Vaccines for *Philasterides dicentrarchi*

ParaFishControl Workshop “Mediterranean Fish Parasite Management Strategies”

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Challenge and Impact

➢ Challenge

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

➢ Impact

- To date, there is no treatment available against scuticocociliatosis.
Our approach and our team

• 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

<table>
<thead>
<tr>
<th>Group</th>
<th>FACTORS</th>
<th>Survival (%)</th>
<th>Mean time to death (days)*</th>
<th>Serum antibody levels (absorbance at 492 nm)</th>
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<tr>
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<td>Cilates ml⁻¹</td>
<td>Formalin (%)</td>
<td>adjuvant (%)</td>
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<td>10⁶</td>
<td>0.2</td>
<td>50</td>
<td>100&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
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* This table represents our approach and our team's results in a controlled environment.
Our approach and our team

- **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**
Our proposed solution (I)

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

![Tree diagram showing the relationships between different serotypes and phenotypes.]

**Turbot immune serum, 1:25.**

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</tr>
<tr>
<td>S1</td>
<td>95%</td>
<td>100%</td>
<td>100%</td>
</tr>
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</table>
Our proposed solution (II)

• 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
Our proposed solution (III)

• 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
Expected benefits for the industry

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

• Protect fish against *P. dicentrarchi* infections in fish farms
Current status and next steps

- 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
Conclusions

• 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
Thank You

ParaFishControl

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