Can We Predict Fish Quality of Juveniles for Release during Larval Stage? A Case Study of the Japanese Flounder

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Background: Fish Quality for Seedlings

Ecology

Behavior

Function

Morphology

Growth Survival

Stocking effectiveness

Quality

Health

Importance of Behavioral Study
(Tsukamoto et al. 1999)
Objectives

1) Screening the index behavior of fish quality (ideally in the earlier stage)
2) Improve seedling production technique

Target Species

Japanese flounder  
(*Paralichthys olivaceus*)
Behavioral development in Japanese flounder

Metamorphosis

Juvenile

Ohm (Ω) posture

Nip

*p<0.05, U-test

Sakakura & Tsukamoto 2002
Day 23 (metamorphosis)

Non-Ω fish

Ω fish

Day 50 (juvenile)

Survival: 22% (88 fish)
Ω-fish: 42 ins.
non-Ω fish: 46 ins.
Size hierarchy on aggressive behavior

![Bar chart showing standard length (mm) for Dominant, Intermediate, and Subordinate groups.](chart.png)

- Dominant: n=35
- Intermediate: n=27
- Subordinate: n=38
<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Ω</th>
<th>Non-Ω</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominant</td>
<td>35</td>
<td>23**</td>
<td>12</td>
</tr>
<tr>
<td>Intermediate</td>
<td>27</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Subordinate</td>
<td>38</td>
<td>14</td>
<td>24**</td>
</tr>
<tr>
<td>SUM</td>
<td>100</td>
<td>47</td>
<td>53</td>
</tr>
</tbody>
</table>

**G-test,  \( p<0.05 \)**
Summary and future research

• We can predict growth performance and behavioral characteristics of juveniles
• Mechanism of individual difference in behavior (Ω-posture)
• Release experiment
  
  seedlings sorted by behavioral index