ParaFishControl

Advanced Tools and Research Strategies for Parasite Control in European farmed fish

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Project description

Evaluation score: 15/15

Total amount: 7.8 M €

Starting date: 1 April 2015 (5 years)

Goal: To increase the **sustainability** and **competitiveness** of European Aquaculture by:

- improving understanding of fish-parasite interactions
- developing innovative solutions and tools for the prevention, control and mitigation of the major parasites affecting farmed Atlantic salmon, rainbow trout, common carp, European sea bass, gilthead sea bream and turbot

Objectives:

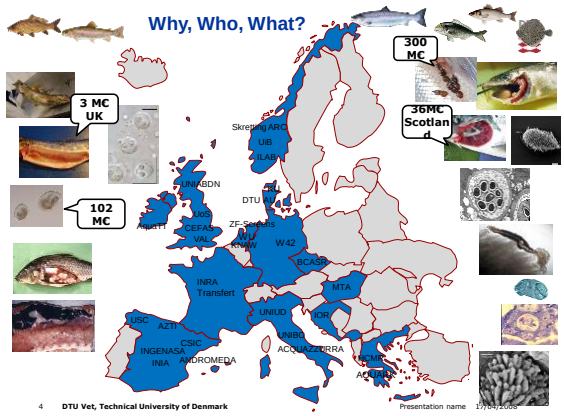
- To generate new **scientific knowledge** on key fish parasites, including genomics, life-cycle, invasion strategy and host-parasite interaction data, with special emphasis on host immunity, pathogen virulence and immunomodulation
- To determine the **transfer of parasites** between **farmed and wild** host populations
- To develop a wide range of novel **prophylactic measures**, including vaccines and functional feeds
- To provide a range of advanced or alternative **treatments** for parasitic diseases
- To develop cost-effective, specific and sensitive **diagnostic tools** for key parasitic diseases
- To assess the **risk factors** involved in the emergence, transmission and pathogenesis of parasitic diseases
- To map the **zoonotic risks** due to fish helminths
- To provide a catalogue of **good husbandry practices** to obtain safe and high-quality fish products

Project description: parasites targeted

Parasite group	Parasite species	Fish	Disease
Crustaceans	*Lepeophtheirus salmonis*, *Caligus* spp.	AS	Sea lice infection
	Ceratothoa oestroides, Caligidae	ESB,GSB	Isopod and sea lice infections
Monogeneans	*Sparicotyle chrysophrii*	GSB	Gill fluke
Myxozoans	*Tetracapsuloides bryosalmonae*	RBT	*PKD*
	Enteromyxum leei	GSB	Knife syndrome
	Enteromyxum scophthalmi	TB	*Sunken head syndrome*
	Sphaerospora molnari	CC	Gill sphaerosporosis
	*Thelohanellus kitauei**	CC	Intestinal giant-cystic disease
Microsporidians	*Enterospora nucleophila**[5]	GSB	Emaciative syndrome
Ciliates	*Ichthyophthirius multifiliis*	RBT, CC	Whitespot disease
	Philasterides dicentrarchi	TB	*Scuticociliatosis*
Dinoflagellates	*Amyloodinium ocellatum*	ESB	*Velvet disease*
Amoebae	*Paramoeba perurans*	AS	AGD
Oomycetes	*Saprolegnia parasitica*	AS, RBT	*Saprolegniasis*
Zoonotic helminths	Anisakidae, Opisthorchidae, Diphyllobothriidae	All	Anisakiasis, Opisthorchiasis, Diphyllobothriasis, allergy (in humans)

Abbreviations: AS = Atlantic salmon (*Salmo salar*); CC = common carp (*Cyprinus carpio*), ESB = European sea bass (*Dicentrarchus labrax*), GSB = gilthead sea bream (*Sparus aurata*). RBT= rainbow trout (*Onchorhynchus mykiss*), TB = turbot (*Psetta maxima*). * Emerging or exotic parasites.

Why, Who, What?



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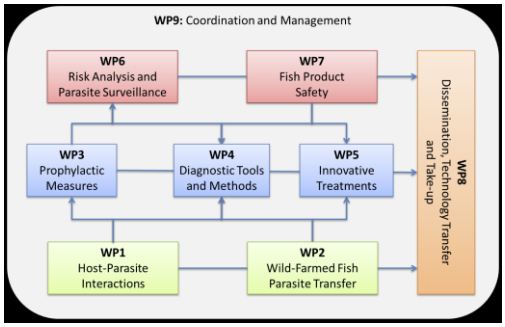
Project description: WP interaction



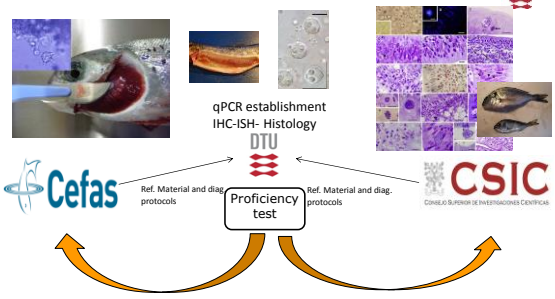
DTU-VET CONTRIBUTION

- DIAGNOSTIC METHODS
- DEVELOPMENT-IMPROVEMENT OF IN VIVO MODELS FOR DISEASE STUDY

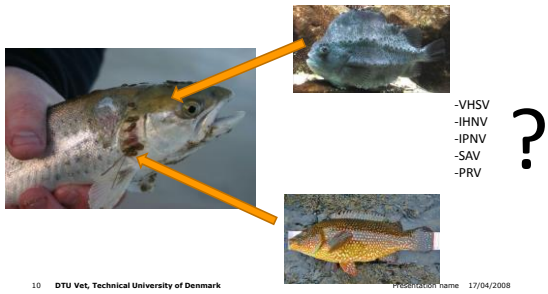
Diagnostics

WP 4 Diagnostic tools and methods
Task 4.1 – Validation of reference diagnosis methods (M1-M32)
Leader: **DTU** Contributors: CSIC, DTU, UNIBO, IOR, UoS, UNAB, CEFAS, VAL
Existing methods for the diagnosis of the infections based on qPCR, ISH and IHC will be updated, evaluated and optimized (CSIC: *E. nucleophila*; DTU: *T. bryosalmonae*; CEFAS: *P. perurans*). If appropriate, alternative methods will be developed. Analytical optimization and validation of techniques will be conducted. Clinical and test samples will be provided by all the participating partners and selected cases will be arranged and delivered blindly, according to ISO 17043 proficiency testing systems, to selected laboratories (DTU). Proficiency tests, comparison of methods and diagnostic validation will be established among different partners with ring tests.

Task 4.1 – Validation of reference diagnosis methods (M1-M32)



WP5 Innovative treatments
Task 5.3 – Optimise use of cleanerfish for controlling ectoparasites (M1-M48)
Leader: DTU Contributors: AU, DTU, MTA, UoS.

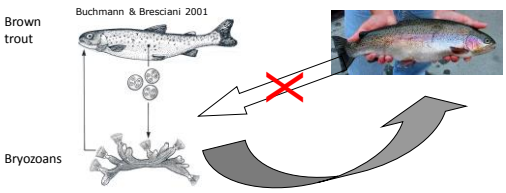


WP5 Innovative treatments

- Cleaner fish provided by UoS
- Infection trial with relevant salmonid viruses.
  - Pathogenesis study assessing viral load at different time points in different organs.
  - Expected output : guidelines for surveillance of relevant fish diseases in cleaner fish
  - In connection with this challenge vaccination trial with DNA vaccine (in cooperation with prof. Niels Lorenzen- AU)

DTU WORK – development implementation of in vivo model for complex diseases study

Task 5.5 – Treatment of infected facilities - PKD



Freshwater bryozoans – hosts of *Tetracapsuloides*

Can we treat the bryozoans to reduce-mitigate the release of tetracapsuloides in fish farms?

Thanks for your attention