ParaFishControl

Vaccines for *Philasterides dicentrarchi*

ParaFishControl Workshop "Mediterranean Fish Parasite Management Strategies"

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Challenge and Impact

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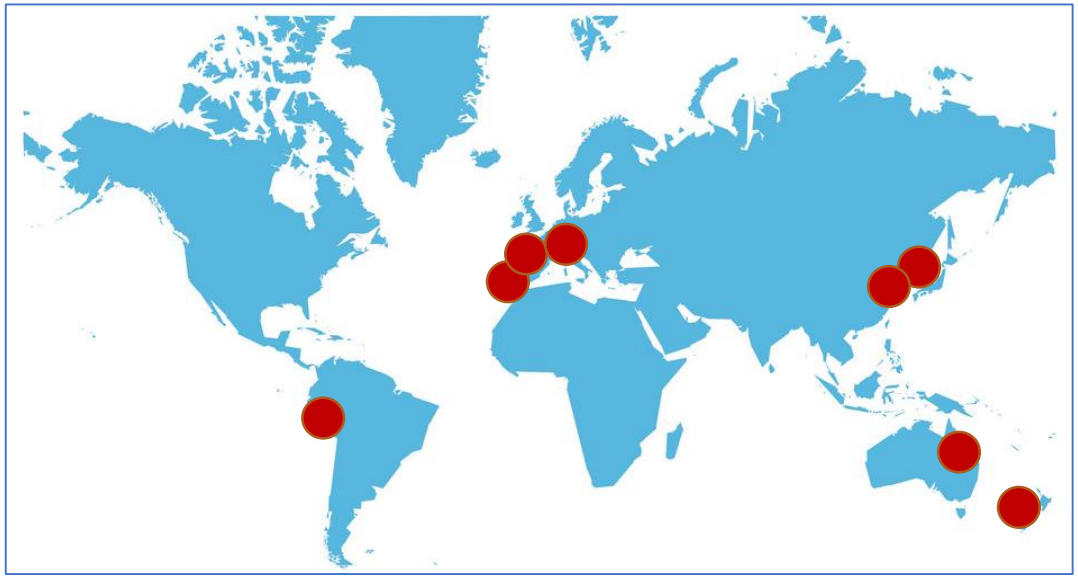
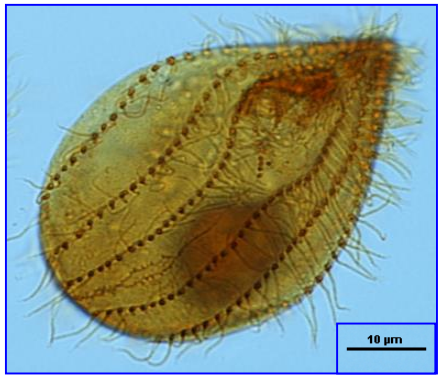
➢ Challenge



➢ Impact



-*Philasterides dicentrarchi* has been reported to cause infections in several cultured fish species worldwide

-To date, there is no treatment available against scuticociliatosis

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Our approach and our team

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- **The University of Santiago de Compostela has generated a vaccine, using the whole parasite as antigen**
- **The vaccine can induce 100% protection in turbot against the homologous serotype. At present, turbot farms are using autovaccines as a preventive measure**

Lamas et al., (2008). Aquaculture, 278:22-26

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Our approach and our team

Group	FACTORS			Survival (%)	Mean time to death (days)*	Serum antibody levels (absorbance at 492 nm)
	Cilates ml^{-1}	Formalin (%)	adjuvant (%)			
1	10^6	0.2	50	100^{a}	18±0	$0.93±0.29^{a}$
2	10^5	0.1	70	83^{b}	16.6±3.0	$0.60±0.35^{abc}$
3	10^6	0.05	90	98^{a}	17.9±0.7	$0.71±0.19^{ab}$
4	10^5	0.1	70	94^{ab}	17.6±1.4	$0.47±0.21^{bc}$
5	10^4	0.2	90	44^{c}	13.7±4.0	$0.21±0.087^{d}$
6	10^4	0.05	90	44^{c}	13.4±4.4	$0.26±0.081^{cd}$
7	10^6	0.05	50	98^{a}	17.9±0.5	$0.92±0.40^{a}$
8	10^4	0.2	50	67^{bd}	15.7±3.8	$0.28±0.20^{bcd}$
9	10^6	0.2	90	100^{a}	18.0±0	$0.53±0.25^{bc}$
10	10^4	0.05	50	84^{b}	16.6±16.6	$0.18±0.14^{d}$
11			50	34^{ce}	12.0±12.0	$0.18±0.12^{d}$
12			70	28^{e}	12.1±12.1	$0.13±0.10^{d}$
13			90	58^{cd}	14.8±14.8	$0.21±0.13^{d}$

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Our approach and our team

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- **Weaknesses of the current vaccine**
- **To generate the antigen, the ciliate has to be passed through fish routinely**
- **The vaccine do not protect or protects partially against heterologous serotypes**

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Our proposed solution (I)

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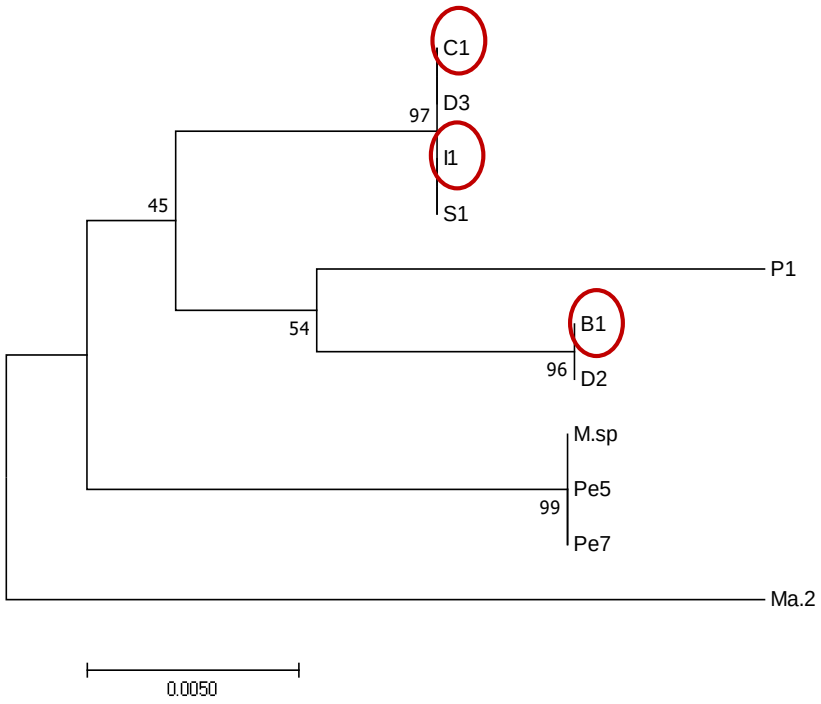
USC has identified three different *P. dicentrarchi* phenotypes and serotypes



	Turbot immune serum, 1:25. Killing activity (%)		
STRAIN	**15 min**	**30 min**	**60 min**
B1	0%	0%	0%
C1	99%	100%	100%
D2	0%	0%	0%
D3	96.50%	100%	100%
I1	96%	100%	100%
P1	50%	50%	50%
S1	95%	100%	100%

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Our proposed solution (II)

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- **Solutions to the problem:**
- To produce a vaccine containing a mix of ciliates from different serotypes as antigens

- **Weaknesses of this solution:**
- Ciliates have to be passed through fish before being used as antigen

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Our proposed solution (III)

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- **Solutions to the problem:**
- **To generate an universal vaccine against *P. dicentrarchi* based on recombinant proteins. The vaccine would contain antigens from the main serotypes**

- **Main challenge:**
- **To identify the protective antigens**

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Expected benefits for the industry

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- Commercialization of a vaccine against *P. dicentrarchi* that could be produced anywhere

- Protect fish against *P. dicentrarchi* infections in fish farms

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Current status and next steps

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- **USC has identified three families of proteins that are good candidates to be used as antigens in a vaccine:**
  - Variant-specific surface proteins
  - Leishmanolysins
  - ABC transporters

- **Current situation:**
- USC is testing these antigens in vaccines

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Conclusions

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- Turbot farmers are using autovaccines against *P. dicentrarchi*
- This vaccine protects against the homologous serotype
- Three *P. dicentrarchi* serotypes have been identified by the USC
- USC propose to generate an universal vaccine against *P. dicentrarchi* based on recombinant proteins.
- Several antigens candidates are being produced and tested in fish vaccines

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Thank You

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