of methods, field tests and recommendations

During the first period of the project, (i) techniques for pathogen (OsHV-1, *Vibrio splendidus*, *V. aestuarianus* and *Nocardia crassostreae*) detection have been transferred to the participating laboratories; (ii) interlaboratory comparison assays have been carried out using the transferred techniques and reference biological materials; (iii) the targeted pathogens have been sought in oyster and mussel samples collected in 2011 and 2012 at different times and location in Spain, France, Ireland, Italy and Netherlands; (iv) around 45 Pacific oyster families have been produced and their susceptibility to OsHV-1, *Vibrio splendidus*, *V. aestuarianus* and *V. harveyi* tested through experimental trials; (v) finally, the efficacy of UV treatment on OsHV-1, *Vibrio splendidus*, *V. aestuarianus* and *Nocardia crassostreae* has been tested.

Further information can also be accessed at the project web site at <http://www.bivalife.eu/>.



AQU A2012, September 1-5, 2012, Praha

BIVALIFE

- Management of infectious diseases in oysters and mussels in Europe -

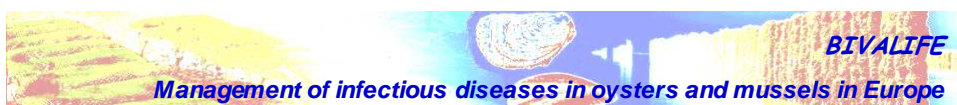
By Tristan RENAULT

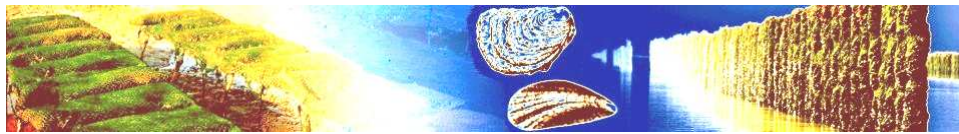


General objectives

The two core objectives of BIVALIFE are:

- (i) to provide innovative knowledge related to pathogens infecting Pacific oysters and mussels
- (ii) to develop practical approaches for the control of infectious diseases and resulting mortality outbreaks these pathogens induce





Bivalve species and relevant pathogens

3 bivalve species: Pacific cupped oyster, *Crassostrea gigas*, and two mussel species, *Mytilus edulis* and *M. galloprovincialis*, the most produced species in the European Union

Pacific oysters and mussels display differences in terms of pathogen susceptibility



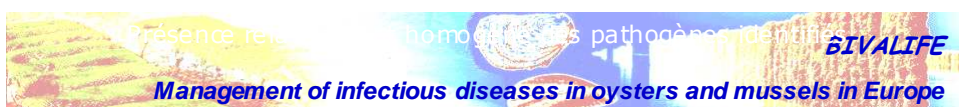
Bivalve species and relevant pathogens

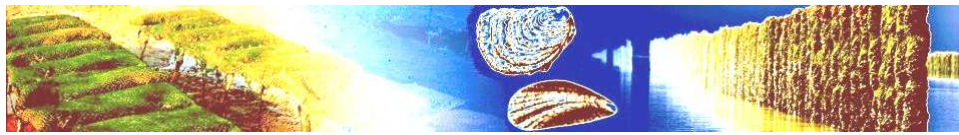
5 relevant pathogens selected: herpesvirus OsHV-1, *Vibrio splendidus* and *V. aestuarianus*, *Marteilia refringens* and *Nocardia crassostreae*

OsHV-1 and *Vibrios* were reported during mortality outbreaks of Pacific oysters in Europe

Marteilia refringens associated with mortality events among mussels and the parasite does not develop in Pacific oysters *C. gigas*

Nocardia crassostreae infects Pacific oysters, *C. gigas* and reported in Europe for the first time in the Netherlands





Participants: 12

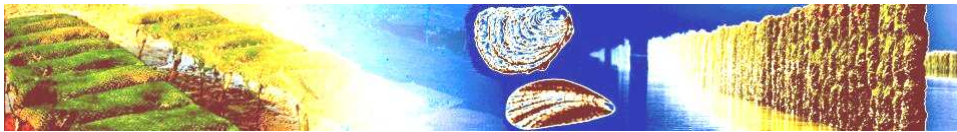
- *Ifremer, France (coordinator)*
- *Cefas, Weymouth, UK*
- *CSIC, Vigo, Spain*
- *Central Veterinary Institute of Wageningen, The Netherlands*
- *Marine Institute, Galway, Ireland*
- *University Cork, Ireland*
- *Department of Biology, University of Genova, Italy*
- *IRTA, Spain*
- *University of Padova, Italy*
- *CNRS, Brest and Montpellier, France*
- *Atlantium, Israël*
- *EMPA (European Mollusc Producers Association)*



Expected achievements

- Harmonisation of diagnostic techniques (molecular techniques) for Pacific oyster and mussel pathogens through method transfer and large scale validation (inter-laboratory assays)
- Detection of relevant pathogens in European sites based on the use of validated common techniques
- Development of tools to measure pathogen survival
- Detection of viable/infective relevant pathogens in different compartments (animals, water, sediment)





Expected achievements

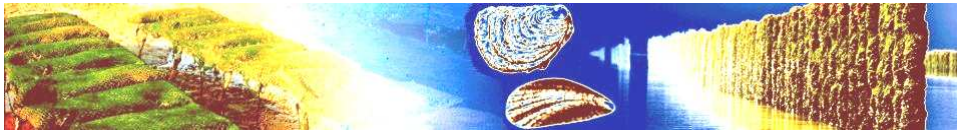
- Identification of relevant host defense mechanisms in contrasted biological material (infected versus non-infected individuals, resistant versus susceptible individuals)
- Identification of virulence factors in relevant pathogens
- Development of practical methods and general recommendations for infectious disease control drawn from knowledge acquired during the project



BIVALIFE - First results

- (i) Effective transfer of molecular diagnosis techniques (Real time PCR) for the detection of OsHV-1, Vibrio splendidus, V. aestuarianus and Nocardia crassostreae to 8 laboratories*
- (ii) Organisation of inter-laboratory assays for the transferred techniques (using reference material)*
- (iii) Searching relevant pathogens in Pacific oysters and mussels using the transferred techniques in 2011 and 2012 in France, Ireland, Italy, the Netherlands and Spain*





BIVALIFE - First results

- (iv) Field sampling data forms were designed in Excel worksheets and a database was comprised of a series of interlinked tables for storing the data on sampled bivalves and their associated parameters*
- (v) Production of 45 Pacific oyster families and testing for their susceptibility to OsHV-1, Vibrio splendidus, V. aestuarianus et V. harveyi (by intramuscular injection)*
- (vi) Testing UV effects on relevant pathogens (OsHV-1 and vibrios)*

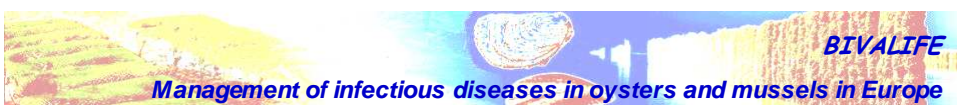


Work package 4 as an example

WP4 - T1: Development of experimental disease models

WP4 - T2: Effects of pathogens on host defence mechanisms

WP4 - T3: Characterization of pathogen virulence factors





Work package 4 - Task 1

45 Pacific oyster families have been produced in 2011 and grown at Ifremer facilities in La Tremblade and Bouin

The susceptibility of 45 families was tested by experimental infection with OsHV-1. A minimal infective dose (inducing at least 50% of mortalities in 5 days) that can allow discrimination of families, was determined (infective dose = 100 μ l/oyster at 6.10^3 viral DNA copies / μ l)

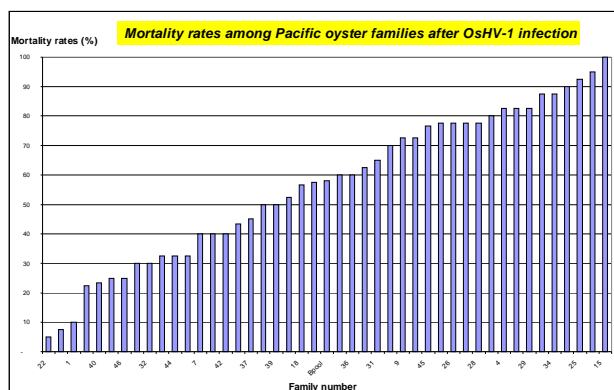
Among the 45 tested families, 16 families were selected for testing their susceptibility to 3 *Vibrio* species: *V. splendidus*, *V. aestuarianus* and *V. harveyi*

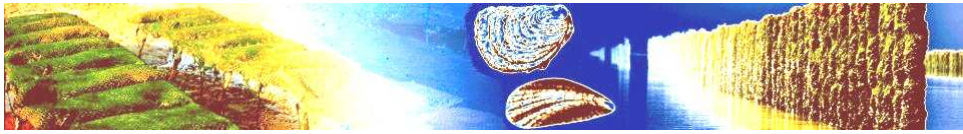


Work package 4 - Task 1

Results:

Susceptibility to OsHV-1 infection in laboratory conditions (45 families)

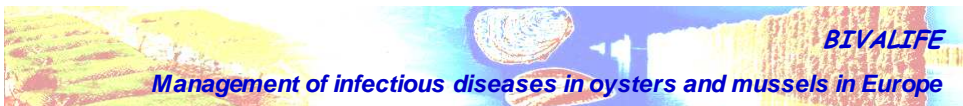
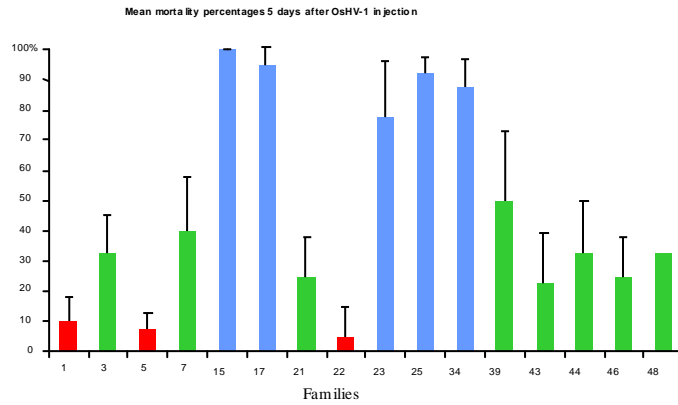




**Work package 4 -
Task 1**

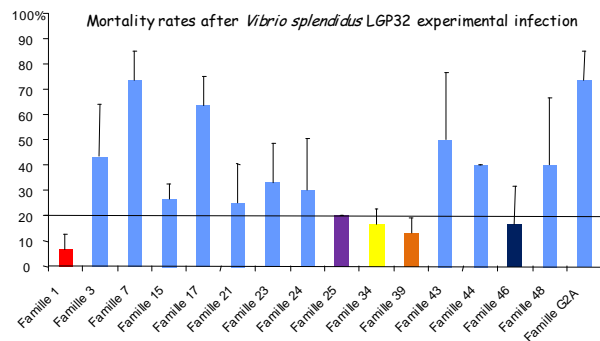
Results

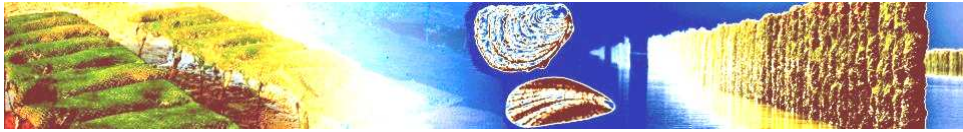
Among the 45 families, 16 were selected and tested 3 times



Work package 4 - Task 1

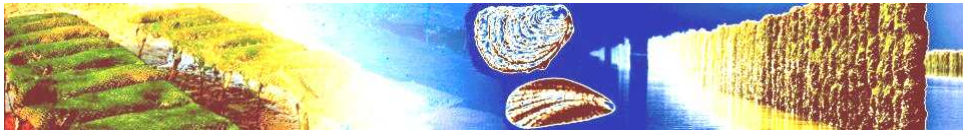
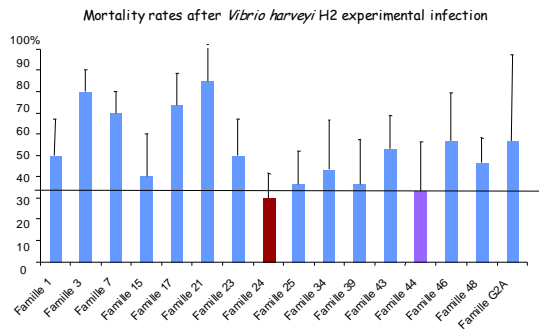
Results
Susceptibility to *Vibrio* infections in laboratory conditions





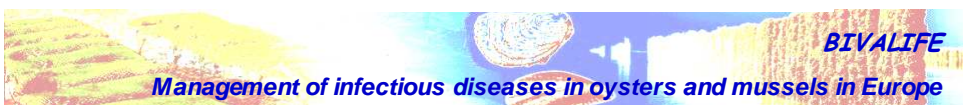
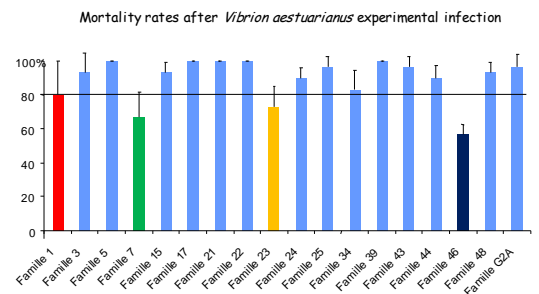
Work package 4 -Task 1

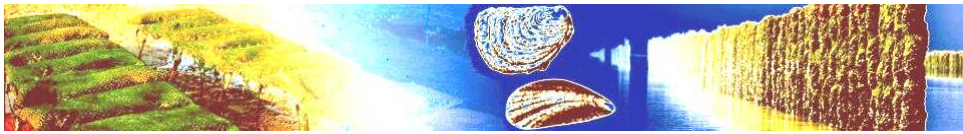
Results
Susceptibility
to *Vibrio*
infections in
laboratory
conditions



Work package 4 -Task 1

Results
Susceptibility
to *Vibrio*
infections in
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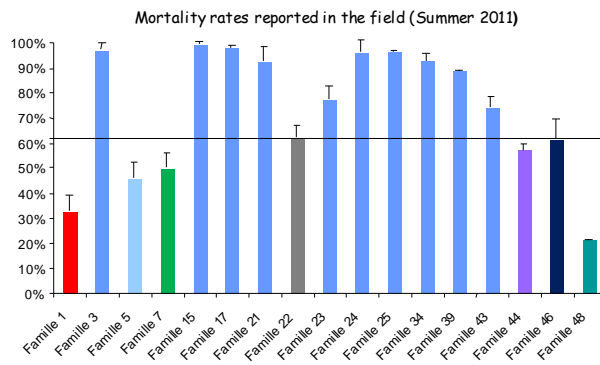




**Work package 4 -
Task 1**

Results

Mortality rates in
the field during the
Summer 2011

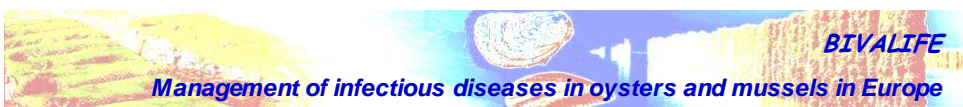


Work package 4 - Task 1

Conclusion

Effective production of Pacific oyster families demonstrating variable susceptibility to OsHV-1, *Vibrio splendidus*, *V. aestuarianus* and *V. harveyi*, in laboratory conditions

Oyster families used for WP3 (searching OsHV-1 RNAs) and for WP4 (studying the oyster immune response to viral and bacterial infections)





Bivalife
Controlling infectious diseases in oysters and mussels in Europe

Collaborative european project : BIVALIFE | News and Events | Reports and publications | Links

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Zoom

OsHV-1 herpes virus

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<http://www.bivalife.eu/>

Management of infectious diseases in oysters and mussels in Europe



AQU A 2012, September 1-5, 2012, Praha

BIVALIFE

- Management of infectious diseases in oysters and mussels in Europe -

Merci pour votre attention

