

CHAPTER 7

BOTANY

Doctoral Theses

045. BHATIA (Varnika)
Study on Molecular Approaches for Developing Aphid Resistance Using Model Plant Arabidopsis Thaliana.
Supervisors : Dr. P L Uniyal and Dr. R C Bhattacharya
Th 18041

Abstract

It has developed transgenics capable of accumulating high levels of E- β -f and its substrate FDP in cytosol as well as plastids. The terpenoid synthases involved in the synthesis of FDP and E- β -f are expressed in cytosol and plastids. It also incorporated E- β -farnesene synthase gene of Citrus reticulata in Arabidopsis thaliana for cytoplasmic and plastidyl expression and Chemical analyses of the developed transgenic lines and bioassay for aphid repellence.

Contents

1. Introduction. 2. Review of literature. 3. Materials and methods. 4. Results. 5. Discussion. 6. Summary and conclusions.

046. CHUGH (Samira)
In Vitro Propagation of Ornamental Plants : Everlasting Paper Daisy [Helichrysum Bracteatum (Vent.) Andrews], a Commercially Important Orchid Hybrid (Cattleya Summer Song) and a Foliage Plant (Yucca Golden Sword).
Supervisor : Prof. I Usha Rao
Th 18042

Abstract

This research work has developed protocols for in vitro mass propagation of three ornamental plants belonging to different families : Helichrysum bracteatum (Vent.) Andrews (Asteraceae), Cattleya Summer Song (Orchidaceae) and Yucca Golden Sword (Agavaceae). In vitro mass multiplication of these three ornamental species has been attempted by axillary branching

in *Helichrysom bracteatum*, regeneration of PLBs in the orchid hybrid *Cattleya Summer Song* and multiplication of shoot clusters and regeneration of shoot buds from shoot base discs of *Yucca Golden Sword*.

Contents

1. Introduction. 2. Material and methods. 3. Observations and results. 4. Discussion. 5. Summary. 6. Literature cited. 7. Publication.

047. GLADYS MUIVAH
In Vitro Precocious Rhizome Induction in *Dendrocalamus Strictus* (Roxb.) Nees : Origin, Growth, Development and Formation of Plants by Using Plant Growth Regulators.
 Supervisor : Prof. I Usha Rao
 Th 18254

Abstract

The research work has devise a protocol for precocious induction of rhizome for rapid in vitro propagation of bamboos leading to the production of mass scale plantlets by using plant growth regulators and their successful establishment under in vitro and ex vitro conditions. It traces the origin, growth and development of rhizome using histological and histochemical techniques to understand the physiological and anatomical processes of rhizome differentiation under the influence of various growth regulators. The ultrastructural changes during rhizome development and chloroplast cells of culm shoot leaves and surface structure of the leaves raised in vitro and during the acclimatization of plantlets are substantiated by using transmission and scanning electron microscopic techniques.

Contents

1. Introduction. 2. Material and methods. 3. Observations and results. 4. Discussion. 5. Summary. 6. Literature cited. 7. Illustrations. 8. Publication.

048. GOVINDAPYARI (H)
Morpho-Taxonomic Studies on the Mosses of Imphal, Manipur.
 Supervisor : Dr. P L Uniyal
 Th 18036

Abstract

This work comprises the study on 120 species in 57 genera in 26 families. Of the 120 species 75 species are acrocarpous and 45 species are pleurocarpous mosses. Majority of the pleurocarpous taxa have been found as epiphytic growing on tree bark and branches. Most of the acrocarpous mosses are found growing on hard substratum lime cement wall/bricks wall and soil. Among the Pottiaceae family *Hyophila involuta* and *Semibarbula orientalis* are found to show wide distribution. *Hyophila perannulata*, *Hyophila comosa*, *Bryoerythrophyllum ferrugineum*, *Splachnophryum bengalense*, *S. synoicum*, *Physcomitrium indicum*, *Brachymenium sikkimense* are some of.

Contents

1. Introduction. 2. Review of literature. 3. Material and methods. 4. Taxonomic description. 6. Results and discussion. 7. Summary and conclusions.

049. JHA (Pooja)
In Vitro Genetic Manipulation of Pennisetum Glaucum (L.) R. BR.
 Supervisor : Dr. Vishnu Bhat
 Th 18039

Abstract

This study has taken up to establish a reproducible regeneration and genetic transformation protocol for crop improvement and study of gene function. Pearl millet is an important food crop among the globally cultivated cereals. Grown largely for its ability to produce grains under hot and dry conditions on infertile soils of low water holding capacity, where other crops generally fail to grow. The integration of genetic engineering into breeding programs provide a powerful approach to overcome barriers of incompatibility as specific genes can be introduced for improvement of the crop for various traits.

Contents

1. Introduction. 2. Review of literature. 3. Materials and methods. 4. Results. 5. Discussion. 6. Summary and conclusion.

050. KHUMAN (Yanglem Sharatchandra)
Bioenergy Modeling in Upland Village Ecosystems.
 Supervisor : Prof. K S Rao
 Th 18033

Abstract

This study focuses on the upland village ecosystems of central Himalaya and attempt to find the biomass stress at micro level. Households consume about 90% of the energy in rural areas and play an important role in the choice of fuels. A large part of the rural population in developing countries like India meet more than one third of the total energy demand from biomass especially in the rural areas, principally in the modestic sector.

Contents

1. General Introduction. 2. Review of literature. 3. Study area. 4. Methodology & data collection. 5. Bioresource availability. 6. Bioresource demand. 7. Bioresource demand vs availability. 8. Conclusion and recommendation.

051. KHURANA (Ashima)
Investigations in Nitric Oxide (NO) Induced Flowering of Lemna Aequinoctialis Welw.
 Supervisor : Prof. Shashi B Babbar
 Th 18255

Abstract

It has investigated the effect of exogenously supplied NO in the form of its various donors on in vitro flowering of the two strains of under inductive (8 h photoperiod) and non-inductive (16 h photoperiod) conditions. Analyzed the possible involvement of endogenous NO in the flowering of L.Aequinoctialis 6746 under inductive (8 h) conditions and explore the possibility of involvement of NO in earlier reported flower inducing effects of cyanide (CN-) and salicylic acid.

Contents

1. Introduction. 2. Materials and methods. 3. Observations. 4. Discussion. 5. Summary and conclusions.

052. MAHALAKSHMI (C)
Elucidation of Reproductive Pathways in Selected Angiosperm Taxa, and Study of Differential Expressions of Orthologues of Meiotic Regulatory Gene DYAD at Key Developmental Stages in an Apo- and a Diplosporous Taxa.
 Supervisors : Dr. Vishnu Bhat and Prof. S N Raina
 Th 18031

Abstract

This studies selected angiosperm taxa analysed by FCSS technique to elucidate the modes of reproduction while optimizing Feulgen-based staining system for comparing developmental events in two species of Aponogeton namely A. crispus and A. decaryi. Further, these indentified stages are used for the analysis of differential gene expression of a meiotic regulatory gene, DYAD using Reverse transcription PCR (RT-PCR). In order to unravel possible differential expression of DUAD across different apomictic taxa, an aposporous pseudogamous apomict namely Cenchrus ciliaris is also used. Using FCSS, eight different reproductive pathways are identified and species are grouped as sexual and apomictic depending on the ploidy of embryo and endosperm. Pennisetum glaucum, Brassica juncea and Cumin cyminum are found to be obligate sexuals while Pennisetum pedicellatum, Hypericum perforatum and Begonia trichocarpa as facultative apomicts.

Contents

1. Introduction. 2. Elucidation of reproductive pathways using flow cytometric seed screen. 3. Developmental biology of aponogeton crispus thunb. and aponogeton decaryi jumelle. 4. Isolation, characterization and expression analysis of orthologues of DYAD n aponogeton species and cenchrus ciliaris L. Summary and references.

053. RAJKUMARI SANAYAIMA DEVI
Fundamental and Applied Studies on in Vitro Conservation and Cryopreservation of Banana (Musa ABB cv. Karpura Chakkarakeli).
 Supervisors : Dr. Rajesh Tandon and Dr. Anuradha Agrawal
 Th 18040

Abstract

The present study establishment novel methods for the initiation

and multiplication of Musa shoot tip cultures to obtain a high proliferation rate, standardised a low cost in vitro conservation medium for Musa shoot cultures, investigated the potential of different cryopreservation protocols for a single cultivar, for further optimization. Also carried out ultrastructural studies at various steps of cryopreservation for establishing any significant subcellular changes and test the effect of low-cost in vitro conservation medium and cryopreservation on the genetic stability of the conserved plants, using morphological and molecular markers.

Contents

1. Introduction. 2. Material and methods. 3. Results. 4. Discussion. 5. Summary and conclusion.

054. SASHI KANT
Transcriptional Regulation of Cry4A Gene of Bacillus Thuringiensis Israelensis.
 Supervisors : Dr. Rupam Kapoor and Prof. Rakesh Bhatnagar
 Th 18038

Abstract

Bacillus thuringiensis israelensis (Bti) produces Cry4A toxin, a potent bioinsecticide for mosquito control. Synthesis of the toxin protein is linked to the developmental process through common sigma factors. For progression of both the processes concomitantly, a stringent regulation of the cry genes is necessary. A DNA sequence overlapping -35 element of the cry4A promoter, responsible for binding to the effector proteins P-HPr-CcpA complex that mediates catabolite repression in Gram positive bacteria has been identified. Gel retardation and DNase I protection assays revealed a 23 bp DNA segment involved in interacting with the protein complex. Effect of oligonucleotide mutagenesis in the cre is evaluated by promoter-lacZ fusion.

Contents

1. Introduction. 2. Review of literature. 3. Material and methods. 4. Results. 5. Discussion. 6. Summary and conclusion. 7. References. 8. Publication.

055. SINGH (Pratibha)
Molecular Characterization and Serological Detection of Putative Begomoviruses Infecting Papaya from Delhi and Haryana.
 Supervisor : Dr. Sudeshna Mazumdar-Leighton
 Th 18037

Abstract

This work screen symptomatic samples by polymerase chain reaction (PCR) using primers specific for begomoviral DNAs and clone and sequence viral genes and genomes. Analyzed genetic diversity among obtained sequences of viruses infecting different varieties of papaya and different plants of the same variety in a field and express the AVI gene of viral isolate from this study as a recombinant antigen for raising polyclonal anti-bodies as a possible detection tool.

Contents

1. Introduction and literature review. 2. Material and methods. 3. Sequence analyses of putative begomoviral complexes infecting papaya from Delhi and Haryana. 4. Detection of begomoviruses infecting papaya using polyclonal antibodies raised against a recombinant Coas Protein. 5. Summary and conclusions.

056. TANVIR-UL-HASSAN DAR
Molecular and Cytological Analysis of Genomic Changes in Neoautopolyploid Phlox Drummondii Hook.
 Supervisors : Dr. Shailendra Goel and Prof. S N Raina
 Th 18032

Abstract

Ploidy is now known to be very common in plants; indeed most of the world's economically important crop plants are polyploids. Present research program created colchitetraploids in Phlox drummondii and followed them through different colchitetraploid generations (C_0 , C_1 , C_2 and C_3). Different markers, including cytological and DNA markers are used to analyze variation between diploids and colchiteraploids. All the DNA markers used are dominant by nature, hence only de novo bands are considered which are absent in diploids but appeared during one or more following colchitetraploid generations. Bands showing variation are eluted, cloned and then sequenced, in order to characterize the nature of variation.

1. Introduction. 2. Materials and methods. 3. Observations. 4. Discussion. 5. Summary. 6. References.

M.Phil Dissertations

057. BASHISTHA (Deepmala)
Grasses of Delhi, Univesity North Campus.
Supervisor : Prof. A K Pandey
058. CHAUBEY (Prince)
Impact of Growth Regulators & Adjuvants on in Vitro Regeneration in Jatropha curcas : A Potential Biofuel Plant.
Supervisor : Prof. Veena Agrawal
059. DAYAMA (Devendra Kumar)
Experimental Studies on Taxus
Supervisor : Dr. P L Uniyal
060. MALIK (Saloni)
DNA Barcoding of Medicinal Plants : An In Silico Approach.
Supervisor : Prof. S B Babbar
061. MD. RAZAQ
Micropropagation and Establishment of Genetic Fidelity in Spilaithesca laval : An Important Antimalarial Herb.
Supervisor : Prof. Veena Agrawal
062. SATISH KUMAR
In Vitro Propagation of Safflower and a Review on Biotechnological Methods for its Improvement.
Supervisor : Prof. I Usha Rao
063. SHARMA (Shruti)
Purification and Biochemical Characterization of Dioscorin of Dioscorea alata.
Supervisor : Dr. Renu Deswal
064. SRIVASTAVA (Shikha)
Degradation of Aflatoxin B1 by Fungal Peroxidase.
Supervisor : Prof. V P Singh

065. THOMAS (Labin)
Advanced Studies on Gymnosperms.
Supervisor : Dr. P L Uniyal
066. YADAV (Neha)
Comparative Analysis of Ginsenosides of Panax spp. and its Pharmacological Effects - A Review.
Supervisor : Prof. A K Pandey
067. ZEESHAN UR RAHMAN
Isolation and Characterization of Chromium - Resistant Bacteria from Tannery Effluent.
Supervisor : Prof. V P Singh