Experimental cage culture of Nile Tilapia (Oreochromis niloticus) and Red Tilapia (Oreochromis spp.) in Sri Lanka

M.H.S Ariyaratne

National Aquatic Resources Research & Development Agency (NARA)
Sri Lanka
Tilapia is very popular in Sri Lanka
Common reasons

- It is an hardy fish
- It is an opportunistic feeder
- It could bear wide salinity range
- It has parental care and mouth breeding pattern
- It’s reproduction rate is very high
Specific reason

- No commercially valid endemic lacustrine fish in reservoirs
Introduction

- Cage culture is commonly practiced worldwide in both freshwater and marine environments.
- It also used in seed rearing of Carp and Tilapia in Sri Lanka.
- The perennial reservoirs have been used to install cages in Sri Lanka.
Cont....

- It is a simple methodology that could be applied by the fishers themselves

- Tilapia is the main stay of our reservoirs
Objectives

- To produce fingerlings of tilapia by the fisheries (community involvement) to stock
  - In Perennial reservoirs
  - In seasonal tanks
  - Other aquaculture practices such as pond culture, cage culture
To test a low-cost farmer made aqua feed for the seed rearing of Tilapia

It is an urgent need to prepare a low cost farmer made feed for the rearing of tilapia
Materials and Method

Trials were carried out in Kiri-Ibbenwewa, a perennial reservoir in Moneragala District in Dry zone of Sri Lanka

Three Different types of feed were used

Rb (Rice bran)

Cf (Commercial feed)

Mf (Man made Aqua feed)

Nf (Natural feed as the supplementary feed)

Mf = Rb+Fm (Locally prepared) + boiled casava tubes
The size of cage = 15m³ (2x4x2.5m)
Cage material = HDPE, 4mm, Knotless
8 Floating cages were set up at once.
Coir were used for cage setting (community involved in cage setting process), kuralon, nylon ropes & plastic cans

Table 1: Stocking Density of Tilapia & Rearing period in cages

<table>
<thead>
<tr>
<th>Fish species</th>
<th>Stocking density</th>
<th>Rearing period</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT</td>
<td>150 fry/m³</td>
<td>51 days</td>
</tr>
<tr>
<td>NT</td>
<td>150 fry/m³</td>
<td>40 days</td>
</tr>
</tbody>
</table>
Feeding

- Twice per day at a rate of 10% of body weight
- Respective feed types were mixed with hot water and prepared as dough
- Feed dough was provided using feeding trays
- The amount of feed were determined through the sampling that was carried out biweekly
Preparation of fish meal

- Small indigenous fish species were used (not exploited by the commercial fishery)
- Sun dried for 3 days
- Wrapped in paper and hung in a fire place for further drying 5-7 days
- Powdered using mortar and pestle/sieved with a sieve of 2mm
Community Involvement

Cage cleaning, cage setting, feed preparation and feeding, harvesting and fish transportation were done by the community.

Special attention was made to prepare fish meal.

Take care throughout the rearing period.
Data Analysis

• SGR-L
• SGR-W
• ADG

Calculated above factors and % survival was determined
Results

Table 1. Specific growth rate in length (SGR-L±sd), Specific growth rate in weight (SGR-W± sd), Average daily growth (ADG± sd) and % survival of Red tilapia(RT) and Nile tilapia(NT) fry in cage culture trials when fed with different types of feed.

<table>
<thead>
<tr>
<th>Tilapia Variety</th>
<th>Culture method</th>
<th>Sto: density</th>
<th>Feed type</th>
<th>SGR_L</th>
<th>SGR-W</th>
<th>ADG</th>
<th>% survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT</td>
<td>Fry-fingerling</td>
<td>150</td>
<td>Rb</td>
<td>2.73±0.007</td>
<td>5.27±0.192</td>
<td>2.5±0.219</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cf</td>
<td>3.18 ±0.127</td>
<td>6.69±0.104</td>
<td>8.4 ±0.375</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mf</td>
<td>2.61 ±0.656</td>
<td>6.51±0.642</td>
<td>7.9 ±2.167</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nf</td>
<td>2.50 ±0.285</td>
<td>6.12±0.592</td>
<td>7.28 ±1.749</td>
<td>31</td>
</tr>
<tr>
<td>NT</td>
<td>Fry-fingerling</td>
<td>150</td>
<td>Rb</td>
<td>2.06 ±0.046</td>
<td>4.02±0.626</td>
<td>2.15 ±0.807</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cf</td>
<td>1.72 ±0.094</td>
<td>5.21±0.78</td>
<td>4.72 ±2.762</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mf</td>
<td>1.60 ±0.125</td>
<td>4.76±0.96</td>
<td>4.66 ±2.728</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nf</td>
<td>1.49 ±0.25</td>
<td>4.66±0.56</td>
<td>4.81±1.507</td>
<td>30</td>
</tr>
</tbody>
</table>
% Survival of RT & NT in cages with different feed types

- Both NT & RT have showed high % survival with Rb Feed type
Conclusion

- The fry of NT & RT could be reared successfully in the cages in perennial reservoirs in Sri Lanka

- Community could be engaged in this activity since no advanced technology is required
Rb could be recommended for seed rearing of RT and NT

However the amount of Rb should be reduced by preparing a suitable aqua feed as the high demand for Rb in poultry farming

Selection of perennial reservoirs for extensive cage culture of NT & RT, the amount of available natural food could be considered
Acknowledgement

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Thank you