Higher Eduction Commission Islamabad

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Project Outcomes

1. **Project/PI particulars**

Title of Project:	Production of all-Female Population in Silver Carp (Hypophthalmichthys Molitrix) by 17 a-Methyltestosterone Immersion and Dietary Treatment To Improve Its Annual Production and Harvesting Period		
Name of PI:	DR. SHAFAQ FATIMA		
Project No:	3468	**PI Email:**	shafaq.fatima@y7mail.com
Duration:	30 Months	**Total Cost:**	1983288
Start Date:	19-06-2015	**Completion Date:**	03/09/2021
University / DAI's:	LAHORE COLLEGE FOR WOMEN UNIVERSITY: LAHORE		

2. **Sector of Institution:** **Public**
3. **Is this project:** **Applied**
4. **Is output of the project commercialize able:** **No**
5. **Objectives of Project**

1. Development of Fisheries & Aquaculture laboratory's resources 2. To ensure the food safety and provision of healthy animal protein to the consumers without any treated or improved feed. 3. To introduce silver carp as an alternative for major commercial carps to ensure sustainability of livestock. 4. Production of neomales by 17?-methyltestosterone immersion and dietary treatment by using monosex and gynogenetic populations (which has not been tried for silver carp before).

6. **Summary of Project**

Time of sex differentiation has been identified in four major commercial carps; bighead carp (Hypophthalmichthys nobilis), grass carp (Ctenopharyngodon idella), silver carp (Hypophthalmichthys molitrix) and catla (Catla catla). Histological differentiation of germ cells has not been previously studied in these species except grass carp. Developmental process of gonads in these species was studied from fertilized egg stage till completion of sex differentiation. Identification of this time is important to find out an appropriate time for sex reversal treatment to produce monosex culture at commercial level thus eliminating the growth rate differences between both sexes. Sex differentiation was observed at 784odph (degree days posthatch) (28 days post-hatch), 1215 odph (45 days post-hatch), 786odph (28 days post-hatch) and 840 odph (28 days post-hatch) in bighead carp, grass carp, silver carp and catla, respectively. present study has not been successful in masculinizing the genetic female silver carp by immersion treatment of 1800 µg/L on hatch, +1 week and +2 weeks post hatch. Dietary treatment of 30 mg/kg for 30 days also did not prove to be effective in sex reversal of this species. It can be inferred that duration of immersion tretment, number of baths or dose of hormone should be enhanced. However, it will add up more labour and consumption of hormone which is not desireable by farmer and consumer.

7. **Out comes**

i. **No of Publications:**

Research papers (National)		Research papers (International)		Total
In impact factor journals	In non-impact factor journals	In impact factor journals	In non-impact factor journals	
0	0	1	0	1

Please mention publication:

11. Fatima, S., Shoukat, A., Qamar, B., Mahmood, F., Rafique, A. 2017. Histological Study of Sex Differentiation in Bighead Carp (Hypophthalmichthys nobilis), Grass Carp (Ctenopharyngodon idella), Silver Carp (Hypophthalmichthys molitrix) and Catla (Catla catla). Turkish Journal of Fisheries and Aquatic Sciences. 7, 1313-1316. http://dx.doi.org/10.4194/1303-2712-v17_6_25.

ii. **Research Supervised** (Number of students who have completed research degrees under said project)

	Name of student	PhD/MS	Registration no	Thesis title	Year of degree notification	University	Department	Name of Supervisor
1	Attia Rafique	Ms	38155118	Histological study of gonadal development and sex differentiation in silver carp (Hypophthalmichthys molitrix); At different environmental conditions in Lahore, Pakistan	2016	Lahore College For Women University	Zoology	Dr. Shafaq Fatima
2	Natasha Anwer	Ms	38155110	Sex reversal in silver carp (Hypophthalmichthys molitrix) by 17 alpha-methyltestosterone immersion treatment	2016	Lahore College For Women University	Zoology	Dr. Shafaq Fatima

iii. **Patents (Numbers)**

Local			Foreign			Total
Submitted	Granted	Income/royalties	Submitted	Granted	Income/royalties	
0	0	0	0	0	0	0

iv. **Major Equipment** (Please give detail of equipment purchased under said project along with verified copy of entry page of university stock register)

S. NO	Name of equipment	Cost of equipment	Entry Page in University Stock Register

1	Four Fiber glass tanks and 24 glass aquaria with all power, water and aeration supply	10	5-20

v. **Linkages with R&D organizations, universities and industries**

S. NO	Counterpart organization	Type of linkage
1	SoyPak, Pvt. Ltd	consultacy service

8. **Other out puts**

No of products		No of process/methods		No of Crop varieties		Any other out put please specify	
Developed	Marketed	Developed	Marketed	Developed	Marketed	Developed	Marketed
0	0	0	0	0	0	0	0

9. **Have you considered communicating any interest in transferring research outcomes/products to (Please fill at least one):**
   a. Private Companies: *
      N/A
   b. Government organization: *
      N/A
   c. None-government organization: *
      N/A
   d. ORICs organization:
      N/A
   e. others (please specify):
      N/A
   f. None of the above:
      None of above

10. **Paper presented under the said NRPU project:**

S.NO	Title of conference	Level	
		International	National
1	16. Fatima, S., Shoukat, A., Qamar, B., Mahmood, F., Rafique, A., Jabeen, G., Latif, A. and Kanwal, Z. 2017. Histological Study of Sex Differentiation in Bighead Carp (Hypophthalmichthys nobilis), Grass Carp (Ctenopharyngodon idella), Silver Carp (Hypophtha6th international fisheries symposium, 08-09 February 2016, University of Veterinary and Animal Sciences, Pakistan	-	National

11. **Benefit of the project to the Community (Please mention the target group of the community, if any):**

D. PROJECT DIGEST: D-I. Salient Features: 1. This project has been designed to improve the production of silver carp (Hypophthalmichthys molitrix) which is a potentially important commercial carp in Aquaculture industry of Pakistan. The major constraint in its large scale commercial production is significant variance in growth rate of male and female fish. Males grow slower as compared to females and cause capital loss to farmers in terms of feed consumption, duration of ponds occupancy and capacity of ponds. This problem can be addressed by the production of all-female population replacing the mixed sex culture. Androgens are sex steroids which can masculinize the female fish if given at an early stage of life. Androgen immersion treatment of fish at yolk sac and larval stage and oral treatment can successfully masculinize the female fish. If these sex reversed fish are crossed with normal females then the whole next progeny will be female. Exclusion of males in silver carp culture will result in increased growth rate and early availability of fish in market thus reducing the time period of occupying the ponds and cost of fish management. Growth rate in all female population is expected to increase up to 50% without using any improved feed.

12. **Major problems hindering in the execution of the project, if any:**

Major problem was faced by university administration. Establishment of first aquaculture facility was main target of this project however, I faced reluctance from university to provide small area of land and funds for civil work. It took me five years to convince them to give me space and funds. There had been red tape in processing bills, tenders and payments to vendors.