CHAPTER 60

ZOOLOGY

Doctoral Theses

646. ANJALI NAGENDRA
Molecular Determinants of Abnormal Follicular development in Rat Model of Polycystic Ovary Syndrome (PCOS)
Supervisor : Dr. Rita Singh
Th 18088

Abstract

In this work an animal model is established for the study of pathophysiology of PCOS. The work includes establishment and characterization of animal model followed by analysis of differential gene-protein expression in granulosa cells from systic ovary in comparison to that of normal ovary. This includes establishment and characterization of animal model for PCOS analysis of specific gene expression and analysis of differential gene expression using DDRT-PCR in granulosa cells.

Contents

1. Review of literature. 2. Establishment and characterization of RU486 induced PCOS model. 3. Analysis of specific gene expression in granulosa cells from RU486 induced PCOS rat ovary. 4. Analysis of differential gene expression in granulosa cells from RU486 induced PCOS rat ovary using DD RT-PCR. Summary. Conclusions and Future.

647. GAUTAM (Sudhida)
Behavioural Interaction of Green Lacewings Chrysoperla Carnea and Mallada Desjardinsi (Neuroptera : Chrysopidae) to Mealybug Phenacoccus Solenopsis (Homoptera : Pseudococcidae) in Cotton Agro - Ecosystem.
Supervisor : Prof. A K Singh
Th 18227

Abstract

The green lacewings are collected from cotton field having

infestation of mealybug Phenacoccus solenopsis. Species of lacewings are identified and their cultures are established. Morphological differences of lacewings are studied and their behavioural differences are recorded in response to P. solenopsis. Studies revealed that M. desjardinsi larvae spend most of their time actively foraging (74.1 min.). Development and life tables of the predators are studies to know the efficacy of these predators for management of this mealybug.

Contents

1. Introduction. 2. Historical resume. 3. Materials and methods. 4. Behavioural responses of green lacewings to mealbug. 5. Development and life table analysis of the predators on mealybug. 6. Orientation of mealybug and lacewings to cotton. 7. Discussion, Summary and Bibliography.

648. GUNJAN
Deciphering the Role of Serine/Threonine Protein Kinases of *Bacillus Anthracis* and *Mycobacterium Tuberculosis*
Supervisor : Dr. Sharmila Basu-Modak and Prof. Yogendra Singh
Th 18092

Abstract

Explores Ser/Thr protein kinases of two pathogenic bacteria-*Bacillus anthracis* and *Mycobacterium tuberculosis.* Aimes to clone, overexpress and purify the recombinant *B.* anthracis STPKs in *E.coli.* The kinase activities of STPKs are compared and novel insights are sought. Also described their possible role by identifying the downstream substrates. In brief this work presents a comparative biochemical analysis of *B.* anthracis STPKs.

Contents

1. Biochemical analysis of Ser_Thr protein phophorylation in Bacillus anthracis. 2. Understanding the role of M. tuberculosis PknJ. Summary and conclusions

649. JINDAL (Swati)
Exploring Functional Diversity of *linB* Gene Encoding Haloalkane Dehalogenase from Hexachlorocyclohexane (HCH) Dumpsite Using Genomic and Metagenomic Approaches.
Supervisors : Prof. Rup Lal
Th 18086

Abstract

This work has undertaken to find and characterize naturally existing novel variants of LinB (Haloalkane dehalogenase). For this, the genetic diversity of linB from a highly contaminated HCH dumpsite is trapped using both genomic (culturable) and metagenomic (unculturable) approaches. A number of HCH degrading bacteria mainly sphingomonads harbouring *lin* genes have been isolated from HCH dumpsite situated in Lucknow, India. These bacterial strains have been shown to posscess better HCH degradation potential than the extensively studied *Sphingobium indicum* B90A and *Sphingobium japonicum* UT26. The native *linB* gene is cloned with its flanking regions and sequenced from the selected sphingomonads. The variants thus obtained are optimized for purification and expression of LinB. Comparative enzyme kinetic studies are carried out with these LinB variants for the purpose of screening out an enzyme variant possessing maximum hydrolytic dechlorination activity.

Contents

650. KAMESHWAR SHARMA Y V R

Purification and Characterization of Proteolytic Enzyme, Trypsin of Indian Major Carps Catla Catla, Labeo Rohita and Cirrhinus Mrigala.

Supervisor : Prof. Rina Chakrabarti

Th 18087

Abstract

In the present study, trypsin is purified from Indian major carps catla, mrigal and rohu. Trypsin is purified from the hepatopancereas of Indian major carps by fractional precipitation with ammonium sulfate and is followed with ion exchange and affinity chromatography. SDS-PAGE of purified trypsin PF2, of Indian major carps catla, mrigal and rohu revealed a homogenous single band with molecular masses of 19.72, 19.15 and 19.08 kDa, respectively.

Contents

651. KIRAN BALA

Purification of ε-HCH (Hexachlocyclohexane); Role of LinA (HCH dehydrochlorinase) and LinB (HCH haloalkane dehalogenase) in its Degradation and Screening Natural Variants of LinA for Better HCH Degrading Potential

Supervisor : Prof. Rup Lal

Th 18090

Abstract

Deals with the enrichment and purification of ε-isomer of HCH from technical HCH using high pressure liquid chromatography with refractive index detector and conducting its toxicity. Studies to pick up better *linA* variants from high hose point sites such as HCH contaminated dumpsite also deals with taxonomical characterization of a novel *sphingobium* species.

Contents

652. LUKRAM INGOCHOUBA MEETEI

Effect of Feeding Regimes on the Digestive Enzyme Profile and Ultrastructure of Digestive Tract of Indian Major Carps During Ontogenic Development.

Supervisor : Prof. Rina Chakrabarti

Th 18089

Abstract

The present work is to evaluate the fate of major digestive enzymes and characterization of the functional proteases appears during early development. Indian major carp: catla Catla catla, rohu Labeo rohita, mrigal Cirrhinus mrigala are taken as test fishes. Carp larvae are cultured inside the aquahouse under various feeding regimes. The larvae are collected on every alternate day and the entire digestive systems are taken

out. Crude digestive extract is prepared and the digestive activities are recorded during ontogenic development. The protein profile of the digestive extract is assayed by SDS-PAGE. Protease profile is evaluated by sustrate SDS-PAGE during development of fish.

Contents

1. Literature review. 2. Materials and methods. 3. Results. 4. Discussion. 5. Summary and Conclusion.

653. RAGESH P R

Biological Activity of Ageratum Conyzoides (L.) (Asteraceae) Extracts Against Gram Podborer Helicoverpa Armigera (Hiibner) (Lepidoptera : Noctuidae).

Supervisor : Prof. A K Singh

Th 18267

Abstract

This work has determine the biological activity of Ageratum conyzoides against grampod borer Helicoverpa armigera. Survival, development and egg production of H. armigera are studied on diet mixed with different concentrations of crude hexane and methanol extract of A. conyzoides under laboratory conditions. The most active extract is found to be crude hexane, none of the larvae survived beyond second instar on diet treated with higher concentrations of this extract (3000ppm and 4000ppm). The effect of crude hexane and methanol extract of A. conyzoides on the feeding behaviour of H. armigera is studied using toxicity bioassay, deterrent bioassay and nutritional experiments.

Contents

1. Introduction. 2. Historical Resume. 3. Materials and methods. 4. Effect of ageratum conyzoides extracts on the survival and development of helicoverpa armigera. 5. Effect of ageratum conyzoides extracts on the feeding of helicoverpa armigera. 6. Effect of ageratum conyzoides extract on the oviposition and orientation of helicoverpa armigera. 7. Bioactive component in crude extract of ageratum conyzoides. 8. Discussion, Summary and Bibliography.

654. SANTOSH KUMAR

Diversity and Ecology of Ciliated Protozoa from Select Diotopes, and a Recombinant Cell Line of *Tetrahymena thermophila* as Potential Model for Toxicological Assays.

Supervisor : Prof. Neeta Sehgal and Prof. Komal Kamra

Th 18094

Abstract

This study includes indentification and systematics of free living ciliated protozoa from a biddiversity hot-spot-The silent valley national park, India - and from two regions with extreme climatic environments - The valley of flowers, India, and karst system in Italy. Species indentification is made on the basis of live cell observations, morphology, morphometry and morphogensis as per standard international norms. Additionally, 18S rDNA sequences are used for species identification and for phylogenetic derivations. In the karst system, ciliate community has been used as bio-indicator of water quality. Further, a genetically modified cell line of a ciliate tetrahymena thermophila has been used in the development of rapid assays for metal toxicants based on the exploitation of stress gene activation.

Contents

655. SIMRAN JIT

Evaluation of hexachlorocyclohexane (HCH) Contamination from the last lindane Production Plant Operating in India adn Resolving HCH Degradation and Toxicity Issues: A Step Towards HCH Bioremediation.

Supervisor : Prof. Rup Lal

Th 18085

Abstract

The evaluation of contamination by HCH isomers, and their metabolites from a major dumpsite created by the lindane

manufacturing unit situated in Ummari village, Lucknow (Uttar Pradesh, India) have been studied. Conducted toxicological studies for the terminal hydroxylated products of β-, and δ– HCH, the β-, and δ– tetrachlorocyclohexane- 1,4-diols: B2, and D2 and screening a group of Sphingomonads isolated from the HCH dumpsite for presence of *lin* genes, and β-HCH degradation. It also studied transformation of α–, δ- , and γ–HCH, and δ-PCCH by HCH dehydrochlorinases: LinA1, and LinA2 from *Sphingobium indicum* B90A. and polyphasic characterizatio of two bacterial isolates from studied HCH contaminated soil.

Contents

1. Evaluation of hexachlorocyclohexane (HCH) contamination, and HCH metabolites from the last lindane productio plant operating in India. 2. Synthesis of β-, and δ-tetrachlorocyclohezadiols: B2 and D2 to study their toxicity, and fate. 3. Transformation of α–, γ–, and δ-HCH by HCH dehydrochlorinases Lin A1, and LinA2 from Sphingobium indicum B90A. 4. Taxonomic charaterization of sphingobium chinhatense IP26^T, and flavobacterium lindanitolerans IP-10^T isolated from HCH dumpsite.

656. SINGH (Sandeep Kumar)
Pesticide Residue Analysis in Lettuce, Orange and Mango Using Modified QuEChERS Method : Estimation of Precision, Uncertainty and Variability.
Supervisor : Dr. Dileep Kumar Singh
Th 18269

Abstract

In the present study, three matrices i.e., lettuce, Orange and Mango are analyzed by the proposed method at two different temprature conditions and with analyte protectants. The extraction solvent and other analytical steps are suitable for the matrices. The processing efficiency of the eqipment is detemine by the peel sizes of the matrices. The matrix effect (diminishing and enhancement), handling error in chemicals and the improper injection technique are few uncertainty factors which are observed on the recovery of pesticide residues.

Contents

1. Introduction. 2. Literature review. 3. Multiresidue methods. 4. Uncertainly and validation. 5. Matrix effect. 6. Protocol. 7.

Materials. 8. Methodology. 9. Results and discussion. 10. Lettuce. 11. Orange. 12. Mango. Summary.

657. SINGHA (Anjana)
Behavioural Responses of Nezara viridula (L.) (Hemiptera: Pentatomidae) to Certain Host Plants and Efficacy of Neem for its Management.
Supervisor : Prof. A K Singh
Th 18093

Abstract

Present work is undertaken to observe the growth and development of N.viridula on different host plants and on laboratory developed artificial diet. Also, the varied effects of neem on N. viridula are studied under the laboratory conditions. Effect of neem on the feeding behaviour of N. viridula has been presented also the implication of the present findings in the insect pest management has been elaborated.

Contents

658. VASHISTHA (Nidhi)
Buffalo Pituitary Thyrotropin Family of Hormones : Studies on Biochemical Purification, Cloning and Expression.
Supervisor : Prof. K Muralidhar
Th 18268

Abstract

It has obtained a combined reference preparation of buffalo pituitary glycoprotein hormones containing FSH, LH and TSH and develop an in vitro bioassay for buffalo TSH involving measurement of homologous buffalo thyroid follicle cAMP release and procedures to obtain native buffalo pituitary TSH free of LH contamination. Further native, freely occurring and recombinant sbunits with regard to interaction with immobilized Cibacron Blue and derive information on structure-function relationship and clone and express buffalo TSH in *pichia pastoris* expression system and determine the piopotency of the recombinant buffalo TSH.

Contents

1. Review of literature. 2. A combined reference preparation of buffalo pituitary glycoprotein hormones, standerdization of cAMP ELISA and an in vitro bioassay for TSH. 3. Purification of native buffalo thyroid stimulating hormone : novel strategies and an LH free preparation. 4. Cloning, expression and purification of the individual subunits of the buffalo pitutary glycoprotein hormones in the prokaryotic system: a study on subunit interaction with cibacron blue dye. 5. Cloning and expression of buffalo TSH in methylotropic yeast pichia pastoris : biologically active reconbinant hormone. 6. General Summary and Bibliography.

659. VERMA (Mansi)
Targeted Gap Filling of the Genome of Rifamycin Producing Actinobacterium, Amycolatopsis mediterranei S6999 and Exploring Genomic Data of Ninety Actinobacteria for Phylogenetic, Codon Usage and Metabolic Analyses.
Supervisor : Prof. Rup Lal
Th 18266

Abstract

The work presented on genome sequencing of *A.* mediterranei S699 is initiated in the 2004. Initial attempts for sequencing are made using pyrosequencing. Eight runs of pyrosequencing resulted in 1,916,079 reads that accounted for ~18 X coverage of ~10 Mb genome of *A.* mediterranei S699. The hybrid approach of Sanger and pyrosequencing are applied to sequence this genome. The large insert (35-50 kb) and small insert (2 kb and 5 kb) libraries are constructed in SuperCos1 and pUC19, respectively.

Contents

1. Introduction. 2. Hybrid assembly and contig graph generation of the genome of Amycolatopsis mediterranei S699. 3. Targeted gap filling of the genome of amycolapsis mediterranei S699 by primer walks. 4. Genome based phylogeny of class actinobacteria. 5. Codon and amino acid usage patterns in actinobacterial genomes. 6.Metabolic insights into the actinobacterial genomes. 7. List of Publications and Appendix.

660. VERMA (Nandini)
Studies on Post-Transcriptional Silencing of TNF-α, TNF-α Receptors and iNOS Genes.
Supervisor : Prof. Rina Chakrabarti and Prof. Rakha H Das
Th 18091

Abstract

The work is focused on the functional characterization TNF-α, TNF-α receptors and iNOS genes with respect to LPS-induced inflammatory states by post-transcriptional silencing. Macrophages represent the most essential subset of leucocytes involved in innate as well as adaptive inflammatory responses. Macrophages are the primary source of inflammatory mediators which are secreted in response to pro-inflammatory signals. TNF-α is one of the earliest cytokine produced majorly by activated macrophages which execute its multiple cellular effects through its two distinct surface receptors TNF-R1 and TNF-R2. Persistently elevated level of TNF-α has been implicated in sevral inflammatory disorders, the cultured human mylomonocytic cells THP-1 are differentiated into macrphages by PMA and activated by LPS to secrete TNF-α.

Contents

M.Phil Dissertations

661. ANNA SENRUNG
Role of Phytochemicals on the Behavioural Response of Spodoptera Species : A Reivew.
Supervisor : Prof. A K Singh

662. BHARDWAJ (Rich)
Effect of Parental Age on Desiceation Tolerance in Drosophila Melanogaster.
Supervisor : Dr. Mallikarjun Shakarad

663. CASH KUMAR
Role of Mycobacterium Lipase (Lip-D and Lip-Q) in Regulating Macrophage Functions.
Supervisor : Dr. Anju Srivastava

664. INDU KUMARI
Chloriogenin and Egg-Envelope in Fish.
Supervisor : Prof. Neeta Sehgal

665. JITENDRA KUMAR
Endosymbiotic Bacterial Diversity in the Mealybug Maconellicoccus Hirsutus Collected from Different Locations in India.
Supervisor : Dr. Rajagopal Raman

666. JOSE (Anisha)
Isolation of Circulating RNA from the Plasma Samples of Human Cancer Patients.
Supervisor : Dr. Rita Singh

667. MISHRA (Nalini)
Effects of Parental Age on Progency Fitness Traits in Drosophila Melanogaster.
Supervisor : Dr. Mallikarjun Shakarad

668. PANDEY (Neeti)
Molecular Characterization of Aleurocanthus Wolglumi and Its Bacterial Endosymbionts.
Supervisor : Dr. Rajagopal Raman

669. PATHANIA (Geeta Lal)
Characterization of a Strain of Mycobacterium Fortuitum and Studying the Role of Calcium and Calcium Dependent Signaling Pathways in Survival of Mycobacteria.
Supervisor : Dr. Shibnath Mazumdar

670. RAWAL (Vagisha)
Bioactivity of Datura SPP (Solanoles Solanaceae) on Insects : A Review.
Supervisor : Prof. A K Singh

671. SABZAR AHMAD
Effect of Ionizing Radiation on Protein Profile of Prostatic Ejaculatory Duct of Reproductive Tract of Mole Spodoptera Litura (Fabr).
Supervisor : Prof. R K Seth

672. SALAM (Kiran Kumar)
Studies on the Genetic Variability of Ades Aegypti in Delhi Using MtCOL Gene as the Molecular Marker.
Supervisor : Dr. D K Singh

673. SHARMA (Pratima)
Reproductive Physiological Profiling of PMSG in Swiss Mice.
Supervisor : Prof. K Muralidhar

674. SINGH (Khushboo)
Diversity of 16 S r DNA and Ammonia - Oxidising Bacteria of Yamuna River Soil of Delhi.
Supervisor : Dr. D K Singh

675. SINGH (Om Prakash)
Biological Clock in Fish.
Supervisor : Prof. Neeta Sehgal

676. THINGREILAQ MUINAO
Effect of Follice Stimulating Hormone on Hematopoietic Cell Kinase (HCK) in Rat Ovarian Follicles.
Supervisor : Dr. Rita Singh