

## CHAPTER 47

### PLANT MOLECULAR BIOLOGY

#### Doctoral Theses

527. CHAUDHARY (Neetu)  
**Analysis of Carotenoid and Tocochromanol Biosynthesis Genes in Cereals for Qualitative Enhancement.**  
Supervisor : Prof. Paramjit Khurana  
Th 16895

#### *Abstract*

Studies the isolation of genes involved in carotenoid and tocochromanol biosynthesis, and their transgenic manipulation to genes alter the content and composition of these important antioxidants in important cereals like rice and wheat. Genes involved in tocopherol biosynthesis are identified in rice and studied with respect to their intron-exon structures, domain organisation of the encoded proteins, phylogenetic relationship and their expression confirmed by EST/cDNA analysis. Expression profile of rice tocochromanol biosynthesis genes in different plant tissues/organs, developmental stages and under abiotic stress conditions is also studied using quantitative PCR, microarray and APSS-based expression profiling methods. In wheat, three genes coding for tocochromanol biosynthesis pathway enzymed are amplified and studied with respect to their expression profile.

#### *Contents*

1. Carotenoid biosynthesis. 2. Tocochromanol biosynthesis. 3. Development of positive selection based plant genetic transformation and seed-specific binary vectors. 4. Summary and Conclusions. Bibliography.

528. GIRI (Jitender)  
**Investigations on Function of Abiotic Stress - Related Genes (OsSAPs, OsRLCKs and codA) and their Influence on Transcript Profiles of Native Genes in Transgenics.**  
Supervisor : Prof. Akhilesh K. Tyagi  
Th 16746

*Abstract*

In present work, function of OsSAP and OsRLCK genes encoding for stress-associated proteins and receptor-like cytosolic kinases, respectively, in rice has been analysed in abiotic stress tolerance in transgenic Arabidopsis plants. Investigates the effects of transgene expression on endogenous genes in transgenic plants.

*Contents*

1. Generic introduction to genomic studies on abiotic stresses in plants. 2. Functional characterization of OsSAP1 and OsSAP11 in transgenic arabidopsis system. 3. SAP (stress-associated protein) interacting protein, OsRLCK253, its homologs from rice and functional characterization of abiotic stress-related members. 4. Transcriptome analysis of transgenic rice expressing codA. 5. Summary and conclusions. References and appendix.

529. PURKAYASTHA (Arunima)  
**Development of Virus-Based Gene Silencing Vector for Rice and Characterization of Negative Promoter Elements in Rice Tungro Bacilliform Virus.**

Supervisor : Prof. Indranil Dasgupta  
Th 16745

*Abstract*

Develops a VIGS vector for rice based on RTBV to down-regulate endogenous rice genes. A VIGS vector for rice was constructed using RTBV and it was used to silence an endogenous marker gene, phytoene desaturase (pds) in rice plants. Attempts to screen the RTBV genome for the presence of any such viral suppressors.

*Contents*

1. RTBV and RNAi - literature review. 2. Developments of RTBV-based VIGS vector for rice and screening of RTBV genome for viral suppressors. 3. Characterization of RTBV promoter negative element. 4. Summary and conclusions. References and appendix.