

SELF-STUDY REPORT

for Masters Programme in
Fish Genetics and Breeding



Submitted to

National Agricultural Education Accreditation Board



College of Fisheries

CENTRAL AGRICULTURAL UNIVERSITY, IMPHAL

Lembucherra, Agartala, Tripura

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6.4. Self-Study Report for Masters Programme in Fish Genetics and Breeding

6.4.1. Brief history of the degree programme

The department of Fish Genetics and Reproduction is one of the core departments of the College of Fisheries, CAU (I) and is at the forefront of seed production technologies and genetic improvement programme, fish biodiversity characterization for augmentation of aquaculture productivity in the northeastern region which is greatly deficit in local fish production as well as food & feed grain production. In this regard, the department is actively engaged in PG teaching and research as well as capacity building of the stake holder. Emphasis is always on to make all these programmes relevant to field conditions. The department has been offering “**Master of Fisheries Science in two disciplines, namely “Fish Genetics and Breeding” and “Fish Biotechnology”**” programme w.e.f. Academic Year 2014-15 and 2019-20 (Intake: 5), respectively, as per the model PG syllabus of ICAR, New Delhi. The main focus of research efforts of the department is to refine/develop technologies and package of practice, quality seed production, trait improvement of indigenous fishes of aquaculture and ornamental value and fish biodiversity characterization for cataloguing and conservation. Towards this, the department has developed/is developing complete package of seed production of several fishes like indigenous carp, catfishes, giant freshwater prawn and ornamental fishes. Department has also barcoded (DNA) 166 fish species. Department has attracted eight (8) number of externally funded project from DBT, ICAR, NHM etc. Through molecular endocrinology research, department has identified molecular mechanism of pigmentation and traits to improve color in ornamental fishes. Department has also conducted active research in molecular endocrinology to enhance maturity and reproductive performance of cultivable species. In recent research, department has also developed BRICS technology for voluntary captive spawning of *Clarias magur*.

Objective of the degree programme

- To produce globally competitive postgraduates in Fish Genetics and Breeding.
- To promote the advancement of learning and persuasion of research in fisheries sciences.
- To make the postgraduates competent to impart extension services to the stakeholders.
- To meet the requirement of well-trained skilled manpower in the North-Eastern states.
- To facilitate the startups, aqua-entrepreneurship, and also to undertake such other activities as it may deem fit from time to time.

Accomplishments

Many of the scholars are now employed in university, state departments, industry and few pursuing higher studies. A systematic table of the pass-out scholars with their current position is annexed below.

University Faculty	Central/State Government	NGO	Project JRF	Pursuing Ph.D.
2	11	0	3	2

6.4.2. Faculty Strength

S. No.	Sanctioned faculty	Faculty in place	Vacant position	Faculty recommended by the ICAR/UGC/VCI/other regulatory bodies
1	Professor 1	-	1	NA
2	Associate Professor 2	1	1	NA
3	Assistant Professor 5	3	2	NA
Total 8		4	4	NA

6.4.3. Technical and Supporting staff

The administrative and accounts supporting staff are centralized in the college and are operating under the direct control of the Dean as part of Dean's office. The dedicated technical staff and supporting staff allotted to the department are as below:

S. No.	Designation	Staff in place
Technical staff		
1	Livestock cum Farm Assistant	01
2	Field cum Laboratory Assistant	02
Supporting staff		
3	Multi-Tasking Staff	01

In addition to the above staff, Skilled and Unskilled labours are hired on contractual basis.

6.4.4. Classrooms and laboratories

Apart from the common laboratory facilities of the college such as Central Instrumental Facility, Central Molecular Biology laboratory etc. the main laboratory, field and other facilities available for PG research of the department are as under:

S. No.	Name of the Lab / Facility	Major Equipments available/Particulars
1	PG Research Lab	<ul style="list-style-type: none">• Molecular spectrophotometer• Electrophoresis apparatus• Gel doc• PCR machine• Cooling centrifuge• pH meter• Incubator• Micropipettes• Realtime PCR• Blotting apparatus• Microinjector• Water bath• Laminar flow• Colour hunter lab• Gene sequencer
2	Hatchery and wet lab	<ul style="list-style-type: none">• Cistern Carp eco-hatchery• Prawn hatchery• FRP tank (500-1000L):20 nos.• Glass Aquariums – 60 nos. of different sizes
3	Freshwater Fish Farm	<ul style="list-style-type: none">• Eleven (15) Earthen Ponds of different sizes with total water area of 0.8 ha• Paddle Wheel Aerators• FRP boat• Water pump sets• Nets etc.

6.4.5. Conduct of practical and hands-on training

The department has well established laboratories and field facilities to support postgraduate research. A separate PG laboratory is in place which is fully dedicated for student's research purpose only. Additionally, the state-of-the-art Central laboratory and Molecular biology laboratory facilities setup under the Centre of Excellence (COE) programme supports hands-on practical knowledge to orient the scholar into futuristic research mind-sets. Considering the fact that the department is mostly focused on trait improvement-oriented research, experimental set-ups are carried out in fields (ponds/cemented tanks) to grasp an absolute understanding of the generated data. Under the compulsory course work allotted to the scholars, students are trained on various need-based and curriculum oriented hands-on practical. To assist the practical classes, the department has one laboratory assistant in place.

6.4.6. Supervision of students in PG programme

Sl. No.	No. of eligible faculty for guidance	Intake capacity	Faculty/Student ratio
1.	04	05	0.8

The department has started the postgraduate programme in Fish Genetics and Breeding in 2015 (and Fish Biotechnology in 2019). All faculties in the department have Ph.D. and higher degree and are well qualified and eligible (Annexed below) for guiding the students as per the ICAR norms.

S. No	Name of Faculty	Designation	Qualification	Area of specialization
1	Dr. Sagar Chandra Mandal	Associate Professor & Head	B.F.Sc., M.F.Sc. (AQC), Ph.D.	Aquaculture
2	Dr. Himanshu Priyadarshi	Assistant Professor	B.F.Sc., M.F.Sc. (FGB), Ph.D.	Fish Genetics and Biotechnology
3	Dr. Anindya Sundar Barman	Assistant Professor	M.Sc. (Fisheries), Ph.D.	Fish Biotechnology
4	Dr. Janmejy Parhi	Assistant Professor	B.F.Sc., M.F.Sc. (FGB), Ph.D., Post Doc (Spain)	Fish Genetics and Biotechnology

S. No	Name of faculty	Post held	Highest qualification received	Teaching/Work experience (in years)	Honors and awards	No. of students guided	Publication
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						(PG/PhD separately)	
1	Dr. Sagar Chandra Mandal	Associate Professor & Head	Ph.D.	19 years	01	PG-09	Research Paper – 46
2	Dr. Himanshu Priyadarshi	Assistant Professor	Ph.D.	13 years	01	PG-02	Research Paper – 14
3	Dr. Anindya Sundar Barman	Assistant Professor	Ph.D.	11 years	-	PG-06	Research Paper – 18
4	Dr. Janmejaya Parhi	Assistant Professor	Ph.D., Post Doc. (Spain)	11 years	11	PG-09	Research Paper – 43

List of Students Awarded M.F.Sc. (Fish Genetics and Breeding) Degree (2016-2020)

S. No.	Name	Title of Thesis	Year
1.	Ms. Laishram Galaxy Khuman	Molecular characterisation of sifamide and its receptor in <i>Macrobrachium rosenbergii</i> (de man, 1879)	2016
2.	Ms. Asem Lembika Devi	Expression profiling of gonadotropin- releasing hormone (gnrh) gene in <i>Puntius gonionotus</i> (bleeker, 1850) during different reproductive stages	2016
3.	Mr. Sumit Kumar	Expression analysis of gonadotropin releasing hormone receptor genes (gnrh-r) in <i>Puntius gonionotus</i> (bleeker, 1850) during different reproductive stages	2016
4.	Mr. Biswaranjan Rath	Identification of aquaporin-1, 4 and 11 genes in <i>Cyprinus carpio</i> (linnaeus, 1758) and their expression analysis during reproduction	2016
5.	Ms. Papuli Adhikary	Molecular Characterization of Enzymes Involved in DNA Methylation and Histone Modification in <i>Macrobrachium rosenbergii</i> (DE MAN, 1879)	2017
6.	Ms. Ningthoujam Chaoba Devi	Characterization and Expression of GnIH Gene in <i>Clarias batrachus</i> (Linnaeus, 1758)	2017
7.	Mr. Rualthantluanga Pachuau	Molecular Characterization and Expression Profiling of GnRH III gene in <i>Barbonymus gonionotus</i> (Bleeker, 1850)	2017

8.	Mr. Sudhakar Bisen	Molecular Characterization of Kisspeptin Gene and their Expression during Reproductive Cycle in <i>Barbonymus gonionotus</i> (Bleeker, 1850)	2017
9.	Ms. Angam Panor	Identification of Dopamine Receptor in <i>Clarias batrachus</i> (Linnaeus, 1758) and its Expression during Different Reproductive Stages	2017
10.	Mr. Maradode Jaywant Raghunath	Characterization and Expression of CYP17 Gene in <i>Clarias batrachus</i> (Linnaeus, 1758)	2018
11.	Ms. Snehalata Mohanty	Molecular Characterization and Expression of Vitellogenin Gene in Silver Barb, <i>Barbonymus gonionotus</i> (Bleeker, 1850)	2018
12.	Mr. Partha Sarathi Tripathy	Characterization and Expression of csflr Gene in <i>Botia dario</i> (Hamilton, 1822)	2018
13.	Ms. Khageshwari Jolhe	Characterization and Expression Analysis of Brdt Gene in <i>Clarias batrachus</i> (Linnaeus, 1758)	2018
14.	Ms. Purna Dobriyal	Characterization and Expression Analysis of Male-Biased Genes Sox9 and Dmrt1 in <i>Ompok bimaculatus</i> (Bloch, 1794)	2019
15.	Mr. Devendra Kumar	Role of Dopamine Receptors on <i>Clarias magur</i> (Linnaeus, 1758) Reproduction	2019
16.	Mr. Bhubanendra Prasad Acharya	Development of Somatostatin (SST) Targeted siRNA Construct in <i>Labeo rohita</i> (Hamilton, 1822)	2019
17.	Mr. Shrish Chandra Yadav	Characterization and Expression of GnRH Gene in <i>Botia dario</i> (Hamilton, 1822)	2019
18.	Mr. Subrata Rudra Paul	Comparative Karyotyping of Somatic and Gametic Cells of <i>Osteobrama belangeri</i> (Valenciennes, 1844) for Sex Chromosome Identification	2019
19.	Ms. Ananya Khatei	Study of Methylation Patterns in Key Pigmentation Genes of <i>Danio rerio</i> (Hamilton, 1822) in Response to Feed Supplementation	2020

6.4.7. Feedback of stakeholders (Students, parents, industries, employers, farmers etc.)

The passed-out scholars have expressed their satisfaction on the various theoretical as well as field-based work they have rendered during their curricula. The field-based learning and integrated analysis of the various seed production technologies, and advanced molecular techniques have enabled their skills with descent contribution in their respective job positions and

peruse higher studies. The existing infrastructures are optimally being utilized for teaching. The resultant graduates have been well received by the professional experts during the interview for selection of faculty, line department officials or NGOs in different states including Assam, Tripura, Manipur, Chhattisgarh, Orissa, etc. For that matter, the department has till now produced 20 nos. of postgraduates since its inception in 2015 and all the students have been well placed. The students remain in touch and express their field experience during the PG program highly handy in addressing the farmers' problems. The farmer related problems of the NE region are mostly undertaken for their dissertation work and have been delivered satisfactorily. The focal areas of research include seed production technology, trait improvement, molecular endocrinology etc.


6.4.8. Student intake and attrition in the programme for the last five years

Name of the degree programme	Actual student admitted in the last five years					Attrition (%)				
	2016-17	2017-18	2018-19	2019-20	2020-21	2016-17	2017-18	2018-19	2019-20	2020-21
M.F.Sc. (Fish Genetics and Breeding)	5	5	4	7	6	0%	20%	75%	0%	0%

6.4.9. ICT application in curricula delivery

The department has a dedicated classroom with modern tools. Lectures are delivered using computer projected PPTs. ICT application are applied in form of online classes delivered via media like G-Meet, Skype are taken. The students are provided online materials for self-preparation.

I, **Prof. Ratan Kumar Saha** the Dean, **College of Fisheries, Lembucherra**, hereby certify that the information contained in the Section 6.4.1 to 6.4.9 are furnished as per the records available in the college, and degree awarding university.


 Dean
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Signature of Dean of the College with Date & Seal