Development and Maintenance of Yellow Perch Broodstock

(OTT ID 1104)

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Current Problems with Yellow Perch

Problems/Unmet Needs:

- Limited production of yellow perch; single annual crop
- Non-optimized use of aquaculture holding facilities
- Slower growing cycle to market size

Solutions

Technological Solution:

- Out-of-cycle spawning of yellow perch broodstocks
- Modification of water temperature and photoperiod regimes allows facilities to spawn anytime on the 12 month calendar
- Gametes can be produced every 2-3 months
- Multiple broodstocks can spawn each year at different times
- This creates a higher yield of yellow perch fingerlings year round

Benefits:

- Safer –no chemicals or hormones used
- Healthier – Yellow perch are low in fat and calories and high in protein and omega-3 fatty acids
- Toxin free –Fish are reared in clean water and fed controlled diet
- Flexibility – Large holding facilities can be scaled down due to year-round production

Intellectual Property and Licensing

- U.S. Utility Patents Issued
  - 7,836,852

- Looking for licensing partners interested in establishing new yellow perch rearing facilities

- Access to the patented methods and knowhow of Dr. Binkowski and his team is available through the School of Freshwater Science

Market Potential

Applications

- Aquaculture

Market

- Yellow perch have long been a popular member of the Friday night fish fry in many Great Lake shore line communities.
- The commercial retail value of yellow perch remains high at $13-16 per pound. Annual harvests from all the Great Lakes averaged more than 23 million pounds from 1950 to 1970, but just 5.75 million pounds from 1990 to 2000.
- A distributor in the Midwest has estimated market demand to be 50 to 100 million pounds annually.
- The annual market value for all aquaculture in the U.S. is approximately $1 billion.
- As the commercial harvest of yellow perch declines, the market for farm-raised fish is becoming increasingly valuable.

Goals of the Technology

- Develop domesticated broodstocks
- Manipulate spawning cycles to produce high quality gametes throughout the year
- Produce healthy, disease-free fingerlings throughout the year
- Reduce dependence on wild broodstock

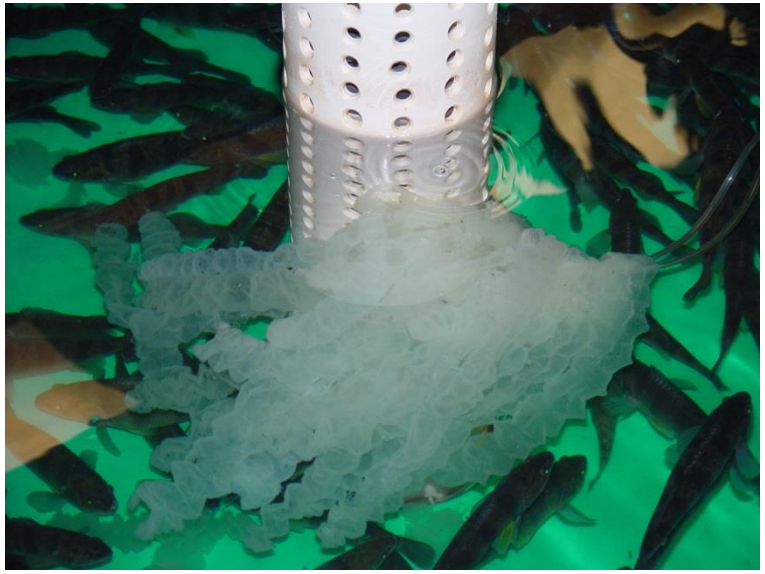
Establishing Domesticated Yellow Perch

Strain Selection

- Obtain multiple geographic “strains”
- Natural March-June spawners
- Examples: North Carolina (March), Green Bay (April), Lake Michigan (June)

Size/Age for Startup

- fertilized eggs
- fingerling
- sub-adult
- Adult (sexually mature)



Out-of-Cycle Spawning

- Manipulate photoperiods and water temperature schedules to push spawning forward or backward from the normal cycle
  - Optimal spawning would be every 2 months
  - Year-round harvest
  - Indoor rearing labor decreases after 1.5 months

- Our work has resulted in creating out-of-cycle spawning in:

  - August (April), October (June), October** (August), December (March), January (March), and February (March)

Development of Out-of-Cycle Spawning

- Identify local temperature profile for that “strain”
- Winter temps 100-180 days (geographically)
- 1°C increase every 2-4 days for “spring”
- 1°C decrease every 2-4 days for “fall”
- “Summer” length is the remainder of the days
- Extend or reduce the post-hatch “summer season” to start the “fall season” at the desired out-of-cycle time

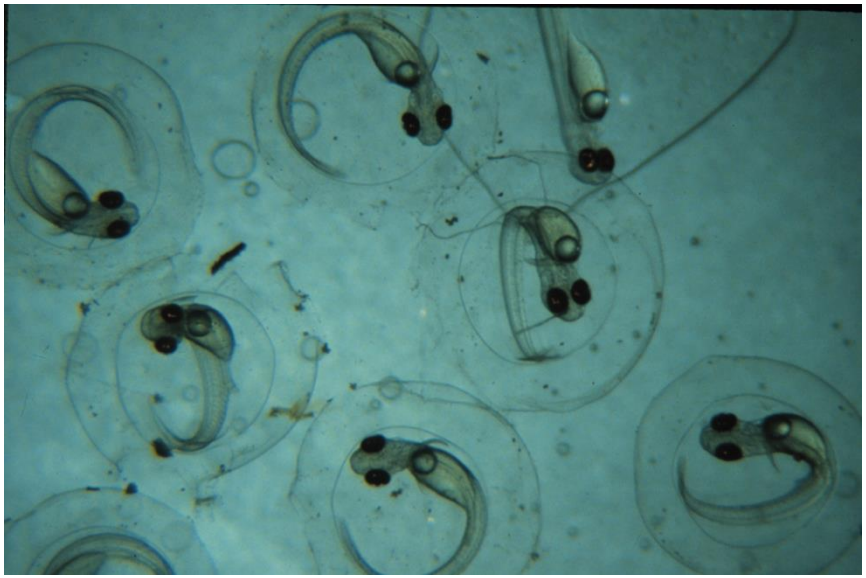
In Summary

- A new method has been developed to increase the number of yellow perch spawning events per year
- An extensive amount of knowhow has been accumulated for successful development of yellow perch broodstock and healthy progeny
- Knowhow includes
  - Facility set up and best practices
  - Understanding of best egg collection practices
  - Selection of ripe males/females for breeding
  - Artificial fertilization methods
  - Fertilized egg processing
  - Proper incubation schedule
  - Hatching techniques
  - Proper feeding and health maintenance of fry and fingerlings

Next Steps

- Identify new partners for licensing and yellow perch facility set-up

- Find partners interested in purchasing fingerlings produced at the UWM School of Freshwater Science facilities



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