

CHAPTER 5

BOTANY

Doctoral Theses

048. ANIL KUMAR
Taxonomic Studies on the Grasses of Aravalli Ranges.
Supervisors : Prof. S. R. Yadav and Dr. P. L. Uniyal
Th 15653

Abstract

It is the result of methodical and meticulous botanical explorations and comprehensive study of the grasses of Aravalli ranges. Spread over more than four years. During 2004-2007, more than 45 field trips were organized for extensive and intensive survey and collection of grasses from Aravalli ranges. In this present work 269 species, 2 sub species and 3 varieties belonging to 102 genera have been described. All these species collected, have been studied well for their distribution, morphology and variation in the wild and processed and deposited at the herbarium, Department of Botany, University of Delhi.

Contents

1. Introduction. 2. Review of literature. 3. Material and methods. 4. Area of study. 5. General vegetation and grasslands of Aravalli. 6. Statistical analysis. 7. Results and discussions. 8. Systematic treatment. 9. Taxonomic account. 10. References. 11. Annexure.

049. BERI (Veena)
Studies on Inhibitors and Activators of Acetylcholinesterase and Trypsin in Plant Extracts.
Supervisor : Dr. Rajendra Gupta
Th 15652

Abstract

It examines edible plants as well as other plants useful to human, with respect to the presence of chemicals that can effect the activities of two important enzymes in the nervous system and the digestive system. The AChE and trypsin are ubiquitously

present in the plant kingdom and that these inhibitors are either absent or present in low amounts in edible portions of plants. the potential usefulness of plants as sources of antiChE and antitrypsin medicines, this thesis presents work on isolation and partial characterization of two new antiChE compounds from onion, *Allium cepa* L. It also shows very high concentration of antiChE in spices. This finding explains the scientific basis for medicinal properties of spices and the reasons for intake of spice in minute quantities as compared to staple food.

Contents

1. Introduction. 2. Materials and methods. 3. Results and discussion. 4. Summary and conclusions. Literature cited. Appendix.

050. NAYAK (Saswati)
Inter and Intra Specific Diversity Analyses of the Genus Anabaena Using Molecular and Traditional Approaches.
 Supervisors : Dr. Dinabandhu Sahoo and Dr. Radha Prasanna
 Th 15654

Abstract

It elaborates on the tremendous diversity of *Anabaena*, isolated from nine diverse rice based cropping systems located in different agro climatic zones of India. The variants for distinguishing at species level included colour and growth pattern of the cultures in liquid and solid media, morphometric values (size and shape of vegetative cell, heterocyst and akinetes and trichome shape/size) and heterocyst frequency. Cluster analysis further aided in deciphering the relationships among the *Anabaena* strains based on morphological attributes. The dendrogram revealed 3 major groups and A2 (ATCC29414) as an outlier. The highest pair-wise similarity of 0.88 is observed between AN5 and AN11 and also in AN53 and AN60. The pair wise similarities ranged between 0.30 - 0.75 for the rest of the strains, indicating in general, moderate morphological divergence among the *Anabaena* strains analyzed.

Contents

1. Introduction. 2. Previous Work. 3. Materials and methods. 4. Observations. 5. Discussion. 6. Summary and conclusions. 7. References.

051. SHARMA (Priyanka)
Development and in Planta Analysis of Chimeric Bt Genes for Resistance to Lepidopteran Pests & Studies on Bt Toxin-Receptor Interactions in Chilo Partellus (Swinhoe).
 Supervisors : Dr. Suman Lakhanpaul and Dr. P. Ananda Kumar
 Th 15651

Abstract

The two synthetic Bt genes coding for novel chimeric Cry1AaAcF and Cry1AaAcB proteins are constructed by domain swapping. Cry1AaAcF confers high expression in plant system and provide resistance against two major polyphagous pests, *Helicoverpa armigera* and *spodoptera litura*. Interaction of *B. thuringiensis* Cry1A toxins with *C. partellus* BBMV have been studied, with an emphasis on binding affinities and receptor sharing. Protocols are standardized for higher recovery of properly folded and active Bt Cry proteins, over-expressed as IBs in *E. coli*.

Contents

1. Introduction. Review of literature. 3. Material and methods. 4. Results. 5. Discussion. 6. Summary and conclusions. 7. References.

052. UPADHYAY (Chandrama Prakash)
Studies on Genetic Transformation of Vigna Mungo (Blackgram) for Abiotic Stress Tolerance.
 Supervisors : Dr. Vishnu Bhat and Prof. Neera Bhalla Sarin
 Th 15655

Abstract

Focuses on the establishment of an efficient transformation protocol for blackgram (*Vigna mungo* L. Hepper) and a reproducible and efficient transformation system utilizing the nodal regions of embryonal axis (cotyledonary node explants) established via *Agrobacterium tumefaciens*. It has also undertaken the engineering abiotic stress tolerance in *V. mungo* by overexpression of the Glyoxalase I (gly I) gene isolated from *Brassica juncea* (Veena et al 1999) under a novel constitutive *Cestrum* yellow lead curling viral (CmYLCV) promoters and most widely used CaMC 35S promoter.

Contents

1. Introduction. 2. Review of literature. 3. Materials and methods. 4. Results. 5. Discussion. 6. Effects of rhizobium & mycorrhiza on in vitro raised VIGNA mungo plantlets. Summary and conclusions. References.