



Creating initial materials for Red Tilapia (*Oreochromis spp*) seed selection



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Introduction



Tilapia:

- Common name for all the fish under *Cichlidae* family.
- 3 main species are based on the breeding and juveniles feeding characteristics (Beveridge and et al., 2000), i.e:
 - *Tilapia*
 - *Sarotherodon*
 - *Oreochromis*
- Nile Tilapia (*O. niloticus*) is the most popular farmed specie.

Introduction (cont.)

Red Tilapia:

- Being hybrid the first time in Taiwan, Israel and Florida (USA)
- **Hybrid species** of:
 - Black mutant-coloured Tilapia (*O. mossambicus*)
 - Nile Tilapia (*O. niloticus*)
 - Green Tilapia (*O. aureus*) and Zanzibar Tilapia (*O. urolepis-horonum*)(Lovshin, 2000)
- Popularly farmed in Asia, Middle America, and South America.



Introduction (cont.)

- Colors: grey, white, pink, red-orange, and can be mixed with black dots (Pante and et al., 1988)
- The combined color is made of the following factors:
 - Color of scale
 - Color of skin
 - Color of flesh muscle
- Main colors found in Vietnam:
 - Red or pink
 - Light pink
 - Mixed with black dots
 - Mixed of red/dark and light pink





Different colors of red Tilapia



Different colors of red Tilapia



Different colors of red Tilapia





Appearance and biology

- Appearance: is not different from Nile Tilapia in terms of form criteria (Pante and et al., 1988)
- Similar characteristics in growing and breeding as Nile Tilapia
- Red Tilapia has a better **salinity tolerance**, therefore it can live and **grow well** in **marine and brackish** water (**15 – 25ppt or even higher**) (Romana-Eugia and Eguia, 1999).



Red Tilapia in the Mekong Delta Area

- Red Tilapia (*O. Spp*): is a popular farmed specie in the East Southern and the Mekong Delta Areas.
- It can adapt well with the industrial farming models, i.e.:
 - Raft culture
 - Pen culture
 - Pond culture



Current status

- **Growth rate is not high:** the average weight after 6 months of raft reached 500g/individual (equal to only 80% of GIFT Tilapia).
- **Low survival rate:** it is to get diseases, high percentage of loss.
- **Color:** not homogenous, but mixed with black dots. Tilapia with solely red/pink color is preferred and can be sold at a higher price.



Solutions

- Seed selection is based on quantitative genetic theory
- The following seed selection programs are being carried out by RIA II:
 - Tra catfish (growth rate, fillet ratio)
 - GIFT Tilapia (growth rate)
 - Green giant prawn (growth rate)
- RIA II, in cooperation with AKVAFORSK Genetic Center (AFGC), creates the initial population of red Tilapia as the basis for:
 - Seed selection program
 - Program of disseminating the selected seeds

Material source

- Red Tilapia seeds selected in Ecuador
- 100 families (100 children populations from 100 different broodstocks)
- F2 generation of the seed selection program carried out in 2004 in Ecuador



Material source (cont.)

The characters selected in Ecuador:

- Good growth rate in marine and brackish water conditions (15 – 25ppt)

- Fillet ratios

Precious characters:

- High growth rate
- High survival rate
- Low percentage of inbreeding, because of the followings:
 - Generated from all the current red Tilapia species in South America)
 - Family selection was carried out to minimize inbreeding



Current status

- 100 families of red Tilapia from Ecuador
- Received in 2 times: on Apr. 1 and May 27, 2008
- Kept separately and cultured at the Southern branch of the National Freshwater Fisheries Seed Center



Selection

Selection of broodstocks for the next generation:

- 500 females (+ 250 spare females)
- 250 males (+ 100 spare males)
- Good-looking red color
- The highest body weight



Magnetic marking for individual differentiating and genealogy maintaining



The selected characters for the next generation

- Growth rate:
 - Fresh water
 - Marine and brackish water
- Color
- Fillet ratio





Cooperation and development

- Experiment on growth rate of Tilapia imported from Ecuador in the farming conditions of the Mekong Delta Area:
 - Commercial raft culture in fresh water environment
 - Rotational culture in tiger shrimp ponds
- Cooperation for disseminating the selected seeds:
 - Potential partners
 - Receiving the selected seeds for production and supply to the farmers
 - Profit sharing based on the percentage of fry income from seeds



Cooperation and development (cont.)

Materials for dissemination:

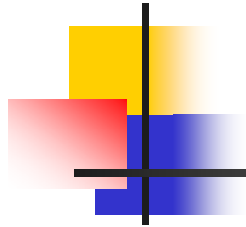
High quality broodstocks obtained from:

- the remained quantity after family representatives have been sent to the selected populations for the next generation.
- the remained quantity after selecting the reserved fish for the next seed selection program.

Cooperation and development (cont.)



- Massive production of high quality reserved fish from the best families in order to create 2 different strains of blood-line.
- Strictly not to use the F1 generation of these strains as broodstocks due to high possibility of inbreeding.
- After a certain time of being used, the reserved fish will be replaced by a new ones from the the seed selection program of the Center. The new fishes have more advantages in some surveyed characters.



**RIA II initiated the first seed
selection program for red
Tilapia in the Mekong Delta
area**



Thank you!