

## **FORNTIER AREAS RESEARCH PROJECTS ACHIEVEMENT DURING 2012-13**

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Central Silk Board invited research projects in frontier areas of sericulture for funding from reputed institutions within India. Total 44 research projects were received pertaining to Insect Physiology, Plant Biotechnology, Plant Pathology, Genetic Engineering, Socio economics, General Entomology and Post Cocoon Technology. The following three projects were sanctioned and approved for implementation

### **1. Development of Silk protein derived artificial nerve growth conduit for neural Tissue engineering”** by Dr. Utpal Bora, Associate professor IIT Guwahati.

The proposed project is aimed at bioengineering of nerve conduit based on biodegradable silk scaffolds as an alternative to nerve graft for peripheral nervous system so as to generate an environment for the regeneration of nerve gap. It is expected that the design and development of synthetic three-dimensional silk based scaffolds that highly mimic the extracellular matrix will be a valuable outcome of the project. Thus silk based scaffolds is expected to support the growth of neurological cells and can be alternative to autologous nerve graft . Dr Bora and his team has already completed the following objectives:

- Fabrication of silk fibre based scaffolds in which they have tried both freeze drying and elector spinning method
- Biofunctionalization of silk fibre based scaffolds
- Scaffold characterization.
- Culture and differentiation of neural stem cells on silk based scaffolds.

### **2. Biodiversity and Molecular Phylogeny of wild silk moths in Mizoram based on mitochondrial (16S rRNA and Col) gene markers** by Dr. G. Gurusubramanian and Dr. N. Senthil kumar, Department of Biotechnology, Mizoram university, Aizwal.

The basic objective of the project is as follows.

- To survey, collect and document the wild silk moths biodiversity in this region
- Molecular characterization of wild silk moths of potentially economic importance such as *Antheraea assama*, *A. frithi*, *samia richini*, *S. canningi*, *Attacus atlas* etc, based on 16S ribosomal RNA and *cytochrome oxidase* subunit (coxI) genes.

survey was conducted from October 2011 to October 2012 in five districts of Mizoram and 15 wild silk moths were collected. Identification and characterization were carried out using standard references. Extraction of mt DNA protocol was standardized and CO1 (9 Sample), ND1 gene (14 Sample), ITS2 gene, (14

sample), D-loop gene (14 sample) gene has already been standardized and have been sequenced. 16s rRNA gene is still in the process of being standardized and the field work will be extensively continued in different districts of Mizoram. The legs and tissue were stored in 70 % alcohol for further DNA work.

**3. Lighten up the feeding constraint traits of Silkworm *Bombyx mori* – by genetic engineering** by Dr. M. Krishnan, Professor and Head, Department of Environmental Biotechnology, Bharathidasan University Tiruchirappalli.

The main objective of the project is to study Cloning and characterization of olfaction receptors for cis-jasmone

### **Achievements**

Protein extracted from head region of silkworm *Bombyx mori* was subjected to 15% SDS PAGE and different protein bands ranging < 150 kDa to > 15 kDa were visualized on the coomassie brilliant blue stained gel. According to Gong et al., 2009, the insect OBP proteins were low molecular weight proteins ranging from 14 to 22 kDa. So a protein detected between 15 to 20 kDa, ranging 17kDa was eluted from the gel and subjected to trypsin digestion, the digested Tryptic peaks were recorded by MALDI-MS analysis. The mass charge (M/Z) value obtained from Tryptic peaks were subjected to MASCOT analysis, unique sequence response for the peaks were retrieved. The missed sequence were searched for BLAST analysis to verify the matching of OBP protein. Unfortunately the matched peptide doesn't show similarity towards *Bombyx mori* OBP but it was found to be shown similarity and aligned with Glutathione S-Transferase and its sub units