

Molecular Genetics for Aquatic and Marine Biodiversity Conservation

Course Code: 176040H01

Overview

In a wider standpoint, conservation genetics uses a combination of ecology, molecular biology, population genetics, evolutionary taxonomy and mathematical modelling. It is mutually a basic and an applied science. First, scientists must understand the genetic relationships among the organisms they're interested to study. Moreover, wildlife experts use techniques to preserve biological diversity in these species. The organisms that conservation geneticists study usually belong to endangered or threatened populations. To develop ways to help these populations, scientists ask two questions: What has brought these populations to the brink of extinction, and what steps can we taken to reverse this trend? Information about the genetic diversity of the organisms under study helps scientists and managers establish strategies where past conservation efforts have addressed populations from a mathematical, evolutionary, or taxonomic point of view. Modern efforts include genetic studies, giving conservation scientists and ecological managers much more information about the diversity among the individuals in a population. Without genetics, we may conserve the wrong population or waste valuable resources on a population that isn't endangered.

Considering the importance of molecular genetic analysis, course would consist of lecture and practical sessions to familiarize students and faculties with the basic theory and practice of molecular genetics that involve genetic principles, marker selection, sample size, sequence assembleance and data analysis using various softwares and programmes. More emphasis will be given for inference making out of the results analysed from the genetic data for conservation.

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| Modules | A: Molecular genetics for aquatic and marine biodiversity conservation : March 15 - 25, 2019 Number of participants for the course will be limited to fifty. |
| You Should Attend If... | <ul style="list-style-type: none">▪ Engaged in ecological research with a biology background▪ You are zoologist, botanist, microbiologist, biotechnologist or veterinary practicenor.▪ You are a student or faculty from academic institution interested in learning how to do research on molecular genetist or molecular biologist or want to work with molecular data for bioinformatics analysis. |
| Fees | The participation fees for taking the course is as follows: Participants from abroad : US \$200 Industry/ Research Organizations: INR 5000.00 Academician : INR 3000.00; Research Students : INR 1500.00 The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation on payment basis. |
| Registration | Link for GIAN portal: http://www.gian.iitkgp.ac.in/GREGN/index |

The Faculty



Professor David Haymer is a professor of molecular biology at university of Hawaii at Manoa, USA. He is investigating the use of genetic markers to study the population dynamics of insect pest species. He is also using a similar approach to document evolutionary relationships of species forming a complex. Cloning and characterization of genes involved in sex determination is another area of his expertise. Using a differential hybridization approach to identify genes involved in the sex determination process in several insect pest species, he have identified a number of candidate genes that appear to be expressed in only one sex. These are being analyzed to determine the extent to which they may be involved in the sex determination process.



Professor Gulab Khedkar is Director of the Paul Hebert Centre for DNA Barcoding and Biodiversity Studies which oversees DNA barcoding involvements in India. He is a Professor of Molecular Biology in the Department of Zoology and Director of its Centre for Coastal and Marine Biodiversity. India is home to at least 0.6 million species (about 7% of global diversity), but only 17% are known. To speed their discovery, Dr. Khedkar has promoted DNA barcoding through workshops, training courses, and collaborations. His laboratory works in the general area of evolutionary biology with a focus on aquatic organisms that combines lab and fieldwork. From a methodological perspective, he exploits diverse techniques for the molecular characterization of population (e.g. microsatellites, DNA sequencing, genome sequencing) and modelling. He is exploring genome size variation among species, and its impact on life history traits. Aside from metabarcoding studies on microbes from different ecosystems, he is probing mitochondrial evolution by assembling complete genomes for 500 taxa. He is also developing molecular protocols to aid food authentication.

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Course Co-ordinator

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